

**MOVING TOWARDS SUSTAINABLE COASTAL DEVELOPMENT IN SOUTH
ASIA BY LINKING COASTAL CLIMATE CHANGE ADAPTATION WITH
INTEGRATED COASTAL ZONE MANAGEMENT THROUGH THE
INSTRUMENTALITY OF LAW**

by

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Submitted in partial fulfillment of the requirements for the degree of Doctor in the
Science of Law

at

Dalhousie University
Halifax, Nova Scotia
December 2013

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Dedicated to My Most beloved Ammamma, the Late Mrs. Lily George

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ABSTRACT

For long, coastal management focused on the sustainable utilization of coastal resources and avoidance and management of conflict, as well as the promotion of complementarities between users. However, with rising sea levels and other climate change impacts, coastal management has become increasingly complex. This thesis investigates the legal instruments underpinning the management of coastal zones, exploring the concept of sustainable coastal development (SCD) and the relevance of the integrated coastal zone management (ICZM) process. Specifically, the discourse analyzes how law and legal regimes play a backbone role in strengthening and supporting ICZM implementation by facilitating the linkage between ICZM and coastal climate change adaptation (CCCA) to contribute to SCD.

Countless reports and studies testify that several of the world's coastal regions have already and will continue to be detrimentally impacted by sea level rise (SLR) and climate change. One of the major theaters where these impacts will be most acute is South Asia, where vast populations are crowded into low-lying coastal areas. Most of the residents in these zones are economically constrained and have poor adaptive capacities, leaving them particularly vulnerable to climate change and SLR. Accordingly, operationalizing ICZM and linking it with CCCA is vital to these coastal communities, as is enacting and reengineering their coastal laws to affect the linkage. However, given the magnitude of the problem and the inability of most of the South Asian coastal countries to be able to respond singularly to the challenges there is an urgent need for greater regional co-operation. Drawing on the experiences of other coastal countries and regions, certain core principles that can inform coastal law-making for South Asia are identified. The idea is that these principles when set in a regional level instrument (in the instant case, the South Asian Seas Action Plan), will not only go a long way to strengthen regional cooperation, but also, and more importantly, will help coastal countries develop their respective coastal laws by effectuating the linkage between ICZM and CCCA implementation. This reform agenda has significant potential to facilitate the move towards SCD.

LIST OF ABBREVIATIONS USED

AF	Adaptation Fund
AFB	Adaptation Fund Board
AR4	IPCC Fourth Assessment Report
AR5	IPCC Fifth Assessment Report
BAP	Bali Action Plan
Barbados CZMA	<i>Coastal Zone Management Act, 1998</i>
Belize CZMA	Belize Coastal Zone Management Authority
BOBLME	Bay of Bengal Large Marine Ecosystem Project
CAF	Cancun Adaptation Framework
CBD	<i>United Nations Convention on Biological Diversity, 1992</i>
CBD	<i>Convention on Biological Diversity, 1992</i>
CC&CRMA	<i>Coast Conservation and Coastal Resource Management Act, 2011</i>
CCA	<i>Coast Conservation Act, 1981</i>
CCCA	Coastal Climate Change Adaptation
CDA	Coast Development Authority
CDM	Clean Development Mechanism
CDS	Coastal Development Strategy, 2006
CFCs	Chlorofluorocarbons
CMAAs	Coastal Management Areas
CMP	Coastal Management Programme
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CMZ 2008	<i>Draft Coastal Management Zone Notification, 2008</i>
CO ₂	Carbon dioxide
COPs	Conferences of the Parties
CRZ	Coastal Regulation Zone
CRZ 1991	<i>Coastal Regulation Zone Notification of 1991</i>
CRZ 2011	<i>Coastal Regulation Zone Notification of 2011</i>
CVCAAs	Critically Vulnerable Coastal Areas

CZ&CRMP	Coastal Zone and Coastal Resource Management Plan
CZM	Coastal Zone Management
CZMA	<i>Coastal Zone Management Act, 1972</i>
CZMP	Coastal Zone Management Programmes
CZMPs	CZM Plans
CZMS	Coastal Zone Management Subgroup
CZP	Coastal Zone Policy 2005
EEZ	Exclusive Economic Zone
EIA	Environmental impact assessment
EMCA	<i>Environmental Management and Co-ordination Act, 1999</i>
EPPA	<i>Environmental Protection and Preservation Act of Maldives, 1993</i>
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GCF	Green Climate Fund
GEF	Global Environment Facility
GHGs	Greenhouse Gases
HRM	Halifax Regional Municipality
HTL	High-tide Line
HWM	High Water Mark
ICM	Integrated Coastal Management
ICM Act	<i>National Environmental Management: Integrated Coastal Management Act, 2008</i>
ICOM	Integrated Coastal and Ocean Management
ICZM	Integrated Coastal Zone Management
ICZMP	Integrated Coastal Zone Management Plan
IMCAM	Integrated Marine and Coastal Area Management
IPCC	Intergovernmental Panel on Climate Change
JLG	Joint Liaison Group
LCPs	Local Coastal Programmes
LDCs	Least Developed Countries

LIEDA	Lasbela Industrial Estates Development Authority
LME	Large Marine Ecosystem
LOMAs	Large Ocean Management Areas
LOSC	<i>United Nations Convention on the Law of the Sea, 1982</i>
LTL	Low-tide Line
LULUCFG	Land Use, Land-use Change and Forestry Guidelines
LUP	Land Use Plan
MAF	Million Acre Feet
MAP Phase II	Action Plan for the Protection of the Marine Environment and the Sustainable Development of the Coastal Areas of the Mediterranean
MARPOL	<i>International Convention for the Prevention of Pollution from Ships, 1973</i>
MoEF	Ministry of Environment and Forests
MoWR	Ministry of Water Resources
MPAs	Marine Protected Areas
MSP	Marine Spatial Planning
NAPA	National Adaptation Programmes of Action
NCZMA	National CZM Authority
NOAA	National Oceanic and Atmospheric Administration
OCRM	Office of Coastal Resource Management
ODA	Official Development Assistance
RCP	Representative Concentration Pathways
RMA	<i>Resource Management Act, 1991</i>
SAARC	South Asian Association for Regional Cooperation
SACEP	South Asia Co-operative Environment Programme
SASAP	South Asian Seas Action Plan
SBI	Subsidiary Body for Implementation
SBSTA	Subsidiary Body for Scientific and Technological Advice
SCCF	Special Climate Change Fund
SCD	Sustainable Coastal Development

SIDS	Small Island Developing States
Sindh CDAA	<i>Sindh Coastal Development Authority Act, 1994</i>
SLR	Sea Level Rise
SPA	Strategic Priority on Adaptation
SWOT	Strengths, Weakness, Opportunities and Threats
TAR	Third Assessment Report
TCCA	<i>Texas Coastal Coordination Act, 1991</i>
TCMP	Texas Coastal Management Program
TCPLMA	<i>Coastal Public Lands Management Act, 1973</i>
TOBA	<i>Open Beaches Act, 1959</i>
UNCCD	<i>United Nations Convention to Combat Desertification</i>
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	<i>United Nations Framework Convention on Climate Change</i>
UNHCR	Office of the United Nations High Commissioner for Refugees

ACKNOWLEDGEMENTS

It goes without saying that researching and writing a doctoral thesis is a solitary experience, and I would not have been able to complete this journey were it not for the support, wisdom, and blessings from Almighty God, as well as the support of my family, elders, teachers, and friends.

At the outset, I must thank and express my gratitude to the Honourable Judge Sandra E. Oxner, OC, whose generosity and support was integral to allowing my academic career in Canada to progress this far. Also, I am also thankful to the Social Sciences and Humanities Research Council for awarding me the prestigious Vanier Canada Graduate Scholarship; without it, this research would have not been possible.

I am grateful, furthermore, to Professor Aldo Chircop, Chair of my Supervisory Committee, for his keen interest in my research and academic development. The foundation of this thesis has its genesis in his advice and suggestions. As well, his insightful and critical feedback, combined with unparalleled encouragement, has enhanced the quality of this work considerably. I am sincerely thankful for the countless hours he spent with me, patiently discussing my work and engaging me in the process of critical thinking and disciplined legal research and writing. Most of all, I am grateful for his abiding belief in my ability to take on this project—especially at the times when I did not share his conviction. As well, I would like to express my sincere appreciation and gratitude for the assistance and guidance provided to me by Professor Lucia Fanning; her classes on Integrated Coastal Zone Management and critical comments has greatly shaped my understanding of this process. Last, but certainly not least, I am thankful to Professor Meinhard Doelle, another committee member, for his continuous support, invaluable comments, along with his thought-provoking questions and suggestions. Moreover, I have been considerably influenced by his encyclopedic knowledge on climate change law.

At this juncture, I must also recognize the support and intellectual advice I have received from other faculty members at the Dalhousie University, namely, Professor Richard Devlin, Professor David VanderZwaag, Professor Moira L McConnell, Professor Wayne MacKay, and Professor Suzanne Sheffield.

Apart from the faculty, I must acknowledge the kind contributions of the administrative staff at the Dalhousie University for their unfailing support, which made navigation through the administrative labyrinth an effortless process. Special mention, as well, should be made to the help I received at all stages of my doctoral studies from Michelle Kirkwood, Lauri McDougall, Judy Kavanagh, Geordie Lounsbury and Alicia Kirk. The majority of the research materials for this thesis were accessed from the Schulich Law School Library, and, in particular, Darlene Taylor and Anne-Marie White went beyond the call of duty to ensure that I had all the necessary materials for research whenever needed.

This thesis has benefitted immensely from paper presentations I made at the 2010 Coastal Zone Canada Association Conference, the 4th Annual South Asia Legal Studies Pre-

Conference Workshop, Wisconsin University Law School (2010), and the 2012 Schulich School of Law Faculty Seminar Series. Support from Professor Aldo Chircop's SSHRCC Standard Research Grant, "Legislating Integrated Coastal Zone Management", to enable presentation of a research paper at the Coastal Zone Canada 2010 and support for the final year of doctoral work is gratefully acknowledged. Portions of this thesis, furthermore, have been published in peer-reviewed international law journals, and I am immensely grateful for the comments I received from anonymous reviewers.

I must also gratefully acknowledge the academic support in terms of materials and advice I received from Dr. Margaret E. Peloso; Vinson & Elkins LLP; Professor Jane McAdam, Faculty of Law, the University of New South Wales; and, Dr. Rowena Maguire, Faculty of Law, Queensland University of Technology.

My Professors in India have also played significant roles in my academic development. In particular, Professor (Dr.) N.R. Madhava Menon, former Director, National Judicial Academy, and Professor V. Vijayabalan, Former Dean of Law, Mahatma Gandhi University, have been instrumental in shaping my understanding of law and legal research. I am also grateful to the Honourable Justice Roshan Dalvi, High Court of Bombay; Professor K.N. Chandrasekharan Pillai, former Director, Indian Law Institute; Professor N.K. Jayakumar, former Vice-Chancellor National University of Advanced Legal Studies; Professor Ishwara Bhatt, Vice Chancellor, National University of Juridical Sciences; Dr. Kylasnatha Pillay, Senior Advocate, Supreme Court of India; Dr. K.C. Sunny, Dean of Law, University of Kerala; and, to Professor Sunny Mathew, Mar Ivanios College.

I also fondly remember all my teachers right from Sunbeams, Loyola, St. Joseph's, and Mar Ivanios, to Kerala Law Academy Law College, the Kerala University Department of Law, and the National University of Juridical Sciences—all of whom have contributed to my academic development and growth.

As well, I am blessed by a large circle of friends: Sabrina Mackenzie, Jeanette Fleming, Jyothi Mangatt, Heather Wilson, David Dzidzornu, Vu Hai Dang, and Jessel Rodricks. I am eternally in debt to all of them for their support and encouragement.

Finally, I thank my family—my parents and my in-laws, Maya *chechi* and family, my aunts, particularly, Aunt Minny who admirably stepped in to carry out some of my personal obligations, all the boys at “Lily Lynne,” and to all members of the “Puthucherril” extended family. I am at a loss for words to describe my gratitude to my wife, Lekshmi Vijayabalan for her unwavering support and unfaltering tolerance, and to my darling bundle of joy, Miriam George Puthucherril. How can I forget to mention my furry friends, Dougald and Bailey? They have been up along with me for several nights sitting right next to my laptop, observing each and every tap on the keyboard. Once again, a big thank-you to all of you!

CHAPTER 1 INTRODUCTION

1.1 INTRODUCTION

The sea, which had been beating against the shores, suddenly broke the boundary that was imposed on it by nature [and] rushed into the city. It coursed through the streets of the beautiful city, [covering] up everything . . . Even as they were all looking, Arjuna saw the beautiful buildings becoming submerged one by one. Arjuna took a last look at the mansion of Krishna. It was soon covered by the sea. In a matter of a few moments it was all over. The sea had now become as placid as a lake. There was no trace of the beautiful city, which had been the favourite haunt of all the Pandavas. Dwaraka was just a name; just a memory.¹

-The Mahabharata

This poignant passage from an ancient Hindu text is one of the earliest accounts of an entire city in the Indian subcontinent – the Dwaraka of Lord Krishna – being inundated by rising seas.² Similar tales abound in other civilizations, including the biblical deluge³ and the epic of Gilgamesh.⁴ Akin to this swallowing of the Dwaraka by the sea, cataclysmic floods, tsunamis and earthquakes have destroyed cities and towns throughout recorded and pre-recorded history. Examples include the fabled continent of Atlantis,⁵ parts of Cleopatra’s royal quarters off coastal Alexandria,⁶ the seven pagodas at

¹ Bhaktivejanyana Swami, *Ithihaasa: The Mystery of His Story is My Story of History* (Bloomington: AuthorHouse, 2013) at 148.

² TS Subramanian, "Significant finds at Dwaraka", *The Hindu [of India]* (23 February 2007) online: The Hindu <<http://www.thehindu.com/>>. The *Matsyapurana* mentions the story of King Manu who was saved by Lord Vishnu in his *Matsya* Avatar, (fish incarnation) from the *Mahapralaya* (the deluge). *Matsya Mahapurana: An Exhaustive Introduction*, 1st ed, KL Joshi, ed, translated by Board of Scholars, Parimal Sanskrit Series, No 93 (New Delhi: Parimal Publishers, 2007) at 15-40, ver 2.10.

³ See *The King James Version of the Holy Bible*, Genesis, ver 6:5-8:21. In the Book of Genesis, God resolves to send a devastating flood to destroy mankind due to its wicked ways. He commands Noah, the only righteous person on Earth, to build a wooden ark and fill it with males and females of all living creatures. When Noah finished the task and boarded the ark with his family, the heavens opened and it rained for 40 days and nights, after which floodwaters overran the earth, destroying all life except for that on the ark. Once the floodwaters receded, Noah and his brood, both human and non-human, left the ark to repopulate the world. *Ibid*.

⁴ *The Epic of Gilgamesh* (Assyrian International News Agency, Books Online, [nd]) chap 5 at 20, online: AINA, Books, The Epic of Gilgamesh <<http://www.aina.org/>>.

⁵ "Has the real lost city of Atlantis finally been found ... buried under mud flats in Spain?", *MailOnline* (15 March 2011) online: MailOnline <<http://www.dailymail.co.uk/home/index.html>>.

⁶ "Sunken treasure - divers recover the stunning artefacts of Cleopatra’s palace", *Mail Online* (26 May 2010) online: MailOnline <<http://www.dailymail.co.uk/home/index.html>>.

Mahabalipuram,⁷ and the port cities of Muziris,⁸ Pavlopetri,⁹ Dunwich¹⁰ and Port Royal.¹¹ A variety of reasons have been offered for the destruction of these places, ranging from the wickedness of the inhabitants, to retribution spells and curses. These losses have been largely localised and sporadic, having taken place at different times in human history.

Today, with global warming and sea level rise (SLR), we have an impending disaster looming over our heads like the proverbial sword of Damocles. A growing body of scientific evidence confirms that the earth's climate is rapidly changing.¹² In fact, climate change, and in particular its impacts on coastal regions, is fast becoming the biggest challenge ever to confront mankind.¹³

In recent history, the Indian Ocean tsunami of 2004, which was one of the worst natural disasters ever to strike the area, brought the coastal communities of South Asia face-to-face with the destructive power of the sea. On 26 December 2004, a massive underwater earthquake measuring 9.3 on the Richter scale, with its epicenter off the western coast of northern Sumatra, triggered a tsunami. Within hours, the wave was cutting a deadly path across two continents, killing nearly 300,000 people.¹⁴ The worst affected countries were Indonesia, Sri Lanka, India, the Maldives and Thailand. Entire coastal communities were wiped out, and in certain places the waves reached three

⁷ TS Subramanian, "The secret of the Seven Pagodas", *Frontline [of India]* 22:10 (20 May 2005) online: Frontline, Archive Search <<http://www.frontline.in/>>.

⁸ Pankaja Srinivasan, "In search of Muziris", *The Hindu [of India]* (8 August 2012) online: The Hindu <<http://www.thehindu.com/>>.

⁹ See generally *The Pavlopetri Underwater Archaeology Project*, online: UK Campus <<http://www.nottingham.ac.uk/pavlopetri/index.aspx>>.

¹⁰ "Underwater city could be revealed", *BBC News* (14 January 2008) online: BBC News <<http://www.bbc.co.uk/>>.

¹¹ *The Underwater City of Port Royal: Description*, online: UNESCO <<http://whc.unesco.org/en/tentativelists/5430/>>.

¹² The IPCC concludes that "[w]arming of the climate system is unequivocal." Core Writing Team, Rajendra K Pachauri & Andy Reisinger, eds, *Climate Change 2007: Synthesis Report* (Geneva: Intergovernmental Panel on Climate Change, 2008) at 30.

¹³ "We underline that climate change is one of the greatest challenges of our time". See UNFCCC, *Draft decision -/CP.15: Proposal by the President: Copenhagen Accord*, FCCC/CP/2009/L.7 (18 December 2009) ¶1.

¹⁴ The Indian Ocean tsunami is one of the worst natural disasters in recorded human history. See generally Hope Lewis, "Human Rights and Natural Disaster The Indian Ocean Tsunami" (2006) 33 Hum Rts 12 (HeinOnline). The killer waves wrecked the coastlines of several countries spread over a vast geographical area in the Indian Ocean that stretched out from the Indonesia in far South East Asia, spread over large parts of coastal South Asia, right up to Somalia in the African continent.

kilometers inland.¹⁵ Over 1.7 million were displaced, and economic losses exceeded USD10 billion.¹⁶ In South Asia, the tsunami primarily hit Sri Lanka, India and the Maldives. Sri Lanka suffered damage to nearly two-thirds of its coastline, lost 35,322 lives, and was left with 853,025 displaced persons.¹⁷ The total loss in assets was about USD1 billion or nearly five per cent of its GDP.¹⁸ In India, the southeastern coastline bore the brunt of the damage, which left nearly 12,500 dead and 647,600 displaced.¹⁹ In the Maldives, the main damage was to water sources and infrastructure, setting the struggling developing country back by several decades.

Even though the Indian Ocean tsunami is not *per se* related to climate change and SLR, the consequent response by the affected countries in the South Asian region is a stark and vivid example of how unorganised nations in this region are in dealing with the impacts of mass disasters in coastal areas, in this case climate change and SLR. Even after the enactment of new responsive mechanisms, it is doubtful whether these countries are still able to respond to emerging challenges.²⁰ In fact a few years later, in 2007, Super Cyclone Sidr swept across the southwest coast of Bangladesh, leaving 3,406 people dead and close to nine million people affected.²¹ The cyclone first struck the Sunderban mangrove forests, a fortunate happenstance, which considerably reduced the storm's intensity before it reached the populated areas.²² A year later, Cyclone Nargis hit

¹⁵ Prema-chandra Athukorala, "Disaster, Generosity and Recovery: Indian Ocean Tsunami", Working Paper No 2012/04 (Canberra: Working Papers in Trade and Development, Australian National University, 2012) at 5.

¹⁶ John Telford, John Cosgrave & Rachel Houghton, *Tsunami Evaluation Coalition: Joint Evaluation of the International Response to the Indian Ocean Tsunami: Synthesis Report* (London: Tsunami Evaluation Coalition, 2006) at 16-17.

¹⁷ International Federation of Red Cross and Red Crescent Societies, *Legal Issues from the International Response to the Tsunami in Sri Lanka: An International Disaster Response Laws, Rules and Principles (IDRL) Programme Case Study* (2006) at 4.

¹⁸ Shamalie Gunawardana, "Legal and Governance Issues of the Tsunami Disaster – The Sri Lankan Experience" in C Raj Kumar & DK Srivastava, eds, *Tsunami and Disaster Management: Law and Governance* (Hong Kong: Sweet & Maxwell Asia, 2006) 227 at 228.

¹⁹ *Tiding over Tsunami - Part I* (Tamil Nadu: India, 2005) at 14.

²⁰ See UNISDR, Press Release, UNISDR 2009/24, "Five years after the Indian Ocean Tsunami – are we better prepared and more resilient to disasters?" (24 December 2009).

²¹ Bangladesh, *Cyclone Sidr in Bangladesh Damage, Loss, and Needs Assessment for Disaster Recovery and Reconstruction* (Bangladesh: Economic Relations Division, 2008) at 4.

²² *Ibid* at 5.

Irrawaddy Delta and southern Yangon in Myanmar, leaving 140,000 people dead and 2.4 million severely affected.²³

The increasing frequency and ferocity of disasters and extreme weather events, points to something out of the order in the natural regulation of the earth's climate.²⁴ All these events have brought the issue of climate change out of science journals and movies and into the realm of public consciousness and debate.²⁵

There is now overwhelming and demonstrable scientific evidence that supports the conclusion that the earth is warming at alarming and unprecedented levels. As the Fifth Assessment Report (AR5) notes “[w]arming of the climate system is unequivocal ... The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen ...”²⁶ These phenomena cannot be accounted for by natural climate variability alone and human activity, particularly the burning of fossil fuels and deforestation processes, appears to be the main contributing factor. The *United Nations Framework Convention on Climate Change* 1992²⁷ (UNFCCC) also recognises human contribution in this phenomenon, defining climate change as

²³ “FACTBOX-Key facts about Cyclone Nargis, Reuters” (30 April 2009) online: REUTERS <<http://www.reuters.com/>>.

²⁴ Hurricane Katrina, a category five hurricane that all but destroyed New Orleans, became the costliest natural disaster to strike the United States. See Casey P Kaplan, “The Act of God Defense: Why Hurricane Katrina & Noah’s Flood Don’t Qualify” (2007) 26 Rev Litig 155 at 156 (QL); see also Staff Reporter, “Climate change-triggered high sea level led to more damage in Japan: Pachauri”, *The Hindu [of India]* (23 March 2011) online: The Hindu <<http://www.hindu.com/>>.

²⁵ Kevin Costner’s 1995 film *Waterworld* is a futuristic vision of the polar ice caps having completely melted and “the earth lying beneath the watery grave”. The survivors managed to adapt to the new water world, living in rusty vessels while searching for a mythical place called “dry land.” *Waterworld*, 1995, DVD: (New York: Universal Pictures, 1995). *The Day After Tomorrow* (2004) is a film in a similar vein that gave audiences a chilling visualization of the possible catastrophic consequences of global warming. *The Day After Tomorrow*, 2004, DVD: (Santa Monica: California, Lions Gate Films, 2004). While climatologists were pleased to see Hollywood dealing with such a critical issue, these movies were criticised for their inaccurate description of the science of climate change and for their melodramatic scenes. This cleared the path for documentaries such as *An Inconvenient Truth*, acclaimed for its articulation of the science of climate change by former United States Vice-President Al Gore. *An Inconvenient Truth*, 2006, DVD: (LA: California, Paramount Pictures, 2006). The documentary highlighted the environmental impacts of climate change and the disastrous consequences of non-action. It also explored what can be done to protect the planet for present and future generations.

²⁶ “Summary for Policymakers” in Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Climate Change 2013: The Physical Science Basis, at SPM-3, online: IPCC <<http://www.climatechange2013.org/>>.

²⁷ *United Nations Conference on Environment and Development: Framework Convention on Climate Change*, 19 June 1993, 31 ILM 849 (adopted at New York on 9 May 1992) [UNFCCC].

a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.²⁸

This study examines the effects of SLR and climate change on coastal areas, ecosystems and communities, analysing the central role that law can play in supporting integrated coastal zone management (ICZM) and in drawing linkages with coastal climate change adaptation (CCCA). It will examine how laws can respond to the multi-dimensional problems confronting degraded coastlines and to climate change-related impacts, thereby moving us towards sustainable coastal development (SCD).²⁹ And in this regard, this study uses a South Asian coastal context to demonstrate the importance of law in supporting ICZM. Coastal South Asia is made up of five countries: India (which has the largest coastline in South Asia), Pakistan, Bangladesh, Maldives, and Sri Lanka. While India, Pakistan and Bangladesh are situated on the Asian mainland and almost encircle the northern portion of the Arabian Sea and the Bay of Bengal, the Sea and the Bay are separated by the downward-protruding, triangular-shaped Deccan plateau, which establishes India's coastline.³⁰ The Maldives and Sri Lanka are island nations in the

²⁸ *Ibid*, art 1.2.

²⁹ See generally Biliana Cicin-Sain, "Sustainable Development and Integrated Coastal Management" (1993) 21 *Ocean & Coast Mgmt* 11. For a detailed discussion on the importance of ICZM and the role played by law in supporting ICZM, see also chs 3 & 4.

³⁰ It can be argued that the Bay of Bengal and the Arabian Sea are semi-enclosed seas. Article 122 of the LOSC defines "enclosed or semi-enclosed sea" to mean "a gulf, basin or sea surrounded by two or more States and connected to another sea or the ocean by a narrow outlet or consisting entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal States." See *United Nations Convention on the Law of the Sea*, 10 December 1982, 1833 UNTS 3, 21 ILM 1261 (entered into force 1994). A perusal of the terms reveals that the article contemplates two elements. The first focuses on the geographical nature of the ocean space, while the second is on the jurisdictional element. The use of the term "or" points out that these elements are mutually exclusive, independent of each other. From the article, it is clear that the connection between the gulf, basin or sea with another sea or ocean has to be through a narrow outlet, which is not so in the case of both the Arabian Sea and the Bay of Bengal. Thus, it can be argued that this Sea and the Bay are not semi-enclosed seas. Lewis M Alexander, "Regionalism and the Law of the Sea: The Case of Semi-enclosed Seas" (1974) 2 *Ocean Devel & Int'l L* 151 at 157. However, the second element conceives of the area as "consisting entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal States." In the case of the Bay of Bengal, the territorial seas and exclusive economic zones of both India (on the eastern side of India), Bangladesh and Myanmar are either entirely or *primarily* within the Bay of Bengal. Similar is the case of the Arabian Sea, where Pakistan, India (western portion) and the sultanate of Oman have their territorial seas and exclusive economic zones in the Arabian Sea. Accordingly, it can be argued that both the Arabian Sea and the Bay of Bengal are semi-enclosed seas. Such a classification is pertinent as it requires states bordering an enclosed or semi-enclosed sea to co-operate with each other in the exercise of

Indian Ocean and are situated close to the Indian mainland.



Figure 1 Coastal South Asia³¹

their rights and in the performance of their duties under the LOSC, article 123 calls upon states bordering an enclosed or semi-enclosed sea to co-operate with each other on matters like protection and preservation of the marine environment, scientific research, and the management, conservation, exploration and exploitation of living resources. Satya N Nandan & Shabtai Rosenne, eds, *United Nations Convention on the Law of the Sea 1982: A Commentary* vol 3 (The Hague: Martinus Nijhoff, 1995) at 343-68.

³¹ Created by Jennifer Strang, GIS Analyst, Dalhousie University, with inputs from the author.

This introduction has two sections. The first explains the nature and scope of this study while the second outlines the research questions and also sets out the road map.

1.2 NATURE AND SCOPE

Coasts represent transitional zones where the land meets the sea and where the landward side is, in large part, determined by the influence exerted by the ocean and *vice versa*.³² Due to this land-sea interface, and the moon's gravitational pull, which leads to oscillation of coastal oceanic waters (the tides), the coastal zone represents a complex and dynamic ecosystem. It encompasses some of the world's most unique biodiversity and economic resources, and includes estuaries, wetlands, mangroves, salt marshes, lagoons, deltas, coral reefs, aquifers and sea grass beds.³³ The largest human populations are also found in coastal regions,³⁴ as is a wide range of economic activities, most of which cannot

³² International Law Association, *Sofia Conference (2012): Baselines Under the International Law of the Sea* at 5, online: International Law Association <<http://www.ila-hq.org/en/committees/index.cfm/cid/1028>> [ILA, *Sofia Conference*].

³³ Charles T O'Reilly, Donald L Forbes & George S Parkes, "Defining and Adapting to Coastal Hazards in Atlantic Canada: Facing the Challenge of Rising Sea Levels, Storm Surges, and Shoreline Erosion in a Changing Climate" in Aldo Chircop & Moira McConnell, eds, *Ocean Yearbook*, 19 (Chicago: The University of Chicago Press, 2005) 189 at 189.

³⁴ UNEP, *Global Environment Outlook GEO₄ Environment for Development* (UNEP, 2007) at 128 (noting that over 60 per cent of the global population lives within 100 kilometres of the coastline). In China, nearly 100 million people moved from inland to the coastal areas in the last 20 years. See Richard J Nicholls & Poh Poh Wong, "Coastal Systems and Low-Lying Areas" in ML Parry et al, eds, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2007) 315 at 345. It is estimated that, even though coastal zones cover only 15 to 20 per cent of the earth's total land surface, more than 50 per cent of the world's population lives within 100 kilometers of the shoreline, a figure that is slated to rise to 75 per cent by 2020. Luitzen Bijlsma et al, eds, *Preparing to Meet the Coastal Challenges of the 21st Century: Conference Report World Coast Conference 1993* (The Netherlands: Ministry of Public Works and Water Management, April 1994) at 13. It is estimated that at the global level more than half the world's population lives within 60 kilometers of the shoreline, and this could rise to three quarters by 2020. Nicholas A Robinson, ed, *Agenda 21 & The UNCED Proceedings*, vol 4, 3rd series, International Protection of the Environment (New York: Oceana Publications, Inc, 1993) at 307, ch 17, ¶17.3; GESAMP (IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) & Advisory Committee on Protection of the Sea, *A Sea of Troubles*, Rep Stud GESAMP No 70 (2001) at 19. Nearly three billion humans, more than half of the world's population live within 60 kilometers of the shoreline. Robert F Blomquist, "Virtual Borders? Some Legal-Geo-Philosophical Musings on Three Globally Significant Fragile Ecosystems under United Nations Agenda 21" (1997) 45 Clev St L Rev 23 at 28

be replicated elsewhere.³⁵ Indeed, coastal areas and resources play a critical role in the economies of virtually all nations that border the sea.³⁶

People continue to gravitate from inland areas to coastal regions in search of improved living standards and economic opportunities,³⁷ and many rural coastal areas being urbanized and small cities and towns are transforming into mega-coastal cities.³⁸ In fact, coastal urbanisation has become one of the most critical issues facing the planet. Due to this massive human presence, there is a proliferation of construction and built-up

(QL). The estimates vary because there is no uniform criterion to determine in exact terms the 'coastal zone'.

³⁵ Coastal and ocean activities contribute more than one trillion dollars to America's GDP. US, Department of State, *U.S. Climate Action Report 2010* (Washington: Global Publishing Services, 2010) at 90. Washington Ochola, "The Future Today" in UNEP, *Africa Environment Outlook 2: Our Environment, Our Wealth* (Nairobi: UNEP, 2006) 412 at 471. For instance, it is estimated that around 20 million people or 22.6 per cent of the total population of Nigeria, live in the coastal zone. In Senegal, around 4.5 million people or 66.6 per cent of the total population live in the coastal zone around Dakar, where approximately 90 per cent of industry is located. Similarly, in Benin, Côte d'Ivoire, Ghana, Nigeria, Sierra Leone and Togo, most economic activities, take place in the coastal zone. *Ibid.*

³⁶ J Dronkers et al, eds, *Report of the Coastal Management Subgroup: Strategies for Adaption to Sea Level Rise* (Geneva: IPCC, Response Strategies Working Group, 1990) at 1.

³⁷ Even though the Metropolitan area of Buenos Aires has only 0.1 per cent of the land mass of the country, it accommodates 31.6 per cent of the total population and the mean density is 2,995 per square kilometer. Within this narrow territory, 45 per cent of the manufacturing industries, 38 per cent of commercial establishments, 39 per cent of the financial institutions are located and it contributes nearly 40 per cent of the Gross national product. See generally José R Dadon & Silvia D Matteucci, "Coastal Zone Management in Buenos Aires, Argentina" in Aldo Chircop, Scott Coffen-Smout & Moira McConnell, eds, *Ocean Yearbook*, vol 23 (Leiden: Martinus Nijhoff Publishers, 2009) 361. Istanbul, the largest coastal city in Turkey, had a growing population of about 11 million in 2000. The population density was 2,107 people per square kilometer. Also, Istanbul contributes 21 per cent of the GDP. See Turkey, Ministry of Environment & Forestry, *First National Communication of Turkey on Climate Change Under the United Nations Framework Convention on Climate Change* (Ankara: Ministry of Environment & Forestry, 2007) at 167.

³⁸ Chua Thia-Eng, *The Dynamics of Integrated Coastal Management: Practical Applications in the Sustainable Coastal Development in East Asia* (Quezon City: GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas, 2006) at 20 [Thia-Eng, *Dynamics of Integrated Coastal Management*]. Rapid urbanization will lead to more coastal cities becoming mega-cities containing 10 million or more people. Already, 13 of the world's 20 megacities are coastal and nearly 700 million people live in low lying coastal areas that is less than 10 meters above sea level. In West Africa, the 500 kilometers of coastline between Accra (Ghana) and the Niger delta (Nigeria) will become a continuous urban megalopolis that will house more than 50 million inhabitants by 2020. IOC/UNESCO et al, *A Blueprint for Ocean and Coastal Sustainability* (Paris: IOC/UNESCO, 2011) at 9; see also UN Habitat, *State of the World's Cities 2008/2009: Harmonious Cities* (Sterling: Earthscan, 2008) at xv (at the global level, nearly 60 per cent of the world's population which live in low-elevation coastal zones are urban). The Brundtland Report points out that "the future will be predominantly urban and the most immediate environmental concerns of most people will be urban ones." World Commission on Environment & Development, *Our Common Future* (Oxford: Oxford University Press, 1987) at 255. More than 60 per cent of the global population lives within 100 kilometers of the coastline, and 21 of the world's 33 mega-cities are located in the coastal zones of developing countries. UNEP, *Global Environment Outlook GEO₄ Environment for Development* (UNEP, 2007) at 346.

area along the water's edge. Industries, power plants and transportation corridors are entrenched on the coastal fringes, spewing dangerous chemicals and heavy metals, and facilitating the introduction of invasive species into coastal waters.³⁹ The increasing urbanization of coastal areas and the subsequent demand for more amenities engenders a series of environmental and natural resource management problems, such as squatter settlements, overcrowded makeshift housing,⁴⁰ lack of potable water,⁴¹ improper sanitation facilities,⁴² unscientific garbage disposal, untreated sewage,⁴³ and diseases.⁴⁴ In

³⁹ See generally Tony George Puthucherril, "Ballast Waters and Aquatic Invasive Species: A Model for India" (2008) 19 *Colo J Int'l Env'tl L & Pol'y* 381. The increasing volumes of trade and shipping and the ever-increasing connectivity of ports and harbors spread invasive species. IUCN, "Intentional introductions" *Marine Menace: Alien Invasive Species in the Marine Environment* (Switzerland: IUCN, 2009) at 11. Fish in the Persian Gulf contain as much as 3.9 parts per million (dry weight) of methyl mercury while dolphins in the Mediterranean have more than 2,200 parts per million of mercury and 770 of selenium. These levels are 1,500 times higher than what is safe for human consumption. Oceana, *Oceans in Danger* (June 2004) online: Oceana <<http://oceana.org/en>>.

⁴⁰ Coastal Mumbai is the seventh largest city in the world with the fifth fastest rate of population growth. However, over half its population, live in abject poverty, crammed into over-crowded slums and hutments located in unhealthy marginal environments. Greg O'Hare, Dina Abbott & Michael Barke, "A Review of Slum Housing Policies in Mumbai" (1998) 15:4 *Cities* 269–83 (ScienceDirect).

⁴¹ In Cyprus and in the Gaza Strip, groundwater quality has been affected by increasing salinity levels as a result of saltwater intrusion into coastal aquifers. In the coastal cities of Chennai in India, Shanghai, and Tianjin in China, excessive groundwater abstraction is resulting in falling water tables, water quality degradation and land subsidence. World Water Assessment Programme, *Managing Water under Uncertainty and Risk*, vol 1, The United Nations World Water Development Report 4 (Paris: UNESCO, 2012) at 66, 94.

⁴² For instance, in Buenos Aires, even though the Autonomous City provides all the residents with drinking water and sewerage service, the reality is that only 37 per cent have drinking water and 20 per cent have sewer services in the peripheral counties. Dadon & Matteucci, *supra* note 37 at 371. The number one factor contributing to the pollution of major river systems and the Manila Bay in Philippines are shanties and other unauthorized structures that do not have septic tanks. *Metropolitan Manila v Concerned Residents of Manila Bay, represented and joined by Divina v Ilas*, (2008), GR Nos 171947-48 (Phil SC), online: Supreme Court of the Philippines, Jurisprudence, December 18, 2008, GR No 171947-48 <<http://sc.judiciary.gov.ph/#>> [*Metropolitan Manila*].

⁴³ Nearly 60 per cent of the waste water discharged into the Caspian Sea is untreated, in Latin America and the Caribbean it is close to 80 per cent, and in large parts of Africa and the Indo-Pacific, the proportion is as high as 80–90 per cent. USD56 billion is needed annually to address this enormous waste water problem. C Nellemann, S Hain & J Alder, eds, *In Dead Water: Merging of Climate Change with Pollution, Over-harvest, and Infestations in the World's Fishing Grounds* (Arendal: UNEP GRID-Arendal, 2008) 42. See generally UNEP, *Marine Litter: A Global Challenge* (UNEP: Nairobi, 2009); see also Mary Schumacher & Porter Hoagland, "The Protocol Concerning Pollution from Land-Based Sources and Activities in the Wider Caribbean Region: A Breakthrough for the Caribbean, But How Closely Should Others Follow Their Lead?" in Elisabeth Mann Borgese, Aldo Chircop & Moria McConnell, eds, *Ocean Yearbook*, vol 16 (Chicago: University of Chicago Press, 2002) 496 at 504-5 (explaining the impacts of coastal sewage discharge).

⁴⁴ People living in small island developing states, coastal and polar regions are particularly vulnerable. World Health Organization, *Protecting Health from Climate Change: World Health Day 2008* (Geneva: WHO Press, 2008) at 14. SLR and higher temperatures will lead to the resurgence of malaria and new mosquito-borne diseases like dengue fever. Robin Kundis Craig, "A Public Health

addition to these problems, the resilience of coastal ecosystems habitat is further reduced⁴⁵ by uncontrolled felling of mangroves,⁴⁶ extraction of beach sand,⁴⁷ filling, draining and conversion of wetlands for agriculture, aquaculture and infrastructural projects,⁴⁸ coral mining,⁴⁹ and upstream diversion of waters (which impairs freshwater flows into estuaries and diminishes the quantity of river-borne sediments into coastal deltas).⁵⁰ The growing number of dead zones near coastal waters, eutrophication and algal blooms are symptomatic of the ills that currently plague coastal zones.⁵¹

It also goes without saying that coastal ecological systems provide a myriad of services to human societies, more importantly, free ecological services like storm surge

Perspective on Sea-Level Rise: Starting Points for Climate Change Adaptation” (2010) 15 Widener L Rev 521 at 531(QL).

⁴⁵ Estuaries are the hardest hit among the various habitats. Tom Garrison, *Oceanography: An Invitation to Marine Science*, 4th ed (California: Brooks/Cole Thomson Learning, 2002) at 479. India lost half of its mangrove forests between 1963 and 1977. *Ibid* at 480; see also US Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century: Final Report* (Washington, DC, 2004) at 170 (since the arrival of the early settlers, US has lost nearly 110 million acres of its wetlands).

⁴⁶ Africa has lost about 500,000 hectares of mangroves over the last 25 years, the primary causes being conversion of land for rice production and coastal infrastructure, and to a lesser extent cutting of wood for poles and for fuel wood. See FAO, *The World's Mangroves 1980-2005*, FAO Forestry Paper 153 (Rome: FAO, 2007) at 18.

⁴⁷ LK Sekhar & SK Jayadev, “Karimanal (Mineral Beach-Sand) Mining in the Alappuzha Coast of Kerala – A People’s Perspective” (Paper delivered at the Third International Conference on Environment and Health organised by the Department of Geography, University of Madras and Faculty of Environmental Studies, York University, India (15 December 2003) [unpublished].

⁴⁸ Nearly two-thirds of all European wetlands have been lost since 1900, and that in Indonesia more than 90 per cent of Java and Bali’s historical wetlands was lost or was converted for agriculture or aquaculture. Royal C Gardner, “Rehabilitating Nature: A Comparative Review of Legal Mechanisms That Encourage Wetland Restoration Efforts” (2003) 52 Cath U L Rev 573 at 574.

⁴⁹ Among different local pressures, overfishing including destructive fishing is the most pervasive immediate threat, affecting more than 55 per cent of the world’s reefs. This is followed by coastal development and watershed-based pollution, each threatening about 25 per cent of reefs. Marine-based pollution and damage from ships threaten 10 per cent of reefs. Lauretta Bruke et al, *Reefs at Risk Revisited* (Washington, DC: World Resources Institute, 2011) at 3; see also *Coral Reef Mining, Harvesting and Trade: Undermining the Future Value of Coral Reefs?*, online: Coral Reef Alliance <<http://www.coral.org/files/pdf/briefs/coralmining.pdf>>.

⁵⁰ As a result of construction of the Aswan High Dam and other dams on the Nile, the amount of sediment reaching the delta has reduced significantly. The delta coastline is eroding by up to 5-8 meters per year, and in certain places this exceeds 240 meters per year. Again, dams have reduced the quantity of sediment transported by the Rhone River to the Mediterranean from 12 million tons to four to five million tons presently leading to erosion rates of up to five meters per year for the beaches. Commission on Dams, *Dams and Development A New Framework for Decision-Making* (London: Earthscan Publications Ltd, 2000) at 81. Damming and withdrawal causes salinization of estuarine land. In Bangladesh, the livelihoods and nutrition requirements of up to 30 million people have been affected because of stream-flow modifications. Reduced sediment discharge to coastal areas is increasing the vulnerability of low-lying coastal communities to inundation. UNEP, *Global Environment Outlook: Geo4 Environment for Development* (Malta: UNEP, 2007) at 130.

⁵¹ The number of dead zones increased from 149 in 2003 to over 200 in 2006. Nellemann, Hain & Alder, eds, *supra* note 43 at 9.

protection, filtration of effluents, etc. Too often, without realising the importance of these services, these are destroyed and subsequently the functions that these ecosystems provide are sought to be replicated through expensive technological interventions. And these technological interventions do not always provide the functions with the same efficiency as those provided by natural systems which were in harmony with the surrounding ecology.

In addition to the above-listed problems, over-fishing is depleting fishery stocks in many coastal waters.⁵² This is having a profoundly negative effect on the economies of several traditional coastal communities, particularly in developing countries as they are heavily dependent on artisanal fishing, subsistence farming, traditional aquaculture, and gathering produce from coastal forests.⁵³ Due in large part to globalization and the implementation of neo-liberal market-based development policies in certain coastal regions, coastal communities are increasingly being boxed into small parcels as their lands and common property resources are appropriated for developmental projects and for special economic zones.⁵⁴ Poverty aggravates the problem of coastal resources depletion as these impoverished communities rely increasingly on deleterious methods for resource extraction, like cyanide and dynamite fishing,⁵⁵ destructive fishing gear,⁵⁶

⁵² In 2008, nearly 45 million people were directly engaged in capture fisheries or aquaculture and that at least 12 per cent were women. This number represents a 167 per cent increase compared to the 16.7 million people engaged in 1980. Although, capture fisheries continue to provide the maximum number of jobs, its share of employment has stagnated or decreased as a result of the decline in fish stocks caused by overfishing and habitat destruction. UNGA, *Oceans and the Law of the Sea: Report of the Secretary-General, Addendum*, 66th Sess, A/66/70/Add.2 (2011) at 33.

⁵³ See generally J Campbell, E Whittingham & P Townsley, “Responding to Coastal Poverty: Should we be Doing Things Differently or Doing Different Things?” in Chu Thai Hoanh et al eds, *Environment and Livelihoods in Tropical Coastal Zones: Managing Agriculture–Fishery–Aquaculture Conflicts* (Oxon: CAB International, 2006) 274 (providing overview of the impact of poverty on coastal communities and utilizes the sustainable livelihoods approach to reduce coastal poverty).

⁵⁴ Nowhere is the phenomenon more at play than in the Indian coastline. See Sandip Roy, “SEZs: The war on India’s coast” *Firstpost* (28 November 2011) online: Firstpost <<http://www.firstpost.com/>>. In the guise of establishing special economic zones, coastal lands are being appropriated by large business houses often with state connivance. *Ibid*; see also Anupam Chakravarty, Gujarat High Court halts work at Mundra SEZ”, *Down to Earth* (9 May 2012) online: Down to Earth <<http://www.downtoearth.org.in/>>.

⁵⁵ Sue Wells, “Dynamite Fishing in Northern Tanzania – Pervasive, Problematic and yet Preventable” (2009) 58 Mar Pollution Bull 20 (ScienceDirect) (despite a ban since 1970s in Tanzania, this practice still continues).

⁵⁶ FAO & UNEP, *Report of the FAO/UNEP Expert Meeting on Impacts of Destructive Fishing Practices, Unsustainable Fishing, and Illegal, Unreported and Unregulated (IUU) Fishing on Marine Biodiversity and Habitats, Rome, 23–25 September 2009*, FAO Fisheries and Aquaculture

and clearing mangrove forests for wood.⁵⁷ In turn, these practices further deplete the resource base⁵⁸ and often lead to conflicts between stakeholders. With coastal populations expected to double or even triple in the coming decades, development and claims to resources are expected to intensify, placing unprecedented pressures on coastal areas and resources.⁵⁹

In short, coastal and marine ecosystems are in a precarious state and the coastline is under siege by a multitude of threats.⁶⁰ Nevertheless, all of these challenges pale in comparison to accelerated SLR and other climate change impacts. Given the overall degraded state of the coastlines, even slight climatic disruptions, such as increased frequency and intensity of storms, will magnify the rate of degradation and produce far-reaching and catastrophic consequences.⁶¹ While these stressors and climate change impacts are by themselves capable of inflicting heavy damage on coastlines, their convergence exponentially worsens the situation, leading to extreme reduction in coastal estate, destruction of ecosystems, and a tearing of the social fabric.

These general observations about the state of coastal zones in most parts of the world also apply to coastal South Asia, where population growth and waterfront expansion have led to increased coastal urbanisation and its attendant problems including marine and coastal pollution.⁶² The coastal countries in the South Asian region are endowed with unique natural resources. This diversity in coastal and marine biodiversity places a concomitantly heavy responsibility on these countries for effective management of their resources. However, amidst the growing clamour for greater economic growth

Report No 932, FIRF/R932 (En) (Rome: FAO, 2010) at 7.

⁵⁷ James Tobey & Elin Torell, “Coastal Poverty and MPA Management in Mainland Tanzania and Zanzibar” (2006) 49 *Ocean & Coast Mgmt* 834 (ScienceDirect) (emphasizing that poverty makes it more difficult to realize conservation goals).

⁵⁸ Campbell, Whittingham & Townsley, *supra* note 53.

⁵⁹ See generally Liz Creel, “Ripple Effects: Population and Coastal Regions” in *Making the Link* (Washington, DC: Population Reference Bureau, September 2003).

⁶⁰ Tricia A Sherick, “A Comparison of the Coastal Zone Management Policies of the Atlantic and Pacific Coastal Regions Versus Programs Implemented in Selected Great Lakes States: The Case for Greater Application of the Public Trust Doctrine in Great Lakes States Coastal Management Policy”, Comment, (1997) 28:2 *U Tol L Rev* 459 at 459 (HeinOnline).

⁶¹ See generally Nellemann, Hain & Alder, eds, *supra* note 43.

⁶² Heavily populated South Asian coastal cities play a central role in supporting national economies. As has been observed, the “[c]oastal cities in South Asia are at the frontline of . . . climatic changes.” Moika Barthwal-Dutta, *Understanding Security Practices in South Asia: Securitization Theory and the Role of Non-State Actors*, Asian Security Studies (New York: Routledge, 2012) at 123.

and eradication of poverty, responsible and sustainable management is all but forgotten.⁶³ As a result, intense economic development and continuing unrestrained population growth have engendered several environmental problems and predicaments that now besiege this region. As well, the vast majority of coastal communities, particularly those in South Asia, are situated in low-lying areas such as flood plains and the banks of estuarine environments. Hence, the exposure to extreme weather events and coastal hazards will be devastating.⁶⁴ In many ways, coastal development in South Asia is a classic example of the age-old human vs nature conflict.

Against this backdrop, the observations by the Coastal Zone Management Subgroup of the Intergovernmental Panel on Climate Change, made in 1991 in a more general context, are relevant for coastal South Asia, despite 20 years of half-hearted action by the concerned states.

In many parts of the world, the natural systems that provide protection against the sea are being degraded by development activities through mining for sand and coral, cutting mangroves, damming and confining the flow of rivers, and filling wetlands. Every year that countries postpone addressing these issues, they continue to increase their vulnerability to climate change and associated sea level rise ... Thus, even though the effects of accelerating sea level rise are still decades away, NOW is the time to take action.⁶⁵

Without a doubt, there is an urgent need to find practical means to resolve conflicting uses and interests in the coastal zones. And in this search for a plausible solution, integrated coastal zone management (ICZM) emerges as the central tool that can be utilised for managing coastal areas and resources while stimulating and sustaining economic development.⁶⁶ In fact with an increasing understanding and recognition of the economic and environmental contributions that coastal regions make to overall national

⁶³ For more details on the dilemma (economic growth v environmental protection) faced by coastal countries, see Ch 3.

⁶⁴ Approximately 360 million urban residents live in coastal areas less than 10 meters above sea level and are vulnerable to flooding and storm surges. Fifteen of the world's 20 megacities are at risk from rising sea levels and coastal surges. The World Bank, *Cities and Climate Change: An Urgent Agenda*, 10 Urban Development Series Knowledge Papers (Washington DC: The World Bank, 2010) at 8.

⁶⁵ Bijlsma et al, eds, *supra* note 34 at 9.

⁶⁶ For a more detailed explanation on the utility of ICZM to attain sustainable coastal development, see Ch 6.

development, the coastal countries of South Asia (as elsewhere) with diverse geographic, economic and political environments are devoting resources (however, there is a mismatch between the scale of problems that confronts the coastal areas and the management, legal and policy tools that are being developed and the resources as plausible solutions to these issues) to develop planning and management initiatives for coastal and marine areas via ICZM.⁶⁷ Before going into further detail, the concept of ICZM must first be understood.⁶⁸

ICZM is a primary management and planning response that aims to prevent degradation of coastal areas by addressing coastal issues in an integrated manner. It seeks to accomplish this by integrating actions and actors on a wide range of fronts thereby minimizing conflicts and maximising the benefits that can be secured through this nuanced approach to coastal management. In fact, ICZM seeks to overcome fragmentation hitherto inherent in sectoral approaches to coastal governance as well as the jurisdictional overlap between different tiers of government and multiple management systems.⁶⁹ Rather than displacing sectoral management, the emphasis here is to draw appropriate linkages between the various sectoral efforts to produce a more holistic response for coastal zone management (CZM). It also seeks to transform top-down bureaucratic models of coastal governance into actions that are more bottom-up, participatory, equitable, inclusive, transparent and accountable.⁷⁰ In doing so, it aims to reduce the vulnerability of coastal areas to natural hazards, climate change and SLR and it seeks to sustain essential ecological processes, life support systems and biological diversity.⁷¹ In sum, it is an operational tool that seeks to achieve sustainable coastal development (SCD).⁷²

⁶⁷ For a more detailed explanation of the problems faced by coastal South Asia, see Chs 2 & 3.

⁶⁸ For further analysis of this concept, see Ch 6.

⁶⁹ See *ibid.*

⁷⁰ *Ibid.*

⁷¹ Biliانا Cicin-Sain & Robert W Knecht, *Integrated Coastal and Ocean Management: Concepts and Practices* (Washington DC: Island Press, 1998) at 39 [Cicin-Sain & Knecht, *Integrated Coastal*]. The ultimate goal of integrated coastal management (ICM) is to improve the quality of life of coastal inhabitants through achieving sustainable development objectives. Chua Thia-Eng, Danilo Bonga & Nancy Bermas-Atrigenio, “Dynamics of Integrated Coastal Management: PEMSEA’s Experience” (2006) 34 *Coastal Mgmt* 303 at 303. ICZM is increasingly being “recognised and promoted as the most appropriate process” to deal with the divergent stressors and the far-reaching impacts of climate change and SLR. Nicholls & Wong, *supra* note 34 at 340.

⁷² Cicin-Sain & Knecht, *Integrated Coastal*, *ibid* at 40. For more details on ICZM, see also Ch 6.

Presently, ICZM has wide recognition as an important adaptive methodology that can be utilised to deal with some of the challenges posed by SLR and other climate change impacts on coastal zones.⁷³ In the context of Asia's low-lying highly populated coastal areas, the Intergovernmental Panel on Climate Change (IPCC), in the Fourth Assessment Report, specifically points out:

ICZM provides an effective coastal protection strategy to maximise the benefits provided by the coastal zone and to minimise the conflicts and harmful effects of activities on social, cultural and environmental resources to promote sustainable management of coastal zones ... The ICZM concept is being embraced as a central organising concept in the management of fisheries, coral reefs, pollution, megacities and individual coastal systems in China, India, Indonesia, Japan, Korea, the Philippines, Sri Lanka, Vietnam and Kuwait. It has been successfully applied for prevention and control of marine pollution in Batangas Bay of the Philippines and Xiamen of China over the past few years ... The ICZM concept and principle could potentially promote sustainable coastal area protection and management in other countries of Asia.⁷⁴

Before proceeding further, a note on terminology would be helpful. While a wide array of terms is used to describe this practice,⁷⁵ the most popular ones are 'integrated coastal zone management,' 'integrated coastal and ocean management' (ICOM),⁷⁶ and

⁷³ *United Nations Conference on Environment and Development: Framework Convention on Climate Change*, 19 June 1993, 31 ILM 849 (adopted at New York 9 May 1992) [UNFCCC] art 4(1)(e).

⁷⁴ Rex Victor Cruz et al, "Asia" in ML Parry et al, eds, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2007) 469 at 491.

⁷⁵ These range from terms like 'coastal zone management', 'coastal area management', 'shore management', 'coastal resources management', 'sea-use planning', 'coastal management', 'cross-sectoral integrated coastal area planning', 'community-based coastal resource management', 'coastal resource management', 'coastal resources co-management', 'integrated coastal zone management', 'coastal area management', and 'coastal planning'.

⁷⁶ Integrated coastal and ocean management [ICOM] has wider geographical connotations, as it places greater emphasis on the ocean side of the land-sea interface. However, in practice, both approaches overlap and are extensions of the same process of integration rather than alternatives. See generally Aldo Chircop & Ryan O'Leary, "Legal Frameworks for Integrated Coastal and Ocean Management in Canada and the European Union: Some Insights from Comparative Analysis" (2012) 13:3 *Vt J Env'tl L* 425 (HeinOnline).

‘integrated coastal management’ (ICM).⁷⁷ The *Convention on Biological Diversity, 1992* introduces another variant term namely, ‘integrated marine and coastal area management (IMCAM).’⁷⁸ Although all these concepts are similar in objective, dissimilarity can arise in terms of approach and application.⁷⁹ For the purposes of this study, the term ICZM will be utilised throughout, primarily because ‘coastal zone’ implies a high degree of definiteness with regard its spatial extent that is the subject of integrated management,⁸⁰ and, secondly, the emphasis on the term ‘integrated’ in ICZM distinguishes it from regular coastal zone management efforts.

ICZM has been on the international agenda for nearly four decades, and the number of national projects and programmes has increased substantially.⁸¹ However, at the international level, ICZM remains entrenched in a series of soft law instruments and documents.⁸² ICZM has also been introduced into South Asia; however the efforts here have remained largely sub-optimal.⁸³ Most coastal nations in this region and particularly, those in other parts of the developing world lack the capacity to translate many of these postulates into action.⁸⁴ Another major reason for the lack of success is that ICZM in

⁷⁷ Evelyne Meltzer, ed, *International Review of Integrated Coastal Zone Management: Potential Application to the East and West Coasts of Canada*, Oceans Conservation Report Series (Ottawa: Department of Fisheries and Oceans, 1998) at 8.

⁷⁸ See AIDEnvironment, National Institute for Coastal and Marine Management/Rijksinstituut voor Kust en Zee (RIKZ), Coastal Zone Management Centre, *Integrated Marine and Coastal Area Management (IMCAM) Approaches for Implementing the Convention on Biological Diversity*, CBD Technical Series No 14 (Montreal: Secretariat of the Convention on Biological Diversity, 2004) at 3.

⁷⁹ Cicin-Sain & Knecht, *Integrated Coastal*, *supra* note 71 at 11.

⁸⁰ As well, it must be mentioned that at a five-day workshop organised in Charleston, USA, in 1989, which brought together 28 participants from 13 different nations to review the progress of ICZM, one of the major issues deliberated related to the appropriate term to describe this practice. After much consideration, it was decided that the best term was Integrated Coastal Zone Management, or ICZM. Jens Sorensen, “The International Proliferation of Integrated Coastal Zone Management Efforts” (1993) 21 *Ocean & Coast Mgmt* 45 at 48-49.

⁸¹ Jens Sorensen, “National and International Efforts at Integrated Coastal Management: Definitions, Achievements, and Lessons” (1997) 25:1 *Coastal Mgmt* 3 at 13 (tracing the history of the concept); see also Cicin-Sain & Knecht, *Integrated Coastal*, *supra* note 71 at 305-432 (describing ICZM practices in 22 selected nations).

⁸² See generally Biliana Cicin-Sain, “Earth Summit Implementation: Progress Since Rio” (1996) 20:2 *Mar Pol’y* 123 (ScienceDirect) [Cicin-Sain, “Earth Summit”]. For further discussion of this aspect, see also Ch 7, Part 7.2.

⁸³ See generally Tony George Puthucherril, “Adapting to Climate Change and Accelerated Sea-Level Rise through Integrated Coastal Zone Management Laws: A Study of the South Asian Experience” in Aldo Chircop, Scott Coffen-Smout & Moira McConnell, eds, *Ocean Yearbook*, vol 26 (Leiden: The Netherlands, 2012) 533 at 573 [Puthucherril, “Adapting to Climate Change”].

⁸⁴ An ICM program must walk before it can run, and that here the general limiting factor is the absence of institutional capacity. T-E Chua, “Introduction to the Special Issue on Lessons Learned in Integrated Coastal Management” (1997) 37:2 *Ocean & Coast Mgmt* 153 at 164. There is a need for

South Asia has been presented primarily as pilot projects sponsored by international funding agencies.⁸⁵ These pilots often have a very narrow mandate, are operational for short periods of time, and generally do not consider broader sustainability issues.⁸⁶

As well, the legal moorings of ICZM are rarely addressed and there is generally a disconnect between the law and the implementation of the ICZM programme, which in the long run hampers its effectiveness. The legal reality is that ICZM involves the

capacity building in two areas, namely, to re-orient existing coastal managers to a more holistic perspective of understanding the interrelationships between human use activities in coastal areas and their ecological impacts and to train and educate a cadre of coastal professionals in a multidisciplinary manner. Biliana Cicin-Sain et al, "Education and Training in Integrated Coastal Management: Lessons from the International Arena" (2000) 43 *Ocean & Coast Mgmt* 291 at 293-94 (ScienceDirect).

⁸⁵ For instance, India began managing its coastlines and resources since 1991. However, it was only recently that India began to move towards ICZM, which is being implemented *via* pilot projects sponsored by the World Bank. For more details, see The World Bank, *Projects & Operations*, online: The World Bank, Projects & Operations, Find a Project, Keyword "Integrated Coastal" <<http://www.worldbank.org/>> [World Bank, *Projects & Operations*]. Way back in 1997 it was observed "[i]f integrated coastal management is to have a significant global impact on the condition of coastal ecosystems we must quickly scale up endeavors that are now largely conceived and implemented as a scattering of pilot projects". Stephen Olsen, James Tobey & Meg Kerr, "A Common Framework for Learning from ICM Experience" (1997) 37:2 *Ocean & Coast Mgmt* 155 at 156 (ScienceDirect). Unfortunately, ICZM is still being implemented primarily via projects at least in coastal South Asia. For more details, see Puthucherril, "Adapting to Climate Change", *supra* note 83.

⁸⁶ Puthucherril, "Adapting to Climate Change", *ibid*; World Bank, *Projects & Operations*, *ibid*. For more details on the non-legislative approach to ICZM implementation as seen in Bangladesh, see also Ch 3, Part 3.2.3. India is relying on a World Bank Project to implement ICZM. For more details see India, Ministry of Environment & Forests, Press Brief, "India, World Bank sign two loan agreements for Coastal Zone Management and Remediation of Polluted Sites" (22 July 2010) online: Ministry of Environment & Forests <<http://moef.nic.in/downloads/public-information/World-Bank-Loans-Press-Brief.pdf>>.

The situation in other regions is also more or less similar. Despite the availability of priming funds from the European Commission, the emphasis in Europe is on "pilot" and "demonstration" methods, (project-based approach to ICZM) which can hamper realization of long-term objectives. See generally Brian Shipman & Tim Stojanovic, "Facts, Fictions, and Failures of Integrated Coastal Zone Management in Europe" (2007) 35 *Coastal Mgmt* 375. For more details on the Coastal Resource Management Project in the Philippines, see Catherine A Courtney & Alan T White, "Integrated Coastal Management in the Philippines: Testing New Paradigms" (2000) 28 *Coastal Mgmt* 39. The object of the World Bank sponsored ICZM project in Morocco is to "pilot the application" of ICZM in the project area by building capacity of government institutions and local communities for ICZM, improve coastal resource management and livelihoods by taking recourse to a co-management approach and finally monitoring and evaluation. See generally World Bank, *Project Appraisal Document on a Proposed Grant from the Global Environment Facility in the Amount of US\$ 5.18 Million to the Kingdom of Morocco for an Integrated Coastal Zone Management Project*, Report No 66413-MA (Sustainable Development Department: Middle East and North Africa Region, June 13 2012). As can be seen, this project applies only to the project area and much will depend upon the country to take it forward even after funding stops.

application of laws and legal institutions at several levels.⁸⁷ These aspects will need to be addressed in the designing and implementation of an ICZM programme.⁸⁸ Indeed, despite an identified need for clear ICZM laws across South Asia, only a few pieces of legislation deal with coastal management, let alone address climate change. As will be seen in greater detail in the subsequent chapters, most of the current laws do not require the decision-maker to consider the potential impacts of climate change on proposed developments in vulnerable coastal areas. And therefore, planning activities continue to be organised in a sectoral way with hardly any scope for linkages.⁸⁹ This fragmented approach contributes to the inefficient use of resources and conflicting claims among various stakeholders, ultimately culminating in missed opportunities and unsustainable development. Moreover, archaic laws and practices negatively affect the resilience and productivity of coastal ecosystems, rendering them vulnerable to threats posed by SLR.

And, this leads us to another important dimension of this inquiry, namely, the need for regional cooperation. It was to protect and manage the shared marine waters and associated coastal ecosystems that a regional seas programme was established along with an action plan for the South Asian region in 1995. ICZM has been identified as one of the

⁸⁷ See generally Cormac Cullinan, *Integrated Coastal Management Law: Establishing and Strengthening National Legal Frameworks for Integrated Coastal Management*, FAO Legislative Study, No 93 (Rome: FAO, 2006).

⁸⁸ In the context of overlapping jurisdiction between different agencies, the importance of a legislative basis for ICZM operation is highlighted. The authors point out [t]here are overlapping jurisdictions/functions among sectoral agencies over coastal areas and resources, which make the adoption of an integrated coastal resource management framework problematic. Furthermore, agencies are sometimes confused about their role in coastal resource management, which can in effect reduce their commitment to ICZM activities. In fact, several agency representatives who were interviewed concurred that this is a primary factor that has thwarted ICZM efforts. Many cite the need for developing appropriate legislation to clarify jurisdictional and functional powers, as the first step towards any real solution. A legal framework is vital for legitimising policy objectives and establishing a structure for implementing policy initiatives related to ICZM. Yet, in Guyana, related legislation is either not there to support the ICZM agenda, or obsolete.

Robin McCall & Talia Choy, "Integrated Coastal Zone Management (ICZM) in Guyana: Development Barriers, Opportunities and Recommendations" in Erlend Moksness, Einar Dahl & Josianne Støttrup, eds, *Integrated Coastal Zone Management* (Oxford: Wiley-Blackwell, 2009) 219 at 229-31.

⁸⁹ For an overview see, Puthucherril, "Adapting to Climate Change", *supra* note 83.

key areas of focus under this action plan. Recently, a coastal management centre under the South Asian Association for Regional Cooperation (SAARC) that aims at capacity building for coastal zone management has been established.⁹⁰ Despite these efforts, regional co-operation exists only on paper and regional regime building in this direction is still in its infancy.

South Asia is in fact one of the “least integrated” regions in the world, and there are several barriers that impede co-operation.⁹¹ Regional cooperation can be an influential platform that can enrich countries by providing greater opportunities to devise solutions for common problems that affect a region.⁹² Cooperation can also shorten the gap between leading and lagging nations in terms of capacity and resources by promoting the build-up of epistemic communities, reduce vulnerabilities, and help the poor improve their economic capacities.⁹³

In sum, the gaps in the normative framework for coastal management at the national level in these countries, the lack of an all-encompassing international treaty on ICZM that sets out the specific rules of the practice, the strong possibility that the harmful consequences of climate change and SLR cannot be managed solely by individual countries by confining them to national borders (there can be spill-overs), the cross-border environmental impacts of developmental decisions of one country (which can influence the coastal environments of other nations situated hundreds of miles away) – all of these factors underscore the need for an overarching regional instrument rooted in

⁹⁰ SAARC, *Area of Cooperation: Environment*, online: SAARC <http://www.saarc-sec.org/areaofcooperation/cat-detail.php?cat_id=54>.

⁹¹ Sadiq Ahmed & Ejaz Ghani, “South Asia’s Growth and Regional Integration: An Overview” in Sadiq Ahmed & Ejaz Ghani, eds, *South Asia: Growth and Regional Integration* (Washington DC: The International Bank for Reconstruction and Development/The World, 2007) 3 at 4.

⁹² For a more detailed analysis on the nature of regional cooperation in South Asia, see generally Ashok K Behuria, ed, *South Asia: The Quest For Regional Cooperation* (New Delhi: Institute for Defence Studies and Analyses, 2009).

⁹³ See generally Aldo Chircop, David VanderZwaag & Peter Mushkat, “The Gulf of Maine Agreement and Action Plan: A Novel but Nascent Approach to Transboundary Marine Environmental Protection” (1995) 19:4 Mar Pol’y 317 (ScienceDirect); see also Lawrence P Hildebrand & Aldo Chircop, “A Gulf United: Canada-U.S. Transboundary Marine Ecosystem-based Governance in the Gulf of Maine” (2010) 15 Ocean & Coastal LJ 339 (QL). In 1989, the States of Maine, Massachusetts, and New Hampshire in the United States and the Canadian Provinces of New Brunswick and Nova Scotia adopted the Agreement on Conservation of the Marine Environment of the Gulf of Maine Between the Governments of the Bordering States and Provinces. This gave birth to an informal system for regional cooperation, namely the Gulf of Maine Council on the Marine Environment. The participants in this regime have cooperated effectively on the basis of “an informal framework consisting of soft principles” to produce tangible results. *Ibid.*

the peculiar coastal problems and economic, social and political milieu of South Asia. The idea is that this regional instrument will be able to offer normative guidance and support to national governments to effectively address complex coastal zone management, SLR, and other climate change related issues and will act as the the first step towards a more comprehensive regime on ICZM and CCCA in South Asia.

1.3 THE RESEARCH QUESTIONS AND THE ROAD MAP

This study explains the role of law in promoting the implementation of ICZM in South Asia by providing a framework and tools for achieving the specific objective of harmonising conservation with development, and supporting CCCA. Since ICZM is highly contextual, by drawing upon experiences from elsewhere (both national and regional), it identifies certain principles that can inform a regional regime at the South Asian level as a possible key step, which can help galvanise efforts at the national level and also contribute to the development of regional regime on the subject. In short, this study is based on the following two *primary research questions*:

- 1) Do laws and legislative frameworks play any role in promoting and facilitating the implementation of ICZM and CCCA, thereby contributing to SCD? And, if yes, what is that role, specifically in the South Asian context?
- 2) What principles can inform the development of a regional legal framework for ICZM implementation in South Asia? And can a regional framework help in strengthening ICZM implementation and promote CCCA for SCD at the national level in South Asia?

In addition, this study will also examine the following *secondary* research questions, namely:

- 1) What is the meaning of SCD and how does ICZM facilitate its attainment?
- 2) What is the importance of CCCA and how it can be implemented via an ICZM process to facilitate the attainment of SCD?

In short, this thesis describes the paramount importance of law and legal frameworks in steering the ICZM process. The objective is to introduce a new narrative to coastal zone

management in South Asia taking into account contemporary problems by highlighting the importance of law and legal frameworks in implementing ICZM and promoting CCCA. And this is to be accomplished through a regional-level legal framework, which will act as a catalyst in developing national level legislations on ICZM.

1.3.1 The Thesis Structure

Apart from this introduction, the above-identified research questions are addressed over the next four parts. Part I sets out the problématique of this thesis and its context (the uniqueness of coastal South Asia) in detail. Part II provides the theoretical foundation of this thesis, in terms of expounding the concept of sustainable coastal development and explaining the role of ICZM in balancing and securing the seemingly conflicting interests of coastal environment protection, coastal development and CCCA to further SCD. Part III analyses the role of law in facilitating an ICZM process and in securing the linkage between ICZM and CCCA. Part IV articulates the importance of a regional regime on ICZM for South Asia and it sets out the elements, which a regional level instrument on ICZM should contain.

1.3.2 Theoretical Framework and Methodology

This study is grounded in the inter-disciplinary concept of sustainable development in relation to coastal areas, resources, and coastal communities. To have a deeper understanding of how sustainable development will be utilised, it is imperative that the doctrinal foundations of sustainable development be examined. Ever since the Brundtland Commission Report,⁹⁴ this concept has gained prominence and international recognition, and has found its way into a large array of international environmental law treaties, national legislations and jurisprudence. Nevertheless, and despite a simple and concise formulation, it remains an elusive concept difficult to put into practice. What is sustainable in a particular context, depending upon available scientific knowledge in a given situation and at a particular point in time, may not be so subsequently. Even though

⁹⁴ See generally World Commission on Environment and Development, *Our Common Future* (Oxford: Oxford University Press, 1987).

more than two decades have passed since “Our Common Future”, the issues that continue to plague the planet remain basically the same – proliferation of reckless development practices, degradation of environmental and natural resources, widespread pollution, and dehumanising poverty. In addition, and as highlighted earlier, we are now confronted with one of the all-time greatest environmental challenge – greenhouse gas emissions and global warming, which in turn leads to biodiversity losses, land degradation, water scarcity, and SLR. This raises the key question that guides this study, namely, as to what is sustainable development and what does it imply in a coastal zone management context? Ultimately, this thesis argues that utilising ICZM as the pathway to SCD makes eminently good sense.

Coastal management is all about influencing human behaviour in relation to the coasts, and this brings into focus the governance dimension of the practice. One of the most potent instruments to regulate human behaviour is the instrumentality of law. Indeed, to demonstrate why law is needed to regulate human activities in the coastal zone, reliance will be placed on common property resource theories to justify the need for a legal framework for coastal management.

A significant portion of this thesis is also carried out on the basis of a theoretical framework provided by the regime theory. The essence of the regime theory is to offer a rationale to help explain how disaggregated interests of different states can converge to further common objectives, and how they evolve. In particular, the regime theory is utilised to explain the different forces at work in the South Asian region to illuminate how regional regime development on ICZM can be achieved there.

Regarding methodology, and as explained earlier, this thesis examines the role of law in supporting ICZM-based responses to the complexities posed by SLR and climate change in relation to coastal zone management. While its scope does not extend to laying down a detailed code on coastal law to support ICZM and provide for CCCA, the emphasis is on articulating essential principles that comport to the identified twin objectives, such as balancing development with conservation and ensuring CCCA, taking into account the peculiarities of the South Asian region. ICZM is not nation-specific and, as pointed out earlier, there are no off-the-shelf models that can be applied across the spectrum. The manner in which ICZM is implemented in each country varies

considerably, and each ICZM programme displays characteristics that are unique to the nation for which it is developed. In other words, there is variety in approach in implementing ICZM and countries can draw lessons from the experiences of others while tailoring such programmes to suit their own needs.

Since the canvas for this thesis is the South Asian region, and since ICZM law has not evolved sufficiently into a core practice, this study is based in comparative law analysis, examining and comparing the coastal law situation in other countries and relevant regional mechanisms. Creative innovations with respect to coastal laws and ICZM programmes of different countries are compared to identify core irreducible principles of an ICZM law and process that should inform the regional regime on coastal management for South Asia. In addition, reliance will be placed on policy and advocacy methods. At the intersection of science, natural resources law and management, this study will employ an interdisciplinary analysis.

1.3.3 Limitations

Like any other study, this thesis can accomplish only so much. The first major caveat is that this analysis is restricted only to examining ICZM models that are predicated on legislation. In drawing the conclusion that implementing ICZM through the legislative route is a much superior and stable option (as it is based on a principled approach to coastal management, helps reduce conflicts and streamlines human behavior in relation to coastal management and coastal resources utilisation), the analysis will not draw comparisons with ICZM programmes that are being implemented even in the absence of a dedicated coastal statute (However, reference will be made to the non-legislative model on ICZM implementation in Bangladesh and the Maldives where necessary). Secondly, in identifying the essential features of a coastal law, it provides only an overview of the statutory frameworks for coastal management in a few coastal countries and some of the regional instruments in this regard. Another drawback that a research project of this nature will encounter is the lack of primary research materials and information from the coastal countries in the South Asian region. Even though reasons can be many and varied, the most important is the absence of laws and policies and exclusive institutional mechanisms to carry out tasks that coastal and marine management demands. To

overcome this limitation vis-à-vis a particular issue, primary focus will be placed on those countries that have specifically addressed the concern. And here reliance will be placed on India's experience. This accent on India is justified as India has utilised the legislative route to address several of the issues affecting the coastal zone and it is this country that has the longest coastline among the South Asian coastal countries. The third limitation is the peculiar circumstances of the context i.e., South Asia. Regional regimes have failed to take off and establish in several other critical areas. However, the coastal problems in South Asia are so complex that, left to their own devices, these countries may be unable to resolve them sustainably. Moreover, climate change, SLR and their impact on the coastal zones do not respect national borders. The transboundary implications of these issues affect the area as a whole, and therefore a regional instrument to place national coastal administrations on the right track would prove highly beneficial. However, as things stand, coastal South Asia may not be ready for a hard law instrument that creates binding obligations on state parties, as accomplishing this may derail the nascent regime. It is this realisation that prompts this study to recommend only a set of broad principles that can inform coastal law-making in these countries. This will enable state parties to be involved in the process without binding themselves to yet another set of legal obligations that could compromise the ability of their domestic legislatures to adapt to evolving national interests.

In sum, this study is premised on the proposition that given the predictions relating to large-scale climate change impacts on the coastal zones in South Asia, it is necessary for these countries to adopt a proactive approach in managing their coastal zones. And this can be accomplished by enacting appropriate laws to facilitate ICZM implementation, CCCA, and SCD. Laws that articulate clearly defined responsibilities will greatly assist decision-makers by providing guidance on how to develop, draft and implement ICZM plans.

While this study underscores the importance and centrality of law in supporting ICZM and in effectuating CCCA, merely enacting a law will not *per se* achieve successful ICZM. The study does not forward any grand illusions that a law on ICZM is the silver bullet solution to all problems that confront our degraded coastlines and that CCCA can be achieved and the journey towards SCD can be secured. Law is simply one

of the many tools that a prudent coastal manager can rely on for efficient coastal management. Other factors are also important, like adequate financial support, political commitment to the programme, effective enforcement, monitoring and feedback, adaptive management, use of good science, and decentralisation of power to lower tiers of government. Nonetheless, the strength of the legal spine will in large measure determine the success or failure of an ICZM programme. By advocating a regional approach on ICZM implementation for coastal South Asia, this thesis pushes ICZM from its present “backwater status”⁹⁵ to the centre stage of national environmental planning and management in the region.

⁹⁵ Shipman & Stojanovic, *supra* note 86 at 380.

PART I

UNDERSTANDING THE PROBLÉMATIQUE IN THE CONTEXT

The purpose of this part is to explain and set out the problématique against the context of coastal South Asia practically providing the background for the succeeding discussion. In doing so, this part is arranged as two chapters. Chapter two introduces and provides a synoptic overview of interacting SLR and climate change impacts and issues relating to coastal areas (in terms of vanishing land territory and maritime estates), coastal ecosystems (impacts on coastal aquifers, coral reefs and wetlands), and coastal communities (the issue of internal displacement and those people who have to cross international borders due to SLR and climate change-related impacts), and the extant international and national laws (as available in some of the coastal countries of South Asia) in responding to these issues. The argument posited is that there is disconnect between applicable law and new realities, and in responding to these challenges new legal rules will have to be crafted to dispel vagueness. This may be a long-drawn out process and in the short-term this brings to the fore the need for other practical measures to deal with these situations, which militates in favour of effective ICZM as one possible strategy that can help increase coastal resilience and adaptive capacities. Chapter three sets out the management and legal frameworks that support ICZM implementation in coastal South Asia. It is an overview of current coastal management efforts in the South Asian coastal countries. It provides the necessary context by identifying gaps in the present national level approaches to ICZM and coastal climate change adaptation and articulates the need for a regional regime on ICZM for South Asia. In explaining the problématique, the chapter essentially points out that there is growing visible evidence that the coastal ecosystems in South Asia are under considerable stress and strain since the developmental trajectories for the coastal environment are so perverse they may overwhelm these fragile coastal ecosystems. Accordingly, the chapter sets out a case for developing a new approach to the management of coastal areas, ecosystems, resources and communities in South Asia, grounded in the concept of ICZM. In particular, it is pointed out that there is a need to strengthen the legal framework to facilitate ICZM implementation. However, given the lack/divergence of capacities at the respective national levels in South Asia and the common nature of problems confronting its coastal regions, one possible way to do so is to strengthen the regional framework, which is the fundamental focus of this thesis.

CHAPTER 2 RISING SEAS, RECEDING COASTLINES, VULNERABLE COASTAL COMMUNITIES AND ECOSYSTEMS: UNDERSTANDING THE IMPORTANCE AND NEED FOR INTEGRATED COASTAL ZONE MANAGEMENT

2.1 INTRODUCTION

Basic science informs us that it is the “heat trapping”¹ feature of naturally occurring greenhouse gases (GHGs) in the atmosphere such as water vapour, carbon dioxide (CO₂), methane, chlorofluorocarbons (CFCs) and ozone,² that keeps the earth’s surface warm thereby playing an integral role in sustaining life.³ And in ensuring the same, practically, the GHGs act as “a sleeping bag or down comforter.”⁴ However, the “earth’s heat budget”⁵ is presently undergoing sweeping changes. Anthropogenic activities (mainly combustion of fossil fuels and coal-fired power plants) are adding large quantities of GHGs to that which occurs naturally in the atmosphere. GHGs are now at far greater concentrations than at any time in the past 160,000 years,⁶ with CO₂, the principal gas that contributes to the enhanced GHG effect, being about 40 per cent higher than in pre-industrial times.⁷ As well, modern industrial processes have also introduced a series of

¹ *Petition to the Inter American Commission on Human Rights Seeking Relief from Violations Resulting from Global Warming Caused by Acts and Omissions of the United States* (7 December 2005) at 28, online: INUIT, Media & Reports, Press Releases, Press Releases-2005 <<http://inuitcircumpolar.com/index.php?Lang=En&ID=1>> [*Inuit Petition*].

² “Historical Overview of Climate Change Science” in Susan Solomon et al, eds, *Climate Change 2007: The Physical Science Basis* (Cambridge: Cambridge University Press, 2007) 93 at 97.

³ Christina K Harper, “Climate Change and Tax Policy” (2007) 30:2 BC Int’l & Comp L Rev 411 at 412 (HeinOnline).

⁴ RT Pierrehumbert, “Climate Change: A Catastrophe in Slow Motion” (2006) 6:2 Chicago J Int’l L 573 at 575 (QL) [Pierrehumbert, “Climate Change”].

⁵ See *Inuit Petition*, *supra* note 1 at 28.

⁶ Before the industrial era, one would have to sift through a million molecules of air to find 280 molecules of carbon dioxide. Pierrehumbert, “Climate Change”, *supra* note 4 at 574.

⁷ Since the dawn of the industrial era in the mid-eighteenth century, when petroleum hydrocarbons first began to fuel the global economy, CO₂ concentrations in the atmosphere have risen several times over. As at 2011, the atmospheric concentrations of greenhouse gases carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) have all increased since 1750 by about 40 per cent, 150 per cent, and 20 per cent, respectively due to human activity. “Summary for Policymakers” in Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, *Climate Change 2013: The Physical Science Basis*, online: IPCC <<http://www.climatechange2013.org/>> [“Summary for Policymakers” in *Physical Science, 2013*]; see also “Summary for Policymakers” in Susan Solomon et al, eds, *Climate Change 2007: The Physical Science Basis* (Cambridge: Cambridge University Press, 2007) 1 at 2 [“Summary for Policymakers” in *Physical Science, 2007*]. As at December 2012, CO₂ concentrations stand at 394.39 parts per million (measured at the Mauna Loa Observatory in Hawaii, USA) *Earth’s CO₂ Home Page*, online: CO₂ Now <<http://co2now.org/>>. Methane (CH₄) is higher by more than 100

new and extremely powerful GHGs into the atmosphere (e.g., chlorofluorocarbons, hydrofluorocarbons, hydrochlorofluorocarbons, perfluorocarbons, and sulfur hexafluoride), compounding the problem.⁸ All these factors have increased warming and have led to the “enhanced green house effect,”⁹ producing far-reaching and unpredictable climatic changes affecting the integrity of a wide array of ecosystems. Climate change is altering hydrological, coastal, marine, forest, and agricultural regimes, and is replacing them with “new assemblies.”¹⁰

In addition to this introduction, this chapter is divided into five sections, arranged as follows. The first offers a generalized overview of the problem of sea level rise (SLR). The second, third and fourth sections analyse the impact of SLR on coastal areas and maritime territories; on coastal communities; and finally, on coastal resources, namely, groundwater, coral reefs and mangroves. All through, the intention is to provide an overview of the far-reaching impacts of SLR on these identified elements and to set out applicable international and national laws (relevant laws from the South Asian coastal countries), identifying their weak points. On the basis of these discussions, the chapter concludes by emphasising the importance of integrated coastal zone management (ICZM).

2.2 “THE RISING SEAS”

As is known, oceans cover almost 70 per cent of the earth’s surface and have a heat capacity that is nearly 1,000 times more than that of the atmosphere.¹¹ Due to this feature,

per cent, and nitrous oxide (N₂O) by more than 15 per cent. *Ibid* at 3. Between 1970 and 2004, there has been a 70 per cent increase in global GHG build-up, while the CO₂ emission during this period grew by about 80 per cent. “Summary for Policymakers” in Core Writing Team, Rajendra K Pachauri & Andy Reisinger, eds, *Climate Change 2007: Synthesis Report* (Geneva: Intergovernmental Panel on Climate Change, 2008) 1 at 5 [“Summary for Policymakers” in *Climate Change 2007*].

⁸ See *Inuit Petition*, *supra* note 1 at 28

⁹ “Climate Change 101: Science and Impacts” in *Climate Change 101: Understanding and Responding to Global Climate Change* (Pew Center on Global Climate Change, January 2001 update) 1 at 2.

¹⁰ JB Ruhl, “Climate Change and the Endangered Species Act: Building Bridges to the No-Analog Future” (2008) 88:1 BUL Rev 1 at 11 (HeinOnline).

¹¹ Nathaniel L Bindoff & Jürgen Willebrand, “Observations: Oceanic Climate Change and Sea Level” in Susan Solomon et al, eds, *Climate Change 2007: The Physical Science Basis* (Cambridge: Cambridge University Press, 2007) 385 at 389.

ocean circulation patterns play a fundamental role in stabilizing climate and moderating global biogeochemical cycles.¹² Oceans also perform a series of other life-sustaining functions, the least of which is the support to sustain the livelihood of coastal communities and therefore any physical, biological and biogeochemical changes in the oceans arising from global warming can have far-reaching catastrophic impacts with potential to impair the stability of the entire climate system.¹³ And the primary impact of these changes in the oceans will resonate on the land that borders these waters (the dry side of the coastal zone).

A key manifestation of these climate change impacts on coastal zones of most countries, including those in South Asia, is through the phenomenon of SLR, which has already begun to claim low-lying lands in most of the coastal countries of this region and has triggered sporadic internal migrations of coastal populations and, in certain cases, even external.¹⁴ Two contributory factors that accelerate global SLR are thermal expansion of the oceans (or the “steric effect”) and loss of glacial ice due to increased melting. With increased dumping of GHGs into the atmosphere, atmospheric and oceanic temperatures are rising, leading to thermal expansion of the waters.¹⁵ Increased temperatures will also produce more glacial melting as well as rapid shrinkage of polar ice sheets.¹⁶ In fact, the Intergovernmental Panel on Climate Change (IPCC) in its Fifth Assessment Report (AR5) points out with *high confidence* that since the early 1970s, glacier mass loss and ocean thermal expansion together accounts for nearly 75 per cent of the observed global mean SLR.¹⁷ Further factors causing SLR include increased

¹² *Ibid.*

¹³ For further details see generally *ibid.*

¹⁴ See also Robin Kundis Craig, “A Public Health Perspective on Sea-Level Rise: Starting Points for Climate Change Adaptation” (2010) 15:2 *Widener L Rev* 521 at 522 (HeinOnline).

¹⁵ AR5 points out that the last three decades has been successively warmer than any preceding decade since 1850. The report expresses *medium confidence* that in the Northern Hemisphere, the period between 1983–2012 was *likely* the warmest 30-year period in the last 1400 years. The report express *high confidence* that the over the last two decades, the Greenland and Antarctic ice sheets have been losing mass, glaciers almost everywhere are shrinking, and Arctic sea ice and Northern Hemisphere spring snow cover have decreased in extent. “Summary for Policymakers” in *Physical Science, 2013, supra* note 7.

¹⁶ Already the polar ice sheets are melting at alarming levels. See *Arctic Sea Ice Shrinks to New Low in Satellite Era* (26 August 2012), online: NASA <<http://www.nasa.gov/index.html>>.

¹⁷ From 1955 to 1995, ocean thermal expansion is estimated to have contributed about 0.4 millimeters per year to SLR; from 1993 to 2003, it was significantly larger, at about 1.6 millimeters per year for the upper 750 meters of the ocean alone. Scientists also estimate that the melting of glaciers and ice caps (excluding the glaciers covering Greenland and Antarctica) contributed to SLR by about 0.3

groundwater mining, impoundment in reservoirs, increased runoff from urbanisation, permafrost thawing, tectonic movements, and deforestation.¹⁸

The IPCC in its Fourth Assessment Report (AR4) expresses high confidence that there is a significant rise in the global mean sea level.¹⁹ From 1961 to 2003, the average rate of SLR was $1.8 \pm 0.5 \text{ mm yr}^{-1}$.²⁰ Depending on the emission trajectory, the IPCC in the Fourth Assessment Report, affirms that by 2100, global warming will cause sea levels to rise by 18 to 59 centimeters.²¹ These calculations are based on six scenarios, excluding “future rapid dynamical changes in ice flow.”²² These are at best conservative estimates,²³ as they omit the fresh water input from glacial and ice cover melting into the oceans.²⁴ For instance, it is estimated that the West Antarctic ice sheet, which lies below sea level, contains enough ice to raise the water by six meters.²⁵ Another important aspect to be noted is that due to geological processes in relation to the earth’s crust and its mantle, the relative position of land and sea, changes in currents, upwelling, tidal range and other oceanic processes, there cannot be any spatial uniformity rate in SLR.²⁶

millimeters per year from 1961 to 1990, increasing to about 0.8 millimeters per year from 2001 to 2004. See Christian Nellemann, Stefan Hain & Jackie Alder, eds, *In Dead Water – Merging of Climate Change with Pollution, Over-Harvest, and Infestations in the World’s Fishing Grounds* (Norway: UNEP/GRID-Arendal, 2008) at 32.

¹⁸ JA Church et al, “Changes in Sea Level” in JT Houghton et al, eds, *Climate Change 2001: The Scientific Basis* (Cambridge: Cambridge University Press, 2001) 639 at 658. Most of the water that is mined from the ground ultimately reaches the ocean through the atmosphere or runoff. As far as lakes are concerned, there has been considerable reduction of their size due to increased irrigation and water use. For instance, the reduced volumes of the Caspian and Aral seas contribute 0.03 and 0.18 millimeters/year to SLR. Urbanization leads to reduced infiltration and increased surface runoff, which may also contribute to SLR. *Ibid* at 657.

¹⁹ Bindoff & Willebrand, *supra* note 11 at 387.

²⁰ *Ibid.*

²¹ Core Writing Team, Pachauri & Reisinger, eds, *Climate Change 2007: Synthesis Report* (Geneva: Intergovernmental Panel on Climate Change, 2008) at 45.

²² *Ibid.*

²³ Satellite measurements show that the sea level has been rising an average of 3.4 millimeters per year since 1993, which is 80 per cent faster than the estimates under the IPCC Third Assessment Report. As well, if ice-sheet mass loss is accounted, the anticipated sea-level rise until 2100 is likely to be at least twice that presented by IPCC AR4, with an upper limit of approximately two meters. *The Copenhagen Diagnosis: Updating the World on the Latest Climate Science* (Sydney: UNSW Climate Change Research Centre, 2009) at 39.

²⁴ Core Writing Team, Pachauri & Reisinger, eds, *supra* note 21 at 44.

²⁵ Church et al, *supra* note 18 at 641.

²⁶ Bindoff & Willebrand, *supra* note 11 at 411. Even within the same country, not all areas will experience the same rate of SLR. For instance, in significant areas of Canada’s Arctic coasts, geological processes are causing the sea level to fall, while the sea level is rising on the Atlantic and Beaufort Sea coasts. Donald S Lemmen & Fiona J Warren, eds, *Climate Change Impacts and Adaptation: A Canadian Perspective* (Ottawa: Climate Change Impacts and Adaptation Directorate, 2004) at 115; see also Nick Bryant, “Low-lying Pacific islands ‘growing not sinking’” *BBC News* (3

Consequently, in some places, the sea may rise at rates several times over the global average (like in the western Pacific and the eastern Indian Ocean), and in certain other regions, the sea level may fall going against the general trend (eastern Pacific and western Indian Ocean).²⁷

The findings in AR5, which represents the most comprehensive and current science on the subject reinforces the observations in AR4 and other previous reports that the sea is rising. AR5 expresses *high confidence* that the rate of SLR since the mid-nineteenth century has been larger than the mean rate during the previous two millennia. In fact, the ascendancy in the global mean sea level during 1901-2010 stands at 0.19 meters.²⁸ As far as determination of future rise is concerned, the report relies on a set of four new pathways termed as representative concentration pathways (RCP) and it expresses *medium confidence* that the global mean SLR for 2081-2100 (relative to 1986–2005) will *likely* be in the following ranges - for RCP2.6, it is expected to be between 0.26 to 0.55 meters, for RCP4.5 between 0.32 to 0.63 meters, for RCP6.0, between 0.33 to 0.63 meters, and for RCP8.5 between 0.45 to 0.82 meters.²⁹ And in these projections, thermal expansion will account for 30 to 55 per cent of the mean SLR; while glacier melt will contribute 15 to 35 per cent.³⁰ In short, the report categorically asserts that the “[g]lobal mean sea level will continue to rise during the 21st century.”³¹

The harms associated with SLR are serious and well recognized. Generally, SLR will lead to inundation of wetlands and lowlands; erode shorelines; increase salinity in estuaries and aquifers; alter tidal ranges in rivers and bays; change the locations and patters where rivers deposit sediments; increase wave heights; lead to storm surges, and, reduces the amount of light that reaches the bottom oceans.³² In the succeeding

June 2010), online: BBC News <<http://www.bbc.co.uk/news/10222679>> (referring to a study which points out that many low-lying Pacific islands were growing and not sinking, but whether all of these will be inhabitable is not clear).

²⁷ Bindoff & Willebrand, *ibid.*

²⁸ “Summary for Policymakers” in *Physical Science, 2013, supra* note 7, SPM-6.

²⁹ *Ibid* at SPM-18.

³⁰ *Ibid.*

³¹ *Ibid.*

³² See generally Richard J Nicholls & Poh Poh Wong, “Coastal Systems and Low-Lying Areas” in ML Parry et al, eds, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2007) 315. For more details, see James G Titus, “Greenhouse Effect, Sea Level Rise, and Land Use” (1990) 7:2 Land Use Pol’y 138 (ScienceDirect).

discussion, the hazards posed by the SLR are described in more detail.

Perhaps, the most visible impact of SLR is that of inundation and flooding. A rise in sea level is expected to inundate hundreds of thousands of square kilometers of low-lying areas, leading to the mass destruction of property and infrastructure, destabilising coastal life.³³ Inundation can be permanent in which case areas remain completely submerged underwater or may remain underwater for a significant portion of the day, while, episodically flooded areas are at risk only from extreme weather events.³⁴ SLR can also pose serious health consequences. It has been observed:

Sea-level rise will create new reservoirs of warm, brackish, stagnant water, perfect for breeding mosquitoes that can transmit malaria, dengue fever and a host of other tropical mosquito-borne diseases, while the warming sea itself will harbor increasing concentrations of opportunistic viruses and bacteria such as cholera and *Vibrio vulnificus* ...³⁵

As oceanic waters become warmer,³⁶ they lose their ability to hold dissolved oxygen essential for sustaining sea life.³⁷ Algal blooms thrive in oxygen-depleted areas and may

³³ It has been estimated that Uruguay, Egypt, the Netherlands, Bangladesh and the Majuro Atoll in the Marshall Islands, will lose 0.05 per cent, one per cent, six per cent, 17.5 per cent, and 80 per cent, respectively of their land territory to the rising seas in the event of a one meter rise. “Summary for Policymakers: Scientific-Technical Analyses of Impacts, Adaptations, and Mitigation of Climate Change” in Robert T Watson, Marufu C Zinyowera & Richard H Moss, eds, *Climate Change 1995: Impacts, Adaptations, and Mitigation of Climate Change: Scientific-Technical Analyses, Contribution of Working Group II to the Second Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 1996) 1 at 11. It is expected that nearly 30 per cent of coastal infrastructure in Africa is at risk of partial or total inundation and the forceful impact of SLR will be felt in urban areas and ports, like Cape Town, Maputo, and Dar Es-Salaam. UNFCCC, *Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries* (UNFCCC, 2007) at 20, online: UNFCCC <<http://unfccc.int/resource/docs/publications/impacts.pdf>>. While a one-meter rise will inundate much of Alexandria, a SLR of 50 centimetres in Tanzania, will inundate over 2,000 square kilometres of land, and the financial loss is pegged at USD51 million. Russell Arthurton & Kwame Korateng, “Coastal and Marine Environments” in UNEP, *Africa Environment Outlook 2: Our Environment, Our Wealth* (Nairobi: UNEP, 2006) 155 at 176.

³⁴ US, New York State Sea Level Rise Task Force, *Report to the Legislature* (2010) at 19, online: Dep't of Environmental Conservation <<http://www.dec.ny.gov/>>.

³⁵ Craig, *supra* note 14 at 540.

³⁶ During the period from 1961 to 2003, the global ocean temperature went up by 0.10 degree Celsius from the surface to a depth of 700 meters. Bindoff & Willebrand, *supra* note 11 at 387. Large parts of the Indian Ocean, the Pacific Ocean and the Southern Ocean have warmed. *Ibid* at 391. The AR5 points out that it is *virtually certain* that the upper ocean (0-700 meters) has warmed from 1971 to 2010. On a global scale, the ocean warming is largest near the surface. In fact, the upper 75 meters has warmed by 0.11 (0.09 to 0.13) °C per decade over the period between 1971–2010. “Summary for

develop into harmful levels.³⁸ Sea surface temperature increases will affect fish distributions as sea creatures migrate towards cooler and deeper waters.³⁹ As well, it can result in lesser fish yield, impact species distribution and lead to increased variability in catches. While the link between global warming and stronger hurricanes has yet to be clearly established, it is believed that rising sea surface temperatures will brew more intense tropical cyclones. As the IPCC affirms, “[t]here is observational evidence for an increase of intense tropical cyclone activity in the North Atlantic since about 1970, correlated with increases of tropical sea surface temperatures.”⁴⁰ Apart from their devastation and consequent loss of life, powerful storms can prove severely destructive of

Policymakers” in *Physical Science*, 2013, *supra* note 7 at SPM-4.

³⁷ Lauren F Jones, “Treasuring the Chesapeake: An Analysis of Climate Change and Its Impact on the Chesapeake Bay and Maryland’s Surrounding Coastal Regions” (2009) 38:2 U Balt L Rev 331 at 332 (HeinOnline) (terming this phenomenon as “temperature-dissolved oxygen squeeze”).

³⁸ RF McLean & Alla Tsyban, “Coastal Zones and Marine Ecosystems”, in James J McCarthy et al, eds, *Climate Change 2001: Impacts, Adaptation, and Vulnerability* (Cambridge: Cambridge University Press, 2001) 335 at 366. In 1997, increased nutrients and sea surface temperature led to an outbreak of toxic dinoflagellate, which caused large fish kills on the U.S. Atlantic coast, leading to an economic loss of USD60 million. Again, a persistent brown tide bloom in the Peconic Estuary system of New York blocked light and depleted oxygen in the water column, severely affecting the sea grass and reducing the value of the Peconic Bay scallop fishery by approximately 80 per cent. *Ibid.* Rising temperatures are found to lead to frequent appearances of red tides in Vietnamese waters, leading to fish kills and damage to aquaculture production. Socialist Republic of Vietnam, Vietnam’s Second *National Communication to the United Nations Framework Convention on Climate Change* (Hanoi: Ministry of Natural Resources and the Environment, 2010) at 83; see also Israel, Ministry of Environmental Protection, *Israel’s Second National Communication on Climate Change Submitted under the United Nations Framework Convention on Climate Change* (Jerusalem: Ministry of Environmental Protection, 2010) at 87 (several species of toxic blue-green algae have been reported in the Sea of Galilee).

³⁹ For an overview of different impacts, see Cynthia Rosenzweig & Gino Casassa, “Assessment of Observed Changes and Responses in Natural and Managed Systems” in ML Parry et al, eds, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2007) 79 at 97 (fish species like sardines, anchovies, red mullet and bass with more southern bio-geographical affinities are moving north); see also *Fisheries and Aquaculture in Our Changing Climate*, online: FAO <[ftp://ftp.fao.org/FI/brochure/climate_change/policy_brief.pdf](http://ftp.fao.org/FI/brochure/climate_change/policy_brief.pdf)>; UNFAO, Fisheries and Aquaculture Department, *Strategy for Fisheries, Aquaculture and Climate Change: Framework and Aims 2011–16* (Rome: FAO, 2012) [UNFAO, *Strategy for Fisheries*]; see also Cook Islands, National Environment Service, *Cook Islands Second National Communication under the United Nations Framework Convention for Climate Change* (Cook Islands: National Environment Service, 2011) at 48 (warmer ocean temperature has affected pearl farming).

⁴⁰ “Summary for Policymakers” in *Physical Science*, 2007, *supra* note 7 at 9. Tropical cyclones have major consequences for Bangladesh. The cyclone of 1970 killed nearly 300,000 people. At the global level, between 1980–2000, 250,000 deaths occurred due to tropical cyclones, out of which 60 per cent were in Bangladesh. See also Nicholls & Wong, *supra* note 32 at 338.

biodiversity.⁴¹ It is also believed that temperature increases and freshening can lead to a collapse of the North Atlantic thermohaline circulation, triggering other profound impacts.⁴²

Moreover, oceans form one of the largest natural reservoirs of carbon. It is estimated that, on a daily basis, the world's seas uptake nearly 22 million metric tons of CO₂.⁴³ The CO₂ dissolves and reacts with H₂O to form carbonic acid, turning an essentially alkaline medium into an acidic one.⁴⁴ Simply stated, ocean acidification is the decrease in the pH of seawater due to the uptake of anthropogenic carbon dioxide.⁴⁵ Thus, if we are not successful in our efforts to control excessive dumping of GHGs (including CO₂) into the atmosphere, the carbon chemistry of the oceans will be considerably altered.⁴⁶ This increase in CO₂ levels will reduce reef calcification⁴⁷ contributing to coral bleaching and unleash other secondary impacts.⁴⁸

Given the forgoing, it is clear that climate change impacts on coastal areas fall under two broad categories: biophysical and socio-economic. Biophysical impacts include: 1) accelerated coastal erosion;⁴⁹ 2) increased flood frequency;⁵⁰ 3) increased

⁴¹ Commonwealth of Dominica, *Initial National Communication under the United Nations Framework Convention on Climate Change* (Roseau: Environmental Coordinating Unit, Ministry of Agriculture and the Environment, 2001) at 31 (reporting that Hurricane David, devastated the feeding and nesting sites of Dominica's endemic parrots and that the population of the two endangered parrots reached critical levels as low as 60 (*A. imperialis*) and 200 (*A. arausiaca*)).

⁴² *Ibid* at 15.

⁴³ Secretariat of the Convention on Biological Diversity, *Scientific Synthesis of the Impacts of Ocean Acidification on Marine Biodiversity*, CBD Technical Series No 46 (Montreal: Secretariat of the Convention on Biological Diversity, 2009) at 12. AR5 which notes that CO₂ concentrations have increased by 40 per cent since pre-industrial times and the oceans have absorbed about 30 per cent of the emitted anthropogenic carbon dioxide, contributing to ocean acidification. "Summary for Policymakers" in *Physical Science, 2013, supra* note 7 at SPM-7.

⁴⁴ Ocean pH has dropped by 30 per cent globally i.e., from 8.2 to 8.1 during the last 200 years. See generally Ellycia Harrould-Kolieb, Matthew Huelsenbeck & Virginia Selz, *Ocean Acidification the Untold Stories* (Washington, DC: Oceana, 2010).

⁴⁵ Jean-Pierre Gattuso & Lina Hansson, eds, *Ocean Acidification* (Oxford: Oxford University Press, 2011) at 2.

⁴⁶ Rachel Baird, Meredith Simons & Tim Stephens, "Ocean Acidification: A Litmus Test for International Law" (2009) 3 *Carbon & Climate LR* 459 at 460.

⁴⁷ McLean & Tsyban, *supra* note 38 at 362.

⁴⁸ *Ibid*. Coral reefs in Indonesia, affected by bleaching in 1993 due to warming of sea water showed very few signs of continued recovery beyond the initial recovery. Luitzen Bijlsma et al, eds, *Preparing to Meet the Coastal Challenges of the 21st Century: Conference Report World Coast Conference 1993* (The Netherlands: Ministry of Public Works and Water Management, April 1994) at 303.

⁴⁹ Rosenzweig & Casassa, *supra* note 39 at 92; J Dronkers et al, eds, *Report of the Coastal Management Subgroup: Strategies for Adaption to Sea Level Rise* (Geneva: IPCC, Response Strategies Working Group, 1990) at 4. Already about 40 per cent of the 81,000 kilometers coastline

precipitation in certain regions (while reducing precipitation in others);⁵¹ 4) saltwater intrusion into estuaries and aquifers and disruptions in the fresh-salt water interface;⁵² 5) changes in wind patterns and intensity;⁵³ 6) decline in biodiversity as well as habitat loss and modification;⁵⁴ 7) increased sea surface temperatures;⁵⁵ 8) increased wave attacks and storm-surges;⁵⁶ and 9) spreading of invasive species.⁵⁷ The main socio-economic consequences include: 1) large-scale inundation and permanent submergence of large parcels of coastal land and coastal habitats;⁵⁸ 2) risk to human lives and well-being;⁵⁹ 3) colossal damage to infrastructure;⁶⁰ 4) disease outbreaks;⁶¹ 5) losses in recreation

has been eroded. Masnellyarti Hilman, ed, *Indonesia Second National Communication Under The United Nations Framework Convention on Climate Change (UNFCCC)*, (Jakarta: Ministry of Environment, 2010) at IV-30.

⁵⁰ Dronkers et al, eds, *ibid.*

⁵¹ For instance, in Mauritius while the mean temperature has increased by 0.18 degree Celsius per decade, rainfall amount during the same period has decreased. Government of Mauritius, *Second National Communication of the Republic of Mauritius under the United Nations Framework Convention on Climate Change (UNFCCC)* (Government of Mauritius, 2010) at 77 [Mauritius, *Second National Communication*].

⁵² See generally A Melloul & M Collin, "Hydrogeological Changes in Coastal Aquifers Due to Sea Level Rise" (2006) 49 *Ocean & Coast Mgmt* 281-97 (ScienceDirect).

⁵³ Increase in greenhouse gases will cause changes in the direction and speed of wind in Thailand. Thailand, *Thailand's Second National Communication under the United Nations Framework Convention on Climate Change* (Bangkok: Ministry of Natural Resources & Environment, 2010) at 71.

⁵⁴ For instance, coastal wetlands are being lost at a rapid rate, averaging 0.5-1.5 per cent per year. Sea-level rise is expected to increase the rate of net coastal wetland loss. Loss of coastal wetlands of international importance is expected to be greater for the coasts of the United States, the Mediterranean Sea, Africa (Atlantic side), East Asia, Australia, and Papua New Guinea. Bijlsma et al, eds, *supra* note 48 at 311.

⁵⁵ For more on this topic, see *supra* notes 32-35 and accompanying text.

⁵⁶ Rosenzweig & Casassa, *supra* note 39 at 92-93.

⁵⁷ Warmer winter water temperatures due to changing climate can provide a thermal refuge for invading species. Gulf of Maine Council on the Marine Environment, *Marine Invasive Species: State of the Gulf of Maine Report* (np: Gulf of Maine Council on the Marine Environment, 2010) at 5.

⁵⁸ A one-meter rise in sea level is predicted to impact nearly 145 million people, causing damage to nearly 2,223,000 square kilometres of land area and racking up costs estimated at USD944 billion. See generally D Anthoff, RJ Nicholls, RSJ Tol & AT Vafeidis, "Global and Regional Exposure to Large Rises in Sea-level: A Sensitivity Analysis", Working Paper 96 (Norwich: Tyndall Centre for Climate Change Research, 2006).

⁵⁹ For instance, it is believed that coastal communities, particularly in low-income countries are vulnerable to a range of health effects due to climate variability like cholera, shell fish and reef fish poisoning. Nicholls & Wong, *supra* note 32 at 334-35.

⁶⁰ It is doubtful whether the majority of coastal protection structures like seawalls, and coastal dikes can withstand the pressures from the sea. McLean & Tsyban, *supra* note 38 at 362. Already, in the United Kingdom to maintain sea defenses and shore protection works around the 4,300 kilometres of coast, approximately USD500 million has to be spent. *Ibid* at 365. These coastal defences will in due course lose their stability and become less functional. In the event of a one-meter SLR, it is estimated that to keep the present level of functions and stability for about 1,000 Japanese ports the

amenities and tourism values;⁶² 7) damage to cultural and historical assets;⁶³ and 8) reductions in fisheries, forests and agriculture.⁶⁴ Some of the major impacts of climate change on coastal areas and the extant international legal regimes applicable to the situation are identified next.

2.3 “RECEDING COASTLINES”: IMPACT ON COASTAL AREAS AND MARITIME TERRITORIES

To give effect to the principle that the “land dominates the sea,”⁶⁵ (essentially, coastal frontage) under the *United Nations Convention on the Law of the Sea, 1982* (LOSC), all coastal states are entitled to certain maritime zones, such as internal waters,⁶⁶ a territorial sea,⁶⁷ a contiguous zone,⁶⁸ an exclusive economic zone,⁶⁹ a continental shelf⁷⁰ and, in

total expenditure will be about USD110 billion. *Ibid* at 366. As well, already many coastal cities are heavily dependent on artificial coastal defenses like Tokyo, Shanghai, Hamburg, Rotterdam, and London. Many of these will require upgradation based on new designs. See Nicholls & Wong, *ibid* at 333. Ports, railways and roads will be vulnerable to coastal flooding. *Ibid*.

⁶¹ Higher temperatures, precipitation and humidity facilitate the spread of diseases such as *chikungunya*, malaria, diarrhea and dengue. Mauritius, *Second National Communication*, *supra* note 51 at 81; Hilman, ed, *supra* note 49 at IV-45.

⁶² The economies of some of the coastal countries are heavily oriented towards coastal activities like beach tourism (sun, sea, and sand) and these can be heavily impacted by climate change and SLR. Nicholls & Wong, *supra* note 32 at 335-36.

⁶³ A 0.5 metre rise in sea level can cause havoc on the Nile delta if no protective measures are adopted. It is expected that nearly 52 per cent of monuments and historic sites will also be lost forever. McLean & Tsyban, *supra* note 38 at 367.

⁶⁴ See generally Gerald C Nelson et al, *Climate Change Impact on Agriculture and Costs of Adaptation*, Food Policy Report (Washington, DC: International Food Policy Research Institute, 2009); see also UNFAO, *Strategy for Fisheries*, *supra* note 39.

⁶⁵ *North Sea Continental Shelf*, [1969] ICJ Rep 3 at 52 (explaining the application of the principle in determining the continental shelf).

⁶⁶ *United Nations Convention on the Law of the Sea*, 10 December 1982, 1833 UNTS 397, 21 ILM 1261 (entered into force 16 November 1994) [LOSC], art 8.

⁶⁷ The territorial sea is the belt of ocean measured seaward from the baseline of the coastal state and extending 12 nautical miles. In its territorial sea, a coastal state exercises complete sovereignty, subject to a right of innocent passage guaranteed to foreign ships. *Ibid*, arts 17-19.

⁶⁸ The contiguous zone runs for another 12 nautical miles from the territorial sea and is determined from the baseline and in the contiguous zone, states can prevent and punish the violation of customs, fiscal, immigration or sanitary laws. *Ibid*, art 33.

⁶⁹ The exclusive economic zone (EEZ) extends to 200 nautical miles, again measured from the baseline. *Ibid*, art 57. In this area, a coastal state has sovereign rights for the purposes of exploration, exploitation and management of living and non-living natural resources in the water column. *Ibid*, art 56. In the EEZ, while the coastal state has sovereign rights over the natural resources and their economic exploitation, the international community is guaranteed freedoms of navigation and over-flight, as well as the right to lay submarine cables and pipelines. *Ibid*, art 58. See *ibid*, part V (entitled “Exclusive Economic Zone”).

⁷⁰ The continental shelf comprises the seabed and subsoil of the submarine areas that extend beyond a country’s territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin. *Ibid*, art 76(1). It generally runs to 200 nautical miles from the baseline even

certain cases (if prescribed geomorphological conditions exist), an extended continental shelf.⁷¹ Within each of these zones, states exercise varying combinations of sovereignty, sovereign rights and jurisdictions, which progressively diminish as the distance from the coastline increases.⁷² The perimeter of all maritime zones is measured from the baseline, which can be normal,⁷³ straight,⁷⁴ or archipelagic.⁷⁵ Baselines also play an essential role in the delimitation of maritime boundaries.⁷⁶

if it does not physically extend that far. *Ibid.* In cases where it does go farther, it is generally limited to 350 nautical miles from the baseline (art 76(6)). In the continental shelf, the state enjoys sovereign rights for the purposes of exploration and exploitation of natural resources of the seabed and subsoil.

⁷¹ See *ibid.*, art 76(4)–(6).

⁷² US, Senate, *United Nations Convention on the Law of the Sea, with Annexes, and the Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea, with Annex: Message from the President of the United States*, 103d Cong, 2d Sess, Treaty Doc 103-39 (1994) at 2, online: US Senate Committee on Foreign Relations, Treaties, United Nations Convention on the Law of the Sea <<http://www.foreign.senate.gov/>>.

⁷³ Coastal states generally rely on *normal* baselines to demarcate their maritime zones, with the low-water line (“as marked on large-scale charts that are officially recognized by the coastal State”) constituting the normal baseline. *LOSC*, *supra* note 66, art 5. Two terms are important here: chart and low-water line. Chart refers to a nautical chart used by mariners to aid navigation, and the Mean Low-Water Spring Tide or the Lowest Astronomical Tide usually determines the low-water line. The phrase “as marked on large-scale charts officially recognized by the coastal State” provides the state with discretion to choose the vertical datum. International Law Association, *Sofia Conference (2012): Baselines Under the International Law of the Sea* at 31, online: International Law Association <<http://www.ila-hq.org/en/committees/index.cfm/cid/1028>> [ILA, *Sofia Conference*]. Additional rules have also been drafted to determine normal baselines for islands situated on atolls and for islands having fringing reefs with low-tide elevations, i.e., the baseline is the seaward low-water line of the reef. *LOSC*, *ibid.*, art 6.

⁷⁴ The crux of these rules is enshrined in the *United Nations Convention on the Law of the Sea, 1982*, stating that that in cases where the coastline is deeply indented and cut into, or if there is a fringe of islands along the coast in its immediate vicinity, then recourse can be had to straight baselines. *LOSC*, *ibid.*, art 7. Article 7(2) allows the drawing of straight baselines where the coastline is highly unstable due to the presence of a delta or due to other natural conditions. If drawn sensibly, straight baselines will not significantly enlarge the limits of the maritime zones if normal baselines are utilized; hence, the matter revolves around the proper plotting of straight baselines. To ensure this will be the case, the *LOSC* states that the straight baseline should not depart “to any appreciable extent from the general direction of the coast, and the sea areas lying within the lines must be sufficiently closely linked to the land domain to be subject to the regime of internal waters.” *Ibid.*, art 7(3). Low-tide elevations such as mud flats and sand bars are naturally formed areas of land, surrounded by water, that remain above water at low tide but disappear at high tide. Due to these features, the *LOSC* states that low-tide elevations can be utilized to draw straight baselines only if lighthouses or similar installations permanently above sea level have been built on them. Low-tide elevations without such structures can still be utilized if they have general international recognition. Again, if low-tide land elevations are situated wholly at a distance exceeding the breadth of the territorial sea from the mainland or an island, they cannot have a territorial sea. Specific rules have also been provided in the case of rivers, bays and historic bays. Tony George Puthucherril, “Rising Seas, Receding Coastlines, and Vanishing Maritime Estates and Territories: Possible Solutions and Reassessing the Role of International Law” (2014) 15:1 Int’l Community LR [unpublished, accepted for publication at Queen Mary University of London].

As rising seas push water inland to erode the coastlines, key baseline points like low-tide elevations (drying rocks),⁷⁷ fringing reefs,⁷⁸ riverbanks,⁷⁹ and islands become

⁷⁵ Archipelagic states are permitted to draw *archipelagic straight baselines* to join the outermost points of the outermost islands and drying reefs of their archipelago. *LOSC, ibid*, art 47. In drawing such baselines, the rules stipulate that the main islands and an area subject to a specified water-to-land ratio should be included within them (art 47(1)). As well, the rules state that the length of the baselines must not exceed 100 nautical miles, with the exception that up to three per cent of the total number of baselines enclosing the archipelago can exceed this length, to a maximum of 125 nautical miles (art. 47(2)). The baselines should not depart in any appreciable extent from the general configuration of the archipelago (art 47(3)). The baselines should not depart in any appreciable extent from the general configuration of the archipelago. Baselines must not be drawn to and from low-tide elevations, unless lighthouses or similar installations that are permanently above sea level have been built on them or the low-tide elevation is situated wholly or partly at a distance not exceeding the breadth of the territorial sea from the nearest island. Furthermore, archipelagic baselines are not to be drawn in a manner that cuts another state off from its territorial waters or the high seas. The waters landward of these baselines are called archipelagic waters, and while the state has sovereignty over these waters, ships of other nations are guaranteed the right of innocent passage and sea-lane passage through them. *Ibid*, art 2(1) (emphasizing the sovereignty of the archipelagic State over its archipelagic waters). The sovereignty of an archipelagic State extends to the archipelagic waters enclosed by the archipelagic baselines drawn in accordance with article 47, regardless of their depth or distance from the coast. *Ibid*, art 49(1). Ships of all states enjoy the right of innocent passage through archipelagic waters. *Ibid*, art 52(1). All ships and aircraft enjoy the right of archipelagic sea-lanes passage. *Ibid*, art 53(2). Archipelagic countries like the Maldives have used this method to determine their maritime zones. Michael Gagain, “Climate Change, Sea Level Rise, and Artificial Islands: Saving the Maldives’ Statehood and Maritime Claims Through the Constitution of the Oceans” (2012) 23 *Colo J Int’l Envtl L & Pol’y* 77 at 95 (HeinOnline).

⁷⁶ The LOSC prescribes the relevant rules when it states that

[w]here the coasts of two States are opposite or next to each other, neither of the two States is entitled, failing agreement between them, to the contrary, to extend its territorial sea beyond the median line, every point of which is equidistant from the nearest points on the baselines from which the breadth of the territorial seas of each of the two States is measured.

LOSC, ibid, art 15; see also *ibid*, art 74 (delimitation of the EEZ between states with opposite or adjacent coasts) & art 83 (delimitation of the continental shelf between states with opposite or adjacent coasts). Even though “the equidistance method is widely used in the practice of maritime delimitation: it . . . does not automatically have priority over other methods of delimitation and, in particular circumstances, there may be factors which make the application of the equidistance method inappropriate.” See *Territorial and Maritime Dispute between Nicaragua and Honduras in the Caribbean Sea (Nicaragua v Honduras)*, [2007] ICJ Rep 659 at 741. In certain circumstances, due to certain peculiar geographical configuration of the coasts, the equidistance line can prove inequitable. In *Continental Shelf (Libyan Arab Jarnahiriya/Malta)*, [1985] ICJ Rep 13 at 47, it was held that “the equidistance method is not the only method applicable . . . and it does not even have the benefit of a presumption in its favour. Thus, under existing law, it must be demonstrated that the equidistance method leads to an equitable result in the case in question.” Even in such situations the appropriate test is “to begin with the median line as a provisional line and then to ask whether “special circumstance” require any adjustment or shifting of that line.” *Maritime Delimitation in the Area between Greenland and Jan Mayen*, [1993] ICJ Rep 38 at 61. “For the delimitation of the maritime zones beyond the 12-mile zone, it will first provisionally draw an equidistance line and then consider whether there are circumstances which must lead to an adjustment of that line.” Thus, there is again requires reliance on basepoints.

⁷⁷ These can serve as a baseline point if they are located within the territorial sea. According to some commentators, if a drying rock is located within 12 nautical miles from shore, permanent

submerged.⁸⁰ This unsettles the baselines, which may ambulate⁸¹ to reflect new physical realities and conditions. Correspondingly, certain maritime zones will also shrink, resulting, *mutatis mutandis*, in a decrease in related entitlements and prerogatives that the coastal zone would otherwise enjoy.⁸² In other words, as coastal territories vanish, so, too, will some maritime zones and the entitlements associated with them. At the same time, this may expand the scope of rights enjoyed by other states. For instance, the right to innocent passage that some states have over certain waters could now enlarge into a freedom of navigation.⁸³ Similarly, as large parts of the exclusive economic zone become high seas, all states (coastal or land-locked) can conduct fishing and other operations in waters that were previously off-limits. Such ambulations in baselines and the reduction in maritime estate can prove particularly devastating in South Asian countries that depend on maritime resources for economic support and well-being.

In such situations, other than for Bangladesh (whose coastlines are highly unstable due to the presence of deltas and its double concave nature⁸⁴ and whose interests may be

submergence of this rock by a rising sea level could mean a loss of territorial sea generated by the rock. Charles Di Leva & Sachiko Morita, “Maritime Rights of Coastal States and Climate Change: Should States Adapt to Submerged Boundaries?”, Law & Development Working Paper Series No 5, at 16, online: The World Bank <<http://www.worldbank.org/>>.

⁷⁸ Since the seaward low-water line of the reef is used to determine the baseline for islands having fringing reefs as the sea rises, the extent of the territorial sea may change for these islands. *Ibid*.

⁷⁹ As seen from the rules, in cases where the baseline is a straight line across the mouth of the river between points on the low-water line of its banks, as and when the sea rises, there could be erosion of the river bank, shifting further inland the base points used to generate the maritime zone. *Ibid*.

⁸⁰ Under article 121 of the LOSC, islands can generate a maritime estate, provided the island is not an artificial installation and is always above sea level. Consequently, formations visible only at low tide and permanently submerged banks and reefs cannot generally produce maritime zones. Therefore, rising seas could swallow an entire island or rock, thereby depriving the ability of the island to generate the necessary maritime zones. *Ibid* at 17.

⁸¹ Jenny Grote Stoutenburg, “Implementing a New Regime of Stable Maritime Zones to Ensure the (Economic) Survival of Small Island States Threatened by Sea-Level Rise” (2011) 26 Int’l J Mar & Coast L 263 at 271-76 (arguing a case for a regime of stable baselines); see also David D Caron, “Climate Change, Sea Level Rise and the Coming Uncertainty in Oceanic Boundaries: A Proposal to Avoid Conflict” in Seoung-Yong Hong & Jon M Van Dyke, eds, *Maritime Boundary Disputes, Settlement Processes, and The Law of the Sea* (The Netherlands: Martinus Nijhof, 2009) 1 at 10.

⁸² Julia Lisztwan, “Stability of Maritime Boundary Agreements”, Note, (2012) 37 Yale J Int’l L 153 at 165 (HeinOnline).

⁸³ Leva & Morita, *supra* note 77 at 20.

⁸⁴ *Dispute Concerning Delimitation of the Maritime Boundary between Bangladesh and Myanmar Concerning Delimitation of the Maritime Boundary between Bangladesh and Myanmar in the Bay of Bengal (BANGLADESH/MYANMAR)*, 16, Judgment (14 March 2012) ¶279 (International Tribunal for the Law of the Sea), online: ITLOS, Search <<http://www.itlos.org/index.php?id=2>>.

protected *via* article 7(2)⁸⁵ for other coastal countries in South Asia and elsewhere), the ambulatory nature of the baselines does not bode well for current or future growth.⁸⁶ Pakistan, for example, has relied on a system of straight baselines to demarcate its maritime estate; thus, when rising seas claim these basepoints, the maritime claims of this country will also be considerably reduced.⁸⁷

As we can see, climate-change-induced SLR threatens to redraw the map of the world, and South Asia is no exception to this.⁸⁸ In consonance with the generally accepted understanding of the concept of statehood, the *Montevideo Convention on the Rights and Duties of States*⁸⁹ (Montevideo Convention) enumerates the following as its constituting elements, namely that “[t]he State as a person of international law should possess the following qualifications: (a) a permanent population; (b) a defined territory; (c) government; and (d) capacity to enter into relations with other States.”⁹⁰ In particular, for Small Island Developing States (SIDS) like the Maldives, the Tuvalu, the Kiribati and the Marshall Islands that lie only a few meters above the sea, the situation can be catastrophic as they face total inundation of their land mass.⁹¹ These countries are formed mainly out of low-lying atolls and have a very limited resource base.⁹² It is forecasted

⁸⁵ This provision was primarily inserted into the LOSC text due to the efforts of Bangladesh and was drafted with the specific case of Ganges/Brahmaputra River delta in mind. It can be applied in the case of other deltaic countries such as Burma, Egypt, Nigeria and Vietnam. Myron H Nordquist, ed, *2 United Nations Convention on the Law of the Sea, 1982: A Commentary* (The Netherlands: Martinus Nijhoff Publishers, Dordrecht, 1993) at 101. It enables the drawing of straight baselines (including in other countries that face similar dilemmas) where the appropriate points can be selected along the furthest seaward extent of the low-water line and, notwithstanding subsequent regression of the low-water line, this shall remain effective unless and until it is changed by the coastal state in accordance with the stipulations in the LOSC.

⁸⁶ Stoutenburg, *supra* note 81 (arguing a case for a regime of stable baselines); see also Caron, *supra* note 81.

⁸⁷ See generally US, Bureau of Oceans & International & Environmental & Scientific Affairs, *Limits in the Seas: Straight Baselines Claim: Pakistan (No 118)* (Office of Ocean Affairs, 1996); see also *Territorial Waters and Maritime Zones Act 1976* (22 December 1976, Pakistan).

⁸⁸ It is difficult to predict when exactly these events will unfold since as pointed out earlier the rate of SLR can vary and is dependant on several factors. See *supra* notes 19-31 and accompanying text.

⁸⁹ For the text, see *Montevideo Convention on the Rights and Duties of States*, 26 December 1933, 165 LNTS 19 (entered into force 26 December 1934).

⁹⁰ *Ibid*, art 1.

⁹¹ Stoutenburg, *supra* note 81 at 268.

⁹² For more details regarding the geographical features of atolls see Colin D Woodroffe, “Reef-island Topography and the Vulnerability of Atolls to Sea-Level Rise” (2008) 62 *Global & Planetary Change* 77 at 78 (Science Direct). The majority of these islands like the Marshall Islands, the Maldives, and the Caribbean Islands are heavily oriented towards coastal activities like beach tourism (sun, sea, and sand) and fishing. UN RIO+20 United Nations Conference on Sustainable Development, *The Future We Want*, A/CONF.216/L.1*, 19 June 2012, ¶178.

that rising seas will gobble up entire parts of the majority of SIDS,⁹³ leading to the “sinking” islands phenomenon.⁹⁴

This scenario is not without precedence. In 1999, Kiribati lost two of its uninhabited islands (Tebua Tarawa and Abanuea) to rising seas.⁹⁵ The IPCC affirms that “[s]ea-level rise impacts on the low-lying Pacific Island atoll states of Kiribati, Tuvalu, Tokelau and the Marshall Islands may, at some threshold, pose risks to their sovereignty or existence.”⁹⁶ In the 2004 Indian Ocean tsunami, large parts of the Maldives were completely under the sea for a few minutes.⁹⁷ In the Sundarbans in India, the residents of the Lohachara Island (located at the confluence of the rivers Ganges and Brahmaputra) had to permanently relocate, as the island was swamped by the Bay of Bengal.⁹⁸

Since mean SLR is a gradual process, the disappearance of islands like the

⁹³ Koko Warner et al, *In Search of Shelter: Mapping the Effects of Climate Change on Human Migration and Displacement* (CARE International, 2009) at 18-19. Carteret Islanders, part of Papua New Guinea, had to abandon their homes as the island was rendered uninhabitable due to king tides, salinization of water sources, dying trees, etc. See Richard Shears, “The world’s first climate change refugees to leave island due to rising sea levels”, *MailOnline* (18 December 2007) online: MailOnline, Advanced Search <<http://www.dailymail.co.uk/home/index.html>>; see also Neil Tweedie, “Carteret Islands: ‘The sea is killing our island paradise’”, *The Telegraph* (9 December 2009) online: The Telegraph, Archive <<http://www.telegraph.co.uk/earth/>>. Already, in Papua New Guinea, inhabitants of the Carteret Islands and the Duke of York Islands had to be relocated. In the Maldives, the residents in the island of Kandholhudoo had to be relocated because of the tsunami. See Susin Park, *Climate Change and the Risk of Statelessness: The Situation of Low-lying Island States*, UNHCR, Legal and Protection Policy Research Series, PLA/2011/04 (Switzerland: Division of International Protection, 2011) at 2-3; see also Walter Kälin & Nina Schrepfer, *Protecting People Crossing Borders in the Context of Climate Change Normative Gaps and Possible Approaches*, UNHCR, Legal and Protection Policy Research Series, PPLA/2012/01 (Switzerland: Division of International Protection, 2012) at 2-3.

⁹⁴ See *Submission: Climate Change and Statelessness: An Overview*, UNHCR (15 May 2009) at 1.

⁹⁵ Alex Kirby, “Islands disappear under rising seas”, *BBC News* (14 June 1999) online: BBC News <<http://www.bbc.co.uk/news/>>; see also *Pacific at Risk: Our Islands, Our Lives*, online: SPREP <http://www.sprep.org/att/publication/000142_Pacific_at_Risk.pdf>.

⁹⁶ W Neil Adger, Shardul Agrawala & M Monirul Qader Mirza, “Assessment of Adaptation Practices, Options, Constraints and Capacity” in ML Parry et al, eds, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2007) 717 at 736.

⁹⁷ See UN, *UNTV: 21st Century, Maldives: Safer Islands*, online: UN News & Media Multimedia, Television, 21st Century <<http://www.unmultimedia.org/>> (reporting that Maldives lost 20 islands during the 2004 tsunami). USAID, *Tsunami Displacement: Lessons for Climate Change Adaptation Programming Findings for the Maldives – Overview Report* (Washington, DC: USAID, 2010) at 8.

⁹⁸ Subhra Priyadarshini, “Vanishing islands, Displaced Climate Casualties, Underlying truth”, *The Telegraph [of Kolkata]* (30 October 2006), online: The Telegraph, Archives, Weekly Features, Knowhow <<http://www.telegraphindia.com/>>. However, there is controversy as to the true causative factor. Achintyarup Ray, “Vanishing islands: Blame on KoPT”, *The Times of India* (3 April 2009), online: The Times of India, Archives <<http://timesofindia.indiatimes.com/international-home>>.

Maldives will also likely be a slow but sure process.⁹⁹ Even before the total obliteration of their land territory, it is probable that many of the coral-reef islands in the Maldives will be rendered uninhabitable, triggering migrations of coastal populations to other lands.¹⁰⁰ Of particular concern will be the impact of salinity intrusion into their freshwater lenses, the destruction of coastal agriculture, and coral bleaching.¹⁰¹ Already, the Maldives is struggling to find freshwater sources. As these islands are slowly denuded of their ability to sustain “human habitation or an economic life,”¹⁰² and as their land territory vanishes, the Maldives faces the danger of degenerating into a disadvantaged sub-category of island, called “rock,”¹⁰³ which can produce only territorial waters and contiguous zones.¹⁰⁴

In others words, it is possible that the exclusive economic zone that the Maldives once generated could vanish. As the sea moves further inland and as the islands disappear, the Maldives may lose its other maritime zones as well and the exclusive and sovereign right to exploit resources, particularly, the fish stocks that these waters harbour. This can have major economic implications, since the maritime zones and attendant resources form the country’s primary economic backbone.¹⁰⁵ The Maldives also faces the prospect of losing significant portions of its population to climate-change-related

⁹⁹ Rosemary Rayfuse, “W(h)ither Tuvalu? International Law and Disappearing States” (University of New South Wales Faculty of Law Research Series, Paper 9, 2009) at 6.

¹⁰⁰ See generally Tony George Puthucherril, “Adapting to Climate Change and Accelerated Sea-Level Rise through Integrated Coastal Zone Management Laws: A Study of the South Asian Experience” in Aldo Chircop, Scott Coffen-Smout & Moira McConnell, eds, *Ocean Yearbook*, vol 26 (Leiden: The Netherlands, 2012) 533 at 573.

¹⁰¹ See David Freestone, “International Law and Sea Level Rise” in Robin Churchill & David Freestone, eds, *International Law and Global Climate Change*, International Environmental Law & Policy Series (London: Graham & Trotman, 1991) 109 at 112.

¹⁰² *LOSC*, *supra* note 66, art 121(3).

¹⁰³ Rocks are basically islands, but they are a disadvantaged category of islands. Islands are economically useful and supports human habitation. Under the definition of island in the *LOSC* an island has four features, namely, 1) naturally formed 2) area of land, 3) surrounded by water, 4) above water at high tide. *Ibid*, art 121(1).

¹⁰⁴ *Ibid*, art 121(3).

¹⁰⁵ If an island has no maritime neighbours within 400 nautical miles, it can generate 431,014 square kilometers of territorial sea, EEZ and continental shelf rights. On the other hand, if it is considered to be a mere “rock” incapable of generating EEZ and continental shelf rights, it can still create a territorial sea of 1,550 square kilometers. The voluntary reclassification of Rockall by United Kingdom from full “island” to “rock” resulted in a loss of around 60,000 square nautical miles of fishery zone. See generally Clive Howard Schofield, *The Trouble with Islands* (LLM Thesis, The Faculty of Graduate Studies, University of British Columbia, 2009) [unpublished]; see also Clive Schofield, “Shifting Limits? Sea Level Rise and Options to Secure Maritime Jurisdictional Claims” (2009) 3:4 Carbon & Climate LR 405 at 409 (HeinOnline) [Schofield, “Shifting Limits?”].

disasters like cyclones and typhoons, with survivors migrating to other areas, rending the social fabric. Thus, out of the four conditions essential to statehood as enumerated in the Montevideo Convention, at least two (a permanent population and a defined territory) will be seriously compromised, throwing into doubt the country's statehood status.

Among the measures suggested to protect the rights and interests of countries like the Maldives, in respect of the maritime zones, a range of promising solutions has been proposed, some of which are analyzed here. One solution is to proceed in a state of inaction or maintain the status quo, allowing nature to determine the course of events. In such a scenario, the seas would slowly move in and determine the equilibrium. While this would save countries the trouble of diverting scarce economic resources and spending huge amounts of money to construct costly barriers to the sea,¹⁰⁶ this 'status quo' approach has several disadvantages. As mentioned, coastal states would lose land and infrastructures as well as inhabitants; for small island states like the Maldives, this could spell the end of their existence.

To address the issues inherent in diminishing maritime estate, an astute way to deal with the crisis would be to organize a conference on the Law of the Sea to fill in the gaps. Failing that, a new protocol on SLR could be developed¹⁰⁷ or the UN General Assembly could be convened to pass resolutions to provide guidance on the matter. Additionally, the amending procedures contemplated under the LOSC could be utilized to modify or reinterpret the rules to cope with new and unforeseen situations.¹⁰⁸ For instance, since one of the main issues of concern is the ambulatory nature of baselines and outer limits of the various maritime zones, these demarcation points could be permanently fixed.¹⁰⁹

¹⁰⁶ But see Nicholls & Wong, *supra* note 32 at 317 (“[a]daptation costs for vulnerable coasts are much less than the costs of inaction (high confidence)”).

¹⁰⁷ David Freestone & John Pethick, “Sea Level Rise and Maritime Boundaries: International Implications of Impacts and Responses” in Gerald H Blake, ed, *Maritime Boundaries*, vol 5, World Boundaries (NY: Routledge, reprint 1997) 73 at 79. This was one of the primary suggestions of the CZMS of the IPCC. In its “Suggested Ten-Year Timeline for the Implementation of Comprehensive Coastal Zone Management Plans,” the CZMS had recommended the adoption of such a protocol by 1992 to “provide a framework for international and multinational cooperation in dealing with the full range of concerns related to impacts of sea level rise and climate change impacts on the coastal zone.” WMO, UNEP & IPCC, *Climate Change: The IPCC Response Strategies* (Washington DC: Island Press, 1991) at 129, 139-40.

¹⁰⁸ *LOSC*, *supra* note 66, arts 312-14.

¹⁰⁹ Both the baselines and the outer limits of the different maritime zones need to be permanently fixed. If only the outer limits of the different maritime zones were fixed and the baselines were allowed to ambulate it will harshly impact the archipelagic states, as they may not be able to comply with the

Using the provision on unstable coasts, straight baselines could be drawn in new areas. Article 7(2) may provide a legal architecture to resolve problems that arise in cases where coastlines are highly unstable, particularly where the instability is exacerbated by SLR. By relying on this method, appropriate points can be selected along the furthest seaward extent of the low-water line. Straight baselines would remain effective until they are changed by the coastal states, in accordance with the LOSC. If a state chooses not to take any action to change its baseline, the old baseline will remain effective. Adoption of such a measure will ensure that if the low-water line were to retreat due to SLR, the affected coastal states will retain their maritime zones. This will particularly benefit SIDS, which might otherwise lose not only their maritime estates but also their statehood.

As well, article 5 provides considerable leeway to coastal states in determining their normal baselines, which is the charted low-water line.¹¹⁰ Hence, it is the state that determines the choice of large-scale charts, with a presumption weighted heavily on the side of states despite the proviso that the chosen chart be a “sufficiently accurate representation of the normal baseline.”¹¹¹ Again, due to unique geographical circumstances, article 7(2) permits the pictorial version of the straight baseline to remain effective. Accordingly, it has been suggested that coastal states threatened by SLR and consequent erosion “officially recognize” a chart that shows features that existed prior to these being claimed by the rising sea and thereby maintain the status quo.

Similarly, the LOSC also allows states to establish the outer limits of their continental shelf for both the 200-nautical-mile limit and to any extended shelf. Since these limits are described as “permanent” in the LOSC, any subsequent recession of baselines due to SLR will not affect the breadth of the continental shelf. In particular, if we can interpret article 76(9) (which obliges coastal states to deposit with the UN Secretary-General any charts and/or other relevant information that permanently describes the outer limits of its continental shelf) as requiring even those coastal states that have a continental shelf that extends only to 200 nautical miles to deposit relevant

archipelagic baseline rules, which stipulate a specific water-to-land ratio and a maximum allowable length for the archipelagic straight baselines. Stoutenburg, *supra* note 81 at 275.

¹¹⁰ LOSC, *supra* note 66, art 5; ILA, *Sofia Conference*, *supra* note 73 (noting that the phrase “as marked on large-scale charts officially recognized by the coastal State” provides the coastal State with discretion to choose the vertical datum).

¹¹¹ ILA, *Sofia Conference*, *ibid.*

information to enable the permanent fixation of the outer limits of the continental shelf, this could guard the state against any subsequent regression in the baseline and/or shrinkage of its maritime zones.¹¹²

In line with this approach, numerous commentators have argued that there is merit in permanently fixing the boundaries of all maritime zones so as to divest them of their ambulatory character.¹¹³ Such an approach aligns with the principles of fairness and equity, since a freeze would not erode any of the entitlements and jurisdictional rights that coastal nations enjoy over their maritime spaces and resources. Furthermore, it would ensure that states do not encroach on other states' maritime zones.¹¹⁴ Nevertheless, these propositions can be disputed on the basis that coastal states stand to gain more ocean space as their coasts retreat. For instance, if the coastline were to recede by one mile, given fixed baselines, the coastal state can claim an additional mile of ocean space, which will become its internal waters and accompanying resources. If its baseline were ambulatory, the state would continue to have a twelve-mile territorial sea but the high seas would increase by one mile.¹¹⁵ However, this argument fails to take into account the fact that the increase is primarily because the state has lost one mile of its land territory, which is now under water. Thus, it makes good sense to have baselines permanently fixed.

¹¹² Stoutenburg, *supra* note 81 at 269-70.

¹¹³ Judge Jesus observes, "it would seem reasonable for the sake of stability that, once the baselines have been established and given publicity to, in accordance with the relevant provisions of the 1982 Convention, such baselines should be seen as permanent base- lines, irrespective of changes." JL Jesus, "Rocks, New-born Islands, Sea Level Rise and Maritime Space" in JA Frowein et al, eds, *Negotiating for Peace-Liber Amicorum Tono Eitel* (New York: Springer, 2003) 579 at 601; Schofield, "Shifting Limits?", *supra* note 105 at 416. Rayfuse advocates, "a more lasting solution to the challenges to coastal states posed by sea level rise will require the international community to adopt new positive rules of international law to freeze existing baseline claims". Rosemary G Rayfuse, "International Law and Disappearing States: Utilising Maritime Entitlements to Overcome the Statehood Dilemma", University of New South Wales Faculty of Law Research Series, (Paper 52, 2010) (SSRN) at 12 [Rayfuse, "International Law"]. "A less expensive, but probably also less dependable means for these States to prevent negative consequences as a result of sea level rise ... is to contribute towards the creation of a new rule of customary international law which allows coastal States in case of sea level rise to maintain the original outer limits of their maritime zones." AHA Soons, "The Effects of a Rising Sea Level on Maritime Limits and Boundaries" (1990) 37(2) *Nethl Int'l L Rev* 207 at 216, 231. "[S]tates should move toward permanently fixing ocean boundaries and away from the current regime of ambulatory boundaries ..." Caron, *supra* note 81 at 14.

¹¹⁴ See generally Alain Khadem, "Protecting Maritime Zones from the Effects of Sea Level Rise" (1998) 6(3) *Boundary and Security Bull* 76 (referring to the possibility of inter-state conflict over navigation and sovereignty rights over living and non-living resources).

¹¹⁵ Lisztwan, *supra* note 82 at 170.

While these suggestions may help to maintain the *de jure* status, at a *de facto* level the charts are an inaccurate representation of ground realities.¹¹⁶ Such stabilization will render the basepoints constant. However, as the rising seas claim more land, the internal waters of coastal states will enlarge, which may prove detrimental to international shipping. A coastal state has sovereignty over its internal waters, which means it can exclude foreign ships at will.¹¹⁷ As mariners rely on these charts for navigational purposes, to adopt such a course of action places international shipping at risk. Already there have been several legal conflicts over whether the charted low-water line is the actual low-water line.¹¹⁸ In such a situation, it may then be necessary to develop two sets of charts – one for maritime jurisdictional purposes, and the other for navigational safety. An alternative would be to design charts that superimpose ground realities over the original maritime zone measurements.

Moreover, SLR rates may not be uniform, which further complicates matters. For instance, in some coastal countries, the rate of SLR may be accelerated due to localized geographical factors or increased groundwater extraction. In such cases, baselines for this country will move further inland in comparison to a neighbouring state. Under international law, a treaty can become void due to a fundamental change in circumstances (article 62(2)(a) of the *Vienna Convention on the Law of Treaties, 1969*¹¹⁹ [*clausula rebus sic stantibus*]). In a situation where a treaty establishes a boundary that includes a maritime delimitation treaty,¹²⁰ the application of this rule is expressly precluded. As

¹¹⁶ Schofield, “Shifting Limits?”, *supra* note 105 at 413.

¹¹⁷ In such cases, the coastal state only continues to retain sovereignty over the territory which has presently become submerged. Stoutenburg, *supra* note 81 at 275-76.

¹¹⁸ For instance, see generally *Maritime Delimitation and Territorial Questions between Qatar and Bahrain*, [2001] ICJ Rep 40. Even though the nautical charts of Qatar pointed out that Qit’at Jaradah was not an island but was a low-tide elevation the International Court of Justice, analysed the evidence submitted by the parties and expert opinion, in particular the opinion of the experts from Qatar to the effect that Qit’at Jaradah was not scientifically proved to be a low-tide elevation. Accordingly, the court concluded that Qit’at Jaradah is an island that should be considered for the drawing of the equidistance line. *Ibid*; see also *In the Matter of Arbitration Between: Guyana v Suriname*, Permanent Court of Arbitration, The Hague, Award (17 September 2007) ¶396. One of the issues related to the accuracy of the low-water line on chart recognised as official by Suriname. Guyana contended that it was an inaccurate representation. However, on examination of the evidence the Tribunal rejected Guyana’s contention and accepted the validity of the basepoints and the chart. *Ibid*.

¹¹⁹ *Vienna Convention on the Law of Treaties*, 1155 UNTS 331, 8 ILM 679 (entered into force 27 January 1980) art 62.

¹²⁰ Stoutenburg, *supra* note 81 at 280; see also *Aegean Sea Continental Shelf (Greece v Turkey)*, [1978] ICJ Rep 3, ¶85 (essentially equating a maritime boundary agreement with those establishing land

well, such treaties fall within the category of “objective or status contracts,” and thus their consequences go well beyond the parties to the treaty. Accordingly, states can protect many of their maritime entitlements by delimiting their maritime boundaries in bilateral treaties with neighbouring states, rendering any subsequent regression of coastlines due to SLR of no consequence. However, this may not be a viable solution for SIDS that are geographically secluded.¹²¹

As far as the issue of protecting statehood is concerned, as seen previously, rocks are incapable of generating an EEZ or continental shelf. A related issue is whether SIDS should be allowed to retain control over their maritime spaces or if these areas should automatically be allowed to become high seas when the islands that generate these maritime zones turn to “rocks” or are inundated. As mentioned above, it is common knowledge that SIDS have contributed the least to the phenomenon of climate change and therefore it is profoundly inequitable that they should suffer the worst impacts of climate change and SLR.¹²² On the grounds of equity and fairness, again a water-tight case can be made for such states being allowed to retain their rights over maritime zones and the valuable resources contained therein. Nevertheless, it is doubtful whether these states or their dispersed populations could actually exercise effective control over maritime spaces, since the native populations would have migrated to other lands and the uninhabited rocks may be located thousands of miles away from their new places of habitation.

Still, there is sufficient rationale for allowing these vanishing SIDS to persist with their maritime territories. It may be extremely difficult for SIDS to find a state willing to sell its land, particularly coastal frontage land. Thus, permitting SIDS to use these maritime spaces and the remaining land guarantees them with an opportunity to sustain their fishing and offshore industries. Maritime spaces are highly prized and to divest a state of their rights over these spaces and resources is patently unfair. While there are presently several instances of countries administering islands that are situated hundreds and thousands of kilometers away, for SIDS exercising rights over the water column and

frontiers and stating that it “is subject to the rule excluding boundary agreements from fundamental change of circumstances”).

¹²¹ See also Stoutenburg, *supra* note 81 at 281.

¹²² Schofield, “Shifting Limits?”, *supra* note 105 at 416.

the corresponding seabed may involve considerable logistical issues if the new territory that is willing to accommodate the displaced population is not as close as possible to the sinking rocks.

In such a scenario, another possible option is for SIDS to forego statehood and merge with another state that has superior resources and the capacity to administer the maritime spaces of the now submerged state.¹²³ An amalgamation between the two countries would result in the maritime territories enjoyed by the SIDS being passed to the host state, creating a larger country with a command over greater resources and an increased ability to safeguard any maritime estate that may be located far away from its land territory. Thus, it becomes extremely important for SIDS to retain control over their maritime estates, which they can use as a bargaining tool at the negotiating table discussing the modalities of the merger, should the need arise.¹²⁴

A suggestion to allow states like the Maldives to persist in their statehood is to provide for the creation of de-territorialised states¹²⁵ or “sui generis international persons.”¹²⁶ Under this provision, states retain statehood status by functioning from the land territory of other states. A closely related idea is that of a “government-in-exile.”¹²⁷ In articulating the functions of such entities, Rayfuse observes:¹²⁸

In the context of disappearing states, the deterritorialised state entity would ... consist of a ‘government’ or ‘authority’ elected by the registered voters of the deterritorialised state. In essence, this ‘authority’ would act as a trustee of the assets of the state for the benefit of its citizens wherever they might now be located. The maritime zones of the

¹²³ Rayfuse, "International Law", *supra* note 113 at 8 & 9 (describing the relocation of Icelanders in what is now southern Manitoba, and their ultimate integration into Canada); see also Schofield, “Shifting Limits?”, *ibid* at 415.

¹²⁴ Rayfuse, "International Law", *ibid*, at 12.

¹²⁵ *Ibid* at 10. The author refers to the Sovereign Order of the Military Hospitaller Order of St John of Jerusalem, of Rhodes and of Malta (or the Order of St John or the Knights of Malta. Having lost its territory when rejected from Malta by Napoleon in 1798, it has historically been considered a sovereign international subject, and is recognised by a large number of states. It also enjoys the rights of active and passive legation, treaty making and membership of international organizations. As well, the Papal See was recognized as a state despite possessing no territory between 1870, when it was annexed by Italy. *Ibid*.

¹²⁶ Freestone, *supra* note 101 at 116.

¹²⁷ Rayfuse, "International Law", *supra* note 113 at 10 & 11.

¹²⁸ *Ibid* at 11.

disappearing state would continue to inure to and be managed by that ‘authority’ such that the resource rents from their exploitation could be used to fund the relocation and continued livelihood of the displaced population – whether diasporic or wholly located within one other ‘host’ state. Although not having sovereignty over its new property acquisitions the ‘authority’ would continue to represent the state at the international level and the rights and interests of its citizens vis-à-vis their new ‘host’ state or states. These rights could include the right to maintain their original personal, property, cultural, linguistic and nationality rights for themselves and their descendants while simultaneously being granted full citizenship rights in the new ‘host’ state or states.

However, it is doubtful as to how far and to what extent these entities would be able to protect their citizens’ rights. There is a strong possibility that these countries may remain as states only on *de jure* and not *de facto*.¹²⁹

Another solution to the territory conundrum is for the disappearing state to buy new territory in another state, which is what the Maldives and Tuvalu are trying to do.¹³⁰ The transaction can be concluded via a treaty of cession, which will transfer sovereignty over the ceded land to the disappearing state.¹³¹ Upon conclusion of the sale, the disappearing state can relocate its population to the new territory.¹³² While it is unlikely that a state may willingly sell a part of its territory to another, there is still a possibility that land-

¹²⁹ UNHCR *Climate Change, Natural Disasters and Human Displacement: A UNHCR Perspective*, UNHCR [nd] at 5, online: UNHCR <<http://www.unhcr.org/4901e81a4.html>>.

¹³⁰ In 2001, Tuvalu approached Australia and New Zealand with a request to accommodate its population. While Australia refused, New Zealand agreed to a 30-year immigration program under which 75 Tuvaluans are accepted per year provided they are of good character and health, less than 45 years of age, possess English language skills, and must have a job offer in New Zealand. However the offer is completely inadequate given that Tuvalu has a population of approximately 11,000. Rayfuse, "International Law", *supra* note 113.

¹³¹ Selma Oliver, "A New Challenge to International Law: The Disappearance of the Entire Territory of a State" (2009) 16 Int'l J Mar & Coast L 209 at 238-39 (HeinOnline) (referring to several such sales and gifts of land territory between states). In 1867, Russia sold Alaska. Here the purchase was based on an offer by Russia and the transaction was affected via a treaty of cession and US paid USD7.2 million. Again Denmark sold territories in the West Indies in 1916, Spain sold the Caroline Islands to Germany in 1899 and Venice was ceded to France by Austria and then by France to Italy in 1866. *Ibid*; see also Rayfuse, "International Law", *ibid* at 7.

¹³² Rayfuse, "International Law", *ibid*.

surplus nations may, on altruistic considerations, be willing to forgo a part of their land territory to accommodate the people of sinking countries, particularly since these nations are not the ones who have contributed to the phenomenon.¹³³ However, relocating people to distant lands may not be ideal, so the re-location should preferably be to areas that are geographically close to where their islands once stood. While international law cannot compel a state to donate or sell part of its land territory,¹³⁴ international financial support can be provided to enable countries to purchase alternate land and to re-establish viable communities.¹³⁵ Purchase of territory seems to be the best possible solution in the circumstance, as it enables continuity of statehood, citizenship, and preservation of cultural heritage.

While the above mentioned solutions are basically legalistic in nature, a range of practical and engineering-based solutions have also been suggested to protect the interests of disappearing states and those that are fast losing their coastal frontage. One important suggestion in this regard is the construction of artificial islands, such as the *Hulhumalé* in the Maldives.¹³⁶ This artificial island, built on a reclaimed lagoon, is two meters above sea level.¹³⁷ Even though states do have rights to construct artificial islands, the legal position under the LOSC is that artificial islands are unable to generate the necessary maritime zones, except certain safety zones around them, which is also not more than 5,000 meters.¹³⁸ Consequently, it has been suggested that the LOSC be

¹³³ "[F]rom a practical perspective it is difficult to envisage any state now agreeing, no matter what the price, to cede a portion of its territory to another state unless that territory is uninhabited, uninhabitable, not subject to any property, personal, cultural or other claims, and devoid of all resources and any value whatsoever to the ceding state." *Ibid* at 8.

¹³⁴ Oliver, *supra* note 131 at 238.

¹³⁵ Rayfuse, "International Law", *supra* note 113.

¹³⁶ The project involves the reclamation of 188 hectares of land. It was completed in 2002. Necessary infrastructural and residential developments were completed in 2004 and the very first settlement (1000 people) began in 2004. Housing Development Corporation, *Introduction*, online: Housing Development Corporation, Introduction <<http://www.hdc.com.mv/index.php>>.

¹³⁷ Gagain, *supra* note 75 at 119. Simon Gardner, "New Maldives Island Rises From The Depths" *Rense.com* (14 April 2012), online: Rense.com <<http://rense.com/general60/newmaldivesisland.htm>>.

¹³⁸ As far as artificial islands that are constructed within a coastal state's internal waters and territorial sea, the state can exercise sovereign rights over the same. If the artificial island is situated either in the EEZ or in the continental shelf then the coastal state has "exclusive jurisdiction over such artificial islands, installations and structures, including jurisdiction with regard to customs, fiscal, health, safety and immigration laws and regulations." *LOSC*, *supra* note 66, arts 60 & 80. In these zones, the coastal state has only jurisdiction over the artificial islands and does not possess sovereignty. Moreover in respect of artificial islands constructed in these zones, the coastal state has to give other states notification of their construction, as well as maintain a permanent warning

amended to provide legal status to these artificial structures.¹³⁹ Even then whether artificial islands are a practicable solution in the long run is moot. Artificial structures pose a host of environmental problems. They have been found to aggravate erosion in other areas. Moreover, whether these artificial structures will be able to sustain human habitation and withstand the battering from intense storms and surges, king tides, etc. is also doubtful. Such structures can also adversely impact the economic mainstay of island countries, as tourists flock to these islands primarily to enjoy the pristine beauty of nature (i.e., beaches and reefs). Artificial concrete structures can repel tourists (as well as their tourist dollars), detrimentally affecting the economy of these regions.¹⁴⁰ Creation of artificial islands may be a temporary solution, but ultimately this will also prove to be futile given the fast pace at which the sea is rising and other changes in the oceanic environment. Continuance of life on these islands will become extremely difficult and ultimately relocation may be required.

An important suggestion to preserve the basepoints is to protect, or armour, the coastlines.¹⁴¹ Currently under the LOSC, outermost permanent harbour works such as jetties, piers, quays, wharves, breakwaters and seawalls¹⁴² are treated as part of the coast and can be used to delimit the territorial sea.¹⁴³ In addition, coast protective and land reclamation works¹⁴⁴ are also treated as part of the coast.¹⁴⁵ Even though armouring can

system of their existence. Again they cannot be constructed in areas where their presence will undermine the use of internationally acknowledged sea-lanes. The coastal state is obliged to pass laws to prevent marine environmental pollution from the construction of its artificial islands and if in case the artificial island is partially or completely abandoned, then the coastal state has a general obligation to remove it, or with respect to an artificial island not completely deconstructed, the coastal state must give suitable notification to other states regarding the dimensions, location, and depth of the remains. *Ibid.*

¹³⁹ See generally Gagain, *supra* note 75.

¹⁴⁰ Lilian Yamamoto & Miguel Esteban, “Vanishing Island States and Sovereignty” (2010) 53 *Ocean & Coastal Mgmt* 1 at 7 (ScienceDirect).

¹⁴¹ Freestone, *supra* note 101 at 117-22.

¹⁴² ILA, *Sofia Conference*, *supra* note 73 at 26.

¹⁴³ LOSC, *supra* note 66, art 11.

¹⁴⁴ ILA, *Sofia Conference*, *supra* note 73 at 27.

¹⁴⁵ Artificial extensions of the coast can extend the normal baseline. In the Netherlands, an extension to the Port of Rotterdam by land reclamation has extended the coast a couple of kilometers seaward, leading to a shift in the low-water line. *Ibid* at 28. Similarly, in the case concerning Land Reclamation by Singapore in and around the Straits of Johor (*Malaysia v Singapore*), Malaysia wanted Singapore (pending the decision of the Arbitral Tribunal) to suspend all land reclamation activities in the vicinity of the maritime boundary between the two States or of areas claimed as territorial waters by Malaysia. *Case Concerning Land Reclamation by Singapore in and Around the Straits of Johor (Malaysia v Singapore)*, 12, Order (8 October 2003) at 23 (International Tribunal

be expensive, it does have the advantage of having the ability to maintain the status quo at least for the foreseeable future.

Nevertheless, hard armouring also has several environmental pitfalls. While their construction has been found to arrest erosion in one part of the coast, the erosion may be magnified in other areas, as these affect the littoral drift.¹⁴⁶ Again, the construction of hard structures like storm walls may end up preventing the natural inland migration of wetlands, ultimately leading to their loss and thereby negatively impacting the livelihood of artisanal fishers.¹⁴⁷ In certain situations, soft armouring measures like beach nourishment and mangrove and wetland conservation may prove more useful and environmentally friendlier.¹⁴⁸ However, there are limitations in utilising soft armouring measures as well and therefore the choice of a measure aimed at the physical protection of the coastlines, including the basepoints, should be decided as part of a more comprehensive strategy targeted towards intelligent coastal management. It is in this context that ICZM assumes relevance, as it provides a practical opportunity to implement coastal armouring as part of a larger and composite package towards sustainable coastal development.

2.4 “VULNERABLE COASTAL COMMUNITIES”: IMPACT OF CLIMATE CHANGE AND SLR ON COASTAL COMMUNITIES

In 2005, the Inuit in the Arctic petitioned the Inter-American Commission on Human Rights for relief against human rights violations guaranteed under the American Declaration of the Rights and Duties of Man.¹⁴⁹ These violations were occasioned by the “acts and omissions” of the United States which contributed overwhelmingly to GHGs that warmed the atmosphere, leading to climate change.¹⁵⁰ The specific averments

for the Law of the Sea). It seems that one of the key concerns of Malaysia was that, “a reconfiguration of Singapore’s coasts would functionally and legally extend Singapore’s baseline seaward to Malaysia’s disadvantage in a delimitation of maritime spaces between the opposite states”. ILA, *Sofia Conference*, *supra* note 73 at 28.

¹⁴⁶ Dronkers et al, eds, *supra* note 49 at 9.

¹⁴⁷ See generally Sudarshan Rodriguez et al, *Policy Brief: Seawalls* (UNDP/UNTRIS: Chennai & ATREE: Bangalore, 2008).

¹⁴⁸ Dronkers et al, eds, *supra* note 49 at 9.

¹⁴⁹ *Inuit Petition*, *supra* note 1 at 28.

¹⁵⁰ *Ibid* at 103.

emphasised that the tranquil life and culture of the Inuit were being harmed.¹⁵¹ The primary petition was to declare that the United States is “internationally responsible for violations of rights”¹⁵² and to recommend that the United States adopt mandatory measures to limit its GHGs emissions.¹⁵³ The petition was dismissed on the grounds of insufficiency of information to prove alleged facts.¹⁵⁴

The Inuit’s grievances are not unique. Coastal communities in South Asia – be it the *Meenavar* in India, the *Mukkuvar* in Sri Lanka, *Jaladash* in Bangladesh, *Mohana* in Pakistan, and the fishing communities in Maldives are also feeling increasingly threatened by climatic changes and SLR,¹⁵⁵ and several have had to migrate to other regions.¹⁵⁶ One of the gravest impacts of climate change is that it will uproot millions of residents, leading to their displacement and consequent migrations. In 2008, it was estimated that “sudden-onset natural disasters,” displaced nearly 36 million people and that of these, more than 20 million were displaced by “sudden-onset climate-related disasters.”¹⁵⁷ In contrast, in the same year, the total population of people (both internally displaced and refugees) living in forced displacement due to conflict was 42 million, with

¹⁵¹ The allegations are that there were drastic reductions in the average annual amounts of sea ice, permafrost thawing leading to collapse of structures, impacts on health, availability of country food, and drinking water and safety concerns. The traditional wisdom of the Inuit dealing with survival on ice (*Inuit Qaujimagatuqangit*) was being rendered redundant due to these changes. See generally, *ibid*. Subsequently, in 2008, the native Inupiat Eskimo coastal village of Kivalina in Alaska brought a public nuisance lawsuit in a federal court in San Francisco against several oil, power and coal companies including ExxonMobil Corp. seeking damages of up to USD400 million on the grounds that the sea ice attached to the Kivalina coast was getting thinner and breaking up earlier, exposing the village to coastal storm waves and surges. The erosion reached such a point that Kivalina was becoming uninhabitable and therefore the village had to be relocated. The matter was dismissed by the U.S. district court on the grounds that regulating greenhouse emissions was a matter that lay within the political rather than the legal domain. *Native Village of Kivalina v ExxonMobil Corp*, 663 F Supp (2d) 863 (ND Cal, 2009).

¹⁵² *Inuit Petition, ibid* at 118.

¹⁵³ *Ibid*.

¹⁵⁴ Letter from Ariel E Dulitzky, Assistant Executive Secretary, Inter-American Commission on Human Rights (16 November 2006) online: The New York Times <<http://www.nytimes.com/packages/pdf/science/16commissionletter.pdf>>.

¹⁵⁵ For instance, see Inam Ahmed, “Climate bell tolls: Livelihood changes with weather”, *The Daily Star [of Dhaka]* (7 December 2009) online: The Daily Star <<http://www.thedailystar.net/newDe sign/news-details.php?nid=116709>>.

¹⁵⁶ For instance, see generally Mirjam Macchi, “Indigenous and Traditional Peoples and Climate Change”, Issues Paper (IUCN, March 2008).

¹⁵⁷ See generally OCHA, IDMC & NRC, *Monitoring Disaster Displacement in the Context of Climate Change: Findings of a Study by the United Nations Office for the Coordination of Humanitarian Affairs and the Internal Displacement Monitoring Centre* (Switzerland, United Nations Office for Coordination of Humanitarian Affairs, 2009).

4.6 million newly internally displaced during that year.¹⁵⁸ In 2009, 16.7 million people were newly displaced by sudden-onset disasters (out of which 15.2 million were displaced due to climate related disasters),¹⁵⁹ and in 2010, the figure was 42.3 million people (out of which 38.3 million were related to climate disasters).¹⁶⁰ It is estimated that by 2050, the number of people who will be forced to move out due to climate change will range between 25 million to one billion.¹⁶¹

While droughts, desertification and food shortages can trigger migrations and cross-border movements,¹⁶² the problem will be particularly acute in low elevation coastal zones. Although these areas constitute only 2.2 per cent of dry land, they hold nearly 10.5 per cent of the world's population.¹⁶³ Even more worrying is the fact that the problem of climate change-induced migrations will almost exclusively be a developing country crisis not only because of the huge populations that live on their coasts but because of the countries' low adaptive capacity, widespread poverty, and lack of good governance.¹⁶⁴

One of the major theatres where the problems of climate change displacement will be played out in its extremity is South Asia. The IPCC estimates that a one-metre rise in sea level will put nearly 125 million people at risk, three quarters of whom live in East

¹⁵⁸ "Summary", in *ibid*; see also *ibid* at 10. In 2008, earthquakes caused more displacement than any other type of disaster. However, this was primarily because of the Sichuan earthquake and if this was removed from the analysis, floods and storms will account for 93 per cent of disaster-related displacement in 2008. *Ibid*.

¹⁵⁹ IDMC & NRC, *Displacement Due to Natural Hazard-Induced Disasters Global Estimates for 2009 and 2010* (Switzerland: Internal Displacement Monitoring Centre, 2011) at 8. In 2009, 15.2 million people, 91 per cent of the total, were displaced due to climate-related disasters, categorized as hydrological, meteorological or climatological (floods and storms). Nine per cent of the remaining was displaced by geophysical hazards, namely earthquakes and volcanic eruptions. 87 per cent of the displacement happened in Asia, the maximum displacement occurred in India. *Ibid* at 9.

¹⁶⁰ Of the total number, 90 per cent were displaced due to climate-related (hydrological, meteorological or climatological) disasters (floods and storms). Again Asia topped the list and here the maximum displacements occurred in China. *Ibid* at 11.

¹⁶¹ IOM, Frank Laczko & Christine Aghazarm, eds, *Migration, Environment and Climate Change: Assessing the Evidence* (Geneva: IOM, 2009). In the Indian subcontinent, if we continue with a business as usual approach of dumping GHGs and if the global temperatures rise by 4-5 degree Celsius, 125 million migrants will be uprooted. Out of this 75 million will be from Bangladesh and the rest from India. See generally Sudhir Chella Rajan, *Blue Alert: Climate Migrants in South Asia: Estimates and Solutions – A Report by Greenpeace* (Greenpeace India Society, 2008).

¹⁶² See generally Warner et al, *supra* note 93.

¹⁶³ Etienne Piguet, "New Issues in Refugee Research: Climate Change and Forced Migration", PDES Working Papers (Research Paper No 153, 2008) at 7.

¹⁶⁴ Jon Barnett & Michael Webber, "Migration as Adaptation: Opportunities and Limits" in Jane McAdam, ed, *Climate Change and Displacement Multidisciplinary Perspectives* (Oxford and Portland, Oregon: Hart Publishing, 2010) 37 at 38, 55.

and South Asia, and it is these people who will need re-settlement.¹⁶⁵ Another study points out that 146 million people live at an altitude of less than one meter on the banks of major rivers, deltas and estuaries, and in the flood zones in South Asia (Indus, Ganges-Brahmaputra, etc.) and East Asia (Mekong, Yangtze, Pearl River, etc.).¹⁶⁶ These two regions account for nearly three quarters of the population at risk.¹⁶⁷ In extreme cases, entire populations of coastal countries like in the case of the Maldives will need to be relocated.

In general, climate-change-displaced populations can be classified into two types. The first and largest type consists of people who will be displaced internally (i.e., within their national boundaries) by climate change-related phenomena.¹⁶⁸ The second type comprises people who will be forced to cross international borders.¹⁶⁹ This category includes the inhabitants of SIDS like the Maldives¹⁷⁰ and countries like Bangladesh, where land and resources are already stretched to the limit and are therefore unable to accommodate huge influxes of people.¹⁷¹ This classification is pertinent in determining both the nature of problems and the rights that are available to both these groups under international law.

Another related aspect that warrants a mention here is that climate change and SLR lead to two potential situations that will impair the stability, sustainability, and continuity of coastal settlements. The first situation is the slow-onset disaster of SLR and consequent inundation of coastal land. This is a steady and gradual process of degradation of the coastal environment, forcing people to move out of their homes over a

¹⁶⁵ *Ibid.*

¹⁶⁶ Pigué, *supra* note 163 at 8.

¹⁶⁷ *Ibid.*

¹⁶⁸ *UNHCR Climate Change, Natural Disasters, supra* note 129 at 2.

¹⁶⁹ Barnett & Webber, *supra* note 164 at 40.

¹⁷⁰ For more details on the geography of Maldives, see Maldives, Ministry of Environment and Energy, *State of the Environment 2011* (2011) at 22 [Maldives, *State of the Environment 2011*].

¹⁷¹ The Minister Abul Maal Abdul Muhith in the interview states

[t]wenty million people could be displaced [in Bangladesh] by the middle of the century, . . . We are asking all our development partners to honour the natural right of persons to migrate. We can't accommodate all these people – this is already the densest [populated] country in the world. . . . The convention on refugees could be revised to protect people. It's been through other revisions, so this should be possible.

“UK should open borders to climate refugees, says Bangladeshi minister”, *TheGuardian* (4 December 2009) internet video: theguardian, online: theguardian <<http://www.guardian.co.uk/environment/2009/nov/30/rich-west-climate-change>>.

period of time.¹⁷² While the impact is direct, there is scope to implement adaptation actions, which will help to reduce and control these impacts to a certain extent. The adaptation measures' chances of success depend on a host of factors, including the socio-economic capacity of the affected populations to absorb the impact, the timing and implementation of the measures, the degree of intelligent planning (i.e., integrating adaptation into the broader coastal management scheme), etc.¹⁷³ If these adaptation measures fail to produce results, relocation, resettlement, and rehabilitating coastal communities are the only options.

The second situation interacting with climate change and SLR is the occurrence of intense disasters like severe storm surges, hurricanes, tsunamis and earthquakes, which can devastate coastal regions and cause widespread upheaval.¹⁷⁴ Although not directly attributable to the climate change phenomenon, such events will be greatly aggravated by climate change and SLR as these will significantly reduce the ability of coastal communities and ecosystems to cope up with intense natural disasters. Moreover, ongoing SLR and climate change will weaken coastal infrastructure and affect the resiliency of coastal ecosystems, rendering them more vulnerable to sudden 'acts of God.'

It must be pointed out that this important classification based on the degree of possible impacts, can also be examined from the perspective of the continued availability of land, the basic resource necessary to support human habitation. The first is the worst-case scenarios as in the case of sinking SIDS where SLR and climate change could ultimately lead to a situation of deterritorialization, displacement, statelessness and eventual crossing of international borders.¹⁷⁵ The second contemplates situations where

¹⁷² See Walter Kälin, "Conceptualising Climate-Induced Displacement" in Jane McAdam, ed, *Climate Change and Displacement: Multidisciplinary Perspectives* (Oxford and Portland, Oregon: Hart Publishing, 2010) 81 at 85.

¹⁷³ For more discussion on climate change adaptation, see Ch 5.

¹⁷⁴ While the link between global warming and stronger hurricane activity has yet to be affirmed, the IPCC states that "[t]here is observational evidence for an increase of intense tropical cyclone activity in the North Atlantic since about 1970, correlated with increases of tropical sea surface temperatures." "Summary for Policymakers" in *Climate Change 2007, supra* note 7 at 2.

¹⁷⁵ The IPCC observes that "[s]ea-level rise impacts on the low-lying Pacific Island atoll States of Kiribati, Tuvalu, Tokelau and the Marshall Islands may, at some threshold, pose risks to their sovereignty or existence." W Neil Adger, Shardul Agrawala & M Monirul Qader Mirza, "Assessment of Adaptation Practices, Options, Constraints and Capacity" in ML Parry et al, eds, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to*

the impact of the climate hazards and SLR are extremely severe and land degradation and water contamination is very high. Even if coastal frontage is lost to the rising waves, there is still the possibility of utilising land available inland for rehabilitation.¹⁷⁶ As well, there is the possibility that through appropriate adaptation measures (anticipatory and reactive),¹⁷⁷ land-use¹⁷⁸ and water management strategies¹⁷⁹ the degraded land can be nursed back to continue to support human habitation.

Migration and re-settlement can be an overwhelming experience. In many instances, the displaced peoples have very limited coping and adaptive capabilities and the cornerstone of their economic development is based on subsistence agriculture, artisanal fishing, traditional aquaculture, and community-based forest management.¹⁸⁰ They also do not have the economic capacity to finance international migration to a wealthier country.¹⁸¹ In other words, these are communities whose existence is dependant on and intertwined with the ecosystem goods and services available in a particular region,

the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (Cambridge: Cambridge University Press, 2007) 717 at 736.

¹⁷⁶ For instance, Bangladesh is one of the most densely populated nations in the world, and land is scarce. Nevertheless, through a right mix of adaptation strategies, land use and water management, up-land areas may still be able to accommodate displaced coastal populations. See Jane McAdam, "Swimming against the Tide: Why a Climate Change Displacement Treaty is Not *the Answer*" (2011) 23:1 Int'l J Refugee L 2 at 12 [McAdam, "Swimming"].

¹⁷⁷ For an overview of the different adaptation strategies, see generally Jessica Grannis, *Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use* (Georgetown Climate Center, 2011).

¹⁷⁸ "Floating Gardens in Bangladesh", *Practical Action: Technology Challenging Poverty: Technical Brief*, online: FAO <<http://www.fao.org/climatechange/17849-0e277b46b31f98942e6bc81bb22319243.pdf>>.

¹⁷⁹ RF Michael Snodgrass, Note, "The Reuse of Household Water: A Small Step Toward Sustainable Living and Adaptation to Climate Change" (2010) 22 Geo. Int'l Envtl L Rev 591 (QL) (advocating the widespread use of grey water); J Mwenge Kahinda, AE Taigbenu & RJ Boroto, "Domestic Rainwater Harvesting as an Adaptation Measure to Climate Change in South Africa" (2010) 35:13-14 Physics & Chemistry of The Earth Parts A/B/C 742 (ScienceDirect) (listing rainwater harvesting as one of the specific adaptation measures for water-stressed Africa). See generally World Water Assessment Programme, *Managing Water under Uncertainty and Risk*, vol 1, The United Nations World Water Development Report 4 (Paris: UNESCO, 2012) at 66.

¹⁸⁰ In the aftermath of the Indian Ocean tsunami, the south Indian state of Tamil Nadu constructed several pucca houses for displaced residents. However, more than 88 per cent of the sites were alternative sites. Coastal communities, however, wanted '*in-situ*' houses, as they feared that they were losing their customary rights to the coast, which would also result in livelihood loss. *National Peoples' Tribunal on Post-tsunami Rehabilitation: Housing, Land, Resources and Livelihoods 18 and 19 December 2008, Chennai: Interim Verdict of the Jury*, at 5, 9, online: Habitat International Coalition <<http://www.hic-net.org/news.php?pid=2937>> [*National Peoples' Tribunal*].

¹⁸¹ In Bangladesh only five per cent of the flood affected rural households can afford to send people abroad. McAdam, "Swimming", *supra* note 176 at 11-12; see also Barnett & Webber, *supra* note 164 at 41-42 (identifying three major barriers to migration, namely, financial, informational and legal).

and so it is often the case that these populations prefer not to move at all unless absolutely necessary.¹⁸² Certainly, international migration would be for them a last resort.

Technically, the groups that migrate and move within a country may be able to access the guarantees contained in the UN Guiding Principles on Internal Displacement, 1998 which defines internally displaced persons to include those displaced by “natural or human-made disasters.”¹⁸³ The Guiding Principles on Internal Displacement, is a normative framework that provides guidance to states on all aspects of internal displacement.¹⁸⁴ Essentially, it is a “restatement of existing norms” and addresses “the specific needs of internally displaced persons worldwide by identifying rights and guarantees relevant to their protection”¹⁸⁵, from the time of “forced displacement,” “during displacement,” and during their return, “resettlement and reintegration.”¹⁸⁶ Interestingly, many of the principles enshrined in the Guiding Principles are recognised by the national Constitution’s and jurisprudence in South Asian coastal countries.¹⁸⁷ Even though this document has wide acceptance by nations, it has no legal consequence and therefore its implementation is found to be waning.¹⁸⁸

Many climate-change-displaced people who have crossed international borders often find themselves in legal ‘twilight zones.’ The starting point of the analysis here is: how are such peoples to be referred to? And, secondly whether the international legal regime on refugees (namely, the Refugee Convention and its related protocol) is applicable to such people. Descriptive terms such as “environmental refugees,”¹⁸⁹

¹⁸² *National Peoples’ Tribunal*, *supra* note 180.

¹⁸³ UNESCO, *Report of the Representative of the Secretary-General, Mr. Francis M. Deng, Submitted Pursuant to Commission Resolution 1997/39: Addendum: Guiding Principles on Internal Displacement*, E/CN.4/1998/53/Add.2, 11 February 1998, ¶2.

¹⁸⁴ *Ibid*, introductory note, ¶5.

¹⁸⁵ *Ibid*, ¶9.

¹⁸⁶ *Ibid*, annex, ¶1.

¹⁸⁷ For instance, during displacement, internally displaced persons are entitled to the inherent right to life protected by law. *Ibid*, annex 1, s 3, prin 10. The right to life is guaranteed by the constitutions of India (article 21), Bangladesh (article 32), Pakistan (article 9), and the Maldives (article 21).

¹⁸⁸ The Guiding Principles is a “restatement of existing norms”, and therefore it do not require formal adoption. Francis Mading Deng, “The Global Challenge of Internal Displacement” (2001) 5 Wash UJL & Pol’y 141 at 147 (QL); see also Roberta Cohen, Statement, “Hardening Soft Law: Implementation of the Guiding Principles on Internal Displacement” (2008) 102 Am Soc Int’l L Proceedings 187 at 189 (HeinOnline) (articulating three reasons as to why there was only a restatement of the law and not a hard law instrument).

¹⁸⁹ See generally Silke Marie Christiansen, *Environmental Refugees: A Legal Perspective* (Nijmegen: Wolf Legal Publishers, 2010).

“climate change refugees,”¹⁹⁰ and “environmental migrants”¹⁹¹ have been coined to label those who cross international borders due to climate-change-related factors.¹⁹² However, the Office of the United Nations High Commissioner for Refugees (UNHCR) has serious reservations about the use of such terms, as they opine that these have no foundation in international refugee law.¹⁹³

[w]hile often used, particularly in the media, it would be incorrect to give the words a legal meaning that has not been endorsed by the legal community. UNHCR is actually of the opinion that the use of such terminology could potentially undermine the international legal regime for the protection of refugees whose rights and obligations are quite clearly defined and understood.... While environmental factors can contribute to prompting cross-border movements, they are not grounds, in and of themselves, for the grant of refugee status under international refugee law. However, UNHCR does recognise that there are indeed certain groups of migrants, currently falling outside of the scope of international protection, who are in need of humanitarian and/or other forms of assistance.¹⁹⁴

At the 2011 Nansen Conference, their usage was once again decried due to the legal incorrectness implicit in the terms climate refugees and environmental refugees, and “environmentally displaced persons” found more favour.¹⁹⁵ However, it is submitted that “environmentally displaced persons” also suffers from the same inconsistencies that plague the other terms in that it fails to relay the nuances between internal and external

¹⁹⁰ Tiffany TV Duong, “When Islands Drown: The Plight of “Climate Change Refugees” and Recourse to International Human Rights Law” (2010) 31 U Pa J Int’l L 1239 at 1250 (HeinOnline).

¹⁹¹ “Environmental migrants are persons or groups of persons who, for reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are obliged to have to leave their habitual homes, or choose to do so, either temporarily or permanently, and who move either within their territory or abroad.” *Ninety-Fourth Session: Discussion Note: Migration and the Environment*, MC/INF/288, 1 November 2007, ¶6 at 1, online: International Organization for Migration <http://www.iom.int/jahia/webdav/shared/shared/mainsite/about_iom/en/council/94/MC_INF_288.pdf>.

¹⁹² Kälin & Schrepfer, *supra* note 93 at 27-8.

¹⁹³ *UNHCR Climate Change, Natural Disasters*, *supra* note 129 at 8.

¹⁹⁴ *Ibid* at 8, 9.

¹⁹⁵ *The Nansen Conference: Climate Change and Displacement in the 21st Century, Oslo, Norway, June 5-7, 2011* (Norwegian Refugee Council, 2011) at 19.

migrations in situations where climate change is the causative factor for the migration. In short, it is clear that we are yet to develop an appropriate nomenclature to describe these groups that reflects the essence of the problems that they face, their entitlements and aspirations and that which has widespread acceptance at the international level.

As far as the second issue is concerned, coming as it does on the heels of the Universal Declaration on Human Rights, 1948, *the Refugee Convention of 1951* is the sole binding human rights instrument that affords protection to refugees by guaranteeing them ‘rights.’ Central to the application of the refugee regimes is the question: Who qualifies for refugee status: As “[A] term of art in international law,”¹⁹⁶ a refugee, under the 1951 *Refugee Convention*, is someone who

owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable, or owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of such events, is unable or, owing to such fear, is unwilling to return to it.¹⁹⁷

If a person meets the specifics of this definition, then the *Refugee Convention* applies and the refugee is immediately clothed with extensive legal protections, including the right not to be forcibly repatriated to the home state, which s/he has fled in the first place (principle of non-refoulement) due to threats to life or freedom.¹⁹⁸ Therefore, it is necessary to examine whether those who are displaced by climate-change-related phenomenon like SLR and have crossed international borders into another state can claim refugee status.¹⁹⁹

The first element in this definition is that of persecution. Proving persecution in the context of SLR requires more than legal ingenuity in terms of interpretative skills, for it is

¹⁹⁶ UNHCR, *UNHCR and Climate Change: Involvement, Challenges & Response*, online: UNHCR <http://www.unhcr.org/4ad5820f9.pdf>.

¹⁹⁷ *Convention relating to the Status of Refugees*, 28 July 1951, 189 UNTS 150 (entered into force 22 April 1954) art 1(A)(2).

¹⁹⁸ *Ibid*, art 33(1).

¹⁹⁹ To provide an understanding of these concepts reference is made to refugee jurisprudence under Canadian law. See *infra* notes 176-79.

practically impossible to treat climate change impacts as persecution on the grounds of race,²⁰⁰ religion,²⁰¹ nationality, membership of a particular social group²⁰² or political opinion.²⁰³ Secondly, it is also not possible to pinpoint a persecutor. The governments of the island states of Maldives, Kiribati, or Tuvalu are not persecutors in that they are not responsible for climate change or SLR, as their carbon footprint is practically negligible.²⁰⁴ It could then be argued that since industrialised countries are the primary emitters of GHG emissions that have precipitated the present problem, these countries may emerge as the persecutors. But then the irony is that rather than fleeing from the alleged persecutor, the inhabitants of most of these countries are seeking shelter with the persecutor.²⁰⁵ In other words, the new dynamic turns the refugee regime on its head.

In sum, a *prima facie* analysis of the definition leads to the inescapable conclusion that those displaced by climate change and who have crossed international borders are disqualified from claiming the benefits under the *Refugee Convention* and its Protocol.²⁰⁶

²⁰⁰ *Singh v Canada (Minister of Citizenship and Immigration)*, 2007 FC 1296, 68 Imm LR (3d) 131 (holding that there was failure on the part of the board to consider evidence, which established nexus between violent incidents [attacks on an Indo-Guyanese by Afro-Guyanese], and grounds of race and ethnicity).

²⁰¹ *Fosu v Canada (Minister of Employment and Immigration)* (1994), 90 FTR 182, [1994] FCJ 1813. Following the decision of the Ghanaian government to suspend the activities of the Jehovah's Witnesses, the applicant was arrested by the police and charged with disobeying a government order and committing acts of sabotage prejudicial to national security (the applicant kept religious pamphlets in his home, contrary to the prohibition). The Refugee Division handed the case back to the Board for reconsideration. *Yang v Canada (Minister of Citizenship and Immigration)*, 2001 FCJ 1463 (TD) (holding that, in determining whether Falun Gong is religion or not, it should be approached from the point of view of the persecutor, i.e., the Government of China. Since the government dealt with the Falun Gong under the Bureau of Religious Affairs, it was considered a religion).

²⁰² Women in China who have more than one child are faced with forced sterilization; they thus share a founded fear of persecution and so form a particular social group. *Cheung v Canada (Minister of Employment and Immigration)*, (1993) 2 FC 314 (CA). *TZU (Re)*, (2002) RPDD 174.

²⁰³ Membership in a social group like the village cooperative, which resisted military action to occupy farmlands, cannot be considered mere opinion, political or otherwise. See *Barima v Canada (Minister of Employment and Immigration)*, (1994) 1 FC 30 (TD); *Canada (Attorney General) v Ward*, [1993] SCJ 74.

²⁰⁴ See Duncan Clark, "Maldives first to go carbon neutral", *The Guardian* (15 March 2009) online: theguardian <<http://www.guardian.co.uk/environment/2009/mar/15/maldives-president-nasheed-carbon-neutral>>; "Tuvalu vows to go carbon neutral", *BBC News* (20 July 2009) online: BBC News <<http://news.bbc.co.uk/2/hi/asia-pacific/8158604.stm>>.

²⁰⁵ Jane McAdam, *Climate Change Displacement and International Law Climate Change Displacement and International Law: Side Event to the High Commissioner's Dialogue on Protection Challenges, 8 December 2010, Palais des Nations, Geneva*, online: UNHCR <<http://www.unhcr.org/4d05ecf49.pdf>>.

²⁰⁶ *Ibid* (discussing case law in Australia and New Zealand where the residents of Tuvalu and Kiribati unsuccessfully argued that they ought to receive refugee protection from climate change impacts).

Overwhelming academic opinion also comports with the view that the *Refugee Convention* is inapplicable to climate refugees.²⁰⁷ However, this does not mean that the *Refugee Convention* is not applicable at all, as there can be situations when the convention can be applied to those who are displaced by climate change.²⁰⁸

As far as the coastal South Asian region is concerned, the problem of climate related displacement acquires serious dimensions. For instance, given the high probability that the rising seas will swallow the archipelago of the Maldives,²⁰⁹ it is generally believed that Maldives residents will migrate to elsewhere within the South Asian region due to cultural affinities. Here, India and Sri Lanka may emerge as potential destinations.²¹⁰ It is also presumed that the bulk of the displaced people from Bangladesh will migrate to India.²¹¹ Already saddled with its own climate-displaced population, India will experience an enormous strain on its resources.

Interestingly, none of the South Asian coastal countries are parties to the 1951 *Refugee Convention* and its related Protocol, nor do they have any concrete legal standards or norms at the respective national level for refugee protection.²¹² It can in fact

²⁰⁷ For instance, see Tiffany TV Duong, “When Islands Drown: The Plight of “Climate Change Refugees” and Recourse to International Human Rights Law” (2010) 31 U Pa J Int’l L 1239 (HeinOnline).

²⁰⁸ The protection under the Refugee Convention will be available where the victims of natural disasters flee if the government consciously withholds or obstructs assistance to punish or marginalize a group on one of the five grounds. UNHCR, *Submission: Forced Displacement in the Context of Climate Change: Challenges for States under International Law*, Paper, 6th Session of the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention (AWG-LCA 6) from 1 Until 12 June in Bonn (19 May 2009) at 9-10.

²⁰⁹ UNDP, *Human Development Report 1999: Overcoming Barriers: Human Mobility and Development* (New York: Oxford University Press, 1999) at 45.

²¹⁰ The comparative political stability that India has enjoyed from the time of its independence (e.g., democratic institutions, a free and independent judiciary and media, a vibrant Bill of Rights, respect for multi-culturalism and secularism and the common cultural heritage of various South Asian countries) has its genesis in the Indian mainland. Of late, India’s economy is growing at a brisk pace and the cost of living is comparatively low. All of this renders India an attractive destination, and India also has a long tradition of accommodating Tibetans, the Tamil minority in Sri Lanka, the Afghans, and the Chakmas. See Prabodh Saxena, “Creating Legal Space for Refugees in India: The Milestones Crossed and the Roadmap for the Future” (2007) 19:2 Int’l J Refugee L 246 at 247, 248; see also Kálin & Schrepfer, *supra* note 93 at 18.

²¹¹ Rajan, *supra* note 161 at 1.

²¹² Even though the inflow of refugees into India began the partition of this country, India is not as yet a party to the 1951 Convention or the 1967 Protocol and has not legislated on this subject. Therefore, protection to refugees flows primarily from constitutional mandates and on liberal judicial interpretations. Judicial process has extended many of the constitutional provisions, like the right to life and the equality clauses, to refugees. *Chairman, Railway Board v Chandrima Das*, (2000) [2000] (2) SCC 465 (India SC) (a Bangladeshi national gang raped by railway employees in an Indian Railways building is entitled to compensation under article 21, which was held available not

be concluded that climate-change-displaced persons in South Asia who may be forced to cross international borders are in a state of suspended animation vis-à-vis their legal status, due mainly to the legal vacuum at the international and national levels. Therefore, it is possible that migrants who cross international borders seeking refuge in other South Asian countries may be subjected to severe human rights abuses, unless and until legal arrangements are put in place to secure their basic rights. Already there have been several instances of conflicts between the local population and the so-called illegal immigrants in India.²¹³

As will be detailed in the next chapter, in most of the South Asian coastal countries, development generally proceeds without heed to embed climate change adaptation measures (particularly, coastal climate change adaptation (CCCA)) within existing developmental strategies. Decades of investment have already gone into developing coastal settlements and infrastructure. It must also be noted that, in most cases, salinity ingress, rising sea levels, extreme weather events and disasters are not the primary causes of displacement. These are factors that emerge as the final trigger; exacerbating already existing conditions of poverty, vulnerability, and substandard living.²¹⁴ Climate change merely compounds existing vulnerabilities. Hence, it is necessary that coastal planning

only to all citizens but to all persons). It was held that the principle of non-refoulement is encompassed in article 21 and is available as long as the presence of the refugee is not prejudicial to national security. *Ktaer Abbas Habib Al Qutaifi v India*, (1998) [1998] INDLAW Guj 69 (Gujarat HC). The Indian Supreme Court directed the state of Arunachal Pradesh to ensure that the life and personal liberty of all Chakmas residing within the state be protected and that attempts to forcibly evict them by organized groups should be repelled. Eviction should occur only in accordance with the law. *Arunachal Pradesh v Khudiram Chakma*, (1994) [1994] Sup (1) SCC 615 (India SC).

²¹³ Thousands of illegal immigrants are entering India from Bangladesh almost on a daily basis through the porous borders on the eastern front, and this has led to the outbreak of riots, such as the one in July 2012 in the Indian state of Assam between indigenous Bodos and migrants of Bangladeshi origin. See Sanjib Kr Baruah, "Illegal migrants turn Assam into drug hub" *Hindustan Times [of India]* (20 August 2012) online: [hindustantimes.com/India-news/NewDelhi/Illegal-migrants-turn-Assam-into-drug-hub/Article1-916434.aspx](http://www.hindustantimes.com/India-news/NewDelhi/Illegal-migrants-turn-Assam-into-drug-hub/Article1-916434.aspx); but see Banajit Hussain, "Riots & the bogey of Bangladeshis" *The Hindu [of India]* (8 August 2012), online: <http://www.thehindu.com/opinion/lead/article3738939.ece>. For more details, see Arpita Bhattacharyya & Michael Werz, "Climate Change, Migration, and Conflict in South Asia Rising Tensions and Policy Options across the Subcontinent" (3 December 2012), online: [Center for American Progress](http://www.americanprogress.org) <http://www.americanprogress.org>.

²¹⁴ Brendan Gogarty, "Climate-change Displacement: Current Legal Solutions to Future Global Problems" (2011) 21:1 *JL Information & Sci* 167 at 179 (HeinOnline); McAdam, "Swimming", *supra* note 176 at 14-15.

and management in these countries deal with even basic socio-economic issues like poverty removal, stymie environmental degradation and improve adaptive capacities.²¹⁵

In sum, climate change and SLR are realities that are upon us, which will profoundly impact the lives and basic rights of millions of coastal residents all over South Asia and even beyond. Presently, as it stands the international instruments that provide a semblance of protection to the rights of the climate change displaced are caught in a time warp and have not developed according to rapidly changing societal needs and the changing environmental landscape. As well, even at the national levels in the South Asian region, the basic human rights of the climate displaced are not adequately protected. It is apparent that since those who cross international borders to flee from their sinking homes do not fall within the ambit of the traditional legal framework on refugee protection, their legal status remains in limbo.²¹⁶ Even more worrying is the fact that we do not have an appropriate and internationally agreed upon terminology to describe them, as the term climate-change refugee is seen as a misnomer.²¹⁷ This situation persists even though, in a matter of decades, vast swathes of coastal regions may be inundated by seawater and entire nations displaced.

As mentioned earlier, in worst-case scenarios, the sea rises to inundate and flood the coast, and land can be permanently lost leading to displacement. Nevertheless, certain, adaptation actions may be able to hold back the water for a while, even though a lot in such cases will depend on the success of mitigative actions. Conversely, even in other situations, coastal lands and associated ecosystems may be nursed back to health and reclaimed, as happened after the 2004 tsunami.²¹⁸ However, in such cases, the rehabilitation must be planned in such a way that if disaster were to strike again, coastal communities would not be put at unnecessary risk.

It is in this foreground that the need for intelligent planning towards CCCA, relief and rehabilitation gains importance. CCCA in the context of climate related displacement including SLR basically involves a three-pronged effort – firstly, it contemplates measures that directly aim to adapt to climate change impacts including SLR by

²¹⁵ In Bangladesh, poverty removal is an integral part of its ICZM process. For more discussion on this topic, see Ch 3, Part 3.2.3.

²¹⁶ See generally Part 2.4, above, for more details.

²¹⁷ For a discussion on terminology and related classifications regarding climate displaced, see *ibid.*

²¹⁸ Kälin, *supra* note 172.

reinforcing corroding coastlines and sinking islands and secondly, it seeks to improve the economic and adaptive capacities of coastal populations so that they are better enabled to absorb the impacts of climate change hazards and related shocks and thirdly, it seeks to enhance the resilience of coastal ecosystems. And here, as the subsequent chapters will attest, appropriate CCCA actions can be implemented via ICZM and this can serve to slow down or reduce the extent of migrations in the long run.

2.5 “VULNERABLE ECOSYSTEMS”: CLIMATE CHANGE IMPACTS ON COASTAL RESOURCES AND ECOSYSTEMS

The ocean space and marine resources adjacent to coastal states and coastal resources *per se* are rife with economic and development opportunities. However, SLR and other climate change processes can severely impact coastal resources such as groundwater, coral reefs, and coastal wetlands (particularly mangrove forests) that are highly essential to the well-being of South Asian coastal communities. Some of these aspects are explained next.

2.5.1 Impacts on Coastal Aquifers

In adopting the UN Millennium Declaration, the heads of state resolved “[t]o halve, by the year 2015, the proportion of the world’s people who are unable to reach or to afford safe drinking water.”²¹⁹ Even though vast distances have been covered and substantial improvements achieved in securing universal access to potable water,²²⁰ climate change threatens to hinder further progress. In October 2011, the island state of Tuvalu declared a state of emergency due to dwindling water supplies.²²¹ A lack of rainfall nearly dried out the island and the situation was made worse by rising sea levels which led to increased salinity intrusion. In response, New Zealand airlifted water containers and

²¹⁹ *United Nations Millennium Declaration*, GA Res 55/2, UNGA, UN Doc A/55/L2 (2000) ¶19.

²²⁰ Already the target has been met in Northern Africa, Latin America and the Caribbean, Eastern Asia and South-Eastern Asia, giving rise to a new challenge of ensuring safe water supply. United Nations, *The Millennium Development Goals Report 2010* (New York: United Nations, 2010) at 58-59.

²²¹ “Tuvalu declares emergency over water shortage”, *BBC News* (3 October 2011) online: BBC News <<http://www.bbc.co.uk/news/world-asia-pacific-15147043>>.

desalination plants to Tuvalu to tide over the crisis.²²² A state of emergency over dwindling water supplies was declared in Tokelau as well.²²³

Coastal aquifers are shallow and sandy and remain in close contact with the sea, rendering them highly vulnerable to pollution in comparison to hard rock aquifers.²²⁴ As the seas begin to rise, most coastal aquifers are at risk of salinisation.²²⁵ What compounds the problem is the increasing abstraction of groundwater at rates over and above sustainable yield levels.²²⁶ Reduced precipitation and increasing urbanisation also affects the recharge possibilities. Additionally, extreme weather events and intense storms lead to overtopping, contaminating freshwater lenses, open dug wells, and other water sources.²²⁷ The persistence of such conditions can produce a host of problems, such as a drop in the water table, aquifer collapse, land subsidence and salinity intrusion.²²⁸

The IPCC observes that “[m]ost measures to compensate and control the salinisation of coastal aquifers are expensive and laborious.”²²⁹ To date, international water law has paid only scant attention to this resource, focusing instead on surface water rights and its management.²³⁰ In most cases, these instruments apply only to

²²² “Tuvalu: state of emergency declared over water shortages”, *The Telegraph* (3 October 2011) online: The Telegraph <<http://www.telegraph.co.uk/news/worldnews/australiaandthepacific/tuvalu/8803267/Tuvalu-state-of-emergency-declared-over-water-shortages.html>>.

²²³ “South Pacific water shortage hits Tokelau”, *BBC News* (4 October 2011) online: BBC News <<http://www.bbc.co.uk/news/world-asia-pacific-15163543>>.

²²⁴ A two to three per cent mixing with sea water renders freshwater unfit for human consumption and irrigation and a four per cent mix can destroy the resource. FAO, *Seawater Intrusion in Coastal Aquifers: Guidelines for Study, Monitoring and Control*, Water Reports No 11 (Rome: FAO, 1997) at 7.

²²⁵ SLR will increase salinity in the groundwater aquifers in the Nile delta, particularly those that are situated in the Northern strip. See Egypt, *Egypt Second National Communication under the United Nations Framework Convention on Climate Change* (Cairo: Egyptian Environmental Affairs Agency, 2010) at 74.

²²⁶ For example, in the Khobar zone of the Dammam transboundary aquifer, in the Bahrain region, groundwater levels have plummeted to such low levels that it now stands below the mean sea level. Bahrain, Public Commission for the Protection of Marine Resources, Environment and Wildlife, *Bahrain's Second National Communication under the United Nations Framework on Climate Change* (Bahrain, 2012) at 33.

²²⁷ UNEP, *Maldives: State of the Environment 2002* (UNEP, 2002) at 31 [UNEP, *Maldives*]. 40,000 drinking water wells were either destroyed or contaminated as a result of the tsunamis of 2004. Tissa Illangasekare et al, "Impacts of the 2004 Tsunami on Groundwater Resources in Sri Lanka" (2006) 42 *Water Resources Research* 1.

²²⁸ Georgetown is subsiding at a rate of about 10 millimeters per year due to groundwater “mining”. See Guyana, *Guyana Initial National Communication in Response to its Commitments to the UNFCCC* (2002) at 94 [Guyana *Initial National Communication*].

²²⁹ Nicholls & Wong, *supra* note 32 at 342.

²³⁰ *UN: Convention on the Law of the Non-navigational Uses of International Watercourses*, 21 May 1997, 36 ILM 700 [UN *Watercourses Convention*] (dealing with transboundary aquifers). Even

transboundary groundwater aquifers.²³¹ What this implies is that groundwater management is essentially a domestic matter that falls within the purview of national governments and their legal systems. This renders national regulation and management of the resource extremely critical.

In most coastal regions of South Asia, there is an overwhelming dependence on groundwater as a primary source of potable water.²³² However, salinity intrusion into coastal aquifers is a major problem aggravated by over-extraction.²³³ For instance, in India, salt-water intrusion has been reported from the coastal states of Tamil Nadu, Pondicherry and from the Saurashtra region in Gujarat state.²³⁴ Salinity intrusion has been reported from the coastal city of Karachi in Pakistan.²³⁵ In coastal Bangladesh,

though the term groundwater finds mention in *United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, 1994* (UNCCD), only once where “salinization and exhaustion of aquifers” is mentioned in the context of Northern Mediterranean justifying the need for an Annex (Annex IV, article 2 (f)) several of the provisions are wide enough to contemplate groundwater management. See 21 September 1994, 33 ILM 1328 (adopted 17 June 1994) [UNCCD]; see also *ibid.*, art 10(2)(d) (enhancement of national hydrological capabilities and development of sustainable irrigation programmes). In addition, soft law instruments also emphasize groundwater management. See *The Dublin Statement on Water and Sustainable Development*, 31 January 1992 (International Conference on Water and the Environment, Dublin, Ireland) online: UN Documents <<http://www.un-documents.net/h2o-dub.htm>>. Chapter 18 of Agenda 21 states, “protection of groundwater is ... an essential element of water resource management”. Nicholas A Robinson, ed, *Agenda 21 & The UNCED Proceedings*, vol 4, 3rd series, International Protection of the Environment (New York: Oceana Publications, Inc, 1993) at 357, ch 18, ¶18.37. Plan of Implementation of the World Summit on Sustainable Development, 2002, talks about mitigating the effects of groundwater contamination by establishing, inter alia effective legal frameworks at the national level. “Plan of Implementation of the World Summit on Sustainable Development” in UN, *Report of the World Summit on Sustainable Development Johannesburg, South Africa, 26 August-4 September 2002*, A/CONF.199/20* (New York: UN, 2002) 6 at 21, ¶25(d).

²³¹ The Dammam aquifer is a large transboundary groundwater system that runs like an “umbilical cord” under Saudi Arabia, Bahrain, Qatar, Kuwait, UAE and Oman, providing nearly one-third of the water requirements of these nations. The aquifer is under severe stress due to over-exploitation, and SLR has increased the rate of salt-water intrusion. Bahrain, *Bahrain's Second National Communication*, *supra* note 226 at 31.

²³² For more details, see generally Tushaar Shah, “The Groundwater Economy of South Asia: An Assessment of Size, Significance and Socio-ecological Impacts” in M Giordano & KG Villholth, eds, *The Agricultural Groundwater Revolution: Opportunities and Threats to Development*, Comprehensive Assessment of Water Management in Agriculture Series No 3 (Wallingford: CABI Publishing, 2007) 7.

²³³ In Europe, 53 out of 126 groundwater areas show saltwater intrusion. David Coates et al, “Water Demand: What Drives Consumption?” in World Water Assessment Programme, *Managing Water under Uncertainty and Risk*, vol 1, The United Nations World Water Development Report 4 (Paris: UNESCO, 2012) 44 at 66.

²³⁴ Héctor Garduño et al, *India Groundwater Governance: Case Study*, Water Papers (Water Unit, Transport, Water and ICT Department, Sustainable Development Vice Presidency, 2011) at 10.

²³⁵ See generally A Mashiatullah et al, “Groundwater Salinity in Coastal Aquifer of Karachi, Pakistan (A Preliminary Investigation)” (2002) 7:3-4 *Sci Vision* 195.

approximately 20 out of 37 million people living on the coasts (over 57 per cent) are adversely affected by salinity in their drinking water, and a majority of these people solely depend on groundwater to meet their basic needs.²³⁶ In the Maldives, freshwater lenses lie atop salt water and thus, as the SLR, salt water penetrates into the freshwater lens, leading to contamination. Due to the peculiar geographical features of these islands, sewage contamination of groundwater is another related major issue.²³⁷ While the capital city of Male has desalinated water, residents in the other islands of the Maldives rely on rainwater for drinking purposes. Despite its poor quality in some of the islands, people are forced, out of necessity, to use the groundwater.²³⁸ A common theme that emerges in all of these countries is aquifer over-exploitation, overlaid by a progressive rise in sea levels. Despite this, groundwater governance in South Asia is poorly organised.²³⁹

Under both common and civil law systems, groundwater rights are tied up with

²³⁶ Aneire E Khan & Mikhail I Islam, “Water salinity and maternal health”, *The Daily Star [of Dhaka]* (5 June 2011) online: The Daily Star <<http://www.thedailystar.net/newDesign/news-details.php?nid=188591>>.

²³⁷ Maldives, *State of the Environment 2011*, *supra* note 170 at 88.

²³⁸ *Ibid* at 84.

²³⁹ In India, one of the earliest recognitions of the need to protect freshwater lenses and coastal aquifers from salinity intrusion from excessive extraction came from the judiciary. *Attakoya Thangal v India*, 1990 (1) KLT 580, was a decision by the Kerala High Court regarding the validity of a scheme evolved by the local administration in the coral islands of Lakshadweep to augment water supplies by drawing out ground water from the coastal aquifers. In affirming that water management was one of the biggest challenges of the present century, the court held that “the right to sweet water, and the right to free air, are attributes of the right to life, for these are the basic elements which sustain life.” *Ibid*. As there were conflicting opinions regarding the true nature of impacts, the court directed that the water development scheme be referred to the Union Ministry of Science and Technology and to the Ministry of Environment, for opinion. Implementation was permitted only if these two specialised bodies favoured the scheme. *Ibid*; see also *MC Mehta v India*, (1997) 11 SCC 312 (India SC) (directing the central government to constitute the Central Groundwater Board as an authority under section 3(3) of the *Environment Protection Act, 1986*, for regulating and controlling indiscriminate extraction of groundwater). For instance, see the *Kerala Ground Water (Control and Regulation) Act 2002* (No 19 of 2002, India). It seeks to conserve groundwater and control and regulate its extraction. The government has been empowered to constitute the State Ground Water Authority under section 3. The Act contemplates registration by groundwater users where pumps driven by engines of horsepower up to 1.5 and tube wells fitted with pumps driven by engines of horsepower above 3 (s 2(1)(f)). The government can, on the recommendation of the State Ground Water Authority, regulate the extraction or use of ground water in an area in public interest and declare the same to be a notified area (s 6(1)). Despite copious surface water resource, Bangladesh relies increasingly on groundwater. Unfortunately, groundwater resources are contaminated by naturally occurring arsenic, which is a serious health issue. Bangladesh, in 1985, brought out its *Ground Water Management Ordinance*. However, the operation of this law was suspended within two years to facilitate irrigation expansion. This law was an insufficient response and it is inadequate to ensure the comprehensive management of groundwater resources. It prescribes nothing to protect the health of coastal aquifers.

land rights.²⁴⁰ What this means is that in the language of the law, the term ‘land’ includes water, and groundwater is treated as belonging to the landowner. This is the cornerstone principle on which most groundwater legal regimes are organised and developed.²⁴¹ To elaborate, under common law, for instance, groundwater is treated as chattel attached to the land property, with rights belonging to the landowner on the basis of the *ad coelum* principle.²⁴² A necessary adjunct is the rule of capture,²⁴³ and accordingly none has rights of action against another, who by sinking wells or other works on his/her land, draws off

²⁴⁰ For instance, see the French Civil Code which states that
[o]wnership of the ground involves ownership of what is above and below it.
An owner may make above all the plantings and constructions, which he deems proper, unless otherwise provided for in the Title of Servitudes or Land Services. He may make below all constructions and excavations which he deems proper and draw from these excavations all the products which they can give, subject to the limitations resulting from statutes and regulations relating to mines and from police statutes and regulations. *Ibid*, art 552.

See 2 *Earl Jowitt's The Dictionary of English Law* 1053 (1959).

“Land”, in its restrained sense, means soil, but in its legal acceptance it is a generic term, comprehending every species of ground, soil or earth, whatsoever, as meadows, pastures, woods, moors, waters, marshes, furze, and heath; it includes also houses, mills, castles, and other buildings; for with the conveyance of the land, the structures upon it pass also. And besides an indefinite extent upwards, it extends downwards to the globe’s centre, hence the maxim, *Cujus est solum ejus est usque ad coelum et ad inferos*; or, more curtly expressed, *Cujus est solum A ejus est altum*.

²⁴¹ For instance, Canadian Water Law is also based on English common law. Accordingly, in line with the rule of absolute capture, groundwater users can extract water having no regard to possible impacts on neighbours. See *Program on Water Governance: Fact Sheet: Groundwater Use Regulation* online: Water Governance <http://www.watgovernance.ca/factsheets/pdf/FS_Groundwater_Regs.pdf>.

²⁴² See Herbert Broom, *A Selection of Legal Maxims, Classified and Illustrated* (1845) ¶172 (HeinOnline) (stating that “*Cujus est solum ejus est usque ad coelum*”, which means he who possesses land possesses also that which is above it). Also pointing out

Not only has land in its legal signification an indefinite extent upwards, but in law it extends also downwards, so that whatever is in a direct line between the surface and the centre of the earth by the common law belongs to the owner of the surface: “not merely the surface, but all the land down to the centre of the earth and up to the heavens” (x); and hence the word “land,” which is *nomen generalissimum*, includes, not only the face of the earth, but everything under it or over it; and if a man grants all his lands, he grants thereby all his mines, woods, waters, and houses, as well as his fields and meadows. (d). *Ibid*, ¶175.

²⁴³ *Acton v Blundell* (1843), 152 ER 1223 (Ex Ch).

and appropriates the underground water.²⁴⁴ In other words, this is a case of *damnum absque injuria*.²⁴⁵ Many countries, in accordance with their common law lineage, base their groundwater legal regimes on the common law approach to land ownership, and the common law countries in South Asia (namely, India, Bangladesh and Pakistan) are no exception to this rule.²⁴⁶ Since only landowners can enjoy groundwater rights, this can, in certain circumstances, prove particularly harsh in countries that have a skewed system of land tenure and where the land rights of traditional coastal fishing communities, pastoral groups, and tribes are based on community-based land ownership. Legally, these groups can be excluded from enjoying ground water rights.²⁴⁷ And moreover, since the rule of capture prevails, landowners enjoy almost unrestricted freedom in mining the water.²⁴⁸ A growing realisation of the dangers in persisting with this inequitable principle has led to its dilution at least in India.²⁴⁹

²⁴⁴ Eric Opiela, “The Rule of Capture in Texas: An Outdated Principle Beyond its Time” (2002) 6 U Denv Water L Rev 87 (QL).

²⁴⁵ Tony George Puthucherril & Lekshmi Vijayabalan, “The Law and Practice on Ground Water Conservation and Management – A Case Study with Specific Reference to the State of Kerala” (Paper delivered at the National Workshop on Water Quality Management and Conservation: Role of the Legal System, National Law School of India University, Bangalore, 16 August 2002) [unpublished].

²⁴⁶ This archaic common law principle is embodied in the Easement's act of India, Pakistan and Bangladesh. For instance, see *Indian Easement Act 1882* (No 5 of 1882, India), s 7, illustration (g). It outlines the natural rights available to the owner of the land, namely, “[t]he right of every owner of land to collect and dispose within his own limits of all water under the land which does not pass in a defined channel ...” See also *Easements Act, 1882* (No V of 1882, Pakistan) s 7(g); *Easements Act, 1882* (No V of 1882, Bangladesh) s 7.

²⁴⁷ In India, groundwater development is still in the hands of private individuals. Hence, there is the possibility that rich upper caste landlords who own most of the land will turn into “water-lords”. In rural India, the person who controls groundwater is extremely important. With the proliferation of borewells and the fruits of this modern technology accruing only to the rich upper caste farmers, drying up wells of small farmers is not uncommon. The rich farmer, taking advantage of the situation, often sells water to small farmers but cuts off supplies at crucial moments, ravaging crops and entrapping the farmers in debt. Soon afterwards, the land is taken over by the rich landlords, using water as a weapon. In the Ramanad district of Tamil Nadu, a class of people known as the *Thaneer Adipathy* or Water Lords has emerged. These people own most of the land and charge huge amounts to pump water. The common law rule has also been carried to excess in protecting the landowner. For instance, a company can sink wells at any depth and force large quantities of water from it and sell it, yet not be liable to other well owners on nearby premises whose wells were either dried up or diminished in quality because of this operation. Water companies’ purchase lands solely for the purpose of abstracting percolating water for sale without being liable for the destruction of other wells in the neighbourhood. This is precisely what has happened of Kerala, where Coke’s water mining in the Palakkad district has parched the lands of more than 2,000 people residing within 1.2 miles of the factory. See generally Puthucherril & Vijayabalan, *supra* note 245.

²⁴⁸ Even in countries like Canada, whose legal system is based on common law tradition, the rule of capture holds the roost. *Ibid.*

²⁴⁹ For more details, see *supra* note 239.

Given the problem of SLR and growing exploitation and contamination of coastal aquifers, it may be necessary to revisit the inequity latent in the legal principles relating to groundwater rights (both civil and common law). A proactive and precautionary approach will have to be adopted towards groundwater management, particularly of coastal aquifers. This requires, first and foremost, that there be a clear understanding that limits will have to be imposed upon the quantity of water that can be extracted. Regulations will have to be placed to ensure distributive justice and sustainable development of the resource. Second, the hydrological compartmentalisation of water into surface and ground water should give way to a more integrated and holistic approach to the management of water resources that includes both vertical and horizontal management.²⁵⁰ It has to be understood that there is a close inter-relationship between groundwater and other ecosystems like wetlands, swamps, etc.²⁵¹ Destruction of such ecosystems can considerably hamper aquifer dynamics. As well, the pollution from coastal and upstream areas can contribute to the contamination of coastal aquifers and in such cases, where groundwater quality is compromised; remedial measures may prove to be cost-prohibitive and sometimes even futile. Therefore, it is necessary that inter-linkages are developed between water management with broader coastal management and planning.

²⁵⁰ See *The Andhra Pradesh Water, Land and Trees Act, 2002* (No 10 of 2002, Andhra Pradesh, India). It is a comprehensive piece of legislation, which imbibes this philosophy. The Act aims to promote water conservation and tree cover and to regulate the exploitation and use of ground and surface water, with a view to protecting and conserving water sources, land, and environment. *Ibid*.

²⁵¹ Wetlands share an important and intricate relationship with groundwater. It is possible for a wetland to depend on aquifer outflow as a source; in a similar vein, the downward seepage of water from the wetland can help to recharge the aquifer. See *Resolution IX.1 Annex C ii Guidelines for the Management of Groundwater to Maintain Wetland Ecological Character*, at 3, online: Ramsar <http://www.ramsar.org/pdf/res/key_res_ix_01_annexcii_e.pdf>. Even though the Ramsar Convention text does not deal with groundwater *per se*, the Conference of Parties to the Ramsar Convention has adopted resolutions and recommendations, some of which are relevant to groundwater management. For instance, see *ibid*. It provides guidance regarding the interaction between wetlands and groundwater to help develop strategies for impact assessment and sustainable groundwater management that can help maintain the ecological character of wetlands as well. *Ibid* at 4. Similarly, Goal One, which deals with “wise use” in the Strategic Plan 2009-2015, calls upon all Contracting Parties to ensure that planning activities and decision-making processes, particularly those relating to groundwater management, are based on integrated water resources management and use an ecosystem approach. *Resolution X.1: The Ramsar Strategic Plan 2009-2015*, at 3, 10, online: Ramsar <http://www.ramsar.org/pdf/res/key_res_x_01_e.pdf>.

2.5.2 Impacts on Coral Reefs

Often described as the tropical rainforests of the oceans,²⁵² coral reefs are home to several marine species²⁵³ and provide major ecosystem services.²⁵⁴ It is no surprise that many coastal communities, including those in South Asia, depend on reefs for their livelihood.²⁵⁵ At a global level, it is estimated that coral reefs provide livelihoods to 100 million people and their annual net benefit is about USD30 billion.²⁵⁶ Despite the overwhelming importance, the reefs are under severe stress from a range of threats,²⁵⁷ including destructive fishing practices,²⁵⁸ mining,²⁵⁹ operational discharges from ships,²⁶⁰

²⁵² Nellemann, Hain & Alder, eds, *supra* note 17.

²⁵³ Marine and Coastal Biodiversity, *Coral*, online: CBD <<http://www.cbd.int/marine/coral.shtml>>.

²⁵⁴ These include regulating (serve as breakwaters to protect coastlines from storm surges and waves), provisioning (supports coastal fisheries, the pharmaceutical industry, provides construction materials) cultural (tourism, spiritual and aesthetic value) and finally supporting (nutrient cycling, nursery habitats). *Ibid*; see also Laretta Burke et al, *Reefs at Risk Revisited in the Coral Triangle* (Washington, DC: World Resource Institute, 2011) at 1. Healthy, well-managed reef in the Indian or Pacific Oceans can yield between 5 and 15 tons of sea-food per square kilometer per year in perpetuity. Again coral reefs protect 150,000 kilometers of shoreline in more than 100 countries and territories. At least 94 countries and territories benefit from reef tourism and in 23 reef countries, it accounts for more than 15 per cent of gross domestic product. *Ibid*.

²⁵⁵ The Coral Triangle also referred to as the “Amazon of the Seas”, spans the marine waters of Indonesia, Malaysia, Papua New Guinea, the Philippines, Solomon Islands and Timor-Leste. It is the global heart of coral reefs and home to nearly 30 per cent of the world’s coral reefs and 75 per cent of all known coral species. Moreover, it sustains nearly 3,000 species of fish, which is twice the number found anywhere else in the world and forms the main sustenance of more than 130 million people living within the Coral Triangle. Burke et al, *ibid* at vi.

²⁵⁶ *Marine and Coastal Biodiversity and Climate Change*, online: CBD <<http://www.cbd.int/doc/bioday/2009/banners/cbd-ibd-banners-5-en.pdf>>.

²⁵⁷ At a global level, it is estimated that nearly 60 per cent of the world’s reefs are under immediate and direct threat from overfishing, destructive fishing, coastal development, watershed-based pollution, or marine-based pollution and damage. Burke et al, *supra* note 254 at 1.

²⁵⁸ Blast fishing uses dynamite to stun or kill fish via shock waves; fish that float to the surface are then collected. However, blasting kills all marine life in the area, including sensitive corals. Pouring cyanide into the water around reefs stuns the fish, which are then captured for the ornamental aquarium fish market. The use of cyanide also affects surrounding corals and other marine life. Since the 1960s, more than one million kilograms of cyanide has been used illegally for fishing in the Philippines alone. Marjorie Mulhall, “Saving the Rainforests of the Sea: An Analysis of International Efforts to Conserve Coral Reefs” (2009) 19 *Duke Envtl L & Pol’y F* 321 at 326-27 (QL).

²⁵⁹ Coral reefs are mined for limestone, which is mixed with sand to make cement. Limestone is also used to make calcium supplement pills and for clinical trials. As well, corals are mined for use in aquariums, as home decorations, and for jewellery. *Ibid* at 329.

²⁶⁰ A typical one-week cruise on a large ship (3,000 passengers and crew) generates almost 800 cubic meters of sewage; 3,700 cubic meters of grey water, half a cubic meter of hazardous waste, 8 tons of solid waste, and nearly 100 cubic meters of oily bilge water. MARPOL’s regulations are met with varying degrees of compliance within the cruise industry and beyond. Burke et al, *supra* note 254 at 24.

run off,²⁶¹ sedimentation,²⁶² and negligent tourism practices²⁶³. It has been reported that in 93 out of 109 countries, coral reefs have been damaged by human activities²⁶⁴ and “are disappearing faster than they can be counted.”²⁶⁵

The total area of coral reefs in India is estimated to be around 2,375 square kilometers, with primary concentrations located in the Gulf of Mannar, the Gulf of Kutch, the Andaman and Nicobar islands, and in the Lakshadweep comprising atoll.²⁶⁶ Pakistan,²⁶⁷ Sri Lanka,²⁶⁸ and Bangladesh²⁶⁹ also have coral reef systems. Being an atoll, the coral reef systems of the Maldives is the eighth largest in the world and are spread over a 4513 square kilometres area, comprising approximately five per cent of the world’s reef areas.²⁷⁰ However, despite their size, the reefs in the Maldives are under considerable stress, with coral bleaching and coral extraction reported to be the major threats.²⁷¹

Even though human activities are the main causes of coral stress, rising ocean temperatures and ocean acidification are also contributing factors. As highlighted earlier, the primary impacts of climate change on coral reef systems are changes in ocean temperature and chemistry.²⁷² Higher sea surface temperatures and the amplified

²⁶¹ *Ibid* at 21.

²⁶² *Ibid* at 23.

²⁶³ Careless swimmers and divers, improperly placed boat anchors, sewage and other wastewater discharge from hotels and resorts is a serious problem. Mulhall, *supra* note 258 at 328.

²⁶⁴ *Living Corals Presented by Odyssey Expeditions*, online: Marine Biology, Coral Reefs <<http://www.marinebiology.org/>>.

²⁶⁵ JC Sylvan, “How to Protect a Coral Reef: The Public Trust Doctrine and the Law of the Sea” (2006) 7:1 SDLP 32 at 33 (QL).

²⁶⁶ *Ibid*.

²⁶⁷ Pakistan, *Pakistan: Fourth National Report* (Islamabad: Ministry of Environment, 2009) at 11.

²⁶⁸ Arjan Rajasuriya, “Coral Reefs of Sri Lanka: Current Status and Resource Management” in Vineeta Hoon, *Regional Workshop on the Conservation and Sustainable Management of Coral Reefs: Workshop Proceedings of the MS Swaminathan Research Foundation, Chennai, India, 1997* (Chennai: CRSARD, 1997) at B-69.

²⁶⁹ In Bangladesh, coral ecosystems are found around St Martin’s Island. Bangladesh, *Fourth National Report to the Convention on Biological Diversity* (Bangladesh: Department of Environment, 2010) at 62.

²⁷⁰ Maldives, *Fourth National Report to the Convention on Biological Diversity Maldives* (Male’: Ministry of Housing and Environment, 2010) at 13.

²⁷¹ UNEP, *Maldives*, *supra* note 227 at 16.

²⁷² The oceans are naturally alkaline, with an average pH of around 8.2. Since 1750, the uptake of anthropogenic carbons has increased. This dissolves in the ocean to form carbonic acid (H₂CO₃), which lowers the pH. This can affect all marine organisms that need carbonate to build their calcareous skeletons and shells, such as corals, seashells, crabs and crayfish, starfish and sea urchins. Nellemann, Hain & Alder, eds, *supra* note 17 at 35-36. It is the symbiotic algae in corals namely, the photosynthetic zooxanthellae that provide energy and oxygen necessary for the growth

presence of GHGs in the atmosphere can lead to coral bleaching.²⁷³ As well, frequent and extreme climate events can also batter the fragile reefs.²⁷⁴ Although corals can recover after bleaching events, they are less resilient and more susceptible to diseases and the series of anthropogenic interferences often prevent their recuperation.²⁷⁵

Degradation of coral reef systems can prove particularly threatening to fishing-dependant coastal communities. Millions of artisanal fishers in tropical and sub-tropical countries, particularly in South Asia, depend solely on coastal fisheries for their livelihood and food requirements. It is estimated that over 90 per cent of the world's fish is caught in the area that lies within 200 nautical miles of the coast, and the majority of the catch is within the first five miles.²⁷⁶ Within this scenario, coral reefs play an important role in supporting the relatively shallow, near-shore water fisheries. In South Asia, most of the fishing activities are non-industrial operations that rely on traditional

and formation of the calcium carbonate skeleton that forms the coral colony. *Belize Institute of Environmental Law and Policy (BELPO) Petition to the World Heritage Committee Requesting Inclusion of the Belize Barrier Reef Reserve System in the List of World Heritage in Danger As A Result of Climate Change and for Protective Measures & Actions* (15 November 2004), at 13 online: UF <<http://www.law.ufl.edu/>> [*Belize Petition*]. Coral bleaching happens when corals are subjected to persistent stress that exceeds its tolerance levels. Nellemann, Hain & Alder, eds, *ibid* at 28. Bleaching can happen in response to higher temperatures or higher solar radiation, causing the corals to lose their zooxanthellae and thereby turn white as the skeleton reflects through the tissue. *Ibid.*; see also *Belize Petition, ibid.* Since the coral reefs support a vast array of diverse marine ecosystems, this can have significant secondary implications for marine biodiversity that extend well beyond the mere “isolated” deaths of a few fringing reefs, as it “jeopardizes the life of the entire ecosystem.” *Ibid.*

²⁷³ JEN Veron et al, “The Coral Reef Crisis: The Critical Importance of <350 ppm CO₂” (2009) 58 Mar Pollution Bull 1428 (ScienceDirect); Nellemann, Hain & Alder, eds, *ibid* at 29 (the first major bleaching event was in 1988 and since then several such incidents have occurred like the bleaching in Caribbean in 2005); see also CBD & UNEP, *Status and Trends of, and Threats to, Mountain Biodiversity, Marine, Coastal and Inland Water Ecosystems: Abstracts of Poster Presentations at the Eighth Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice of the Convention on Biological Diversity*, CBD Technical Series No 8 (Montreal: Secretariat of the Convention on Biological Diversity, 2003) at 99 (pointing out that the 1998 mass bleaching led to a loss of 16 per cent of the world's living corals).

²⁷⁴ Australian Gov't, *An Assessment of Damage to Maldivian Coral Reefs and Baitfish Populations from the Indian Ocean Tsunami Prepared by an Australian Government Mission and the Maldives Marine Research Centre* (Commonwealth of Australia, 2005) (reporting that the Indian ocean tsunami of 2004 did not cause much damage to the corals in the Maldives). Higher average temperatures have led to the outbreak of several coral diseases like black band and coral plague. Belize, *Second National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change* (Belmopan, 2009) at 56; Clive Wilkinson, ed, *Status of Coral Reefs of the World: 2008* (Townsville: Global Coral Reef Monitoring Network and Reef and Rainforest Research Centre, 2008) at 14.

²⁷⁵ Burke et al, *supra* note 254 at 2.

²⁷⁶ Dafna Hopenstand, “Global Warming and its Impact on Near-Shore Communities: Protection Regimes for Fish and Coastal People Affected by Coral Reef Damage” (2002) 8 Wis Env'tl LJ 85 at 93 (QL).

modes of capture and harvest.²⁷⁷ As most fishing communities are steeped in poverty and lack access to basic and essential services,²⁷⁸ coral bleaching can magnify adverse consequences.²⁷⁹ For instance, the bleaching event of 1998 caused extensive damage to the coral reefs of the Maldives, killing an estimated 90 per cent of the total coral.²⁸⁰ Accordingly, changes in sea surface temperatures and other climate change impacts on corals can prove damaging to the overall fishing industry as well as to the individuals who rely on it.²⁸¹

As corals die, secondary impacts emerge such as increased mortality of marine life and reductions in the diversity of marine biodiversity, leading to shifts and collapses in fishery stocks. The repercussions of these developments can be particularly devastating for fishing communities.²⁸² Reduced catches can lead to migration and even conflicting demands for “the negotiation of new treaties among nations facing different levels of fish stock or the renegotiation of current treaties between such nations.”²⁸³ To sum up, protection of coral reefs is critical for the stability and continuity of coastal communities.

Presently, there is no exclusive and dedicated instrument at the international level on coral conservation, even though supplemental or indirect roles in protecting the reef systems are being played by the LOSC,²⁸⁴ the *Convention on Biological Diversity*,²⁸⁵ *United Nations Convention Concerning the Protection of the World Cultural and Natural*

²⁷⁷ See generally Chandrika Sharma, “Coastal Area Management in South Asia: A Comparative Perspective” (Background Paper prepared for the South Asia Workshop on Fisheries and Coastal Area Management, 26 September - 1 October 1996, Madras, India) (Chennai: ICSF, 1997).

²⁷⁸ See IUCN, CORDIO & ICRAN *Managing Marine and Coastal Protected Areas: A Toolkit for South Asia* (Switzerland & Bangkok, IUCN Gland, 2008) at 55.

²⁷⁹ “States, either directly or through appropriate subregional, regional or global organizations or arrangements, to intensify efforts to assess and address, . . . the impacts of global climate change on the sustainability of fish stocks and the habitats that support them”. See UNGA, Resolution Adopted by the General Assembly [without Reference to a Main Committee (A/64/L.29 and Add.1)] 64/72. Sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments Resolution adopted by the General Assembly, 64th Sess, A/RES/64/72 (19 March 2010) ¶3.

²⁸⁰ UNEP, *The Maldives*, at 280, online: UNEP <http://www.unep.org/tsunami/reports/TSUNAMI_MALDIVES_LAYOUT.pdf>; Maldives, *State of the Environment 2011*, *supra* note 170 at 67.

²⁸¹ Maldives, *State of the Environment 2011*, *ibid*.

²⁸² Fish stocks in certain reef areas in the Federated States of Micronesia are seriously depleted forcing locals to find alternative sources of fish and other foods. Hopenstand, *supra* note 276 at 92.

²⁸³ *Ibid*.

²⁸⁴ See generally LOSC, *supra* note 66.

²⁸⁵ *United Nations Conference on Environment and Development: Convention on Biological Diversity*, 5 June 1992, 31 ILM 818 (entered into force 29 December 1993) [CBD].

Heritage,²⁸⁶ the *Convention on Wetlands of International Importance especially as Waterfowl Habitat* (Ramsar Convention),²⁸⁷ and the International Maritime Organization (through its designations like special areas²⁸⁸ and particularly sensitive sea areas).²⁸⁹ The Honolulu Declaration on Ocean Acidification and Reef Management, 2008 provides guidance in adapting policy and management practices to enhance coral reef resilience to ocean acidification.²⁹⁰ In this regard, the constitution of the informal partnership of the International Coral Reef Initiative to preserve coral reefs around the world is also important.²⁹¹ However, the most important international instruments applicable to coral reef health are the UNFCCC and the Kyoto Protocol, with mandates on mitigation measures like emissions avoidance and carbon sequestration.²⁹²

The Maldives and Sri Lanka have enacted laws that proscribe the mining of corals

²⁸⁶ *UNESCO Convention for the Protection of the World Cultural and Natural Heritage*, 16 November 1972, 27 UST 37, 11 ILM 1358 (entered into force 17 December 1975) [*World Heritage Convention*].

²⁸⁷ *Convention on Wetlands of International Importance Especially as Waterfowl Habitat*, 2 February 1971, 996 UNTS 245, 11 ILM 963 (entered into force 21 December 1975) [*Ramsar Convention*].

²⁸⁸ Under the MARPOL Annexes, certain sea areas have been designated as special areas. For more details, see *Special Areas under MARPOL*, online: IMO, Our Work, Marine Environment, Pollution Prevention, Special Areas Under MARPOL <<http://www.imo.org/Pages/home.aspx>>.

²⁸⁹ A Particularly Sensitive Sea Area (PSSA) is an area that needs special protection through action by IMO because of its significance for recognized ecological, socio-economic, or scientific attributes where such attributes may be vulnerable to damage by international shipping activities. To be identified as a PSSA, the area should meet at least one of the following criteria: ecological; social, cultural, and economic; and scientific and educational. As far as ecological criteria are concerned, the following are required: Uniqueness or rarity, Critical habitat, Dependency, Representativeness, Diversity, Productivity, Spawning or breeding grounds, Naturalness, Integrity, Fragility, and Biogeographic importance. See IMO, Resolution A.982(24) Adopted on 1 December 2005 (Agenda item 11) Revised Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas, 24th Sess, A 24/Res 982 (6 February 2006) ¶¶4.4.1-11. Once an area is designated as a PSSA, then specific measures can be employed to regulate maritime activities in that area such as routeing measures, installation of vessel traffic services, and strict application of MARPOL discharge and equipment requirements for ships. Some PSSA's identified include the Great Barrier Reef, Australia (designated a PSSA in 1990); the Sabana-Camagüey Archipelago in Cuba (1997); Paracas National Reserve, Peru (2003), and the Galapagos Archipelago, Ecuador (2005). For further details, see *Particularly Sensitive Sea Areas*, online: IMO, Our Work, Marine Environment, Pollution Prevention, Particularly Sensitive Sea Areas <<http://www.imo.org/Pages/home.aspx>>.

²⁹⁰ See generally Elizabeth McLeod et al, *The Honolulu Declaration on Ocean Acidification and Reef Management* (Gland: IUCN, 2008).

²⁹¹ *International Coral Reef Initiative: An Informal Partnership to Preserve Coral Reefs around the World*, online: ICRI <<http://www.icriforum.org/>>.

²⁹² For instance, the Kyoto Protocol specifies the emission targets on a country-by-country basis for developed countries, keeping 1990 as the base year for the first commitment period from 2008 to 2012. *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 16 March 1998, 37 ILM 32 (adopted at Kyoto 11 December 1997 and entered into force 16 February 2005) [*Kyoto Protocol*] art 3, annex B. In fact, it requires that some of the Annex I states that have signed and ratified the protocol reduce emissions to an average of five per cent below 1990 levels during the 2008-2012 period (art 3).

but they are observed more in breach than in practice.²⁹³ India has yet to enact a law on coral conservation, working instead under the *Wildlife Protection Act, 1972*.²⁹⁴ A crucial development towards fostering coral conservation in South Asia is the creation of the South Asia Coral Reef Task Force under the South Asia MCPA (Marine Conservation and Protected Areas) project. Funded by the European Union, the task force is intended “to facilitate coordination in the management of coral reefs and associated ecosystems at a national level, and to promote collaborative action at the regional level, encouraging trans-boundary responses to shared environmental challenges.”²⁹⁵

In sum, coral reefs act as natural sea defences.²⁹⁶ However, given the rate of degradation of the corals in, for instance, the Maldives, it is doubtful whether they will be able to safeguard the islands against SLR for much longer.²⁹⁷ Thus, it is imperative that sensitive coastal ecosystems such as these be protected, but without forsaking development opportunities. It is balancing these two needs – ecosystem protection and economic development – that ICZM assumes relevance. On the other hand, there is also an urgent need to rapidly reduce global emissions of GHGs, which underscores the importance of mitigation measures.

²⁹³ For instance, see *The Fisheries Law of the Maldives* the *Fisheries Law* (Law No 5/87, 1987 Maldives), the *Environment Protection and Preservation Act of Maldives* (Law No 4/93), and the *Maldives Tourism Act* (Law No 2/99). See *Coast Conservation Act* (No 57 of 1981 Sri Lanka), as amended by the *Coast Conservation (Amendment) Act*, No 64 of 1988, s 31A(1). The *Fisheries and Aquatic Resources Act* prohibits persons from using or attempting to use any poisonous, explosive or stupefying substance or other noxious or harmful material or substance in Sri Lanka waters for the purpose of poisoning, killing, stunning or disabling any fish or other aquatic resources. Aquatic resources have been defined in section 66 to include living aquatic organisms. (No 2 of 1996, Sri Lanka) s 27(1). The *Marine Pollution Prevention Act* is also relevant. Even though it does not deal specifically with corals, it deals with one of the causes that contribute to reef destruction, namely, water pollution. See (No 59 of 1981, Sri Lanka).

²⁹⁴ See *Tamil Nadu v Messers Kaypee Industrial Chemicals Private Ltd*, (2005), [2005] AIR 304 (Madras HC). This case related to the use of corals for the manufacture of lime. Even though it was contended that the fishermen used to collect only dead corals, the death due to discharge of hot water from a nearby thermal power station, and due to global warming, the Madras High Court held that as long as the respondents purchased dead corals that were washed ashore, the authorities could not interfere. However, if the sea-farer killed the animal, the *Wildlife Protection Act* would be applicable. *Ibid*. For an overview on the state of the coral environment in Sri Lanka, see Priya Monaguruswamy & Asha Dhanasini, *Sri Lanka -- Corals at Risk: The Need for Protection*, online: eLAW <<http://www.elaw.org/node/1679>>.

²⁹⁵ *South Asia Coral Reef Task Force*, online: SACEP, [South Asia Coral Reef Task Force](http://www.sacep.org/) (SACRTF) <<http://www.sacep.org/>>.

²⁹⁶ John C Pernetta, ed, *Marine Protected Areas Needs in the South Asian Seas Region*, A Marine Conservation and Development Report, vol 3: Maldives (Gland, Switzerland: IUCN, 1993) at 17.

²⁹⁷ *Ibid*.

2.5.3 Impacts on Mangrove Forests

Among the portfolio of measures suggested to mitigate the presence of GHGs is the development of geo-engineering and related technologies.²⁹⁸ These seek to enhance carbon-absorbing processes (artificially and naturally) on land and sea to offset the negative consequences of climate change. Geo-engineering efforts have also served to shine a spotlight on the importance of coastal and near-shore marine ecosystems, particularly on the ability of ‘blue carbon sinks,’ i.e., vegetative coastal environments such as mangroves, tidal salt marshes, peat lands and sea grass meadows that have the potential to capture and sequester carbon.²⁹⁹ In comparison to green carbon, blue carbon has a very high sequestration potential. These ecosystems are important for other reasons as well, including: 1) helping to improve livelihood opportunities for impoverished coastal communities, and augment food security;³⁰⁰ 2) protecting coastal areas from harmful waves and storm surges;³⁰¹ 3) performing essential ecological processes like filtering and sustaining coastal aquifers;³⁰² 4) serving as fishing grounds and habitats for a large number of species;³⁰³ and, 5) acting as carbon sinks.³⁰⁴ It is estimated that these ecosystems can sequester carbon at rates higher than what mature tropical forests can accomplish.³⁰⁵

²⁹⁸ Ralph Bodle, “Geoengineering and International Law: The Search for Common Legal Ground” (2010) 46 *Tulsa L Rev* 305 (QL).

²⁹⁹ Indonesia has lost about 30-40 per cent of its sea grass areas while Thailand has lost 20-30 per cent. Stephen Crooks et al, “Mitigating Climate Change through Restoration and Management of Coastal Wetlands and Near-shore Marine Ecosystems: Challenges and Opportunities”, Environment Department Paper 121 (Washington, DC: World Bank, 2011) at 19; see also Jeremy Corbin, *Restoring Mangrove Forests in Indonesia Through the Use of Market-based Incentives: Lessons Learned from International Case Studies* (MMM, Dalhousie University, 2013) [unpublished].

³⁰⁰ Mangroves play an important role in supporting local economies. For instance, both in the Indus delta and along the Balochistan coast in Pakistan, mangroves are harvested for fuel. For more details, see Ch 3, Part 3.2.2.

³⁰¹ Daniel M Alongi, “Mangrove Forests: Resilience, Protection from Tsunamis, and Responses to Global Climate Change” (2008) 76:1 *Estuarine, Coastal & Shelf Science* 1 at 6 (ScienceDirect).

³⁰² Mangrove ecosystems are effective as nutrient traps and ‘reactors’, helping to mitigate and decrease coastal pollution. Dan Laffoley & Gabriel Grimsditch, eds, *The Management of Natural Coastal Carbon Sinks* (Gland: IUCN, 2009) at 14.

³⁰³ For instance, see *Guyana Initial National Communication*, *supra* note 228 (noting that mangrove swamps act as natural breeding and nursery grounds for brackish water shrimp and fin fish species).

³⁰⁴ UNEP, Christian Nellemann et al, eds, *Blue Carbon: A Rapid Response Assessment* (GRID-Arendal, 2009) at 7.

³⁰⁵ Mangroves and other coastal ecosystems can amass huge quantities of carbon in organic rich sediments of up to five times more than the capacity of temperate and tropical forests. “Mangroves Among the Most Carbon-Rich Forests in the Tropics; Coastal Trees Key to Lowering Greenhouse

Nevertheless, despite the economic and environmental potential of these ecosystems, large swathes of mangrove forests and other coastal ecosystems are being increasingly degraded and drained.³⁰⁶ The dormant stores of carbon entrapped in these systems is then released into the atmosphere, contributing to anthropogenic climate change. For instance, reclamation for agriculture in the Sunderbans mangrove ecosystem has left it severely strained,³⁰⁷ while in Mumbai, which is nearly encircled by mangroves, development projects are rapidly replacing them.³⁰⁸ The situation is similar in neighbouring Sri Lanka, which had nearly 11,500 hectares of mangroves in 1994 but now has only 6,000-7,000 hectares.³⁰⁹ In Pakistan, mangroves are falling victims to land-based sources of pollution.³¹⁰ It is pertinent to note that none of these countries have direct and dedicated legislations devoted to mangrove forest conservation. This is generally left to a patchwork of forest conservation laws (terrestrial-based) and general environmental

Gases”, *Science News* (5 April 2011), online: ScienceDaily <http://www.sciencedaily.com/releases/2011/04/1104041_73247.htm>.

³⁰⁶ For instance, see *The Goa Foundation v The Konkan Railway Corporation*, (1992), [1992] AIR 471 (Bombay HC) (upholding the construction of a railway line through the *Kazhan* estuarine wetlands); see also *People United for Better Living in Calcutta-Public v West Bengal*, (1992), [1993] AIR 215 (Calcutta HC) (restraining the state from reclaiming further wetlands, but left open the possibility of an exemption to this decision). The court did not curb the setting up of a petrochemical park in an Indian coastal Ramsar site on the ground that the objection raised “is opposed to the concept of sustainable development as well as to the progress and prosperity of the nation.” *Ramgopal Estates Private Ltd v Tamil Nadu*, (2007) [2007] INDLAW 964 (Madras HC).

³⁰⁷ Reclamation of the Sunderbans began in the year 1770 and it continues to this day. It has been estimated that nearly 150,000 hectares of mangroves have been destroyed during the past 100 years. See K Kathiresan, “Threats to Mangroves: Degradation and Destruction of Mangroves” in *United Nations University Syllabus for Training Course on Mangroves and Biodiversity* (2010) 476 at 479, online: United Nations University <<http://ocw.unu.edu/international-network-on-water-environment-and-health/unu-inweh-course-1-mangroves/Degradation-and-destruction-of-mangroves.pdf>>.

³⁰⁸ To accommodate the requirement of a second international airport for Mumbai, at Navi Mumbai, 98 hectares of mangroves were destroyed. However, strict conditions were imposed to ensure that the developer create a mangrove park to compensate for the mangroves that were to be cut down for the project. *Ministry of Environment and Forests: Subject: Navi Mumbai International Airport*, online: MoEF <<http://moef.nic.in/downloads/public-information/Press%20Release%20-%20Navi%20Mumbai%20Airport.pdf>>.

³⁰⁹ Sarasi Paranamanna, “Destruction under the Guise of Development: Mangroves of the Negombo Lagoon”, *Daily Mirror [of Sri Lanka]* (1 September 2012), online: DailyMirror Archives <<http://archives.dailymirror.lk/>>; Sarasi Paranamanna, “Mangroves Destroyed to Make Way for Concrete”, *Daily Mirror [of Sri Lanka]* (8 September 2012), online: DailyMirror Archives <<http://archives.dailymirror.lk/>>.

³¹⁰ Manzoor Iqbal Khattak, Mahmood Iqbal Khattak & Muhammad Mohibullah, “Study of Heavy Metal Pollution in Mangrove Sediments Reference to Marine Environment Along the Coastal Areas of Pakistan” (2012) 44(1) *Pakistan J Botany* 373.

statutes; in certain cases, the responsibility falls on coastal laws.³¹¹

The LOSC,³¹² the Ramsar Convention,³¹³ the World Heritage Convention,³¹⁴ the international forestry regime,³¹⁵ the CBD,³¹⁶ and the sink regulation and forestry-related aspects of the climate change regime are relevant to the conservation of mangrove forests and other coastal ecosystems. In particular, the UNFCCC,³¹⁷ the Kyoto Protocol,³¹⁸ the clean development mechanism rules relating to forest projects,³¹⁹ the Land Use, land-use

³¹¹ For instance, the entire Indian coast was once rich in mangrove vegetation, and historically, the Kerala coast was described as a mangrove forest. However, that state is now left with only 16 square kilometers of mangroves. Nonetheless, India still harbours some of the best mangrove swamps in the world, located in the alluvial deltas of Ganga, Mahanadi, Godavari, Krishna and Cauvery rivers, and on the Andaman and Nicobar group of islands. India, *Report of the Committee to Review the Coastal Regulation Zone Notification 1991* (Chairman: MS Swaminathan, New Delhi: Ministry of Environment & Forests, 2005) at 9, 39. The mangroves of Sunderbans, home to the famous Royal Bengal Tiger, are the largest single block of tidal holophytic mangroves in the world. It is estimated that the total area covered by mangroves in India is about 6,700 square kilometers, which amounts to about seven per cent of the world's mangroves. India, Ministry of Environment & Forests, *India's Second National Report to the Convention on Biological Diversity* (Delhi: Ministry of Environment & Forests, 2001). Apart from the threats that these unique eco-systems face from development projects, many of the mangrove concentrations in India are on the brink of extermination due to global warming. For instance, the Sunderbans runs the risk of being lost to the rising sea. Subir Bhaumik, "Fears rise for sinking Sunderbans", *BBC News* (15 September 2003), online: BBC News <<http://www.bbc.co.uk/>>. The two primary forest management and conservation laws, the *Indian Forest Act, 1927* and the *Forest Conservation Act, 1980*, are the primary legislative basis for mangrove protection. In addition, there are certain programmes on mangrove conservation, and India has also established a National Committee on Mangroves and Coral Reefs. However, economic development projects have encroached on mangrove forests. For an example of both the legislature and the judiciary failing to take action against a company that submitted a doctored plan to obtain possession of lands that contained a mangrove forest, see *Ajit D Padiwal v India*, (1998), [1998] AIR 147 (Gujarat HC). The company subsequently set up constructions that degraded this mangrove forest, which was protected under the *Indian Forest Act, 1927*. *Ibid*.

³¹² As a constitution for the oceans, it may seem that the LOSC does not provide much for the protection of corals. However, there are provisions in the LOSC, which can indirectly relevant to coral conservation, See for instance article 194 which calls upon states to take measures to prevent, reduce and control pollution of the marine environment. See generally *LOSC*, *supra* note 66.

³¹³ *Ramsar Convention*, *supra* note 287.

³¹⁴ *World Heritage Convention*, *supra* note 286.

³¹⁵ See generally UNCED, *Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests*, [Adopted at Rio de Janeiro, June 13, 1992] 31 ILM 881; UNGA, Non-legally Binding Instrument on All Types of Forests: Note by the Secretariat, 62nd Sess, A/C.2/62/L.5 (22 October 2007).

³¹⁶ *CBD*, *supra* note 285.

³¹⁷ *United Nations Conference on Environment and Development: Framework Convention on Climate Change*, 19 June 1993, 31 ILM 849 (adopted at New York on 9 May 1992) [UNFCCC] opening plenary, arts 4(1)(a)-(d) & 4(8)(c).

³¹⁸ *Kyoto Protocol*, *supra* note 292.

³¹⁹ The Clean Development Mechanism (CDM) finds its basis in the Kyoto Protocol, under which a developed country can work towards its GHG reduction targets through emission-reduction project activities implemented in developing countries. *Ibid*, art 12. Through these projects, saleable certified emission reduction (CER) credits can be earned, which can then be counted towards meeting Kyoto targets. UNFCCC, *Clean Development Mechanism (CDM)*, online: UNFCCC, Kyoto

change and forestry Guidelines (LULUCFG),³²⁰ and the REDD+ policy³²¹ are significant.³²² The United Nations Environment Programme has also launched Blue

Protocol, Mechanisms, Clean Development Mechanism <<http://unfccc.int/2860.php>>; see also Rowena Maguire, “Deforestation, REDD and International Law” in Shawkat Alam et al, eds, *Routledge Handbook of International Environmental Law* (Oxon: Routledge, 2013) 697 at 707 (for details regarding forest Clean Development Mechanism). Even though CDM projects can accommodate coastal resources like mangrove forests, there are not many blue carbon-related projects, mainly because there are no exclusive methodologies under the CDM framework for establishing baselines and for monitoring results for blue carbon projects. This is a serious weakness, which may require amendments in criteria to provide for blue carbon projects that aim to protect or rehabilitate degraded coastal ecosystems. Gabriel Grimsditch, “Options for Blue Carbon within the International Climate Change Framework” (2011) 11:2 Sustainable Dev L & Pol’y 22 at 23 (HeinOnline).

³²⁰ Maguire, *ibid* at 706-07.

³²¹ REDD and its analogs are based on the principle that countries able to reduce their emissions by curbing deforestation should be financially compensated for doing so. Even though reducing emissions from deforestation (RED) can be traced to the submission by Papua New Guinea and Costa Rica at the UNFCCC’s COP 11 (Montreal), the concept received further fillip at the COP 13 in Bali, where it was elevated as an integral pillar of the Bali Roadmap. The Subsidiary Body for Scientific and Technological Advice (SBSTA) also produced a draft decision on approaches to stimulate action relating to REDD. Subsequently, the COP at the Copenhagen affirmed the utility of REDD by adopting the draft instrument prepared by the SBSTA. It is interesting also to note that it was at the Copenhagen meet that REDD metamorphosised into REDD+ indicating a “transition to an enhanced, broad-based approach that includes conservation, sustainable forest management, and forest carbon stock enhancement”. At COP 16 in Cancun, Parties to the Kyoto Protocol agreed to adopt REDD+, a comprehensive policy to reduce emissions from deforestation and degradation by providing financial incentives to forest nations to prevent deforestation and restore forests through sustainable forestry practices. The plus in REDD stands as recognition of the ability to conserve and enhance carbon stocks. See Randall S Abate, “REDD, White, and Blue: Is Proposed U.S. Climate Legislation Adequate to Promote a Global Carbon Credits System for Avoided Deforestation in a Post-Kyoto Regime?” (2010) 19 Tul J Int’l & Comp L 95 at 100 (HeinOnline); see generally Jay Tufano, “Forests and Climate Change Policy: An Analysis of Three REDD-Plus Design Options” (2011) 5:4 Carbon Climate LR 443; see also Maguire, *ibid*.

³²² Conserving and augmenting sinks is one of the most economical and sustainable ways to implement mitigation actions. Generally, such ecosystems, particularly mangrove forests, can be brought under the international forestry regime. However, the principle of national sovereignty has circumscribed the development of binding international forestry law rules. Under the UNFCCC all parties have a duty to promote sustainable management, conservation and enhancement of GHG sinks and reservoirs in the oceans and in coastal and marine ecosystems. *UNFCCC, supra* note 317, art 4.1(d). In accordance with the principle of common but differentiated responsibilities, the primary duty to reduce and control GHG emissions rests with developed countries. Developing countries do not have any clear-cut obligation in this respect. By indirectly drawing in developing countries into its remit, the emissions trading regime under the Kyoto Protocol circumvents these situations and thus emerges as the centerpiece legislation that can help sink conservation. It also provides a platform to dovetail the interests of both developing and developed countries, as it offers Annex I nations a mechanism to attain their targets at less costs, while at the same time providing developing countries an opportunity to contribute to mitigation efforts and to profit from these efforts. By utilising market-based mechanisms as a compliance strategy, and by providing sufficient incentives in conserving their green cover, forest conservation has been rendered a palatable proposition to all nations concerned. However, this holds true more for cases of terrestrial based sinks like forests and less for cases of near-shore marine and oceanic ecosystems, which remain on the periphery of the present regime. In fact the regime holds out very few incentives in conserving blue carbon sinks like mangrove forests and preventing their degradation, even though such ecosystems have a much

Carbon Initiative to advance a global partnership for the sound management of coastal and marine ecosystems to ensure that their carbon sequestration and storage functions are maintained and for this purpose it supports the development of global, regional and national policies for ecosystem management and possible financial instruments.³²³ Despite the high potential to sequester carbon, blue carbon stores do not enjoy full recognition in international emission reduction strategies and the focus of International law is predominantly on terrestrial carbon sinks.

At the national levels, it is evident that mangroves are under severe stress in the South Asian coastal countries, where these ecosystems are often cleared to make way for coastal development. This is now compounded by climate change impacts, a situation that demands immediate and comprehensive protection of these vulnerable ecosystems. Although mangroves have the propensity to migrate inland, this is not always possible due to the heavy concentration of coastline development.³²⁴ Moreover, inland ecosystem migration can trigger other environmental consequences such as contamination of freshwater resources and brackish habitats.³²⁵ All this requires action on many fronts, again underscoring the need for effective ICZM that can help manage and protect these sensitive ecosystems, while at the same time, continuing to secure sustainable livelihoods and other economic opportunities.

2.6 CONCLUSION

In analysing “Rising Seas, Receding Coastlines, Vulnerable Coastal Communities and Ecosystems,” which is an overview of the present and future impacts of climate change and SLR from a South Asian perspective, in the context of applicable international and national law, the following significant points emerge. First and foremost, SLR is an issue of widespread concern amongst coastal states. Already, significant SLR has taken place

greater capacity to sequester carbon than tropical forests. The lack of appropriate carbon accounting methodologies and the full scientific awareness about these ecosystems have been cited as reasons as to why these ecosystems are not presently preferred. Grimsditch, *supra* note 319.

³²³ For further details, see *Blue Carbon Project: Project Overview*, online: GRID ARENDAL, Projects & Activities, Blue Carbon Project <<http://www.grida.no/marine/>>; UNEP, *Blue Carbon Initiative*, online: UNEP <<http://www.unep.org/>>.

³²⁴ For more on the concept, see generally Christine Schlepner, “Evaluation of Coastal Squeeze and Its Consequences for the Caribbean Island Martinique” 51:5 (2008) *Ocean & Coast Mgmt* 383 (ScienceDirect).

³²⁵ Sri Lanka, Ministry of Environment, *Sri Lanka’s Second National Communication on Climate Change* (Sri Lanka: Climate Change Secretariat, 2011) at 92.

and will likely accelerate in the near future.³²⁶ Even though the international climate change regime has entered a second commitment period,³²⁷ it is doubtful whether the regime will be able to turn down the heat unless and until drastic steps are taken.³²⁸ Consequently, the amount of GHGs being pumped into the atmosphere continues to grow at alarming levels highlighting the importance of climate change adaptation. Second, climate change impacts on coastal areas, resources and communities raise a myriad of complex legal issues that touch upon aspects like maritime boundaries, refugee rights, statelessness, and protection of coastal biodiversity. Due to huge concentrations of populations in coastal regions, high poverty levels and heavy dependence on ecosystem goods and services, coastal populations have very poor adaptive capacities, and to the impacts of climate change and SLR in South Asia will be severe. The Maldives is expected to sink while large parts of Bangladesh will be lost to rising waters, leaving these countries saddled with massive displaced populations, who may move to neighbouring countries. Other coastal countries in South Asia face similar problems of land and maritime territory loss and displacement. Furthermore, this region may also lose its rich coastal and marine biodiversity. The story is far more complicated and animated than what has been described above.

The third point is that an analysis of extant international law reveals that there is a normative gap in terms of prescriptions and ground realities. At the time when most of the instruments identified above were developed, SLR and climate change were not issues of concern. Consequently, International law has not evolved as much as necessary in terms of normative development to provide states guidance on how to deal with the legal consequences that emanate in the face of extreme climate change impacts. The conjecture that emerges is that there is a normative vacuum in terms of legal principles and avenues that impose explicit obligations to tackle the full range of issues brought to the fore by climate change and SLR. Ultimately, the challenges posed are *sui generis* in

³²⁶ See Part 2.2, above, for more discussion on SLR.

³²⁷ See generally UNFCCC, *Outcome of the Work of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol Draft Decision Proposed by the President Draft Decision -/CMP.8: Amendment to the Kyoto Protocol Pursuant to its Article 3, Paragraph 9*, FCCC/KP/CMP/2012/L.9 (8 December 2012).

³²⁸ See generally Potsdam Institute for Climate Impact Research and Climate Analytics, The World Bank, *Turn Down the Heat: Why a 4°C Warmer World Must be Avoided* (Washington DC: The World Bank, 2012).

nature and these test our fundamental legal understandings and assumptions regarding these issues and therefore these require a unique legal response. At the international level, there is a need for stronger legal compacts, which may also require a fundamental re-writing of well-established rules to assist governments as, at the national level in South Asia, since the national level legal frameworks on the identified issues are also comparatively inadequate in providing a management and regulatory basis. As well, most of the issues examined are politically contentious, and some of them involve far reaching questions of human rights, and they entail huge costs in terms of social, environmental and financial aspects. This can pose severe consequences for social welfare, lead to anarchical situations, mass migrations, derail development and impede economic growth. However, the world community seems to be dragging its feet over the issue. There are other pragmatic difficulties in securing agreement on the specific elements of an hard law instrument on the subject, the tortuous nature and time periods involved in most treaty negotiations, the issue of ratification and coming into force of the treaty – all render the development of international agreements, a difficult prospect.³²⁹ This inaction in addressing the problem of rising sea levels by the world community has been compared by the former president of Nauru, Rene Harris, to that of a modern holocaust.³³⁰

One primary reason for this inaction is that despite incontrovertible scientific evidence affirming climate change, and even if it is acknowledged that we have crossed the tipping points and that climate change and its consequences are irreversible, it is extremely difficult to predict with precision what the actual effects will be, where exactly will it occur, what will be the precise magnitude and on what time scales will they occur. Due to the lack of visible propinquity of predicted impacts, it may be infeasible to

³²⁹ For instance, the *Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009*, was adopted in 2009 to coincide with the glut in the number of single hull oil tankers that would be available for recycling by 2010. Accordingly, the convention was to enter into force 24 months after the date on which 15 States, representing 40 per cent of world merchant shipping by gross tonnage, would have ratified it. See International Conference on the Safe and Environmentally Sound Recycling of Ships: Agenda Item 8, Adoption of the Final Act and Any Instruments, Recommendations and Resolutions Resulting from the Work of the Conference: Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009, Text Adopted by the Conference, IMO/SR/CONF/45, 19 May 2009 (opened for signature 1 September 2009) art 17. This convention is yet to enter into force due to insufficient ratifications. See *Recycling of Ships: The Development of the Hong Kong Convention*, online: IMO, Our Work, Marine Environment, Ship Recycling <<http://www.imo.org/Pages/home.aspx>>.

³³⁰ Phil Mercer, "Islanders press Bush on global warming", *BBC News* (17 August 2001), online: BBC News <<http://news.bbc.co.uk/2/hi/1496591.stm>>.

publicly admit that it is already too late in the day to halt the harmful consequences through mitigative steps alone and that concerted measures need to be taken on a war footing on various fronts. An admission as to the disastrous consequences that await us may trigger the panic button leading to climate change alarmism. Actions on these fronts may be expensive, and given the lack of resources and capital, and the international community battling a host of daunting issues on several other fronts, it may be unwise and politically suicidal to begin talk about sinking nations and displaced populations when we are still unsure as to the precise nature of the impacts.

The narrative in this chapter clearly highlights the disparate character of international rules on this subject and the need for new rules of international law to provide guidance to deal with the exacerbated effects of climate change and SLR. While new international treaties and legal regimes may have to be developed, the fact is that this is a time consuming process, as the wheels of International Law grind rather slowly and this may require more precise data and consensus among nations, which may be difficult to secure. Accordingly, one of the more practicable approaches for countries in South Asia whose coastlines will be affected by climate change impacts and SLR is to cooperate at the regional level (since some of the problems can be best addressed at the regional level) and provide for a regional instrument that prescribes rules relating to more intelligent coastal management, one that furthers sustainable development in coastal areas.

The fourth point that emerges is that since the solutions to climate change are more complex and arcane, it brings to the fore the need for a more practical, holistic and effective coastal management, grounded on a precautionary-based adaptive approach, to help to reign in the destructive climatic forces at least to a certain degree. In other words, for the degraded South Asian coastlines, the objective should be to ensure SCD through the unique methodology of ICZM, linking it up with CCCA. And here a legal statute has an underpinning role to play in facilitating ICZM implementation and in supporting *Coast Conservation Act, 1981*, through an ICZM process. Essentially, these aspects constitute the problématique of this thesis, which will be examined and developed in the succeeding parts of this study.

CHAPTER 3 THE SOUTH ASIAN EXPERIENCE ON INTEGRATED COASTAL ZONE MANAGEMENT AND COASTAL CLIMATE CHANGE ADAPTATION WITH SPECIFIC REFERENCE TO COASTAL LAWS

3.1 INTRODUCTION

In October 2009, under the leadership of the then President Mohamed Nasheed, the cabinet of the Maldives held an underwater meeting in scuba gear. Ministers and officials, shouldering compressed - air tanks, dove into the turquoise waters off Girifushi Island and took their seats at a table arranged on the seafloor in the backdrop of a coral reef teeming with fish and other marine life.¹ The meeting went on for half an hour, with members communicating with one another and with their President via white boards and hand signals. The primary purpose behind this unconventional venue was to influence a positive outcome at the United Nations Climate Change Conference to be held later that year in Copenhagen.² At a subsequent press conference, when President Nasheed was asked by reporters what would happen if the summit failed, he somberly replied: “[w]e are going to die.”³

Even though the world’s first underwater cabinet meeting failed to create ripples in terms of concrete outcomes at the Copenhagen Summit, it nevertheless did serve to highlight the predicament faced by small island states, which are some of the world’s lowest-lying places on Earth.⁴ While the primary contributors to the incessant dumping of GHGs into the atmosphere are the developed nations, the paradox is that the harmful consequences of this pollution will disproportionately befall developing nations (including small island states), which have the least capacity to adapt to climatic changes.⁵

¹ “Maldives government holds underwater cabinet meeting”, *The Telegraph* (17 October 2009) online: The Telegraph <<http://www.telegraph.co.uk/news/newstoppers/howaboutthat/6356036/Maldives-government-holds-underwater-cabinet-meeting.html>>.

² “Maldives politicians submerge”, *ReutersVideo* (17 October 2009) YouTube Video, online: YouTube <<http://www.youtube.com/watch?v=odFmDiYWJ0M&feature=related>>.

³ See also “President Nasheed: “Our country will not exist”, *350org* (22 September 2009) YouTube Video, online: YouTube <<http://www.youtube.com/watch?v=QLmP40gYH7c>>.

⁴ “Maldives politicians submerge”, *supra* note 2.

⁵ “Summary for Policymakers: A Report of Working Group II of the Intergovernmental Panel on Climate Change” in James J McCarthy et al, eds, *Climate Change 2001: Impacts, Adaptation, and Vulnerability* (Cambridge: Cambridge University Press, 2001) 1 at 8; see also *Asia-Pacific Human*

The five coastal countries of the South Asia region have a combined coastline length of about 11,500 kilometers,⁶ with low elevation coastal zones spread over an area of about 160,000 square kilometers. These coastal zones house upwards of 135 million people⁷ and support 40 per cent of the economic activities of the region, including most of the critical economic infrastructure.⁸ This region also supports some of the most diverse and rich concentrations of coastal biodiversity and marine species.⁹ The Gulf of Mannar, the Maldivain atolls and the Sunderban mangroves are but a few examples. In addition, the presence of perennial rivers such as the Brahmaputra, the Ganges, the Godavari, the Indus, and the Mahaweli Ganga have led to the creation of large networks of backwaters, estuaries, salt marshes and mangroves that sustain diverse flora and fauna. Importantly, these ecosystems are home to some of the largest conglomerations of coastal populations in the world.

Coastal ecosystems in South Asia are under considerable stress due to the huge coastal populations these regions accommodate. Moreover, these mostly poor populations depend primarily on coastal resources and ecosystems for their livelihood and sustenance,¹⁰ putting further stress on marine resources and coastal ecosystems. Exploitation is not always based on sustainability principles, and this has significantly hampered the resilience of these ecosystems. For instance, when the 2004 Indian Ocean tsunami hit South Asia, the destruction was far less in regions where there were extensive

Development Report: One Planet to Share: Sustaining Human Progress in a Changing Climate (New Delhi: Routledge, 2012) at 20 (pointing out that “vulnerability perpetuates poverty, and poverty, in turn, exacerbates vulnerability”) [*Asia-Pacific Human Development Report*].

⁶ SASP, *Objectives and Activities*, online: SACEP <http://www.sacep.org/html/sas_objectives.htm>.

⁷ LOICZ South Asia Mode, *About South Asia Coast*, online: <<http://www.loiczsouthasia.org/southasiacoast.php>>.

⁸ *Ibid.*

⁹ UNEP, *Global Synthesis: A Report from the Regional Seas Conventions and Action Plans for the Marine Biodiversity Assessment and Outlook Series* (UNEP Regional Seas Programme, 2010) at 52.

¹⁰ Data from the SAARC Coastal Management Centre suggests that, as of 2000, nearly 54.80 per cent of the population in Bangladesh, 26.30 per cent of the population in India, 81.10 per cent of the population in Maldives, 09.10 per cent of the population of Pakistan, and nearly 100 per cent of the population of Sri Lanka living within 100 kilometers of the coastline depend on fishing. SAARC, *Coastal Statistics*, online: SAARC Coastal Zone Management Centre <<http://www.sczmc.org/coastal-statistics/>> [SAARC, *Coastal Statistics*].

mangroves, which acted as a buffer to dissipate the wave energy;¹¹ conversely, in areas where the mangroves were degraded, the destruction was immense.

As seen in the previous chapters, South Asia, especially its coastal regions, is slated to be worst hit by climate change and sea level rise (SLR). The projected rise in sea level is expected to cause significant damage to coastal land and ecosystems and will affect millions who live in this area. On the sub-continent alone, it is estimated that nearly 130 million people live in the low-coastal elevation zones.¹² Moreover, as the entire land territory of the Maldives lies in the low coastal elevation zone, it is predicted that this country will be lost to rising sea levels. Sri Lanka also stands to lose substantial chunks of its land territory. Indeed, Sri Lanka has already had to deal with significant coastal erosion. The burgeoning population, scarce resources, and high levels of poverty means that even a small variation in climate can lead to irreversible damage that will push large numbers of people into further destitution, as they have the little capacity and few resources to adapt to climate change impacts.

The Intergovernmental Panel on Climate Change (IPCC) observes that, by the most conservative estimates, the sea level will be about 40 centimeters higher at the end of century.¹³ This will increase the number of people that are exposed to floods annually from 19 million to 94 million, and almost 60 per cent of this increase will be in South Asia.¹⁴ According to the IPCC, the current rate of SLR in Asia's coastal areas is one to three millimeters per year, which is marginally higher than the global average.¹⁵ An annual SLR rate of 3.1 millimeters has been reported over the past decade, compared to 1.7-2.4 millimeters per year over the 20th century as a whole, which suggests that SLR

¹¹ Environmental Justice Foundation, *Mangroves: Nature's Defence against Tsunamis: A Report on the Impact of Mangrove Loss and Shrimp Farm Development on Coastal Defences* (London: EJF, 2006) at 8.

¹² Sudhir Chella Rajan, *Blue Alert: Climate Migrants in South Asia: Estimates and Solutions – A Report by Greenpeace* (Greenpeace India Society, 2008) at 6.

¹³ Rex Victor Cruz et al, "Asia" in ML Parry et al, eds, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2007) 469 at 484.

¹⁴ Bangladesh, Climate Change Cell, *Climate Change and Bangladesh* (Dhaka: Department of Environment, 2007) at 10 [Bangladesh, *Climate Change and Bangladesh*].

¹⁵ Cruz et al, *supra* note 13 at 479; see also, UNEP, SAARC & DA, *South Asia Environment Outlook 2009* (Kenya: UNEP, 2009) at 47.

has accelerated in relation to the long-term average.¹⁶ Additionally, an anticipated rise in sea surface temperature of two to four degree Celsius will increase the incidence of tropical cyclones by 10 to 20 per cent in South Asia.¹⁷

The coastal mega-cities of South Asia, namely, Mumbai (20 million), Kolkata (15.6 million), Karachi (13.1 million), Dhaka (14.7 million)¹⁸ and Chennai (6.9 million),¹⁹ are situated only a few meters above sea level. It is expected that the rising seawaters will inundate large tracts of land, destroy coastal wetlands and other estuarine systems, increase salinity, impact the availability of fresh water, and destroy coastal agriculture and aquaculture, leading to the displacement of millions. It is also expected that rising coastal water temperatures in South Asia will exacerbate the incidence and toxicity of cholera.²⁰

This chapter provides an overview of the current state of coastal zone management (CZM) in India, Pakistan, Bangladesh, Sri Lanka and Maldives by setting out the context of this study to determine the relevance of the South Asian experience in coastal law making. Essentially, it is a report on the state of coastal governance and of coastal management laws, systems and practices in South Asia. Specifically, the central query that will guide the exploration is how is coastal South Asia preparing for SLR and other climate change impacts via their coastal laws? As such, it examines the extent to which the coastal laws in these countries further the concept of integrated coastal zone management (ICZM) and coastal climate change adaptation. And here, the analysis will be based on four parameters, namely: 1) the coastal situation in the country; 2) major threats to the coastal zone, including the problems posed by SLR; 3) an overview of the features of the coastal law, policies, practices, and relevant institutions on coastal zone management and what specific measures they envisage for CCCA; and 4) critical flaws and gaps in the national coastal zone management efforts, including the coastal laws that have hampered SCD. In doing so, it identifies major loopholes in the current CZM legal

¹⁶ Cruz et al, *ibid* at 479.

¹⁷ *Ibid.*

¹⁸ *Asia-Pacific Human Development Report*, *supra* note 5 at 121.

¹⁹ IOC/UNESCO et al, *A Blueprint for Ocean and Coastal Sustainability* (Paris: IOC/UNESCO, 2011) at 9.

²⁰ Cruz et al, *supra* note 13 at 471.

apparatuses at the respective national levels that have hampered ICZM development, in effect setting the stage for this study.

Apart from this introduction, this chapter is divided into three sections. Section 3.2 examines the development of ICZM legal regimes and coastal climate change adaptation (CCCA) in South Asia by chronicling the experiences of India, Bangladesh, Sri Lanka, Maldives and Pakistan. Based on these status reports, section 3.3, carries out a coastal law audit. The study concludes by emphasizing the need for a regional framework to help operationalise ICZM law in South Asia and to facilitate adaptation to climate change and SLR.

3.2 SEA LEVEL RISE, INTEGRATED COASTAL ZONE MANAGEMENT, AND COASTAL CLIMATE CHANGE ADAPTATION IN SOUTH ASIA

3.2.1 India

Lapped by the warm waters of the Arabian Sea to the west, the Bay of Bengal to the east, and the Indian Ocean to the south, India boasts a lengthy coastline of about 8,158 kilometers. Of this, nearly 6,064 kilometers are mainland coastline, and the remainder is island coastline of the Andaman and Nicobar and the Lakshadweep Islands (2,094 kilometers).²¹ The entire coastal landmass falls within nine maritime states and four union territories.²² These waters are rich and unique from marine biodiversity and eco-conservation perspectives. The several major and minor rivers and their tributaries that criss-cross the Indian land mass before discharging into the two seas have gifted the country with a wide array of coastal ecosystems like estuaries, mangroves, beaches, backwaters, salt marshes, lagoons, coral reefs, and wetlands.²³ In addition, the bay islands of the Andaman and Nicobar group and the atoll island group of Lakshadweep add to the rich marine and coastal biodiversity of this country.

²¹ India, R Ramesh, R Purvaja & A Senthil Vel, *National Assessment of Shoreline Coast: Puducherry Coast* (Chennai: NCSCM, Ministry of Environment & Forests, 2001) at 30; Centre for Environment and Development, *Draft Final Report, World Bank Assisted Integrated Coastal Zone Management Project: Environmental and Social Assessment*, E2303 v2 (Thiruvananthapuram: Ministry of Environment & Forests, 2009) at 1 [*Draft Final Report*].

²² *States & Union Territories*, online: GOI web directory <<http://goidirectory.gov.in/state.php>>.

²³ For an overview, see India, Ministry of Environment & Forests, *Report of the Committee Chaired by Prof. M.S. Swaminathan to Review the Coastal Regulation Zone Notification 1991* (New Delhi: Ministry of Environment & Forests, 2005) at 7-10 [India, *Report of the Committee Chaired by Prof. M.S. Swaminathan*].

The Indian coastline is the locus of huge agglomerations of people, industry, and development projects. It is estimated that more than 250 million people reside within 50 kilometers of the coastline and that the 73 coastal districts (out of a total of 593 districts) accommodate nearly seventeen per cent of the national population.²⁴ Seventy-seven cities dot the Indian coastline, of which Mumbai, Kolkata, Chennai, Kochi and Visakhapatnam are among the largest and most densely populated urban cities in South Asia. The density of population in coastal areas ranges from less than 25 people per square kilometer to as high as 700 or more in others.²⁵ To support this vast population, the coastal regions accommodate a colossal infrastructure, including thermal and nuclear power plants, an array of industries, mines, sewage treatment plants, and major and minor ports.²⁶

India's coasts are also attracting an increasing number of tourists.²⁷ Apart from acting as bases for the launching of catamarans and other traditional craft, and for repairing and drying nets and other gear, beaches have traditionally been popular recreational sites. Of late, they have been transformed into heavily developed areas housing tourist resorts, amusement parks, hotels, etc. All of this development has led to the displacement of many fishing villages and vast stretches of beaches have been barricaded.²⁸ Even though such development projects bring jobs to local communities and stimulate the local economy, they also bring in their wake a series of socio-economic and

²⁴ *Draft Final Report, supra* note 21. According to data from SAARC Coastal Zone Management Centre, as of 2000, nearly 26.3 per cent of the country's population lived within 100 kilometers of the coastline. SAARC, Coastal Statistics, *supra* note 10; see also Gov't of India, Space Applications Centre, *Coastal Zones of India* (Ahmedabad: Space Applications Centre, 2012) (pointing out that nearly 25 percent of the country's population lives within 100 kilometers of the coastline).

²⁵ R Krishnamoorthy et al, "Environmental and Human Impacts on Coastal and Marine Protected Areas in India" in Guido Visconti et al, eds, *Advances in Global Change Research: Global Change and Protected Areas* (The Netherlands: Kluwer Academic Publishers, 2001) 373 at 392. There are nearly 3,600 fishing villages in India and the total fishing population is about 14.66 million. Ramesh, Purvaja & Vel, *supra* note 21.

²⁶ It is estimated that there are nearly 308 large-scale industrial units situated on the Indian coasts. *Draft Final Report, supra* note 21 at 2. The Indian coastline houses 13 major ports and 187 minor ports, which supports over 90 per cent of India's foreign trade by sea. See also Ministry of Shipping, *Ports Wing* online: Ministry of Shipping <<http://shipping.nic.in/index1.php?lang=1&level=0&linkid=16&lid=64>>.

²⁷ See generally Ligia Noronha et al, eds, *Coastal Tourism, Environment, and Sustainable Local Development* (New Delhi: TERI, 2002).

²⁸ See generally, Rohini Mohan, "A Storm Foretold: Coastal Wars", *Tehelka.com* 47:8 (26 November 2011) online: *Tehelka.com* <<http://tehelka.com/a-storm-foretold/>>. For more stories on the state of degradation facing India's beaches and coastline, see "Gujarat's Mangroves Under Threat – NDTV Report", *Save Our Beach* (8 June 2009) YouTube online: *Save Our Beach* <<http://saveourbeach.wordpress.com/tag/Indias-dying-beaches/>>.

environmental problems, since several of these tourism-related and other developmental projects are being implemented at the expense of the health of fragile coastal ecosystems.²⁹

From the above, it is clear that coastal area resources play a critical role in supporting India's national economy and in sustaining the subsistence economies of local communities. Nevertheless, misguided exploitation of these resources exceeds sustainable yields, leading to resource degradation. For instance, mechanisation in the fishing sector has led to a sharp decline in the catch available to the traditional sector, which has seriously hampered livelihood prospects.³⁰ Furthermore, access and usufructuary rights to beachfronts and to other coastal resources currently enjoyed by traditional fishing communities are fast giving way to mega-development projects.³¹

In addition to non-point sources of pollution, the near absence of effective treatment plants and the presence of a large number of pollution-intensive industries have led to the dumping of enormous quantities of hazardous and municipal wastes into coastal waters.³² An instance in point is the shipbreaking yard at Alang in Gujarat state, where shipbreaking is carried out under primitive conditions. As there is no containment of the wastes, deadly carcinogens and bio-accumulative heavy metals flow directly into the Arabian Sea.³³ Frequent algal blooms on the east and west coasts are clear indications

²⁹ *Ibid.*

³⁰ *Cochin Trawl Net Boat Operators Association v Kerala*, (1992) [1992] AIR 342 (Ker HC).

³¹ For an overview on the impacts on special economic zones and the fishing community, see Manshi Asher, "SEZs: Stirring up a storm along the Indian coast" *InfoChange* (July 2007), online: Infochange, Analysis, Trade and Development, News & Features <<http://infochangeindia.org/>>; see also *Dighi Koli Samaj Mumbai Rahivasi Sangh, Secretary, Jagannath Ambaji, Mumbai v India*, (2009) [2009] INDLAW 797 (Bombay HC) (upholding the acquisition of public land and handing it over to a private entrepreneur for developing a port); *Bhikaji Jagannath Waghdhare, Mumabi v India, Department of Atomic Energy*, (2009) [2009] INDLAW 1001 (Bombay HC) (upheld acquisition of lands of coastal communities under urgency clause for the Jaitapur nuclear power plant).

³² The total amount of industrial wastes discharged is about 13,500 million liters/day (MLD), of which 8,000 MLD are partially or fully treated and the rest discharged into the oceans untreated. 87 cities and towns in the coastal areas generate about 5,560.99 MLD of wastewater, of which only 521.51 MLD are treated. Thus, nearly 90.62 per cent of the wastewater finds its way into coastal waters without any treatment. *Draft Final Report, supra* note 21 at 92.

³³ See generally Tony George Puthucherril, *From Shipbreaking to Sustainable Ship Recycling: Evolution of a Legal Regime*, David Freestone, ed, 5 Legal Aspects of Sustainable Development (The Netherlands: Martinus Nijhoff, 2010) [Puthucherril, *From Shipbreaking*]; *Research Foundation for Science v India*, (2007) [2007] AIR 3118 (India SC) (directing the government of India to formulate a comprehensive code for shipbreaking). Shipbreaking activities discontinued in

of the poor quality of coastal waters.³⁴ With increasing economic activity and heightened demand for power, the growing number of thermal and nuclear power plants situated on the coasts poses severe environmental threats.³⁵ Even now, wetlands and mangrove swamps are considered merely dumping grounds for garbage and a breeding ground for mosquitoes; as a consequence, they are filled in to make way for the construction of housing colonies, roadways, power plants and industrial units.³⁶

The burgeoning population and widespread poverty among coastal communities, compounded by overexploitation of coastal resources, competing uses, destruction of habitats, implementation of a plethora of developmental projects in coastal areas (the environmental soundness of many of which are seriously disputed), rampant pollution and the dumping of all sorts of wastes into coastal waters have considerably affected the health of India's oceans and coasts.³⁷ As mentioned in chapter one, the overarching effects of SLR and climate change will exacerbate these problems.³⁸ The predicted rise in mean sea temperature may increase the frequency and intensity of tropical storms and

Ramanathapuram district, taking into account the impact on marine and coastal ecology. *TNSS Steels Private Ltd v India*, (2009) [2009] INDLAW 4295 (Madras HC).

³⁴ See generally Tony George Puthucherril, "Ballast Waters and Aquatic Invasive Species: A Model for India" (2008) 19 *Colo J Int'l Env'tl L & Pol'y* 381 (QL) [Puthucherril, "Ballast Waters"].

³⁵ Nuclear plants release nearly 50 per cent of their generated heat into the coastal and marine environment. *Draft Final Report*, *supra* note 21 at 93; see also *Citizens for a Just Society, through its Vice President, K Pullaiah v India*, (2005) [2005] 5 *Bom CR* 316 (Bombay HC) (refused to deal with the issue of radioactive nuclear waste leaks from the Babha Atomic Research Centre into the Thane Creek on the ground of national security). The court rejected the argument to impugn setting up a thermal power plant, since arrangements were made to ensure an ambient temperature of the water discharged from the cooling system into the creek. *Bombay Environmental Action Group v Maharashtra*, (1991) [1991] AIR 301 (Bombay HC).

³⁶ Mohan, *supra* note 28; see also Nauzer K Bharucha, "500 acres in city may open up for development", *The Times of India* (26 December 2011) online: The Times of India <<http://timesofindia.indiatimes.com/archive.cms>>; Chinmayi Shalya, "2 mangrove stretches at risk from dumping" *The Times of India* (20 February 2013) online: The Times of India <<http://timesofindia.indiatimes.com/archive.cms>>.

³⁷ The construction of a harbour in 1989 and two breakwaters in Puducherry stopped the littoral drift leading to severe coastal erosion. India, Ministry of Environment & Forests, *Final Frontier: Agenda to Protect the Ecosystem and Habitat of India's Coast for Conservation and Livelihood Security, Report of the Expert Committee on the Draft Coastal Management Zone (CMZ) Notification, Constituted by the Ministry of Environment and Forests, Under the Chairmanship of Prof. MS Swaminathan* (New Delhi: Ministry of Environment & Forests, 2009) at 21 [India, Ministry of Environment & Forests, *Final Frontier*]; *Coastal and Marine Pollution*: National Institute of Oceanography, DonaPaula, Goa-403004, India (March, 2008), online: SAARC-SDMC <<http://saarc-sdmc.nic.in/pdf/workshops/goa/india/COA%20AND%20MARINE%20POLLUTION.pdf>>.

³⁸ The ADB points out that "[c]limate change represents an important potential brake on recent rapid economic growth in India." Asian Development Bank, *Addressing Climate Change and Migration in Asia and the Pacific: Final Report* (Metro Manila: Asian Development Bank, 2012) at 32.

hurricanes and trigger other catastrophic phenomena like bleaching of corals, extreme changes in weather patterns, and increased precipitation. Combining climate change processes and SLR with these other pressures jeopardizes the well-being of coastal communities and significantly reduces their capacity to adapt to SLR.

India has been identified as one of the 27 countries slated to be most affected by SLR, with current average SLR along the Indian coast estimated at about 1.3 mm/year.³⁹ An early study on the impact of SLR on India's coasts revealed that nearly 5,763 square kilometers of coastal area in eight coastal states will be affected, displacing a total of 7.1 million people (as of 1981), representing nearly 4.6 per cent of the total coastal population.⁴⁰ A more recent study forecasts that by 2050 nearly 37.2 million people will be at risk from the SLR.⁴¹ India stands to lose the entire Lakshadweep archipelago in the event of a one-meter rise in sea level.

The Kutch region in Gujarat state, Mumbai in Northern Malabar, Southern Kerala, the Cauvery delta in Tamil Nadu, the Krishna and Godavari deltas in Andhra Pradesh, the Mahanadi delta in Orissa, and the Ganges delta in the West Bengal are considered to be the most vulnerable to SLR.⁴² In the event of a one-meter rise, Gujarat and West Bengal stand to lose the maximum amount of land; West Bengal, Maharashtra, and Tamil Nadu will be most affected in terms of population; and West Bengal, Orissa, and Maharashtra will sustain maximum damage in terms of land use.⁴³ While a one-meter rise in sea level will result in an inundation of nearly 4.2 square kilometers in Nagapattinam of Tamil Nadu, nearly 478 square kilometers in Paradip will be inundated, with the probable

³⁹ India, INCCA, *Climate Change and India: A 4X4 Assessment, A Sectoral and Regional Analysis for 2030s*, No 2 (New Delhi: Ministry of Environment & Forests, 2010) at 47 [INCCA, *Climate Change and India*].

⁴⁰ Ligia Noronha, "The Rising Seas: Need for Longer-term Perspective in Coastal Planning and Adaptation for Developing Countries" in TERI, ed, *Environmental Threats, Vulnerability, and Adaptation: Case Studies from India* (New Delhi: TERI, 2004) 167 at 174. The World Bank estimates that more than 60 million people (63,188,208 persons, out of which 31,515,286 are urbanites) who presently live in the area of the low elevation coastal zone (which covers an estimated area of 81,805 square kilometers) will be badly impacted by SLR. *Draft Final Report*, *supra* note 21 at 83.

⁴¹ Asian Development Bank, *supra* note 38 at 25.

⁴² Ligia Noronha, BS Choudri & KS Nairy, "Relative Vulnerability of Districts to a Potential Sea-Level Rise Along the Coastline of India" in TERI ed, *Environmental Threats, Vulnerability, and Adaptation: Case Studies from India* (New Delhi: TERI, 2004) 121 at 126.

⁴³ Noronha, *supra* note 40 at 174-75.

inundation zone 40 kilometers landward.⁴⁴ Due to the presence of backwaters and islands, the Kochi region (net SLR is 1.75 millimeters per year) in Kerala will be severely affected.⁴⁵ Overall, the Chennai district in Tamil Nadu is considered to be the most vulnerable to SLR in India, followed by North Goa and Mumbai.⁴⁶

It also has been reported that the sea surface temperature of the two seas flanking the Indian land mass is increasing by about 0.04°C annually. As a consequence, species of fish like oil sardines, a cheap source of protein for local communities, are migrating to higher latitudes with colder waters.⁴⁷ The incidence of tropical cyclones has also increased.⁴⁸

India adopted its first coastal law in 1991, the *Coastal Regulation Zone Notification of 1991* (CRZ 1991).⁴⁹ This law held the field for nearly two decades and had a turbulent existence. Attempts to replace it with a new legal framework came to fruition in 2011 with the *Coastal Regulation Zone Notification of 2011* (CRZ 2011). Even though the new law supersedes the CRZ 1991, its legal architecture draws heavily on the CRZ 1991. Therefore, an inclusive study on India's coastal law requires an analysis of both of these coastal laws and of the sequence of events that led to the CRZ 2011. Additionally, this legal regime is supported by extensive judicial intervention that not only shaped the 1991 law but will influence how the 2011 law is implemented.

⁴⁴ INCCA, *Climate Change and India*, *supra* note 39 at 56.

⁴⁵ *Ibid* at 47.

⁴⁶ Noronha, Choudri & Nairy, *supra* note 42 at 131. The megalopolis of coastal Mumbai, with a population of nearly 18 million, an SLR rate of 1.20 millimeters per year, and an 80 kilometre coastline, is highly vulnerable to the combined effects of global warming and SLR. A significant portion of Mumbai is built on reclaimed land and, as the population continues to grow, the degradation of mangroves and the pollution of creeks and coastal waters increases. It is predicted that a one-meter rise in sea level will inundate about 86.75 square kilometers of the city. Noronha, *supra* note 40 at 183. A recent study notes that while a one-meter rise in average sea level will permanently inundate about 1,091 square kilometers along the Tamil Nadu coast, the total area at risk will be nearly six times as large. It also calculates the total replacement value of infrastructure (ports, power plants and major roads) that will be impacted by SLR to be approximately USD11 billion (somewhere between INR47,418 and INR53,554 crores [in 2010 terms] according to the present rate of exchange). Sujatha Byravan, Sudhir Chella Rajan and Rajesh Rangarajan, *Sea Level Rise: Impact on Major Infrastructure, Ecosystems and Land along the Tamil Nadu Coast* (Madras: CDF, IFMR [nd]).

⁴⁷ Until 1985, almost the entire catch of oil sardines was from the Malabar upwelling zone and there were practically no catches north of 140N along the west coast. However, in the past two decades, catches between 140N and 200N contributed nearly 15 per cent of the total Indian sardine catch by 2006. INCCA, *Climate Change and India*, *supra* note 39 at 75-76.

⁴⁸ *Ibid* at 48.

⁴⁹ *The Coastal Regulation Zone Notification* (N, SO114(E) 1991, India). This coastal law is a piece of subordinate legislation and applied throughout the country.

3.2.1.1 The Coastal Regulation Zone Notification, 1991

The need to protect Indian's coast line found concrete expression in 1981, when the then Indian Prime Minister, Indira Gandhi, addressed letters to the chief ministers of all coastal states, directing them to ensure that the coastal zone up to 500 meters from the high-tide line (HTL) was kept free from all development activities.⁵⁰ However, due to pressure from the tourism industry, the central government reduced the distance from 500 to 200 meters.⁵¹ Subsequently, in 1983, administrative guidelines were issued to regulate the development of beaches.⁵² Finally, in 1991, the central government adopted the CRZ 1991 as a piece of subordinate or delegated legislation under the *Environment (Protection) Act, 1986*, and its rules, to accord special protection to coastal areas.⁵³ As

⁵⁰ India, CEE Coordination Team, *Report of the Public Consultation with Fisherfolks and Community to Strengthen Coastal Regulation Zone (CRZ) Notification, 1991* (Ministry of Environment & Forests, 2010) at 7 [India, *Report of the Public Consultation with Fisherfolks*].

⁵¹ Shyam Divan & Armin Rozencranz, *Environmental Law and Policy in India: Cases Materials and Statutes*, 2nd ed (India: Oxford University Press, 2001) at 477.

⁵² *Ibid* at 478.

⁵³ Under the theory of separation of powers, law making is primarily the prerogative and function of the legislature. However, due to the ever-increasing functions performed by the modern state, the legislature was compelled to delegate a part of its law-making function to the executive. In such situations, the assumption is that the legislature does not abdicate its essential function of law making, but only authorizes a delegate to perform a subsidiary part of that function. Delegated legislation may take different forms, such as ordinance, order, by-law, rule, regulation, notification, etc., and under article 13 (3)(a) of the *Constitution of India*, they are all treated as law. As there is no terminological consistency in the family of delegated legislation as employed in Indian Administrative Law, terms like rules, regulations, etc., are used interchangeably. An essential feature of delegated legislation is that there has to be publication or promulgation, which is generally done through the official gazette. As well, it is one of the essential principles that a subordinate legislation has to be in conformity with its parent statute. If this is not the case, then the subordinate legislation will be struck down as being ultra vires of the parent Act. In other words, the subordinate legislation is practically hemmed by the mandate of the parent statute. For a discussion, see *Sukhdev Singh v Bhagat Ram*, (1975) [1975] AIR 1331 (SC India); *BK Srinivasan v Karnataka*, (1987) [1987] AIR 1059 (SC India); see also NK Jayakumar, *Administrative Law*, 1st ed (New Delhi: Prentice-Hall of India, 2005) at 14; see also SS Vishweshwaraiah, "Delegated Legislation" (Lecture delivered at the National Law School of India University, Bangalore, 26 July 2004) [unpublished]. The *Environment (Protection) Act, 1986* (EPA, 1986) was enacted under entry 13, list I, of schedule VII of article 253 of the *Constitution of India* in 1950. Its preamble clearly states that it was enacted to implement the decisions taken at the United Nations Conference on the Human Environment 1972. The EPA, 1986 is a comprehensive piece of legislation that confers wide powers on the federal government to make delegated legislation on any matter relating to environmental protection. This law is so wide in scope and so broad in its delegation that it led to the development of a new trend towards the centralization of India's environmental law and of protecting the different strands of the environment through delegated legislation rather than by enacting full-fledged statutes. For examples, see the *Noise Pollution (Regulation and Control) Rules, 2000*; *Ozone Depleting Substances (Regulation and Control) Rules, 2000*; *Municipal Solid Wastes (Management and Handling) Rules, 2000*; the *Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996*; the *Bio-Medical Waste (Management and Handling) Rules, 1998*; the

will be subsequently seen, the nature of the law is a vital element in determining the stability of a coastal law regime.⁵⁴

The CRZ 1991 declared the coastal regulation zone (CRZ) to be that portion of seas, bays, estuaries, creeks, rivers and backwaters influenced by tidal action in the landward side up to 500 meters from the HTL and the land between the low-tide line (LTL) and the HTL.⁵⁵ The CRZ was divided into four categories: CRZ-I,⁵⁶ CRZ-II,⁵⁷ CRZ-III,⁵⁸ and CRZ-IV⁵⁹. To achieve an orderly conduct of development activities, each CRZ category was designated for a different level of development based on a different set of restrictions on the setting up and expansion of industries and on the conduct of operations or processes within this zone. As a general regulatory measure, the CRZ 1991 prohibited thirteen activities (subject to exemptions) within the entire CRZ.⁶⁰ In due course, several amendments widened the scope of these exemptions, considerably diluting the potency of the regulatory scheme.⁶¹ All coastal states and union territory administrations were required to prepare CZM plans (CZMPs) that identified and

Batteries (Management and Handling) Rules, 2001; the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2009 etc.

⁵⁴ See Part 3.2.1.1.1, below, for more on this aspect.

⁵⁵ *The Coastal Regulation Zone Notification, 1991, supra* note 49.

⁵⁶ *Ibid*, annex I, ¶6(1). The CRZ-I consisted of “ecologically sensitive and important areas,” the area between the LTL and the HTL and those that were likely to be inundated by SLR. It also included areas that may be declared by the central government or by the authorities concerned at the state or union territory level to fall under category I. *Ibid*.

⁵⁷ The CRZ-II consisted of areas that were developed up to or close to the shoreline. *Ibid*.

⁵⁸ Relatively undisturbed areas and those that did not fall under categories I or II were treated as CRZ-III. This included coastal zones of rural areas, irrespective of the degree of development, and also areas within municipal or other legally designated urban areas that were not substantially built up. *Ibid*.

⁵⁹ The coastal stretches of the Andaman and Nicobar Islands, the Lakshadweep Islands, and other small islands that had not been designated either as CRZ-I, II or III, fell under the CRZ-IV. *Ibid*.

⁶⁰ Some of the major proscriptions related to the prohibition on the setting up of new industries and expansion of existing ones in the CRZ; the manufacture, handling, storage, or disposal of hazardous substances; the discharge of untreated wastes and effluents; the dumping of city or town wastes, ash or other wastes; land reclamation; the bunding or disturbing of the natural course of sea water; the dressing or altering of sand dunes, hills, and natural features; and the mining of sand, rock and other substrate materials. Since surface water resources are scarce in coastal areas, and given the high density of the populations that depend on groundwater to meet their basic needs, protection of groundwater aquifers is critical. Consequently, over and above the various groundwater laws of coastal states, the CRZ 1991 imposed certain restrictions on groundwater usage. As a common rule, it banned the harvesting or the withdrawal of groundwater and the construction of mechanisms for this within 200 meters of the HTL. *Ibid*, ¶2.

⁶¹ For the text of various amendments, see Ministry of Environment & Forests, *Legislations: Coastal Regulation Zone*, online: Ministry of Environment & Forests <<http://www.moef.nic.in/legis/crz.htm>> [MEF, *Legislations*].

classified the CRZ areas.⁶² The Ministry of Environment and Forests (MoEF) was to approve these CZMPs,⁶³ and all development activities within the CRZ were to be carried out within the framework of these plans.⁶⁴

3.2.1.1.1 Evaluation of the CRZ, 1991

The CRZ 1991 was a unique attempt to bring under a single directive a comprehensive framework for the effective regulation and management of the Indian coastline. It was based on the fundamental principle that different coastal areas have diverse ecological features and sensitivity and therefore require varying degrees of protection. The CRZ 1991 did not have a preamble; hence, it is difficult to decipher its underlying objectives. Nonetheless, the CRZ 1991 was in certain ways far-reaching in its vision and scope, and some of its provisions were designed to support a sustainable approach to coastal development. This was evident from the proscriptions that it imposed on thirteen activities, even though the rigor of these prohibitions was subsequently diluted.⁶⁵ Furthermore, the classification of the coastal zone into the four categories with specified limits on coastal development reinforced a sustainable approach to coastal management.

However, the major deficiency of this law was that it failed to adequately provide for “integration” and for a “principled” approach to ocean and coastal space management. The CRZ 1991 did very little to transcend the sectoral approach to management of coastal areas and resources by imposing a more composite, integrative and sustainable methodology. Some of these aspects are detailed below.

A significant omission in the CRZ design from an ICZM perspective is the absence of a seaward side in the overall scheme for specialized and integrated coastal management.⁶⁶ This is a critical omission, because the health of coastal ecosystems depends in large measure on the health of the oceans, and *vice-versa*.⁶⁷ Managing coastal

⁶² *The Coastal Regulation Zone Notification, 1991, supra note 49, ibid* ¶3(3)(i).

⁶³ *Ibid.*

⁶⁴ *Ibid*, ¶3(3)(ii).

⁶⁵ *Ibid*, ¶2.

⁶⁶ See generally *The Coastal Regulation Zone Notification, 1991, supra note 49.*

⁶⁷ Biliiana Cicin-Sain & Robert W Knecht, *Integrated Coastal and Ocean Management: Concepts and Practices* (Washington DC: Island Press, 1998) at 45 (identifying spatial integration i.e., integration between the land and ocean sides of the coastal zone as a core feature of the ICZM process).

lands without planning for the related seawater component renders the regime inchoate and unsustainable in the long term.⁶⁸

Furthermore, nothing in the CRZ 1991 facilitates participatory decision-making, even though community involvement is an important facet of the ICZM process.⁶⁹ This has had serious repercussions in the effective implementation of the law. For instance, in identifying and classifying the different CRZ zones, there have been several instances of wrong classification, which ultimately helped land developers and hoteliers circumvent the law.⁷⁰ This confusion could have been avoided had local communities, at least through the constitutionally stipulated local self-government units,⁷¹ been involved in the process of classification of the different zones. Moreover, greater public involvement also could have improved the enforcement mechanism, because local communities have better knowledge of the terrain and are more cognizant of violations.⁷² Even though the CRZ 1991 was amended nearly 25 times during its two-decade existence, not a single amendment pertained to conferring significant roles on the local self-government bodies.⁷³

In its initial version, the CRZ 1991 prohibited thirteen activities in the CRZ with minimal exemptions. Successive amendments diluted the original intent and increased the scope of the exemptions, thereby virtually opening up the coast to a large range of development activities. For instance, an amendment was effected in 2001 that permitted land reclamation, bunding or disturbing the natural course of seawater “essential for

⁶⁸ *Ibid.*

⁶⁹ *Ibid* at 129-34. For more on this topic, see also Ch 6, Part 6.3.

⁷⁰ The legal battle over a factual dispute as to whether the disputed property fell within CRZ-I or CRZ-III went to the Supreme Court for determination. *Goa Foundation, Goa v Diksha Holdings Pvt Ltd*, (2001) [2001] 2 SCC 97 (India SC) [*Diksha Holdings*]; *The Goa Foundation v The North Goa Planning and Development Authority*, (1995) [1995] AIR 342 (Bombay HC). The question here was whether the hotel project was situated on the beach or on an estuarine environment; since the CZM plan of the state had not been approved, the court relied on an interpretation provided by the government to conclude that the project was in an estuarine environment. *Ibid.* Relying on the CZM plan, it was held that the thermal power plant was situated well beyond the CRZ. *Forum for Sustainable Development, Hyderabad v India*, (2010) [2010] 5 ALT 189 (Andhra Pradesh HC).

⁷¹ See generally *Constitution of India 1950*, parts IX, IX-A (empowering local self-government units).

⁷² *The Goa Foundation, Represented by its Secretary v Goa, Through its Chief Secretary*, (2000) [2000] 4 Bom CR 709 (Bombay HC). The court concurred with a scheme developed by the state by which various authorities were asked to carry out weekly patrols and fortnightly and monthly inspections to detect violations of the CRZ 1991. *Ibid.*

⁷³ See MEF, *Legislations*, *supra* note 61.

activities permissible under the notification.”⁷⁴ Even though reclamation for commercial purposes was prohibited, the use of such broad language could have inadvertently opened up more coastal spaces to unbridled development.

Perhaps the most important factor that led to near turmoil in the administration of this coastal law in India was the ineffective and half-hearted enforcement of the truncated CRZ 1991. Several amendments were made to legalise violations, which further undermined the efficacy of this law and emboldened increased numbers of violations. The CRZ 1991 was issued after copious and rigorous study; however, the ink was barely dry when the tourism industry started demanding amendments. As it is a piece of subordinate legislation, it is comparatively easy to effect amendments, which lie more or less in the domain of the executive. This is one of the factors that facilitated the passage of the 25 amendments. Moreover, only a few of these amendments were placed in the public domain and consequently most of them were bereft of valuable and critical input. Interestingly, a study notes that, up to July 2003, of the 19 amendments carried out, only three were open for public comment.⁷⁵ This points to something seriously amiss; the strategy morphed into one of managing through notifications and subsequent revisions rather than by a full-fledged statute that would have had the benefit of the collective wisdom of the elected representatives of the people.

Moreover, the CRZ 1991 did not provide mechanisms for ensuring compliance. It merely read, “The Ministry of Environment & Forests and the Government of state or union territory and such other authorities at the State or Union Territory levels as may be designated ... shall be responsible for monitoring and enforcement of the provisions of this Notification.”⁷⁶ Coastal states and union territory administrations were required to prepare, within one year, CZM plans identifying and classifying regulation zones, which were then to be examined and subsequently approved by the MoEF. Since the CRZ 1991 came into force on February 19, 1991, the coastal states and union territories were to prepare these plans by February 19, 1992. However, due to non-compliance with these stipulations, in 1995 (specifically, April 3, 1995), the Supreme Court of India directed all

⁷⁴ For the text, see (N, SO 329(E), 2001, India) at 2, online: MoEF <[http://www.moef.nic.in/legis/crz/so329\(e\).pdf](http://www.moef.nic.in/legis/crz/so329(e).pdf)>.

⁷⁵ See generally Manju Menon, Sudarshan Rodriguez & Aarthi Sridhar, “Coastal Zone Management: Better or Bitter Fare?” (2007) 42 *Economic & Political Weekly* 3840.

⁷⁶ *The Coastal Regulation Zone Notification, 1991*, *supra* note 49, ¶4.

coastal states and union territory administrations to frame CZMPs within a period of six weeks. Despite these efforts to secure the implementation of the coastal law, states continued with their recalcitrant attitude.

Indeed, non-compliance with the CRZ 1991 and earlier court orders formed the subject of a challenge before the Supreme Court of India in *Indian Council for Enviro-legal Action v India*.⁷⁷ This decision was ‘path-breaking’ in several respects, because the Supreme Court directed the central government to set up state coastal management authorities for all coastal states and also to set up the national coastal management authority. States were also directed to file complete CZMPs and the central government was to finalise and approve these plans within three months of the judgment. In a hard-hitting observation, the Supreme Court expressed its anguish over the continued non-observation of the coastal law:

Enactment of a law, but tolerating its infringement, is worse than not enacting a law at all ... Violation of antipollution laws not only adversely affects the existing quality of life but the non-enforcement of the legal provisions often results in ecological imbalance and degradation of environment, the adverse effect of which will have to be borne by the future generations.⁷⁸

Persistent attempts by the executive to subvert the beneficence of the coastal law by not implementing it in earnest left the court with no other choice but to step beyond its traditional confines to prod the executive to discharge its constitutional obligations vis-à-vis the coastal law. Still, the coastal law continued as if in ‘suspended animation’, as it took considerable time for coastal states and union territory administrations to prepare their CZMPs. Due to this delay, it became difficult to identify the specific zones where activities were permitted, regulated, or prohibited, considerably hampering the efficient working of the CRZ 1991.

Surprisingly, the CRZ 1991 did not provide for any administrative apparatus. It was only consequent to the Supreme Court’s intervention in *Indian Council for Enviro-legal Action*⁷⁹ that the MoEF issued additional notifications under the *Environment*

⁷⁷ (1996), [1996] INDLAW 1074 (India SC) [*Indian Council for Enviro-legal Action*].

⁷⁸ *Ibid.*, ¶26.

⁷⁹ See generally *Indian Council for Enviro-legal Action*, *supra* note 77.

(Protection) Act, 1986 constituting a national CZM authority (NCZMA)⁸⁰ and authorities for the different coastal states⁸¹ and union territories.⁸² The three sets of CZMAs were granted powers to take measures to protect and improve the quality of the coastal environment and to prevent, abate, and control environmental pollution in the coastal areas under their control.⁸³

Even though these authorities were empowered to take punitive action against violations, they were often selective, and generally actions were initiated only against small-scale operators.⁸⁴ One major reason for the overall shoddy enforcement of the law is that the introduction of this coastal regulatory framework coincided with India's embrace of globalisation and the initiation of a series of economic reforms. In the new scheme for economic development, coastal lands emerged as prized real estate and a facilitator of the rise of a globally-competitive India. Accordingly, the CRZ 1991 was diluted on one pretext or the other.

From an ICZM perspective, these institutional structures were inadequate and not sufficiently geared to meet the challenges posed by ICZM. One of the major functions of the state CZMA is to prepare ICZM plans.⁸⁵ Neither the CRZ 1991 nor any other notification that created the state and union territory CZMAs provided any guidance on

⁸⁰ *Coastal Regulation Zone Notification for National Coastal Zone Management Authority* (N SO991 (E) 1998, India); see also *Reconstituting the National Coastal Zone Management Authority* (N SO302 (E) 2011) [NCZMA]. Specifically, the NCZMA was to: examine and give approval to area-specific management plans; advise the central government; review violations; examine proposals to modify the CZMPs and make recommendations to the central government; provide technical assistance and guidance to state and union territory governments and to the state and union territory CZMAs; and co-ordinate the actions of the state and union territory CZMAs. See *NCZMA, ibid* ¶¶ II-VIII.

⁸¹ For instance, see *Orissa Coastal Zone Management Authority Order* (O SO 1759(E) 2008, India) [*Orissa CZMAO*]. For their part, the state and union territory CZMAs were to: identify ecologically sensitive areas in the CRZ and formulate area-specific management plans for such areas; identify economically important stretches in the CRZ area and prepare ICZM plans; examine all projects that were proposed in the CRZ and give recommendations before the project proposals were referred to the central government or to the agencies concerned for approval; identify coastal areas that were highly vulnerable to erosion or degradation and formulate specific management plans; and examine proposals for changes in the classification of CRZ areas and make recommendations to the NCZMA. See *ibid*, ¶¶II-IX; *Andaman and Nicobar Coastal Zone Management Authority Order* (O SO 2058 (E) 2008, India), ¶¶II-IX.

⁸² *Andaman and Nicobar Coastal Zone Management Authority Order, ibid*.

⁸³ See *supra* notes 80-82.

⁸⁴ India, Ministry of Environment & Forests, *Final Frontier, supra* note 37 at 15-16.

⁸⁵ For instance, see *Orissa CZMAO, supra* note 81, ¶¶VI.

what these ICZM plans were to contain. In the absence of specific guidelines, it is doubtful whether these ICZM plans truly furthered ICZM.

The CRZ 1991 was inadequate on several other counts as well. The law incorporated very few specific adaptive strategies to meet the dangers that emanate from the growing intensity of cyclonic storms, sea surges, and SLR, except perhaps the power conferred on the authority concerned to determine areas that are likely to be inundated by SLR and include them within Category I for protection.⁸⁶ There were no provisions to protect coastal farming communities and coastal agriculture, to promote capacity-building to offset the lack of adequate scientific data to support decision-making, or to facilitate the use of technology-enabled (for instance, satellite-based) monitoring and enforcement.

In spite of these loopholes, and despite the fact that there is no explicit recognition of the doctrine of public trust or protection afforded to activities like fish-drying, boat-parking on beaches, and net-mending and storage (all of which are integral to the beneficial enjoyment of the right to livelihood of traditional fishing communities), the CRZ 1991 had wide acceptance among fishermen.⁸⁷ The law provided for construction or reconstruction of dwelling units between 200-500 meters from the HTL in the CRZ-III as long as it was within the ambit of traditional rights and customary use.⁸⁸ The CRZ 1991 also provided that hoteliers and developers were to ensure that fencing their property did not hamper public access to the beach and that a minimum distance of 20 meters was provided between two hotels or beach resorts so that public access to the beach was not restricted.⁸⁹ These provisions endeared the law to the fisher community, as they found

⁸⁶ “Annexure – I Coastal Area Classification and Development Regulations” in Aarthi Sridhar, *The Coastal Regulation Zone Notification 1991, Consolidated Version Annexure 2 [Incorporating Amendments Upto 24th July 2003]*, ¶6(1)(i), online: Common Cause, Environment, Laws and Regulations, Water Pollution <<http://www.commoncause.in/environment/TheCoastalRegulationZoneNotification1991.PDF>>.

⁸⁷ India, *Report of the Public Consultation with Fisherfolks*, *supra* note 50 at 67.

⁸⁸ “CRZ-III” in *The Coastal Regulation Zone Notification* (N, SO114(E) 1991, India), Consolidated Version Incorporating Amendments Upto 24th July 2003, (iii), online: ICSF <http://old.icsf.net/icsf2006/uploads/resources/legalIndia/pdf/english/resource/1119443024107***CRZ__Notifications_India.PDF>.

⁸⁹ “Annexure-II: Guidelines for Development of Beach Resorts/Hotels in the Designated Areas of CRZ-III for Temporary Occupation of Tourist/Visitors, with Prior Approval of the Ministry of Environment & Forests” in *The Coastal Regulation Zone Notification* (N, SO114(E) 1991, India), Consolidated Version Incorporating Amendments Upto 24th July 2003, ¶7(1)(i)(ia), (ix), online: ICSF <<http://old.icsf.net/icsf2006/uploads/resources/legalIndia/pdf/english/resource/1119443024>

themselves increasingly losing control over beachfronts. They also thought that the regulatory strategy of 500 meters was uncomplicated and easy to understand.⁹⁰

3.2.1.2 Sustainable Coastal Development and the Judicial Process

Protection under the CRZ 1991 has proven to be a fertile ground for judicial intervention in India. Courts have been called upon to determine a range of issues, including the validity of amendments to the CRZ 1991 Notification⁹¹ and the setting up of a naval museum,⁹² a hospital,⁹³ a sewage treatment plant,⁹⁴ resorts,⁹⁵ and sea link projects.⁹⁶ In addition, courts strove to protect several important coastal ecosystems such as mangroves⁹⁷ and wetlands⁹⁸ (to protect fisheries)⁹⁹ and control marine pollution.¹⁰⁰ S

107***CRZ__Notifications_India.PDF>.

⁹⁰ See India, Ministry of Environment & Forests, *Final Frontier*, *supra* note 37 at 11.

⁹¹ *Indian Council for Enviro-legal Action*, *supra* note 77.

⁹² *Visakha SPCA v India*, (2000), [2000] 6 ALT 666 (Andhra Pradesh HC). The court directed the CZMA to conduct an inspection of the proposed site which was visited by Olive Ridley sea turtles before installing a decommissioned submarine and a naval ship to create a museum. *Ibid*.

⁹³ *Citizens Interest Agency v Lakeshore Hospital and Research Centre Pvt Ltd*, (2003), [2003] 3 KLT 424 (Kerala HC). It was held that since the disputed canal was manmade and not tidal, the construction of the hospital near this canal was not caught by the CRZ 1991. *Ibid*.

⁹⁴ *Visakhapatnam Municipal Corporation v Gov't of India, Ministry of Environment & Forests* (16 August 2001), WP No 25687/98 of 2001 (Andhra Pradesh HC). It was held that the commissioning of a sewerage treatment plant to treat about 25 million liters of effluents per day before it enters the sea will help attain the objectives of the CRZ 1991. *Ibid*.

⁹⁵ *Diksha Holdings*, *supra* note 70.

⁹⁶ *Rambhau Patil v Maharashtra State Road Development Corporation* (9 October 2001), WP No 348 of 2000 (Bombay HC) [*Rambhau Patil*] (upholding the construction of Worli-Bandra sea link).

⁹⁷ *The Bombay Environmental Action Group v Maharashtra* (6 October 2005) WPs No 3246 of 2004 & No 1470 of 2003 & 2208 of 2004 (Bombay HC) (guidelines provided to prevent further destruction of mangroves to ensure their conservation and rejuvenation in Maharashtra state); *Krishnadevi Malchand Kamathia v Bombay Environmental Action Group*, (2011), [2011] 2 SCALE 133 (India SC) (directing the removal of a bund to restore the natural flow of seawater to the mangroves); *Ajit D Padiwal v India*, (1998), [1998] AIR 1998 147 (Gujarat HC). The court failed to take action against a delinquent company even when there was evidence to show that it had committed substantial degradation of mangrove forests by manipulating records. *Ibid*.

⁹⁸ For instance, see *The Goa Foundation v The Konkan Railway Corporation*, (1992), [1992] AIR 471 (Bombay HC) (upheld the construction of a railway line through the *kazhan* estuarine wetlands on the ground that the destruction was trivial); *People United for Better Living in Calcutta-Public v West Bengal*, (1993), [1993] AIR 215 (Calcutta HC) (restraining the state from reclaiming further wetlands, but left open the possibility of an exemption); *TN Godavarman Thirumalpad v India*, (2006) [2006] INDLAW SC 123 (India SC). The court upheld demolition of aquaculture tanks constructed in the Kolleru wetland sanctuary as the bunds raised diminished the retention capacity of the lake obstructing the free flow of water into the sea. *Ibid*.

⁹⁹ For instance, see *Kerala v Joseph Antony*, (1994) [1994] AIR 721 (India SC). The court upheld a government notification banning the use of purse seine, ring seine, pelagic and mid-water trawl gear for fishing in the territorial waters to protect the livelihood of traditional fishermen and also to save pelagic fish wealth from depletion. *Ibid*.

Jagannath v India,¹⁰¹ *Goa Foundation v Diksha Holdings Pvt. Ltd.*,¹⁰² *Ramgopal Estates Private Limited v Tamil Nadu*¹⁰³ clearly reveals certain trends. A clean and healthy coast

¹⁰⁰ Idols made of clay can be immersed only at designated disposal areas under the supervision of a monitoring committee. See *V Elangovan v The Home Secretary, Tamil Nadu* (17 September 2004) WP No 25586 of 2004 (Madras HC).

¹⁰¹ For centuries, coastal communities in India have practiced coastal aquaculture by following the traditional rice/shrimp rotating system. As part of the blue revolution, a more intensive method of shrimp culture, which enabled production of thousands of kilograms per hectare, was introduced in the coastal regions. This posed severe environmental risks, leading to this public interest litigation in the supreme court seeking enforcement of the CRZ 1991, which prohibited the setting up of new industries and the expansion of existing ones, except those directly related to the waterfront or directly needing foreshore facilities. Affirming the state's obligation to control marine pollution and to protect the coastal environment, the supreme court held that since the shrimp culture industry was neither directly related to the waterfront nor did it need foreshore facilities, the establishment of coastal shrimp farms in the CRZ areas was prohibited. Although the shrimp aquaculture industry had the singular distinction of earning maximum foreign exchange for the country, the court concluded that it caused considerable damage to local ecology and ordered the demolition and removal of all aquaculture industries in the CRZ, except traditional and improved traditional ones. In one stroke, this judgment threw nearly 300,000 aquaculture workers out of work and, consequently, many review petitions were filed in the Supreme Court. *S Jagannath v India*, (1997) [1997] 2 SCC 87 (India SC). In *Gopi Aqua Farms v India*, [1997] AIR 3519 (India SC), the Supreme Court declined to entertain these review petitions. Thereafter, the central government enacted the *Coastal Aquaculture Authority Act, 2005*, which legitimized intensive aquaculture. See generally Coastal Aquaculture Authority, *Compendium of Act, Rules, Guidelines and Notifications* (Chennai: Coastal Aquaculture Authority, Gov't of India, 2006). Most coastal inhabitants feel that this act promotes unsustainable and ecologically damaging activities (including over-extraction of groundwater and widespread pollution) and that it should be repealed as soon as possible. India, *Report of the Public Consultation with Fisherfolks*, *supra* note 50 at 3.

¹⁰² *Diksha Holdings*, *supra* note 70. This case rose from an appeal against the judgment of the Bombay high court, which dismissed an objection to the construction of a hotel on a plot of land on the grounds that it came within CRZ-I area due to the presence of sand dunes. In the impugned judgment, the high court held that even though the hotel project was located in area that had sand dunes and therefore could be classified as CRZ-I, if such a view were taken, no development could ever take place along the entire Goan seacoast. In the appeal before the Supreme Court, the primary issue was more factual. Emphasizing the importance of sustainable development, the court held that it was imperative that there be a proper balance between the need to protect the environment and the development process. Society was to prosper, but not at the cost of the environment, and similarly, the environment was to be protected but not at the cost of development. In this case, since under the Goa state CZMP approved by the MoEF, the whole of the area wherein the proposed hotel was to be situated was classified as CRZ-I, the Supreme Court concurred with the high court and held the construction valid. The court rejected the divergent opinion based on a report by the National Institute of Oceanography and refused to remit the matter to the MoEF for reconsideration. *Ibid.*

¹⁰³ Pulicat Lake is one of the major Ramsar sites protected under Indian law. Following the establishment of a thermal power plant and a satellite port, the ecosystem of the area was under considerable stress. Ignoring these problems, the government decided to set up a petrochemical park on an island situated close to the lake and to a bird sanctuary. This decision was impugned on the ground that these projects were in violation of article 207 of the LOSC. Furthermore, it was claimed that the project violated the CRZ 1991 and would affect the coastal ecology, marine life, and biodiversity of the area. Based on an environment impact evaluation report, the government brushed aside these concerns since the total loss would only be marginal. Faced with such conflicting arguments, the Madras high court directed the petitioners to approach the appropriate authorities under the EP Act, 1986 for directions to curb the environmental hazards caused by existing projects. As far the permission for the petrochemical park was concerned, the court adopted a pro-

is essential if the right to live in a clean and healthy environment is to be enjoyed. It was to protect this interest that the Supreme Court in *Indian Council for Enviro-Legal Action* directed the executive to implement the CRZ 1991 in earnest. The desire to defend this interest and to ensure sustainable development was taken a step further by the court in *Jagannath*, which directed the removal of intensive and semi-intensive aquaculture farms.

However, the beneficence of this judgment was negated by the other two branches of government by enacting the *Coastal Aquaculture Authority Act 2005*,¹⁰⁴ which likely had a cathartic effect on the judiciary.¹⁰⁵ Since 2005, in seeking to balance environmental protection with development in the coastal law context, the judicial balance seems to have tilted in favor of development. This is evident from the judicial approach in both *Goa Foundation* and in *Ramgopal Estates* where despite a serious discrepancy in the CZMP¹⁰⁶ and grave concerns expressed over the setting up of a petrochemical park in an already degraded part of the coastal zone,¹⁰⁷ respectively, the courts¹⁰⁸ brushed aside these concerns to favor the development projects. This pro-development line of reasoning in interpreting the coastal law ignored genuine environmental considerations and is evident in several other cases as well.¹⁰⁹ The repeated amendments that have rendered the CRZ 1991 inconsistent and nugatory have also not served the judicial process well. In sum, the judiciary in large part failed in its attempt to integrate the two seemingly competing values of development and environmental protection at least in the coastal law context.

development line of reasoning and held that the objection “is opposed to the concept of sustainable development as well as to the progress and prosperity of the nation”, thereby upholding the project. (2007), [2007] INDLAW 964 (Madras HC).

¹⁰⁴ (No 24 of 2005, India).

¹⁰⁵ See generally *The Coastal Aquaculture Authority Bill 2004* (No LIV of 2004, India), statement of objects and reasons, online: ICSF <http://old.icsf.net/icsf2006/uploads/resources/legalIndia/pdf/english/central/1115268683972***Coastal_Aquaculture_Authority_Bill,_2004.PDF>.

¹⁰⁶ *Diksha Holdings*, *supra* note 70.

¹⁰⁷ *M/S Ramgopal Estates Pvt Ltd v Tamil Nadu* (2 March 2007), WP (Madras HC), online: Indian Kanoon <<http://indiankanoon.in/doc/985034/>>.

¹⁰⁸ It was the Supreme Court of India that decided *Goa Foundation* and the Madras High Court that decided *Ramgopal Estates*.

¹⁰⁹ For instance, see *Rambhau Patil*, *supra* note 96 (upholding the Worli-Bandra sea link project, as there was substantial compliance with the law even though there was no technical compliance with procedure).

3.2.1.3 The Draft Coastal Management Zone Notification, 2008

In 2004, to bring in a degree of coherence and consistency to the coastal law regime, the central government undertook a comprehensive review of the CRZ 1991.¹¹⁰ The core recommendation of the review committee was to move the 1991 coastal law away from the regulatory model and ground it in ICZM.¹¹¹ In this light, and in the wake of the 2004 tsunami, the central government decided to notify the draft *Coastal Management Zone Notification, 2008* (CMZ 2008) for the whole country.¹¹² The CMZ 2008 sought to introduce certain well-established scientific principles of CZM into Indian coastal law semantics, namely, “integrated coastal zone management,”¹¹³ “integrated coastal zone management plan” (ICZMP),¹¹⁴ and “setback line.”¹¹⁵ In a marked departure from the CRZ 1991, where the emphasis was on management through regulation, the focus of the CMZ 2008 shifted to management through planning. This change was reflected in several key provisions. For instance, the definition of the term ‘coastal zone’ was broadened to include an aquatic area, in addition to the land component, practically giving effect to the concept of spatial integration.¹¹⁶

While the CMZ 2008 was indicative of the new thinking on CZM, this law was severely lampooned by civil society for being the end of the road for coastal protection and yet another instance of the MoEF yielding to pressure from the pro-development lobby.¹¹⁷ This draft notification was no improvement over the CRZ 1991. Rather, some

¹¹⁰ India, *Report of the Committee Chaired by Prof. M.S. Swaminathan*, *supra* note 23.

¹¹¹ *Ibid* at 92, ch 4 (entitled, “Suggestions of the Committee for Integrated Coastal Zone Management”).

¹¹² Like the CRZ, 1991, the CMZ, 2008 was also envisaged as a piece of delegated legislation to be promulgated under the Environment Protection Act, 1986. The CMZ, 2008 was also to have application throughout the country.

¹¹³ Defined to mean “a process by which decisions are made for protection of coastal population and infrastructure, protection and conservation of coastal and marine areas and resources and sustainable development.” *Coastal Management Zone Notification 2008* (SO 1761 (E)/ 2008, India) n 3(b).

¹¹⁴ It is “the land use plan or development plan prepared for implementation of Integrated Coastal Zone Management.” *Ibid*, cl 3(c).

¹¹⁵ It is “a line demarcated along the coast, based on its vulnerability to sea level rise, flooding and shore line changes as per Guidelines given in this notification in Appendix –I.” *Ibid*, cl 3(4).

¹¹⁶ *Ibid*, cl 3(a). The aquatic area extended to territorial waters limit (12 nautical miles measured from the appropriate baseline) and the seabed.

¹¹⁷ Menon, Rodriguez & Sridhar, *supra* note 75. For one, the preamble was modified at the last minute to permit new green field airports and the modernization and expansion of existing coastal airports requiring the clearance of mangroves and wetlands, subject to the usual standard qualifying clause

suggested, it had diluted the regulatory requirements of the earlier law and opened up more pristine territory to intensive development (which may not be always sustainable). The fishing community and eight coastal states strongly opposed this notification. Consequently, in 2009, the MoEF constituted yet another committee to determine future steps concerning the CMZ 2008. The committee unanimously recommended that the central government allow the CMZ 2008 to lapse and that the CRZ 1991, with suitable amendments, be kept as the basic framework for coastal management.¹¹⁸

3.2.1.4 Re-engineering the Coastal Regulation Zone Notification, 1991: The Coastal Regulation Zone Notification, 2011

The CRZ 2011 was introduced to fundamentally re-cast India's coastal law and supersede the CRZ 1991. It seeks to ensure livelihood security for fishers and local coastal communities, promote conservation and protection of the coastal environment and marine areas, and promote sustainable development based on scientific principles, taking into account natural hazards and SLR.¹¹⁹ The legal architecture of the CRZ 2011 draws heavily on the framework provided by the CRZ 1991. Its regulatory design operates as follows: first, it defines the area of its jurisdiction (namely, the CRZ) and provides for its classification; second, it enumerates certain general prohibitions on development activities in the CRZ (subject to exceptions); third, it regulates permissible activities in the CRZ; fourth, specific norms for development and construction activities in the different categories of the CRZ are provided; and finally, it explains its methodologies.

Under the CRZ 2011, the CRZ now includes not only the land area from the HTL to 500 meters on to the landward side along the seafront and the intertidal zone, but it also includes the land area between the 'hazard line' and 500 meters from the HTL on the landward side of seafronts.¹²⁰ Additionally, the rules provide for new elements in the

“without compromising environmental considerations”. Aarthi Sridhar et al, *Coastal Management Zone Notification '08: The Last Nail in the Coffin: A Final Critique* (Bangalore: ATREE, 2008) at 4.

¹¹⁸ India, Ministry of Environment & Forests, *Final Frontier*, *supra* note 37 at 3.

¹¹⁹ *Coastal Regulation Zone Notification* (N, SO19(E), 2011, India) pmb [CRZN, 2011].

¹²⁰ *Ibid*, ¶¶(i), (iii), (iv).

CRZ,¹²¹ of which the most important is the water area and its corresponding seabed between the LTL up to the territorial water limit of twelve nautical miles.¹²² The hazard line emerges as an important SLR management tool introduced in the CRZ 2011. The line is mapped by the MoEF through the Survey of India along the coastline of the country based on tides, waves, SLR, and shoreline changes.¹²³ The hazard line determines the type of development that can take place both seaward and landward.¹²⁴ However, dwelling units, including those of the fishers, will not be relocated even if they are located on the seaward side of the hazard line.¹²⁵ In such cases, the state government has to provide these dwelling units with necessary safeguards from natural disasters.¹²⁶

To conserve and protect coastal areas and marine waters, the CRZ area has been reclassified into five categories: CRZ-I,¹²⁷ CRZ-II,¹²⁸ CRZ-III,¹²⁹ CRZ-IV,¹³⁰ and CRZ-V.¹³¹ As in the CRZ 1991, the CRZ 2011 also provides for a general prohibitory scheme

¹²¹ In tidal water bodies, the CRZ includes the land area between the HTL and 100 meters or the width of the creek, whichever is less, onto the landward side and also the land area between the hazard line and 100 meters. *Ibid*, ¶¶(ii)-(iii). In tidal water bodies, the water and bed area between the LTL at the bank to the LTL on the opposite side of the bank also fall under the CRZ. *Ibid*, ¶7(i)A(a)-(k).

¹²² *Ibid*, ¶(v).

¹²³ *Ibid*, ¶5(iii).

¹²⁴ *Ibid*, annex-I, D II 7-8. No development activities other than those listed (e.g., fishing villages, fishing jetties, ice plants, and fish drying platforms) are permitted between the hazard line and 500 or 100 meters, or the width of the creek to the landward side. *Ibid*.

¹²⁵ *Ibid*, annex-I, D II 8.

¹²⁶ *Ibid*.

¹²⁷ The CRZ-I includes ecologically sensitive areas whose geomorphological features play an important role in maintaining coastal integrity. In addition, the CRZ-I includes the area between the LTL and the HTL. *Ibid*, ¶7(i)B.

¹²⁸ Areas developed up to or close to the shoreline fall under CRZ-II. *Ibid*, ¶7(ii).

¹²⁹ Relatively undisturbed areas and those that are not category I or II are considered as CRZ-III. While coastal zones in rural areas, irrespective of the degree of development, are classified as CRZ-III, areas within municipal limits or legally designated urban areas are treated as CRZ-III, provided they are not substantially built up. *Ibid*, ¶7(iii).

¹³⁰ In the CRZ 1991, the CRZ-IV comprised certain coastal stretches in the Andaman and Nicobar, the Lakshadweep and other islands. The CRZ 2011 excludes these island territories from its regulatory scope; they are instead subject to an independent legal framework, the *Island Protection Zone Notification*. See (N, SO20(E), 2011, India) [*Island Protection Notification*]. The CRZ-IV now includes the water area from the LTL to twelve nautical miles on the seaward side and the water area of tidal water bodies from the mouth of the water body at the sea up to the point where the tidal influence ceases to exist. *CRZN, 2011, supra* note 119, ¶7(iv).

¹³¹ Application of a straitjacket legal formulation throughout the country without considering the peculiar features of coastal ecosystems was bound to unleash implementation issues. This was one of the reasons that led to amendments to the CRZ 1991, because this notification was perceived by most coastal states as being too rigid and not accommodative of their specific concerns. The CRZ 2011 seeks to assuage these apprehensions by introducing a new category, namely the CRZ-V, “areas requiring special consideration.” The CRZ-V is subdivided into sub-category “A” (CRZ areas falling within municipal limits of Greater Mumbai, Kerala including the backwaters and backwater

subject to wide exemptions.¹³² Furthermore, the regulatory scheme of the CRZ 2011 also provides specific rules regulating development and construction activities in the different categories (for Mumbai and Navi Mumbai,¹³³ for the coastal states of Kerala,¹³⁴ Goa,¹³⁵ and critically vulnerable coastal areas (CVCAs)¹³⁶) administered by the CZMA concerned.

islands, and Goa) and sub-category “B”, ‘critically vulnerable coastal areas’ (CVCAs), which include the Sunderbans and other identified ecologically sensitive areas. *Ibid*, ¶7(v).

¹³² *Ibid*, ¶3.

¹³³ The CRZ 2011 envisages a new development plan for their CRZ areas in Mumbai and Navi Mumbai, both areas that are vulnerable to SLR. In the CRZ-I areas, roads can be constructed on stilts without affecting the free flow of tidal water. If mangroves are destroyed, a reforestation process is prescribed. Mangrove areas should be mapped and notified as protected forest, and solid waste disposal sites relocated outside the CRZ. *Ibid*, ¶8V1(i)A, B. Specific regulations are put in place concerning redevelopment in CRZ-II areas. *Ibid*, ¶8V1(iii)(b)2. To preserve and protect the green lung, all open spaces, parks, and playgrounds, even if they are CRZ-II areas, are treated as NDZs as under the CRZ-III. *Ibid*, ¶8V1(iii)(e). Fishing settlement areas are treated as CRZ-III areas. *Ibid*, ¶8V1(iii)(g).

¹³⁴ The high population density in coastal areas of the state of Kerala posed implementation difficulties for the CRZ 1991. In *Parthan v Nayarambalam Grama Panchayath*, (2006) [2006] 3 KLT 734 (Kerala HC), the high court directed the Kerala state CZMA to inquire about the possibility of amending the CZMP and if necessary forwarding it to the Government of India for necessary action. This decision might have influenced the drafters of the CRZ 2011, which includes new rules for the backwater islands of Kerala. The CRZ area for the backwater islands was reduced to 50 meters from the HTL on the landward side. Within this 50 meter zone, no new construction is permitted except repairs or reconstructions of existing dwelling units of local communities. However, traditional foreshore facilities and activities related to fishing are permitted within 0-50 meters. Beyond 50 meters, construction of dwelling units of local communities is possible with permission from the local authority. *CRZN, 2011, supra* note 119, ¶8V 2(ii)-(v).

¹³⁵ Implementation of the CRZ 1991 was always problematic in the state of Goa due to the immense potential for coastal tourism and the overwhelming dependence of coastal populations on fishing. Analysis of satellite data of Goa’s coastal area revealed 4,553 structures in violation of the CRZ 1991 within the 200-500 meter zone. A further 2,272 illegal structures were built in the restricted zone of 100 meters along rivers with tidal influence. India, Ministry of Environment & Forests, *Final Frontier, supra* note 37 at 16. Rather than taking action to evict these encroachers, the state government approached the union government for a one-time exemption for these structures. Since then, there have been demands to tailor the coastal law to the specific circumstances of Goa. The CRZ 2011 requires the Goa government to notify fishing villages that require foreshore facilities for fishing and fishery-related activities. Reconstruction and repair of structures belonging to local communities is permissible in the CRZ, as is construction of customary temporary and seasonal structures. To protect coastal biodiversity, development activities are prohibited in the *kazhan* lands (which are basically saline floodplains along tidal estuaries in the state of Goa reclaimed over the centuries by constructing an intricate system of dykes and sluice gates), sand dune areas, and beaches designated as turtle nesting sites. All of these areas are to be surveyed and management plans prepared for their protection. *CRZN, 2011, ibid*, ¶8V 3(i)-(vii).

¹³⁶ The entire Sunderbans and certain other identified ecologically important areas are designated as CVCAs. The management process in such areas is to involve local fishers and communities. The CRZ 2011 envisages the development of an integrated management plan (IMP) that considers the need to conserve and manage mangroves, the needs of local communities, and the impact of SLR and other natural disasters. The IMPs are prepared in accordance with the same procedures as CZMPs. *Ibid*, ¶8V 4(a)-(d).

A serious lacuna in the CRZ 1991 is that it did not subject permissible activities to any clearance procedure. This regulatory oversight has been overcome in the CRZ 2011.¹³⁷ Another interesting feature of the CRZ 2011 is that it incorporates a post-clearance monitoring mechanism.¹³⁸ It is mandatory for the project management to submit biannual compliance reports to the regulatory authority concerned, which are displayed on its Web site.¹³⁹

As mentioned previously, the CRZ 1991 did not provide for any enforcement mechanism, yet another oversight that encouraged rampant violations. To ensure effective implementation and enforcement of the coastal law, the CRZ 2011 vests responsibility for monitoring and enforcement in the state and union territory CZMAs.¹⁴⁰ To assist in this task, the state government and union territory administrations can establish district level committees consisting of at least three representatives from local traditional coastal communities, including fishers.¹⁴¹ To strengthen good coastal governance, the coastal law seeks to secure transparency in the working of the CZMAs, and accordingly they are required to maintain a dedicated web site where all relevant documents are to be posted.¹⁴²

The most important management tool in the CRZ 2011 is the CZMP. It is to be prepared by the state government or union territory administration within 24 months from the date of the notification by engaging scientific institutions like the National Institute for Sustainable Coastal Zone Management.¹⁴³ Moreover, it should be prepared in consultation with concerned stakeholders, including through public hearings,¹⁴⁴ and the

¹³⁷ After examining certain documents like the rapid EIA report, comprehensive EIA, disaster management report and risk assessment report and management plan, in accordance with the CZMP and the CRZ notification, the CZMA makes recommendations to the state environmental impact assessment authority and, in certain cases, to the MoEF. Once a clearance is granted, it is valid for five years. *Ibid*, ¶4.2(i). It is now provided that project proponents should submit the proposal together with certain documents and reports to the state or union territory CZMA concerned. Certain permissible activities like the laying of pipelines, conveyancing systems and transmission lines, mining of rare minerals, and exploration and extraction of oil and natural gas require clearance from the MoEF. *Ibid*, ¶4.2(ii), (iv).

¹³⁸ *Ibid*, ¶4.2(v).

¹³⁹ *Ibid*.

¹⁴⁰ *Ibid*, ¶6(c).

¹⁴¹ *Ibid*.

¹⁴² *Ibid*, ¶4.2(vi). This includes the agenda, minutes, decisions and actions taken, violations, relevant judicial orders, the approved CZMPs, and so on are posted.

¹⁴³ *Ibid*, ¶5(2), (6).

¹⁴⁴ *Ibid*, annexure I, part IV.

draft submitted to the relevant CZMA for review.¹⁴⁵ The CZMA incorporates suggestions and objections received from stakeholders in the draft plan, which, together with recommendations, are to be submitted to the MoEF for approval.¹⁴⁶

The CZMP is the blueprint within which all development activities in the CRZ are implemented. It demarcates the HTL, the LTL, and the hazard line.¹⁴⁷ It also classifies coastal zones and buffer zones in mangrove areas and identifies tidal influenced water bodies, fishing villages and common property infrastructure in fishing communities. As well, it demarcates the water areas of CRZ-IV and the fishing zones and fish breeding areas, indicating pollution levels and facilities for rescue and natural disaster relief operations.¹⁴⁸ Once approved, the CZMP is posted online.¹⁴⁹ The CZMP is not a static document and can be revised every five years.¹⁵⁰

3.2.1.5 The CRZ, 2011: An ICZM-friendly Law and an Adaptive Tool to Manage SLR?

The CRZ 1991 was the first coastal law in India. While far from ideal, it did nevertheless serve as an important step in introducing a regulatory framework for coastal zones in that country. The primary weakness of the law was that it did little to transcend the purely sectoral approach to CZM. Its implementation was also abysmal, and the numerous amendments to the original notification diluted the regulatory requirements and opened up coastal zones to further development. The 2008 attempt to replace the CRZ 1991 with a new ICZM framework also came to naught, since it favoured development over environmental and community considerations. It was in this context that India notified the CRZ 2011. Introduced after a series of consultations with the fishing community and other stakeholders like non-governmental organisation working in the field, India's new coastal law has several features that are relevant from an ICZM perspective. The question then is: do these new features produce an ICZM-friendly legal framework? Given that

¹⁴⁵ *Ibid*, ¶5(vii).

¹⁴⁶ *Ibid*, ¶5(viii), (ix).

¹⁴⁷ See generally *ibid*, ¶5; *ibid*, annexure I.

¹⁴⁸ *Ibid*, annexure I.

¹⁴⁹ *Ibid*, annexure I, IV(c). It is to be posted on the web site of the MoEF and relevant state and union territory CZMAs.

¹⁵⁰ *Ibid*, ¶5(xi).

SLR poses a grave threat to the Indian coastline, it is also necessary to examine whether the coastal law facilitates adaptation to SLR. These aspects are considered below.

Based primarily on the regulatory scheme of the CRZ 1991, the CRZ 2011 retains the general prohibitions applicable to certain activities (which could detrimentally affect coastal ecosystems) in the CRZ area, subject to exemptions that have been carved out over the years. These prohibitions include no new construction in the CRZ-I, on the seaward side of the CRZ-II or in the NDZ of the CRZ-III. In addition, the CRZ 2011 preserves the CRZ 1991 features concerning the need to obtain environmental clearance from the MoEF, guidelines on setting up tourist resorts, and preservation of access rights.¹⁵¹

As far as the novel features of the CRZ 2011 are concerned, it spells out a procedure for clearance for activities that can be carried out in the CRZ, subject to specific time frames.¹⁵² Furthermore, it provides for post-clearance monitoring, requires submission of biannual compliance reports by project proponents, use of scientific inputs, and includes provisions that enhance transparency.¹⁵³ For the first time, district-level committees with local representation assist CZM authorities in the implementation of the coastal law. Provisions for public hearings during the preparation of CZMPs enhance stakeholder participation in the CZM regime.¹⁵⁴ At the same time, the CRZ 2011 avoids some of the controversial provisions of the CRZ 1991, such as an exception that permitted setting up service industries in the CRZ of special economic zones, which threatened the rights of fishermen.¹⁵⁵ The CRZ 2011 also fundamentally re-casts the CRZ classification system and restricts its application to mainland India. A new legal regime has been put in place for the management of the marine islands.¹⁵⁶

Despite the experience gathered from administering the CRZ 1991 for over two

¹⁵¹ See *ibid*, annexure III (entitled, “Guidelines for development of beach resorts or hotels in the designated areas of CRZ-III and CRZ-II for occupation of tourist or visitors with prior approval of the Ministry of Environment and Forests”).

¹⁵² For instance, the notification points out that authorities are to implement schemes for phasing out the discharge of untreated wastes and effluents within a time period not exceeding two years from. *Ibid*, ¶3(vi).

¹⁵³ For details on post clearance monitoring, see *ibid*, ¶4.2(v).

¹⁵⁴ *Ibid*, annexure I, IV (public views on the CZMP).

¹⁵⁵ *Site Visit to M/s Mundra Port & SEZ Limited Port Site at Mundra and M/s OPG Power Gujarat Private Limited on 6th-7th December 2010*, online: MoEF <<http://moef.nic.in/downloads/public-information/site-visit-Mundra-OPG.pdf>>.

¹⁵⁶ *Island Protection Notification*, *supra* note 130.

decades, there are nonetheless serious discrepancies in the CRZ 2011 that can undermine its successful operation in the long-run. Unfortunately, rather than enacting a full-fledged CZM legislation, the MoEF once again has persisted with the strategy of managing sensitive coastal ecosystems through a notification (subordinate legislation), thereby retaining wide executive powers to amend the coastal law. In doing so, it seems that the MoEF has re-sown the seeds of confusion that have characterised the administration of the CRZ regime for the past 20 years. A dedicated statute on CZM would have gone a long way to ending the ad hoc approach that has characterised the Indian CZM regime.¹⁵⁷

Notwithstanding the fact that a subordinate legislation has limited legal remit, another shortcoming of the CRZ 2011 is that it does little to further a principled approach to coastal and oceans management. The law does state the need to ensure livelihood security and to promote sustainable development, and in certain provisions it reflects the precautionary principle. However, there is no mention of other principles that advance sustainable development and management of coastal areas and resources, like the polluter pays or the inter-generational equity.

The CRZ 2011 breaks new ground with its provisions to control marine pollution in the coastal zone.¹⁵⁸ Previously, India had no comprehensive regime to control this type of pollution. Although the responsibility to work with these provisions lies with CZM authorities, past experience shows that monitoring and enforcement of rules relating to the landward component of the CRZ was a difficult task for CZM authorities. It is doubtful whether they have adequate capacity and infrastructure to monitor implementation of the new rules in relation to the seaward component of the CRZ.

¹⁵⁷ A dedicated coastal statute offers both upsides and downsides. As far as the upsides are concerned, it ensures consistency in practice. Since legislative time and resources are limited, amending a dedicated statute is difficult. A statute can be amended only by the concerned legislature, which passed the law, and, it cannot be amended every now and then. At the same time, subordinate legislation can be amended easily as the power to do so lies solely within the executive domain. The Union Ministry of Environment and Forests in India has utilised this power to amend Coastal Regulation Zone Notification, 1991 every now and then and as the discussion points out, these amendments were carried out only to dilute the beneficence of the law. The coastal environment is dynamic and SLR brings up new challenges, which the lawmakers would not have anticipated. This does not mean that the law needs to be amended frequently to reflect these changes. Rather, while the law and its substantive fundamentals remains more or less constant, being based on a principled approach, changes that are more or less managerial or procedural are to be carried out to the ICZM plan. As will be seen in the subsequent sections of this study, a coastal law should be on firm grounding, to bring in consistency in practice, while changes to respond to new realities are to be reflected in the ICZM plan. It should not be the other way round.

¹⁵⁸ *CRZN, 2011, supra* note 119, ¶(IV)(a).

While the CRZ 2011 has omitted the controversial provisions relating to special economic zones in the CRZ 1991,¹⁵⁹ it retains several contentious ones and fails to address certain critical issues, as did its predecessor. Accordingly, it continues to permit roads on stilts or pillars, even in CRZ-I areas, i.e., ecologically sensitive areas, like mangroves, coral reefs, sand dunes, and nesting grounds of birds.¹⁶⁰ This permission was granted despite strong apprehensions expressed by the fishing community that such provisions would be subjected to abuse.¹⁶¹

The Indian economy is one of the fastest growing in the world and nuclear energy is emerging as a crucial component in its energy mix. The country has six nuclear power plants at different stages of construction in addition to the 20 currently in service.¹⁶² Due to the easy availability of water, coastal regions are a preferred location for nuclear power plants, leading to contamination of the coastal and marine environment.¹⁶³ Against the backdrop of the 2011 earthquake and tsunami in Japan that caused serious damage and leakage of radiation from the Fukushima nuclear power plant, questions are being raised in India about the safety of its nuclear power plants in coastal regions. Of particular concern are the *Koodankulam* nuclear reactor¹⁶⁴ and the *Jaitapur* nuclear power station (a European pressurized reactor) in Maharashtra.¹⁶⁵ When commissioned, the *Jaitapur* plant will be one of the largest nuclear power-generating stations in the world.¹⁶⁶ Interestingly, both the CRZ 1991 and CRZ 2011 exclude Atomic Energy Department projects from the

¹⁵⁹ For the text of the relevant notification, see (N SO470 (E) 2002, India).

¹⁶⁰ *CRZN, 2011*, *supra* note 119, ¶3(iv)(a).

¹⁶¹ Staff Reporter, “Elevated Expressway Opposed” *The Hindu [of India]* (1 August 2010), online: The Hindu <<http://www.thehindu.com/news/cities/Chennai/article544745.ece>>.

¹⁶² *Nuclear Power Corporation of India Limited*, online: NPCIL <<http://www.npcil.nic.in/>>.

¹⁶³ Tony George Puthucherril, “Harnessing the Atom: Strengthening the Regulatory Board for Nuclear Safety in India Based on the Canadian Experience” (2008) 26 *J Energy & Nat’l Res L* 553 (HeinOnline).

¹⁶⁴ *G Sundarrajan v India* (31 August 2012) WP No24770 of 2011 (Madras HC) (clearing the decks for the commissioning of Units I and II of the Kudankulam nuclear power project); see also *G Sundarrajan v India* (6 May 2013) CA No 4440 of 2013 (SC India) (upholding the Madras High Court decision granting clearance to the project) [*Sundarrajan*, 2013].

¹⁶⁵ “Debate: Time to Review Jaitapur?-1”, *The Times of India*, Video (19 April 2011), online: The Times of India <<http://www.timesnow.tv/Debate-Time-to-review-Jaitapur1/videoshow/4367863.cms>>.

¹⁶⁶ Ketki Angre & Prachi Jawadekar Wagh, “Villagers Protest against Jaitapur Nuclear Power Plant” *NDTV* (28 December 2010) online: NDTV <<http://www.ndtv.com/article/india/villagers-protest-against-jaitapur-nuclear-power-plant-75503>>.

ambit of their regulatory requirements.¹⁶⁷ This could have serious consequences, as it was revealed that the environmental clearance for the *Jaitapur* nuclear power station did not provide for the effects of a tsunami.¹⁶⁸ With Fukushima as a recent example, this lack of provision is a serious lapse for a nuclear reactor that is to be situated on the coast.¹⁶⁹

With reference to the concept of ICZM, the centerpiece of the integration provisions in the CRZ 2011 is the inclusion of territorial waters and the water area of tidal water bodies within its jurisdictional ambit. In operationalizing this jurisdiction over the water space component of the coastal zone, the intent is to control the discharges of effluent, waste and pollution from a wide range of community and industrial activities. This law clearly provides for spatial integration. Furthermore, the CRZ 2011 adds a fifth category to the CRZ – CVCAs – to strengthen the ICZM process.¹⁷⁰ The designation and management of CVCAs will involve fishermen and local communities in the development of integrated management plans.¹⁷¹ Enhanced stakeholder participation in the implementation of ICZM in India is an important step forward.

Despite providing for spatial integration and the preparation of integrated management plans for CVCAs, the CRZ 2011 does not advance the concept of integration of the coastal management legal regime far enough. For instance, as pointed out earlier, a plethora of laws are relevant to CZM, including those applicable to fisheries, water pollution, forest management, coastal aquaculture, planning, environmental impact assessment, and disaster management.¹⁷² The CRZ 2011 does nothing to integrate this vast body of laws or their prescriptions,¹⁷³ nor does it ensure co-

¹⁶⁷ *The Coastal Regulation Zone Notification, 1991*, *supra* note 49, ¶2(i)(b); *CRZN, 2011*, *supra* note 119, ¶3(i)(b); see also *Sundarrajan*, 2013, *supra* note 164, ¶¶130-32 (turning down the argument that as a project of the Nuclear Power Corporation of India Limited and not of the Department of Atomic Energy, the Koodankulam nuclear power plant, located within 500 metres of HTL was a prohibited activity under *CRZ notification 1991*).

¹⁶⁸ Bahar Dutt, “Tsunami not Factored into Jaitapur N-plant” *IBNLive* (15 September 2011), Video, online: [IBNLive <http://ibnlive.in.com/news/tsunami-not-factored-into-jaitapur-nplant/146146-3.html>](http://ibnlive.in.com/news/tsunami-not-factored-into-jaitapur-nplant/146146-3.html); see *CRZN, 2011*, *ibid*, annexure-IV.

¹⁶⁹ Staff Reporter, “Elevation Reduces Chances of Tsunami at Jaitapur: Kakodkar” *The Hindu [of India]* (15 March 2011), online: [The Hindu <http://www.hindu.com/2011/03/15/stories/2011031562621400.htm>](http://www.hindu.com/2011/03/15/stories/2011031562621400.htm).

¹⁷⁰ *CRZN, 2011*, *supra* note 119, ¶7(v)B.

¹⁷¹ *Ibid* at 16, ¶4(a)-(e).

¹⁷² For instance, see *The Water (Prevention and Control of Pollution) Act, 1974*; *Forest (Conservation) Act, 1980*; *Coastal Aquaculture Authority Act, 2005* and *National Disaster Management Act, 2005*.

¹⁷³ One of the more practical ways to ensure legal integration between the different statutes is to provide rules to resolve conflicts between the different legislative prescriptions. For instance, see

operation and co-ordination of activities between the different ministries (at both the federal and provincial levels), statutory authorities, and administrative agencies with responsibilities in the coastal zone.¹⁷⁴ This is a significant lapse, given that the CRZ 2011 extends jurisdiction over territorial waters as well. Interestingly, the Government of India has initiated an ICZM project at both the national and state levels with financial assistance from the World Bank.¹⁷⁵ The primary activities under the national component involve mapping the hazard line and ecologically sensitive areas, establishing a national centre for sustainable CZM, and building to capacity.¹⁷⁶ In the states, the project seeks to implement ICZM in Orissa (covering the coastal stretches of Paradeep to Dhamra and Gopalpur to Chilka),¹⁷⁷ Gujarat (Gulf of Kutch),¹⁷⁸ and West Bengal (for Digha-Shankarpur and Sagar Island, the Sunderbans).¹⁷⁹ On closer examination, it can be seen

Section 6(1) ensures overriding effect to the provisions of the National Environmental Management: Integrated Coastal Management Act, 2008, (South Africa) in the event of a conflict between this law and any other legislation in relation to coastal management.

¹⁷⁴ An important feature of the now aborted CMZ, 2008 is that it provides for the constitution of a National Board for Sustainable Coastal Zone Management, a large body consisting of not more than 32 members with mandate to provide advice to the Central Government on coastal zone management matters. The Union Minister for Environment and Forests chairs this body while the Union Minister in-charge of the Ministry of Earth Sciences acts as the co-chair. The body also consists of experts (from diverse fields like coastal ecosystems, marine biology, maritime law, meteorology, disaster management, and environmental economics), representatives from the National Commission for Women, Ministry of Urban Development, Ministry of Panchayati Raj, representatives from fishers (1 male and 1 woman), aquaculture, tourism, mining, and ports, representatives of coastal Rural District Panchayats and coastal Urban Local Authorities, etc. Even though this body performs advisory functions, and cannot undertake regulatory tasks, it is an important measure that can facilitate greater co-ordination between the different stakeholders.

¹⁷⁵ India, Ministry of Environment & Forests, Press Brief, "India, World Bank sign two loan agreements for Coastal Zone Management and Remediation of Polluted Sites" (22 July 2010).

¹⁷⁶ The Society of Integrated Coastal Management comprises experts from coastal science and management and is the nodal agency to implement this project. Society of Integrated Coastal Management, *Implementation of Integrated Coastal Zone Management Project* (New Delhi: SICOM, [nd]), online: MoEF <<http://moef.nic.in/downloads/publicinformation/SICOM%20Brochure.pdf>> [SICOM, *Implementation of ICZMP*].

¹⁷⁷ Major activities include constitution of a state project management unit, ICZM plan preparation, construction of embankments, construction of multi-purpose cyclone shelters, establishment of solid waste landfill, mangrove plantation and protection of wetlands, ecotourism, conservation of archaeological and cultural assets, capacity building, etc. *Ibid*; see also *Integrated Coastal Management Society of Odisha*, online: ICZMP <<http://www.iczmpodisha.org/>>.

¹⁷⁸ Major activities include constitution of a state project management unit, ICZM plan preparation, socio-economic development of villages, mangrove restoration, coral transplantation, underground sewage system, ecotourism, livelihood improvement, marine oceanarium, marine national park, etc. SICOM, *Implementation of ICZMP*, *supra* note 176; see also *Gujarat State Project Management Unit*, online: GECICZMP <<http://www.geciczmp.com/>>.

¹⁷⁹ Major activities include constitution of a state project management unit, ICZM plan preparation, ecotourism, 100 per cent household electrification in Sagar, beach cleaning and beautification, drainage system, construction of cyclone shelter facilities in Sunderban, livelihood improvement and

that many of the project areas are CVCAAs identified under the CRZ 2011.¹⁸⁰ Thus, India has adopted a cautious approach in implementing ICZM, restricting its current efforts to this narrow category, which, in due course, may be extended, to other coastal states and union territories.¹⁸¹ Here, it seems, the emphasis has shifted to developing adequate capacity to implement ICZM subsequently on a grander scale.

The provisions in the CRZ 2011 regarding conservation and protection of coastal stretches and promotion of sustainable development are practically inadequate to respond to the effects of rising sea levels. Without a doubt, the law is weak from the perspective of adaptation to the adverse consequences of climate change, including SLR. In the CRZ 1991, areas threatened by inundation were categorized under CRZ-I.¹⁸² In effect, these areas were subjected to a high degree of protection, as little to no new construction was possible. This protective and precautionary measure has been completely abandoned in the CRZ 2011. Demarcation of the hazard line is the principal methodology envisaged in the CRZ 2011 to address rising waters.¹⁸³ Determined on the basis of tides, waves, SLR and shoreline changes, the area under the CRZ expands if the hazard line falls beyond 500 meters from the HTL on the landward side. Once determined, no development activities are permitted in the area between the hazard line and 500 meters on the landward side, except fishing villages and their related fishing facilities, infrastructure and local communities (e.g., dispensaries, roads, and schools).¹⁸⁴ Furthermore, the CRZ 2011 provides that the dwelling units of local communities, including those of fishermen, will not be relocated even if the dwelling units are located on the seaward side of the

market access in Sagar, post-fish-harvest handling and fish auction centre at Digha, etc. SICOM, *Implementation of ICZMP*, *ibid.*

¹⁸⁰ The entire Sunderbans mangrove area, the Gulf of Khambat and the Gulf of Kutchchh in Gujarat, Malvan, Achra-Ratnagiri in Maharashtra, Karwar and Coondapur in Karnataka, Vembanad in Kerala, Gulf of Mannar in Tamil Nadu, Bhaitarkanika in Orissa, Coringa, East Godavari and Krishna in Andhra Pradesh have been declared as Critical Vulnerable Coastal Areas. *CRZN, 2011*, *supra* note 119 at 16, ¶4(b).

¹⁸¹ India, Ministry of Environment & Forests, Press Brief, “Society to implement India’s major Coastal Zone Management Project launched” (15 September 2010).

¹⁸² See *Notification under Section 3(1) and Section 3(2)(V) of the Environment (Protection) Act, 1986 and Rule 5(3)(D) of the Environment (Protection) Rules, 1986 Declaring Coastal Stretches as Coastal Regulation Zone (CRZ) and Regulating Activities in the CRZ* (N SO114 (E) 1991, India), annexure-I, n6.1(i) (entitled “Coastal Area Classification and Development”).

¹⁸³ For more details, see *CRZN, 2011*, *supra* note 119, annexure I, ¶D (entitled, “Hazard mapping”).

¹⁸⁴ *Ibid.*, ¶¶7-8.

hazard line. Instead, state governments are to provide these units with necessary safeguards from natural disasters.¹⁸⁵

In the aftermath of the Indian Ocean tsunami of 2004 and the large death toll attributed to the close proximity of fishing hamlets to the sea, the coastal state of Tamil Nadu, one of the worst affected, issued a notification to move fishing communities away from the coast and to discourage settlements so as to prevent beachfront land development.¹⁸⁶ Since then, most coastal states have discouraged fishing communities from setting up hamlets or continuing habitation in close vicinity of the sea. Justifiable on the grounds of safety, this retreat strategy has been viewed with suspicion by many environmental NGOs and fishing communities. They consider these measures as an attempt to ensure that these lands are rendered free of claims by fishing communities in order to make them available to corporate development projects, tourism infrastructure, or special economic zones.¹⁸⁷ Setback and hazard lines, they believe, will lead to large-scale forced evictions, ruining the lives and livelihoods of fishing communities.¹⁸⁸ It is to assuage these fears that the CRZ 2011 expressly provides that the dwelling units of local communities, including those of fishers, will not be relocated.

The CRZ 1991 restricted new construction close to the shoreline and provided for a 200-meter no-development zone in CRZ-III areas. The CRZ 2011 practically reduces the 200-meter NDZ to 100 meters, allowing construction or reconstruction of dwelling units of traditional coastal communities in this stretch of land.¹⁸⁹ This provision essentially permits entry of people into the 100-to-200-meter zone, an area previously out of bounds to all. These changes, together with the provision not to re-settle fishers living seaward of the hazard line, mean that traditional fishers (who have the least capacity to adapt to climate change and SLR) are unnecessarily being put at risk.

This situation could have been avoided if awareness programmes had been launched to sensitize coastal communities to the dangers posed by SLR and settlement in

¹⁸⁵ *Ibid*, ¶8.

¹⁸⁶ *Natural Calamities - Tsunami 2004 - Housing Reconstruction Policy 2005* (GO Ms No 172, Tamil Nadu) online: Revenue (NC III) Department <<http://www.tn.gov.in/gorders/rev/rev-e-172-2005.htm>>.

¹⁸⁷ Manju Menon, Sudarshan Rodriguez & Aarthi Sridhar, *Coastal Zone Management Notification '07: Better or Bitter Fare?: A Critique* (Bangalore: ATREE, 2007) at 12, online: dakshin foundation <<http://www.dakshin.org/DOWNLOADS/BitterorBetterFare.pdf>>.

¹⁸⁸ *Ibid*.

¹⁸⁹ *CRZN, 2011, supra* note 119, ¶IIIA(ii).

close vicinity to the rising sea. Furthermore, the CRZ 2011 could have included provisions recognising the doctrine of public trust, such as those provided in the *South African National Environmental Management: Integrated Coastal Management Act 2008*.¹⁹⁰ Such a provision could have assuaged public fears that these lands, once cleared of fishers, would subsequently be usurped for development projects.¹⁹¹ As will be seen in chapter six, the doctrine of public trust emerges as a significant bulwark against any attempt by the state to transfer public trust properties for development purposes, since the property has to be maintained for particular types of uses.¹⁹² The doctrine of public trust envisions the state as trustee of all natural resources for public use and enjoyment; indeed, as trustee, the state has a legal duty to protect such resources.¹⁹³ Even though, both the CRZ 1991 and the CRZ 2011 secure the right of public access to the beachfront,¹⁹⁴ this right is not viewed from the prism of the doctrine of public trust, particularly in the new coastal law. These are significant omissions and much confusion on this count could have been avoided if the management of coastal areas were grounded in public trust.

It would have been apposite if the CRZ 2011 had retained the previous restrictions on construction of new dwellings in the CRZ-III NDZ and yet permitted local fishing facilities. Furthermore, in cases where the hazard line has been determined, new settlements in highly vulnerable areas on the seaward side of the hazard line should be discouraged;¹⁹⁵ moreover, existing vulnerable human habitations should be protected and, as required, re-located to higher ground, based on the rate of SLR. In this way, these vulnerable lands could still benefit traditional fishing communities by permitting fishing-related infrastructure until rising waters engulf the areas.

¹⁹⁰ *National Environmental Management: Integrated Coastal Management Act*, (S Afr), No 24 of 2008, s 12 (state is a trustee of coastal public property) [*SA, Integrated Coastal Management Act*].

¹⁹¹ India, *Report of the Public Consultation with Fisherfolks*, *supra* note 50 at 22.

¹⁹² Joseph L Sax, "The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention" (1970) 68 Mich L Rev 471 at 477 (HeinOnline).

¹⁹³ The doctrine of public trust in Indian environmental law is the product of judicial legislation and innovation. *MC Mehta v Kamal Nath*, (1997) [1997] 1 SCC 388 (India SC); *MI Builders v Radhey Shyam Sahu*, (1999) [1999] AIR SC 2468 (India SC); *KM Chinnappa v India*, (2003) [2003] AIR SC 724 (India SC); *West Bengal v Kesoram Industries Ltd*, (2004) [2004] 10 SCC 201 (India SC); *Intellectual Forum v AP*, (2006) [2006] 3 SCC 549 (India SC); *Fomento Resorts and Hotels Ltd v Minguel Martins*, (2009) 3 SCC 571 (India SC); For discussion on the public trust doctrine and coastal zone management, see also Ch 6, Part 6.3.

¹⁹⁴ *CRZN, 2011*, *supra* note 119, annexure-III, ¶I(c), (p).

¹⁹⁵ For instance, see *SA, Integrated Coastal Management Act*, *supra* note 190, s 25(1). It prohibits or restricts the building, erection, alteration or extension of structures that are wholly or partially seaward of that coastal setback line. *Ibid*.

The Coastal Management Subgroup of the IPCC identified the concepts of retreat, accommodate and protect as three broad adaptation responses to SLR.¹⁹⁶ No one strategy is superior to the others, and the choice of one is based primarily on realities in the field. In certain cases, a combination of all three strategies may be required for optimal results. By providing that, for instance, fishing communities not be relocated, the CRZ 2011 forecloses the range of options available under retreat and accommodation and casts an onerous responsibility on state governments to protect dwelling units, thereby placing its faith squarely in protection options. Traditionally, state governments in India have relied on hard structures like sea walls or on armouring coastlines with rocks to protect the coastline. For instance, 332 kilometers of Kerala's 590-kilometer coastline is already encompassed by concrete sea walls.¹⁹⁷ However, in many places along the Indian coastline, sea walls and rocks have not been able to hold their ground against an advancing sea and have also triggered severe environmental impacts.¹⁹⁸ Both agricultural and fishing communities reject sea walls as they prevent rainwater runoff into the sea, lead to flooding of agricultural lands, or cut off unimpeded access to the sea for local fishermen.¹⁹⁹ In several areas, sea walls have put an end to catamaran-based fishing.²⁰⁰

In short, then, CRZ 2011, like its predecessor, continues to be weak in operationalizing ICZM goals and essentially follows a pro-development paradigm. It is inadequate in terms of its prescriptions, both in implementing ICZM and in adapting to climate change. Furthermore, it provide very little normative guidance to prepare either the Indian coastline or the residents of coastal communities to adapt to current and future climate-related challenges. Moreover, the concept of hazard line management is highly flawed. In seeking to protect the interests of traditional fishing communities, this law opens up the coastline to more people, placing populations with the least adaptive capacity at undue risk from rising waters. Thus, from the above appraisal, it is clear that the battle to bring coherence to the coastal law fabric in India is far from over. It is only a

¹⁹⁶ J Dronkers et al, eds, *Report of the Coastal Management Subgroup: Strategies for Adaption to Sea Level Rise* (Geneva: IPCC, Response Strategies Working Group, 1990) at 147-48.

¹⁹⁷ For anti-sea erosion works, see Gov't of Kerala, Minister of Water Resources, *Projects and Programmes Under the Chief Engineer - Irrigation & Administration*, online: Department of Irrigation <http://www.irrigation.kerala.gov.in/pjt_&_pgm/Anti_sea_erosion_%20works.php>.

¹⁹⁸ Sudarshan Rodriguez et al, *Policy Brief: Seawalls* (UNDP/UNTRS, & ATREE, 2008).

¹⁹⁹ *Ibid* at 2.

²⁰⁰ *Ibid*.

question of time before we once again see controversies, amendments, and rancorous court battles over this narrow but vital strip where the land meets the sea.

3.2.2 Pakistan

The Islamic Republic of Pakistan²⁰¹ has a 990-kilometer coastline encircling the northern rim of the Arabian Sea.²⁰² This generous coastal expanse has helped the Pakistani landmass generate substantial maritime estate, accounting for over 30 per cent of its land area.²⁰³ In terms of physiographic and geological characteristics, the coastal areas of Pakistan are basically a “sub-tropical desert”²⁰⁴ that can be divided into two sections: the Balochistan coast (760 kilometers in the Balochistan province) and the Sindh coast (230 kilometers in the Sindh province).²⁰⁵ The Balochistan coastal segment can be further subdivided into Mekran (the Gwadar district) and Lasbela (the Lasbela district),²⁰⁶ while the Sindh coast can be apportioned into the Indus delta and the Karachi coastline.²⁰⁷

In coastal Balochistan, Mekran is tropical and semi-arid, fresh water supplies are limited, and rainfall is scanty. Accordingly, the soils are highly saline, which discourages the development of human settlements and agriculture.²⁰⁸ Consequently, Mekran is the least developed portion on the Pakistani coastline and is comparatively pristine. Nevertheless, with the commissioning of the Gwadar deep-sea port and a series of other

²⁰¹ A Shah Amjad, I Kasawani & J Kamaruzaman, “Degradation of Indus Delta Mangroves in Pakistan” (2007) 1:3 Int’l J Geology 27 at 27.

²⁰² Pakistan Environmental Protection Agency, *Brief on Environmental Problems of the Marine and Coastal Areas*, online: Intervention <http://www.environment.gov.pk/PRO_PDF/Position Paper/Marine %20pollution.pdf>.

²⁰³ Pakistan has 22,820 square kilometers of territorial waters, 240,000 square kilometers of exclusive economic zone and its continental shelf area is about 50,270 square kilometers. *Pakistan: National Strategy and Action Plan for Mangroves for the Future* (2010) at 5, Mangroves for the Future <<http://www.mangrovesforthefuture.org/assets/Repository/Documents/NSAP-Final-Doc2.pdf>> [*Pakistan: National Strategy and Action Plan*]; see also FAO, *Fishery and Aquaculture Country Profile: Islamic Republic of Pakistan* (FID/CP/PAK, 2009), at 2.

²⁰⁴ John C Pernetta, ed, *Marine Protected Areas Needs in the South Asian Seas Region*, A Marine Conservation and Development Report, vol 4: Pakistan (Gland: IUCN, 1993) at 1 [Pernetta, *Pakistan*].

²⁰⁵ The tail end of the southwest monsoon waters the Sindh coast. The Balochistan coast is semi-tropical and arid. The Balochistan coastal areas are characterized by oceanic waters and is rocky, has some coral-reefs, and there is a thin scatter of mangrove stands. The Sindh coast has a shallower profile with a combination of mangrove forests, mudflats, and sandy beaches. *Pakistan: National Strategy and Action Plan*, *supra* note 203 at 3.

²⁰⁶ IUCN Pakistan & Gov’t of Balochistan, *Balochistan Conservation Strategy* (Karachi: IUCN Pakistan & Gov’t of Balochistan, 2000) at 97.

²⁰⁷ Sindh Programme Office, *Preliminary Compendium of Coastal and Marine Protected Areas in Pakistan* (Karachi: Sindh Programme Office, IUCN-The World Conservation Union, 2005) at 11.

²⁰⁸ *Ibid* at 10.

projects that may soon see fruition,²⁰⁹ it is expected that there will be more development in Balochistan, necessitating effective CZM. In contrast, the Lasbela segment, situated close to Karachi, houses the Gadani shipbreaking yard (in its heyday, one of the world's largest)²¹⁰ and several other industrial estates.²¹¹

Similarly, there is sharp contrast between the Sindh portions of the coastline: while one section is highly developed (Karachi segment), the other (Indus delta) is pristine and highly important from a biodiversity perspective, but under severe stress. The primary economic activity in the coastal zones, along with most of the population, is concentrated in the coastal city of Karachi,²¹² which is the capital of the Sindh Province and the economic nerve center of Pakistan.²¹³ Not surprisingly, then, the 70-kilometer stretch of coastline near Karachi is more developed than the rest of Pakistan's coastal area.²¹⁴ Karachi is home to one of the biggest ports in South Asia²¹⁵ as well as to fishing harbors and power plants (including the Karachi nuclear power plant).²¹⁶ It is also a major industrial hub housing several establishments.²¹⁷

The Pakistani coastline harbors several unique living and non-living resources, including mangroves, which are being degraded at an alarming rate.²¹⁸ In addition, and as

²⁰⁹ See Hasan Yaser Malik, "Strategic Importance of Gwadar Port" (2012) 19:2 J Political Stud 57; "Pakistan hands management of strategic Gwadar port to China", *Reuters [Islamabad]* (18 February 2013) online: Reuters <<http://www.reuters.com/article/2013/02/18/us-pakistan-portidUSBRE91H0IU20130218>>.

²¹⁰ This yard had a total area of 1,400 hectares, divided into 200 plots and a water frontage of 8,000 meters. The industry used to provide employment to nearly 35,000 people, and another half a million people were indirectly dependent on it. IUCN Pakistan & Gov't of Balochistan, *supra* note 206 at 98.

²¹¹ For more details, see *Lasbela Industrial Estates Development Authority*, online: LIEDA <<http://www.lieda.gov.pk/>>.

²¹² Most of the coastal areas of Pakistan are sparsely populated, except for Karachi, which has a population of about 18 million people. *Ibid.*

²¹³ *Official Web Portal of City District Government Karachi*, online: CDGK <<http://www.karachicity.gov.pk/>>.

²¹⁴ Pakistan, Ministry of Environment, *Pakistan's Initial National Communication on Climate Change* (Islamabad: Ministry of Environment, 2003) at 29 [*Pakistan's Initial National Communication*].

²¹⁵ *Karachi Port Trust*, online: KPT <<http://kpt.gov.pk/>>.

²¹⁶ See generally Zia Mian, *Some Issues Associated with Pakistan's Karachi Nuclear Power Plant (KANUPP)* (Working Paper Series #51) (Islamabad: SDPI, 2000).

²¹⁷ Karachi has nearly 8,000 small and large industrial units. Muhammad Yasin Janjua, *Environmental Problems of Marine and Coastal Areas of Pakistan*, online: SAARC Disaster Management Centre <<http://saarcsdmc.nic.in/pdf/workshops/goa/Pakistan/Environmental%20Problems%20of%20Marine%20&%20Coastal%20Area%20of%20Pakistan.pdf>>.

²¹⁸ Pernetta, *Pakistan*, *supra* note 204 at 13.

mentioned earlier, the pollution from the shipbreaking industry,²¹⁹ the constant threat from oil pollution (due to close proximity to some of the major and busiest shipping lanes),²²⁰ dam construction, and upstream abstraction of water²²¹ are some of the major challenges the Pakistani coastline faces, rendering it all the more vulnerable to SLR. Like elsewhere in South Asia, coastal and marine resources, particularly fisheries, play an important role in supporting the local and national economies.²²² However, most of the coastal communities live below the poverty line.²²³

Pakistan falls in the list of ten countries most vulnerable to the impacts of rising sea levels.²²⁴ Currently, SLR along the Pakistan coast is approximately 1.1 millimeters per year.²²⁵ The IPCC predicts that a 20-centimeter rise in sea level will inundate about 1,700 square kilometers of the country's coastal land (under a scenario of no adaptation measures).²²⁶ It is believed that the Sindh coastal zone is more vulnerable to SLR than the Balochistan coast because of geographical factors and that the main areas of vulnerability are the coastal areas of Karachi and the Indus deltaic creek system.²²⁷ In the Balochistan area, the sea level is rising at a rate of 1.1 millimeters a year, which will aggravate the

²¹⁹ The Gadani beach resulted in the ruin of an important ecosystem that had considerable tourism potential. IUCN Pakistan & Gov't of Balochistan, *supra* note 206 at 104.

²²⁰ In 2003, the oil tanker *Tasman Spirit* carrying 67,535 tonnes of light crude oil grounded in the channel of the Karachi port and disgorged huge amounts of oil into the water, contaminating the environment. For further details, see *Tasman Spirit Oil Spill – Assessment Report*, online: OCHANet <<http://ochanet.unocha.org/p/Documents/Pakistan.pdf>>.

²²¹ The construction of a dam over the river resulted in elimination of oyster beds. IUCN Pakistan & Gov't of Balochistan, *supra* note 206 at 108.

²²² It provides employment to about 300,000 fishermen and another 400,000 are employed in ancillary industries. It is also a major source of export earnings. In July-May 2002-03, fish and fishery products valued at USD117 million were exported from Pakistan. Its contribution to GDP is currently one per cent and Pakistan earns six per cent of its total foreign exchange by exporting fish, shrimp, and other fish products. Mohsin-ul-Ibad Haider, Fahad Abdul Malik & Hussain Shahid Rajput, "The Fishing Industry of Pakistan" (2011) ¶4.2, online: SCRIBD <<http://www.scribd.com/doc/94100938/Fishing-Industry-Final>>.

²²³ Humera Alwani, "Rescuing Sindh's coastal communities", *Dawn* (24 August 2008), online: Dawn.Com <<http://archives.dawn.com/archives/190148>> (pointing out that nearly 79 per cent of the coastal population of Sindh live below the poverty line.)

²²⁴ Amjad, Kasawani & Kamaruzaman, *supra* note 201 at 30.

²²⁵ *Pakistan's Initial National Communication*, *supra* note 214 at 44.

²²⁶ Murari Lal, Hideo Harasawa & Daniel Murdiyoso, "Asia" in James J McCarthy et al, eds, *Climate Change 2001: Impacts, Adaptation, and Vulnerability: Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2001) 533 at 569.

²²⁷ Tariq Masood Ali Khan et al, "Sea Level Variations and Geomorphological Changes in the Coastal Belt of Pakistan" (2002) 25:1 Mar Geodesy 159.

problem of salinity intrusion into the aquifers.²²⁸ SLR is a serious problem in coastal and industrially important Karachi.²²⁹ Apart from the destruction to coastal infrastructure, rising seawater can also lead to salinity intrusion, further aggravating the water crisis. Coastal erosion has been noticed at the ports of Gwadar, Pasni and Gadani,²³⁰ and on the islands at the approaches of the creeks in the Indus delta.²³¹ Out of nine vulnerabilities identified in the National Climate Change Policy, 2012, which affect the Pakistani coastline, three specifically are the intrusion of saline water into the Indus river delta, SLR and increased cyclonic activity due to higher sea surface temperatures, and water stress between upper and lower riparians over water sharing.²³² In the paragraphs below, an overview will be provided of the dynamics of water management *vis-à-vis* the coastal zone by exploring the water relations between the provinces in Pakistan and how it is affecting the Indus delta, magnifying SLR impacts.

The River Indus is one of the world’s largest river systems, measuring about 3,180 kilometers. From its source in China, the Indus flows through India and Pakistan to the Arabian Sea.²³³ In Pakistan, the river flows primarily through the provinces of Punjab and Sindh. When it finally empties into the Arabian Sea, it creates the Indus river delta, which is 200 kilometers long and 50 kilometers wide and extends over an area of nearly 600,000 hectares on the border between Pakistan and India.²³⁴ It is home to nearly 900,000 people. The Indus River discharges some 200 square kilometers of water and 450 million tonnes of suspended sediment annually into the delta and the related estuary²³⁵ to create

²²⁸ IUCN Pakistan & Gov’t of Balochistan, *supra* note 206 at 99.

²²⁹ Further lowering of the water table in the coastal aquifer of Karachi will enhance seawater intrusion. This will affect the quality of drinking water in the coastal aquifer system, and ultimately the whole aquifer water will be rendered unfit for use. A Mashiatullah et al, “Groundwater Salinity in Coastal Aquifer of Karachi, Pakistan (A Preliminary Investigation)” (2002) 7:3-4 *Sci Vision* 195 at 196. Karachi is at high risk from SLR, prolonged cyclonic activity, and salt-water intrusion. Asian Development Bank, *supra* note 38 at 23.

²³⁰ *Pakistan’s Initial National Communication*, *supra* note 214 at 60.

²³¹ *Ibid* at 45.

²³² Pakistan, Ministry of Climate Change, *National Climate Change Policy* (Islamabad: Ministry of Climate Change, 2012) at 2, 3 [Pakistan, *National Climate Change Policy*].

²³³ For more on the River Indus, see *Indus River*, online: The Encyclopedia of Earth <http://www.eoearth.org/article/Indus_River>.

²³⁴ See generally Peter John Meynell & M Tahir Qureshi, “Sustainable Management of Mangroves in the Indus Delta, Pakistan” in Davis, ed, *Towards the Wise Use of Wetlands: Report of the Ramsar Convention Wise Use Project*, TJ (Gland: Ramsar Convention Bureau, 1993) 113.

²³⁵ Pakistan, *Fourth National Report* (Islamabad: Ministry of Environment, 2009) at 10.

the fifth largest delta system in the world.²³⁶ It accommodates nearly 97 per cent of Pakistan's mangroves (the remaining three per cent is in Balochistan).²³⁷ In fact, this mangrove forest system is the seventh largest in the world, and the largest in arid climates. It is home to several unique species, such as the blind Indus dolphin.²³⁸

The most critical issue wreaking havoc on this delta and related ecosystems is the large-scale abstraction of water from the river to support agriculture and other activities in the upstream areas.²³⁹ Pakistan has a vast irrigation network and a significant volume of the Indus water is diverted to this network,²⁴⁰ pointing out to the centrality of this river system in sustaining the nation.²⁴¹ Due to these diversions, by the time the Indus reaches the Kotri Barrage (about 200 kilometers away from the Arabian sea), the flow is woefully inadequate and cannot support the natural ecosystems of the Indus delta.²⁴² It has been estimated that the freshwater flow has drastically reduced from the annual 150 million acre feet (MAF) 60 years ago to just 0.72 MAF in 2006.²⁴³ The situation is so acute that while the International Union for Conservation of Nature estimates that 27 MAF is absolutely essential to maintain the health of the delta, during the negotiations preceding the water sharing agreement entered into between the four provinces of Punjab, Sindh, Balochistan and the North West Frontier Province regarding water apportionment Sindh was of the view that the at least ten MAF needed to be set aside for this purpose. However, since the other states forwarded different figures, the agreement failed to decide the matter, leaving the issue to be decided later-on after comprehensive studies.²⁴⁴ Consequently, sea water has intruded inland up to nearly 75 kilometers, severely

²³⁶ For further details, see *Indus Delta, Pakistan*, online: WWF <http://wwf.panda.org/what_we_do/where_we_work/indus_delta/>.

²³⁷ R Rajagopalan & Ahana Lakshmi, *A Comparative Review of Coastal Legislation in South Asia*, UNEP & GPA (May 2003) at 117.

²³⁸ For further details on delta diversity, see *Indus Delta, Pakistan*, *supra* note 236.

²³⁹ See Amjad, Kasawani & Kamaruzaman, *supra* note 201 at 29.

²⁴⁰ IUCN, "Indus Delta, Pakistan: Economic Costs of Reduction in Freshwater Flows" (Case Studies in Wetland Valuation #5 (May 2003) at 3 online: CBD <<http://www.cbd.int/doc/external/countries/pakistan-wetland-cs-2003-en.pdf>> [IUCN, "Indus Delta, Pakistan"].

²⁴¹ *Ibid*; Pakistan, Shafaq Zaheer, "Environment" in *Pakistan Economic Survey 2007-08* (Islamabad: Ministry of Finance, 2008) 267 at 273.

²⁴² IUCN, "Indus Delta, Pakistan", *supra* note 236 at 3.

²⁴³ Sindh, Inayatullah Qureshi et al, eds, *Sindh Development Review 2008-09* (Karachi: Monitoring & Evaluation Cell, 2009) at 212.

²⁴⁴ Pakistan Institute of Legislative Development & Transparency, *Issues of Water Resources in Pakistan*, 2d ed, Briefing Paper for Pakistani Parliamentarians, No 7 (Islamabad: PILDAT, 2011) app A, ¶7 [PILDAT, *Issues of Water Resources*].

damaging the delta and the aquifers.²⁴⁵ The river hardly adds any sediment to the delta, with the consequence that the rates of erosion have increased considerably. For instance, in the Chan creek, erosion is calculated to be as high as 5,446 feet per year.²⁴⁶

In a study involving the three *talukas* of *Keti Bunder*, *Ghora Bari* and *Kharo Chan*, in Sindh Province, approximately 30,000 households incurred an average annual loss of USD70,000 in crop damage and USD45,000 from reduction in fish catch due to saltwater intrusion.²⁴⁷ It is estimated that nearly, 28,000 people in *Keti Bunder* will be displaced within the next ten years due to SLR, which has already swallowed 28 out of a total of 42 settlements.²⁴⁸ *Keti Bunder* has lost significant land area to the sea.²⁴⁹ The large-scale destruction of the mangroves has also rendered this area highly vulnerable to cyclones and tsunamis.²⁵⁰

These environmental changes have triggered socio-economic tensions as well. Due to the lack of potable water, supplies are brought in to *Keti Bunder* in tankers, which are then bought up by the landlords who then sell them at exorbitant rates to the locals.²⁵¹ Earlier, only 20 per cent of the population of *Keti Bunder* was involved in fishing.²⁵² However, due to increased salinity intrusion and destruction of coastal agriculture (*Keti Bunder* used to export red rice), now nearly 80 per cent of its population is engaged in fishing.²⁵³ At the same time, to add to their woes, there has been a considerable decline in the fish stock as well. The major variety, the *palla*, an anadromous fish that swims up into the delta from the Arabian Sea for spawning, is disappearing fast due to the low discharge of water from the Indus.²⁵⁴ Increasing salinity has also affected the *palla* and the stock has declined from about 7,900 tons in the 1959 to less than 200 metric tons in 1995.²⁵⁵

²⁴⁵ *Ibid.*

²⁴⁶ See generally Qureshi et al, eds, *supra* note 243.

²⁴⁷ See generally IUCN, "Indus Delta, Pakistan", *supra* note 236.

²⁴⁸ Faiza Ilyas, "Karachi: Keti Bunder facing sea intrusion", *The DAWN Group [of Pakistan]* (19 June 2008) online: DAWN.COM <<http://archives.dawn.com/2008/06/19/local8.htm>>.

²⁴⁹ *Ibid.* (about 113,900 acres of land has been claimed by the sea).

²⁵⁰ *Ibid.*

²⁵¹ *Ibid.*

²⁵² *Ibid.*

²⁵³ *Ibid.*

²⁵⁴ Pakistan, *Fourth National Report*, *supra* note 235.

²⁵⁵ Zofeen Ebrahim, "Save the Indus Plead Delta Folk", *Inter Press Service News Agency* (16 March 2009) online: IPS <<http://www.ipsnews.net/news.asp?idnews=46111>>.

Despite the conclusion of the *Indus Waters Treaty, 1960*,²⁵⁶ the sharing of the Indus waters between India and Pakistan has been contentious. Within Pakistan itself, there have been disputes among the provinces over water sharing.²⁵⁷ To resolve these issues, the provinces entered into a water apportionment accord in 1991.²⁵⁸ In 1994, due to severe drought, the Punjab government proposed a new formula for water sharing known as “historical uses” and obtained a higher reallocation.²⁵⁹ Since then, water sharing among the provinces has been a thorny issue. The failure of the federal government and the provinces to ensure a steady and adequate flow into the delta can aggravate the problem of SLR in this coastal region.²⁶⁰

Before proceeding to examine the coastal law framework of Pakistan, it is necessary to examine how Pakistan is approaching the issue of climate change adaptation, and in particular coastal climate change adaptation. The growing realisation that, despite its low carbon footprint, Pakistan will be one of the many countries worst affected by climate change, prompted this country to establish a Ministry of Climate Change.²⁶¹ Recently, Pakistan has approved a NCC Policy,²⁶² which provides a framework for addressing some of the climate change related issues that it faces. The goal of this policy is “[t]o ensure that climate change is mainstreamed in the economically and socially vulnerable sectors of the economy and to steer Pakistan towards climate resilient development”, and adaptation is an area of primary focus.²⁶³ Specifically, to this end, the NCC Policy identifies the following adaptation measures for the coastal zone: developing salinity tolerant crop cultivars for coastal agriculture; promoting aquaculture; maintaining optimal river water flows to ensure continuity of natural processes; controlling land-based sources of pollution; maintaining marine

²⁵⁶ *Indus Waters Treaty, 1960*, Pakistan and India, 19 September 1960, (1961) 55:3 AJIL 797 (ratifications exchanged 12 January 1961).

²⁵⁷ Manav Bhatnagar, “Reconsidering the Indus Waters Treaty” (2008) 22 Tul Envtl LJ 271 at 281 (HeinOnline).

²⁵⁸ PILDAT, *Issues of Water Resources*, *supra* note 244, app A, 37-40.

²⁵⁹ Ray Fulcher, “PAKISTAN: Kalabagh dam threatens livelihood of millions” *Green Left* (15 March 2006) online: Green Left <<http://www.greenleft.org.au/node/34432>>.

²⁶⁰ *Pakistan’s Initial National Communication*, *supra* note 214 at 45.

²⁶¹ The government has created Ministry of Climate Change by renaming Ministry of National Disaster Management. *Ministry of Climate Change: Government of Pakistan*, online: MOCC <<http://www.mocc.gov.pk/>>.

²⁶² Pakistan, *National Climate Change Policy*, *supra* note 232.

²⁶³ *Ibid* at 1.

ecosystems and fish habitats; building natural barriers, plantation and regeneration of mangroves, coastal palms and other trees to control erosion and to minimise the disastrous impacts of cyclones and tsunamis; and constructing barriers to protect low-lying coastal human settlements against rising seas and cyclones.²⁶⁴

As far as the legal framework to protect and manage coastal areas is concerned, the *1973 Constitution of Pakistan* determines its contours. Apart from India, Pakistan is the only other federal polity among the coastal countries of South Asia. Since the subject “environmental pollution and ecology”²⁶⁵ finds a place in the concurrent legislative list, both the federal and provincial governments can legislate on matters relating to the environment. However, in practice, it is the provinces that have enacted laws for the coastal management, even though there are a large number of federal environmental laws that can apply to the coastal zone.²⁶⁶ The origin of ICZM in Pakistan can be traced to the “International Workshop on Integrated Coastal Zone Management” organised in October 1994 in Karachi.²⁶⁷ The primary objective of this Workshop was “to draft guidelines for the integrated coastal zone management planning process” and it emphasised in clear terms that ICZM is “the most imperative and immediate need for Pakistan.”²⁶⁸ It is on the basis of the recommendations of this Workshop that the provinces of Sindh and Balochistan enacted their coastal laws. The salience of the prescriptions of both these laws are detailed below.

²⁶⁴ *Ibid* at 16.

²⁶⁵ *The Constitution of the Islamic Republic of Pakistan, 1973*, item 24.

²⁶⁶ Firuza Pastakia, ed, *Environmental Law in Pakistan: Governing Natural Resources and the Processes and Institutions that Affect them – Federal: Part I* (Karachi: IUCN, Environmental Law Programme, 2005) at 13. Some of the major environmental statutes (federal and provincial) that can apply to the coastal zone are: *Pakistan Environment Protection Act, 1997*; *Forest Act, 1927*; State Wildlife Protection ordinances of 1972 in Sindh and Balochistan; *West Pakistan Mines and Mineral Development Act, 1958*; *Balochistan Mining Concession Rules, 1970*; *Ports Act, 1908*; Karachi Fisheries Harbour Ordinance, 1984; *Land Acquisition Act, 1894*; Provincial Fisheries Ordinance; *Territorial Waters and Maritime Zones Act, 1979*. *Pakistan: National Strategy and Action Plan*, *supra* note 203 at 21.

²⁶⁷ Intergovernmental Oceanographic Commission, *International Workshop on Integrated Coastal Zone Management (ICZM) Organized in Co-operation with the National Institute of Oceanography, Ministry of Science and Technology, Government of Pakistan, Karachi, Pakistan, 10–14 October 1994*, Workshop Report No 114 (UNESCO, 1994).

²⁶⁸ *Ibid*.

3.2.2.1 The Coastal Laws of Pakistan (Sindh and Balochistan)

The province of Sindh enacted the *Coastal Development Authority Act* (CDAA) in 1994²⁶⁹ and subsequently amended it in 2006.²⁷⁰ The legislative mandate of this law, which extends to the coastal areas²⁷¹ of Sindh, is to provide for the development, improvement and beautification of the coastal areas in the districts of Thatta and Badin.²⁷² The Sindh CDAA contemplates coastal management by two sets of authorities. At the apex is the Provincial government of Sindh, which has the power to provide directions on policy matters from time to time.²⁷³ In addition, it has rule-making powers to implement the purposes of the Act²⁷⁴ and the power to approve the master plan and the development schemes prepared by the Coastal Development Authority.²⁷⁵

The primary authority contemplated under the Coastal Development Authority Act is the Sindh Coastal Development Authority.²⁷⁶ Subject to the general or special directions from the government, the Authority exercises thirteen major far-reaching functions²⁷⁷ and prepares a master plan that deals with the “development, improvement, expansion and beautification” of coastal areas and development schemes for coastal

²⁶⁹ *Coastal Development Authority Act 1994* (No XXVIII of 1994, Sindh) [*Sindh CDAA 1994*].

²⁷⁰ *Coastal Development Authority (Amendment) Act 2006* (No VIII of 2006, Sindh) [*Sindh CDAA, 2006*].

²⁷¹ *Sindh CDAA 1994*, *supra* note 269, s 1(3); see also *ibid*, s 2(c) (defines coastal areas as the coastal areas of the districts of Thatta and Badin).

²⁷² *Ibid*, pmbi.

²⁷³ *Ibid*, s 4(2).

²⁷⁴ *Ibid*, s 24.

²⁷⁵ *Ibid*, s 12(1). The government can approve both the documents either with or without modifications (s 12 (2)).

²⁷⁶ See *ibid*, pmbi. This Authority, which is a body corporate having perpetual succession and common seal with power to acquire and hold both movable and immovable property, has its seat in Karachi or in such other places in the coastal areas as the government may determine and can sue and be sued in its name. *Ibid*, ss 3(2) & (3); see also *Sindh CDAA, 2006*, *supra* note 270, s 2.

²⁷⁷ Some of these functions include overall development; improvement and beautification of the coastal zone; identification, execution and monitoring of the developmental schemes like development of fisheries, livestock, horticulture, forest and agriculture; upgrading and improvement of socio-economic conditions of the inhabitants; providing drinking water facilities, drainage and other rural development works; acting as coordinating agency and collaborating with federal or provincial, public or private agencies engaged in developmental activities and in environmental protection; providing technical guidelines and technical service; undertaking research, compiling relevant literature; conducting training programs; executing such schemes as are entrusted to it by the federal or provincial governments; assisting and coordinating the establishment of palm/coconut oil plantations, fish harbours and mini or deep ports at feasible locations; outfitting oil refineries with necessary pipelines. The authority can also perform other functions such as are necessary to achieve its objectives. *Sindh CDAA 1994*, *supra* note 269, s 7.

areas.²⁷⁸ It can also acquire property²⁷⁹ and is vested with power to make regulations to carry out the purposes of the Act.²⁸⁰

To facilitate the Authority's functioning, the Act vests its general direction and administration with a governing body²⁸¹, which is chaired by the Minister for Planning and Development Department.²⁸² The governing body exercises all powers and can do all "acts and things" done by the Authority.²⁸³ In discharging its functions, the governing body acts on sound principles of planning, development, operation, management and maintenance of coastal areas, and here the directions provided by the government guide it.²⁸⁴ The governing body is empowered to constitute committees like financial, technical and executive to carry out the purposes of the act.²⁸⁵ Another interesting feature of the Sindh coastal law is that, on the one hand, while it contains provisions to ensure accountability on the part of the Authority,²⁸⁶ it also has provisions that clothe the Authority with immunity from legal proceedings for acts done to further the purposes of the Act.²⁸⁷

After Sindh's brush with coastal law-making, it was Balochistan's turn. This province enacted the *Balochistan Coastal Development Authority Act* in 1998²⁸⁸, which is modeled largely on the Sindh legislation. Subsequently, this coastal law was amended in

²⁷⁸ *Ibid*, ss 12 & 13.

²⁷⁹ *Ibid*, ss 14 & 15.

²⁸⁰ *Ibid*, s 25.

²⁸¹ *Ibid*, s 5; see also *Sindh CDAA, 2006, supra* note 270, s 4. It recasts the composition of the governing body. The governing body consists of a chairman (the minister for planning and development department) and the secretaries to the following departments: planning and development; finance; forest and wildlife; irrigation and power; agriculture; culture, sports, youth affairs and tourism; local government, Kachi Abadis and spatial development; works and services; environment and alternate energy; and livestock and fisheries. Apart from these members, it consists of a district coordination officer of Thatta and Badin, two members of the provincial assembly of the Sindh (one each from the Thatta and Badin districts, to be nominated by the Chief Minister), and two eminent persons of the province nominated by the Chief Minister and the Director General, who is the secretary of the governing body. *Ibid*. The government is empowered to appoint the Director General, who possesses such qualifications and on such terms and conditions as it may determine. The Director General is also the chief executive of the authority. *Ibid*, s 6.

²⁸² *Sindh CDAA, 2006, ibid*, s 5.

²⁸³ *Sindh CDA 1994, supra* note 269, s 4.

²⁸⁴ *Ibid*, s 4(2).

²⁸⁵ *Ibid*, s 8.

²⁸⁶ The authority is to prepare and submit a report of its activities to the government. *Ibid*, s 19. Its accounts are to be audited by the auditor general. *Ibid*, s 18(2).

²⁸⁷ *Ibid*, ss 21-23.

²⁸⁸ *Balochistan Coastal Development Authority Act 1998* (No 1 of 1998, Balochistan) [*Balochistan CDA 1998*].

2001²⁸⁹ and in 2003.²⁹⁰ The Balochistan coastal law provides for coastal regulation and management at two levels. First, the Government of Balochistan is empowered to provide directions on policy matters from time to time and in cases of dispute decide whether a matter falls within the realm of policy or not.²⁹¹

While the Government is conferred with overarching powers for coastal administration, the key authority for coastal management in Balochistan is the Balochistan Coastal Development Authority, which is responsible for the “planning, development, preservation, monitoring, construction, operation, management and maintenance of the coastal areas Balochistan for the purposes of fostering of all resources concomitant to coastal development and for waters connected therewith or ancillary thereto.”²⁹² The Balochistan Coastal Development Authority has corporate trappings²⁹³ and is subject to governmental directions; furthermore, it is tasked with the implementation of wide-ranging functions,²⁹⁴ including the preparation of a master plan and development schemes for coastal areas.²⁹⁵ The Authority is also vested with a coastal development authority fund.²⁹⁶ Similar to the Sindh Coastal Development Authority, the Balochistan coastal law places general administration of this authority with a governing body, which can exercise all such powers and do all such acts and things, as is carried out by the Authority.²⁹⁷ The constitution of the governing body was revamped by the 2003 amendment and presently, no less a constitutional authority than the Chief Minister of

²⁸⁹ *Balochistan Coastal Development Authority (Amendment) Ordinance 2001* (No XVII of 2001, Balochistan).

²⁹⁰ *Balochistan Coastal Development Authority (Amendment) Act 2003* (No VII of 2003, Balochistan) [*Balochistan CDAA 2003*].

²⁹¹ *Balochistan CDA 1998*, *supra* note 288, s 4(2), (3).

²⁹² *Ibid*, pmb1 & s 3.

²⁹³ *Ibid*, s 3(2).

²⁹⁴ The authority is *inter alia* responsible for: the overall development of coastal areas; the identification, development and execution of schemes drinking water facilities, electricity, tourism and rural development; the establishment of educational, technical and professional institutions; the development of fisheries, forest, agriculture, livestock; and the development of marketing facilities, jetties and harbours, etc. It also acts as a coordinating agency of the federal and provincial governments and other local bodies; collaborates with the federal or provincial, public or private agencies involved in development activities and environmental protection; provides technical guidance; undertakes town planning and sewage disposal; provides public utilities like roads, dams; assists and coordinates the establishment of oil refineries and pipelines, conducts training programs, etc. *Ibid*, s 7.

²⁹⁵ *Ibid*, ss 12, 13.

²⁹⁶ *Ibid*, s 16.

²⁹⁷ *Ibid*, s 4(1).

Balochistan is the chairman of the governing body, an indication as to the importance the province affords to coastal management.²⁹⁸ In addition, the administrative secretaries of some of the major government departments of Balochistan, two members of the provincial assembly, and two nominated experts on coastal affairs are inter alia members of the governing body.²⁹⁹ This body is also empowered to delegate its powers, functions and duties and can constitute financial, technical, and executive committees for carrying out the purposes of the act.³⁰⁰

As far the territorial application of this coastal law is concerned, it extends to the coastal areas of Balochistan and adjoining upland areas up to 30 kilometers from the high tide water line.³⁰¹ However, townships, villages, defence and other Federal government installations, Lasbela Industrial Estates Development Authority (LIEDA), the Gaddani shipbreaking yard and areas are excluded from its jurisdictional ambit.³⁰² As will be explained subsequently, the exclusion of such wide areas substantially reduces the potency of this coastal law.

As mentioned, the Balochistan coast is comparatively unoccupied and unspoiled. However, due to the thriving ship breaking industry, attempts have been made in certain quarters to turn the coastal regions into dumping yards for wastes including radioactive substances. *In re: Human Rights Case (Environment Pollution in Balochistan)*³⁰³ was a public interest litigation case that came before the Supreme Court of Pakistan. Pursuant to a news item entitled “N-Waste to be dumped in Balochistan,” which expressed apprehensions that certain business groups were attempting to purchase coastal areas in Balochistan to dump waste material such as nuclear wastes from developed countries, the court directed the Chief Secretary of Balochistan to inquire the matter. The dumping of such wastes which could affect the health of the people, the environment, marine life, and the development of ports, thereby leading to the violation of article 9. The Chief

²⁹⁸ *Balochistan CDAA 2003, supra* note 290, s 3.

²⁹⁹ This includes the additional chief secretary (development); the finance department; the environment, wildlife, forest and tourism department; the fisheries department; the irrigation and power department; the education, literacy and non-formal education, culture, sports and youth affairs department; the local government, rural development and Agrovilles department; the public health engineering department; and the communication and works department. *Ibid.*

³⁰⁰ *Ibid.*, ss 10, 8.

³⁰¹ *Ibid.*, s 1(3).

³⁰² *Ibid.*

³⁰³ PLD 1994 SC 102 (Pakistan SC).

Secretary reported that while land was allotted to the shipbreaking industry, no plot was allotted for dumping nuclear waste. Even though the records revealed no foul play, the court was aware that dumping is a clandestine act in the garb of a legal and proper business activity. This demanded constant vigil on the part of the authorities by regularly checking vessels and also by ensuring that the allottees were not engaged in dumping industrial or nuclear waste on the land or in the sea or destroying it by any device. Accordingly, the Balochistan Development Authority was directed to submit to the court a list of those who were allotted land on the Balochistan coast. Again, the Government functionaries were directed to insert a condition into the terms of allotment that the allottee was not to use the land for dumping, treating, burying or destroying by any device, waste of any nature including industrial or nuclear waste in any form. The concerned authority was also to obtain a similar undertaking from all those who were already allotted the land. This decision is extremely relevant from the perspective of coastal management as it emphasised in clear terms the need to maintain and protect the coastal ecosystems from land-based sources of pollution.

3.2.2.2 Discussion

As mentioned, it was the Workshop of 1994 that set ICZM in motion in Pakistan. Nevertheless, in 2011, another Workshop on ICZM was organised and it was apparent that not much progress had been made in implementing ICZM, even after the lapse of some seventeen years.³⁰⁴ Despite this gloomy picture, it is commendable that both the coastal provinces of Pakistan enacted coastal legislations and the necessary institutional mechanisms were set up fairly early in the day, especially as some of the other coastal countries in the region were yet to recognise the merit and utility of a coastal law. Both of the coastal laws were largely appropriate for their time, but in light of changing circumstances, there is the need to amend these legislations to attune them to new developments and to base management in an integrated format to support the pressing need of coastal climate change adaptation. Climate change adaptation is critical to

³⁰⁴ Pervaiz Asghar, "Integrated coastal zone Management", *Pakistan Today* (10 June 2011) online: PakistanToday <<http://www.pakistantoday.com.pk/>>.

Pakistan. However, as has been observed, “Pakistan has a low institutional and financial capacity to adapt to climatic changes; therefore improving the adaptation capability is considered to be of the highest priority at this stage”.³⁰⁵

Here, from the perspective of coastal regions, coastal legislations can play an important role in augmenting adaptive capacities by facilitating ICZM implementation. While both of these coastal legislations do contain notable points (for instance, the Balochistan Coastal Development Authority is headed by no less a functionary than the chief minister of the province, and in the case of Sindh, it is the Minister for Planning and Development), the fact is that both legislative frameworks may not be able to further ICZM and CCCA for the following reasons.

First, the concept of spatial integration, which is the central pillar of ICZM, is not afforded express recognition in either coastal law. There is no provision for a seaward component in the Sindh coastal law and the regulation is primarily land-based. As pointed out earlier and as will be seen in detail in chapter six, ICZM implies the holistic management of both the dry and the wet segments of the coastal zone. At the same time, though not expressly mentioned, it seems that the Balochistan coastal law contemplates some sort of integration between the dry and wet sides of the coastal zone. The Preamble to the Balochistan statute mentioning of “connected waters” and “land” has been defined to include the seabed below the high-water mark.³⁰⁶ Furthermore, the Balochistan Coastal Development Authority is also empowered to “[f]ormulate and implement policies and plans for the purpose of developing, establishing and maintaining its coastal area and waters along the Balochistan Coast...”³⁰⁷ Despite this, the law is not amply clear with regards to the exact extent of the seaward limit. Thus, the Balochistan Coastal Act, while referring to the wet side, does not sufficiently carry the message of coastal integration forward.

Another aspect of these coastal laws is that they do not contain provisions to control the problem of land-based sources of coastal and marine pollution. In fact, the *Balochistan Act* exempts townships, villages, defence and Federal government installations, the Lasbela Industrial Estate, and the Gaddani shipbreaking yard from its

³⁰⁵ *Pakistan’s Initial National Communication*, *supra* note 214 at 17.

³⁰⁶ *Balochistan Coastal Development Authority Act 1998* (No 1 of 1998, Balochistan) s 2(o).

³⁰⁷ *Balochistan CDAA 2003*, *supra* note 290, s 4.

operational remit, thereby considerably reducing its efficacy. This is a serious lacuna and may not augur well in the long run, given that some of the industries excluded (e.g., the ship breaking industry) are known major polluters of the coastal environment.

Even though there is provision for the preparation of master plans and schemes in both statutes, the relevant provisions appear open-ended and there is no legislative guidance in these laws as to how these plans are to be prepared and no provision for public participation in their preparation and implementation is contemplated. Again, the coastal development authorities contemplated under both statutes are top-heavy. There is no provision for women representation in these bodies. This exclusion can affect the attainment of sustainable development goals in the long run, as women and children are the primary sufferers of climate change impacts including SLR.³⁰⁸

Except for the coastal city of Karachi, the coastal regions in Pakistan are comparatively free from development, so even in the event of SLR, it may be possible for this country to implement a retreat strategy to deal with the impacts. Taking into account the specific vulnerabilities of Karachi, it may even become necessary for Pakistan to develop in due course an adaptation strategy for this city, where salinity intrusion into the coastal aquifers has already been reported.³⁰⁹ Apart from Karachi, the primary impacts of climate change and SLR on the coastal zones of Pakistan are closely intertwined with the diminished water flows into the Indus River Delta and consequent saline intrusion, as mentioned earlier. However, the coastal law of Sindh does not contain any adaptive strategy to respond to the impacts of climate change and SLR on Karachi and the Indus River Delta. These are serious omissions attributable to the fact that the law was drafted at a time when SLR and climate change were not issues of concern. Presently, the provinces have taken the lead on CZM, and therefore it may seem that the federal government has a comparatively lesser role to play. Nevertheless, as the number and intensity of extreme weather events hitting the Pakistani coast increases, the federal

³⁰⁸ For more details, see generally UN, *Fact Sheet: Women, Gender Equality and Climate Change*, UN Women Watch (2009); see generally UNICEF, Emma Back & Catherine Cameron, *Our Climate, Our Children, Our Responsibility: The Implications of Climate Change for the World's Children* (np: UNICEF UK, 2008).

³⁰⁹ Mashiatullah et al, *supra* note 231 at 197 (identifying SLR, reduced precipitation, as possible factors that contribute to increased salinity); Our Correspondent, "Karachi at high risk from sea level rise", *Dawn* (14 March 2012) online: DAWN.COM <<http://dawn.com/>>.

government, in co-ordination with the provinces, must formulate a comprehensive strategy for climate change adaptation for the coastline via ICZM.

3.2.3 Bangladesh

One of the least developed nations in the world,³¹⁰ the People's Republic of Bangladesh is a unitary state that became independent in 1971.³¹¹ Bangladesh has a coastline of about 710 kilometers in length, rimming the Bay of Bengal. This comprises approximately 32 per cent of the country³¹² spread over 19 out of a total of 64 districts.³¹³ The coastal regions have been classified into three zones (west, central, and east), each characterised by unique features.³¹⁴ The exclusive economic zone (EEZ) is also treated as part of the coastal zone.³¹⁵ Bangladesh is essentially the delta of the *Ganges-Padma*, the *Brahmaputra-Jamuna*, and the *Surma-Meghna* rivers, and its coastal zone is the last part of the extended Himalayan drainage ecosystem where these three mighty rivers join the Bay of Bengal.³¹⁶ The entire landmass, including its coastline, is dominated by these three major river systems, which unites with several other smaller rivers to form the largest deltaic system in the world.³¹⁷ It is estimated that the Ganges-Brahmaputra-

³¹⁰ International Human Development Indicators, *Bangladesh: Country Profile: Human Development Indicators*, online: Human Development Reports <<http://hdrstats.undp.org/en/countries/profiles/BGD.html>>.

³¹¹ See *Constitution of the People's Republic of Bangladesh, 1972*, art. 1. The legal system of Bangladesh is based on English Common Law, even though its constitution of 1972 (as amended in 1975 and 1977) reflects the Islamic character of the nation. Most of the natural resources laws that operate in Bangladesh are of British vintage, like the *Forest Act, 1927*, which incidentally is also the centerpiece forest law of both India and Pakistan. Being a part of former Pakistan, some of its laws have been inherited from Pakistan. Md Yousuf Mehedi, *Controlling Pollution in the Coastal and Marine Zone of Bangladesh: Developing A Management Approach* (MMM Thesis, Dalhousie University, 2001) [unpublished] at 76.

³¹² MS Iftekhar & MR Islam, "Managing Mangroves in Bangladesh: A Strategy Analysis" (2004) 10 *J of Coastal Conservation* 139.

³¹³ M Rafiqul Islam, ed, *Where Land Meets the Sea: A Profile of the Coastal Zone of Bangladesh* (Dhaka: The University Press Ltd, 2004) at 4.

³¹⁴ Bangladesh, Ministry of Environment & Forest, *Initial National Communication under the United Nations Framework Convention on Climate Change (UNFCCC)* (Dhaka: Ministry of Environment & Forest, 2002) at 18, 22 [Bangladesh, *Initial National*].

³¹⁵ Officially, the coastal zone has been demarcated to include nineteen districts and the exclusive economic zone. M Rafiqul Islam, "ICZM Initiatives and Practices in Bangladesh" in RR Krishnamurthy et al, eds, *Integrated Coastal Zone Management – The Global Challenge* (Singapore: Research Publishing Services, 2008) 73 at 75 [Islam, "ICZM Initiatives"].

³¹⁶ *Ibid.*

³¹⁷ John C Pernetta, ed, *Marine Protected Areas Needs in the South Asian Seas Region*, A Marine Conservation and Development Report, vol 1: Bangladesh (Gland: IUCN, 1993) at 2 [Pernetta, *Bangladesh*].

Meghna river systems carries each year more than six million cusecs of water and more than a billion tons of sediment that is finally deposited into the coastal areas adjoining the Bay of Bengal.³¹⁸ This renders the coast highly dynamic, resulting in accretions in some regions and erosion in others.³¹⁹

The Bangladesh coast is home to several unique coastal ecosystems, including the Sunderbans (the world's largest uninterrupted stretch of mangrove forests and a designated UNESCO World Heritage Site),³²⁰ the coral island of St. Martin, the Cox Bazar beach (the world's longest beach),³²¹ and several islands and extensions to the mainland formed primarily from accretion (which are generally unstable and uninhabitable).³²²

The Bangladesh coastline is wrecked by a series of climate hazards and is often described as "a zone of multiple vulnerabilities as well as opportunities."³²³ Each year, cyclones, storm surges, tornados, floods and erosion hit the country with ferocity.³²⁴ Records show that nearly 30 to 35 per cent of the total land surface of the country is inundated annually during the monsoons.³²⁵ In both 1988 and 1998, more than 65 per cent of the geographical area was inundated.³²⁶ The Bay of Bengal is referred to as "the breeding ground of catastrophic cyclones;"³²⁷ it is estimated that a severe tropical cyclone

³¹⁸ *Ibid* at 6; see also Bangladesh, *Initial National*, *supra* note 314 at 22 (pointing out that nearly 2.4 billion tons of sediments are carried per year).

³¹⁹ Bangladesh, *Initial National*, *ibid*.

³²⁰ World Heritage Convention & UNESCO, *The Sundarbans*, online: WHC:UNESCO <<http://whc.unesco.org/en/list/798/documents/>>. The Sunderbans mangroves support nearly 425 species of recorded fauna, which includes 41-49 mammals, 261-270 birds, 158-177 fish, 35-63 reptiles, 8-12 amphibians and 26 molluscs. Dipak Kamal, *Biodiversity Conservation in the Coastal Zone of Bangladesh* (MMM Thesis, Dalhousie University, 1999) [unpublished] at 11.

³²¹ *Third National Report (Submitted by Bangladesh)* at 7, online: Convention on Biological Diversity <<http://www.cbd.int/doc/world/bd/bd-nr-03-en.pdf>> [*Third National Report*].

³²² Islam, ed, *supra* note 313 at 16-17.

³²³ *Ibid* at 3.

³²⁴ More than a dozen tropical cyclones occur in the Bay of Bengal every year, with three or four hitting the Bangladeshi coastal zones with wind speeds of 150-240 kilometers per hour. Due to the low elevation of GBM deltaic plain, resulting storm surges can penetrate as far as 100 kilometers inland. Four cyclonic storms and associated tidal bores between 1970-1997 have killed nearly 44,668,000 people. Kamal, *supra* note 320 at 41.

³²⁵ Nearly 80 per cent of the land gets affected by floods, which are primarily, flash floods, rain floods, monsoon floods and coastal floods. Bangladesh, *Initial National*, *supra* note 314 at 15.

³²⁶ UNEP & Regional Resource Centre for Asia and the Pacific, *Bangladesh: State of the Environment Report, 2001* (Pathumthai: UNEP, 2001) at 98 [UNEP & RRCAP].

³²⁷ *Ibid* at 99.

hits Bangladesh once every three years,³²⁸ accompanied by severe storm surges, leading to severe losses in life and in property.³²⁹ Land erosion is another natural phenomenon that affects the Bangladeshi coastline.

As per the 2001 census, the total population of Bangladesh is approximately 130 million, and the coastal population is about 36.8 million.³³⁰ This country is one of the most densely populated countries in the world, with density in the coastal zones much higher than in the upland areas.³³¹ Nearly 28 per cent of the population of Bangladesh lives in the coastal areas.³³² While the average population density for the entire country is 839 per square kilometer, for the coastal regions it is 743. The average population density in the exposed coast is 482 people per square kilometer and 1,012 for the interior coasts.³³³ There are about 6.82 million households in the coastal zone, of which 52 per cent are extremely poor.³³⁴ The official poverty indicators point out that the percentage of the population that lives below the absolute poverty line is slightly higher in the coastal zone (52 per cent) than for the whole country (49 per cent).³³⁵

Coasts play a significant role in supporting the Bangladeshi economy. The Bengali adage “*Mache-Bhate Bangali*,” which means a “Bengali body is made up of fish and rice,” sums up the importance of fish and fisheries in the life of Bangladeshis.³³⁶ Fishing, agriculture, shrimp farming, salt farming, and tourism (mainly domestic) are the primary economic activities in the coastal area.³³⁷ However, the coastal fishing communities live in deep poverty. Coastal fishers generally have no land holdings, their literacy levels are

³²⁸ Bangladesh, *Bangladesh Climate Change Strategy and Action Plan 2008* (Dhaka: MoEF, 2008) at 10.

³²⁹ Bangladesh, *Initial National*, *supra* note 314 at 21.

³³⁰ Bangladesh, Ministry of Water Resources, *Coastal Development Strategy: Approved at the 2nd Meeting of the Inter-Ministerial Steering Committee on ICZMP held on February 13, 2006* (Bangladesh: Water Resources Planning Organization, 2006) at 1 [*Coastal Development Strategy, 2006*].

³³¹ The population density in the coastal zones is 1,018 persons per square kilometer than in the upland areas where it is 827.4 persons per square kilometer). Kamal, *supra* note 320 at 3.

³³² *Ibid* at 1.

³³³ Md Golam Mahabub Sarwar, *Impacts of Sea Level Rise on the Coastal Zone of Bangladesh* (Masters Thesis, Lund University, Sweden, 2005) [unpublished] at 8.

³³⁴ *Ibid*.

³³⁵ Fourteen out of 19 coastal districts reel under extreme poverty greater than the national average. Islam, “ICZM Initiatives”, *supra* note 315 at 76.

³³⁶ UNEP & RRCAP, *supra* note 326 at 105.

³³⁷ It is estimated that fisheries provide employment to 1.5 million rural people, while providing partial employment to another 11 million. Bangladesh, *Initial National*, *supra* note 314 at 14.

dismal, and they have very limited opportunities to access credit and the market.³³⁸ More importantly, these communities are frequently exposed to a series of natural hazards like cyclones and tidal surges that seriously affect their life, security and property; that they have limited access to even minimal social security services increases their vulnerability.³³⁹ Marine fisheries contribute significantly to the total fish production and here it is the artisanal fishers that contribute the overwhelming share.³⁴⁰ Anthropogenic and natural factors affect the health and resilience of Bangladesh's coastal ecosystems and affect their ability to support the Bangladeshi economy.

As mentioned, the Sunderbans mangroves represent nearly half of this country's forest cover and are rich in biodiversity, providing a habitat for several species of animals and birds.³⁴¹ The delta also supports coastal communities whose livelihood and well-being are intrinsically linked to the fate of the delta itself. However, since the 1970s, the Sunderbans has been in a state of progressive deterioration, primarily due to the reduced inflow of fresh water in the dry season into this ecosystem. This is attributable mainly to the diversion of the Ganges waters at the Farraka Barrage in the summer months.³⁴² Consequently, salinisation has prevented the natural regeneration of mangroves and has contributed to the infectious top-dying disease of *sundari*, the dominant mangrove species in the Sunderbans.³⁴³ Apart from the reduced inflow of freshwater, the Sunderbans also face threats from conversion of mangrove tracts for aquaculture and agriculture; pollution; poaching of wild animals like the Bengal tiger, the estuarine crocodile, marine turtles and horseshoe crab; and the uncontrolled fishing and collection of prawn seedlings.³⁴⁴

³³⁸ Naisruddin Md Humayun, *Can Community-Based Participation of Coastal Fishers Contribute to Sustainable Management and Development of Coastal and Marine Fisheries Resources of Bangladesh?* (MMM Thesis, Dalhousie University, 2004) [unpublished] at 13. Kamal, *supra* note 320 at 3 (pointing out that nearly 68.8 per cent of the coastal population is landless).

³³⁹ *Ibid* at 4.

³⁴⁰ The contribution of the marine fisheries ranges between 20 to 25 per cent of the total fish production, out of which the artisanal sector contributes 95 per cent. *Ibid* at 10.

³⁴¹ Kamal, *supra* note 320 at 3.

³⁴² M Shafi N Islam & Albrecht Gnauck, "Threats to the Sunderbans Mangrove Wetland Ecosystems from Transboundary Water Allocation in the Ganges Basin: A Preliminary Problem Analysis" (2009) 13:W09 *Int'l J Ecol Econ Stat* 64 at 70-72.

³⁴³ Md Saidur Rahman, "Ecology and Management of Sundarban: A Rich Biodiversity of the World's Largest Mangrove Ecosystem" [on file with the author].

³⁴⁴ *Ibid*.

Land-based sources of marine pollution are a major cause for concern. The major rivers (i.e., the Ganges and the Brahmaputra) carry pollutants from upstream countries (China, Bhutan, Nepal, India), which traverse through the Bangladeshi heartland before being dumped into the Bay of Bengal.³⁴⁵ In addition, several other activities like fisheries, transport, industrial discharges, use of agrochemical fertilizers and untreated sewage also add to the pollution load. A description of some of these activities and their impact is offered below.

In recent years, there has been considerable industrial growth in Bangladesh, which has had significant environmental impacts in the coastal zone. Land based sources of pollution of coastal and marine waters and related ecosystems are a major problem. Bangladesh has been operating one of the largest shipbreaking yards in the world at the Sitakunda region in Chittagong. It is believed that, at present, there are 32 shipbreaking yards located on a 10 kilometer stretch of the Chittagong coast offering employment to 20,000 workers.³⁴⁶ Like Alang in India, the shipbreaking industry in Bangladesh functions in a highly “disorganized and primitive way.”³⁴⁷ All of the breaking takes place in the intertidal zone. Since Bangladesh is the only country that does not insist on a gas-free-for-hot-work certificate,³⁴⁸ a majority of deadly tankers, generally not accepted in other countries, make their way into these shipbreaking yards. With nearly 90 ships being dismantled annually, it is estimated that nearly 22.5 tons of PCBs are released into the coastal environment of Bangladesh.³⁴⁹ The ship scrapping activities have led to the increased presence of tributyltin in fish organs.³⁵⁰ For a long time, Bangladesh did not have any direct law to regulate the shipbreaking industry. Following the directions of its Supreme Court, the Ministry of Environment and Forests put together the Draft

³⁴⁵ Mehedi, *supra* note 311 at 23.

³⁴⁶ Puthucherril, *From Shipbreaking*, *supra* note 33 at 27-29.

³⁴⁷ Md Saiful Karim, “Environmental Pollution from the Shipbreaking Industry: International Law and National Legal Response” (2010) 22 *Geo Int’l Env’tl L Rev* 185 at 187 (QL).

³⁴⁸ *Ibid.*

³⁴⁹ Bangladesh, Department of Environment in Collaboration with IUCN-The World Conservation Union, *Bangladesh: National Programme of Action for Protection of the Coastal and Marine Environment from Land-Based Activities*, at 12, online: <http://www.doe-bd.org/npa_draft.pdf> [*Bangladesh, National Programme of Action*].

³⁵⁰ Kamal, *supra* note 320 at 62.

Shipbreaking and Hazardous Waste Management Rules, 2010, to regulate this industry, although they are yet to be formalized.³⁵¹

Other pollution intensive industries like tanneries, paper pulp manufacturing and textile units operate in coastal regions without proper treatment plants, contaminating the coastal environment.³⁵² Vessel-source pollution is another pollution source, since the primary mode of transportation is the extensive network of inland waterways.³⁵³ There have been several oil spills from foreign and local ships calling at the Mongla Port that have threatened the eco-stability of the nearby Sunderbans.³⁵⁴ None of the coastal cities have proper sewage systems or waste treatment plants. Consequently, the sewage of nearly 36 million people living in 19 coastal districts directly or indirectly ends up in the Bay of Bengal.³⁵⁵ Solid waste disposal in coastal cities also makes its way into the marine environment, particularly during floods and monsoons, since landfill sites are open and there is no leachate treatment technology in place.³⁵⁶ The use of pesticides to expand agricultural production has increased tremendously, putting further stress on the coastal environment.³⁵⁷ Studies reveal that the groundwater in 61 out of 64 districts is arsenic-contaminated, and nearly 30 million people are exposed to the associated risks.³⁵⁸ The problem is most acute in the coastal regions, where both surface and groundwater resources are contaminated due to saline intrusion from the seas.³⁵⁹ Salinity intrusion has

³⁵¹ For the text, see *Welcome to Ministry of Environment & Forest*, online: <<http://www.moef.gov.bd/>>.

³⁵² Chandrika Sharma, “Coastal Area Management in South Asia: A Comparative Perspective” (Background Paper prepared for the South Asia Workshop on Fisheries and Coastal Area Management, 26 September – 1 October 1996, Madras, India) (Chennai: ICSF, 1997) at 18.

³⁵³ Abdul Kalam Azad, *Integrated Coastal Zone Management in Bangladesh: A Case for People’s Management*, BIISS Papers, no 20 (Dhaka: Bangladesh Institute of International and Strategic Studies, 2003) at 27 [Azad, *Integrated Coastal Zone Management*].

³⁵⁴ Md Saiful Karim, “Implementation of the MARPOL Convention in Bangladesh” (2009) 6 *Macq J Int’l & CEnv’tl L* 51 (HeinOnline).

³⁵⁵ *Bangladesh, National Programme of Action*, *supra* note 349 at 9.

³⁵⁶ *Ibid* at 10.

³⁵⁷ Craig Meisner, *Report of Pesticide Hotspots in Bangladesh*, Working Paper: 41045, vol 1 (Development Economics Research Group, World Bank, 2004) ¶1; *Bangladesh, National Programme of Action*, *supra* note 349 at 11.

³⁵⁸ Government of the People’s Republic of Bangladesh, Department of Disaster Management, Ministry of Disaster Management and Relief, *Arsenic Contamination*, online: Department of Disaster Management <<http://www.ddm.gov.bd/arsenic.php>>; Hossain Shahid Mozaddad Faruque & Saiful Alam, “State of Arsenic Contamination in Bangladesh” (Paper delivered at the International Water Conference, Hanoi, Vietnam, 14-16 October 2002) at 4-5.

³⁵⁹ The problem of salinity intrusion is primarily seasonal. During the rainy season, salinity is pushed back due to the fresh water flow. But in the summer months, saline waters penetrate up to 130

also contaminated the soils in coastal regions.³⁶⁰ Since more than 30 per cent of the net available cultivable land of Bangladesh is located in coastal areas, soil salinity detrimentally impacts food security.³⁶¹

Bangladesh has an elaborate legal framework to regulate land-based sources of marine pollution. The *Environment Conservation Rules, 1997*, specifies standards for sewage discharge, water quality, and industrial waste discharge.³⁶² The *Territorial Waters and Maritime Zones Act, 1974* likewise empowers the government to take appropriate measures to prevent and control marine pollution.³⁶³ There are several other laws that are also relevant.³⁶⁴ Bangladesh has also formulated a *National Programme of Action for Protection of the Coastal and Marine Environment from Land-Based Activities*. This document identifies twelve major factors that contribute to coastal and marine pollution, and proposes seven strategies and action programmes and twelve major activities to combat land-based marine pollution.³⁶⁵ Although Bangladesh is one of the few countries in South Asia to have a national programme of action for controlling land-based marine pollution, it must still develop a dedicated enforcement framework to support the strategies, programmes and action plans it has in place to deal with this challenge to its sustainable development.

For many years, the contribution of the Bangladeshi fisheries sector to national development was insignificant. In the early 1980s, as part of an initiative to popularize shrimp culture, the government allotted tidal land in the *Chakaria Sundarban* to the Department of Fisheries. Since then, shrimp farming has accelerated, often at the expense

kilometers in the lower Meghna and up to 290 kilometers up the Passur River. Bangladesh, *Initial National*, *supra* note 314 at 30.

³⁶⁰ *Ibid.*

³⁶¹ UNEP & RRCAP, *supra* note 326 at 104.

³⁶² *The Environment Conservation Rules, 1997* (R SRO No 197-Law/97 of 1997, Bangladesh), sch 9.

³⁶³ (No XXVI of 1974, Bangladesh), s 8.

³⁶⁴ *The Marine Fisheries Ordinance, 1983* (No XXXV of 1983, Bangladesh) s 28 (constitution of marine reserves), s 29 (prohibition on fishing, dredging, etc., in marine reserves), s 8 (introduces licensing system for marine fishing). *East Bengal Protection and Conservation of Fish Act 1950* (No XVIII of 1950, Bangladesh) (subsequently amended in 1963, 1970, 1982, 1995 and 2002). This law empowers the government to make rules to prohibit or regulate the destruction of (including attempt) fishes by explosives, gun, bow and arrow in inland waters or in coastal territorial waters. The Environmental Policy 1992, the Forest Policy 1994, the Fisheries Policy 1995 are also relevant to coastal management.

³⁶⁵ *Bangladesh, National Programme of Action*, *supra* note 349.

of mangroves, wetlands and agricultural lands.³⁶⁶ While shrimp farming has benefitted the country in many ways, the reality is that its operation has exacerbated rural poverty. There have been intense and violent clashes between the owners of shrimp farms and agriculturists.³⁶⁷ Apart from socio-economic tensions, shrimp farming poses several environmental concerns. For instance, to facilitate the intake of tidal water, shrimp culturists have cut through the coastal embankments and built hundreds of unauthorized sluice gates, which has weakened these structures.³⁶⁸ Such practices raise the need for a mechanism to resolve conflicting interests relating to the use of coastal space and resources.³⁶⁹

Bangladesh has established a network of marine protected areas, mainly under the *Bangladesh Wildlife Preservation (Amendment) Act, 1974*,³⁷⁰ and under section 5 of the *Bangladesh Environment Conservation Act, 1995*, whereby the government can declare ecologically critical areas. There are eight such areas, and some of them are highly sensitive coastal ecosystems, including St. Martin's island, the sea front of Cox Bazar and Teknaf, a 10 kilometer strip outside the Sunderbans reserve forest, and the Sonadia Island.³⁷¹ Despite the MAP network, these ecosystems are under considerable ecological stress.³⁷² Coral reefs around St. Martin's have also been destroyed due to shell and coral collection, dynamite fishing, and recreational activities.³⁷³

The peculiar geographical features, lack of infrastructure, low socio-economic development and widespread poverty, lack of institutional capacity, and higher dependence on natural resources make Bangladesh one of the most disaster-prone countries in the world.³⁷⁴ Although the contribution of Bangladesh to global greenhouse gas emissions is negligible, it will be severely affected by climate change and SLR.

³⁶⁶ Syed Mahmood Anwar, *Effect of Shrimp Culture on Ecology in the Coastal Areas of Bangladesh* (Term Paper, Human Landscape Ecology: MNFEL 330, 2003) at 10, 13.

³⁶⁷ *Ibid* at 39.

³⁶⁸ *Ibid* at 32.

³⁶⁹ Md Mahbub Alam, *An Integrated Approach to Coastal Aquaculture and Mangrove Ecosystem Management in Bangladesh* (MMM Thesis, Dalhousie University, 1996) [unpublished] at 3.

³⁷⁰ *Third National Report*, *supra* note 321 at 8.

³⁷¹ Bangladesh, Ministry of Environment & Forests, *Fourth National Report to the Convention on Biological Diversity: Biodiversity National Assessment and Programme of Action 2020* (Dhaka: Department of Environment, 2010) at 25.

³⁷² For more details on the state of the environment of Sunderbans, see *supra* notes 342-45 and accompanying text.

³⁷³ Pernetta, *Bangladesh*, *supra* note 317 at 15.

³⁷⁴ UNEP & RRCAP, *supra* note 326 at 93.

Within Bangladesh, coastal regions will be the most affected due to its low elevation and exposure to various water-related hazards.³⁷⁵

SLR can produce various impacts on Bangladesh; the major ones are coastal land erosion, salinity intrusion, biodiversity loss and destruction of human life and property.³⁷⁶ In addition, SLR can increase riverbank erosion, flooding, and destruction of fisheries. SLR can lead to the inundation of one-tenth of the total land area along the coastal belt displacing nearly 10 million people.³⁷⁷ It has been predicted that by 2050 SLR will affect 27 million people in Bangladesh.³⁷⁸ The IPCC forecasts that a one-meter rise in sea level will inundate about 20 per cent of the Bangladeshi landmass. It is estimated that there will be a one-meter rise in sea level by 2100, which will inundate 17.5 per cent (25,000 square kilometers) and all of the Sunderbans.³⁷⁹

The economy of Bangladesh is primarily agrarian. It is predicted that SLR will adversely impact agriculture, and will damage more than a million hectares of agricultural land and different varieties of rice crop³⁸⁰ and fodder.³⁸¹ Since the population density is very high, grazing fields for cattle are rare and, generally, farmers meet their demand from the rice paddy fields. Any decrease in rice production would result in a fodder shortage and a decline in livestock population aggravating rural poverty.³⁸² SLR may also impact coastal fisheries and aquaculture.³⁸³ Due to excessive flooding of the coastline, the positions of many water channels and estuaries will be altered and salinity

³⁷⁵ Bangladesh, *Climate Change and Bangladesh*, *supra* note 14 at 3.

³⁷⁶ Md Ahad Ali, *Assessment of Possible Impacts in the Coastal Parts of Bangladesh Due to Sea Level Rise and Other Effects of Global Climate Change* (MMM Thesis, Dalhousie University, 2007) [unpublished] at 39 [Ali, *Assessment of Possible Impacts*].

³⁷⁷ *Ibid* at 40.

³⁷⁸ Asian Development Bank, *supra* note 38 at 25.

³⁷⁹ *Ibid*.

³⁸⁰ *Ibid* at 42. The farmers in Bangladesh had nearly 10,000 varieties of rice that belonged to the Aus, Aman, Boro and IRRI groups. SLR related flooding and salinity increase is expected to affect all these major groups. *Ibid*.

³⁸¹ Since Bangladesh is a densely populated country, there are no specific grazing grounds as such and therefore grass from paddy fields are used to feed cattle. Therefore, any decrease in agricultural production will lead to a decline in the livestock population. *Ibid* at 43.

³⁸² Abu Muhammad Shajaat Ali, "Rice to Shrimp: Land use/Land Cover Changes and Soil degradation in Southwestern Bangladesh" (2006) 23:4 Land Use Pol'y 421 at 426 (ScienceDirect).

³⁸³ While increasing surface water temperatures will affect shrimp, high tides may breach the earthen mini-polders (*ghers*) used to produce shrimp in captivity. Ahsan Uddin Ahmed, *Bangladesh Climate Change Impacts and Vulnerability: A Synthesis* (Bangladesh: Climate Change Cell, Department of Environment, 2006) at 27.

will spoil the habitat and breeding grounds of exotic species such as the *Hilsha* fish.³⁸⁴ Salt production is another major industry in Bangladesh, providing employment to millions. In the event of SLR, salt fields may be inundated, throwing large numbers of people out of work.³⁸⁵ These impacts can also produce severe health consequences. Increased salinity and the consequent contamination of potable water, will lead to the outbreak of water-borne diseases like cholera and diarrhea, and since salinity can impact food production, it will cause malnutrition.³⁸⁶

The damage to coastal infrastructure from SLR will also be immense. Bangladesh has a vast network of coastal roads.³⁸⁷ In addition, as all cities in the central coastal region are connected to the capital city, Dhaka, by waterways, coastal flooding consequent to SLR will erode the roads and damage port facilities, coastal embankments, dykes, groins, and storm surge protection infrastructure.³⁸⁸ In short, climate change will accentuate the rigor of many of the existing problems and natural hazards that this country faces.

As far as adaptation to these impacts is concerned, Bangladesh has created a climate change cell under the Department of Environment, Ministry of Environment and Forests to establish an integrated approach to climate risk management.³⁸⁹ In addition, Bangladesh has identified certain vulnerable sectors and the appropriate adaptation measures for each of them.³⁹⁰ Even though most of these sectors are relevant to the broader issue of coastal management, as far as the specific measures (i.e., physical and institutional) are concerned, they are in relation to certain primary physical effects such as saline water intrusion,³⁹¹ drainage congestion,³⁹² extreme events,³⁹³ and changes in

³⁸⁴ Ali, *Assessment of Possible Impacts*, *supra* note 376 at 48-49.

³⁸⁵ Sarwar, *supra* note 333 at 22.

³⁸⁶ *Ibid* at 52-53.

³⁸⁷ *Ibid* at 43.

³⁸⁸ See generally A Ali, "Vulnerability of Bangladesh to Climate Change and Sea Level Rise through Tropical Cyclones and Storm Surges" (1996) 92 *Water, Air, & Soil Pollution* 171.

³⁸⁹ *Climate Change Cell, Dep't of Environment, Ministry of Environment and Forests (MoEF)*, online: Climate Change Cell <<http://www.climatechange.org.bd/>>

³⁹⁰ Some of the areas identified include the three major river basins; freshwater resources; coastal zone, resources and coral reefs; agriculture and food security; fisheries and marine resources, human health and socio-economic impacts. See generally Bangladesh, *Initial National*, *supra* note 314 at 57-112.

³⁹¹ As far as the prominent physical adaptation measures identified are concerned, it includes increasing surface water flow from upstream; establishment of desalinization plants; and construction of cross

coastal morphology.³⁹⁴ In addition, its National Adaptation Programme of Action of 2005 identifies fifteen measures or projects, some of which are directly related to the issue of CCCA in the context of SLR.³⁹⁵

3.2.3.1 The Coastal Management Framework

Despite the magnitude of interests and reliance in coastal regions and the overarching threat of climate change and SLR, Bangladesh does not have a direct law on CZM. There are a series of legislations and other legal instruments that prescribe general measures in relation to the coastal zone, the most significant of which is the *Bangladesh Environment Conservation Act, 1995*.³⁹⁶ It establishes the Department of the Environment, which has discretionary power to adopt measures for environmental conservation and control and to mitigate environmental pollution.³⁹⁷ Other laws and policies have indirect relevance to CZM,³⁹⁸ and Bangladesh has put in place a system for its development and operation. In Bangladesh, CZM emanated primarily as reactive responses to several natural disasters

dams or embankments. The institutional adaptation measures envisaged include groundwater management, maintenance and operation of sluices and regulators, extension services etc. *Ibid* at 78.
³⁹² The physical measures identified are: 1) bringing water from the land into the main drainage system and 2) draining water into the sea. Institutional measures include establishing water management associations and maintaining drainage channels and infrastructure. *Ibid*.

³⁹³ Physical Adaptation measures include construction of cyclone shelters, coastal embankments, improved warning systems, and mangrove belts. Institutional adaptation measures include monitoring, forecasting and warning systems, and evacuation procedures. *Ibid* at 79-80.

³⁹⁴ *Ibid*.

³⁹⁵ Some of the major measures envisaged are: “Reduction of Climate Change Hazards through Coastal afforestation with community participation”, “Providing drinking water to coastal communities to combat enhanced salinity due to sea level rise”, and “Promoting adaptation to coastal crop agriculture to combat increased salinity.” Bangladesh, Ministry of Environment and Forest, *National Adaptation Programme of Action (NAPA)*, Final Report (November 2005) at 26-42.

³⁹⁶ *The Bangladesh Environment Conservation Act, 1995*(No 1 of 1995, Bangladesh).

³⁹⁷ *Ibid*, pmb; see also *ibid*, ss 3, 4.

³⁹⁸ *Third National Report, supra* note 321 at 76-77. ICZM in Bangladesh is basically policy driven, guided by a series of policy documents like the National Environment Policy, 1992; National Tourism Policy, 1992; the National Forestry Policy, 1994; the National Fisheries Policy, 1998; the National Policy for Safe Water and Sanitation 1998; the National Agricultural Policy, 1999; the National Water Policy, 1999; the Industrial Policy, 1999; the National Shipping Policy, 2000; and the National Land Development Policy, 2001. While these policy documents may not have express provisions to spur ICZM development, nevertheless, they assume indirect relevance. Abul Kalam Azad, *Integrated Coastal Zone Management in Bangladesh: Charting out A People Based Management Framework* (MMM Thesis, Dalhousie University, 2002) [unpublished] at 61. The country has signed 24 and ratified 22 international conventions/treaties/protocols relating to the environment and natural resources conservation. *Ibid* at 52. Some of the prominent laws are *Forest Act, 1855, Protection and Conservation of Fish Act, 1950, Territorial Water and Maritime Zones Act, 1974, Wildlife Preservation Act, 1974, Territorial Waters and Maritime Zones Rules, 1977, Marine Fisheries Ordinance, 1983, Environment Conservation Act, 1955* and *Environmental Conservation Rules, 1977*. *Ibid* at 54.

that battered this country's coastline.³⁹⁹ In this, the Bangladesh Water Development Board took the lead, but CZM efforts remained sectoral.⁴⁰⁰ CZM was initially considered as an "engineering paradigm" and problems in coastal areas were addressed by constructing embankments and cyclone shelters.⁴⁰¹ Attempts to introduce an area-specific approach began in 1977 with the establishment of the Offshore Islands Development Board.⁴⁰² Thereafter, the Bangladesh National Conservation Strategy, the Coastal Environment Management Plan for Bangladesh (both in 1987), the Coastal Area Resources Development Plan (1988), the Special Parliamentary Committee on Coastal Area Development (1988-90), and a national capacity building initiative for ICZM (1997) set the stage for the development of an ICZM process.⁴⁰³ The cumulative outcome of these efforts was the 1999 policy note by the government entitled "Integrated CZ Management: Concept and Issues," which provided a conceptual foundation for ICZM.⁴⁰⁴ This was further elaborated through a Joint Mission of the Bangladesh Government, the International Development Agency, and the Netherlands Development Assistance that established the Program Development Office for ICZM in 2002 (with the Ministry of Water Resources as the lead ministry) and formulated the Coastal Zone Policy 2005.⁴⁰⁵

The Coastal Zone Policy 2005 (CZP) seeks to "provide ... general guidance ... for the management and development of the coastal zone ... so that the coastal people are able to pursue their life and livelihoods within secure and conducive environment."⁴⁰⁶ Accordingly, it sets targets for priority actions and arranges for their implementation. It also provides for an assessment framework. The CZP seeks to create harmony by transcending sectoral perspectives and deals with eight broad areas aimed at furthering

³⁹⁹ It was the catastrophic cyclone and the related tidal surge of 1970, which claimed the lives of more than 150,000 people, that turned focus on the need to protect the coast from natural hazards. It also brought the issue of coastal management to the fore and reliance was placed on the engineering paradigm, i.e., the construction of embankments and sluice gates under the coastal embankment project with external funding. Azad, *ibid* at 47.

⁴⁰⁰ *Ibid*.

⁴⁰¹ UK, Department for International Development, *Integrated Coastal Zone Management in Bangladesh: A Policy Review*, Livelihood-Policy Relationships in South Asia: Working Paper 6 (London: DFID, 2004) at 2.

⁴⁰² Islam, "ICZM Initiatives", *supra* note 315 at 73.

⁴⁰³ *Coastal Development Strategy, 2006*, *supra* note 330 at 2.

⁴⁰⁴ Islam, "ICZM Initiatives", *supra* note 315 at 74.

⁴⁰⁵ *Ibid* at 83.

⁴⁰⁶ Bangladesh, Ministry of Water Resources, *Coastal Zone Policy, 2005* (Government of the People's Republic of Bangladesh, 2005) online: WARPO <http://www.warpo.gov.bd/Coastal%20Zone%20Policy/czpo_eng.pdf> [*Bangladesh Coastal Zone Policy, 2005*].

development objectives: economic growth for poverty reduction; enhancing livelihood opportunities; vulnerability reduction; sustainable management and equitable distribution of coastal resources; empowerment of coastal communities and gender equity.⁴⁰⁷ It also calls for measures to conserve and enhance critical aquatic and terrestrial ecosystems,⁴⁰⁸ control pollution⁴⁰⁹ and adapt to climate change.⁴¹⁰ Furthermore, the CZP provides for mainstreaming CZM by incorporating coastal development into all national strategy documents⁴¹¹ and by providing for development of a coastal development strategy.⁴¹² Finally, the policy emphasizes the need for an appropriate legislative framework, with the first step being the preparation of a “Compendium on the Laws Relating to and/or Having Bearing on Coastal Areas.”⁴¹³

The 2006 Coastal Development Strategy (CDS) focuses on the implementation of the Coastal Zone Policy.⁴¹⁴ The CDS does not provide an “overall framework and recipe” for all development actions in the coastal zone.⁴¹⁵ Rather, the CDS translates the development objectives identified in the CZP into nine strategic priorities, including ensuring access to potable water; ensuring safety from manmade and natural hazards; environmental conservation; and creating an enabling institutional environment. It also identifies three strategic routes – “mainstreaming,” “investments” and “governance” – to implement the strategic priority areas⁴¹⁶ and sets the stage for the third tier of implementation. This tier is the Priority Investment Program, a programme of 20 to 25 projects implemented over a five-year period⁴¹⁷ as the responsibility of relevant ministries and departments.⁴¹⁸

One additional aspect that needs mentioning here is who (or what) is responsible for coastal management in Bangladesh. As noted earlier, three mighty rivers play an important role in stabilizing, shaping and re-shaping the country’s coastal environment.

⁴⁰⁷ *Ibid*, ¶4.

⁴⁰⁸ *Ibid*, ¶4.8.1.

⁴⁰⁹ *Ibid*, ¶4.8.2.

⁴¹⁰ *Ibid*, ¶4.8.3.

⁴¹¹ *Ibid* at 9.

⁴¹² *Ibid*.

⁴¹³ *Ibid* at 12.

⁴¹⁴ *Coastal Development Strategy, 2006, supra* note 330 at 4.

⁴¹⁵ *Ibid*.

⁴¹⁶ *Ibid* at 7.

⁴¹⁷ *Ibid* at 49.

⁴¹⁸ *Ibid*.

Therefore, it is only natural that the Ministry of Water Resources (MoWR) plays a lead role in coastal management by ensuring that the water flow to the sea is maintained and that there is less salinity intrusion into the estuaries and other water bodies.⁴¹⁹ The MoWR has also constructed embankments to secure the coastal zone and thus has become the primary agency to implement ICZM in Bangladesh. In addition, several other ministries and departments have responsibilities in the coastal zone and administer programmes relevant to an ICZM process. For instance, zoning, which is an integral part of ICZM, falls within the domain of the Ministry of Land,⁴²⁰ while the Ministry of Environment and Forests deals with environmental aspects of ICZM.⁴²¹

3.2.3.2 Discussion

Despite its rapid strides in operationalizing ICZM, there are some significant flaws in the Bangladeshi approach to ICZM and coastal climate change adaptation. Clearly, Bangladesh stands to be severely affected by climate change and SLR and this requires that the country develop systems and measures to facilitate coastal climate change adaptation. However, this is no easy task, as the peculiar geographic features, high population density and widespread poverty render implementation of many CCCA measures (particularly the retreat strategy) difficult.⁴²² Again, as part of coastal adaptation efforts, nearly 4,800 kilometers of existing coastal defences need re-calibration, while an additional 4,000 kilometers have to be newly created, costing nearly a billion dollars, which is beyond the financial capacity of this impoverished nation.⁴²³

The discussion in the preceding part points out that Bangladesh has yet to enact a specific legislation for ICZM. Though it recognises that “[s]etting the appropriate legislative framework is fundamental to effective implementation of the CZP,”⁴²⁴ the

⁴¹⁹ *Ministry of Water Resources*, online: MoWR <<http://www.mowr.gov.bd/>>; M Rafiqul Islam, “Bangladesh’s ICZM Efforts in Practice” in Robbert Misdorp, ed, *Climate of Coastal Cooperation* (Leiden: Coastal & Marine Union - EUCC, 2011) 64 at 64 [Islam, “Bangladesh’s ICZM”].

⁴²⁰ The Ministry of Land is implementing a Coastal Land Zoning Project. See Ministry of Land, *Coastal Land Zoning Project*, online: Ministry of Land <<http://www.minland.gov.bd/clzp.aspx>>.

⁴²¹ *Welcome to Ministry of Environment & Forest*, *supra* note 351. The Bangladesh Forest Department under the Ministry of Environment and Forests plays an important role in conserving mangrove forests like the Sunderbans. *Natural Mangrove Forests*, online: Bangladesh Forest Department <<http://www.bforest.gov.bd/index.php/forest-category/mangrove-forests>>.

⁴²² Mehedi, *supra* note 311 at 106.

⁴²³ Ahad Ali, *supra* note 376 at 45.

⁴²⁴ *Bangladesh Coastal Zone Policy, 2005*, *supra* note 406 at 12.

CZP is implemented, and the obligation to protect the coastal environment is, as of now, pegged to a diffused legal framework. According to one estimate, this includes a minimum of 90 laws.⁴²⁵ Seeking to implement ICZM through such a fragmented legal framework is not an appropriate approach for Bangladesh, given the anticipated impacts of SLR. To date, there has only been debate about umbrella legislation on coastal management. The lack of legally ordained integration between the various ministries and departments tasked with the responsibility of implementing different facets of CZM has led to conflicts, and this is perhaps the biggest bottleneck to efficient coastal management. As pointed out, there are several ministries and departments that have duties relevant to coastal management.⁴²⁶ The presence of such a vast array of administrative authorities with jurisdiction over the coastal zones has led to challenges. For instance, conflicts have been reported between the Ministry of Land and the Ministry of Environment over administration of water bodies and between the Ministry of Fisheries and the Department of Forest over fisheries management in the Sunderbans.⁴²⁷ ICZM is a complex process that requires integrated decision-making, something that is generally hard to secure in countries that have very poor inter-departmental coordination, as different government departments zealously guard their turf. ICZM is all about compromises and trade-offs, and when it is legally mandated, the parties involved will have to come together, discuss, develop and implement solutions collectively. However, as things stand, the present institutional arrangement in Bangladesh is inadequate to further this objective.⁴²⁸ Not only is there mistrust and conflict between government departments, but there have also been conflicts between the different stakeholders (like conflicts between the shrimp culturists and local communities), and some of these conflicts have turned violent and fatal.⁴²⁹ One prime reason for these

⁴²⁵ Bangladesh, Ministry of Water Resources, *Coastal Development Strategy* (Dhaka: Water Resources Planning Organization, 2006) at 45.

⁴²⁶ Kamal, *supra* note 320 at 83.

⁴²⁷ Azad, *Integrated Coastal Zone Management*, *supra* note 353 at 79.

⁴²⁸ Golam Rabbani, A Atiq Rahman & Nazria Islam, "Climate Change and Sea Level Rise: Issues and Challenges for Coastal Communities in the Indian Ocean Region" in David Michel & Amit Pandya, eds, *Coastal Zones and Climate Change* (Washington, DC: The Henry L Stimson Center, 2010) 17 at 23 (pointing out that the Bangladeshi coast is an area of institutional weakness).

⁴²⁹ In a two-decade span nearly 150 people have been killed and thousands injured in shrimp-related violence. M Rafiqul Islam, "Managing Diverse Land Uses in Coastal Bangladesh: Institutional Approaches" in CT Hoanh et al, eds, *Environment and Livelihoods in Tropical Coastal Zones:*

conflicts is the lack of a dedicated legal statute on coastal management to articulate exact rights and corresponding duties.

Like most of its counterparts in South Asia, ineffective governance, lack of effective institutions and widespread corruption plagues Bangladesh. The CZP emphasizes socio-economic development, eradication of poverty, and gender equity, which are indicative of the general socio-economic situation. Coastal zone management is viewed as a broad programme that can eradicate poverty, enhance livelihoods, and improve governance.⁴³⁰ Clearly, a CZM framework has to be situated within the larger socio-economic challenges that confront a country. However, to be successful, its mandate has to be narrower and more realistic. By providing for a sweeping mandate, it seems that Bangladeshi policy-makers are being overly ambitious. Admittedly, a CZM programme cannot be oblivious to the socio-economic realities and it will have to address larger issues of poverty removal. However, it cannot be converted into a tool to tackle the underlying socio-economic problems facing a country, as this could prove to be its undoing in the long run. Here, ICZM planning and management can be viewed only as a sub-set of broader developmental plans and programmes.

Further complicating matters is that coastal management efforts in Bangladesh are not well-documented and analyzed, thus preventing their use in future endeavors. As well, ICZM operates in Bangladesh on the basis of specific projects that are funded primarily by international agencies and foreign governments.⁴³¹ Once the project or the funding ends, it is unclear whether sustained efforts are expended to build on the experience gained.⁴³² This is a serious lacuna in the present coastal management system in Bangladesh that has actually prevented its entrenchment and metamorphosis.

Managing Agriculture-Fishery-Aquaculture Conflicts, Comprehensive Assessment of Water Management in Agriculture Series, vol 2 (Oxon: CABI, 2006) 237 at 242.

⁴³⁰ *Coastal Development Strategy, 2006*, *supra* note 330 at 2. Eleven coastal districts have low gender disparity. M Rafiqul Islam, "ICZM Initiatives and Practices in Bangladesh" in RR Krishnamurthy, eds, *Integrated Coastal Zone Management – The Global Challenge* (Singapore: Research Publishing Services, 2008) 73 at 76.

⁴³¹ Islam, "Bangladesh's ICZM", *supra* note 419.

⁴³² *Ibid.*

3.2.4 Sri Lanka

Separated from the Indian subcontinent by the Palk Strait, the unitary Democratic Socialist Republic of Sri Lanka⁴³³ has the unique distinction of being the first Asian country to have a well-defined CZM programme.⁴³⁴ Sri Lanka is an island nation with 1,620 kilometers of coastline⁴³⁵ and an EEZ of 533,000 square kilometers, which is eight times larger than its land area.⁴³⁶ Fourteen (grouped into five maritime provinces) out of the 25 districts (grouped into nine provinces) are located on the coasts.⁴³⁷ The capital city of Colombo and the major railway line and national highway are also situated on the coasts. The coastal areas make significant contributions to the national economy, which is expanding, as evidenced by the increasing migration of people to coastal areas and consequent economic activity.⁴³⁸ The total population of Sri Lanka is 20 million (14 million Sinhalese and 3 million Tamils),⁴³⁹ and the coastal regions accommodate nearly 8.4 million.⁴⁴⁰ Nearly 65 per cent of the urbanized land area, 17 per cent of agricultural lands and 20 per cent of home gardens are located in the coastal zones.⁴⁴¹ The coastal region is also an industrial hub, with 80 per cent of all industrial units.⁴⁴² Another

⁴³³ *The Constitution of the Democratic Socialist Republic of Sri Lanka, 1978*, arts 1, 2 [*Sri Lanka Constitution*].

⁴³⁴ K Lowry & HJM Wickremeratne, “Coastal Area Management in Sri Lanka,” in EM Borgese, N Ginsburg & JR Morgan, eds, *Ocean Yearbook 7* (Chicago: The University of Chicago Press, 1988) 263 at 264.

⁴³⁵ Leslie Joseph, *National Report of Sri Lanka on the Formulation of a Transboundary Diagnostic Analysis and Strategic Action Plan for the Bay of Bengal Large Marine Ecosystem Programme*, at 16, online: Bay of Bengal LME <http://www.boblme.org/documentRepository/Nat_Sri_Lanka.pdf>.

⁴³⁶ UK, Department for International Development, *Integrated Coastal Zone Management in Sri Lanka: A Policy Review* (Livelihood-Policy Relationships in South Asia, Working Paper No 4) by Mark Aeron-Thomas, at 1 (UK: DFID/IIED/MRAG/ University of Leeds/Overseas Development Group, [nd]) [Aeron-Thomas, *Integrated Coastal Zone Management*].

⁴³⁷ Joseph, *supra* note 435 at 5; see also *Sri Lanka Constitution, supra* note 433, art 5 & sch I.

⁴³⁸ Ministry of Environment & Natural Resources & UNEP, *Sri Lanka Environment Outlook: 2009* (Sri Lanka: MENR–SL & UNEP, 2009) at 37 [*Sri Lanka Environment Outlook: 2009*].

⁴³⁹ UNDP, *Sri Lanka Human Development Report: Bridging Regional Disparities for Human Development* (Sri Lanka: UNDP, 2012) at 2 [UNDP, *Sri Lanka Human Development Report*].

⁴⁴⁰ KWG Rekha Nianthi & Rajib Shaw, “Climate Change and its Impact on Coastal Economy of Sri Lanka” in RR Krishnamurthy, eds, *Integrated Coastal Zone Management – The Global Challenge* (Singapore: Research Publishing Services, 2008) 585 at 587.

⁴⁴¹ Sri Lanka, Ministry of Environment, *Sri Lanka's Second National Communication on Climate Change* (Sri Lanka: Climate Change Secretariat, 2011) at 3 [Sri Lanka, *Second National Communication*].

⁴⁴² *Ibid.*

important driver of the economy, tourism, is mainly coastal-based.⁴⁴³ Tropical Sri Lanka is rich in coastal and marine biodiversity. However, as will be seen below, these ecosystems and resources are under considerable stress.

Coastal and marine pollution is on the rise in Sri Lanka, exacting a cost in terms of human health.⁴⁴⁴ The large numbers of rivers that flow down to the coasts carry huge pollution loads from inland areas. Apart from the dumping of industrial effluents,⁴⁴⁵ pesticide residues and coconut husk retting⁴⁴⁶ have also adversely affected coastal waters. Another major pollutant is the discharge of untreated municipal sewage, which results in fecal contamination.⁴⁴⁷ Waste disposal also poses problems to the coastal environment.⁴⁴⁸ Coastal aquifers are being contaminated by leachate of fertilizers, heavy metals, extensive use of pit latrines, and agricultural run-off.⁴⁴⁹ In addition, over-extraction of groundwater has resulted in saline intrusion into the aquifers⁴⁵⁰ and ballast water discharged by ships has introduced invasive species.⁴⁵¹

Sandwiched between two busy shipping lanes, Sri Lanka has three major ports in Colombo, Hambantota and Trincomalee, a regional port in Galle, and a few minor ones.⁴⁵² There have been several oil spills in these ports, and the beaches have been polluted by the accumulation of tar balls.⁴⁵³ This has occurred even though Sri Lanka enacted the *Marine Pollution Prevention Act, 1981*, to regulate pollution from oil and other pollutants generated from sea or land-based sources.⁴⁵⁴ It also adopted a National

⁴⁴³ Nearly 70 per cent of all hotels registered with the tourism board are situated on the coasts. Coast Conservation Department, *Revised Coastal Zone Management Plan, Sri Lanka 1997*, Rev ed (Colombo: Coast Conservation Department of the Ministry of Fisheries & Aquatic Resources Development, 1997) at 43 [*Revised Coastal Zone Management Plan, 1997*].

⁴⁴⁴ Sri Lanka, Coast Conservation Department, *Coastal Zone Management Plan, Sri Lanka 2006* (Colombo: Coast Conservation Department of the Ministry of Fisheries and Aquatic Resources Development, 2006) ¶4.1.1, online: Coast Conservation Department <<http://www.coastal.gov.lk/czmp%20english.pdf>> [*Coastal Zone Management Plan, Sri Lanka 2006*].

⁴⁴⁵ *Ibid.*

⁴⁴⁶ *Revised Coastal Zone Management Plan, 1997, supra* note 443 at 71.

⁴⁴⁷ *Coastal Zone Management Plan, Sri Lanka 2006, supra* note 444, ¶4.2.1.

⁴⁴⁸ *Revised Coastal Zone Management Plan, 1997, supra* note 443 at 71.

⁴⁴⁹ *Coastal Zone Management Plan, Sri Lanka 2006, supra* note 444, ¶4.2.1.

⁴⁵⁰ *Revised Coastal Zone Management Plan, 1997, supra* note 443 at 53.

⁴⁵¹ WU Chandrasekara & MAST Fernando, “Accidental Introduction of Alien Plankton into the Sri Lankan Coastal Zone through Ballast Water of Cargo Ships” (2009) 14 Sri Lanka J Aquatic Sci 87 at 88.

⁴⁵² *Sri Lanka Ports Authority*, online: Sri Lanka Ports Authority <<http://www.slpa.lk/>>.

⁴⁵³ *Coastal Zone Management Plan, Sri Lanka 2006, supra* note 444, ¶3.2.1.

⁴⁵⁴ *Marine Pollution Prevention Act, 1981* (No 59 of 1981, Sri Lanka).

Oil Spill Contingency Plan, which spells out emergency procedures in the case of an oil spill.⁴⁵⁵

The fishing sector is of crucial importance to the Sri Lankan economy.⁴⁵⁶ While coastal fisheries are the dominant sector, the offshore fishery is the fastest growing.⁴⁵⁷ For a long time, beach seining dominated coastal fisheries, but its significance declined with the mechanization of fisheries.⁴⁵⁸ Generally conducted in bays and in calm waters, beach seining requires large tracts of beach land for manually hauling the net and for drying the nets and fish.⁴⁵⁹ With the development of coastal tourism, the traditional rights enjoyed by the artisanal sector regarding public access to land on beaches and lagoon fronts has been denied at several places, resulting in conflicts.⁴⁶⁰

Coastal fisheries have also been affected by increasing levels of pollution due to higher industrialization in the coastal zone, and aquaculture operations have ruined local coastal environments.⁴⁶¹ Pond water from shrimp farms are often discharged into adjoining waters, affecting lagoon fishing and leading to salinisation of wells.⁴⁶² Mangroves and agricultural lands have been converted to facilitate shrimp culture, and these actions have triggered a host of other environmental problems.⁴⁶³

In 1961, a series of protected areas was established under the *Fauna and Flora Protection Ordinance, 1937* (as amended).⁴⁶⁴ This law provides for six categories of protected areas, including marine sanctuary and nature reserve. The Ordinance has provisions to protect certain categories of animals and plants, including threatened species

⁴⁵⁵ *National Oil Spill Contingency Plan*, online: Marine Environment Protection Authority <http://www.mepa.gov.lk/web/index.php?option=com_content&view=article&id=49&Itemid=50&lang=en>.

⁴⁵⁶ The fishery sector earns valuable foreign exchange. It provides direct employment to about 150,000 people, and indirectly it sustains close to a million. Jinie DS Dela, *Fourth Country Report from Sri Lanka to the United Nations Convention on Biological Diversity* (2009) at 35 (provides livelihood to 2.4 million people); Sri Lanka, *Second National Communication*, *supra* note 441 at 19.

⁴⁵⁷ Sri Lanka, Ministry of Fisheries & Aquatic Resources, *Ten Year Development Policy Framework of the Fisheries and Aquatic Resources Sector 2007-2016* (March 2007) at 4.

⁴⁵⁸ *Coastal Zone Management Plan, Sri Lanka 2006*, *supra* note 444, ¶5.2.2.

⁴⁵⁹ *Ibid.*

⁴⁶⁰ *Ibid.*

⁴⁶¹ *Ibid.*, ¶3.1.2.

⁴⁶² Aeron-Thomas, *Integrated Coastal Zone Management*, *supra* note 436 at 7.

⁴⁶³ *Coastal Zone Management Plan, Sri Lanka 2006*, *supra* note 444, ¶5.2.3.

⁴⁶⁴ *Fauna and Flora Protection Ordinance, 1937* (No 2 of 1937, Sri Lanka), as amended by *Fauna and Flora Protection (Amendment) Act, No 49 of 1993*, s 3.

of corals, fish, turtles, and all marine mammals found in Sri Lankan waters.⁴⁶⁵ In addition, the government can declare “fisheries management areas” and “special area management” under the *Fisheries and Aquatic Resources Act, 1996*.⁴⁶⁶ Despite these laws, protection of marine and coastal areas exists mainly on paper due to the lack of effective implementation.⁴⁶⁷

Tropical Sri Lanka will also be severely affected by SLR, particularly through coastal erosion along the western and southwestern coasts.⁴⁶⁸ Apart from natural factors, human activities like sand and coral mining and the construction of hard structures to prevent erosion have amplified the problem. For decades, Sri Lanka has invested considerable resources in the construction of coastal defense structures. These attempts to reduce erosion in one area have often aggravated erosion in others.⁴⁶⁹ It is estimated that the Sri Lankan coastline recedes, on average, three meters every year.⁴⁷⁰

Sand mining on beaches or in rivers is one of the primary reasons for coastal erosion in Sri Lanka as this decreases the presence of coastal sediments. Most construction activity is concentrated in the northwestern, western and southern provinces, and it is in these areas that the problem of sand mining is acute and, consequently, so is erosion.⁴⁷¹ Sand mining poses other environmental problems, including lowering of riverbeds, causing water levels to drop below sea level and resulting in seawater intrusion.⁴⁷² Sri Lanka enacted the *Soil Conservation Act* in 1951 to prevent and mitigate soil erosion.⁴⁷³ It empowers the Minister to declare “erodible areas”⁴⁷⁴ and issue regulations for their management.⁴⁷⁵ The *Mines and Minerals Act, 1992*, while granting licenses for mining, requires the license holder to restore and rehabilitate the land on which the exploration or mining is carried out.⁴⁷⁶ In 2005, Sri Lanka formulated a

⁴⁶⁵ See e.g. *Fauna and Flora Protection Ordinance, 1937* (No 2 of 1937, Sri Lanka) s 6A(1).

⁴⁶⁶ (No 2 of 1996, Sri Lanka), s 31.

⁴⁶⁷ Nishan Perera & Asha de Vos, “Marine Protected Areas in Sri Lanka: A Review” (2007) 40 *Env't Mgmt* 727 at 734-35.

⁴⁶⁸ *Revised Coastal Zone Management Plan, 1997*, *supra* note 443 at 13.

⁴⁶⁹ *Ibid* at 17.

⁴⁷⁰ Sharma, *supra* note 352 at 5.

⁴⁷¹ *Revised Coastal Zone Management Plan, 1997*, *supra* note 443 at 22.

⁴⁷² *Sri Lanka Environment Outlook: 2009*, *supra* note 438 at 61.

⁴⁷³ (Nos 25 of 1951 & 29 of 1953, Sri Lanka), pmb1.

⁴⁷⁴ *Ibid*, s 3.

⁴⁷⁵ *Ibid*, s 4.

⁴⁷⁶ *Ibid*, s 61.

“National Policy on Sand as a Resource for the Construction Industry,”⁴⁷⁷ which outlines several management and regulatory principles for sand mining from rivers. It also provides rules for sand mining from coastal ecosystems like coastal dunes.⁴⁷⁸

Another catalyst that has contributed to the increasing rate of coastal erosion is coral mining for the construction industry.⁴⁷⁹ Although coral mining has existed in Sri Lanka for long time, it was confined mainly to certain relic reefs. The recent construction boom has seen an increase in coral mining, contributing to erosion.⁴⁸⁰ In response, the government has banned the mining of sea coral,⁴⁸¹ resulting in a decline in the quantity mined,⁴⁸² but illegal mining involving the use of several destructive practices continues.⁴⁸³

SLR is projected to reach one meter by 2070.⁴⁸⁴ Since the topography in the coastal regions is basically flat, the natural drainage path is ineffective and the coastal regions are already experiencing severe flooding, which SLR will magnify.⁴⁸⁵ Salinity intrusion into groundwater sources in the northern dry zone coastal districts,⁴⁸⁶ loss of coastal wetlands,⁴⁸⁷ and damage to existing sea defence structures and near-shore infrastructure⁴⁸⁸ are some of the possible impacts indentified.

As part of developing its adaptation strategy, the Climate Change Secretariat,⁴⁸⁹ established under the Ministry of Environment to provide a comprehensive national approach to address challenges related to climate change, has developed a National Climate Change Adaptation Strategy, with assistance from the Asian Development

⁴⁷⁷ Sri Lanka, Ministry of Environment, *National Policy on Sand as a Resource for the Construction Industry – 2005 (Draft)*, online: ELAW <<http://www.elaw.org/node/1584>>.

⁴⁷⁸ *Ibid.*, ¶4.2.1.

⁴⁷⁹ *Coastal Zone Management Plan, Sri Lanka 2006*, *supra* note 444, ¶2.2.2.

⁴⁸⁰ *Revised Coastal Zone Management Plan, 1997*, *supra* note 443 at 22.

⁴⁸¹ *Coast Conservation Act 1981* (No 57 of 1981, Sri Lanka) [*Sri Lanka CCA 1981*], as amended by *Coast Conservation (Amendment) Act 1988* (No 64 of 1988, Sri Lanka) s 8 [*Sri Lanka CCAA 1988*] (inserts 31A(1), 31C, into the *Sri Lanka CCA 1981*); see also *Coast Conservation (Amendment) Act 2011* (No 49 of 2011, Sri Lanka) s 29 [*Sri Lanka CCAA 2011*] (inserts section 31BB, into the *Sri Lanka CCA 1981*). The new section prohibits the mining of sea corals within or outside the coastal zone. *Ibid.*

⁴⁸² *Coastal Zone Management Plan, Sri Lanka 2006*, *supra* note 444, ¶2.2.2.

⁴⁸³ *Ibid.*

⁴⁸⁴ Nianthi & Shaw, *supra* note 440 at 591-95.

⁴⁸⁵ Sri Lanka, *Second National Communication*, *supra* note 441 at 91.

⁴⁸⁶ *Ibid.*

⁴⁸⁷ *Ibid.* at 92.

⁴⁸⁸ *Ibid.*

⁴⁸⁹ *Climate Change Secretariat*, online: Climate Change Secretariat <http://www.climatechange.lk/ccs_index.html>.

Bank.⁴⁹⁰ This document is structured around five strategic thrust areas;⁴⁹¹ within each of these, thematic areas of action are specified along with priority adaptation measures.⁴⁹² In addition, Sri Lanka has in its “Second National Communication on Climate Change” identified certain specific adaptation measures, such as preparation of a groundwater extraction regulation policy, incorporation of climate change concerns in town and country planning and wetland conservation programmes, preparation of set-back lines taking into account SLR, and introduction of salinity-tolerant crops.⁴⁹³

3.2.4.1 Sri Lanka’s Coastal Law

Prior to Sri Lanka’s independence in the 1920s, there was growing interest in coastal issues, triggered primarily by coastal erosion.⁴⁹⁴ The initial emphasis was on hard engineering solutions.⁴⁹⁵ In 1963, a Coast Protection Unit was set up under the Colombo Port Commission, which, in 1978, evolved into the Coast Conservation Division (at present a Department) under the Ministry of Fisheries and Aquatic Resources.⁴⁹⁶ To develop a comprehensive approach to CZM, the Coast Conservation Division lobbied for the establishment of a legislative framework, which ultimately led to the *Coast Conservation Act, 1981* (CCA).⁴⁹⁷ Even though, at its enactment, the CCA was way ahead of its time, in due course, it was increasingly felt that the Act required a substantial re-write to retain relevance.

The CCA has been amended twice and the recent amendment has almost overhauled the coastal law of Sri Lanka.⁴⁹⁸ In fact, after this amendment, the law was

⁴⁹⁰ *National Climate Change Adaptation Strategy for Sri Lanka 2011 to 2016: Final Draft* (2010), online: Climate Change Secretariat <[http://www.climatechange.lk/adaptation/Files/Strategy_Booklet-Final_for_Print_Low_res\(1\).pdf](http://www.climatechange.lk/adaptation/Files/Strategy_Booklet-Final_for_Print_Low_res(1).pdf)>.

⁴⁹¹ The areas are mainstreaming climate change adaptation into national planning and development; enabling climate resilient and healthy human settlements; minimizing climate change impacts on food security; improving climate resilience of key economic drivers, and safeguarding natural resources and biodiversity from climate change impacts. *Ibid*.

⁴⁹² Specifically, the document identifies the promotion of integrated coastal resource management as a priority adaptation measure under the thematic area of enhancement of the resilience of coastal and marine ecosystems and associated vulnerable species under the strategic thrust area of safeguarding natural resources and biodiversity from climate change impacts. *Ibid* at 22.

⁴⁹³ Sri Lanka, *Second National Communication*, *supra* note 441 at 93.

⁴⁹⁴ *Revised Coastal Zone Management Plan, 1997*, *supra* note 443 at 12.

⁴⁹⁵ *Ibid*.

⁴⁹⁶ *Ibid* at 2.

⁴⁹⁷ *Sri Lanka CCA 1981*, *supra* note 481.

⁴⁹⁸ *Sri Lanka CCAA 1988*, *supra* note 481; *Sri Lanka CCAA 2011*, *supra* note 481.

renamed the *Coast Conservation and Coastal Resource Management Act (CC&CRMA)* and its ambit considerably broadened to include not only coast conservation but also coastal resources management.⁴⁹⁹ The CC&CRMA calls for four main actions: a survey of the coastal zone; preparation of a coastal zone and coastal resource management plan (CZ&CRMP) based on the survey; regulation and control of development activities in the coastal zone via a permit system; and formulation and execution of work schemes for coastal conservation and coastal resources management.⁵⁰⁰ To achieve these objectives, it vests the “administration, control, custody and management” of the coastal zone with the Republic,⁵⁰¹ which in turn carries out these responsibilities through the two sets of authorities: the “Director-General of Coast Conservation and Coastal Resource Management” (Director-General), which is primarily responsible for the administration and implementation of the CC&CRMA,⁵⁰² and the “Coast Conservation and Coastal Resource Management Advisory Council” (the Advisory Council),⁵⁰³ which is primarily responsible for advisory functions.⁵⁰⁴ In addition, the Advisory Council also reviews the CZ&CRMP and environmental impact assessments and forwards recommendations to the Director-General.⁵⁰⁵ Apart from these two authorities, the Minister in charge of coastal conservation is empowered to make regulations to operate certain provisions of this

⁴⁹⁹ *Sri Lanka CCAA 2011, ibid, s 3(d).*

⁵⁰⁰ *Sri Lanka CCA 1981, supra note 481, ss 11, 12, 14 & 20; see also ibid, s 2.*

⁵⁰¹ *Sri Lanka CCA 1981, ibid, s 2.*

⁵⁰² *Ibid, ss 3, 4.*

⁵⁰³ The 2011 amendment to the coastal law has completely revamped the constitution of the Coast Conservation and Coastal Resource Management Advisory Council. A high-powered body, the Secretary to the Ministry of the Minister in charge of Coast Conservation and Coastal Resource Management acts as the Chairman. In addition, the Secretaries to the Ministry of the Minister in charge of Plan Implementation, the Ministry of Tourism, Ministry of Urban Development, Ministry of Public Administration, Ministry of Industries, Ministry of Provincial Councils, Ministry of Environment, or the representatives or the respective secretaries are members. The Director-Generals of the Fisheries and Aquatic Resources, the National Aquatic Resources Research and Development Agency, the Urban Development Authority, the Central Environmental Authority, the Geological Survey and Mines Bureau or their respective representatives are other members. The Land Commissioner, the Director-General of Coast Conservation and Coastal Resource Management (acts as Secretary), three persons appointed by the Minister (from the fishing industry, non-governmental organizations concerned with coastal protection and an academic). To enable it to discharge its functions effectively, the Advisory Council is empowered to co-opt any other secretary to serve as a member of the Advisory Council so long as is necessary. *Sri Lanka CCAA 2011, supra note 481, s 7.*

⁵⁰⁴ *Sri Lanka CCA 1981, supra note 481, ss 6-10.*

⁵⁰⁵ *Ibid, s 7.*

statute⁵⁰⁶ and has the power to declare affected areas, beach parks, conservation and special management areas, and to formulate regulations relating to their administration,⁵⁰⁷ and appoint certain members to the Advisory Council.⁵⁰⁸

Wide powers are conferred on the Director-General to work the CC&CRMA. The Director-General has the responsibility to formulate and execute coast conservation schemes;⁵⁰⁹ prepare and implement the coastal zone and coastal resource management plan;⁵¹⁰ and disseminate information, tender advice and proffer guidance on coast conservation and coastal resource management to the general public and to other departments, agencies and institutions.⁵¹¹ In addition, the Director-General coordinates the activities of other departments, institutions and agencies that relate to the coastal zone, including the conduct of research.⁵¹² The Director-General can delegate any of his/her powers to Divisional Secretaries or to prescribed officers. In comparison to the earlier provision, the amended section now provides for a wider delegation.⁵¹³

In administering the CC&CRMA, the Director-General is to cause a survey of all the resources and activities in the coastal zone and prepare a report,⁵¹⁴ on the basis of which the CZ&CRMP is prepared.⁵¹⁵ This document is revised once every five years.⁵¹⁶

⁵⁰⁶ *Ibid*, s 32; see also *Sri Lanka CCAA 2011*, *supra* note 481, s 12.

⁵⁰⁷ *Sri Lanka CCAA 2011*, *ibid*, s 19.

⁵⁰⁸ *Ibid*, s 7.

⁵⁰⁹ *Sri Lanka CCA 1981*, *supra* note 481, s 4(b); see also *Sri Lanka CCAA 2011*, *ibid*, s 5(2)(g).

⁵¹⁰ *Sri Lanka CCAA 2011*, *ibid*, s 5(2)(d). The Director-General is to cause a survey of all resources and activities within the coastal zone and is to publish a report embodying the same. *Sri Lanka CCA 1981*, *supra* note 481, s 11; see also *Sri Lanka CCAA 2011*, *ibid*, s 8. The Director-General is tasked with the duty to prepare a coastal zone and coastal resources management plan (plan) based on the survey results within three years. The plan is to include guidelines for the management of coastal resources and a comprehensive programme for coastal resources conservation for sustainable development. It is also to include guidelines to determine the suitability of particular development activities in the coastal zone, proposals dealing with subjects like land use, mineral extraction, preservation and management of scenic and other natural resources, coastal erosion management, zoning of coastal water usage, and coastal water quality. In addition, the plan is to contain recommendations identifying special area management sites, the paths, routes and corridors to secure access to the beach and to the coastal zone, measures to clear obstructions, recommend guidelines for the sustainable development and management of the coastal zone, etc. *Sri Lanka CCA 1981*, *ibid*, s 12; *Sri Lanka CCAA 2011*, *ibid*, s 9.

⁵¹¹ *Sri Lanka CCAA 2011*, *ibid*, s 5(2)(e).

⁵¹² *Ibid*, s 5(2)(c) & (f).

⁵¹³ *Ibid*, s 6 (replaces section 5 of the *Sri Lanka CCA 1981*).

⁵¹⁴ *Ibid*, s 8 (replaces s 11 of the *Sri Lanka CCA 1981*). In preparing this report, the Director-General is to have regard to relevant data and information collected or compiled by government departments, institutions and agencies and there is a corresponding duty on these bodies to supply data necessary for the report. *Ibid*.

⁵¹⁵ *Sri Lanka CCA 1981*, *supra* note 481, s 12(1); see also *Sri Lanka CCAA 2011*, *supra* note 481, s 9.

As is presently conceived, after the 2011 amendment, the CZ&CRMP emerges as a detailed blue print for managing the coastal zones covering many areas. It includes guidelines for coastal resources management and a comprehensive programme for the conservation of coastal resources targeted towards sustainable development.⁵¹⁷ To maintain “long term stability, productivity and environmental quality of the coastal zone,”⁵¹⁸ development activities therein are subject to a permit system administered by the Director-General.⁵¹⁹ In managing this permit system, the Director-General relies on criteria prescribed by the Minister.⁵²⁰ The applicant may be required to furnish an initial environmental examination report or an environmental impact assessment, as the case may be, which is forwarded to the Advisory Council for its comments.⁵²¹ The public also has the right to provide comments on the environmental impact assessment.⁵²² The permit is issued only if the development activity is consistent with the CZ&CRMP and related regulations and is valid for such periods as may be prescribed. The Director-General can attach conditions necessary for the proper management of the coastal zone.⁵²³ In cases where the permit holder violates any of the conditions, the Director-General can vary the conditions or can even revoke the permit.⁵²⁴

To resolve user conflicts, the 1988 amendment⁵²⁵ to the *Coast Conservation Act*,

⁵¹⁶ *Sri Lanka CCAA 2011, ibid, s 9(2).*

⁵¹⁷ The plan contains proposals dealing with subjects like coastal erosion management, coastal water quality, coastal water usage zoning; guidelines in determining the suitability of particular developmental activities in the coastal zone; identifying the routes paths and corridors to facilitate public access; recommendations identifying special area management sites, etc. *Sri Lanka CCA 1981, supra* note 481, s 12(1); *Sri Lanka CCAA 2011, ibid, s 9.* The CZ&CRMP is submitted to the advisory council, which in turn makes modifications before submitting it to the minister. Once the minister receives the plan, it is available for public inspection and comment. Thereafter, subject to necessary modifications, the Minister grants provisional approval and it is forwarded to the cabinet for final approval. *Sri Lanka CCA 1981, ibid, s 12(2)-(4).*

⁵¹⁸ *Sri Lanka CCA 1981, ibid, s 14(2).*

⁵¹⁹ *Ibid, s 14(1).*

⁵²⁰ The minister, having regard to the long-term stability, productivity and environmental quality and the sustainability of the resources within the coastal zone, can prescribe criteria to be used to determine whether a permit should be issued. *Ibid, s 13; Sri Lanka CCAA 2011, supra* note 481, s 10.

⁵²¹ *Sri Lanka CCA 1981, ibid, s 16; see also Sri Lanka CCAA 2011, ibid, s 12.*

⁵²² *Sri Lanka CCA 1981, ibid, s 16(3)(b).*

⁵²³ *Ibid, s 17.*

⁵²⁴ *Ibid, s 19; Sri Lanka CCAA 2011, supra* note 481, s 15. The Director can vary the conditions attached to any permit or revoke the permit, if satisfied that the permit holder has contravened the conditions attached to the permit and that such variation or revocation is necessary for the proper management of the coastal zone or the resources therein. *Sri Lanka CCA 1981, ibid, s 19.*

⁵²⁵ *Sri Lanka CCAA 1988, supra* note 481.

1981 (CCA) provides that “[n]o person shall, by reason of possession or use of any specific portion of the beach claim to have acquired title to such portion of the beach as against the State.”⁵²⁶ Furthermore, the right of the public to use or enjoy any portion of the beach was also guaranteed.⁵²⁷ Despite these amendments, conflicts continued between the fishing and tourism industries. There have also been conflicts between the artisanal and mechanized segments of the fishing industry. To address these issues, the 2011 amendment seeks to secure coastal access.⁵²⁸ Accordingly, the Director General is tasked with the duty to identify through a survey all routes, paths and corridors, which, facilitates public access to beaches and coastal zones. Based on these findings, a comprehensive report (coastal access plan) is prepared, which is submitted to the Advisory Council.⁵²⁹ Based on recommendations, the coastal access plan is modified and put before the public domain for comments.⁵³⁰ The public can forward their comments within 60 days, to the Director-General, who incorporates them in the plan.⁵³¹ Thereafter, a revised plan is submitted to the minister, who places it before the cabinet for approval.⁵³² Once the plan secures cabinet approval, it is gazetted to render it operative.⁵³³ As well, the Minister can make regulations specifying matters that need to be included in the Coastal Access Plan, the activities that can be carried out, and details regarding ownership of the lands inclusive of extents and locations.⁵³⁴

To secure protection to the coastal environment and to strengthen the provisions relating to coast conservation and coastal resources management, section 19 of the *Coast*

⁵²⁶ *Ibid*, s 8 (inserts section 31D(1) in the *Sri Lanka CCA 1981*).

⁵²⁷ *Ibid* (inserts section 31D(3) in *Sri Lanka CCA 1981*).

⁵²⁸ “[C]oastal access” means the right of the public to approach, enter, or use an approach to enter into or to go along a coastal margin in a physical and visual sense and also includes access along the shoreline, usually a strip of land parallel to the water’s edge or path or trail which runs parallel to or along the shoreline, path or trail which connects the nearest public roadway with a shoreline destination along a reasonable direct route or access to the shoreline from a public road to the Mean High Water Level.

Sri Lanka CCAA 2011, supra note 481, s 36(1).

⁵²⁹ *Ibid*, s 19 (inserts section 22(F)(1) into *Sri Lanka CCA 1981*).

⁵³⁰ *Ibid* (inserts section 22(F)(3) into *Sri Lanka CCA 1981*).

⁵³¹ *Ibid*.

⁵³² *Ibid*.

⁵³³ *Ibid* (inserts section 22(F)(4) into *Sri Lanka CCA 1981*).

⁵³⁴ *Ibid* (inserts section 22(F)(5) into *Sri Lanka CCA 1981*).

Conservation (Amendment) Act, 2011 inserts new tools into the principal enactment.⁵³⁵ The first is the concept of “affected areas”. The amended section now empowers the Minister to declare any area within or adjacent, or falling within both such areas in the coastal zone, any water body or a part thereof, any lagoon or part of any lagoon or its peripheral areas as an “affected area”.⁵³⁶ All detrimental developmental activities, including those sanctioned by under the permit (e.g., the filling, obstruction, pollution or the carrying out of any act that can harm aquatic and marine life) are prohibited in the affected areas and are liable to be punished.⁵³⁷ In addition, the Minister can make regulations for the administration of affected areas and activities prohibited in such areas.⁵³⁸

The second tool is the “beach park”.⁵³⁹ Accordingly, if the Minister is of the opinion that any area within the coastal zone due to its scenic beauty and biodiversity needs preservation, the area can then be declared as a “beach park”, and regulations can be made for its administration.⁵⁴⁰ The Minister is also empowered to declare “conservation areas”, in which special measures can be implemented to protect coastal and aquatic eco-systems. Even though development activities, the collection and gathering of aquatic resources are prohibited in such areas, the Director-General can issue permits for scientific study and research.⁵⁴¹ Again, the Minister is empowered to make regulations prescribing the manner and the mode of administration of such areas.⁵⁴²

Another important feature of the 2011 amendment is that it entrenches the concept of “special management areas” to facilitate a collaborative approach to resource management.⁵⁴³ Accordingly, the Minister has the discretionary powers to declare coastal zone areas and those lying adjacent to it or comprising both these areas, as “Special Management Area,” provided that these are included within the Coastal Zone and Coastal

⁵³⁵ *Ibid* (inserts parts IIIA, IIIB, IIIC and IIID (sections 22B, 22C, 22D, 22E, 22F, and 22G) into *Sri Lanka CCA 1981*).

⁵³⁶ *Ibid* (inserts part III A (section 22B(1)) into *Sri Lanka CCA 1981*).

⁵³⁷ *Ibid* (inserts section 22B(2), (3) into *Sri Lanka CCA 1981*).

⁵³⁸ *Ibid* (inserts section 22 B(6) into *Sri Lanka CCA 1981*).

⁵³⁹ *Ibid* (inserts section 22C(1) into *Sri Lanka CCA 1981*).

⁵⁴⁰ *Ibid*.

⁵⁴¹ *Ibid* (inserts section 22D(2) into *Sri Lanka CCA 1981*).

⁵⁴² *Ibid* (inserts section 22D(3) into *Sri Lanka CCA 1981*).

⁵⁴³ *Ibid* (inserts section 22E(1) into *Sri Lanka CCA 1981*).

Resource Management Plan.⁵⁴⁴ As in the case with others, the minister can make regulations prescribing administrative details for such areas (i.e., the activities that can be carried out and the persons entitled to have access).⁵⁴⁵

Apart from prohibiting the mining of sea corals within and outside the coast,⁵⁴⁶ the Sri Lankan coastal law proscribes the filling of land or water bodies within the coastal zone without a permit.⁵⁴⁷ In cases where this prohibition is violated, the Director-General can call upon persons responsible to remove the substances used for filling up the land or water body and restore the same to its original state within a specified time.⁵⁴⁸ If the restoration is not completed, then the Director-General can remove the substance and the costs can be recovered from the concerned person as arrears due to the state.⁵⁴⁹

3.2.4.2 Remarks

Even with certain drawbacks, Sri Lanka's experience with coastal law making is a model worthy of emulation by other countries not only within the South Asian region but also beyond. As pointed out, this country has the distinction of being the first Asian nation to have a comprehensive programme for CZM.

A first-generation coastal law enacted well before the entrenchment of the concept of ICZM at the international level, the *Coast Conservation Act 1981* has been remarkably resilient in operationalization of ICZM in Sri Lanka. The proclivity towards ICZM is evident even from the definition given to the term "coastal zone," which is the area of 300 meters landwards from the mean high water line and two kilometers seawards from the mean low water line.⁵⁵⁰ It is notable that the *Coast Conservation Act 1981* provides for spatial integration, which is central to an ICZM process. The recent amendment has considerably strengthened and fortified the ICZM regime in Sri Lanka. As well, from an ICZM perspective, this coastal law now provides legal recognition to the right of public access to coastal areas,⁵⁵¹ contains provisions to control marine pollution,⁵⁵² protects

⁵⁴⁴ *Ibid* (inserts section 22E(1), (2) into *Sri Lanka CCA 1981*).

⁵⁴⁵ *Ibid* (inserts section 22 E(2) into *Sri Lanka CCA 1981*).

⁵⁴⁶ *Ibid*, s 29 (inserts section 31BB into *Sri Lanka CCA 1981*).

⁵⁴⁷ *Ibid*, s 32 (inserts section 31G into *Sri Lanka CCA 1981*).

⁵⁴⁸ *Ibid* (inserts section 31G(1), (2) into *Sri Lanka CCA 1981*).

⁵⁴⁹ *Ibid* (inserts section 31G(8) into *Sri Lanka CCA 1981*).

⁵⁵⁰ *Sri Lanka CCA 1981*, *supra* note 481, s 42.

⁵⁵¹ *Sri Lanka CCAA 1988*, *supra* note 481, s 8 (inserts section 31D(1) & (3) into *Sri Lanka CCA 1981*); see also *Sri Lanka CCAA 2011*, *supra* note 481, part IIID.

sensitive coastal ecosystems like coral reefs,⁵⁵³ and requires that the CZ&CRMP *inter alia* provide for coastal erosion management,⁵⁵⁴ and zoning of coastal water usage.⁵⁵⁵ By including 'zoning of coastal water usage', the drafters of the 2011 amendment seek to establish inter-linkages between ICZM and marine spatial planning.⁵⁵⁶

Until the recent amendment of 2011, only one amendment was carried out to this law during the past three decades.⁵⁵⁷ This is primarily because this is a framework law that provides a broad structure and the tools for CZM. The details of the management process are worked out through CZ&CRMPs. The first CZ&CRMP was developed in 1990. It dealt with managing the critical coastal problems of that time, namely, erosion control and sand and coral mining. Subsequently, in association with the University of Rhode Island, the Coast Conservation Department prepared “Coastal 2000: Recommendations for A Resource Management Strategy for Sri Lanka’s Coastal Region” (Coastal 2000), in 1992, which spearheaded Sri Lanka’s movement towards ICZM.⁵⁵⁸

In the revised Coastal Zone Management Plan of 1997, based on the principles of Coastal 2000, SLR was linked to the broader goal of coastal erosion control and attention was also directed to new areas of concern like marine pollution. More importantly, in a marked shift in perspective, this second generation CZ&CRMP initiated a new bottom-up and collaborative management strategy to complement the top-down approach by providing for a new tool, namely, “special area management.”⁵⁵⁹ In the 2004 version of the CZ&CRMP, apart from subjects that were dealt with by the earlier CZ&CRMPs, the emphasis shifted to integrating coastal fisheries and aquaculture, facilitating public

⁵⁵² *Sri Lanka CCA 1981, supra* note 481, s 25; see also *Sri Lanka CCA 1988, ibid*, s 8 (inserts section 31C into *Sri Lanka CCA 1981*, which calls for the demolition of kilns in the coastal zone); see also *Sri Lanka CCAA 2011, supra* note 481, s 32.

⁵⁵³ See *Sri Lanka CCA 1988, ibid*, s 8 (inserts s 31A which prohibits the mining of corals within the coastal zone); *Sri Lanka CCAA 2011, ibid*, s 29.

⁵⁵⁴ *Sri Lanka CCAA 2011, ibid*, s 9.

⁵⁵⁵ *Ibid*.

⁵⁵⁶ For the European Union approach on linking ICZM and marine spatial planning, see also Ch 9, Part 9.3.2.2.

⁵⁵⁷ *Sri Lanka CCAA 1988, supra* note 481.

⁵⁵⁸ See generally S Olsen et al, eds, *Coastal 2000: Recommendations for A Resource Management Strategy for Sri Lanka’s Coastal Region*, vols 1 & 2 (Colombo: Coast Conservation Department and Coastal Resources Center, Sri Lanka & the University of Rhodes Island, 1992); John R Clark, *Integrated Management of Coastal Zones*, FAO Fisheries Technical Paper, No 327 (Rome: FAO, 1992) at 581.

⁵⁵⁹ *Revised Coastal Zone Management Plan, 1997, supra* note 443 at 97.

access, and using new regulatory mechanisms. It has been decided to provide greater emphasis to climate change considerations in the next revision of the CZ&CRMP.⁵⁶⁰

In conclusion, it can be seen that Sri Lanka has one of the best normative frameworks on CZM supported by comprehensive ICZM plans. Despite this, coastal degradation continues, and this points to the need for effective implementation of the laws. However, other issues must also be considered. Sri Lanka was in the grip of Asia's longest running civil war that lasted for more than 30 years.⁵⁶¹ During this period, the writ of the national government did not run in the war-torn regions of the north and the east. Among the eight SAARC countries, even though Sri Lanka has the highest level of human development, there is large regional disparity attributable to the prolonged conflict.⁵⁶² Now, with the Liberation Tigers of Tamil Elam having been militarily defeated, the first priority of the national government is reconciliation and initiation of development in these regions.⁵⁶³ Prior to the outbreak of the war, the Tamil-dominated northern provinces played a very important role in sustaining Sri Lankan fisheries. In 1983, about 40 per cent of the total marine fish production of the country was from Mullaitivu, Jaffna and Mannar.⁵⁶⁴ The conflict has completely destroyed the fishing industry and efforts are now being directed to resuscitating them.⁵⁶⁵ There is also considerable potential for tourism development in these regions.

Coming in the wake of a culmination of nearly three decades of civil war, the new amendment to the coastal law is indicative of Sri Lanka's intention to utilise and manage its coastal resources to promote economic development. Thus, the law is not solely about coast conservation but also about coast conservation and coastal resource management. Nonetheless, Sri Lanka continues to adopt a dirigiste approach to coastal management and regrettably, the new amendment to the coastal law practically fortifies the 'command

⁵⁶⁰ Sri Lanka, *Second National Communication*, *supra* note 441 at 93.

⁵⁶¹ Jayashree Bajoria, "The Sri Lankan Conflict" (18 May 2009), online: Council on Foreign Relations <<http://www.cfr.org/terrorist-organizations/sri-lankan-conflict/p11407>>.

⁵⁶² UNDP, *Sri Lanka Human Development Report*, *supra* note 439 at 13; see generally *ibid* at ch 7.

⁵⁶³ C Bryson Hull, "Sri Lanka president pledges reconciliation, development" *Reuters* (10 April 2010) online: Reuters <<http://www.reuters.com/>>.

⁵⁶⁴ Wadakkinn Wasantham, *Accelerated Fisheries Sector Development Plan for the Northern Province in Sri Lanka*, online: Ministry of Fisheries & Aquatic Resources Development <<http://www.fisheries.gov.lk/>>.

⁵⁶⁵ For a summary of damage caused to economic and social infrastructure in the northern province, see UNDP, *Sri Lanka Human Development Report*, *supra* note 439 at 6; see generally *ibid* at ch 7.

and control' method. As of now, there is provision only for a single national ICZM plan. Moreover, the recent amendment to the law does not contain any provision relating to decentralization and the involvement of local bodies in coastal management.⁵⁶⁶ Tamil representation from the war-torn north has not been secured in the constitution of the Advisory Council even though the amendment, while recasting the Advisory Council, specifically provides that the Minister can appoint three persons: one representing academic staff from the Universities, one representing non-governmental organizations concerned with coastal environment protection, and the other representing the fishing industry.⁵⁶⁷ Employment of such wide legislative language does not necessarily guarantee representation of Tamil coastal communities in the body.

Such a centralized approach to CZM may not prove successful in the long run. There may be the need for ICZM plans at the provincial level that takes into consideration the development aspirations and conservation objectives espoused by each coastal province in the context of the national constitutional dynamics and development imperatives.

The CC&CRMA has proven to be a remarkably adaptable tool for achieving sustainable coastal management. Despite the 2011 amendment, the CC&CRMA may have to be re-visited in light of new thinking on CZM law. The CC&CRMA does not embody the concept of a principled approach to coastal and ocean governance. Rather, it facilitates tightening state control over coastal areas and resources by vesting them in the Republic.⁵⁶⁸ In other words, the CC&CRMA is more state-centric and less people-centric. The Sri Lankan coastal law mirrors the Indian approach, which provides for public participation in the preparation of CZ&CRMPs but subsequently undermines community-based management of coastal areas and resources. As well, the strategy for combating

⁵⁶⁶ See generally *Sri Lanka CCAA 2011*, *supra* note 481. There are four levels of government in Sri Lanka. At the apex, there is the central government with a 225 member parliament. The next layer is the nine provincial councils, followed by 18 municipal councils and 42 urban councils, which administer large and small towns. The 270 *Pradeshiya sabhas* (village councils) are the last layer, which administer villages. UNDP, *Sri Lanka Human Development Report*, *ibid* at 111. Provinces and local bodies are dependent on the central government for funds and because of the civil war there was shortage of funds. *Ibid* at 113.

⁵⁶⁷ *Sri Lanka CCAA 2011*, *ibid*, s 7.

⁵⁶⁸ See *Sri Lanka CCA 1981* as amended by *Sri Lanka CCAA 2011*, *supra* note 481, s 2. The Sri Lankan government has been reluctant to implement the 13th amendment to the constitution, brought about by the *Indo-Lanka Political Accord of 1987*, which is an important attempt to devolve power to the Tamil provinces. UNDP, *Sri Lanka Human Development Report*, *supra* note 439 at 3.

climate change and SLR needs to be strengthened, as the thrust has primarily been limited to controlling coastal erosion. Climate change and SLR are treated as sub-sets of coastal erosion when, in reality, the problems posed by climate change and SLR are more grave and complex and warrant an independent but holistic approach.

3.2.5 The Maldives

The smallest Asian country, the Maldives is a low-lying archipelago situated on the Laccadives-Chagos submarine ridge in the heart of the Indian Ocean.⁵⁶⁹ It comprises nearly 1,192 small low-lying islands, out of which 194 support human habitation, infrastructure and economic activities and are grouped into 26 atolls to form a chain over 820 kilometers in length, spread over an area that is more than 90,000 square kilometers in the Indian ocean.⁵⁷⁰ Maldives remains isolated and is surrounded by a vast Indian ocean. It has very little terrestrial resources, and with an EEZ that is about 959,100 square kilometers,⁵⁷¹ it has more territorial sea (67,000 square kilometers)⁵⁷² than land. Thus, this country depends heavily on the sea and its marine wealth for its existence.

With 80 per cent of Maldives less than a meter above sea level,⁵⁷³ (the average ground level being only 1.5 meters above sea level) and with more than half of its population and other critical infrastructure (airports, ports, sewerage systems, etc.) located within 100 meters of the coastline, there is high possibility that many of these islands, the infrastructure and human settlements will be submerged in due course.⁵⁷⁴ In fact, the Maldives is one of the lowest countries on the planet, and if sea levels were to

⁵⁶⁹ Maldives, GEF, UNDP & Ministry of Environment, Energy & Water, *National Adaptation Programme of Action (NAPA)* [nd] at 7, online: UNFCCC <<http://unfccc.int/resource/docs/napa/mdv01.pdf>> [Maldives, *NAPA*].

⁵⁷⁰ *Ibid*; see also Maldives, Ministry of Environment and Energy, *State of the Environment 2011* (2011) at 22 [Maldives, *State of the Environment 2011*]. The largest atoll is Huvadhu Atoll, which covers an area that is approximately 2,800 square kilometers. The smallest atoll is, Thoddoo Atoll, has an area of 5.4 square kilometers. *Ibid* at 22. The largest island is Gan in Laamu Atoll, with an area of 5.16 square kilometers. *Ibid* at 23. Maldives has two international airports and three domestic airports, and 11 more are being planned. *Ibid* at 39.

⁵⁷¹ *Maldives*, online: Mangroves for the Future <<http://mff08.fatcow.com/Countries/Maldives.html>>.

⁵⁷² John C Pernetta, ed, *Marine Protected Areas Needs in the South Asian Seas Region*, A Marine Conservation and Development Report, vol 3: Maldives (Gland: IUCN, 1993) at 1 [Pernetta, *Maldives*].

⁵⁷³ IDA & IFC, *Country Assistance Strategy for the Republic of Maldives*, Report No 41400 – MV (World Bank Group: South Asia Region, 2007) at 81 [IDA & IFC, *Country Assistance*].

⁵⁷⁴ Maldives, *State of the Environment 2011*, *supra* note 570 at 61.

rise by 50 centimeters, this could prove catastrophic.⁵⁷⁵ With the climb in sea level predicted to hover around 1.7 millimeters per year, climate change and SLR represents an “existential threat” to these islands.⁵⁷⁶ Other climate change impacts will also profoundly impact the Maldives. Already, 41 islands have experienced severe erosion,⁵⁷⁷ powerful tidal waves have hit the islands,⁵⁷⁸ and the prevalence of vector borne and respiratory diseases has increased.⁵⁷⁹ In addition, an increasing trend in sea surface temperature has been observed⁵⁸⁰ and tropical cyclones are predicted to increase in intensity by ten per cent.⁵⁸¹ In several ways, this country epitomizes a worst-case scenario of SLR and climate change impacts on Small Island Developing States.

The population of Maldives is more than 300,000 and more than a third live in the capital Malé, which has an area of less than two square kilometers.⁵⁸² With only less than

⁵⁷⁵ Maldives is an archipelago of 26 natural atolls, consisting of 1,190 coral reef islands in the Indian Ocean. Out of the 200 islands that are inhabited, 89 islands are used as tourist resorts. The islands are scattered over an area of 750 kilometers from north to south and 120 kilometers from east to west covering around 90,000 square kilometers. About 99.5 per cent of its territory consists of ocean. Eighty per cent of the land area in the Maldives is less than one meter above mean high tide level. The highest elevation in the country is only 2.4 meters above sea level. *Climate Change – Impacts, Policies and Strategies for Adaptation and Mitigation for the Maldives APFIC Workshop on Implications of Climate Change on Fisheries and Aquaculture*, online: Asia-Pacific Fishery Commission <http://www.apfic.org/uploads/smartsection/357_Maldives.pdf> [*Climate Change– Impacts, Policies*]. As well, when the Tsunami struck Maldives, it “pretty much submerged” the entire country for a few minutes. Jon Hamilton, “Maldives Builds Barriers to Global Warming” *NPR* (28 January 2008), online: npr <<http://www.npr.org/templates/story/story.php?storyId=18425626>>; see also *ibid* at 34. Maldives is the sixth smallest sovereign state in terms of land area. Ninety six per cent of the land area of the islands are less than one square kilometer in area. Only 10 islands are more than 2.5 square kilometers. The largest island Gan (Laamu Atoll), has an area of 6.1 square kilometers. Land is highly scarce and the 358 islands that are currently in use account for 176 square kilometers. The remaining unutilized islands make up only 59 square kilometers. Maldives, *NAPA, supra* note 569 at 19.

⁵⁷⁶ Ali Hashim, “Address” (Governor’s Speech delivered at the 43rd Annual Meeting, Board of Governors, Asian Development Bank, Tashkent, Uzbekistan, 1-4 May 2010) at 2, online: ADB <<http://www.adb.org/AnnualMeeting/2010/GOV/AM2010-MLD.pdf>>; see also Maldives, *State of the Environment 2011, supra* note 570 at 60.

⁵⁷⁷ *Ibid* at 61.

⁵⁷⁸ On 15th May 2007 and four days since, powerful swells hit Maldives affecting 88 islands on 18 atolls. *Ibid* at 62; Maldives, *NAPA, supra* note 569 at 16.

⁵⁷⁹ Maldives, *State of the Environment 2011, supra* note 570 at 69.

⁵⁸⁰ Maldives, *NAPA, supra* note 569 at 15.

⁵⁸¹ *Ibid*.

⁵⁸² Maldives, *NAPA, supra* note 569 at 9. Fifty-six per cent of the population is children and youth with 41 per cent under 15 years of age. The average population size in these islands is 900. Maldives, *State of the Environment 2011, supra* note 570 at 27. The population of Maldives has increased by 57 per cent over the last 25 years. *Ibid* at 35. Thirty-four islands have already reached their carrying capacity, while 17 islands will exhaust the available land by 2015. *Ibid* at 64.

one per cent of this country habitable, land is the scarcest and most precious resource.⁵⁸³ This makes it difficult to accommodate the growing population.⁵⁸⁴ Previously, all land was owned by the state, which granted permission to private individuals for construction purposes. It was only after the introduction of the *Maldivian Land Act* in 2002 that individuals could acquire private ownership rights.⁵⁸⁵ The new Constitution also recognizes the right of citizens “to acquire, own, inherit, transfer or otherwise transact ... such property”⁵⁸⁶ subject to the state’s power of acquisition for the “public good.”⁵⁸⁷ Consequently, private ownership over land is steadily increasing, particularly in Malé and other urban areas.⁵⁸⁸ This change in the nature of land tenancy raises the issue of access to beachfronts for traditional fishing communities.

Since land and water resources are limited, the soil is largely infertile, and coastal agriculture is confined to a few basic crops.⁵⁸⁹ Agricultural production in the Maldives is extremely low, leaving this island a major importer of food products.⁵⁹⁰ Moreover, local products have to compete with imports, which are lower priced.⁵⁹¹ In the event of an extreme climatic event, this could result in serious food shortages and insecurity.⁵⁹² The Maldives has no surface water sources except for a few freshwater ponds (*kulhis*) and freshwater lakes and therefore dependence on groundwater is almost complete.⁵⁹³ However, potable groundwater resources are also very scarce, so the overwhelming majority of the population depends on rainwater tapped from rooftops and stored in tanks.⁵⁹⁴ In the capital of Malé, the residents have access to desalinated water through a

⁵⁸³ Maldives, *NAPA*, *ibid* at 19.

⁵⁸⁴ *Ibid* at 21.

⁵⁸⁵ (Law No 1/2002, Maldives), s 1(a).

⁵⁸⁶ *Constitution of the Republic of Maldives, 2008*, translated by Dheena Hussain, online: Ministry of Tourism Arts and Culture <<http://www.maldivesinfo.gov.mv/home/upload/downloads/Compilation.pdf>> [*Constitution of the Republic of Maldives*].

⁵⁸⁷ *Ibid*, art 40.

⁵⁸⁸ The Government of Maldives, “*Aneh Dhivehi Raajje*”: *The Strategic Action Plan, National Framework for Development 2009-2013*, at 444, online: The President’s Office, Republic of Maldives <<http://www.p.residencymaldives.gov.mv/>> [“*Aneh Dhivehi Raajje*”].

⁵⁸⁹ The total land area of Maldives is only 300 square kilometers. Maldives, *State of the Environment 2011*, *supra* note 570 at 23.

⁵⁹⁰ Pernetta, *Maldives*, *supra* note 572 at 14; see also *ibid* at 52, 53.

⁵⁹¹ Maldives, *State of the Environment 2011*, *ibid* at 53.

⁵⁹² Maldives, *NAPA*, *supra* note 569 at 35.

⁵⁹³ Shaheedha Adam Ibrahim, Mohamed Rasheed Bari & Leon Miles, “Water Resources Management in Maldives with an Emphasis on Desalination”, online: SOPAC <<http://www.pacificwater.org/serfiles/f/Case%20Study%20B%20THEME%201%20Maldives%20on%20Desalination.pdf>>.

⁵⁹⁴ Maldives, *State of the Environment 2011*, *supra* note 570 at 82.

piped network.⁵⁹⁵ Sewage pollution is a major cause for concern, as it contaminates water supplies, making it unfit for human consumption.⁵⁹⁶

Despite the inhospitable nature of its environment, Maldives is the only South Asian country that has managed to secure the Millennium Development Goal of eradicating extreme poverty and hunger.⁵⁹⁷ This is a rare and unique achievement for any country, let alone one from a region in which large sections of humanity live on less than a dollar a day.⁵⁹⁸ However, as the economy is primarily tourism-based, any change in the environment can significantly impact the economic well-being of this country.⁵⁹⁹

To a great extent, the stability of these islands depends on the health of its coastal reefs.⁶⁰⁰ The coral reefs act as natural sea defenses.⁶⁰¹ Given the rapid pace at which the climate is changing, the corals may not offer adequate protection to the Maldives beyond 2050.⁶⁰² Until that time, they could potentially delay the worst effects of SLR. However, the corals are being degraded to facilitate development of tourism-related infrastructure and are also under considerable threat from bleaching due to changes in ocean temperature. This has affected tourism prospects, fisheries, and food security.⁶⁰³

A related issue is that of mining, primarily for construction purposes.⁶⁰⁴ The massive boom in construction of cement houses and high-rise concrete buildings has led to an increased demand for sand. To meet this demand, river sand and aggregates are usually imported from India,⁶⁰⁵ but this is very expensive. As a result, illegal coral sand

⁵⁹⁵ *Ibid* at 85.

⁵⁹⁶ *Ibid* at 87.

⁵⁹⁷ The World Bank, *Maldives Overview*, online: The World Bank, Country, Maldives, Overview <<http://www.worldbank.org/>>.

⁵⁹⁸ Maldives, *State of the Environment 2011*, *supra* note 570 at 41.

⁵⁹⁹ The tsunami reduced the real GDP growth of this country by -4.6 per cent in 2005. *Ibid* at 44.

⁶⁰⁰ *Ibid* at 38.

⁶⁰¹ Pernetta, *Maldives*, *supra* note 572 at 17.

⁶⁰² *Ibid*.

⁶⁰³ Jean-Luc Solandt & Chris Wood, *Observations of Reef Conditions on Central Maldives Reefs, 2005 (surveyed from 23 June to 7 July 2005, with additional notes from 10-21 January 2005): A Report by the Marine Conservation Society in Collaboration with Maldives Scuba Tours (2005)* at 6. Climate change related risks on the coral reefs are exacerbated by human activities like coral mining, anchor and snorkeller damage, improper sewage disposal, and overexploitation of reef fish. Maldives, *NAPA*, *supra* note 569 at 74.

⁶⁰⁴ "Sand Mining Might Erase Some Islands from Map of Maldives," *BLUEPEACE Blog* (17 July 2008), online: BLUEPEACE <<http://www.bluepeacemaldives.org/blog/biodiversity/sand-mining-might-erase-so-me-islands-of-maldives>>.

⁶⁰⁵ *Ibid*.

mining continues, threatening the stability of the islands.⁶⁰⁶

To augment the limited land supply, Maldives has implemented several land reclamation schemes.⁶⁰⁷ Sand is pumped from the atoll lagoon floor and layered onto reef flats to form new land.⁶⁰⁸ This process is environmentally harmful, as it destroys reef flat communities, increases the level of suspended sediments,⁶⁰⁹ and also adversely affects neighboring coral reef communities.⁶¹⁰ Moreover, changing the shape of the island alters wave refraction patterns, interfering with local wave and current regimes and enhancing the rate of coastal erosion.⁶¹¹ The lack of space poses problems for waste disposal. The Thilafushi waste disposal site, built on a reclaimed lagoon, receives all kinds of wastes, including hazardous substances that threaten the surrounding ocean.⁶¹² As well, untreated sewage effluents are disposed into coastal waters, contaminating the environment.⁶¹³

The sovereign and independent Maldives is a unitary democratic republic based on the principles of Islam, which influences its CZM regime.⁶¹⁴ In 2008, the Maldives adopted a new constitution that guarantees every citizen “the right to a healthy and ecologically balanced environment.”⁶¹⁵ It imposes upon the state “... a fundamental duty to protect and preserve the natural environment, biodiversity, resources and beauty of the country for the benefit of present and future generations.”⁶¹⁶ Another important feature of the Maldivian Constitution is that it stipulates decentralised administration.⁶¹⁷ To facilitate people-oriented development, it empowers citizens by promoting grassroots-

⁶⁰⁶ *Ibid.*

⁶⁰⁷ The largest land reclamation project is the creation of the Hulhumale' (Kaafu Atoll), an artificial island that is approximately two square kilometers, reclaimed to reduce population pressure on Male'. Maldives, *NAPA*, *supra* note 569 at 22.

⁶⁰⁸ Pernetta, *Maldives*, *supra* note 572 at 15.

⁶⁰⁹ “Towards an Artificial Paradise on Earth,” *BLUEPEACE Blog* (24 May 2008), online: BLUEPEACE <<http://www.bluepeacemaldives.org/blog/biodiversity/towards-an-artificial-paradise-on-earth>>.

⁶¹⁰ Pernetta, *Maldives*, *supra* note 572 at 15.

⁶¹¹ *Ibid.*

⁶¹² *Table 2.5: Waste Transported to Thilafushi from Malé, 2003-2008*, (in tons), online: Department of National Planning, Republic of Maldives <<http://planning.gov.mv/yearbook2009/Environment/2.5.htm>>.

⁶¹³ “Sewage around Male’,” *BLUEPEACE Blog* (22 April 2008), online: BLUEPEACE <<http://www.bluepeacemaldives.org/index.htm>>.

⁶¹⁴ *Constitution of the Republic of Maldives*, *supra* note 586, art 2.

⁶¹⁵ *Ibid.*, art 23(d).

⁶¹⁶ *Ibid.*, art 22.

⁶¹⁷ *Ibid.*, arts 230-235.

level democracy.⁶¹⁸ The Maldives does not have legislation on CZM. However, there are several general laws that may make up for this deficiency. A primary reason for the non-enactment of a dedicated coastal statute is the small sizes of the islands, which, in their entirety, are treated as coasts.⁶¹⁹

The most important among the general environmental laws is the *Environmental Protection and Preservation Act of Maldives, 1993* (EPPA) based on the principles of inter-generational equity and sustainable development.⁶²⁰ The EPPA empowers government authorities to issue guidelines and to provide advice on matters relating to environmental protection, which responsible actors should take into consideration in their activities.⁶²¹ Section 10 provides that the government can claim compensation for environmental damage.⁶²² From the perspective of CZM, section 4 is important as it provides for the identification of protected areas and natural reserves and the development of rules for their preservation. Accordingly, Maldives has established 39 protected areas, out of which 25 are marine protected sites.⁶²³ Other notable features include provisions for environmental impact assessments,⁶²⁴ the power to terminate projects that pose undesirable impacts on the environment, and a prohibition on the disposal of hazardous, toxic or nuclear wastes.⁶²⁵

Fisheries have long sustained life on these islands. More than 20 per cent of the population depends on fisheries for their livelihood, which are also the primary export.⁶²⁶ In recent years, there has been a marked decline in fish production and local fish consumption has also decreased.⁶²⁷ Traditionally, Maldivian fishermen relied on the

⁶¹⁸ Maldives, *Act on Decentralization of the Administrative Divisions of the Maldives, 2010 (Draft)*, online: shareefweb <<http://www.shareefweb.com/documents/LocalGovReforms/MaldivesDraftlaw®ulations/Draft%20Translation%20of%20decentralisation%20ActMaldives.pdf>>.

⁶¹⁹ Abdulla Naseer, "Pre-and Post-tsunami Coastal Planning and Land-use Policies and Issues in the Maldives", online: FAO Home <<http://www.fao.org/>>.

⁶²⁰ *Environmental Protection and Preservation Act of Maldives, 1993* (Act No 4/1993, Maldives), s 1 [EPPA].

⁶²¹ *Ibid*, s 2.

⁶²² *Ibid*, s 10.

⁶²³ Maldives, *State of the Environment 2011*, *supra* note 570 at 32.

⁶²⁴ EPPA, *supra* note 620, s 5; Maldives, Ministry of Environment, Energy and Water, *Environmental Impact Assessment Regulations, 2007* (Maldives, [nd]), regs 3-11.

⁶²⁵ EPPA, *ibid*, ss 7-8.

⁶²⁶ Maldives, *NAPA*, *supra* note 569 at 10.

⁶²⁷ *Ibid*.

environment-friendly pole and line fishery.⁶²⁸ However, this may soon be replaced by long line fishing as the government has withdrawn restrictions on the latter.⁶²⁹ This may trigger intense competition, which may affect coastal health and adaptive capacity. As well, climate change has led to the warming of the seas, leading to fish migrations and further reducing the supply.⁶³⁰

Tourism is the life-blood of the Maldivian economy, contributing to more than one-third of its GDP.⁶³¹ Since the first resort opened in 1972, this industry has seen an exponential growth with a turnover of about USD198 million annually⁶³² and a total bed capacity reaching 19,028 in 2007.⁶³³ Despite the 2004 tsunami, tourist arrivals have increased at an average annual rate of eight per cent over the last 10 years.⁶³⁴ The tourism industry is primarily regulated by the *Maldives Tourism Act, 1999*,⁶³⁵ which determines the zones and islands that can be developed for tourism, the leasing of islands and lands, and the management of all such facilities, including the operation of tourist vessels, diving centers and travel agency services.⁶³⁶ From an environmental perspective, section 15 proscribes the dredging of lagoons, reclamation of land, and felling of coconut palms and trees on any island or land that has been leased for development as a tourist resort, unless authorized by the Ministry of Tourism.⁶³⁷

The Maldives is party to several international environmental law instruments and these have influenced the development of its domestic legal regime. They have also played a pivotal role in drawing the attention of the international community to the vulnerability of small islands to climate change and SLR. In 1989, Maldives hosted the

⁶²⁸ M Shiham Adam, “Country Review: Maldives” in Cassandra De Young, ed, *Review of the State of World Marine Capture Fisheries Management: Indian Ocean*, FAO Fisheries Technical Paper: 488 (Rome: FAO, 2006) 383 at 383.

⁶²⁹ Laura Restrepo Ortega, “Cabinet approves long line fishing for Maldivian vessels” *Minivan News* (31 March 2010), online: Minivan News <<http://minivannews.com/environment/cabinet-approves-long-line-fishing-for-maldivian-vessels-5385>>.

⁶³⁰ Maldives, *NAPA*, *supra* note 569 at 28.

⁶³¹ *Ibid* at 10; “*Aneh Dhivehi Raajje*”, *supra* note 588 at 314.

⁶³² *Bureau of South Asian Affairs: February 2005, Background Note: Maldives*, online: US Department of State <<http://web.archive.org/web/20060127092914/http://www.state.gov/r/pa/ei/bgn/5476.htm>>.

⁶³³ *Table 10.8: Bed Capacity of Tourist Resorts and the Distance from Malé International Airport, 2006–2008*, Department of National Planning, Republic of Maldives, online: <[http://plannin g.gov.mv/yearboo k2009/Tourism/10.8.htm](http://plannin.g.gov.mv/yearboo k2009/Tourism/10.8.htm)>.

⁶³⁴ IDA & IFC, *Country Assistance*, *supra* note 573 at 1.

⁶³⁵ *Maldives Tourism Act, 1999* (Law No 2/99, Maldives).

⁶³⁶ *Ibid*, s 1(a).

⁶³⁷ *Ibid*, s 15(a).

Small States Conference on Sea Level Rise which produced the *Malé Declaration on Global Warming and Sea Level Rise, 1989* (Malé Declaration)⁶³⁸ that set out a programme of action for small states in relation to climate change, global warming, and SLR.⁶³⁹ As far as CCCA is concerned, due to the unique physical characteristics of the islands described earlier and the undiversified nature of its economy,⁶⁴⁰ the country has very little capacity to adapt and minimal variations in temperature and sea levels can upset the fragile equilibrium. Maldives has developed a National Adaptation Programme of Action, which broadly recognises the importance of climate change adaptation.⁶⁴¹ The document identifies several adaptation actions, affording top-most priority to building capacity for coastal protection, CZM and flood control.⁶⁴² Other prominent coastal adaptation measures include implementation of integrated reef fishery management; safe rainwater harvesting; recharging of aquifers, etc.⁶⁴³ In addition, the document also recognizes several projects to protect the islands from SLR.⁶⁴⁴ Another important aspect in relation to implementing adaptation is that given its limited perimeter, scarcity of land and extreme low elevation, it is practically difficult for Maldives to implement the options of retreat and establishing setbacks. Accordingly, proactive CCCA schemes, like beach replenishment, hard coastal armouring, and creation of artificial islands are the primary options available.

Maldives has yet to enact a specific ICZM law and has adopted a rather sectoral and fragmented approach to coastal management that is rooted in several general environmental laws. The most prominent of these is the *Environment Protection and*

⁶³⁸ “Male’ Declaration on Global Warming and Sea Level Rise” (1990) 5:2 Int’l J Estuarine & Coast L 401 (HeinOnline) [“Male’ Declaration”].

⁶³⁹ *Ibid*, ¶1.

⁶⁴⁰ The fisheries sector provides employment for 13,890 fishermen as well as around 6,000 artisanal fish processors of ‘Maldivian fish’. Fisheries accounts for six per cent of GDP and 98 per cent of exports. See *Climate Change—Impacts, Policies, ibid*.

⁶⁴¹ See generally Maldives, *NAPA*, *supra* note 569.

⁶⁴² *Ibid* at 43.

⁶⁴³ *Ibid* at 43-44.

⁶⁴⁴ For instance, “Coastal Protection of Safer Islands to Reduce the Risk from Sea Induced Flooding and Predicted Sea Level Rise” is priority project no. 2 in the Maldives NAPA. This adaptation project seeks to demonstrate innovative measures appropriate for the protection of small islands to reduce their vulnerability. Accordingly, there is to be a detailed technical and engineering study on coastal protection options and adaptation measures for five safer islands and thereafter demonstration coastal protection measures will be implemented in these islands. The total project cost is about USD13,931,000 and predicted long-term output is to increase the resilience of safer islands. *Ibid* at 50, 51.

Preservation Act of Maldives, 1993, which has only indirect relevance to the objectives of CZM. Due to the small size of the islands, the entire territory is considered as “coast” and the management response is moulded accordingly. However, in contrast, other small island states (for example, Barbados⁶⁴⁵ the Marshall Islands⁶⁴⁶) have dedicated statutes on CZM and integrated sectoral efforts to produce a more holistic response to the problems that confront them. Interestingly, the Malé Declaration⁶⁴⁷ *inter alia* recommended, “where necessary, all states must take immediate measures to establish the institutional framework to protect and manage their coastal zones and to enact legislation to facilitate such measures.”⁶⁴⁸ Maldives is in the throes of developing a national framework for ICZM,⁶⁴⁹ and in light of this, implementing ICZM through a dedicated coastal law could be a more feasible and practicable option for the country to secure its development imperatives, prevent fragmentation, secure greater integration, and at the same time deal with the basic challenges to its territorial existence posed by climate change and SLR. Specifically, a coastal law for Maldives could help this country majorly to protect and conserve sensitive coastal ecosystems, which can bolster the country’s climate change adaptation strategies to produce long-term tangible results. Nevertheless, given Maldives’ vulnerability to climate change impacts and the strong possibility that this country may eventually be lost to the rising waves, it may become necessary for the island nation buy land territory or even merge with another country.⁶⁵⁰ Until then, the Maldives has to persist with a proactive approach to CCCA based on an ICZM process.

3.3 INTEGRATED COASTAL ZONE MANAGEMENT AND COASTAL CLIMATE CHANGE ADAPTATION IN SOUTH ASIA: A COASTAL LAW AUDIT

The inescapable conclusion that emerges from these national reports on the state of CZM in South Asia is that in spite of the convergence of evidence and dire predictions relating to SLR and climate change, their potential consequences have not been afforded due

⁶⁴⁵ *New Coastal Zone Management Act 1988* (No 39 of 1998, Barbados).

⁶⁴⁶ *Coast Conservation Act 1988* (PL 1988-13, Marshall Islands).

⁶⁴⁷ “Malé Declaration”, *supra* note 638.

⁶⁴⁸ *Ibid* at 402.

⁶⁴⁹ *Maldives*, *supra* note 571; *Policy Brief on Governance and Integrated Coastal Management: Maldives*, online: Mangroves for the Future <http://mff08.fatcow.com/Assets/documents/Policy%20Briefs/MFF_Maldives_Policy_Brief_web.pdf>.

⁶⁵⁰ Tony George Puthucherril, “Climate Change, Sea Level Rise and Protecting Displaced Coastal Communities: Possible Solutions” (2013) 2 *Global J Int’l L* [unpublished in press] [Puthucherril, “Climate Change”].

consideration in their national CZM regimes in the different South Asian coastal countries. The legal aspects of coastal zone management are often sidelined, and hence there are very few dedicated coastal laws in South Asia that truly support the implementation of an ICZM process. In general, as is evident from the national reports, most of these countries have been constrained from adopting a proactive approach to operationalizing ICZM to ensure the sustainable development of their coastal areas and resources as the emphasis has largely been on utilising coastal resources to secure short-term economic benefits which in all cases might not be environmentally sustainable. More importantly, these countries have also been unsuccessful in employing ICZM as a core adaptive strategy to counter challenges to the sustainability of their coastal ecosystems, environment and resources, particularly in the event of SLR.

India's experience holds several important lessons for coastal managers, the most important being how a coastal law can be used as an effective instrument for zoning, when generally it is the land use and planning legislations that provide for the same. This is a tool that will increasingly be utilized in the coming years to plan and situate coastal development in the event of SLR. All the same, India presents a classical example where decision-makers are frequently confronted with this dilemma and, where, for short-term economic gains and myopic development, genuine environmental considerations are often slighted. This is why the government could not implement the CRZ 1991 in its true spirit. The CRZ 1991 may be the only coastal law in the world to have been amended nearly 25 times during its two-decade lifespan, and yet the government appears unsure on how to move forward and implement the ICZM agenda to harmonize coastal development with coastal environmental considerations. Presently, the country's coastline is experiencing rapid changes due to economic development, most of which is at the cost of environmental integrity, resulting in a growing sustainability crisis. As seen, the recent CRZ 2011 has also not been able to resolve the stalemate, as it adopts a rather cautious approach to ICZM, and the concept of hazard line management practically pushes large segments of coastal populations right into harm's way.⁶⁵¹

After decades of internal strife, Sri Lanka is now experiencing a period of peace. The writ of the national government for a long time did not run in the war-torn Tamil-

⁶⁵¹ See Parts 3.2.1.5, above for more details.

dominated north and eastern coastal provinces. Even though an ICZM-friendly law has been in place since 1981, it is doubtful whether the *Coast Conservation Act* has had any perceptible impact on the management of the coastal areas in these regions. Moreover, as seen, the *Coast Conservation Act* is a first generation coastal law that does not accommodate the requirements and challenges posed by climate change and SLR. Immediately upon conclusion of the civil war, the national government passed the *Coast Conservation (Amendment) Act, 2011*, with emphasis on coastal resources management. This was a broad indication of the resolve of the national government to exploit coastal resources. Nevertheless, the amendment does not facilitate decentralization of coastal management or ensure public participation in the decision making process; rather, it fortifies and further entrenches the bureaucratic and centralised model.⁶⁵² In such a situation, the coastal law amendment, if imaginatively employed, could have become an instrument to promote comprehensive economic growth of the war-ravaged coastal regions and could ensure inclusiveness and the economic well-being of the Tamils.

Bangladesh and Maldives represent worst-case scenarios in terms of the impact of SLR because both countries stand to lose large chunks of their territories due to the rising seas. Bangladesh has not yet enacted a national law for ICZM, although it has come a long way in developing a national policy and a development strategy for ICZM. Being one of the poorest nations, the primary concerns in Bangladesh are poverty eradication, employment generation, and reduction of socio-economic inequities.⁶⁵³ Here, ICZM is viewed as an instrument to attain broader development objectives like gender equality.⁶⁵⁴ While it is true that an ICZM law is a social welfare legislation that cannot be oblivious to the larger socio-economic issues that entrap a country and that improving socio-economic conditions definitely helps advance adaptation capacity, it has to be emphasized that ICZM espouses a much narrower mandate. As well, Bangladesh has to advance coastal legislation that can help it manage coastlines effectively and plan for coastal climate change adaptation, especially since conflicts frequently erupt between different

⁶⁵² See Part 3.2.4, above, for more details on the centralised nature of the Sri Lankan model on coastal management.

⁶⁵³ See Part 3.2.3, above, for an overview on the socioeconomic conditions in Bangladesh.

⁶⁵⁴ See *supra* notes 406 & 407.

stakeholders regarding their rights and entitlements over the coastal zone.⁶⁵⁵ For Maldives, climate change and SLR pose questions of survival, which may be beyond the scope of an ICZM regime.⁶⁵⁶ Nevertheless, an ICZM law that furthers CCCA may help to decelerate the process of destruction through careful planning and optimal use of coastal resources. In the federal state of Pakistan, CZM is a domain determined by the provinces. Although both Sindh and Balochistan have enacted coastal legislations, given the dimensions of the anticipated impacts of climate change and SLR in coastal regions, they may prove inadequate. As well, the protection of the Indus river delta from a rising Arabian sea requires the maintenance of definite quantities of water supplies clearly warranting greater intervention at the federal level.⁶⁵⁷ As the discussion reveals, on the whole, the ICZM law in South Asia stands on extremely weak ground and there are not many concerted national efforts to bolster it. Except for Sri Lanka, it is doubtful whether the other coastal countries even have ICZM plans in the true sense of the term.⁶⁵⁸ The institutional capabilities in most of the South Asian countries to implement ICZM are seriously deficient and existing approaches seem unable to respond to the scale of the problems posed by climate change. Therefore, these approaches have to be realigned and scaled up to the new challenges and demands. As well, climate change adaptation is generally treated as a fringe activity in these developing nations. Especially, in the South Asian context, apart from being a natural resources management and environmental protection legislation, a coastal law emerges as a classical example of social welfare legislation as well, a progressive force that can spur the economic development of impoverished coastal communities and their adaptive capacities and attainment of sustainable development in the coastal context.⁶⁵⁹ Unfortunately, the present design of

⁶⁵⁵ See Part 3.2.3, above, for a detailed discussion on the coastal management scenario in Bangladesh.

⁶⁵⁶ See generally Part 3.2.5, above, for a discussion on the position in Maldives.

⁶⁵⁷ See *supra* notes 235-62 and accompanying text.

⁶⁵⁸ For instance, the CRZ, 1991 calls for the development of CZM plans. However, as pointed out earlier these are more or less maps than plans for coastal management. See generally Part 3.2.1.1.1, above, for more on this topic.

⁶⁵⁹ Friedman identifies three features of legislations that fall into this mould: First, the statute sets out or implies a minimum standard of living. Second, it points that there is a group that falls below this minimum standard; and finally, it creates or implies a programme to facilitate the entire or part of that group to rise up to the minimum standard. Lawrence M Friedman, "Social Welfare Legislation: An Introduction" (1969) 21 Stan L Rev 217 at 220 (HeinOnline). As far as South Asia is concerned, the prescriptions in a coastal legislation *inter alia* are targeted towards improving the lot of impoverished coastal communities.

these coastal laws, as seen from the above national reports, does not inspire confidence that SCD can be attained at any time in the near future.

3.4 CONCLUSION

The depth of investigation in this chapter reveals that, in general, the South Asian coastline is more vulnerable today than at any time in the past and is experiencing rapid changes such as intense cyclonic storms, salinity ingress, sea surges, rising sea surface temperatures and SLR. Yet these problems are not specific to South Asia but are rather a microcosm of coastal problems that confront several coastal regions in different parts of the world. Specifically, the impact of all this on fishing and other traditional coastal communities is enormous. And the challenge in South Asia is how to foster SCD while balancing and promoting environmental, social, and economic development objectives in mutually reinforcing ways, while at the same time providing for CCCA. The foregoing discussion points out that, even though some amount of integration has been attempted in some of the countries at the national level in coastal South Asia, the observable reality is that there is large disjoint between the obligations prescribed by the different national coastal law regimes and their practical observance. The existing legal statutes erected for coastal management do not provide for unanticipated challenges posed by SLR. Most of the laws are inapplicable to new situations, in large part because these laws operate primarily on a sectoral basis. Government efforts to manage coastal development and protection proceeds on an issue-by-issue basis, and there is very little coordination between the programs. The attitude of the national governments in the South Asian region has been laggard and this apathy can prove very costly to these nations. The institutional capabilities in most of the South Asian countries to implement ICZM are also seriously deficient, with existing approaches unable to respond to the scale of the problems posed by climate change. Some more obvious reasons for this are political instability, lack of financial resources, absence of trained personnel, and corruption. Additional factors have hampered ICZM implementation is that the parties are more motivated by poverty eradication concerns and their need to quickly develop their national economies than by climate change concerns. It is clear that these countries are in various stages of legislative sophistication regarding the ability to protect their environments. This does not bode well for a region that stands to be severely impacted by

climate change and SLR. Clearly, ICZM remains at the periphery of coastal management efforts in South Asia, and this is where the challenge lies. Whatever ICZM programmes exist, they are still germinating and not showing signs of favorable growth or evolution.

Certainly, there is room for improvement in the coastal management framework of all of these countries. At heart, there has to be a paradigm shift in how coastal spaces and resources are administered – a move away from the present piecemeal approach to coastal management to a new holistic system that is people-centric and environmental friendly and not merely development oriented. The new approach also has to be promotive of social-ecological resilience and should integrate actors and actions on a wide range of fronts to make them consistent and coherent. More importantly, the framework should be supportive of adaptive programmes to meet the challenges posed by the impending calamity of SLR. In sum, what these coastal countries of South Asia need are new management systems and legal frameworks that can help attain SCD and promote greater cooperation between these nations. Laws, policies and systems for ICZM and CCCA should be put in place to reduce conflict and provide for effective management, with the ultimate aim of sustainable coastal development. In this context, it must also be noted that climate change and SLR does not recognize man-made boundaries. Already in South Asia there is a looming possibility of climate change refugees crossing national borders and moving into nearby coastal countries. As well, it is also apparent that climate change impacts will not be uniform throughout the region and that devastation may be more amplified in some countries than in others. It is also evident that the coastal countries in South Asia are not on the same footing in relation to their ability to adapt to climate change and SLR and moreover, the consequences of actions in one country can have transboundary ramifications, some of which can detrimentally affect the stability and eco-resilience of coastal systems in other countries. It is in this context that one has to look at the possibility for greater regional cooperation and regional mechanisms on ICZM implementation. This aspect will be explored in greater detail in part IV.

PART II

MOVING TOWARDS SUSTAINABLE COASTAL DEVELOPMENT BY LINKING INTEGRATED COASTAL ZONE MANAGEMENT AND COASTAL CLIMATE CHANGE ADAPTATION

The purpose of this part is to explain the concepts of sustainable coastal development, coastal climate change adaptation and ICZM and their inter-relationship. It doing so, it provides the doctrinal foundation for this thesis and is laid out in three chapters as follows. The first chapter, namely, chapter four explains the intricacies of sustainable coastal development. It accomplishes this objective by discussing the concept of sustainable development, which is premised on the idea that environmental and development agendas are inseparably inter-linked. It also explores the changing conceptions of sustainable development and argues that given the brooding omnipresent nature of the phenomenon of climate change and its potential to overturn development, it is necessary also to consider climate change mitigation and adaptation concerns, if sustainable development is to be achieved in its true sense. Based on this nuanced understanding of sustainable development, the chapter proceeds to explain the concept of sustainable coastal development. Chapter five is devoted to analysing climate change adaptation, its status in international law and its relevance to the coastal zone. Even though sustainable development has widespread international recognition, one major reason as to why the efficacy of sustainable development has been reduced is the absence of specific pathways to operationalize such development in different settings. Fortunately, there is little doubt that ICZM is the most sustainable method for managing degraded coastlines, and accordingly chapter six describes this concept in greater detail. It also posits that the interlinking of the lateral development of ICZM and CCCA could produce ideal and sustainable solutions for the coastline.

CHAPTER 4 UNDERSTANDING SUSTAINABLE COASTAL DEVELOPMENT

4.1 INTRODUCTION

As the previous chapters demonstrate, reckless development, unsustainable resource exploitation and marine pollution have placed South Asia's coastal environments under enormous stress. Generally, on the waterside of the coastal baseline, the primary stressors are over-exploitation of fishery resources, degradation of water quality due to land-based sources of marine pollution, and the spread of invasive species from increased maritime transportation. On the landward side, to support the needs of an ever-increasing coastal population, coastal regions accommodate colossal infrastructure in terms of thermal and nuclear power plants, industries, mines, sewage treatment plants, major and minor ports, railway and roadways, etc. All of this economic development requires waterfront expansion, which places excessive demands on fragile coastal ecosystems and resources, threatening their ecological resilience and sustainability. These problems are further exacerbated by dehumanising poverty and by large populations concentrated on narrow strips of coastal land, particularly in low-lying areas, such as, flood plains and the banks of estuarine environments. The consequences of rising sea levels and changing weather patterns will only aggravate this situation by increasing vulnerability and stifling future development.¹

It is against this backdrop of growing environmental degradation and growing threats posed by sea level rise (SLR) and climate change that the concept of sustainable coastal development (SCD) must be examined. Section 4.2 delineates the concept of sustainable development, highlighting its uniqueness and centrality in international environmental law. Based on this understanding of the evolving dimensions of sustainable development, the section 4.3 defines the term “sustainable coastal development” or “coastal sustainability.”

¹ See generally C Nellemann, S Hain & J Alder, eds, *In Dead Water: Merging of Climate Change with Pollution, Over-harvest, and Infestations in the World's Fishing Grounds* (Arendal: UNEP GRID-Arendal, 2008) at 42; see also Secretariat of the Convention on Biological Diversity, *Scientific Synthesis of the Impacts of Ocean Acidification on Marine Biodiversity*, Technical Series No 46 (Montreal: Secretariat of the CBD, 2009).

4.2 THE DIALECTIC OF SUSTAINABLE COASTAL DEVELOPMENT

Since the close of the Second World War, global powers have been advancing a set of goals, under the umbrella term ‘development’, that can be summed up simply as peace and security, economic development, social justice, human rights, and good national governance.² At the outset, environmental protection found no place in this paradigm, as it was generally believed that pollution and the degradation of the natural environment was the unavoidable cost of material progress.³ However, the fallacy of this argument became obvious as environmental destruction began to endanger the stability of life-support systems, threaten socio-economic progress, impair the quality of national governance, and destabilize peace and security.⁴ Environmental considerations and general human progress were then viewed as essential elements that cannot be sidelined in a developmental discourse, and the concept of sustainable development emerged as an alternative path towards economic growth. Sustainable development departs from a model that is determined solely on the basis of higher gross domestic product to one that is centered on environmental protection, economic development, and social equity and justice.⁵

This section begins by tracing the history of sustainable development, its entrenchment in international and national environmental law, and its changing dimensions. Based on this understanding of sustainable development, the discussion will then analyze the meaning of the term SCD, which is the ultimate objective of all management efforts in coastal zones.

² John C Dernbach, “Making Sustainable Development Happen: From Johannesburg to Albany” (2004) 8 Alb L Env’tl Outlook 173 at 174-75 (HeinOnline) [Dernbach, “From Johannesburg to Albany”]; John C Dernbach, “Sustainable Development as a Framework for National Governance” (1998) 49 Case W Res L Rev 1 at 9-14 (HeinOnline) [Dernbach, “Sustainable Development”].

³ Dernbach, “From Johannesburg to Albany”, *ibid* at 175.

⁴ Environmental stress can be a source of conflict. World Commission on Environment & Development, *Our Common Future* (Oxford: Oxford University Press, 1987) at 290-94. The wars of this century will be fought over water. Interview, “Of water and wars: Interview with Dr. Ismail Serageldin, Senior Vice-President, World Bank”, *Frontline [of India]* 16:9 (24 April 1999), online: Frontline <<http://frontlineonnet.com/>>.

⁵ Duncan French, *International Law and Policy of Sustainable Development* (Manchester: Manchester University Press, 2005) at 24-33 (apart from this triad, the element of empowerment is highlighted).

4.2.1 The Concept of Sustainable Development and Its Changing Contours

The notion that humankind should live in tandem with the surrounding environment was a central leitmotif in many ancient civilizations.⁶ However, this notion officially fell out of favor in the modern developed world until the Stockholm Conference of 1972, which emphasized the need to re-work the conventional developmental model to factor in the concept of environmental protection.⁷ The primary product of the Stockholm Conference

⁶ Vice-President Weeramantry opines in *Case Concerning Gabčíkovo-Nagymaros Project (Hungary/Slovakia)*, “[s]ustainable development is thus not merely a principle of modern international law. It is one of the most ancient ideas in the human heritage.” See [1997] ICJ Rep 7. See *Separate Opinion of Vice-President Weeramantry*, at 107, online: International Court of Justice <<http://www.icj-cij.org/docket/files/92/7383.pdf>>. Under the Judeo-Christian traditions, God gives mankind complete domination over the natural world. See Alex Geisinger, “Sustainable Development and the Domination of Nature: Spreading the Seed of the Western Ideology of Nature” (1999) 27 BC Env’tl Aff L Rev 43 at 49 (QL). This stands in contrast to the Hindu philosophy where, humans are viewed as integral to nature. Emperor Asoka in the third century B.C. issued an edict to preserve wild life and environment. “Twenty-six years after my coronation, I declare that the following animals were not to be killed, parrots, mynas, . . . cranes, bats, queen, ants, terrapins, boneless fish, rhinoceroses . . . and all quadrupeds which are not useful or edible . . . Forest must not be burned.” cited in *Bihar v Murad Ali Khan* (1989), [1989] AIR SC 1 (India SC). The Supreme Court of India has observed

[t]he Indian society has, since time immemorial, been conscious of the necessity of protecting environment and ecology. The main motto of social life has been to live in harmony with nature. Sages and Saints of India lived in forests. Their preaching contained in Vedas, Upanishadas, Smritis, etc. are ample evidence of the society's respect for plants, trees, earth, sky, air, water and every form of life. It was regarded as a sacred duty of every one to protect them. In those days, people worshipped trees, rivers and sea, which were treated as belonging to all living creatures. The children were educated . . . about the necessity of keeping the environment clean and protecting earth, rivers, sea, forests, trees, flora fauna and every species of life.

Fomento Resorts & Hotels v Minguel Martins (2009) CA No 4154 of 2000, ¶36 (India), online: Indian Kanoon <<http://www.indiankanoon.org/doc/1238478/>>.

⁷ At Stockholm, there was divergence of opinion between developed and developing countries. For the developed countries, environmental degradation was the biggest threat facing the planet, while for the developing nations represented by Group 77, it was poverty. The developing nations feared that developed countries would use environmental standards to block entry of their goods into developed country markets. Finally, a compromise was reached to affirm that economic development was not necessarily incompatible with environmental protection, and that development could proceed provided it avoided damaging the environment. Lakshman Guruswamy, “International Environmental Law: Boundaries, Landmarks, and Realities” (1995) 10 Nat Resources & Env’t 43 (HeinOnline); *Declaration of the United Nations Conference on the Human Environment*, 16 June 1972, 11:6 ILM 1416 [*Stockholm Declaration*]. The Stockholm Conference produced a groundbreaking declaration that contains 26 principles, the notable ones being the right to a quality environment (*ibid*, prin1), the “responsibility to protect and improve the environment”

was its Declaration, which, though not binding, spurred the development of international environmental law,⁸ with its principles and concepts later confirmed and elaborated upon in several other treaties.⁹ The concept received precise articulation when the World Commission on Environment and Development, chaired by then Prime Minister of Norway, Gro Harlem Brundtland, issued her 1987 landmark report entitled “Our Common Future” or simply, the Brundtland Report.¹⁰ The striking aspect of the work of the Brundtland Commission was that it clearly recognized that the attainment of the four basic components of development necessarily requires the realization of environmental protection.¹¹ Subsequently, in 1992, the Earth Summit at Rio endorsed sustainable development as one of the central tenets of international environmental law, even though the Rio Declaration did not specifically define sustainable development.¹² Together, the 27 principles of the Rio Declaration¹³ and the 40 chapters of Agenda 21¹⁴ laid the groundwork for the progressive realization of the goal of sustainable development.¹⁵

(*ibid*) and the no-harm rule against significant transboundary environmental pollution or damage (prin 21)).

⁸ Guruswamy, *ibid*.

⁹ Marc Pallemarts, “The Future of Environmental Regulation: International Environmental Law in the Age of Sustainable Development: A Critical Assessment of the UNCED Process” (1996) 15 JL & Com 623 at 626-27.

¹⁰ See generally World Commission on Environment & Development, *supra* note 4.

¹¹ Dernbach, “Sustainable Development”, *supra* note 2 at 19.

¹² See Alhaji BM Marong, “From Rio to Johannesburg: Reflections on the Role of International Legal Norms in Sustainable Development” (2003) 16 Geo Int’l Envtl L Rev 21 at 30-31 (QL).

¹³ *United Nations Conference on Environment and Development: Rio Declaration on Environment and Development*, 14 June 1992, 31:4 ILM 874 [*Rio Declaration*]. Some of the prominent principles introduced by the Rio Declaration include the right to development (*ibid*, prin 3), common but differentiated responsibilities (prin 7), reduction and elimination of unsustainable patterns of production and consumption (prin 8), public participation in environmental decision-making (prin 10), trade-environment linkage (prin 12), the precautionary principle for dealing with scientific uncertainty (prin 15), the polluter-pays principle (prin 16), promotion of environmental impact assessment (prin 17), protection of indigenous people and local communities (prin 22), and a reaffirms the no-transboundary-harm rule (prin 2).

¹⁴ See generally Nicholas A Robinson, ed, *Agenda 21 & The UNCED Proceedings*, vol 4, 3rd series, International Protection of the Environment (New York: Oceana Publications, Inc, 1993).

¹⁵ “[H]uman beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature”. *Rio Declaration*, *supra* note 13, prin 1. Half of the Rio principles contain the norm sustainable development. See George (Rock) Pring, “The 2002 Johannesburg World Summit on Sustainable Development: International Environmental Law Collides With Reality, Turning Jo’Burg Into “Joke’Burg”” (2002) 30 Denv J Int’l L & Pol’y 410 at 413 (QL).

The Earth Summit also resulted in three major environmental treaties: the *United Nations Convention on Biological Diversity* (CBD),¹⁶ the *United Nations Framework Convention on Climate Change* (UNFCCC),¹⁷ and the *United Nations Convention to Combat Desertification* (UNCCD),¹⁸ which also underscored the centrality of sustainable development. Other important outcomes of the Earth Summit were the creation of the Global Environment Facility¹⁹ and the United Nations Commission on Sustainable Development.²⁰ Both bodies continue to play significant roles in operationalising sustainable development. At the 2000 UN Millennium Summit, nearly 189 countries adopted the Millennium Declaration, pledging themselves to the Millennium Development Goals to reduce poverty, improve health, promote peace and human rights, and secure environmental sustainability by 2015.²¹ The seventh goal calls for the integration of the principles of sustainable development into country policies and programmes and to reverse the loss of environmental resources. Recently, Rio+20, which took place 20 years after the Rio Earth Summit of 1992, renewed political commitment towards sustainable development. Its primary outcome document, “The future we want”

¹⁶ *United Nations Conference on Environment and Development: Convention on Biological Diversity, 1993*, 5 June 1992, 31 ILM 818 (entered into force 29 December 1993). *Convention on Biological Diversity*, online: CBD Home <<http://www.cbd.int/>>.

¹⁷ *United Nations Conference on Environment and Development: Framework Convention on Climate Change*, 19 June 1993, 31 ILM 849 (adopted at New York 9 May 1992) [UNFCCC].

¹⁸ Even though negotiated in the framework of the UNCED, the convention was released only two years later. *United Nations: Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa*, 21 September 1994, 33 ILM 1328 (adopted 17 June 1994).

¹⁹ *Global Environment Facility: Investing in Our Planet*, online: gef <<http://www.thegef.org/gef/>>.

²⁰ UN, *CSD: About the CSD*, online: UNCSO <http://www.un.org/esa/dsd/csd/csd_aboutsd.shtml> (establishment of the Commission on Sustainable Development); *Establishment of the Commission on Sustainable Development*, E/1993/207, UNESC, 1993, online: United Nations <<http://www.un.org/documents/ecosoc/res/1993/eres1993-207.htm>> (detailing the functions of the Commission); *Institutional Arrangements to Follow up the United Nations Conference on Environment and Development*, A/Res/47/191, UNGA, 47th Sess (1993), online: United Nations <<http://www.un.org/documents/ga/res/47/ares47-191.htm>>.

²¹ The eight Millennium Development Goals and its targets are based on the UN Millennium Declaration by which world leaders committed themselves to a new global partnership to reduce extreme poverty by 2015. See generally *United Nations Millennium Declaration*, GA Res 55/2, UNGA, UN Doc A/55/L.2 (2000); see also *Summit on the Millennium Development Goals 20-22 September 2010*, online: United Nations Millennium Development Goals <<http://www.un.org/millenniumgoals/>>. For the most recent report, see *The Millennium Development Goals Report 2008* (New York: United Nations Department of Economic and Social Affairs, 2008).

emphasizes the need to “mainstream sustainable development at all levels.”²² The document focuses on two themes: (a) a green economy in the context of sustainable development and poverty eradication; and (b) the institutional framework for sustainable development. In addition to these themes, the document calls for action on a wide range of areas such as energy, sustainable cities, food security and sustainable agriculture, water, oceans, and disaster readiness.

As a legacy of these milestones, sustainable development has emerged as a cardinal standard to test the eco-soundness of all developmental actions, and now appears in the majority of environmental treaties, agreements, and legislation (including in a few national constitutions).²³ It is also being increasingly utilized as a touchstone in the judicial review of environmental cases.²⁴ Yet, despite normative entrenchment of sustainable development and progressive economic growth in developing countries, both environmental degradation and poverty remain widespread. That these problems persist is a testament to the complexities involved in pursuing sustainable development.²⁵ At the same time, there has been a growing realization that hard law treaties and soft law commitments are not producing tangible results on the scale initially contemplated.²⁶ In a marked departure from the general pattern previously adopted to expand international environmental law by creating new hard and soft law commitments, it was resolved at the

²² UN RIO+20 United Nations Conference on Sustainable Development, *The Future We Want*, A/CONF.216/L.1*, 19 June 2012, ¶3.

²³ See David R Boyd, *The Environmental Rights Revolution: A Global Study of Constitutions, Human Rights, and the Environment* (Vancouver: UBC Press, 2012). For instance see, “[e]veryone has the right ... to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that ... secure ecologically sustainable development”. See *Constitution of the Republic of South Africa*, 1996, (S Afr), No 108 of 1996, s 24.

²⁴ *Shehla Zia v WAPDA*, (1994) PLD 693 (Pak SC). This case dealt with the setting up of grid station in a residential area and possible health impacts. In emphasizing the need for sustainable development, the court held that “a method should be devised to strike balance between economic progress and prosperity and to minimize possible hazards”. *Ibid.* The traditional concept of development and ecology as opposed to each other is no longer acceptable. “Sustainable Development” is the answer. See *Vellore Citizens Welfare Forum v India*, (1996) [1996] (5) SCC 647 (India SC) [*Vellore Citizens Welfare Forum*].

²⁵ Even though global poverty rate will fall below 15 per cent by 2015, it will still be under the 23 per cent target. See *The Millennium Development Goals Report 2011* (New York: United Nations Department of Economic and Social Affairs, 2011) at 7.

²⁶ S Jacob Scherr & R Juge Gregg, “Johannesburg and Beyond: The 2002 World Summit on Sustainable Development and the Rise of Partnerships” (2006) 18 *Geo Int’l Envtl L Rev* 425 at 431-32 (QL) (outlining difficulties in treaty implementation, like reluctance to utilize dispute resolution mechanisms and lack of funding).

2002 World Summit on Sustainable Development (Rio+10), held in Johannesburg, to reinvigorate the implementation of Agenda 21 and the concept of sustainable development through partnerships.²⁷

As explained, “[t]hese ‘second type’ of outcomes ... consist of a series of commitments and action-oriented coalitions focused on deliverables and ... contribute in translating political commitments into action.”²⁸ This change in emphasis is the product of a growing realization that achieving sustainable development is not the sole responsibility of a single actor such as the United Nations or of national governments. Rather, it is a process requiring input and effort on the part of several players, including the private sector, transnational corporations, international organizations, academic institutions, civil society, and, more importantly, local communities.²⁹ Partnerships help leverage the potential and resources that these players make available, all of which can be channeled towards attaining sustainable modes of development.³⁰

²⁷ Two types of outcomes were promoted at Johannesburg. The first is type I, which refers to documents or agreements negotiated by states, including political agreements like conventions and declarations. The second, namely, Type II outcomes are a series of action-oriented deliverables that translates political commitments into action. Marion Wilson, “The New Frontier in Sustainable Development: World Summit on Sustainable Development Type II Partnerships” (2005) 36 VUWLR 389 at 392 (QL). Even though the two are interlinked, Type II partnership initiatives are not intended to substitute Type I commitments. To have WSSD status, such partnerships must be registered with the Commission on Sustainable Development. UN Commission on Sustainable Development, *Report on the Eleventh Session (27 January 2003 and 28 April-9 May 2003)*, E/2003/29, E/CN.17/2003/6, UNESCO, Official Records, 2003, Supplement No 9 (2003) ¶22. Some of the major criticisms against Type II partnerships are that it creates no legal obligations, it diverts government’s attention from Type I agreements and that there is lack of accountability. Wilson, *ibid* at 401-5. Partnerships cannot be a substitute to international treaties rather they should be tied to international standards, goals and objectives. See Scherr & Gregg, *ibid* at 425; UNESCO, *Partnerships for Sustainable Development: Report of the Secretary-General*, E/CN.17/2004/16, Commission on Sustainable Development, 12th Sess (2004) at 3.

²⁸ *Partnerships/Initiatives to Strengthen the Implementation of Agenda 21 (To be Elaborated by Interested Parties in Preparation for the World Summit on Sustainable Development for Launching at the Summit): Explanatory Note by the Chairman of the Preparatory Committee*, Third Summit Preparatory Committee (PREPCOM 3) 25 March-5 April 2002, New York, online: Johannesburg Summit 2002 <<http://www.johannesburgsummit.org/html/documents/prepcom3.html>>. Some 300 public-private partnerships were created focusing on six major areas, namely, water and sanitation, energy, health, agriculture, biodiversity and ecosystem management, and finance, trade and globalization. Hari M Osofsky, “Defining Sustainable Development after Earth Summit 2002” (2003) 26 Loy LA Int’l & Comp L Rev 111 at 124 (QL).

²⁹ Wilson, *supra* note 27 at 392.

³⁰ Symposium, Keynote Address, *The Road from Johannesburg January 28, 2003* (2003) 15 Geo Int’l Envtl L Rev 809 at 822 (QL). But see Scherr & Gregg, *supra* note 26.

Based on this line of reasoning, the major outcomes of the Johannesburg Summit were two documents. The first was the Declaration on Sustainable Development,³¹ a political statement reaffirming commitment to sustainable development, and the second was the Johannesburg Plan of Implementation,³² which is also a non-binding, aspirational document that calls upon national governments to adopt measures to promote sustainable development in a multitude of areas.³³ The concept of partnerships was taken a step further at Rio+20, where nearly 700 voluntary commitments, mobilizing more than USD500 billion in actions involving diverse stakeholders (such as national governments, the United Nations system, financial institutions and NGOs), all targeted the implementation of sustainable development practices.³⁴

At this point, it is noteworthy to observe the change in emphases in describing the milestone conferences that led to the development of international environmental law, which is also indicative of the growing acceptance of the centrality of sustainable development. While the 1972 Stockholm Conference focused on the human environment, by 1992 the emphasis had shifted to the environment and development, and then, at the Johannesburg Conference, shifted further to sustainable development. This term has since guided developmental actions to ensure that they remained environmentally consistent

³¹ UN World Summit on Sustainable Development, *Draft Political Declaration Submitted by the President of the Summit: Corrigendum*, A/CONF.199/L.6/Rev.2/Corr.1 (4 September 2002).

³² "Plan of Implementation of the World Summit on Sustainable Development" in UN, *Report of the World Summit on Sustainable Development Johannesburg, South Africa, 26 August-4 September 2002*, A/CONF.199/20* (New York: UN, 2002) at 6 [*Johannesburg Plan of Implementation*].

³³ The Johannesburg Plan is divided into 11 sections and it emphasizes that these "efforts will also promote the integration of the three components of sustainable development, economic development, social development and environmental protection as interdependent and mutually reinforcing pillars." *Ibid* at 2, ¶2.

³⁴ The importance of partnerships in implementing sustainable development can be discerned from the following observation of Sha Zukang, the Rio+20 Conference Secretary General, "[t]his Conference is about implementation. It is about concrete action. The voluntary commitments are a major part of the legacy of this Conference. They complement the official outcome of the Conference." *RIO+20 Voluntary Commitments*, online: RIO+20-United Nations Conference on Sustainable Development <<http://www.uncsd2012.org/content/documents/790Summary%20of%20Voluntary%20Commitments%20Registered%20at%20Rio20%20v6.pdf>>. Some of these commitments are coast-related like "Climate change mitigation through sustainable management of coastal ecosystems", "Ocean Watch: Assessment and Promotion of Progress in the Implementation of the 1992, 2002, and 2012 Global Commitments On Oceans, Coasts, and Small Island Developing States (SIDS)", and "Building Oceans Readiness: Capacity Development for Integrated Ocean Governance." *Voluntary Commitments: Governments*, online: RIO+20-United Nations Conference on Sustainable Development <<http://www.uncsd2012.org/allcommitments.html>>.

and workable in the long-term.³⁵ Despite sustainable development being a fundamental norm in international³⁶ and national law³⁷ as well as in the enunciations of several international judicial bodies³⁸ and national judiciaries,³⁹ it is still in the development phase, so to speak, regarding how it is to be realized.⁴⁰ As far as its normative definition is concerned, the principal formulation remains the one suggested by the Brundtland Report:

[s]ustainable development is development that meets the needs of the present without compromising the ability of future generations to

³⁵ Sumudu A Atapattu, *Emerging Principles of International Environmental Law* (New York: Transnational Publishers, 2006) at 91.

³⁶ For further details on sustainable development application in international law, see *infra* notes 76-84.

³⁷ For instance, see *Sustainable Development Act*, RSQ 2006, c D-8.1.1, s 6. It provides the following guiding principles for attaining sustainable development, namely, health and quality of life, social equity and solidarity, environmental protection, economic efficiency, participation and commitment, access to knowledge, subsidiarity, inter-governmental partnership and cooperation, prevention, precaution, protection of cultural heritage, biodiversity preservation, respect for ecosystem support capacity, responsible production and consumption, polluter pays, internalization of costs. *Ibid.*

³⁸ *Legality of the Threat or Use of Nuclear Weapons Case*, Advisory Opinion, [1996] ICJ Rep 226 at 241, ¶29. *Case Concerning Pulp Mills on the River Uruguay (Argentina v Uruguay)*, [2010] ICJ Rep 14 [*Case Concerning Pulp Mills*]. This case deals with the installation and operation of pulp mills on the banks of River Uruguay, which forms the boundary between Argentina and Uruguay. Way back in 1975, both countries concluded the statute of the River Uruguay, which established the Administrative Commission of the River Uruguay (CARU) for the optimal and rational utilization of the river. The primary complaint by Argentina was that the two pulp mills that Uruguay authorized to be built on its side of the river threatened the health of the river and that of the local residents and were in violation of the statute. The court decided that Uruguay breached the procedural obligations contained in the 1975 statute, namely, the obligation to inform CARU and Argentina of the activities that it planned to undertake in the river. But since Argentina failed to prove that significant environmental damage would occur, the mill could continue to operate. Interestingly, the 1975 statute does not mention sustainable development as one of its objectives. However “optimum and rational utilization” is the “cornerstone of the system of co-operation established in the 1975 statute and the joint machinery set up to implement this co-operation” (¶174). In interpreting the term ‘optimal and rational utilization’ the court held it as something akin to sustainable development. It was held that “. . . the attainment of optimum and rational utilization requires a balance between the Parties’ rights and needs to use the river for economic and commercial activities on the one hand, and the obligation to protect it from any damage to the environment that may be caused by such activities, on the other” (¶175). See generally *On Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area*, Case No 17, Advisory Opinion (1 February 2011) (International Tribunal for the Law of the Sea, Seabed Disputes Chamber) [*On Responsibilities and Obligations*, ITLOS, Advisory Opinion].

³⁹ For instance, see *Vellore Citizens Welfare Forum*, *supra* note 24; *Andolan v India*, (2000) [2000] (10) SCC 664 (India SC) (sustainable development in the context of dam construction) [*Narmada Bachao Andolan*]; *People United for Better Living in Calcutta-Public v West Bengal*, (1993) [1993] AIR 1993 215 (Calcutta HC) (sustainable development and wetland conservation).

⁴⁰ Michael McCloskey, “The Emperor has No Clothes: The Conundrum of Sustainable Development” (1999) 9 Duke Envtl L & Pol’y F 153 (WLeC).

meet their own needs. It contains within it two key concepts: the concept of ‘needs’, in particular the essential needs of the world’s poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment’s ability to meet present and future needs.

... In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations.⁴¹

As can be seen from this definition, sustainable development, at a conceptual level, underscores the need to integrate environmental concerns into developmental decision-making. However, the terms obfuscate the undercurrents and conflicts between the various interests. How and who determine present needs, but what is meant by not compromising the ability of future generations to meet their needs?⁴² Does the term ‘needs’ refer to basic needs or does it imply something broader?⁴³ And does this definition mask a deeply anthropocentric bias?⁴⁴

⁴¹ World Commission on Environment & Development, *supra* note 4 at 43, 46. The International Law Association defines it as

a comprehensive economic, social and political process, which aims at the sustainable use of natural resources of our planet and the protection of the environment on which nature and human life as well as social and economic development depend and which seeks to realize the right of all human beings to an adequate living standard on the basis of their active, free and meaningful participation in development and in the fair distribution of benefits resulting there from, with due regard to the needs and interests of future generations.

International Law Association, *Legal Aspects of Sustainable Development (1992-2002) New Delhi Conference: Final Conference Report* (Kamal Hossain & Nico Schrijver, Members, 2002) at 6.

⁴² “[S]ustainable development has become a buzzword largely devoid of content ... a concept [that] provides little policy traction.” Daniel C Esty, “A Term’s Limits: Many flocked to the banner of sustainable development, but it led them nowhere”, *Foreign Policy* (1 September 2001) at 74-75. Sustainable development is only a manifestation of Western ideology and it equates human quality of life with economic growth and views nature only as a useful resource to man. Geisinger, *supra* note 6 at 66-67.

⁴³ Felix Rauschmayer et al, *What About Needs? Re-conceptualising Sustainable Development* (Sustainable Europe Research Institute (SERI) Working Paper No 8, 2008) at 14.

⁴⁴ Ole Pedersen, Alwin Pillai & Anne-Michelle Slater, “Justice and Sustainable Development: Compatibility or Conflict? A Scottish Case Study” in Duncan French, ed, *Global Justice and*

Another factor that compounds the sustainable development riddle is the absence of a specific roadmap to sustainability. Thus, regardless of sustainability being part of customary international law,⁴⁵ and regardless of government commitments to sustainable development and the growing tendency of the general public to internalize a green culture,⁴⁶ ecosystems continue to degrade, and poverty and pollution remain widespread.⁴⁷ The inability to work out sustainability at macro-spatial scales necessitated re-thinking just what economic growth and development actually mean and what they imply. The World Commission on Environment and Development also emphasized that, in certain circumstances, it was necessary to transform the meaning of the 'quality of growth', as “[s]ustainable development involves more than growth. It requires a change in the content of growth, to make it less material- and energy-intensive and more equitable in its impact.”⁴⁸

To facilitate this transformation, it is essential to refocus developmental efforts in order to highlight limitations on exploitation and consumption of natural resources.⁴⁹ For instance, a hydropower plant should not be viewed merely as a means to produce more electricity. Rather, the consequences of the project on the environment, on local communities, on marginalized sections, and even future generations should be given due consideration. If it is not possible to secure the balance espoused by sustainable development, abandonment of the project on the grounds that it will disturb a rare ecological system can be “*a measure of progress, and not a setback to development.*”⁵⁰ Clearly, the emphasis should not be on ephemeral short-term economic gains but on long-term sustained economic growth. Such an approach comports with the principles of precaution in addition to intra- and inter-generational equity.⁵¹

Sustainable Development, Legal Aspects of Sustainable Development (Leiden: Martinus Nijhoff Publishers, 2010) 363 at 370-71.

⁴⁵ Sustainable development falls short of a principle of customary international law and is more a legitimate expectation. Marong, *supra* note 12.

⁴⁶ Emily Fisher, “Sustainable Development and Environmental Justice: Same Planet, Different Worlds?” (2002) 26 *Environ L & Pol’y J* 201 at 202 (HeinOnline).

⁴⁷ For an overview of coastal and marine pollution and degradation, see Ch 1.

⁴⁸ World Commission on Environment & Development, *supra* note 4 at 52.

⁴⁹ *Ibid* at 53.

⁵⁰ *Ibid* at 54 [emphasis added].

⁵¹ For more details on these principles, see Ch 5, Part 5.3.1.

The wisdom of not pursuing development in certain cases where the social and environmental costs are too high has yet to find widespread acceptance, particularly in South Asia, due to economic compulsions. In the guise of striking a balance between environment and development, short-term and myopic economic considerations are afforded predominance over other considerations.⁵² This is an extremely dangerous trend, amplified by the far-reaching changes presently occurring in the climate system.⁵³ Has sustainable development been reduced to mere tokenism, a convenient label that is pasted over a developmental project to pass off its environmental credentials, when in the majority of cases, the project is environmentally indefensible?⁵⁴

Conceptually, our present understandings of sustainable development are rooted in the idea that “the possibilities open to people tomorrow should not differ from those open today....”⁵⁵ These, however, do not adequately capture the nuances of this concept, which is now increasingly being viewed through the lens of human development. Immediately in the wake of de-colonization and the rise of communism, the dominant belief was that it was best to leave the engines of development in the hands of the state.⁵⁶ However, with the fall of socialism and a subsequent growing proclivity towards privatization, deregulation, free-market economy, liberalization and globalization, the development paradigm had to be re-designed.

⁵² For instance, see *Narmada Bachao Andolan*, *supra* note 39. It was held that even though the construction of the dam would undoubtedly result in changes to environment, it was not correct to presume that it would result in ecological disaster. India has an experience of over 40 years in dam construction and the experience shows that it is wrong to assume that the construction of large dams are not cost effective or that it leads to ecological or environmental degradation. On the contrary, the construction of large dams has lead to ecological upgradation. *Ibid.*

⁵³ For an overview of climate change impacts on the coastal zone, see generally Ch 2.

⁵⁴ This is precisely what happened in the South Indian state of Kerala where it was decided to forgo developmental benefits in the interests of conservation by dropping the Silent Valley Hydro Project. World Commission on Environment & Development, *supra* note 4 at 54; see also *ibid* at 66, note 4; see generally, Tony George Puthucherril, *From Shipbreaking to Sustainable Ship Recycling: Evolution of a Legal Regime*, David Freestone, ed, 5 *Legal Aspects of Sustainable Development* (The Netherlands: Martinus Nijhoff, 2010) [Puthucherril, *Shipbreaking*]. At Rio, development interests won the all-important noun, and all other interests - environment, society, culture, governance, human rights, etc. were relegated to being the adjective. See Pring, *supra* note 15 at 412.

⁵⁵ UNDP, *Human Development Report 2011: Sustainability and Equity: A Better Future for All* (New York: UNDP, 2011) at 17 [UNDP, *HDR 2011*].

⁵⁶ Dani Rodrik, “The ‘Paradoxes’ of the Successful State” (1997) 41:3-5 *Eur Econ Rev* (Paper and Proceedings of the Eleventh Annual Congress of the European Economic Association) 411 at 412 (ScienceDirect).

In this period of structural adjustment programmes and transformation, the state began to retrace from its role of commanding the heights of the economy, and private enterprise stepped in.⁵⁷ Non-state actors and the invisible hand of the market fuelled development.⁵⁸ While considerable material progress was achieved and large sections of society began to experience improved living standards, it soon became apparent that the gap between the haves and the have-nots was widening, discrediting the “Kuznets curve” hypothesis.⁵⁹ Wealth continues to concentrate in a small segment of society and the consumption patterns associated with it are extremely unsustainable.⁶⁰ Meanwhile, the majority of the world’s population continue to live in varying degrees of poverty, having very little or no access to natural resources and other developmental benefits.⁶¹

⁵⁷ See generally László Muraközy, *The Centrally Planned “Invisible Hand” - The Case of Hungary* (TIGER Working Paper Series No 119, Warsaw, 2010). Market reform during the first five years has been a monumental disaster in terms of its impact on social welfare. Kent Klautdt, “Hungary After the Revolution: Privatization, Economic Ideology and the False Promise of the Free Market” (1995) 13 *Law & Ineq* 303 (HeinOnline); Richard D Cudahy, “From Socialism to Capitalism: A Winding Road” (2010) 11 *Chi J Int’l L* 39 (HeinOnline); see generally Roman Frydman, Andrzej Rapaczynski & John S Earle et al, *The Privatization Process in Russia, Ukraine and the Baltic States*, vol 2, Central European University Privatization Reports (London: Central European University Press, 1993).

⁵⁸ Muraközy, *ibid*.

⁵⁹ The concept states that as income inequality follows an inverse-U shape along the development process, which first rises with industrialization and then declines as more workers join the high productivity sectors of the economy. See generally Thomas Piketty, “The Kuznets Curve: Yesterday and Tomorrow” in Abhijit Vinayak Banerjee, Roland Bénabou & Dilip Mookherjee, eds, *Understanding Poverty* (New York: Oxford University Press, 2006) 63; see generally Income inequality rises first and then drops with development. Jeffrey G Williamson, “British Inequality During the Industrial Revolution: Accounting for the Kuznets Curve” in YS Brenner, Hartmut Kaelble & Mark Thomas, eds, *Income Distribution in Historical Perspective* (Cambridge: Cambridge University Press, 1991) 57. Despite tremendous progress, the world faces huge backlogs of deprivation and inequality. Poverty is omnipresent. Nearly 1.3 billion people live on an income of less than USD1 a day. Even in industrialized countries, there is enormous disparity - one of eight are affected by some aspect of human poverty. UNDP, *Human Development Report 1999: Overcoming Barriers: Human Mobility and Development* (New York: Oxford University Press, 1999) at 28. But see Abdul Jalil, “Modeling Income Inequality and Openness in the Framework of Kuznets Curve: New Evidence from China” (2012) 29 *Econ Modelling* 309 (ScienceDirect) (suggesting that while the opening up of the economy in 1978 by China led to unprecedented economic growth, it also led to severe economic inequality).

⁶⁰ “While poverty results in certain kinds of environmental stress, the major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialized countries . . .” Robinson, ed, *supra* note 14, ch 4, ¶4.3.

⁶¹ It is becoming clear that climate change related processes is reversing developmental gains. See World Bank, *World Development Report 2010: Development and Climate Change* (Washington DC: World Bank, 2010) at 39-44 [World Bank, *WDR 2010*] (discussing the negative impacts of climate change on development).

When it eventually became understood that the inability of economic reforms to ensure inclusive growth could stymie long-term development, re-conceptualizing our fundamental understandings and criteria for development became essential. John Rawls, in his theory of “Justice as Fairness,” sought to tone down the excesses of the market economy⁶² through his “difference principle” which, while allowing for inequalities in income and wealth, emphasizes that those who are better off can be so only if those at the bottom are also made better off.⁶³

A similar view is adopted by Amartya Sen in “Development as Freedom,” which brings to the forefront the well-being of humans as both the goal and the means for development.⁶⁴ For Professor Sen, development is a process of expanding “the real freedoms that people enjoy,”⁶⁵ since achieving development requires the removal of poverty, tyranny, lack of economic opportunities, social deprivation, and neglect of public services.⁶⁶ This nuanced understanding of development found clearer articulation in the United Nations Development Programme (UNDP) Human Development Report series beginning in 1990.⁶⁷ In this enhanced understanding of sustainable development, the term development acquires new dimensions that relate to the expansion of human capabilities.⁶⁸ Inevitably, the resultant product, 'sustainable human development', is “the

⁶² See generally John Rawls, *A Theory of Justice*, 1st ed. (Oxford: Oxford University Press, 1999); John Rawls, *Justice as Fairness: A Restatement*, ed by Erin Kelly (Massachusetts: Harvard University Press, 2001) at 61-66.

⁶³ See generally Rex Martin, “Rawls’s New Theory of Justice” (1994) 69 *Chicago-Kent L Rev* 737 (QL); David Elkins, “Responding to Rawls: Toward a Consistent and Supportable Theory of Distributive Justice” (2007) 21 *BYU J Pub L* 267 (QL); Xiaobing Xu & George Wilson, “On Conflict of Human Rights” (2006) 5 *Pierce L Rev* 32 (HeinOnline).

⁶⁴ See generally Amartya Sen, *Development as Freedom* (Oxford: Oxford University Press, 1999).

⁶⁵ See generally *ibid* (arguing for a development model that enhances people’s capabilities in contrast to an approach that focuses solely on income enhancement). The elaboration of the “Human Development Approach,” or the “Capability Approach,” has been “the most important theoretical development in human rights during the past two decades” and has been operationalized in the Human Development Reports of the United Nations Development Programme. Martha Nussbaum, “Human Rights and Human Capabilities” (2007) 20 *Harv Hum Rts J* 21 (WLeC).

⁶⁶ Sen identifies five freedoms as instrumental to this goal and consequently vital to overall economic development: political freedoms, economic facilities, social opportunities, transparency guarantees, and protective security. Sen, *supra* note 64 at 38.

⁶⁷ “Human development is a process of enlarging people’s choices”. UNDP, *Human Development Report 1990* (New York: Oxford University Press, 1990) at 1. “Human development is the expansion of people’s freedoms and capabilities to lead lives that they value and have reason to value. It is about expanding choices”. See UNDP, *HDR 2011*, *supra* note 55 at 1.

⁶⁸ UNDP, *HDR 2011*, *ibid*.

expansion of the substantive freedoms of people today while making reasonable efforts to avoid seriously compromising those of future generations.”⁶⁹

In sum, even with obvious drawbacks, sustainable development has evolved into a seminal principle that exerts influence over all aspects that interface between environment and development, seeking to place development on pathways that are environmentally sound.⁷⁰ Sustainable development replaces the context and tenor of economic development, viewing it as qualitative improvement of human life rather than a quantitative expansion of economic wealth.⁷¹ In effect, it is people that form the core focus of sustainable development and it represents a paradigmatic shift in the way in which development was previously understood and seeks to synthesize and assimilate the aspirations of environmental protection with human development objectives based on the belief that, “[p]rotecting the environment is part of what progress means; it is not the price of progress.”⁷²

Moreover, sustainable development views the quintessentially discrete concepts of environment protection and development as synergistic and not antagonistic forces, seeking to bridge the apparent disconnect between the two. Primarily, it seeks to improve the quality of life without necessarily increasing natural resource use beyond the carrying capacity of the ecosystem.⁷³ So profound is the influence of this ideal that it has emerged as one of the fundamental values of modern civilization, akin to democracy, rule of law, justice, liberty, and human rights.⁷⁴ As it has undeniably emerged as a key concept that enhances people’s rights and freedoms, no nation will ever want to run the risk of being antagonistic to sustainable development values and principles.⁷⁵ It should also be noted that, rather than prescribing a normative one-size-fits-all approach to developmental

⁶⁹ *Ibid* at 18.

⁷⁰ AV Lowe, “Sustainable Development and Unsustainable Arguments” in AE Boyle & D Freestone, eds, *International Law and Sustainable Development: Past Achievements and Future Challenges* (Oxford: Oxford University Press, 1999) 19 at 31.

⁷¹ French, *supra* note 5 at 13-14.

⁷² John C Dernbach, “Sustainable Versus Unsustainable Propositions” (2002) 53 Case W Res L Rev 449 at 450 (HeinOnline).

⁷³ Robert John Araujo SJ, “Rio+10 and the World Summit on Sustainable Development: Why Human Beings Are at the Center of Concerns” (2004) 2 Geo JL & Pub Pol’y 201 at 203 (QL).

⁷⁴ Lowe, *supra* note 70.

⁷⁵ Christina Voigt, *Sustainable Development a Principle of International Law: Resolving Conflicts between Climate Measures and WTO Law* (Lieden: Martinus Nijhoff, 2009) at 3.

issues, current practice segregates issues and views them through a sustainable development lens. Consequently, sustainable development has extensive application in varied contexts, including international trade,⁷⁶ shipbreaking,⁷⁷ tourism,⁷⁸ fishing,⁷⁹ ocean governance,⁸⁰ agriculture,⁸¹ water management,⁸² health,⁸³ and forestry.⁸⁴ Additionally,

⁷⁶ See *General Agreement on Tariffs and Trade-Multilateral Trade Negotiations (The Uruguay Round): Agreement Establishing the Multilateral Trade Organization [World Trade Organization]*, 15 December 1993, 33 ILM 13, pmb1. The major role that international trade can play in promoting economic development and the alleviation of poverty . . . and since ‘the majority of WTO Members are developing countries . . . we seek to place their needs and interests at the heart of the WTO Work Programme . . .’ See *World Trade Organization (WTO) - Doha Ministerial 2001: Ministerial Declaration*, 14 November 2001, Wt/Min(01)/Dec/I 20 November 2001, 41 ILM 746, ¶2. Furthermore, the Ministers strongly confirmed their commitment ‘to the objective of sustainable development, as stated in the Preamble of the Marrakesh Agreement’: ‘We are convinced that the aims of upholding and safeguarding an open and non-discriminatory multilateral trading system, and acting for the protection of the environment and the promotion of sustainable development can and must be mutually supportive’ (¶6).

⁷⁷ International Conference on the Safe and Environmentally Sound Recycling of Ships: Agenda Item 8, Adoption of the Final Act and Any Instruments, Recommendations and Resolutions Resulting from the Work of the Conference: Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009, Text Adopted by the Conference, IMO/SR/CONF/45, 19 May 2009 (opened for signature 1 September 2009); see generally Puthucherril, *Shipbreaking*, *supra* note 54.

⁷⁸ Sustainable tourism is tourism that is not only economically viable, but it also does not destroy the resources on which the future of tourism will depend, notably the physical environment and social fabric of the host community. Furthermore, ecotourism falls under the rubric of sustainable tourism. Alison Gill et al, “The Challenges of Integrating Tourism into Canadian and Australian Coastal Zone Management” (2003) 26 Dalhousie LJ 85 at 90 (HeinOnline).

⁷⁹ For instance, see generally FAO, *Code of Conduct for Responsible Fisheries* (Rome: FAO, 1995). UNGA, *Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks*, 4 August 1995, A/CONF 164/37, 8 September 1995, 34 ILM 1542 (entered into force 11 December 2001).

⁸⁰ For instance, see *United Nations Convention on the Law of the Sea*, 10 December 1982, 1833 UNTS 397, 21 ILM 1261 (entered into force 16 November 1994) [LOSC], part XII.

⁸¹ See *FAO International Treaty on Plant Genetic Resources for Food and Agriculture*, Rome 3 November 2001, FAO Conference Res 3/2001, S Treaty Doc No 110-19, art 1.1 (entered into force 29 June 2004). The objectives of this treaty are conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of benefits arising out of their use for sustainable agriculture and food security. *Ibid.*

⁸² *UN: Convention on the Law of the Non-navigational Uses of International Watercourses*, 21 May 1997, 36 ILM 700 [*UN Watercourses Convention*].

⁸³ In articulating the relationship between health and sustainable development, Gro Harlem Brundtland observes

[t]he goals of sustainable development cannot be achieved when there is a high prevalence of debilitating illness and poverty and the health of a population cannot be maintained without a responsive health system and a healthy environment. Environmental degradation, mismanagement of natural resources, and unhealthy consumption patterns and lifestyles impact health. Ill health, in turn, hampers poverty alleviation and economic development.

with the emergence of Type II partnerships as a means to implement normative prescriptions, sustainable development has become more broad-based and practical oriented.⁸⁵ Despite the extensive range of its applicability, the common core of sustainable development (i.e., the need to coalesce and balance human development, environment protection and social justice) remains the same, straddling different situations, issues and regimes.

At this point, it must be emphasised that sustainable development has a new dimension as well, juxtaposed by climate change. To appreciate the relationship between sustainable development and climate change, it is helpful to examine the term “environment” within a sustainable development context.⁸⁶ Environment includes the climate system,⁸⁷ which in turn consists of five core components: the atmosphere,⁸⁸ the hydrosphere,⁸⁹ the cryosphere,⁹⁰ land surface,⁹¹ and the biosphere.⁹² To maintain

Hans Christian Bugge, & Lawrence Watters, “A Perspective on Sustainable Development after Johannesburg on the Fifteenth Anniversary of Our Common Future: An Interview with Gro Harlem Brundtland” (2003) 15 *Geo Int'l Env'tl L Rev* 359 at 364 (HeinOnline).

⁸⁴ For more on sustainable forest management, see *A Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests*, 13 June 1992, 31 ILM 881.

⁸⁵ For further discussion on the concept of partnerships, see *supra* notes 27-30.

⁸⁶ See World Commission on Environment & Development, *supra* note 4 at 43, 46.

⁸⁷ For instance, see *Canadian Environmental Protection Act*, SC 1999, c 33, s 3(1).

“[E]nvironment” means the components of the Earth and includes:

- (a) air, land and water;
- (b) all layers of the atmosphere;
- (c) all organic and inorganic matter and living organisms; and
- (d) the interacting natural systems that include components referred to in paragraphs (a) to (c). *Ibid.*

⁸⁸ It is the most unstable component in the climate system and it consists of nitrogen, oxygen, argon, and trace gases like carbon dioxide, methane, nitrous oxide, water vapor, and ozone which absorbs and emits infrared radiation. APM Baede, “The Climate System: An Overview” in JT Houghton et al, eds, *Climate Change 2001: The Scientific Basis* (Cambridge: Cambridge University Press, 2001) 85 at 87.

⁸⁹ The hydrosphere comprises all surface and subterranean waters (both fresh and saline as well). *Ibid* at 88. In particular, the oceans which cover approximately 70 per cent of the earth and they store and transport a large amount of energy and dissolve huge quantities of carbon dioxide. Moritz Bollmann et al, *World Ocean Review 2010: Living with the Oceans* (Hamburg: Maribus, 2010) at 9.

⁹⁰ It consists of the ice sheets of Greenland and Antarctica, sea ice, permafrost, snow fields and continental glaciers. It is important to the climate system due to its high reflectivity for solar radiation (albedo), low thermal conductivity, and in driving deep ocean water circulation. Bollmann et al, *ibid.*

⁹¹ Land surface includes vegetation and soils, which play an important role in determining how the energy received from the sun is returned to the atmosphere. Baede, *supra* note 88 at 89.

equilibrium,⁹³ several complex physical, chemical, and biological interactions take place between and among these systems across a wide range of space and time scales.⁹⁴ However, the enhanced green house effect triggers a series of perturbations that can disrupt climate equilibrium, leading to environmental upheavals. This makes it virtually impossible to balance environmental and developmental considerations, which is a fundamental requisite in the sustainable development paradigm.⁹⁵

Climate change has the potential to impact the entire planet and all sectors of human activity. As observed by the Human Development Report, “[c]limate change may be the single factor that makes the future very different, impeding the continuing progress in human development.”⁹⁶ In a similar vein, the World Development Report also notes that, “[l]eft unmanaged, climate change will reverse development progress and compromise the well-being of current and future generations.... Impacts will be felt everywhere, but much of the damage will be in developing countries.”⁹⁷ Clearly, climate change has the potential not only to upset and but to reverse the developmental gains that have been achieved over the years.⁹⁸

⁹² It includes the marine and terrestrial life forms. Biota plays an important role in the uptake and release of GHGs. Marine and terrestrial plants (particularly) forests store significant amounts of carbon via the photosynthetic process. *Ibid.*

⁹³ For long the dominant paradigm that influenced the development of environmental law was the equilibrium model, which was based on the view of a balance of nature. The equilibrium paradigm has been rejected in ecology, replaced with a complex, stochastic nonequilibrium one which provides a more dynamic view of nature. The idea here is that the ever-growing interactions between humans and the natural environment makes it impossible to return to an ideal state of nature. In such a situation ecosystems can be managed at best, but not restored or preserved. Even in such cases there is the need for strong regulation. See A Dan Tarlock, “The Nonequilibrium Paradigm in Ecology and the Partial Unraveling of Environmental Law” (1994) 27 Loy LA L Rev 1121 (HeinOnline); A Dan Tarlock, “Biodiversity and Endangered Species” in John C Dernbach, ed, *Stumbling Towards Sustainability* (Washington, DC: Environmental Law Institute, 2002) 311 at 318-319; see also Douglas J Spieles, *Protected Land: Disturbance, Stress, and American Ecosystem Management*, Springer Series on Environmental Management, 1st ed (New York: Springer, 2010) at 27-28.

⁹⁴ Spieles, *ibid.*

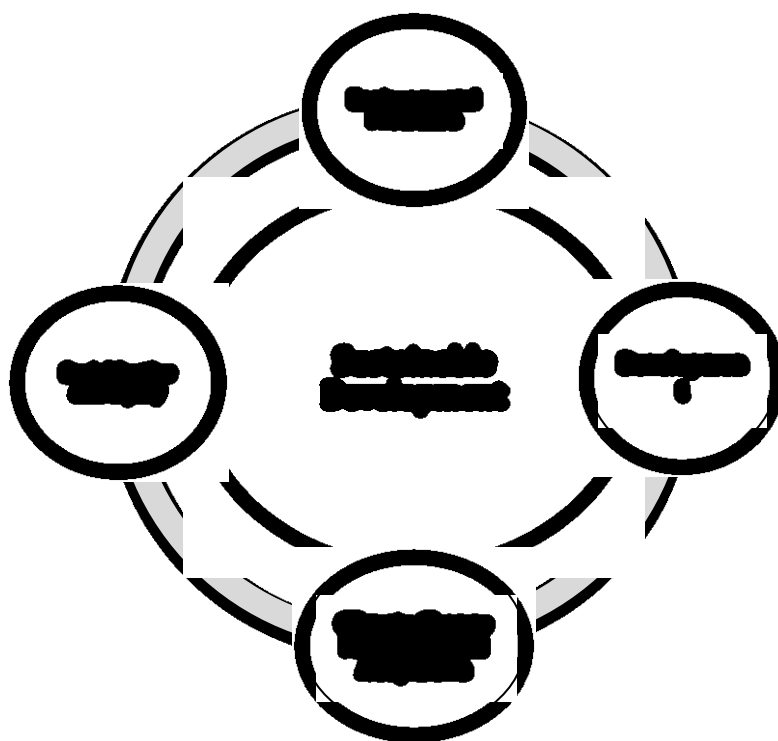
⁹⁵ Even land use changes, like deforestation, agriculture, irrigation, implementation of development projects and urbanization, can significantly alter the local, regional and even the global climate and impact the carbon cycle. Baede, *supra* note 88 at 92-93.

⁹⁶ UNDP, *Human Development Report 2010: 20th Anniversary Edition: The Real Wealth of Nations: Pathways to Human Development* (New York: UNDP, 2010) at 102.

⁹⁷ World Bank, *WDR 2010*, *supra* note 61 at 36.

⁹⁸ Yields of major crops in India are projected to decline by 4.5 to nine per cent within the next three decades. *Ibid* at 40.

Given the pervasiveness and complexity of climate change, if sustainable development is to be attained as part of the requisite to ensure environmental protection, it is essential that countries reorient their development paths in ways that secure mitigation (i.e., limits on carbon-intensive growth, where practicable) and adaptation.⁹⁹ Indeed, mitigation, adaptation and the other elements of sustainable development – namely, economic development, environmental protection, social justice, are all intrinsically inter-linked, since the various hazards associated with climate change have the potential to undermine progress.¹⁰⁰ The figure below depicts a contemporary understanding of sustainable development:



⁹⁹ Prominent examples include the construction of the Confederation Bridge (connects Prince Edward Island with mainland Canada) and the Qinghi-Tibet railroad. SLR was recognized in the construction of the Confederation Bridge and it has been built one meter higher than currently required to accommodate the rising sea over its 100-year life span. Nearly 500 kilometers of the Qinghi-Tibet railroad is situated nearly 4,000 meters above sea level on permafrost. Given that temperatures are rising, a combination of cooling and insulations systems has been used to ensure that minimum heat is transmitted. W Neil Adger, Shardul Agrawala & M Monirul Qader Mirza, “Assessment of Adaptation Practices, Options, Constraints and Capacity” in ML Parry et al, eds, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2007) 717 at 724.

¹⁰⁰ Adaptation coupled with mitigation is as one of the ways to achieve sustainable development. See Armin Rosencranz, Dilpreet Singh & Jahnavi G Pai, “Climate Change Adaptation, Policies, and Measures in India” (2010) 22 *Geo Int'l Evtl L Rev* 575 at 576 (QL).

Figure 2: Elements of Sustainable Development

Accordingly, sustainable development requires that development should not only be environmentally friendly but it should also be “climate compatible.”¹⁰¹ It is therefore essential that sustainable development initiatives explicitly consider the hazards and risks associated with climate change and seek the means to reduce the same by aggressively pursuing both mitigation and adaptation in all developmental initiatives. For example, development projects should promote climate resilience and leave the smallest possible carbon footprint.¹⁰² In short, sustainable development becomes the optimal balance between environment and development (social and economic) that is climate-friendly. In other words, development should necessarily encompass measures that are aimed at mitigation (where possible) and adaptation within the broader goal of securing environmental protection. Based on this understanding, we now move on to examine the nuances of sustainable development, as applied to coastal zones.

4.3 SUSTAINABLE COASTAL DEVELOPMENT

The narrow littoral ribbons of land and adjoining salt waters where terrestrial and marine environments meet are fast emerging as laboratories for testing sustainable development ideas.¹⁰³ This is no simple task, as “[t]he qualities that have made coastal regions so critically important to our species are already under great pressure.”¹⁰⁴ Hence, one has to physically design and carry out the concept of SCD, which has been defined as “enhancing the capacity of current and future generations to realize their human potential, within the context of maintaining diverse, healthy and productive coastal ecosystems.”¹⁰⁵

¹⁰¹ It “is development that minimises the harm caused by climate impacts, while maximising the many human development opportunities presented by a low emissions, more resilient, future”. Tom Mitchell & Simon Maxwell, “Defining climate compatible development”, *Climate & Development Knowledge Network: Policy Brief* (November 2010) at 1.

¹⁰² See Core Writing Team, Rajendra K Pachauri & Andy Reisinger, eds, *Climate Change 2007: Synthesis Report* (Geneva: Intergovernmental Panel on Climate Change, 2008) at 56-62.

¹⁰³ Stephen B Olsen, “Educating for the Governance of Coastal Ecosystems: The Dimensions of the Challenge” (2000) 43 *Ocean & Coast Mgmt* 331 at 332 (ScienceDirect).

¹⁰⁴ *Ibid.*

¹⁰⁵ Coastal Management Policy Programme, *White Paper for Sustainable Coastal Development in South Africa: Our Coast, Our Future* (Department of Environmental Affairs and Tourism, April 2000). Defining a sustainable coast in the context of the Mediterranean, as one that exhibits the following five features, namely, resilience (resilient to future uncertainties of climate change,

Rather than forestalling coastal development, the objective is to strike a balance between development and coastal environmental protection objectives to ensure social equity, particularly in relation to the ability of impoverished coastal communities to access and enjoy limited coastal resources.¹⁰⁶ As well, it seeks to (where practical) implement mitigative and adaptation actions and improve the quality of life of coastal communities and help augment their adaptive capacity, critical given the uncertainties associated with SLR and other climate change hazards. A classical example of a SCD strategy, in this regard, would be the creation of a mangrove plantation. As seen in Chapter two, mangroves are part of the blue carbon panoply due to its enhanced potential to sequester carbon. In addition, mangroves secure livelihood opportunities and human development, and can act a speed-breaker protecting the shoreline from harmful waves.

SCD requires enhancement of the adaptive capacity of coastal populations and creation of mechanisms to combat SLR and other climate change related threats.¹⁰⁷ To achieve these objectives, it identifies and calls upon different stakeholders to implement actions and programmes that can help increase the productivity of current economic activities, prevent wastage and duplication of effort, promote alternative and environmentally sustainable livelihood opportunities, and ensure that all developmental activities reference the carrying capacity of coastal ecosystems and are targeted to enhance human development.¹⁰⁸

Unquestionably, SCD emerges as the end-goal of all of our management efforts in coastal zones. The salient question therefore is: what are the feasible means to achieving SCD? Fortunately, integrated coastal zone management (ICZM) carries a prescriptive roadmap that can assist a move towards SCD, transforming high-sounding rhetoric into

including rising sea levels); productive (able to support the economic aspirations of coastal communities); diverse (ecologically diverse); distinctive (retaining the cultural distinctiveness of coastal areas); attractive (retain the attractiveness of the coast); healthy (free from pollution). *The ICZM Process - a Roadmap towards Coastal Sustainability - Introduction*, online: [pegasoproject.eu <http://www.pegasoproject.eu/wiki/ICZM_Process_diagram>](http://www.pegasoproject.eu/wiki/ICZM_Process_diagram).

¹⁰⁶ “[T]he key is not only to manage the use of ecosystems, and the goods and services they provide, but to manage and regulate human activity to avoid jeopardizing their functional integrity.” Chua Thia-Eng, *The Dynamics of Integrated Coastal Management: Practical Applications in the Sustainable Coastal Development in East Asia* (Quezon City: GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas, 2006) at 76.

¹⁰⁷ For more on this topic, see Ch 6.

¹⁰⁸ *Ibid.*

tangible deliverables. In fact, SCD represents the goal and ICZM the means to facilitate it. Chapter six illuminates this notion in greater depth. Before proceeding to that section, the next chapter examines the concept of climate change adaptation and the rubric term coastal climate change adaptation (CCCA).

4.4 CONCLUSION

In sum, coastal zones in South Asia and in several other parts of the world are under considerable stress due to climate change as well as demographic and economic growth. And the impact of this stress is increased loss and suffering, collapse of ecological systems, and deeply strained social relations particularly in the developing world. The pressures on coastal ecosystems and resources are increasing at rates faster than the time and efforts that are presently being expended to stabilise and restore them. Amidst such a gloomy scenario, SCD provides a new paradigm for all those who have a stake in maintaining healthy coastlines and in ensuring the well-being of coastal communities. It can help to alleviate threats, reign in injudicious development practices, and improve efficiency to strengthen and increase coastal resilience and the adaptive capacity of coastal communities and to also ensure that future generations are not denied their rights to enjoy the aesthetics and values associated with coastal zones. In tandem with sustainability, SCD likewise seeks a convergence between social equity, economic development and environmental protection, taking into consideration the need for CCCA and climate change mitigation. This is the key message that is to permeate all aspects of coastal development and decision-making and is particularly relevant to the South Asian coastal scenario.

CHAPTER 5 THE SIGNIFICANCE AND DYNAMICS OF CLIMATE CHANGE ADAPTATION AND ITS RELEVANCE TO COASTAL ZONES

5.1 INTRODUCTION

Homo sapiens are generally considered to be the most adaptable among all species, as mankind has a long history of employing ingenuity and planning to mould techniques that have facilitated adaptation to diverse climatic settings.¹ Of late, due to the problems posed by climate change, an assortment of adaptation measures have been developed, such as new irrigation management systems,² crop diversification,³ rainwater harvesting,⁴ and floating gardens.⁵ Likewise, programmes like “living with floods” have been implemented, where flood-prone and similarly vulnerable communities are provided with swimming lessons and life jackets.⁶

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- ¹ Ian Burton, Elliot Diringer & Joel Smith, “Adaptation to Climate Change: International Policy Options”, at 3, online: Pew Center on Global Climate Change <http://www.pewclimate.org/docUploads/PEW_Adaptation.pdf>. Coastal communities have been adapting to change for many years Nicholas A Robinson, “IUCN as Catalyst for a Law of the Biosphere: Acting Globally and Locally” (2005) 35 *Envtl L* 249 at 257-58 (QL).
- ² Israel is a leader in drip irrigation that has increased water efficiency. Israel, Ministry of Environmental Protection, *Israel’s Second National Communication on Climate Change Submitted under the United Nations Framework Convention on Climate Change* (Jerusalem: Ministry of Environmental Protection, 2010) at 43 [Israel, *Second National Communication*].
- ³ Martin Parry, Osvaldo Canziani & Jean Palutik, “Technical Summary” in ML Parry et al, eds, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2007) 23 at 65.
- ⁴ Stephen N Ngigi, *Climate Change Adaptation Strategies Water Resources Management Options for Smallholder Farming Systems in Sub-Saharan Africa* (New York: The MDG Centre for East and Southern Africa, Earth Institute at Columbia University, 2009) at 84. Rainwater harvesting is one of the specific adaptation measures for water-stressed Africa. J Mwenge Kahinda, AE Taigbenu, RJ Boroto, “Domestic Rainwater Harvesting as an Adaptation Measure to Climate Change in South Africa” (2010) 35 *Physics & Chemistry of the Earth* 742 (ScienceDirect).
- ⁵ Floating gardens are promoted to address the needs of landless farmers in Bangladesh. It is created by using water hyacinth, earth and bamboo and is used to grow vegetables. “Floating Gardens in Bangladesh”, *Practical Action: Technology Challenging Poverty: Technical Brief*, online: FAO <<http://www.fao.org/climatechange/17849-0e277b46b31f98942e6bc81bb22319243.pdf>>.
- ⁶ Kevin Watkins, *Human Development Report 2007/2008, Fighting Climate Change: Human Solidarity in a Divided World* (New York: UNDP, 2007) at 165.

Prior to the advent of the global warming phenomenon, as the natural climatic variations were limited in space and time, humans could easily and successfully adapt.⁷ But now, with the shorter time scales at which climatic variations are taking place, adaptation has become a daunting task. Complicating the situation is the expansion of human settlements into high hazard zones, placing entire communities at greater risk.⁸ The abuse of natural systems due to anthropogenic activities is already so extreme that many critical thresholds have been crossed, making these systems less resilient to climate variability and change. Thus, successfully responding to anthropogenic climate change is a gargantuan challenge.⁹

This chapter explains the concept of climate change adaptation and its relevance to the coastal zone. It begins with an analysis of climate change adaptation and its various classifications. Next, it probes the theoretical foundations of adaptation and explores how adaptation fits into the sustainable development landscape. At the international level, for long, discourses on climate change solutions have centered primarily on mitigation. Consequently, the rules on adaptation are yet to attain maturity, and what does exist is fragmented and disparate. Much of the research thereafter is directed at identifying the various international rules on adaptation. Based on this foundational understanding of adaptation, this chapter will subsequently examine its relevance to SLR and climate change impacts on coastal zones.

5.2 UNDERSTANDING THE FUNDAMENTALS OF CLIMATE CHANGE ADAPTATION

As neither the UNFCCC nor the Kyoto Protocol provides any definition of adaptation or of affiliated concepts such as adaptive capacity and vulnerability, we turn instead to the Intergovernmental Panel on Climate Change (IPCC), which, in the Third Assessment Report (TAR), has comprehensively defined adaptation as:

[a]djustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustment in natural or human systems in

⁷ E Lisa F Schipper & Ian Burton, "Understanding Adaptation: Origins, Practice and Policy" in E Lisa F Schipper & Ian Burton, eds, *The Earthscan Reader on Adaptation to Climate Change* (London: Earthscan, 2009) 2 [Schipper & Burton, "Understanding Adaptation"].

⁸ *Ibid.*

⁹ *Ibid* at 1.

response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation.¹⁰

In the Fourth Assessment Report, adaptation has been defined as:

[i]nitiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects. Various types of adaptation exist, e.g., anticipatory and reactive, private and public, and autonomous and planned. Examples are raising river or coastal dykes, the substitution of more temperature-shock resistant plants for sensitive ones, etc.¹¹

Vulnerability is another critical component in the adaptation semantic. It is defined as

... the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity.¹²

Maladaptation refers to “[a]ny changes in natural or human systems that inadvertently increase vulnerability to climatic stimuli; an adaptation that does not succeed in reducing vulnerability but increases it instead.”¹³ Another important term in the adaptation lexicon is ‘capacity,’ which is society’s degree of ability to adapt to changing climatic conditions. TAR defines it as “[t]he ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.”¹⁴ Capacity is determined to a large extent by society’s access to technology and resources, the level of wealth, literacy, and

¹⁰ Robert T Watson, World Bank & Core Writing Team, eds, *Climate Change 2001: Synthesis Report* (Cambridge: Cambridge University Press, 2001) at 365.

¹¹ Alfons P M Baede, Paul van der Linden & Aviel Verbruggen, “Annex II: Glossary” in Core Writing Team, Rajendra K Pachauri & Andy Reisinger, eds, *Climate Change 2007: Synthesis Report* (Geneva: Intergovernmental Panel on Climate Change, 2007) 76 at 76.

¹² *Ibid* at 89.

¹³ Watson, World Bank & Core Writing Team, eds, *supra* note 10 at 378.

¹⁴ *Ibid* at 365.

institutional infrastructure.¹⁵ Resilience is “the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change.”¹⁶

There are different kinds of adaptation measures that have application to human societies and to ecosystems. In cases where measures are initiated prior to the observation of impacts, adaptation is treated as anticipatory or proactive.¹⁷ When adaptation measures are designed post-occurrence, they are reactive.¹⁸ Where adaptation is the result of deliberate policy decisions, it is planned or proactive, and in cases where the response is spontaneous, it is treated as autonomous.¹⁹ In managed systems, adaptation is generally anticipatory and planned, while in unmanaged natural systems, it is more reactive and autonomous.²⁰ Anticipatory adaptations are considered more effective and cost-efficient.²¹ Planned adaptation for human societies can take varied forms. These include creating robust designs for infrastructure, fortifying a society’s ability to withstand a range of extreme weather events, devising techniques to transfer risks away from communities that are vulnerable (i.e., providing for the collective sharing of losses),²² and enhancing the adaptability of vulnerable natural systems by employing setback lines.²³

Adaptation should be considered in the backdrop of a complex set of social, economic and political variables.²⁴ Most developing countries are reluctant to broach the

¹⁵ Burton, Diringer & Smith, *supra* note 1 at 3.

¹⁶ Baede, Linden & Verbruggen, *supra* note 11 at 86.

¹⁷ “Appendix I: Glossary” in ML Parry et al, eds, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2007) 869 at 869.

¹⁸ Donald S Lemmen & Fiona J Warren, eds, *Climate Change Impacts and Adaptation: A Canadian Perspective* (Ottawa: Climate Change Impacts and Adaptation Directorate, 2004) at 10.

¹⁹ A Barrie Pittock & Roger N Jones, “Adaptation to What and Why?” in E Lisa F Schipper & Ian Burton, eds, *The Earthscan Reader on Adaptation to Climate Change* (London: Earthscan, 2009) 35 at 37-38.

²⁰ *Ibid.*

²¹ Lemmen & Warren, eds, *supra* note 18 at 9.

²² Patricia Park, Anthony Gallagher & Michael Galley, “What Chance Adaptive Coastal Management for Climate Change? A Legal Dysfunction in Vertical Governance” (2010) 3:1 *Sea Grant L & Pol’y J* 59 at 66 (HeinOnline).

²³ For instance, see Department of Environment, Forests and Wildlife, Ministry of Environment and Forests, *Coastal Regulation Zone Notification* (SO19(E), India) ¶3.

²⁴ W Neil Adger, Shardul Agrawala & M Monirul Qader Mirza, “Assessment of Adaptation Practices, Options, Constraints and Capacity” in ML Parry et al, eds, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of*

subject of long-term adaptation, mainly because it is simply not on their priority list. They have more pressing problems, like poverty reduction and the limited amount of capital and other resources to meet the fiscal demands of adaptation.²⁵ The “long time horizon and inherent uncertainty” associated with climate change also makes it an unimpressive candidate for investment.²⁶

Adaptation depends considerably on the availability of sufficient adaptive capacity. In most developing economies, it is often the politically, socially, and economically marginalized groups that have the least adaptive capacity. These groups may include tribal peoples, artisanal fishers, women, children, the elderly, and natural-resource-dependent communities.²⁷ Circumstances such as underdevelopment, unemployment, large-scale environmental pollution, natural resource degradation, extreme poverty, gender bias, illiteracy, institutional weaknesses and wide-spread corruption impair adaptive capability development.²⁸ There is also an increasing tendency towards systematically alienating traditional communities from accessing the natural resources upon which their existence and survival depends, further hindering their adaptive capacities.²⁹ As the experience in some of the South Asian coastal countries demonstrates traditional communities are often replaced by a different set of players (e.g., tourism operators, industries, private port operators) who are generally more socially, economically and politically powerful and who often seek to intensively exploit coastal

the Intergovernmental Panel on Climate Change (Cambridge: Cambridge University Press, 2007) 717 at 728.

²⁵ Capital can be financial, natural, social and human. In responding to the problems of increased storm surge, technological capital may be needed for seawalls; financial capital for insurance and financing; human capital for improved building techniques; social capital for emergency response and retreat practices; and natural capital in the form of enhanced coastal wetlands and dune systems. JB Ruhl, “Climate Change Adaptation and the Structural Transformation of Environmental Law” (2010) 40 *Envtl L* 364 at 385 (QL).

²⁶ John Smithers & Barry Smit, “Human Adaptation to Climatic Variability and Change” in E Lisa F Schipper & Ian Burton, eds, *The Earthscan Reader on Adaptation to Climate Change* (London: Earthscan, 2009) 15 at 16.

²⁷ Anne T Kuriakose, Livia Bizikova & Carina A Bachofen, *Assessing Vulnerability and Adaptive Capacity to Climate Risks: Methods for Investigation at Local and National Levels*, Social Development Working Papers (No 116, May 2009) at 7.

²⁸ The primary determinants of adaptive capacity are economic wealth, technology, information and skills, infrastructure, institutions, and equity. Barry Smit & Olga Pilifosova, “Adaptation to Climate Change in the Context of Sustainable Development and Equity” in James J McCarthy et al, eds, *Climate Change 2001: Impacts, Adaptation, and Vulnerability* (Cambridge: Cambridge University Press, 2001) 877 at 895-97.

²⁹ *Ibid* at 899.

resources to further their economic interests which may not be sustainable in the long run.³⁰ Such barriers can undermine the success of an adaptation process and contribute to negative consequences. In other words, misguided efforts may result in maladaptation,³¹ such as planting moisture-sensitive crops in drought-prone areas, constructing dwellings in flood plains, and draining wetlands to construct infrastructure.³²

If adaptation is to be fruitful and cost-effective, it must be anchored in a principled approach³³ and integrated into larger developmental planning and implementation processes.³⁴ Mainstreaming adaptation in existing efforts aimed at, for instance, poverty alleviation, biodiversity conservation, and combating land degradation in CZM can potentially produce greater sustainable results and help increase the adaptive capacities of vulnerable populations.³⁵ It must be stressed here that adaptation is not solely about developing capacity and capability to cope with negative consequences. In certain parts of the world, particularly those in the higher latitudes, higher temperatures may result in enhanced plant growth, which will provide access to hidden resources.³⁶ In such cases, adaptation will turn into a discourse about how to sustainably utilize these resources. Thus, adaptation is crucial in containing the fallout of climate change and in seizing opportunities that arise from its positive outcomes.

³⁰ See generally Perspectives Group, “Swimming against the Tide: Coastal Communities and Corporate Plunder in Kutch” (2012) 47:29 *Economic & Political Weekly* 12.

³¹ Maladaptation is defined as “[a]ny changes in natural or *human systems* that inadvertently increase *vulnerability* to climatic *stimuli*; an *adaptation* that does not succeed in reducing vulnerability but increases it instead.” “Annexes” in Core Writing Team, Rajendra K Pachauri & Andy Reisinger, eds, *Climate Change 2007: Synthesis Report* (Geneva: Intergovernmental Panel on Climate Change, 2008) 355 at 378.

³² Smithers & Smit, *supra* note 26 at 17.

³³ Some prominent principles that can sustain an adaptation process are adopting integrated approaches; prioritizing the most vulnerable; using the best available scientific knowledge; building strong partnerships; applying risk management methods; applying eco-system based approaches; maximizing mutual benefits; and continuous performance evaluation. US, The White House Council on Environmental Quality, *Progress Report of the Interagency Climate Change Adaptation Task Force: Recommended Actions in Support of A National Climate Change Adaptation Strategy* (5 October 2010) at 10.

³⁴ Salemul Huq & Hannah Reid, “Mainstreaming Adaptation in Development” in E Lisa F Schipper & Ian Burton, eds, *The Earthscan Reader on Adaptation to Climate Change* (London: Earthscan, 2009) 313 at 319.

³⁵ *Ibid.*

³⁶ *Arctic Melting May Lead to Expanded Oil Drilling*, online: Worldwatch Institute <<http://www.worldwatch.org/node/5664>>.

5.3 SITUATING ADAPTATION IN THE SUSTAINABLE DEVELOPMENT SCHEME

For long, the pendulum has swung disproportionately in favor of mitigation as the primary response to moderate the problems posed by climate change. Due to the lackadaisical attitude on the part of states to implement their obligations in relation to mitigation, and given the magnitude of the problem, it has been reduced to a form of ‘bandaid’ fix. Despite this, mitigation has overshadowed the significance of adaptation.³⁷ As seen earlier, sustainable development or to place it in context given the backdrop of the present study, SCD is a balancing act where adaptation plays a highly critical, multi-faceted role. At the recently concluded Rio+20, the Heads of State, Government and high-level representatives in renewing commitment to sustainable development declared that:

We reaffirm that climate change is one of the greatest challenges of our time, and we express profound alarm that emissions of greenhouse gases continue to rise globally. We are deeply concerned that all countries, particularly developing countries, are vulnerable to the adverse impacts of climate change, and are already experiencing increased impacts including persistent drought and extreme weather events, sea level rise, coastal erosion and ocean acidification, further threatening food security and efforts to eradicate poverty and achieve sustainable development. In this regard we emphasize that adaptation to climate change represents an immediate and urgent global priority.³⁸

Climate change adaptation and sustainable development share several commonalities, such as poverty reduction, improving access to resources, and lowering inequities between inter- and intra-generations.³⁹ When, due to uncertainty, developmental projects do not provide for adaptation, there is the possibility that the development will result in

³⁷ See Schipper & Burton, “Understanding Adaptation”, *supra* note 7 at 1, 7. Mitigation is all about the sources of climate change, while adaptation deals with its consequences. E Lisa F Schipper, “Conceptual History of Adaptation in the UNFCCC Process” in E Lisa F Schipper & Ian Burton, eds, *The Earthscan Reader on Adaptation to Climate Change* (London: Earthscan, 2009) 359 at 361.

³⁸ UN RIO+20 United Nations Conference on Sustainable Development, *The Future We Want*, A/CONF.216/L.1*, 19 June 2012, ¶190, online: RIO+20 United Nations Conference on Sustainable Development <<http://daccess-ddsny.un.org/doc/UNDOC/GEN/N12/381/64/PDF/N1238164.pdf?OpenElement>>.

³⁹ Smit & Pilifosova, *supra* note 28.

negative growth and thus prove unviable in the long run. Moreover, the choice of implementing an adaptive programme at a later stage is a more expensive prospect and, in most cases, the chances of its success are remote, since the dangers associated with climate change will have been magnified.

Adaptation, then, is essentially an extension of good development practice.⁴⁰ In situations where there is a higher level of development that is compatible with climate change related variability, there is also enhancement of adaptive capacity.⁴¹ Conversely, where development patterns do not take into account the need for adaptation, populations are exposed to greater levels of risk, thereby undermining the ability of these groups to adapt.⁴² By mainstreaming adaptation and placing it front and center in all developmental processes, the possibility of attaining sustainable growth, diversification of economic activity, enhancement of resilience capabilities, and promotion of risk pooling are greatly enhanced.⁴³

The concept of sustainable development runs like a golden thread throughout the text of the UNFCCC. Specifically, it has express accommodation in article 3.4, which declares promotion of sustainable development as a party's right and duty.⁴⁴ Furthermore, the UNFCCC states that policies and measures designed to protect the climate system should be appropriate for the specific conditions of each party and integrated with national development programmes, "taking into account that economic development is essential for adopting measures to address climate change."⁴⁵ The UNFCCC also calls upon parties to cooperate to promote a supportive and open international economic system that leads to sustainable economic growth and development, particularly in developing countries, so as to enable them to better address the problems of climate change.⁴⁶

⁴⁰ Nicholas Stern & The Cabinet Office – HM Treasury, *The Economics of Climate Change: The Stern Review* (New York: Cambridge University Press, 2007) at 430.

⁴¹ "Summary for Policymakers: A Report of Working Group II of the Intergovernmental Panel on Climate Change" in James J McCarthy et al, eds, *Climate Change 2001: Impacts, Adaptation, and Vulnerability* (Cambridge: Cambridge University Press, 2001) 1 at 12.

⁴² Burton, Diring & Smith, *supra* note 1 at 5.

⁴³ Stern & HM Treasury, *supra* note 40 at 430.

⁴⁴ See generally *United Nations Conference on Environment and Development: Framework Convention on Climate Change*, 19 June 1993, 31 ILM 849 (adopted at New York 9 May 1992) [UNFCCC]; see also *ibid*, art 4.1(d).

⁴⁵ *Ibid*, art 3.4.

⁴⁶ *Ibid*, art 3.5.

Subsequently, the Kyoto Protocol further hammered out sustainable development norms in relation to the climate change regime.⁴⁷ The Delhi Ministerial Declaration on Climate Change and Sustainable Development,⁴⁸ speaks about the importance of integrating adaptation concerns into sustainable development strategies while re-emphasizing that parties have a right to and should promote sustainable development.⁴⁹ In addition, this Declaration also specifies measures to secure sustainable development, like increasing the global share of renewable energy sources, diversifying energy supply, and technology transfer.⁵⁰ In the following paragraphs, the principles of precaution and inter- and intra-generational equity – all of which are central in achieving sustainable development – will be utilized to justify climate change adaptation.

5.3.1 Precaution, Inter- and Intra-generational Equity, and Adaptation

As the overwhelming magnitude of climate change impacts is primarily theoretic (being yet future events), their precise nature is uncertain.⁵¹ This factor has emerged as the primary impediment to concerted action by national governments in mainstreaming and investing resources to implement climate change adaptation initiatives. While it may be difficult to lay down a hard and fast rule regarding when threshold levels are crossed in relation to each ecosystem, a certain amount of reliance can be placed on the principle of precaution to justify adaptation actions. More often than not, science does not provide appropriate knowledge necessary to trigger actions that can effectively protect the environment.⁵² Consequently, for a long time, measures to protect the environment were

⁴⁷ *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 16 March 1998, 37 ILM 32 (adopted at Kyoto 11 December 1997 and entered into force 16 February 2005) [*Kyoto Protocol to the UNFCCC*] art 12 (“[t]he purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development”); see also *ibid.*, art 2.

⁴⁸ *Decision_CP.8: The Delhi Ministerial Declaration on Climate Change and Sustainable Development*, Advanced Unedited Version, ¶(e), online: UNFCCC <http://unfccc.int/cop8/latest/1_cpl6rev1.pdf>.

⁴⁹ *Ibid.*

⁵⁰ *Ibid.*

⁵¹ For instance, see Core Writing Team, Rajendra K Pachauri & Andy Reisinger, eds, *Climate Change 2007: Synthesis Report* (Geneva: Intergovernmental Panel on Climate Change, 2008) at 45.

⁵² Caroline E Foster, *Science and the Precautionary Principle in International Courts and Tribunals: Expert Evidence, Burden of Proof and Finality*, Cambridge Studies in International and Comparative Law No 79 (Cambridge: Cambridge University Press, 2011) at 10-12.

taken only after a critical mass of scientific knowledge had been accumulated, which often led to delays in proactively solving problems and to undesirable consequences.

Moreover, the assimilative capacity approach, as evinced by Principle 6 of the Stockholm Declaration, assumed that science could provide policy-makers with the necessary means and information to avoid encroachments upon the capacity of the environment to assimilate impacts. It was presumed that relevant technical expertise would be available when environmental harm was predicted and there would be sufficient time to avert harm.⁵³ By the same token, prudent financial management also called for wise allocation of limited resources and elimination of wastage to the maximum extent possible.⁵⁴ Accordingly, the fog of scientific uncertainty was often used as an excuse to postpone appropriate action to prevent the harm.⁵⁵

The inadequacies of science have forced a change in emphasis, whereby current practices have increasingly accepted the principle of precaution.⁵⁶ The principle of precaution is based on the theory that it is better to err on the side of caution and prevent environmental harm, than it is to retroactively attempt to deal with irreversible harm. While some would accord this principle the status of a norm of international customary law, its application to any potential situation is influenced largely by the circumstances of each case.⁵⁷ The principle involves anticipating and taking measures to avoid

⁵³ Charmian Barton, "The Status of the Precautionary Principle in Australia: Its Emergence in Legislation and as a Common Law Doctrine" (1998) 22 Harv Envtl L Rev 509 at 512 (HeinOnline).

⁵⁴ *Ibid.*

⁵⁵ See *AP Pollution Control Board v MV Nayudu*, (1999) [1999] AIR 812 (India SC); *AP Pollution Control Board v MV Nayudu II*, (2000) [2001] 2 SCC 62 (India SC).

⁵⁶ Barton, *supra* note 53 at 547.

If it is not possible to make a decision with 'some' confidence, then it makes sense to err on the side of caution and prevent activities that may cause serious or irreversible harm. An informed decision can be made at a later stage when additional data is available or resources permit further research. To ensure that greater caution is taken in environmental management, implementation of the principle through judicial and legislative means is necessary.

⁵⁷ Some argue that the precautionary principle has crystallized into a norm of customary international law. Owen McIntyre & Thomas Mosedale, "The Precautionary Principle as a Norm of Customary International Law" (1997) 9:2 J Envtl Law 221. There was considerable divergence as to whether precaution was to be viewed in terms of being a principle (hard commitment) or was it an approach (flexible). For a discussion on the principles/approach dichotomy, see Simon Marr, *The Precautionary Principle in the Law of the Sea: Modern Decision Making in International Law (Publications on Ocean Development)* 1st ed (Martinus Nijhoff, 2003) 18; see also Jacqueline Peel, "Precaution - A Matter of Principle, Approach or Process?" (2004) 5(2) Melbourne J Int'l L 483

environmental harm or choosing the least environmentally harmful activity.⁵⁸ In practice, the precautionary approach entails that in cases where there are threats of serious or irreversible damage, lack of full scientific knowledge and certainty should not be used to postpone appropriate measures to prevent environmental harm.⁵⁹ In other words, from a legal perspective, the principle implies that, “once a prima facie case is made that a risk exists, then scientific uncertainty works against the potential polluter rather than, as in the past, in his/her favour.”⁶⁰ In effect, the precautionary principle provides a legal basis that lowers the threshold under which states are compelled to act to protect or prevent environmental damage even in the face of uncertainty.⁶¹

While the inadequacies of science led to the precautionary principle, it in turn led to the development of a special standard of onus in environmental cases where the burden as to the absence of the injurious effect of the proposed action falls on those who want to change the status quo.⁶² In a practical sense, this amounts to a reversal of the burden of proof, since in environmental cases evidentiary burden generally falls upon those opposing the change.⁶³ Accordingly, when there is an identifiable risk of serious or irreversible harm (for example, the extinction of a species or widespread toxic pollution), the burden of proof is placed on the person or entity proposing the activity, which is potentially harmful to the environment.⁶⁴

(HeinOnline). This principle has widespread application in domestic jurisdictions. See also *Shehla Zia v WAPDA*, (1994) PLD 693 (Pak SC). Even when scientific evidence regarding the biological effects from exposure to power-frequency fields was inconclusive, the court emphasized the need to apply the precautionary principle. *Ibid*.

⁵⁸ David Freestone, “The Precautionary Principle” in Robin Churchill & David Freestone, eds, *International Law and Global Climate Change*, International Environmental Law & Policy Series (London: Graham & Trotman/Martinus Nijhoff, 1991) 21 at 31-32.

⁵⁹ *United Nations Conference on Environment and Development: Rio Declaration on Environment and Development*, 14 June 1992, 31:4 ILM 874 [*Rio Declaration*] prin 15.

⁶⁰ David Freestone & Ellen Hey, “Origins and Development of the Precautionary Principle” in David Freestone & Ellen Hey, eds, *The Precautionary Principle and International Law: The Challenge of Implementation*, vol 31, International Environmental Law and Policy Series (The Hague: Kluwer Law International, 1996) 3 at 13.

⁶¹ Roda Verheyen, *Climate Change Damage and International Law: Prevention Duties and State Responsibility* (Leiden: Martinus Nijhoff, 2005) at 79 [Verheyen, *Climate Change Damage*].

⁶² See also Foster, *supra* note 52 at 240.

⁶³ Barton, *supra* note 53 at 519; *Case Concerning Pulp Mills on the River Uruguay (Argentina v Uruguay)*, [2010] ICJ Rep 14 ¶¶160-64.

⁶⁴ See Barton, *ibid* at 549.

Principle 15 of the Rio Declaration calls upon states to widely apply the precautionary approach “according to their capabilities.”⁶⁵ The precautionary approach is also one of the central tenets in the UNFCCC. Article 3.3 states:

The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost.⁶⁶

A close reading of this provision reveals that the precautionary principle applies not only to mitigative actions but that it has equal force in adaptation measures.⁶⁷ From an adaptation standpoint, application of the principle of precaution implies the following. First, states are compelled to act even in the absence of conclusive evidence regarding possible future harms brought about by climate change. Scientific certainty is not needed in such cases, as the threshold levels are lowered considerably to justify adaptation actions. Second, the new burden of proof implies that in cases where there is prima facie evidence that a particular development activity may be affected by climate change impacts or that the development activity may magnify climate change impacts. Developers, and those who are interested in changing the status quo, will have to prove that the proposed activity is compatible with the environment and that adaptation to climate change impacts has been taken into account. To elucidate this point, if a developer intends to establish a seaport, then the possible impacts of SLR and extreme

⁶⁵ See also UNGA, *Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks*, 4 August 1995, A/CONF 164/37, 8 September 1995, 34 ILM 1542 (entered into force 11 December 2001). It calls upon States to widely apply the precautionary approach to conservation, management and exploitation of straddling fish stocks and highly migratory fish stock. *Ibid*, art 6; see also Simon Marr, *The Precautionary Principle in the Law of the Sea: Modern Decision Making in International Law (Publications on Ocean Development)* 1st ed (Martinus Nijhoff, 2003) at 17-21. “[B]y stating that the precautionary approach shall be applied by States “according to their capabilities”, the first sentence of Principle 15 introduces the possibility of differences in application of the precautionary approach in light of the different capabilities of each State.” *On Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area*, Case No 17, Advisory Opinion (1 February 2011) (International Tribunal for the Law of the Sea, Seabed Disputes Chamber) ¶129.

⁶⁶ UNFCCC, *supra* note 44.

⁶⁷ Verheyen, *Climate Change Damage*, *supra* note 61 at 74.

weather events must be considered factors in the port design and measures incorporated. By the same token, the port and its related infrastructure should not cause significant or harmful alterations to ecosystems and habitats, such as the clearing of mangroves or destruction of wetlands, as these activities may precipitate and magnify climate change impacts, like storm surges and coastal erosion.

Given the uncertainties and the fast pace of changes associated with climate change, the precautionary principle is increasingly utilized in developmental decision-making mostly at the national levels (including in judicial, quasi-judicial and tribunal proceedings), particularly in the context of SLR and its consequences on coastal environments. This principle has been applied to, for instance, refuse licenses to extract groundwater from coastal aquifers,⁶⁸ to emphasize the need for a coastal hazard vulnerability assessment for a permit application for dwellings,⁶⁹ to raise the floor level of buildings,⁷⁰ and to decide the appropriateness regarding the sub-division of a lot to provide for a second one.⁷¹ The precautionary principle has also been applied as grounds

⁶⁸ See *Alanvale Pty Ltd & Anor v Southern Rural Water*, (2010), VCAT 480 (Austl, VCAT) (applying the precautionary principle to turn down applications for groundwater extraction licenses). But see *Paul v Goulburn Murray Water Corporation*, (2010), VCAT 1755 (Austl, VCAT), online: AustLII <<http://www.austlii.edu.au/au/cases/vic/VCAT/2010/1755.html>>. The grant of licenses for extraction from an aquifer located in the Ovens Valley was challenged. The Tribunal held that the aquifer was subject to much assessment and monitoring and there was reasonable understanding of the groundwater and surface water systems within it. Accordingly, the Tribunal distinguished these proceedings from *Allanvale*, which turned on the fact that the hydrogeology of the subject areas was poorly understood. In the instant case since the extractions were so small as to be imperceptible, there was no need to disturb the licenses. *Ibid*.

⁶⁹ *Owen v Casey CC* (includes Summary) (Red Dot), (2009), VCAT 1946 (Austl, VCAT) online: AustLII <<http://www.austlii.edu.au/au/cases/vic/VCAT/2009/1946.html>>. The tribunal directed a coastal hazard vulnerability assessment for the subject land. The assessment was to consider factors like SLR, storm tide and surge, and coastal processes and was to be done by a qualified coastal engineer or coastal processes specialist. *Ibid*; see also *Cooke v Greater Geelong CC*, (2010), VCAT 60 (Austl, VCAT) (emphasizing the need for a coastal hazard vulnerability assessment).

⁷⁰ In line with the precautionary principle and to protect the interests of present and future generations, and taking into account the data, knowledge and policies, available at that point in time, the suggestion to raise the floor level of the dwelling in accordance with the advice of Melbourne Water was confirmed. It was characterized as “a prudent response to the anticipated rise in sea levels.” *Cadzow Enterprises Pty Ltd v Port Phillip CC*, (2010), VCAT 634 (Austl, VCAT) online: AustLII <<http://www.austlii.edu.au/au/cases/vic/VCAT/2010/634.html>>; *Suburban Blue Print Pty Ltd v Hobsons Bay CC*, (2010), VCAT 1272 (Austl, VCAT) online: AustLII <<http://www.austlii.edu.au/au/cases/vic/VCA/T/2010/1272.html>> (applying the principle of precaution, it was concluded that since the dwellings had acceptable floor levels, the council's decision refusing construction permit was set aside).

⁷¹ *Myers v South Gippsland SC* (includes Summary) (Red Dot), (2009), VCAT 1022 (Austl, VCAT) online: AustLII <<http://www.austlii.edu.au/au/cases/vic/VCAT/2009/1022.html>>; *Myers v South Gippsland SC (No 2)* (includes Summary) (Red Dot), (2009), VCAT 2414 (Austl, VCAT) online: AustLII <<http://www.austlii.edu.au/au/cases/vic/VCAT/2009/2414.html>> [*Myers v South Gippsland*

for refusal to use and develop a dwelling and remove vegetation from a land located on an isolated peninsula,⁷² and to restrain development on land abutting coastal wetlands.⁷³ In light of these applications, it is now not a stretch to say that it is vital that decision-makers factor in rising sea levels when planning for coastal development.⁷⁴

The most obvious and pre-eminent factors that contribute to environmental degradation are population growth and unsustainable resource consumption patterns. To meet the expanding resource demands, new technologies for drastic exploitation of natural resources were developed.⁷⁵ The essence of this trend towards rapacious exploitation of natural resources is captured by the opulent model, which implies that the present generation can consume all natural resources without any caps on its exploitation and use them to generate as much wealth as is necessary, since there is no certainty regarding the future.⁷⁶ This stands in contrast to the preservationist view, which, if stretched to its logical extreme, implies continuance of the status quo. Nevertheless, judicious exploitation and utilization of natural resources should contemplate the interests of future generations. In other words, preservation of the environment and its natural

SC (No 2)]. This case involved an application to subdivide an existing lot into two. In line with the precautionary principle, a coastal hazard vulnerability assessment was carried out which revealed that the subject site would be inundated by seawater. Accordingly, the permit was refused. The tribunal was of the opinion that granting it would be tantamount to consenting to poor planning outcomes and would unnecessarily burden future generations. *Ibid*.

⁷² *West Gippsland Catchment Management Authority v East Gippsland SC*, (2010), VCAT 1334 (Austl, VCAT) online: <<http://www.austlii.edu.au/au/cases/vic/VCAT/2010/1334.html>>. The relevant rules provided that access was to be provided to the dwelling by an all-weather road. The council granted permit treating waterways as roadways. This was set aside on the ground that under the *Planning and Environment Act, 1987*, road refers to passageways over land and a waterway could not be considered to be an all-weather road. Here the tribunal was influenced by the problem of SLR. *Ibid*.

⁷³ *Wade v Warrnambool CC*, (2009), VCAT 2177 (Austl, VCAT) online: AustLII <<http://www.austlii.edu.au/au/cases/vic/VCAT/2009/2177.html>>. In refusing to grant permit it was held that, "climate change impacts will occur over time but decisions about development have long term implications because of the permanency of structures." *Ibid*. In the instant case, there was no indication that such an approach informed the design and there were also uncertainties regarding the impacts of SLR on the two lower-lying lots.

⁷⁴ "[T]he precautionary approach is an accepted principle in coastal decision making." Melbourne Water, *Planning for Sea Level Rise: Assessing Development in Areas Prone to Tidal Inundation from Sea Level Rise in the Port Phillip and Westernport Region* (Melbourne: Melbourne Water Corporation, 2010).

⁷⁵ For instance, concomitant with population explosion, reliance on groundwater, mined through the intensive use of bore well technology is pervasive in several parts of the world.

⁷⁶ Edith Brown Weiss, *In Fairness to Future Generations: International Law, Common Patrimony, and Intergenerational Equity* (New York: Transnational Publishers, Inc, 1989) at 23 [Weiss: *Fairness to Future Generations*].

resources – “our common patrimony” – should necessarily focus on the future.⁷⁷ The idea that the choices that we make today will have a profound impact on what our future generations will experience is encapsulated in the principle of inter-generational equity, which represents the inter-temporal dimension of sustainable development.⁷⁸

The Stockholm Declaration provided the first formulation of the inter-generational equity principle in 1972 when it stated that “[m]an ... bears a solemn responsibility to protect and improve the environment for present and future generations.”⁷⁹ Again, the Rio Declaration, in principle 3, provides for the right to develop “so as to equitably meet developmental and environmental needs of present and future generations.”⁸⁰ The principle of intergenerational equity is rooted in a compact between the present and future generations, wherein the present generation is bound by a “fiduciary duty” based on “planetary trust” to pass on the environment and natural resources which they inherited from previous generations in a manner that is no worse off than what they received.⁸¹ In bequeathing the environment and the resources to future generations, there should be no compromise on its nature and quality that would restrict the ability of future generations to utilize the environment and natural resources to their benefit.⁸²

In her 1983 treatise, Edith Weiss Brown proposes three basic principles of inter-generational equity. The first is the “conservation of options”, which means that each generation should conserve the diversity of the natural and cultural resource base so as not to unduly restrict the options available to future generations.⁸³ The second is “conservation of quality”, which implies that each generation is required to maintain the quality of the planet so that it is passed on to the future generations in no worse condition

⁷⁷ *Ibid.*

⁷⁸ The Brundtland Commission defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Alexandre Kiss, “The Rights and Interests of Future Generations and the Precautionary Principle” in David Freestone & Ellen Hey, eds, *The Precautionary Principle and International Law: The Challenge of Implementation*, 31, International Environmental Law and Policy Series (The Hague: Kluwer Law International, 1996) 19 at 23.

⁷⁹ *Declaration of the United Nations Conference on the Human Environment*, 16 June 1972, 11:6 ILM 1416 [*Stockholm Declaration*].

⁸⁰ *Rio Declaration*, *supra* note 59.

⁸¹ Edith Brown Weiss, “The Planetary Trust: Conservation and Intergenerational Equity” (1983) 11 *Ecology LQ* 495 at 499 (HeinOnline).

⁸² *Ibid* at 505.

⁸³ Weiss: *Fairness to Future Generations*, *supra* note 76 at 40-42.

that what the present generation received it.⁸⁴ Third, “conservation of access” states that each generation has to provide to its members equitable rights of access to the legacy from past generations and should conserve it for future generations as well.⁸⁵ Inter-generation equity requires the formulation and implementation of specific duties and obligations in respect to future generations, like conserving resources, compensating for environmental harm, emergency assistance, and equitable usage.⁸⁶

Regardless of the wide recognition in numerous international and national environmental law instruments (particularly, judicial decisions from different common law jurisdictions), inter-generational equity has yet to muster concrete support as a principle of customary international law. Overwhelming empirical evidence regarding the state of the environment at the global level, also presents a picture of continuing degradation thereby faulting the core assumptions articulated by Edith Weiss Brown regarding equity between generations.⁸⁷ As well, there is also an inherent reluctance to afford legal standing to unborn generations whose interests are unknown.⁸⁸ Nevertheless,

⁸⁴ *Ibid* at 42-43.

⁸⁵ *Ibid* at 43-45.

⁸⁶ Rajendra Ramlogan, *Sustainable Development: Towards a Judicial Interpretation*, David Freestone, ed, 9 *Legal Aspects of Sustainable Development* (The Netherlands: Martinus Nijhoff, 2011) at 231.

⁸⁷ For an overview of the state of coastal degradation in the marine and coastal environments, see Ch 1.

⁸⁸ *Minors Oposa v Secretary of the Department of Environment and Natural Resources*, (1993) [1994] 33 ILM 203 at 204 (Philippines SC). The plaintiffs were minors, represented and joined by their parents and the Philippine Environmental Inc. to protect virgin tropical rainforests. The petitioners asserted that they represented unborn generations. Chief Justice Davide in recognizing this claim held that “. . . every generation has a responsibility to the next to preserve that rhythm and harmony for the full enjoyment of a balanced and healthful ecology.” *Ibid*; see also *Metropolitan Manila v Concerned Residents of Manila Bay, represented and joined by Divina v Ilas*, (2008), GR Nos 171947-48 (Phil SC), online: Supreme Court of the Philippines <<http://sc.judiciary.gov.ph/jurisprudence/2008/december2008/171947-48.htm>>. The Philippines SC issued a continuing mandamus to ensure the cleanup and restoration of the Manila Bay and to preserve the water quality after restoration. It was held

[e]ven assuming the absence of a categorical legal provision specifically prodding petitioners to clean up the bay, they and the men and women representing them cannot escape their obligation to future generations of Filipinos to keep the waters of the Manila Bay clean and clear as humanly as possible. Anything less would be a betrayal of the trust reposed in them.
Ibid.

But see *Farooque v Bangladesh*, [1996] WP 998 of 1994, CA 24 of 1995 (Bangladesh SC), online: Environmental Law Alliance Worldwide <<http://www.elaw.org/node/1300>>. The SC held that in *Minors Oposa*, locus standi was allowed since the right to a balanced and healthful ecology was a fundamental right and moreover, there were several laws that emphasized conservation of the country’s forest “not only for the present generation but for the future generation as well.” However,

it can be relied upon to justify adaptation actions, for “[c]ommonsense tells us that” we “should not approve coastal developments that are likely to be unduly threatened by future flooding and/or coastal inundation, creating a mess to be dealt with by future generations.”⁸⁹

For equity between generations to work and for development to be truly sustainable, it is imperative that there be intra-generational equity, i.e., equity within the current generation. This is perhaps one of the most difficult objectives to realize, given the socio-economic disparities and asymmetries in power that exist between social groups, communities and even nations.⁹⁰ Several developing countries face an economy that is growing at an expedited pace.⁹¹ However, a miniscule portion of the population gleans the benefits of this economic growth, while the rest continue to live in poverty or near-poverty conditions.⁹²

An examination of income levels and consumption patterns worldwide also reveals wide disparities⁹³ exemplified by skewed distribution of material resources, which does

the Bangladesh Constitution does not contain any analogous provision and therefore did not apply it. *Ibid.*

⁸⁹ *Seifert v Coloc-Otway SC*, (2009), VCAT 1453, ¶49 (Austl, VCAT) online: AustLII <<http://www.austlii.edu.au/au/cases/vic/VCAT/2009/1453.html>>; see also *Taip v East Gippsland SC* (includes Summary) (Red Dot), (2010), VCAT 1222 (Austl, VCAT) online: AustLII <<http://www.austlii.edu.au/au/cases/vic/VCAT/2010/1222.html>> [*Taip v East*]. The tribunal refused to grant permit for the residential development in an area highly vulnerable to SLR and other climate change impacts on the ground that to do so will fail “to satisfy the purposes of planning . . . for intergenerational equity, sustainable, fair and socially responsible development and . . . orderly planning outcome.” *Ibid*; see also *Myers v South Gippsland SC (No 2)*, *supra* note 71 (refusing to grant permit to subdivide the lot as it would unnecessarily burden future generations).

⁹⁰ GF Maggio, “Inter/intra-generational Equity: Current Applications under International Law for Promoting the Sustainable Development of Natural Resources” (1997) 4 Buff Envtl L J 161 at 163-4 (QL). There are several international environmental law instruments that deal with intra-generational equity. The intra-generational dimension of equity has received scant attention at judicial hands at the international level. But see *Dispute Regarding Navigational and Related Rights (Costa Rica v. Nicaragua)*, [2009] ICJ Rep 213 at 266, ¶144 (calling upon Nicaragua to respect fishing by the inhabitants of the Costa Rican bank of the San Juan River for subsistence purposes as a customary right).

⁹¹ For instance, there is rapid economic growth in South Asia, which averages around six per cent a year. While this has reduced poverty, nearly 571 million people survive on less than USD1.25 a day. The World Bank, *South Asia Regional Brief* (25 September 2012), online: The World Bank, News, Feature Stories <<http://www.worldbank.org/>>.

⁹² The emphasis of the government has shifted to ensuring inclusive economic growth Deloitte: AIMA, *Inclusive Growth: A Challenging Opportunity* (September 2011) at 4.

⁹³ Since 1970, 155 countries home to 95 per cent of the world’s people have experienced tremendous increases in real per capita income. The annual average income today is USD10,760, almost 1.5 times its level 20 years ago and twice its level 40 years ago. While the richest country today (Liechtenstein) is three times richer than the richest country in 1970, the poorest country today (Zimbabwe) is about 25 per cent poorer than the poorest country in 1970 (also Zimbabwe). Jeni

not augur well for sustainable development. As poverty leads to instability, disease, despoilment of natural resources and environmental pollution, its alleviation is essential for sustainable development.⁹⁴ The emphasis in the economic growth process is thus to foster inclusive and broad-based economic growth targeting marginalized and poverty-ridden sections.⁹⁵ In other words, the strategy is to amalgamate equity with growth.

Intra-generational equity is premised on the belief that each member of the present generation has a right to access the earth's natural resources in an equal measure like that of his/her peers.⁹⁶ The *United Nations Convention on the Law of the Sea, 1982* (LOSC),⁹⁷ the Rio Declaration in several of its principles,⁹⁸ the *Convention on Biological Diversity, 1993*,⁹⁹ and the *United Nations: Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, 1994* (UNCCD)¹⁰⁰ reaffirms the importance of intra-generational equity. This theme is also echoed in goal no. 7 of the Millennium Development Goals, which seeks to ensure “environmental sustainability”, which all the United Nations member states and the major international organizations have agreed to achieve by 2015.¹⁰¹

This principle of environmental justice has widespread recognition in national jurisdictions,¹⁰² and both inter- and intra-equity are recurring and prominent themes in the

Klugman, *Human Development Report 2010: 20th Anniversary Edition Human Development Report 2010, The Real Wealth of Nations: Pathways to Human Development* (New York: UNDP, 2010) at 40, 42.

⁹⁴ One in five people on this planet, or over 1 billion people, live in extreme poverty, and that one in seven or 14 per cent, is undernourished. UN RIO+20 UNCSD, *The Future We Want*, *supra* note 38, ¶21.

⁹⁵ *Ibid*, ¶58(d).

⁹⁶ Ramlogan, *supra* note 86 at 234.

⁹⁷ See *United Nations Convention on the Law of the Sea*, 10 December 1982, 1833 UNTS 397, 21 ILM 1261 (entered into force 16 November 1994) [LOSC], part XII, art 136 (deep sea bed mining).

⁹⁸ See *Rio Declaration*, *supra* note 59, prins 3, 5, 7, 8, 12 & 14.

⁹⁹ *United Nations Conference on Environment and Development: Convention on Biological Diversity, 1993*, 5 June 1992, 31 ILM 818 (entered into force 29 December 1993) [CBD] ¶¶19 & 20, art 8; *Convention on Biological Diversity*, online: CBD Home <<http://www.cbd.int/>>.

¹⁰⁰ *United Nations: Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa*, 21 September 1994, 33 ILM 1328 (adopted 17 June 1994) [UNCCD].

¹⁰¹ See generally *Summit on the Millennium Development Goals 20-22 September 2010*, online: United Nations Millennium Development Goals <<http://www.un.org/millenniumgoals/>>.

¹⁰² *Ratlam Municipality v Vardichand*, (1980), [1980] AIR 1622 (India SC) (utilizing public nuisance provisions to clean up a municipality to protect public health). In issuing an injunction to prevent the mining of uranium and thorium in the Kwale District without proper environmental impact assessment, Kenya High Court emphasized the importance of intra-generational equity. *Rodgers Muema Nzioka v Tiomin Kenya Ltd*, (21 September 2001), Civil Case No 97 of 2001 (Kenya HC)

international regime on climate change. Particularly significant is article 3(1) of the UNFCCC, which states that “[p]arties should protect the climate system for the benefit of present and future generations of humankind” The intra-generational dimension of equity is premised on the assumptions that all human beings have an equal right to the common atmospheric resource and that the sharing of the carbon commons should be based on equity. Since the largest share of historical and current global emissions of green house gases has its origins in developed countries, and in line with the principle of historic responsibility, developed country parties are called upon to take the lead in combating climate change and its adverse effects.¹⁰³

As a necessary corollary, the implication is that developing countries are not to be unduly restricted in their access to an equitable share of the global atmospheric resource and carbon space. This theme is echoed again in article 3 of the UNFCCC, which states that “the developed country Parties should take the lead in combating climate change and the adverse effects thereof.”¹⁰⁴ As well,

[t]he specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, and of those Parties, especially developing country Parties, that would have to bear a disproportionate or abnormal burden under the Convention, should be given full consideration.¹⁰⁵

Clearly, the right to development that developing countries also enjoy, in line with the common but differentiated responsibilities, finds recognition under the UNFCCC. From an adaptation point of view, intra-generational equity is again fortified in article 4.4, which states that developed country parties and annex II parties are to assist developing countries, particularly those vulnerable to the adverse consequences of climate change, in meeting the costs of adaptation to these adverse effects. Additionally, developed country parties and annex II parties are also to take practicable steps to finance the transfer of

online: Environmental Law Alliance Worldwide <http://www.elaw.org/system/files/kenya.tio_min.case.pdf>.

¹⁰³ UNFCCC, *supra* note 44, art 3(1).

¹⁰⁴ *Ibid*, art 3.1.

¹⁰⁵ *Ibid*, art 3.2.

environmentally sound technologies, particularly to developing countries, to enable them to implement the UNFCCC.¹⁰⁶

In conclusion, it can be derived from the above that the umbrella concept of sustainable development and its attendant principles of precaution, inter- and intra-generational equity provide sufficient juridical basis for triggering adaptation actions.¹⁰⁷

5.4 INTERNATIONAL ATTEMPTS AT IMPLEMENTING ADAPTATION

The starting point of any dialogue on the international legal regime on adaptation necessarily begins with the UNFCCC and the Kyoto Protocol, the central pillars of the climate change regime. Accordingly, the discussion below analyses the implications of the relevant provisions of the UNFCCC and the Kyoto Protocol for climate change adaptation. Thereafter, it provides a succinct description of the various funding mechanisms established to fund adaptation projects. The importance of other international environmental law instruments that can trigger climate change adaptation obligations relevant to the coastal zone will also be examined.

At this point, it must be noted that global warming has potentially significant implications for the entire panoply of human rights. Therefore, international human rights law and its prescriptions can play an important role in triggering and supporting adaptation actions in relation to climate change impacts. On this basis, the logical adjunct that emerges in articulating a human rights-based approach to adaptation is that decision-makers must increasingly be guided by core human rights standards in developing and implementing adaptation programmes.¹⁰⁸

¹⁰⁶ *Ibid*, art 4.5.

¹⁰⁷ Alexandre Kiss, “The Rights and Interests of Future Generations and the Precautionary Principle” in David Freestone & Ellen Hey, eds, *The Precautionary Principle and International Law: The Challenge of Implementation*, 31, International Environmental Law and Policy Series (The Hague: Kluwer Law International, 1996) 19 at 27. It should be noted that there is a close inter-relationship between the principles of precaution and that of inter-generational equity. This is so because the primary objective of precaution is to ensure that the environment is preserved not only for the present but also for the future generations as well.

¹⁰⁸ See UNHRC, *Human Rights and Climate Change*, Res 7/23, 41st Mtg (28 March 2008). It goes without saying that climate change has significant implications for the right to life. For e.g., rising sea levels, king tides, storm surges, hurricanes and tsunamis can wipe out entire coastal communities. Therefore, the first and foremost among the different human rights, namely, the right to life which is guaranteed by a series of international human rights instruments can impose positive obligations on the state to implement adaptation measures to protect the right to life from a rising

5.4.1 Adaptation under the UNFCCC and the Kyoto Protocol

Out of a total of 26 articles, even though only one in UNFCCC text specifically refers to adaptation, the centrality of adaptation measures in combating climate change finds emphasis in a number of key articles in the UNFCCC text.¹⁰⁹ Article 2, which outlines the objectives of the international climate change regime, points out the need to stabilize “greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” Should the international community achieve the requisite stabilization, adaptation then becomes superfluous. Unfortunately, we have crossed the threshold levels and past greenhouse gas (GHG) emissions commit us to decades of climate change-related impacts. It is unlikely that stabilization of GHG concentrations at sustainable levels will be “achieved within a time-frame sufficient to

sea. In this regard, article 3 of the Universal Declaration of Human Rights, 1948 (UDHR), article 6(1) of the International Covenant on Civil and Political Rights, 1966 (ICCPR), and article 6 of the *Convention on the Rights of the Child, 1989* (CRC) are relevant. Increased salinity will destroy coastal agriculture and rising ocean temperatures and coral bleaching will lead to the migration of commercially significant species thereby violating the rights to livelihood and to food. The right to adequate food is a human right that is enshrined in article 11 of the ICESCR article 24(c) of the CRC; article 25(f) and article 28 ¶1 of the *Convention on the Rights of Persons with Disabilities, 2006* article 14, ¶2(h) of the *Convention on the Elimination of All Forms of Discrimination against Women, 1979*, and article 5(e) *International Convention on the Elimination of All Forms of Racial Discrimination, 1965*. Rising sea levels will contaminate surface and ground water sources leading to severe shortage of potable water supplies and violation of the human right to water. Even though there is no express formulation of this right in the text in international bill of rights, in 2002, the treaty monitoring body of the International Covenant on Economic, Social and Cultural Rights, 1966 (ICESCR), namely, the Committee on Economic, Social and Cultural rights, in its General Comment No 15, traced a human right to water to articles 11 and 12 of the ICESCR. Subsequently, the General Assembly in 2010, formally recognized the right to water and sanitation via resolution 64/292, which acknowledges that clean drinking water and sanitation are integral to the realization of all human rights.

Again, climatic changes can seriously impair the right to health. Stagnant water due to flooding can prove to be a breeding ground for mosquitoes leading to malaria and dengue outbreak. Shortage of potable water can lead to dehydration and consumption of contaminated water, which can lead to epidemics like cholera. Article 25 of the UDHR, article 12 of the ICESCR, article 24(1) of the CRC, all guarantees the right to health. Coastal communities share a symbiotic relationship with the sea, the land, and the air and with the living creatures that inhabit the coastal waters. In tropical countries, and in small-island developing states, there is a wealth of traditional knowledge developed over the years regarding resource management and conservation practices. Any measure to relocate coastal communities to place them away from harm's way, requires that the culture and traditions of coastal communities be taken into account. Article 27 of the ICCPR and article 15 of the ICESCR and *Declaration on the Rights of Indigenous Peoples, 2007* emphasize this aspect.

¹⁰⁹ David Freestone, ‘The International Legal Framework for Adaptation’ in Michael B Gerrard and Katrina Fischer Kuh (eds), *The Law of Adaptation to Climate Change: U.S. and International Aspects* (American Bar Association, 2012) 603 at 604 [Freestone, “International Legal Framework”].

allow ecosystems to adapt naturally to climate change....”¹¹⁰ A logical adjunct that can be inferred is the interpretation that the UNFCCC has an important unstated objective of promoting adaptation in countries that are particularly vulnerable to the adverse consequences of climate change.¹¹¹

On the one hand, article 3.1 requires developed country parties to take the lead in combating climate change and its adverse consequences by giving effect to inter- and intra-generational equity and the principle of common but differentiated responsibilities. On the other hand, article 3.2 requires that the specific needs and circumstances of developing country parties, especially those that are most vulnerable to the adverse consequences of climate change and that bear a disproportionate or abnormal burden under the convention, be given full consideration. A combined reading of both articles supports climate change adaptation. This is further reinforced by articles 4.3 and 4.4, which seek to give effect to these principles by mandating that annex II countries shall assist the developing country parties to cope with climate impacts, particularly to “the adverse effects of climate change in meeting costs of adaptation to those adverse effects.” Article 3.3 also has an adaptation dimension, as it calls upon parties to “take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects.”

Article 4.1(b) is described as the “pivotal commitment in the Convention,”¹¹² as it requires parties to “[f]ormulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to...facilitate adequate adaptation to climate change.” Since all countries, irrespective of the degree of development (i.e., whether developed or developing), are slated to be affected, they are obliged under article 4.1(b) to formulate and implement adaptation programmes even in the wake of uncertainties.¹¹³ However, the respective state parties have been given

¹¹⁰ Roda Verheyen, “The Legal Framework of Adaptation and Adaptive Capacity” in Joel B Smith, Richard JT Klein & Saleemul Huq, eds, *Climate Change, Adaptive Capacity and Development* (London: Imperial College Press, 2003) 163 at 169.

¹¹¹ Yamin Farhana & Joanna Depledge, *The International Climate Change Regime: A Guide to Rules, Institutions and Procedures* (Cambridge: Cambridge University Press, 2004) at 216.

¹¹² *Ibid* at 218.

¹¹³ *UNFCCC, supra* note 44, art 3.3 (outlining the precautionary approach).

considerable leeway in determining the nature of the measures, taking into account national and regional development priorities, objectives, and circumstances.¹¹⁴

Furthermore, article 4.1(e) requires parties to cooperate with each other in preparing to adapt to climate change impacts. Interestingly, this article emphasizes the need for international cooperation in tackling the issue and it also calls upon parties to develop and expand upon appropriate adaptation specific actions, like integrated plans for CZM, water resources and agriculture, protection and rehabilitation of certain areas (e.g., Africa) that are affected by drought, desertification, and floods. Even though this article stresses cooperation, parties are to develop these adaptive actions into their platforms, taking into account their specific national and regional development priorities, objectives, and circumstances.¹¹⁵

Additionally, article 4.1(f) is relevant to adaptation. It provides that, where feasible, parties are to take climate change considerations into account in their relevant social, economic and environmental policies and actions. Parties are also to employ appropriate methods, such as impact assessments, to minimize the adverse effects from projects or measures undertaken by them to adapt to climate change on the economy, public health and the quality of the environment. In effect, this provision seeks to caution societies regarding the possibility of the social, economic and environmental policies and actions that do not take into account how climate change considerations degenerate into maladaptation.¹¹⁶ Again, the use of terms “to the extent feasible” and “as formulated and determined nationally” leaves the matter of integration and the scope and application of impact assessment as issues best determined by respective state parties.¹¹⁷

Implementing adaptation actions generally requires huge amounts of capital, which developing countries are rarely in a position to raise due to other compelling priorities and constraints. To this end, the UNFCCC incorporates provisions that provide for financial support to developing nations.¹¹⁸ A related aspect is that most developing countries are presently seeking to advance to more sustainable forms of development by

¹¹⁴ *Ibid*, art 4.1.

¹¹⁵ *Ibid*.

¹¹⁶ Farhana & Depledge, *supra* note 111 at 222.

¹¹⁷ *Ibid*.

¹¹⁸ See Part 5.4.4, below, for a discussion on how UNFCCC secures financial assistance to developing nations for implementing its obligations.

bypassing development phases that are driven by more polluting, less efficient, and costlier technologies. It is by employing these ineffective technologies that industrialized nations managed to traverse several cycles, which, while degrading the global commons, enabled them to attain the present economic development. By providing direct access to technologies that are more advanced, less polluting and green, developing nations can now circumvent the pollution-intensive cycles. Realistically, the challenge, then, is how we can ensure that these new technologies can be accessed, as there are restrictive technology transfer regimes, such those relating to intellectual property. The UNFCCC seeks to address these issues by calling upon developed country parties to take practicable steps to “promote, facilitate, and finance” the transfer of or access to environmentally sound technologies and know-how to other parties, particularly to developing countries to enable them to implement the terms of the convention.¹¹⁹ The term “environmentally sound technologies” is broad enough to encompass adaptation technologies.¹²⁰

Another important feature of the adaptation scheme embodied in the UNFCCC is that it underscores the need for all parties to consider the specific needs, concerns and special situations of developing country parties and the least developed countries (LDCs). Article 4.8 of the UNFCCC mandates that to meet the specific needs and concerns of developing country parties (particularly small island countries and countries with low-lying coastal areas) arising from the adverse effects of climate change, the parties are to give full consideration as to what actions are necessary under the Convention, including those related to funding, insurance and technology transfer. The LDCs constitute a bloc of nearly 48 countries representing some of the poorest nations in the world that have the least capacity to adapt to the adverse impacts of climate change. In recognizing this reality, article 4.9 provides that parties shall take “full account of the specific needs and special situations of the least developed countries in their actions with regard to funding and transfer of technology.” This provision is also wide enough to facilitate adaptation actions in LDCs.

¹¹⁹ UNFCCC, *supra* note 44, art 4.5.

¹²⁰ Since the obligations enshrined in the article are not mandatory in character, the COPs have adopted a series of decisions to realize the goal of technology transfer. Friedrich Slotau, *Fairness in International Climate Change Law and Policy* (New York: Cambridge University Press, 2009) at 195.

Broadly, these are some of the salient provisions in the UNFCCC that support adaptation actions. As can be seen, these provisions are worded generally and are not adaptation specific. It does not identify clear plans that can facilitate the application of adaptation in different contexts like water management, coastal planning, forestry, and biodiversity conservation.¹²¹ A considerable amount of interpretative ingenuity is required to inter-link several of these provisions to weave out a scheme that triggers adaptation. As we shall see, the situation under the Kyoto Protocol is no different. Being loaded primarily in favor of mitigation, reliance again has to be placed on creativity to support adaptation actions. Some major provisions in the Kyoto Protocol from the standpoint of adaptation are detailed below.

Articles 2.3 and 3.14 of the Kyoto Protocol require that annex I parties minimize the adverse effects of climate change and the impacts of response measures on developing country parties. These provisions, which lead to “integration of climate considerations in non-climate policy and in the greater use of tools such as EIA”,¹²² can also be examined from another angle. As noted earlier, the primary responsibility for emissions-induced global warming lies squarely on the doorsteps of developed countries. Moreover, by requiring annex I parties to implement measures to reduce their overall emissions of GHGs by at least five per cent below 1990 levels in the first commitment period (2008 to 2012), the Kyoto Protocol practically facilitates the successful implementation of adaptation measures in developing countries. This is so because if annex I countries persists with a ‘business as usual’ approach in the matter of emissions, adaptation in developing countries will be unsuccessful.

Other notable provisions include article 10(b), which requires parties to formulate, implement, publish and update programmes containing measures to facilitate adequate adaptation to climate change, and article 10(c), which requires all parties to cooperate in the promotion of effective modalities for the development, application and diffusion of environmentally sound technologies, know-how, practices and processes pertinent to climate change in particular to developing countries. The term “environmentally sound

¹²¹ Jeffrey A McNeely, “Symposium: A Climate of Disruption: Legal Measures for Adaptation and Mitigation: Applying the Diversity of International Conventions to Address the Challenges of Climate Change” (2008) 17 Mich St J Int’l L 123 at 124 (QL).

¹²² Farhana & Depledge, *supra* note 111 at 223.

technologies” includes both mitigation and adaptation technologies within its fold. Similarly, article 10(g) requires that in implementing the commitments enumerated under this article, parties should give full consideration to article 4.8 of the UNFCCC, while article 11.1 specifies that in implementing article 10 of the Kyoto Protocol, parties have to give consideration to article 4.9 of the UNFCCC. Both articles 4.8 and 4.9 of the UNFCCC are directly relevant to adaptation. Perhaps the most important provision in the Kyoto Protocol that facilitates adaptation activities is the one that requires that proceeds from certified project activities be used to assist developing country parties meet the costs of adaptation.¹²³

5.4.2 Conference of the Parties and Adaptation: Incremental Development of the Rules

The various Conferences of the Parties (COPs) have played important roles in highlighting the importance of adaptation and in developing the rules. However, as will be seen in the following discussion, the COPs have not been able to create a coherent body of adaptation principles. Apart from the COPs, the UNFCCC regime has fostered the creation of an innovative mechanism to promote adaptation; namely, the Nairobi Work Programme, whose salient features are also detailed below.

One of the first COPs that dealt with the issue of adaptation is decision 5/CP.7, which implements article 4, paras. 8 and 9. Other highlights of this decision from the perspective of adaptation are as follows: 1) it recognizes that the LDCs are most vulnerable to the consequences of climate change and that widespread poverty limits their adaptive capacity;¹²⁴ 2) to avoid maladaptation, adaptation actions should follow an assessment and evaluation process based on national communications or other relevant information;¹²⁵ 3) the Global Environment Facility (GEF) should support activities related to “information and methodology”¹²⁶ and “vulnerability and adaptation”;¹²⁷ and 4)

¹²³ *Kyoto Protocol to the UNFCCC, supra* note 47, art 12(8).

¹²⁴ *Decision 5/CP.7: Implementation of Article 4, paragraphs 8 and 9, of the Convention (decision 3/CP.3 and Article 2, paragraph 3, and Article 3, Paragraph 14, of the Kyoto Protocol)* [nd], recital, online: UNFCCC <http://unfccc.int/files/cooperation_and_support/ldc/application/pdf/13a01p32.pdf> [*Decision 5/CP.7*].

¹²⁵ *Ibid*, 2.

¹²⁶ This includes providing training in specialized fields relevant to adaptation like ICZM. *Ibid*, 7(a)(iii).

the Special Climate Change Fund (SCCF) and the Adaptation Fund (AF) should be utilised to implement activities like ICZM.¹²⁸ More importantly, this decision also creates a work programme for the LDCs and a fund to support this work programme.¹²⁹ After this decision, adaptation began to receive attention by subsequent COPs.

The next major decision is the Buenos Aires Programme of Work on Adaptation and Response Measures adopted at the COP 10, which seeks to strengthen the implementation of actions enumerated under decision 5/CP.7.¹³⁰ It also urges annex II parties to contribute to the special climate change fund and to support adaptation actions as a matter of “top priority.”¹³¹

Adopted at the COP 13 held in 2007, the Bali Action Plan (BAP), identifies adaptation as one of the key pillars “to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to, and beyond 2012 . . .”¹³² It also seeks to address the need for “enhanced action on adaptation” through a series of measures like international co-operation to support urgent implementation of adaptation actions, risk management and risk reduction strategies, disaster reduction strategies, and economic diversification to develop resilience.¹³³ The BAP also stresses the need for innovative means of funding to assist developing country parties, especially those who are particularly vulnerable, in meeting adaptation costs.¹³⁴

The Cancun Adaptation Framework (CAF) adopted at COP 16 as an “Outcome of the Work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention” affirmed that adaptation should be addressed on a level equal to mitigation.¹³⁵ With this in mind, it seeks to implement enhanced action on adaptation and

¹²⁷ Some of the measures contemplated include: transfer of adaptation technologies; establishing or strengthening early warning systems in developing countries; and enhancing institutional capacity to integrate adaptation into sustainable development programmes. *Ibid*, ¶7(b).

¹²⁸ *Ibid*, ¶8.

¹²⁹ *Ibid*, ¶¶11-12.

¹³⁰ *Decision 1/CP.10: Buenos Aires Programme of Work on Adaptation and Response Measures*, FCCC/CP/2004/10/Add.1, 17-18 December 2004, ¶¶5-14, online: UNFCCC <<http://unfccc.int/resource/docs/cop10/10a01.pdf>>.

¹³¹ *Ibid*, ¶3.

¹³² *Decision 1/CP.13 Bali Action Plan*, FCCC/CP/2007/6/Add.1, (14–15 December 2007) ¶1, online: UNFCCC <<http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf#page=3>>.

¹³³ *Ibid*, ¶1(c).

¹³⁴ *Ibid*, ¶1(e)(iii).

¹³⁵ *Ibid*, ¶1.2.(b).

invites all parties to work towards securing the same.¹³⁶ The CAF seeks to achieve this by enumerating a series of enhanced adaptation actions grouped under five headings: implementation,¹³⁷ support,¹³⁸ institutional arrangements,¹³⁹ principles,¹⁴⁰ and stakeholder engagement.¹⁴¹ At the recently concluded COP17 at Durban, the need to address adaptation planning in the broader context of sustainable development planning was recognized.¹⁴² Apart from launching the Green Climate Fund (GCF),¹⁴³ it draws attention to the importance of developing national adaptation plans by adopting initial guidelines for the formulation of national adaptation plans for use by LDCs and even invites developing countries that are not LDCs to prepare the same based on these guidelines, taking into account their national circumstances.¹⁴⁴

¹³⁶ *Ibid.*, ¶14.

¹³⁷ All parties are to plan, prioritize and implement adaptation actions and use existing channels to provide information on support provided and received for adaptation actions and on activities undertaken. Again, a process should be established to enable LDC Parties based their NAPA experience to formulate and implement national adaptation plans and an invitation to other developing country Parties to employ the modalities formulated to support those plans. Finally, there should be a two-year work programme to consider approaches to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to climate change. *Cancun Adaptation Framework*, online: UNFCCC, <http://unfccc.int/adaptation/cancun_adaptation_framework/items/5852.php>.

¹³⁸ Developed country parties should provide developing country parties, taking into account the needs of those particularly vulnerable, with long-term, scaled-up, predictable, new and additional finance, technology, and capacity-building to implement adaptation actions, plans, programmes and projects. *Ibid.*

¹³⁹ At the global level, the CAF provides for the establishment of an Adaptation Committee to promote the implementation of enhanced action on adaptation in a coherent manner. At the regional level, it seeks to strengthen and even establish regional centers and networks, particularly in developing countries and finally at the national level, the CAF envisages strengthening and establishing national-level institutional arrangements. *Ibid.*

¹⁴⁰ To facilitate enhanced action on adaptation, the CAF enumerates certain steps like adaptations should be in accordance with the convention; adaptation should be integrated into relevant social, economic and environmental policies and actions; the measures should follow a country-driven, gender-sensitive, participatory and fully transparent approach, taking into consideration vulnerable groups, communities and ecosystems. Finally, it should also be based on best available science and, where relevant by traditional and indigenous knowledge. *Ibid.*

¹⁴¹ The CAF invites relevant multilateral, international, regional and national organizations, the public and private sectors, civil society and other relevant stakeholders to undertake and support enhanced action on adaptation at all levels. *Ibid.*

¹⁴² See generally UNFCCC, *Conference of the Parties: Report of the Conference of the Parties on its Seventeenth Session, Held in Durban from 28 November to 11 December 2011: Addendum: Part Two: Action Taken by the Conference of the Parties at its Seventeenth Session*, FCCC/CP/2011/9/Add.1 (15 March 2012) [UNFCCC, *Report of the COP on its Seventeenth Session*, Add.1].

¹⁴³ For an overview of the GEF, see *infra* notes 172-74 and accompanying text.

¹⁴⁴ UNFCCC, *Report of the COP on its Seventeenth Session*, Add.1, *supra* note 142 at 83.

The Nairobi Work Programme on impacts, vulnerability, and adaptation to climate change is yet another milestone that seeks to assist all parties, particularly developing countries, to augment their adaptive capacity.¹⁴⁵ Established as a five-year programme in 2005 at the eleventh COP, it was decided that the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UNFCCC would pilot it. The programme has been categorized based on two thematic areas: “impacts and vulnerability” and “adaptation planning, measures and actions.” Each theme has five action-oriented sub-themes,¹⁴⁶ implemented via nine work areas,¹⁴⁷ of which two are directly related to adaptation.¹⁴⁸

In its entirety, the programme involves several players, such as parties, organizations (nearly 250 partner organizations),¹⁴⁹ experts, the private sector, the global community and the UNFCCC secretariat. These sectors were in two phases. Phase I (2005 to mid-2008) saw over 100 organizations engaged in various activities (e.g., identification of calls for action and pledged activities), while the second phase (from mid-2008 to 2010) involved the addition of several more activities.¹⁵⁰ Despite the conclusion of the programme’s second phase at the SBSTA’s 33rd session in Cancun (30 November-4 December 2010), it was decided to continue activities, with the SBSTA pledging to carry out a review and submit a report at its 34th session.¹⁵¹

¹⁴⁵ This programme seeks to develop the capacity of parties to improve their understanding, assessment of impacts; vulnerability and adaptation to climate change, and thereafter make informed decisions. *The Nairobi Work Programme: An Overview*, at 1, online: UNFCCC <http://unfccc.int/resource/docs/publications/09_nwp_overview_en.pdf>. It seeks inter alia to improve understanding and assessment of impacts, and to make informed decisions on practical adaptation actions to respond to climate change based on sound scientific, technical and socio-economic basis. UNFCCC, Progress Made in Implementing Activities under the Nairobi Work Programme on Impacts, Vulnerability and Adaptation to Climate Change: Note by the Secretariat, FCCC/SBSTA/2012/INF.1, 16 April 2012, online: UNFCCC <<http://unfccc.int/resource/docs/2012/sbsta/eng/inf01.pdf>> [UNFCCC, Progress Made in Implementing Activities].

¹⁴⁶ UNFCCC, *The Nairobi Work Programme: The Second Phase* (Bonn: UNFCCC Secretariat, 2008) at 8-9.

¹⁴⁷ They are methods and tools; data and observations; climate modeling, scenarios and downscaling; climate related risks and extreme events; socio-economic information; adaptation planning and practices; research; technologies for adaptation; and economic diversification. *Ibid* at 10-11.

¹⁴⁸ See generally UNFCCC, *The Nairobi Work Programme on Impacts, Vulnerability and Adaptation to Climate Change: The Nine Work Areas of The Nairobi Work Programme*, online: UNFCCC <http://unfccc.int/resource/docs/publications/09_nwp_wp_9areas_en.pdf>.

¹⁴⁹ See UNFCCC, Progress Made in Implementing Activities, *supra* note 145.

¹⁵⁰ *The Nairobi Work Programme: An Overview*, *supra* note 145 at 2.

¹⁵¹ UNFCCC, *Nairobi Work Programme: Negotiations and Decisions*, online: UNFCCC <http://unfccc.int/adaptation/nairobi_work_programme/negotiations_and_decisions/items/3916.php>.

At Durban, the COP 17 requested that the SBSTA reconsider the work areas of this programme with a view to making recommendations to the 19th COP on how best to support its objectives.¹⁵² A request was also made to organize a series of workshops around themes like water, climate change impacts and adaptation strategies, ecosystem-based approaches for climate change adaptation, and the importance of disseminating the outcomes.¹⁵³ As a programme of far-reaching impacts, its legacy in creating a critical mass of knowledge and experience to support adaptation activities has been summed up by the SBSTA as follows: “[t]he Nairobi work programme has been successful in creating significant momentum for adaptation through engaging a large number of organizations representing a wide range of adaptation stakeholders.”¹⁵⁴ Thus, it can be affirmatively stated that the programme has been able to galvanize a large number of players to generate a corpus of knowledge and information on adaptation.

At the Qatar COP 18, it was decided to provide guidance to developing countries particularly vulnerable to the adverse effects of climate change to enhance their adaptive capacity.¹⁵⁵ Originally the National Adaptation Programmes of Action (NAPA) preparation and implementation was restricted only to the LDCs. In a marked departure from this approach, the COP 18 enhanced the scope of the process by calling upon developed country parties to mobilize financial support through bilateral and multilateral channels including the SCCF for developing countries, which are not LDCs to implement the NAPA process.¹⁵⁶ As well, the COP also approved the three-year work plan of the

¹⁵² For the text of the Decision 6/CP.17, titled “Nairobi Work Programme on Impacts, Vulnerability and Adaptation to Climate Change”, see UNFCCC, *Report of the COP on its Seventeenth Session*, Add.1, *supra* note 142 at 3.

¹⁵³ *Ibid.*

¹⁵⁴ UNFCCC, Progress Made in Implementing Activities under the Nairobi Work Programme on Impacts, Vulnerability and Adaptation to Climate Change: Note by the Secretariat, FCCC/SBSTA/2010/INF.7, 4 November 2010, ¶46(a), online: UNFCCC <<http://unfccc.int/resource/doc/s/2010/sbsta/eng/inf07.pdf>>.

¹⁵⁵ “Decision 3/CP.18: Approaches to Address Loss and Damage Associated with Climate Change Impacts in Developing Countries that are Particularly Vulnerable to the Adverse Effects of Climate Change to Enhance Adaptive Capacity” in UNFCCC, *Report of the Conference of the Parties on its Eighteenth Session, Held in Doha from 26 November to 8 December 2012 Addendum, Part Two: Action Taken by the Conference of the Parties at its Eighteenth Session*, Advance Version, FCCC/CP/2012/8/Add.1 (28 February 2013) at 21, online: UNFCCC <<http://unfccc.int/resource/docs/2012/cop18/eng/08a01.pdf>>.

¹⁵⁶ “Decision 12/CP.18: National Adaptation Plans” in UNFCCC, *Report of the Conference of the Parties on its Eighteenth Session, Held in Doha from 26 November to 8 December 2012 Addendum, Part Two: Action Taken by the Conference of the Parties at its Eighteenth Session*, Advance Version, FCCC/CP/2012/8/Add.2 (28 February 2013) 3 at 3, online: UNFCCC <<http://unfccc.int>>

Adaptation Committee, which represents an important effort in “promoting coherence in adaptation under the Convention and synergies with organizations, centres and networks outside the Convention and providing technical support and guidance to the Parties.”¹⁵⁷ Furthermore, it also calls upon the Adaptation Committee to consider the establishment of an annual adaptation forum, to *inter alia* raise awareness and to facilitate enhanced coherence of adaptation actions.¹⁵⁸

5.4.3 Discussion

It is clear that anthropogenic emissions, past and present, have profoundly impacted the climate system and have set in motion chaotic changes, which will be played out over for a very long time. To compound matters, the scale and severity of environmental degradation and poverty at the global level, has reached unprecedented scales than at any time in human history. Therefore, all nations as a matter of necessity will at some point have to invest in adaptation. Even though both developed and developing countries are already moving in this direction, developed nations are better positioned to implement adaptation actions, as they already have in place good governance, responsible and responsive institutions, adequate legal support, technology, and the economic capacity to absorb even extreme climate shocks.¹⁵⁹ More importantly, as seen earlier, ever since sustainable development entered the environmental law horizon, it has changed the tenor of development and absent consideration of climate change impacts and related adaptation and mitigation measures, development may prove superfluous on long-term

/resource/docs/2012/cop18/eng/08a02.pdf>. Among the South Asian coastal countries, Bangladesh and Maldives have developed National Adaptation Programmes of Action. For more details, see United Nations Framework Convention on Climate Change, *NAPAs Received by the Secretariat*, online: United Nations Framework Convention on Climate Change <<https://unfccc.int/adaptation/items/4159.php>>.

¹⁵⁷ “Decision: 11/CP.18: Work of the Adaptation Committee”, in UNFCCC, *Report of the Conference of the Parties on its Eighteenth Session, Held in Doha from 26 November to 8 December 2012 Addendum, Part Two: Action Taken by the Conference of the Parties at its Eighteenth Session, Advance Version*, FCCC/CP/2012/8/Add.2 (28 February 2013) 2 at 2, online: UNFCCC <<http://unfccc.int/resource/docs/2012/cop18/eng/08a02.pdf>>.

¹⁵⁸ “Decision 1/CP.18: Agreed Outcome Pursuant to the Bali Action Plan” in UNFCCC, *Report of the Conference of the Parties on its Eighteenth Session, Held in Doha from 26 November to 8 December 2012 Addendum, Part Two: Action Taken by the Conference of the Parties at its Eighteenth Session, Advance Version*, FCCC/CP/2012/8/Add.1 (28 February 2013) at 3, online: UNFCCC <<http://unfccc.int/resource/docs/2012/cop18/eng/08a01.pdf>>.

¹⁵⁹ Watkins, *supra* note 6 at 168.

scales. Therefore, it is essential that adaptation and mitigation be juxtaposed into the development process.

Right from the time of its inception, the focus of the international regime on climate change was on mitigation. Even with imperfections and serious doubts cast over its ability to ensure that the global increase in temperature is maintained below 2 degrees Celsius, the international regime on mitigation has entered the second commitment period, while the rules on climate change adaptation still remain nascent and vague. Despite the significance of adaptation in the climate change equation, and a two-decade existence, the international legal regime on adaptation draws its sustenance primarily from a patchwork of multifarious rules and initiatives rather than a full-fledged dedicated legal instrument. Moreover, the international rules on climate change adaptation continue to develop rather slowly and are dependant on the COPs. As seen, the international regime on adaptation is riddled with ambiguity primarily because nations are unwilling to admit that the international regime on mitigation has accomplished very little to prevent the spewing of GHGs into the atmosphere and that nations will have to adapt.¹⁶⁰ Then there is also the uncertainty regarding the true nature and magnitude of climate change impacts. While there is strong scientific consensus that we have crossed the tipping scales in relation to several ecosystems *vis-à-vis* climate change we may have only limited information regarding all possible scenarios. Given the complexity of climatic systems, uncertainty in adaptation is unavoidable and therefore we will have to build adaptation strategies around this uncertainty, as it is a question of survival for many. It cannot be stressed enough that mitigation and adaptation are two sides of the same coin and must be vigorously pursued as complementary rather than isolated approaches.

The final theme emerging from the review is two-pronged – namely, that there is a growing adaptation deficit, and the backbone of the international legal regime on climate change adaptation is weak. In light of this, it seems, that the time may have emerged for marshalling an effective adaptation response at the international level, which may take the form of an exclusive protocol on adaptation that sets out the basic norms of adaptation as to prompt the development of more coherent, and holistic adaptation

¹⁶⁰ Freestone, “International Legal Framework”, *supra* note 109.

responses.¹⁶¹ In this regard, an adaptation protocol could help transform adaptation from a being “poor relation,”¹⁶² to an equal and integral constituent of the climate change regime. The Protocol could serve to codify and prescribe new rules on climate change adaptation, streamline financial arrangements, promote technology transfer, provide for direct capacity building on adaptation and resilience, and create suitable institutions to ensure that the funds are being appropriately utilised to further adaptation at the ground-level. In unison with the Kyoto protocol, the adaptation protocol could help create win-win situations for sustainable development particularly in developing countries. Since ICZM is an integral part of climate change adaptation, at least in its application to the coastal zones, an adaptation protocol can provide impetus for the development of specific rules on ICZM.

5.4.4 Financing Adaptation

No review of the international regime on climate change adaptation is complete without scrutinizing financing arrangement, which is what this section attempts to do. The implementation of climate change adaptation measures is a costly endeavor. Carrying the magnitude of a universal problem, no country is immune from its adverse and widespread consequences and therefore all nations will have to invest in adaptation. Both developed and developing countries are already moving in this direction. Developed nations are better positioned to implement adaptation actions, as they already have in place good governance, responsible and responsive institutions, adequate legal support, technology, and the economic capacity to absorb even extreme climate shocks. In contrast, in most developing countries adaptation continues to be a “fringe activity”¹⁶³ and the primary impediment in its implementation is financial unavailability and systemic inefficiencies.¹⁶⁴ Consequently, the incremental dangers that accompany climate change will be superimposed on societies that are characterized by massive poverty, low living standards, poor livelihood opportunities, environmental pollution, over-exploited natural

¹⁶¹ See *UNFCCC*, *supra* note 44, art 17.

¹⁶² Freestone, “International Legal Framework”, *supra* note 109 at 603.

¹⁶³ Watkins, *supra* note 6 at 172.

¹⁶⁴ “Globally, wealthier nations are better placed financially and technologically to cope with the effects of possible climate change.” World Commission on Environment & Development, *Our Common Future* (Oxford: Oxford University Press, 1987) at 49.

resource systems, food and water insecurity, low economic growth, and high human vulnerability.¹⁶⁵

The UNFCCC secretariat estimates that by 2030, developing countries will require about USD28-67 billion annually to adapt to climate change, a figure which is beyond most developing nations, particularly the LDCs.¹⁶⁶ Consequently, environmental justice postulates that these vulnerable countries and societies must be provided with sufficient and sustained assistance that will enhance their adaptive capacities. In putting this into effect and in consonance with the principles of equity and common but differentiated responsibilities, the UNFCCC articles provide that developed countries are to extend financial assistance to developing countries to enable them to comply with their obligations.¹⁶⁷ In emphasizing this aspect, in a veiled warning, the UNFCCC text observes:

[t]he extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology....¹⁶⁸

Adequacy and predictability in the flow of funds is *sine qua non* for the successful implementation of climate change adaptation activities. To ensure the same, the UNFCCC established a financial mechanism under the COP¹⁶⁹ that decides policies, programme priorities and eligibility criteria.¹⁷⁰ This financial mechanism, accountable to

¹⁶⁵ Watkins, *supra* note 6 at 171.

¹⁶⁶ Presently, there are 48 LDCs, out of which 33 are in Africa, 14 in Asia and one in Latin America and the Caribbean. *Least Developed Countries: Country Profiles*, online: UN-OHRLLS <<http://www.unohrlls.org/en/ldc/related/62/>>. These countries represent the poorest and weakest segment of the international community. To be categorized as an LDC, the following has to be satisfied, 1) low-income; 2) human capital status; and 3) economic vulnerability. *Least Developed Countries: Criteria for Identification of LDCs*, online: UN-OHRLLS <<http://www.unohrlls.org/en/ldc/related/59/>>. UNFCCC, *Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries* (UNFCCC, 2007) at 6, online: UNFCCC <<http://unfccc.int/resource/docs/publications/impacts.pdf>>.

¹⁶⁷ See *UNFCCC*, *supra* note 44, arts 4.3, 4.4, 4.5 & 4.9.

¹⁶⁸ *Ibid*, art 4.7.

¹⁶⁹ *Ibid*, art 11.

¹⁷⁰ *Ibid*, art 11.1.

the COP, has “an equitable and balanced representation of all Parties within a transparent system of governance.”¹⁷¹

Set up in 1991 as a pilot under the World Bank to protect the global environment and promote sustainable development,¹⁷² the GEF was restructured at the Earth Summit, and included the participation of the UNDP and the United Nations Environment Programme. It was then taken out of the World Bank system to confer it with greater autonomy and independence. The GEF’s central role in the financial dynamics of the climate change regime is that it acts as the financial mechanism of the UNFCCC on an interim basis. A memorandum of understanding between both of these entities articulates the relationship between the GEF and the COP to the UNFCCC.¹⁷³ Here, the GEF functions under the guidance of COP, to which it is also accountable.¹⁷⁴ Subsequently, different funds have been established to finance adaptation activities, and the GEF is responsible for their administration as well. The overview below reveals the major sources of funding and their relevance to adaptation.

While the 6th COP in Bonn in 2001 created three funds to assist developing country parties to meet adaptation costs (namely, the Special Climate Change Fund, the Least Developed Countries Fund [LDCF] and the AF), the 7th COP allotted GEF the responsibility to administer the first two funds.¹⁷⁵ However, prior to operationalizing these funds, it was considered ideal to call upon the GEF to finance pilot projects “that would demonstrate the practical and successful use of adaptation planning and

¹⁷¹ *Ibid*, art 11.2.

¹⁷² *What is the GEF?*, online: Global Environment Facility <<http://www.thegef.org/gef/whatisgef>>. At the Rio Earth Summit, the GEF was restructured to become a permanent independent financial organization that unites nearly 182 member governments, “in partnership with international institutions, nongovernmental organizations (NGOs), and the private sector-to address global environmental issues.” Bonizella Biagini et al, *Global Environment Facility: Financing Adaptation Action*, at 5, online: Global Environment Facility <http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf>. The largest funder of projects to improve the global environment, the GEF serves as financial mechanism for a series of conventions, including, the CBD, *Stockholm Convention on Persistent Organic Pollutants, 2001*, and the UNCCD, Though not formally linked to the Montreal Protocol on Substances that Deplete the Ozone Layer, the GEF supports its implementation in countries with economies in transition. *Ibid* at 6; see also *What is the GEF?*, *ibid*.

¹⁷³ See *Decision 12/CP.2: Memorandum of Understanding Between the Conference of the Parties and the Council of the Global Environment Facility*, FCCC/CP/1996/15/Add.1, 19 July 1996, annex, online: UNFCCC <<http://unfccc.int/resource/docs/cop2/15a01.pdf#page=55>>.

¹⁷⁴ *Ibid*, annex, ¶2.

¹⁷⁵ GEF Evaluation Office, GEF Council, *Evaluation of the GEF Strategic Priority for Adaptation*, GEF/ME/C.39/4 (22 October 2010) at 3.

assessment.”¹⁷⁶ Accordingly, the GEF established the strategic priority on adaptation (SPA), in 2001, with a USD50 million corpus trust fund with the object “to support pilot and demonstration projects to show how adaptation planning and assessment can be practically translated into projects that provide real benefits and can be integrated into national policy and sustainable development planning.”¹⁷⁷ The SPA is essentially a pioneering initiative, since, until that time, there were no “on-the-ground adaptation interventions and the entire focus was on research, assessments, and screening tools.”¹⁷⁸ All countries otherwise eligible for GEF funding can access the funds under the SPA. By the end of 2009, the funds financed 26 projects, some of which are relevant to coastal management.¹⁷⁹

The LDCF traces its origin to article 4.9 of the UNFCCC, which, in recognizing the special situation and vulnerability of LDCs, states that parties should “take full account of the specific needs and special situations of the Least Developed Countries in their actions with regard to funding and transfer of technology.”¹⁸⁰ The LDCF was established at COP 7 in Marrakech to support the identification of and to fund urgent and immediate adaptation actions for the LDCs.¹⁸¹ To implement article 4.9, Decision 5/CP.7 envisages a work programme for the LDCs¹⁸² by establishing the LDCF, which is operated by the

¹⁷⁶ *Evaluation of the GEF Strategic Priority for Adaptation: Full Report*, Evaluation Rep No 61 (Washington, DC: Global Environment Facility Evaluation Office, July 2011) at 1.

¹⁷⁷ *Adaptation*, online: Global Environment Facility <<http://www.thegef.org/gef/adaptation>>.

¹⁷⁸ Biagini et al, *supra* note 172 at 11.

¹⁷⁹ *GEF-Administered Trust Funds*, online: Global Environment Facility <http://www.thegef.org/gef/trust_funds>. Some of the projects are: Coastal and Marine Resources Management in the Coral Triangle: Southeast Asia; Coastal and Marine Resources Management in the Coral Triangle of the Pacific; Participatory Coastal Zone Restoration and Sustainable Management in the Eastern Province of Post-Tsunami Sri Lanka: Adaptation to Climate Change-Responding to Coastline Change and Its Human Dimensions in West Africa through Integrated Coastal Area Management; and Implementation of Pilot Adaptation Measures in Coastal Areas of Dominica, St. Lucia and St. Vincent & the Grenadines. See *Evaluation of the GEF SPA: Full Report*, *supra* note 176 at 20-21.

¹⁸⁰ UNFCCC, *supra* note 46.

¹⁸¹ *Least Developed Countries Fund*, online: Global Environment Facility <<http://www.thegef.org/gef/lDCF>> [*Least Developed Countries Fund*].

¹⁸² This work programme has the following elements: establishing or strengthening national secretariats or focal points in LDCs; provide ongoing training in negotiation skills and language to develop the capacity of negotiators in LDCs to enable them to participate effectively in the negotiation process; supporting the preparation and implementation of national adaptation programmes of action; promote public awareness programmes on climate change issues; development and transfer of adaptation technology; etc. See *Decision 5/CP.7*, *supra* note 124 at part II.

GEF.¹⁸³ The LDCF also supports the preparation and implementation of the NAPA, which are basically country-driven strategies that identify the pertinent and immediate adaptation requirements of LDCs. Eligibility for project funding under the LDCF is reserved to all LDCs who are parties to the UNFCCC and have completed the preparation of their NAPA. Annex II countries along with some annex I countries of the UNFCCC can contribute funds to the LDCF.¹⁸⁴

At their annual meetings, the COPs have provided additional guidance to streamline the operation of the LDCF at regular intervals.¹⁸⁵ The presence of this fund

¹⁸³ See *Decision 7/CP.7: Funding under the Convention*, FCCC/CP/2001/13/Add.1, 10 November 2001, ¶6, online: UNFCCC <<http://unfccc.int/resource/docs/cop7/13a01.pdf#page=43>> [*Decision 7/CP.7*]; *Governance of the Fund*, online: Global Environment Facility <http://www.thegef.org/gef/LDCF_Governance>. *Governance of the Fund*, online: Global Environment Facility <http://www.thegef.org/gef/SCCF_Governance>.

¹⁸⁴ *Decision 7/CP.7, ibid*, ¶¶1(c)(iii), 6.

¹⁸⁵ The guidance relates to: providing funding to meet full cost of preparing the NAPAs; ensuring transparency in relation to the operation of the fund; encouraging the use of national and where appropriate regional experts; ensuring complementarity and separation of funding from the LDCF and other funds with which the operating entity is entrusted; adopting streamlined procedures for the operation of the fund, etc. *Ibid.* Decision 8/CP.8, calls upon the GEF and its implementing agencies to ensure the speedy release and disbursement of funds and timely assistance for the preparation of national adaptation programmes of action; organize regional workshops to advise the LDCs regarding the preparation of NAPAs; encourages annex and annex II parties to address the needs of the LDCs with regard to training in negotiation skills and language. See *Decision 8/CP.8, Guidance to an Entity Entrusted with the Operation of the Financial Mechanism of the Convention, for the Operation of the Least Developed Countries Fund*, FCCC/CP/2002/7/Add.1, 1 November 2002, at 19-20, online: UNFCCC <<http://unfccc.int/resource/docs/cop8/07a01.pdf#page=19>>. Decision 6/CP.9, requests the GEF to support NAPA implementation. The GEF is to take into account the following factors to develop their operational guidelines relating to funding NAPA implementation: ensuring a country-driven approach in line with national priorities; equitable access to the funding, etc. See *Decision 6/CP.9: Further Guidance for the Operation of the Least Developed Countries Fund*, FCCC/CP/2003/6/Add.1, 12 December 2003, ¶¶2-3, online: UNFCCC <<http://unfccc.int/resource/docs/cop9/06a01.pdf#page=13>>. Decision 3/CP.11, provides *inter alia* the following further guidance: the operation of the LDCF should be consistent with a country driven approach; support learning-by-doing and the implementation of the activities identified in the NAPAs; ensure balanced access to resources; full cost funding to meet additional costs; and invites annex II parties to contribute to the LDCF for implementing NAPAs. See *Decision 3/CP.11: Further Guidance for the Operation of the Least Developed Countries Fund*, FCCC/CP/2005/5/Add.1, 9-10 December 2005, at 10-11, online: UNFCCC, <<http://unfccc.int/resource/docs/2005/cop11/eng/05a01.pdf#page=10>>. Decision 5/CP.14, requests the GEF to implement the other elements of the LDCs work programme in addition to the NAPAs; assist countries that have not submitted the NAPAs to help them complete and submit the same as soon as possible, establishing a time-frame within which the LDC parties can access funding and other support for the preparation and implementation of projects identified in the NAPAs; etc. *Decision 5/CP.14: Further Guidance for the Operation of the Least Developed Countries Fund*, FCCC/CP/2008/7/Add.1, 12 December 2008, at 8-9, online: UNFCCC <<http://unfccc.int/resource/docs/2008/cop14/eng/07a01.pdf#page=8>>. Decision 5/CP.16, notes the following additional guidance: the GEF to provide funding to the LDC parties to update their national adaptation programmes of action; invites annex II parties to contribute to the LDCF, etc. See generally *Decision 5/CP.16: Further Guidance for the Operation of the Least Developed*

has ensured that 48 of the world's countries most vulnerable to climate change impacts are able to access resources for NAPA preparation.¹⁸⁶ At COP 17 held in Durban, the GEF was requested to continue to provide information to the LDCs regarding project baselines, applications for accessing funding from the LDCF, and the project development process.¹⁸⁷ Presently, the fund supports 52 projects and programmes in 42 LDCs, representing the largest portfolio of adaptation projects of its kind.¹⁸⁸ Of these, 33 projects have already started and, as of December 2011, the LDCF has approved some USD217 million for projects and mobilized more than USD919 million in co-financing.¹⁸⁹ While 53 per cent of the approved funds are dedicated to increasing resilience of LDCs in Africa, 23 per cent is for adaptation projects in Asia, 21 per cent is for Small Island Developing States (SIDS), and the remaining three per cent is earmarked for Latin America and the Caribbean. It is important to note that projects related to coastal management receive the second largest share of funds, nearly 24 per cent.¹⁹⁰

Another product of the Marrakesh Accords, the SCCF, seeks to “finance activities, programmes and measures relating to climate change.”¹⁹¹ These are in the areas of adaptation, technology transfer, energy, transport, agriculture, forestry, and waste management, and include activities that seek to assist developing countries that are fossil fuel-dependent to diversify their economies.¹⁹² Among these various activities, adaptation receives the highest priority in addressing the adverse impacts of climate change.¹⁹³ In implementing adaptation activities, consideration is given to national communications and NAPA, as well as to other relevant information provided by the party. The SCCF is

Countries Fund, FCCC/CP/2010/7/Add.2, 10–11 December 2010, online: UNFCCC <http://unfccc.int/files/cooperation_and_support/ldc/application/pdf/decision_5.cp.16.pdf>; see also *Decision 10/CP.18: Further Guidance to the Least Developed Countries Fund*, FCCC/CP/2012/8/Add.1, 7 December 2012, online: UNFCCC <<http://unfccc.int/resource/docs/2012/cop18/eng/08a01.pdf>> [*Decision 10/CP.18*].

¹⁸⁶ *Least Developed Countries Fund*, *supra* note 181.

¹⁸⁷ For the text of the Decision 9/CP. 17, see UNFCCC, *Report of the COP on its Seventeenth Session*, Add.2, *supra* note 142 at 11.

¹⁸⁸ *Least Developed Countries Fund*, *supra* note 181.

¹⁸⁹ *Ibid.*

¹⁹⁰ *Ibid.*

¹⁹¹ Bonizella Biagini & Saliha Dobardzic, *Accessing Resources under the Special Climate Change Fund* (GEF, 2011) at 7.

¹⁹² *Ibid.*

¹⁹³ *Decision 5/CP.9: Further Guidance to an Entity Entrusted with the Operation of the Financial Mechanism of the Convention, for the Operation of the Special Climate Change Fund*, FCCC/CP/2003/6/Add.1, 12 December 2003, ¶1(c), online: UNFCCC <<http://unfccc.int/resource/docs/cop9/06a01.pdf#page=11>> [*Decision 5/CP.9*].

operated by the GEF.¹⁹⁴

Subsequently, various COPs have provided initial¹⁹⁵ and further¹⁹⁶ guidance to the GEF regarding the different modalities for operationalizing the SCCF. COP guidance lists the following areas for adaptation under the SCCF: water resources management; land management; agriculture; health; infrastructure development; fragile ecosystems (including mountain ecosystems); ICZM; and climatic disaster risk management.¹⁹⁷ Additionally, for 39 projects under its adaptation programme, the SCCF has approved nearly USD150 million and leveraged about USD1.03 billion in co-financing.¹⁹⁸ The importance of the SCCF as a funding for adaptation projects can be gauged from the fact that, in recent years, the demand for SCCF adaptation resources exceeds the current supply of resources.¹⁹⁹

The genesis of the AF can be traced to the Kyoto Protocol, which calls upon the COP to ensure that a share of the proceeds from certified project activities is used to assist vulnerable developing nations in the Kyoto Protocol to meet the costs of adaptation.²⁰⁰ Noted in the annex to decision 5/CP.6 of the Bonn Agreements on the Implementation of the Buenos Aires Plan of Action (from the Sixth COP of the UNFCCC) is that an AF should be established to finance concrete adaptation projects and

¹⁹⁴ See *Decision 4/CP.7: Development and Transfer of Technologies* (Decisions 4/CP.4 and 9/CP.5), FCCC/CP/2001/13/Add.1, 10 November 2001, ¶3, online: UNFCCC <<http://unfccc.int/resource/docs/cop7/13a01.pdf>>.

¹⁹⁵ In operating the SCCF, the GEF should promote complementarity of funding and ensure financial separation between the SCCF and other funds, which it administers; ensure transparency, and streamline procedures in the operation of the SCCF; etc. See *Decision 7/CP.8: Initial Guidance to an Entity Entrusted with the Operation of the Financial Mechanism of the Convention, for the Operation of the Special Climate Change Fund*, ¶1(a)-(d), FCCC/CP/2002/7/Add.1, 1 November 2002, online: UNFCCC <<http://unfccc.int/resource/docs/cop8/07a01.pdf#page=17>>.

¹⁹⁶ Decision 5/CP.9 provides for the following: the SCCF should serve as a catalyst to leverage additional resources from bilateral and other multilateral sources; activities should be country-driven, cost effective and integrated into national sustainable development and poverty reduction strategies. *Decision 5/CP.9*, *supra* note 193 at 11-12.

¹⁹⁷ Biagini & Dobardzic, *supra* note 191 at 7.

¹⁹⁸ *Special Climate Change Fund (SCCF)*, online: GEF <<http://www.thegef.org/gef/SCCF>>.

¹⁹⁹ *Ibid.*

²⁰⁰ *Adaptation Fund*, online: UNFCCC <http://unfccc.int/cooperation_and_support/financial_mechanism/adaptation_fund/items/3659.php>; *Kyoto Protocol to the UNFCCC*, *supra* note 47, art 12(8). As at 31 August 2011, the total accrual of proceeds from the monetization of certified emission reductions have reached USD166 million. See UNFCCC, *Report of the COP on its Seventeenth Session, Add.2*, *supra* note 142 at 4 (detailing Decision 6/CP.17 re: Nairobi work programme on impacts, vulnerability and adaptation to climate change).

programmes in countries that are parties to the Protocol.²⁰¹ It was also emphasized that the AF should be financed from proceeds from the clean development mechanism (CDM) project activities as well as other sources of funding.²⁰² These advances in subsidization were taken a step further at the seventh COP held in Marrakech, where it was decided that two per cent of the certified emission reductions issued for a CDM project activity were to be used towards the AF.²⁰³ The parties at Marrakech also delineated which activities were to receive support from the AF; ICZM-related adaptation activities were included on the list.²⁰⁴

Once the Kyoto Protocol entered into force, further modalities relating to the AF were worked out at the COP in Montreal in 2005, which, incidentally was also the first meeting of the parties to the Kyoto Protocol. Decision 28/CMP.1 lays down principles to guide the operation of this fund, specifying a country-driven approach, sound financial management and transparency, separation from other funding sources, and a learning-by-doing method.²⁰⁵ Decision 5/CMP.2, made at Nairobi in 2006, added more principles²⁰⁶ and also decided on operational specifics.²⁰⁷ The COP held in Bali in 2007, which served

²⁰¹ UNFCCC, Review of the Implementation of Commitments and of Other Provisions of the Convention Preparations for the First Session of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol (Decision 8/CP.4), Decision 5/CP.6: Implementation of the Buenos Aires Plan of Action, FCCC/CP/2001/L.7, 24 July 2001, annex part II, online: UNFCCC <<http://unfccc.int/resource/docs/cop6secpart/107.pdf>> (funding under the Kyoto Protocol).

²⁰² *Ibid.*

²⁰³ See generally *Decision 10/CP.7: Funding under the Kyoto*, FCCC/CP/2001/13/Add.1, 10 November 2001, online: UNFCCC <<http://unfccc.int/resource/docs/cop7/13a01.pdf>>.

²⁰⁴ These include activities like establishing national and regional centers and information networks for rapid response to extreme weather events; improving diseases and vector monitoring, disease control and prevention; supporting capacity building; and implementing adaptation in areas like water resources management, land management, agriculture, health, infrastructure development, and integrated coastal management. See *Decision 5/CP.7*, *supra* note 124, ¶7.

²⁰⁵ *Decision 28/CMP.1: Initial Guidance to an Entity Entrusted with the Operation of the Financial Mechanism of the Convention, for the Operation of the Adaptation I*, FCCC/KP/CMP/2005/8/Add.4, 9-10 December 2005, ¶3, online: UNFCCC <<http://unfccc.int/resource/docs/2005/cmp1/eng/08a04.pdf#page=3>>.

²⁰⁶ Some of the major principles include, transparency and openness in the governance of the fund; accountability in management, operation and use of funds; equitable and balanced access to the fund by eligible countries; efficiency and effectiveness in the management, operation and governance of the fund; and the fund to operate under the authority and guidance of and be accountable to the COP which shall decide its overall policies. *Decision 5/CMP.2: Adaptation Fund*, FCCC/KP/CMP/2006/10/Add.1, 17 November 2006, ¶1, online: UNFCCC <<http://unfccc.int/resource/docs/2006/cmp2/eng/10a01.pdf>>.

²⁰⁷ Major modalities include, funding for parties to be available for national, regional and community level activities; learning by doing; sound financial management including use of international fiduciary standards; projects to be country-driven based on the needs, views and priorities of eligible

as the third meeting of Kyoto Protocol parties, decided that the AF would be supervised and managed by the Adaptation Fund Board (AFB)²⁰⁸ under the authority and guidance of the COP, with full accountability to the COP.²⁰⁹ Furthermore, the AFB would be serviced by a secretariat²¹⁰ and a trustee,²¹¹ the former which would be guaranteed functional independence (with its head accountable to AFB),²¹² and the latter which would be given “fiduciary responsibility and the administrative competence to manage the adaptation fund.”²¹³ Rules regarding functions,²¹⁴ composition,²¹⁵ financial interest,²¹⁶ quorum,²¹⁷ decision-making procedures,²¹⁸ chairmanship,²¹⁹ and other miscellaneous matters were also detailed.²²⁰

The COP that served as the fourth meeting of the parties to the Kyoto Protocol was held in Poznan in 2008. At this meeting, it was decided to confer AFB with legal capacity

parties, taking into account national sustainable development strategies, poverty reduction strategies; and funding for concrete adaptation projects in eligible countries. *Ibid*, ¶2.

208 *Adaptation Fund Board*, online: Adaptation Fund <<http://www.adaptation-fund.org/about/the-board>>.

209 *Decision 1/CMP.3: Adaptation Fund*, FCCC/KP/CMP/2007/9/Add.1, 14-15 December 2007, ¶¶3-4, online: Adaptation Fund <http://adaptation-fund.org/system/files/Decision_1-CMP.3.pdf>.

210 Secretariat services are to be provided to the AFB to support and facilitate its activities. The GEF provides secretariat services to the AFB on an interim basis. *Ibid*, ¶¶18-19.

211 The AF is to have a trustee who has fiduciary responsibilities and the administrative competence to manage the AF. *Ibid*, ¶20. The World Bank has been requested to perform the trustee functions on an interim basis. *Ibid*, ¶23.

212 *Ibid*, ¶18.

213 *Ibid*, ¶20.

214 These functions are: develop strategic priorities, policies and guidelines; develop criteria to ensure that the implementing and executing entities have the capacity to implement the administrative and financial management guidelines of the Adaptation Fund; decide on projects, including allocation of funds; develop and agree additional rules of procedure; monitor and review the implementation of Adaptation Fund operations; establish committees, panels and working groups, to provide expert advice, to review performance reports on implementation and ensure independent evaluation and auditing of activities supported by the Adaptation Fund; develop and approve draft legal and administrative arrangements for secretariat and trustee services; be responsible for the monetization of certified emission reductions, and to report annually to the COP. *Ibid*, ¶5(a)-(m).

215 Taking into account fair and balanced representation among different groups, the AFB is composed of 16 members and 16 alternates representing parties to the Kyoto Protocol. *Ibid*, ¶6.

216 The members including alternate members are not to have any personal financial interest in the project activities. *Ibid*, ¶10.

217 A simple majority is necessary to constitute the quorum. *Ibid*, ¶11.

218 Decisions are to be taken by consensus and in its absence; they are taken by a two-thirds majority of the members present at the meeting. *Ibid*, ¶12.

219 The AFB elects its own Chair and Vice-Chair with one being a member from an annex I party and the other from a non-annex I party. The positions of the Chair and the Vice-Chair alternate annually between the annex I and non-annex I parties. *Ibid*, ¶13.

220 For instance, rules have been provided regarding frequency of meetings (generally, twice a year); monetization of certified emission reductions; access to funding; etc. *Ibid*, ¶¶15, 28-30.

to enable it to discharge functions more effectively.²²¹ As well, the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) also adopted the rules of procedure to regulate AFB's business conduct. Other notable aspects were also decided upon, such as a memorandum regarding secretariat services to be provided to the AFB;²²² the terms and conditions of services to be provided by the World Bank, as trustee for the AF;²²³ and the strategic priorities, policies and guidelines of the AF.²²⁴

At the 15th COP in Copenhagen in 2009, which served as the fifth meeting of the parties to the Kyoto Protocol, the parties endorsed the decision by the AFB to accept Germany's offer to confer it legal capacity.²²⁵ The CMP also adopted amendments to the rules of procedure of the AFB,²²⁶ and the parties decided to encourage annex I parties and international organizations to provide additional funding to the AF, over and above the shares from the CDM proceeds.²²⁷ The Subsidiary Body for Implementation (SBI) was requested to initiate a review of the AF and report to the COP (serving as the meeting of the Parties to the Kyoto Protocol at its sixth session).²²⁸ However, as the SBI could not carry out the review (it was considered premature),²²⁹ the Body concluded that the CMP, at its sixth session, should consider undertaking the review of the AF at CMP.7, with the CMP providing the terms of reference.²³⁰

Accordingly, at the COP 16/CMP.6, held in Cancun in 2010, the parties decided to undertake a review of the AF at its seventh session, with subsequent reviews to be

²²¹ *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol on its Fourth Session, Held in Poznan from 1 to 12 December 2008: Addendum, Decision 1/CMP.4, Adaptation Fund, FCCC/KP/CMP/2008/11/Add.2, 19 March 2009, ¶11, online: UNFCCC <<http://unfccc.int/resource/docs/2008/cmp4/eng/11a02.pdf>>.*

²²² *Ibid* at 12.

²²³ *Ibid* at 15.

²²⁴ *Ibid* at 21.

²²⁵ *Decision 4/CMP.5: Report of the Adaptation Fund Board, FCCC/KP/CMP/2009/21/Add.1, 18–19 December 2009, recital, ¶1, online: UNFCCC <<http://unfccc.int/resource/docs/2009/cmp5/eng/21a01.pdf>>.*

²²⁶ *Ibid*, ¶5.

²²⁷ *Ibid*, ¶¶9 & 5.

²²⁸ See generally *Decision 5/CMP.5: Review of the Adaptation Fund: FCCC/KP/CMP/2009/21/Add.1, 18–19 December 2009, online: UNFCCC <<http://unfccc.int/resource/docs/2009/cmp5/eng/21a01.pdf>>.*

²²⁹ See *UN Framework Convention on Climate Change: Subsidiary Body for Implementation Report of the Subsidiary Body for Implementation on its Thirty-second Session, Held in Bonn from 31 May to 9 June 2010, FCCC/SBI/2010/10, 25 August 2010, ¶¶114-15, online: UNFCCC <<http://unfccc.int/resource/docs/2010/sbi/eng/10.pdf>>.*

²³⁰ *Ibid*.

conducted every three years.²³¹ The CMP.6 also confirmed the terms of reference for the review whose objective is to “ensure the effectiveness and adequacy of the Adaptation Fund and its institutional arrangements.”²³² Additionally, the CMP.6 requested annex I parties and international organizations provide funding to the AF, in addition to the share of proceeds from CDM project activities;²³³ it also requested that the secretariat conduct regional or sub-regional workshops to enable parties to familiarize the process and requirement of accreditation of national implementing entities.²³⁴

At the COP 17, held in Durban in 2011 (which served as the seventh meeting of the Parties to the Kyoto Protocol), the AFB submitted its report.²³⁵ It was decided that the initial review of the AF be completed at the eighth session.²³⁶

The latest addition to the string of funding mechanisms is the GCF, established at the 16th COP in Cancun, with the objective to allocate resources between adaptation and mitigation activities to contribute to the achievement of the ultimate objective of the UNFCCC.²³⁷ As noted,

[i]n the context of sustainable development, the Fund will promote the paradigm shift towards low-emission and climate-resilient development pathways by providing support to developing countries to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change, taking into account the needs of those developing countries particularly vulnerable to the adverse effects of climate change.²³⁸

²³¹ *Draft Decision-/CMP.6: Review of the Adaptation Fund*, Advance Unedited Version, ¶1, online: UNFCCC <http://unfccc.int/files/meetings/cop_16/conf_ erence_documents/application/pdf/2010_1204_cop16_cmp_review_afb.pdf>.

²³² *Ibid*, annex, ¶3.

²³³ *Ibid*, ¶6.

²³⁴ *Ibid*, ¶8.

²³⁵ See generally UNFCCC, *Report of the Adaptation Fund Board: Note by the Secretariat*, FCCC/KP/CMP/2011/6 (22 November 2011).

²³⁶ See “Decision 7/CMP.7: Review of the Adaptation Fund” in UNFCCC, *Report of the COP on its Seventeenth Session*, Add.2, *supra* note 142 at 5.

²³⁷ “Decision 1/CP.16: The Cancun Agreements: Outcome of the Work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention” in UNFCCC, *Report of the Conference of the Parties on its Sixteenth Session, Held in Cancun from 29 November to 10 December 2010: Addendum, Part Two: Action Taken by the Conference of the Parties at its Sixteenth Session*, FCCC/CP/2010/7/Add.1 (15 March 2011) at 17 [“Decision 1/CP.16”].

²³⁸ “Annex: Governing Instrument for the Green Climate Fund” in *Green Climate Fund - Report of the Transitional Committee, Draft Decision -/CP.17* (Advance Unedited Version) ¶2, online: UNFCCC <http://unfccc.int/files/meetings/durban_nov_2011/decisions/application/pdf/cop17_gcf.pdf>.

The parties also entrusted the work of designing the details of this fund with the Transitional Committee.²³⁹ Subsequently, at the 17th COP, the report of the Transitional Committee was accepted and approval granted to the governing instrument for the GCF.²⁴⁰ The COP also decided to designate the GCF as an operating entity of the financial mechanism of the Convention, in accordance with Article 11 of the UNFCCC.²⁴¹ The governing instrument of the GCF confers on it juridical personality and it is to be managed by a board consisting of 24 members representing, in equal numbers, developing and developed country parties.²⁴² All developing country parties are eligible to receive resources from this fund, which will have thematic funding windows.

Furthermore, the Fund will finance and support enhanced action on adaptation, mitigation, technology development and transfer, capacity-building and the preparation of national reports by developing countries. It will also support developing countries in pursuing project-based and programmatic approaches in accordance with climate change strategies and plans, such as low-emission development strategies or plans, nationally appropriate mitigation actions, and national adaptation plans of action.²⁴³ As of now, the fund has windows only for adaptation and mitigation.²⁴⁴ In allocating resources for adaptation, the board has been tasked to take into account the urgent and immediate needs of developing countries that are particularly vulnerable to the adverse consequences of climate change, including LDCs, SIDS and African States, using minimum allocation floors for these countries, where appropriate.²⁴⁵

In recognising the important role of the GCF in the climate finance architecture, the COP 18 at Doha stressed on the need to confer juridical personality and legal capacity to the Green Climate Fund.²⁴⁶ In addition, it also called for the expeditious implementation

²³⁹ "Decision 1/CP.16", *supra* note 237.

²⁴⁰ *Decision 3/CP.17: Launching the Green Climate Fund*, FCCC/CP/2011/9/Add.1 (11 December 2011), online: UNFCCC <http://test.informea.org/uploads/decisions/unfccc/_10227_502b64d884945_English_%20%203%20CP17.pdf>; see also *Green Climate Fund*, online: Green Climate Fund: Home <<http://gcfund.net/home.html>>.

²⁴¹ *Decision 3/CP.17, ibid.*

²⁴² *Ibid.*

²⁴³ *Ibid* at 63, ¶36.

²⁴⁴ *Ibid.*

²⁴⁵ "Annex: Governing Instrument for the Green Climate Fund" *supra* note 238, ¶52.

²⁴⁶ *Decision 10/CP.18, supra* note 185.

of the work plan and related policies and emphasised the need to balance the allocation of the GCF resources between adaptation and mitigation activities.²⁴⁷

5.4.4.1 Remarks

Drawing from the foregoing parts and connecting the salient points, a few crucial themes emerge. The first is that despite efforts to secure adequate funds for adaptation activities in developing countries, the reality is that we are “drifting into a situation of global adaptation apartheid,”²⁴⁸ as the flow of funds does not come close to the projected needs.²⁴⁹ Given this wide disparity between the actual demand and the supply of funds for adaptation activities, the current framework is analogous to using a sponge to mop up flood waters.²⁵⁰ In certain parts of the world, the situation is so desperate that people are using imported garbage to construct sea walls,²⁵¹ while in more affluent societies, adaptation takes diverse forms, like the construction of luxurious floating houses.²⁵² For millions of this planet’s impoverished people, climate change adaptation projects represent a primary lifeline; hence, developed countries must play greater roles in supporting adaptation activities through adequate funding and technology transfers.

Nevertheless, even vast increases in funding will not alone resolve the adaptation crisis, since the question as to whether the poor in vulnerable countries are truly able to benefit depends on a host of intrinsic and extrinsic factors, not the least of which is how the funds are administered. There is also concern that, due to the overlap between

²⁴⁷ *Ibid.*

²⁴⁸ Watkins, *supra* note 6 at 166. The Netherlands is spending up to USD25 billion to upgrade the water control systems that are already in place to combat SLR. See Lauren F Jones, “Treasuring the Chesapeake: An Analysis of Climate Change and Its Impact on the Chesapeake Bay and Maryland’s Surrounding Coastal Regions”, Comment, (2009) 38 U Balt L Rev 331 at 334 (HeinOnline). At the same time, developing countries are struggling to find funds for basic socio-economic and developmental issues.

²⁴⁹ As of 10th January 2010, the total funds made available under the five primary global adaptation assistance programmes was USD581 million, whereas, the UNFCCC estimates that the annual adaptation costs in developing countries stand somewhere between USD27 billion to USD66 billion per year. See generally Jordan Diamond & Carl Bruch, ‘The International Architecture for Climate Change Adaptation Assistance’ in Ryo Fujikura & Masato Kawanishi, eds, *Climate Change Adaptation and International Development: Making Development Cooperation More Effective* (Washington, DC: Earthscan, 2010) 291 at 292.

²⁵⁰ Watkins, *supra* note 6 at 167.

²⁵¹ People in the island of Majuro in Kiribati have built sea walls by using imported garbage from the US. *Rising Waters: The Islands*, online: ITVS <<http://archiv.e.itvs.org/risingwaters/islands.html>>.

²⁵² Watkins, *supra* note 6 at 167.

adaptation assistance and official development assistance (ODA), donors may divert their current ODA for adaptation activities rather than provide additional and a more secure stream of funds for the same.²⁵³ This highlights the need to streamline the different funding activities to avoid redundancies and achieve greater efficiency through improved coordinated activities, information sharing, and capacity building.²⁵⁴ As well, there has to be monitoring of these adaptation programmes where the emphasis should be on ground realities rather than the amounts transferred. The proposed protocol on climate change adaptation can at minimum *inter alia* streamline funding mechanisms so as to ensure adequacy and predictability in their supply, broaden access to funding, diversify revenue streams into the fund and establish performance and accountability standards to ensure that adaptation funds are utilised efficiently and that it truly reaches the needy. In addition, it can also broadly identify major areas and actions that require funding like coastal management, marine biodiversity protection, support to alternative livelihood opportunities, etc.

²⁵³ Diamond & Bruch, *supra* note 249.

²⁵⁴ *Ibid* at 307.

5.4.5 Climate Change Adaptation Obligations Under Other International Environmental Law Instruments

Apart from the primary climate change related instruments,²⁵⁵ a plethora of other international environmental law instruments can also trigger and support climate change adaptation actions,²⁵⁶ of which the CBD and the UNCCD are particularly relevant (and will be discussed below). Admittedly, climate change alters natural processes that have far-reaching implications for biodiversity conservation.²⁵⁷ As the impacts become more severe, there will be even greater losses to biota and increased desertification. Already in several parts of the world, habitats are transforming and species are experiencing changes in life cycles; some are developing new physical traits, while many are dying or becoming extinct.

In addition to the UNFCCC, the other conventions adopted as part of the Rio package (i.e., the CBD and the UNCCD) can also be used to facilitate climate change mitigation and adaptation. Moreover, measures under one convention can have repercussions on objectives espoused by the other two.²⁵⁸ To elucidate this aspect, it is well known that wetlands and mangroves are rich in marine biodiversity, which the CBD seeks to protect. Concurrently, given the high sequestration potential of wetlands and forests, sustainable management of these ecosystems fosters effective mitigation. If these are degraded, then their ability to absorb the excess amounts of carbon is diminished and natural carbon sinks become defunct forever. Similarly, from an adaptation perspective, wetlands and mangroves act as an important buffer to protect coastal infrastructure against sea level rise (SLR) and storm surges; thus, their conservation helps to promote

²⁵⁵ Slotau, *supra* note 120 at 195-99.

²⁵⁶ The international bill of rights, namely, the UDHR, ICCPR with its two Optional Protocols and the ICESCR can trigger adaptation actions. See generally *supra* note 108. Noteworthy is the fact that apart from the Rio instruments, there are several others like the *Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar), 1971*, the *Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972*, the *Convention on the Conservation of Migratory Species of Wild Animals, 1979*, and Forestry Principles that are relevant to climate change adaptation and marine and coastal biodiversity conservation.

²⁵⁷ See Ch 2, Part 2.5, for more details on the impact of climate change on coastal biodiversity.

²⁵⁸ UNEP & CBD, *Options for Enhanced Cooperation among the Three Rio Conventions, Note by the Executive Secretary*, UNEP/CBD/SBSTTA/10/INF, 15 December 2004, at 2, online: Convention on Biological Diversity <<http://www.cbd.int/doc/meetings/sbstta/sbstta-10/information/sbstta-10-inf-09-en.pdf>>.

climate change adaptation. Conserving coastal biodiversity can also serve to thwart desertification and land degradation.

The inter-relationship between the three Rio Conventions can be deciphered from an examination of article 2 of the UNFCCC, which recognizes the importance of limiting climate change to levels that will allow ecosystems to naturally adapt to it. This is an objective, which both the CBD and the UNCCD likewise espouse. Among the three conventions, the UNCCD expressly fosters this by highlighting the need to coordinate activities under relevant international agreements, particularly among the Rio instruments, to maximize benefits and avoid duplication of effort.²⁵⁹ To build inter-linkages between the Rio instruments, a Joint Liaison Group (JLG) consisting of the secretariats of the CBD, the UNCCD and the UNFCCC was established in 2001. The JLG works to enhance co-ordination between the three Conventions on a broad range of issues, including those relating to climate change adaptation.²⁶⁰

From the perspective of climate change adaptation in coastal zones, the CBD has the most relevance. A summary is provided below on the synthesis attempted between climate change adaptation and marine and coastal biodiversity conservation under the CBD. On its own, the CBD devotes energy to articulate links and build bridges between these themes, thereby providing a more concrete basis for actions. The various CBD COP meetings have played important roles in articulating this relationship and in providing further direction for coastal zone adaptation projects. Apart from several general COP decisions that are relevant to climate change, there are a few specific ones on climate change adaptation and biodiversity conservation, which are explained next.

One of the initial COPs that articulated this relationship was COP 5, Decision V/3, which noted that climate change was the primary causative factor leading to extensive coral bleaching, and that, in line with the precautionary approach, remedial measures needed to be taken. It sought to transmit this view to the UNFCCC and urged this body to take all possible actions to reduce the effect of climate change on water temperatures and to address the socio-economic impacts of coral bleaching on affected countries and

²⁵⁹ UNCCD, *supra* note 100, art 8.1.

²⁶⁰ *Joint Liaison Group* online: Convention on Biological Diversity <<http://www.cbd.int/cooperation/liaison.shtml>>.

communities.²⁶¹ It also sought to integrate the issue of coral bleaching in the programme of work for the conservation and sustainable use of marine and coastal biological diversity and to develop and implement a specific work plan on coral bleaching, in cooperation with the UNFCCC.²⁶²

Meanwhile, Decision VII/15 explained the importance of the ecosystem approach which “provides a framework for the integrated management of land, water and living resources”,²⁶³ and Decision VIII/30 calls upon parties and governments to develop rapid assessment tools to design and implement biodiversity conservation measures that contribute to climate change adaptation, particularly in vulnerable countries. Further, the decision calls for more involvement of indigenous and local communities and the promotion of regional cooperation in activities to enhance habitat connectivity across ecological gradients.²⁶⁴ Decision IX/16 on biodiversity and climate change provides for a series of guidance measures grouped under four clusters, many of which are relevant to climate change adaptation perspective.²⁶⁵

The COP via Decision X/33 re-emphasizes the importance of an ecosystem-based approach to adaptation. In compatibility with national capabilities and circumstances, it calls upon countries to integrate ecosystem-based approaches into national biodiversity strategies. As well, it plans to combat desertification and hopes to institute sustainable land management plans.²⁶⁶ In planning and implementing effective adaptation activities,

²⁶¹ V/3. *Progress Report on the Implementation of the Programme of Work on Marine and Coastal Biological Diversity (Implementation of Decision IV/5)*, UNEP/CBD/COP/5/23, at 75, ¶5, online: Convention on Biological Diversity <<http://www.cbd.int/doc/decisions/cop-05/full/cop-05-dec-en.pdf>>.

²⁶² *Ibid.*, ¶4.

²⁶³ UNEP & CBD, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Seventh Meeting: VII/15. Biodiversity and Climate Change*, UNEP/CBD/COP/DEC/VII/15, 13 April 2004, ¶8, online: Convention on Biological Diversity <<http://www.cbd.int/doc/decisions/cop-07/cop-07-dec-15-en.pdf>>.

²⁶⁴ UNEP & CBD, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Eighth Meeting: VIII/30. Biodiversity and Climate Change: Guidance to Promote Synergy among Activities for Biodiversity Conservation, Mitigating or Adapting to Climate Change and Combating Land Degradation*, UNEP/CBD/COP/DEC/VIII/30, 15 June 2006, ¶¶(2)-(4), online: Convention on Biological Diversity <<http://www.cbd.int/doc/decisions/cop-08/cop-08-dec-30-en.pdf>>.

²⁶⁵ UNEP & CBD, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Ninth Meeting, IX/16. Biodiversity and Climate Change*, UNEP/CBD/COP/DEC/IX/16, 9 October 2008, at 1, 3, 7-8, online: Convention on Biological Diversity <<http://www.cbd.int/doc/decisions/cop-09/cop-09-dec-16-en.pdf>>.

²⁶⁶ UNEP & CBD, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Tenth Meeting, X/33. Biodiversity and Climate Change*,

impacts on biodiversity should be considered and biodiversity-rich areas are neither to be degraded nor converted.²⁶⁷ The decision also prohibits the carrying out of any climate-related geo-engineering activities that may impact biodiversity until there is adequate scientific basis.²⁶⁸

5.4.5.1 Remarks

In sum, a number of opportunities exist to integrate climate change adaptation into several ongoing and future programmes by referencing a range of biodiversity relevant instruments. However, to secure a more coherent response in relation to coastal zones, it is necessary that the JLG extend its mandate well beyond the Rio Conventions, build synergies, and facilitate cross-pollination between other relevant environmental instruments. More importantly, to adapt to a rising sea and consequent impacts, the JLG must goad national governments to enact mainstream conservation of coastal and marine biodiversity and climate change adaptation in line with the precautionary and ecosystem-based approaches into all national policies, programmes and plans that apply to coastal zones. With this understanding of climate change adaptation, the next sub-section examines its relevance to the coastal zone.

5.5 CLIMATE CHANGE ADAPTATION FOR COASTAL AND MARINE ENVIRONMENTS

In 1988, the IPCC established three working groups, one of which was the Response Strategies Working Group. This group, in turn, established four subgroups, chief among which was the Coastal Zone Management Subgroup (CZMS), chaired by New Zealand and the Netherlands. The CZMS was entrusted with providing information and recommendations on CZM strategies and long-term policies on adaptation to climate change and SLR.²⁶⁹ It held two workshops, the first in Miami, Florida, and the second in Perth, Australia. Representatives from nearly 70 countries participated in both of these

UNEP/CBD/COP/DEC/X/33, 29 October 2010, ¶8(j), (k), online: Convention on Biological Diversity <<http://www.cbd.int/climate/doc/cop-10-dec-33-en.pdf>>.

²⁶⁷ *Ibid.*, ¶8(v).

²⁶⁸ *Ibid.*, ¶8(w).

²⁶⁹ J Dronkers et al, eds, *Report of the Coastal Management Subgroup: Strategies for Adaption to Sea Level Rise* (Geneva: IPCC, Response Strategies Working Group, 1990) at ii.

workshops and identified several adaptive responses,²⁷⁰ which were compiled in the report by the CZMS, subsequently adopted by the IPCC in 1990 as part of its First Assessment Report.²⁷¹

In crafting adaptive responses for coastal area climate change, the Report of the Coastal Management Subgroup emphasized the importance of government and the private sector input in coastal management.²⁷² As well, it articulated three principal objectives of coastal management: 1) avoiding development in areas vulnerable to inundation; 2) ensuring the continual functioning of critical natural systems; and 3) protecting human lives, essential properties and economic activities against the ravages of the seas.²⁷³ Moreover, the report stressed that coastal management programmes should give due consideration to ecological, cultural, historic and aesthetic values as well as to human safety and economic development.²⁷⁴ The report also identified several climate change adaptation measures that are grouped under the three broad categories of retreat, accommodate and protect.²⁷⁵ However, before proceeding to examine these in detail, it must be noted that it is difficult to categorize the different measures into silos as represented by these headings, as there is considerable overlap.

Planned retreat is a form of proactive adaptation that emphasizes hazard-avoidance and reduction. Although it is difficult to implement in countries where populations are already concentrated on the coastline, retreat seeks to prevent and remove further influxes of people and investment to areas that are vulnerable to severe erosion, flooding and weather events, all of which will be aggravated as SLR intensifies.²⁷⁶ The simplest form

²⁷⁰ *Ibid.*

²⁷¹ *Ibid* at iii.

²⁷² *Ibid* at 6.

²⁷³ *Ibid.*

²⁷⁴ *Ibid.*

²⁷⁵ *Ibid* at 6-8.

²⁷⁶ See also *Printz v Glenelg SC*, (2010), VCAT 1975 (Austl, VCAT), online: AustLII <<http://www.austlii.edu.au/au/cases/vic/VCAT/2010/1975.html>>. Initially, no planning permit was required to develop the land in question, which was the floodway of the Surrey River lying adjacent to a low lying coastal area. Accordingly, a building permit was issued. During construction the Environmental Significance Overlay Schedule 4 (ESO4) came into force. It became necessary for the construction to obtain permit and this was challenged. Even though the assessment was that the site is at a low risk of coastal impacts, the construction was disallowed. The tribunal was influenced by Victoria's Coastal Strategy which stressed caution while allowing development in coastal spaces, so that the future ability to apply adaptation strategies are not compromised. In this case, the buffering provided by the dune system and the estuary to the urban developed areas of Narrawong, would be diminished by the dwelling, which was described as a poor design that would occupy the

of planned retreat involves preventing development on vulnerable properties, placing restrictions on building within hazard zones, and permitting development in coastal areas only under stringent conditions.²⁷⁷ Planned retreat can be achieved by increasing public awareness and by increasing taxes on properties in vulnerable zones,²⁷⁸ setting high insurance premiums,²⁷⁹ and establishing setback lines,²⁸⁰ zoning, and buffer zones.²⁸¹

Retreat envisages different kinds of roles for the government. In the first instance, governmental effort is directed to limit development.²⁸² This is achieved by providing information on risks, expropriating land, withdrawing subsidies and incentives for development in vulnerable areas, enforcing land use restrictions, and prohibiting reconstruction of property damaged by storms.²⁸³ The second role calls upon the government to lay out the specifics, thereby providing investors with the opportunity to evaluate the uncertainty and make determinations on whether or not to proceed with development. This approach can be implemented in various ways, such as by enacting regulations that prohibit private construction of protective structures, or converting land ownership into long-term or conditional leases that terminate as and when the sea reaches a particular point.²⁸⁴

In the third role, the government takes on a more passive position, limiting itself to ensure that all stakeholders have full knowledge about the rate of expected SLR and the associated consequences, many of which may be uncertain.²⁸⁵ In other words, the forces of nature triggered by climate change are given a free hand to determine changes to coastal morphology.²⁸⁶ Accordingly, crops and timberlands may be left to deteriorate

buffer space. Placing a dwelling in such a setting introduced a foreign built element into a coastal foreshore setting, which could not blend into the landscape seriously compromising the capacity for adaptation. *Ibid.*

²⁷⁷ Dronkers et al, eds, *supra* note 269 at 6.

²⁷⁸ For more details on utilizing tax and market based tools to facilitate adaptation, see Jessica Grannis, *Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use* (Georgetown Climate Center, 2011) at 54-56.

²⁷⁹ Lloyd's, *Coastal Communities and Climate Change: Maintaining Future Insurability*, at 23, online: LLOYD'S <<http://www.lloyds.com/>> (emphasizing the key role of the insurance industry in facilitating adaptation).

²⁸⁰ For an elaboration of the concept, see text accompanying notes 591-93.

²⁸¹ For an elaboration of the concept, see text accompanying notes 594-98.

²⁸² Dronkers et al, eds, *supra* note 269 at 6.

²⁸³ *Ibid.*

²⁸⁴ *Ibid* at 6-7.

²⁸⁵ *Ibid* at 7.

²⁸⁶ *Ibid.*

from salt intrusion or by flooding, and mangroves, marshes and coral reefs may be allowed to drown with the inward movement of the sea. Market forces will then determine decisions relating to development, provided that private entities are willing to accept the risk. As a condition precedent to implementing retreat, it is essential that there be land for resettlement. Hence, retreat may not be a viable option for small island states and for areas reeling under intense coastal squeeze, such as mega-coastal cities.²⁸⁷

Accommodation involves advanced planning and the realization that some coastal zone values will invariably be lost.²⁸⁸ In other words, some people will have to abandon their homes and relocate to higher ground. Accommodation can take several forms – from “building codes and resilient designs”,²⁸⁹ to rebuilding restrictions and redesigning structures to minimize impacts (e.g., elevating residential and commercial buildings on pilings to protect them from floods).²⁹⁰ Measures like modifying drainage, rezoning vulnerable properties to discourage inappropriate land use, increasing natural resilience through coastal dune rehabilitation, beach nourishment²⁹¹ and wetland renewal and so on also fall under accommodation,²⁹² as do prohibitions on activities that impair the natural protection values of coastal ecosystems. These can include restrictions on infilling wetlands, cutting down mangroves, and mining corals and beach sand.²⁹³

²⁸⁷ Nick Abel et al, “Sea Level Rise, Coastal Development and Planned Retreat: Analytical Framework, Governance Principles and an Australian Case Study” (2011) 14 *Envtl Sci & Pol’y* 279 (ScienceDirect) (noting that in South East Queensland, Australia, the option of planned retreat is fast disappearing).

²⁸⁸ Dronkers et al, eds, *supra* note 269 at 6.

²⁸⁹ Grannis, *supra* note 278 at 23.

²⁹⁰ In Maasbommel (the Netherlands), houses are built to float on water. These wood-frame constructions are anchored to flexible mooring posts and they can accommodate a difference in water level up to 5.5 meters. *Facing up to Rising Sea-Levels: Retreat? Defend? Attack?, The Future of our Coastal and Estuarine Cities*, at 8, online: Building Futures <http://www.buildingfutures.org.uk/assets/downloads/Facing_Up_To_Rising_Sea_Levels.pdf>; see also *Taip v East*, *supra* note 89. Residential development permit was set aside, despite the fact that the buildings would suffer little physical impact from SLR and climate change due to it being raised to a certain level. Services such as sewer, water, power and telecommunications rely either on ground infrastructure or on assets that are susceptible to flooding and which were not protected from possible floods raising a foreseeable risk of failure of these services leading to residents being without sanitary services, clean drinking water and power. On this count, it was held that it is simply not enough to consider that the building itself will be protected due to it being raised to a certain level from SLR and that the sweep of other impacts are relevant and need to be taken into account. *Ibid.*

²⁹¹ See *Stop the Beach Renourishment, Inc. v Florida Dep't of Environmental Protection* (2010) USSC 08-1151, 130 S Ct 2592 (2010).

²⁹² Dronkers et al, eds, *supra* note 269 at 7.

²⁹³ *Ibid.*

The most effective implementation of planned retreat and accommodation is through legislated setback regulations.²⁹⁴ Setback lines are determined with reference to the tide line (the high water mark or the low water mark, the vegetation line, or a line that is associated with the primary dune), and restrictions can take the form of prohibitions on the setting up of new infrastructure seaward of the setback line.²⁹⁵ Setback lines must be determined by employing the best available science to ensure that coastal constructions are moved sufficiently inland to protect them from harmful waves and erosion.²⁹⁶

Buffer zones are another method to implement accommodation and retreat. Akin to setbacks, properties that offer critical natural processes (like buffering flood impacts, preserving aesthetics, and ensuring public access) are left untouched so that ecosystems such as wetlands are able to migrate inland with minimal impediments.²⁹⁷ Zoning and overlay zones are additional adaptation techniques. Given that a single storm may have the strength to haphazardly pull down constructed buildings and wash away roads and other critical infrastructure, zoning emerges as an important land-use planning tool that can minimize susceptibility to storms and coastal erosion through smart planning.²⁹⁸

Typically, zoning is the responsibility of local governments that divide the area into zones based on various criteria (e.g., earmarking land for residential, commercial, industrial and other purposes).²⁹⁹ The demarcations are plotted on a map and, development proceeds based on the zoning regulations. In order not to disrupt existing zoning classifications, local governments sometimes superimpose additional regulatory requirements in areas with special characteristics. This mechanism can be utilized to create an SLR overlay zone for areas that are most vulnerable to inundation and

²⁹⁴ Timothy Beatley, David J Brower & Anna K Schwab, *An Introduction to Coastal Zone Management*, 2d ed (Washington, DC: Island Press, 2002) at 138.

²⁹⁵ “Review of U.S. Ocean and Coastal Law: The Evolution of Ocean Governance Over Three Decades, Appendix 6 to the Final Report” in U.S. Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century: Final Report* (Washington, DC, 2004) at 28.

²⁹⁶ In the US, several states require new constructions to be set up only after considering the extent of erosion over long-time scales (the next 30 to 60 years). James E Neumann et al, *Sea-level Rise & Global Climate Change: A Review of Impacts to U.S. Coasts* (Pew Center on Global Climate Change, 2000) at 20.

²⁹⁷ *Ibid* at 26.

²⁹⁸ *Village of Euclid v Amber Realty Company*, 272 US 365, 47 S Ct 114, 71 L Ed 303, 1926 US LEXIS 8.

²⁹⁹ Cormac Cullinan, *Integrated Coastal Management Law: Establishing and Strengthening National Legal Frameworks for Integrated Coastal Management*, FAO Legislative Study, No 93 (Rome: FAO, 2006) at 187.

flooding.³⁰⁰ Overlays can disallow or impose new conditions on expansion or renovation of existing structures, prohibit or impose conditions on the rebuilding of damaged structures, or require the elevation of rebuilt structures.³⁰¹ Rebuilding restrictions may constrain landowners from reconstructing structures substantially destroyed by natural hazards. This may take the form of a total prohibition on re-construction or permit construction under stringent conditions.³⁰² Land and easement acquisition can also be used to implement planned retreat and accommodation.³⁰³

Generally, retreat and accommodate strategies are based on the assumption that inevitably there will be land loss and coastal flooding and that some coastal functions and values will be lost or altered. The focus is to help retain the dynamic nature of coastal ecosystems by allowing them to naturally adapt to SLR and other climatic processes.³⁰⁴

The last in the trio of objective of coastal management is protection, which seeks to insulate coastal residents from harmful impacts. This is achieved, to varying degrees, through the construction of a range of defensive coastal armouring and other measures to strengthen the ability of existing protective structures. These commonly take two forms: hard and soft coastline protection measures (or structural and non-structural devices).

Hard shoreline armouring is the conventional option adopted to combat SLR. It involves the use of engineering expertise to build solid structures like bulkheads, seawalls, revetments, dykes, groins, tide gates, and storm surge barriers to barricade the

³⁰⁰ See Grannis, *supra* note 278 at 19-20.

³⁰¹ *Ibid* at 19.

³⁰² *Ibid* at 31; see also Neumann et al, *supra* note 296 at 20 (noting that *South Carolina's Beachfront Management Act, 1988* states that structures incurring damages of more than two-thirds of pre-storm value cannot be reconstructed).

³⁰³ In the US, states and local governments use public funds to acquire lands (properties damaged by floods, or hazards) for conservation, and to promote public safety. Grannis, *supra* note 278 at 47. To ensure that coastal development does not prevent the inward migration of coastal ecosystems, rolling easements are used and are implemented via rolling coastal management statues, rolling conservation easements and conditions imposed through development permits (*ibid* at 41). Conservation easements or open space easements seek to preserve the property in its natural state. Here the landowner is paid for the easement or in the alternative provided a tax benefit in lieu of the grant. The property continues to be in private hands but development is limited according to the terms of the easement (*ibid* at 50-52). For more details on the concept of rolling easements, see also Ch 7, Part 7.3.1.3.

³⁰⁴ Luitzen Bijlsma et al, "Coastal Zones and Small Islands" in Robert T Watson, Marufu C Zinyowera & Richard H Moss, eds, *Climate Change 1995: Impacts, Adaptations, and Mitigation of Climate Change: Scientific-Technical Analyses, Contribution of Working Group II to the Second Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 1996) 289 at 311.

coast against flooding and erosion.³⁰⁵ Their construction is expensive³⁰⁶ and their long-term durability to hold back the magnitude of a rising sea on a large scale is limited. In certain cases, particularly from an ecological perspective, this measure can have counter-productive consequences on neighbouring properties. For instance, the construction of storm walls may end up preventing the natural inland migration of wetlands and mangroves, ultimately leading to their loss,³⁰⁷ and groins can entrap sediments that move along the shore. Moreover, protection to one area is often achieved at the expense of increased erosion in another.³⁰⁸ While construction of dams and salt-water intrusion barriers can safeguard water supplies, they can have negative consequences such as increasing sedimentation, which will erode coastal headlands and impair the ability of deltaic wetlands to naturally adapt to a rising sea.³⁰⁹ Furthermore, by interfering with the process of littoral drift, hard armouring can increase erosion and exacerbate flooding.³¹⁰ As well, it can restrict public access and prevent the launching and landing of traditional

³⁰⁵ Grannis, *supra* note 278 at 36.

³⁰⁶ The costs involved are site specific and many factors need to be considered like drainage requirements, labour costs, and foundation preparation work. Neumann et al, *supra* note 296 at 18.

³⁰⁷ Eric Gilman et al, *Pacific Island Mangroves in a Changing Climate and Rising Sea*, UNEP Regional Seas Reports and Studies No 179 (Nairobi: United Nations Environment Programme, Regional Seas Programme, 2006) at 9 (noting that landward migration of mangroves can be obstructed by seawalls). The salt marshes in southeast England appear to be migrating inland along the estuary. However, flood embankments interrupt the natural movement. Bijlsma et al, *supra* note 304 at 302.

³⁰⁸ Groins are a major technique used to stabilize the beach. In certain countries these are constructed by utilizing the trunks of rhun palm trees, which are jettied into the beach and tied together with timber. Sometimes they are also constructed by using re-enforced concrete. Dronkers et al, eds, *supra* note 269 at 9; Gambia, *First National Communication of the Republic of the Gambia to the United Nations Framework Convention on Climate Change* (Gambia: Department of State for Fisheries, Natural Resources and the Environment, Department of Water Resources, National Climate Committee, 2003) at 64.

³⁰⁹ Dronkers et al, eds, *ibid* at 12.

³¹⁰ As originally enacted, South Carolina's *Coastal Zone Management Act* of 1977 provided for seawalls, bulkheads, and other erosion control methods, which were later found to increase coastal erosion. Accordingly, the Beachfront Management Act amended this *Act* in 1988; see also *Byron Shire Council v Vaughan, Vaughan v Byron Shire Council*, (2009), [2009] NSWLEC 88 and (No 2) [2009] NSWLEC 110. The Land and Environment Court granted injunction restraining the respondents from putting up a rock wall since it could potentially produce adverse impacts on neighboring properties. *Ibid*. In 1989, with the construction of the harbour and two breakwaters, the littoral drift, (the natural south to north movement of sand) was affected in Pondicherry, India and since then the beaches have been eroding. By 2002, Northern Pondicherry lost all its sand and the government constructed a seven kilometers long seawall, aggravating erosion in nearby state of Tamil Nadu. India, Ministry of Environment & Forests, *Final Frontier: Agenda to Protect the Ecosystem and Habitat of India's Coast for Conservation and Livelihood Security, Report of the Expert Committee on the Draft Coastal Management Zone (CMZ) Notification, Constituted by the Ministry of Environment and Forests, Under the Chairmanship of Prof. MS Swaminathan* (New Delhi: Ministry of Environment & Forests, 2009) at 21.

catamarans that are used for fishing operations in the vast majority of coastal areas in the developing world.³¹¹ But perhaps the biggest drawback of hard shoreline armouring is that it lulls the government authorities, developers, and (more importantly) coastal communities into a false sense of security and complacency that all is well, so that a 'business-as-usual approach' towards coastal development can continue.³¹² Consequently, shoreline armouring is now only used when it is absolutely necessary to protect critical infrastructure or in cases where the area is intensely developed and supports a huge population, making relocation difficult.³¹³

Preference is given instead to soft armouring (“natural infrastructure” or “living shorelines”), which offers substantial protection against inundation, tidal flooding, wave impact, shore erosion, and salinity intrusion.³¹⁴ Soft armouring measures can take various forms, like artificial nourishing of beaches, dune creation,³¹⁵ protection of existing and creation of new bioshields (such as mangrove replanting,³¹⁶ wetland restoration,³¹⁷ and

³¹¹ Sudarshan Rodriguez et al, *Policy Brief: Seawalls* (UNDP/UNTRS: Chennai & ATREE: Bangalore, 2008) at 3.

³¹² Grannis, *supra* note 278 at 38.

³¹³ Dronkers et al, eds, *supra* note 269 at 7. See also US, *Living Shoreline Protection Act*, Md C Ann Envir §16-201(c)(1)(i) (2008), reads

(c)(1) Improvements to protect a person’s property against erosion shall consist of nonstructural shoreline stabilization measures that preserve the natural environment, such as marsh creation, except

(I) in areas designated by department mapping as appropriate for structural shoreline stabilization measures; and

(II) in areas where the person can demonstrate to the department’s satisfaction that such measures are not feasible, including areas of excessive erosion, areas subject to heavy tides, and areas too narrow for effective use of nonstructural shoreline stabilization measures.

³¹⁴ Robert RM Verchick & Joel D Scheraga, “Protecting the Coast” in Michael B Gerrard & Katrina Fischer Kuh, eds, *The Law of Adaptation to Climate Change: U.S. and International Aspects* (Chicago: American Bar Association, 2012) 235 at 250; *Living Shoreline Protection Act*, *ibid*.

³¹⁵ Grannis, *supra* note 278 at 39.

³¹⁶ In wake of the Indian Ocean tsunami, Malaysia and China are taking steps to protect mangroves, including their replanting. Poh Poh Wong, “Rethinking Post-tsunami Integrated Coastal Management for Asia-Pacific Ocean and Coastal Management” (2009) 52 *Ocean & Coast Mgmt* 405 at 407 (ScienceDirect).

³¹⁷ The Pichavaram wetlands in the South Indian State of Tamil Nadu acted as a buffer against the Indian Ocean tsunami, saving several villages from a total washout. In areas where the mangroves were destroyed as in the nearby Nagapattinam district the destruction was intense. *Ibid* at 407. The degree of protection afforded by mangroves depends on a host of factors like soil texture, angle of tsunami incursion relative to the coastline, slope of the forest floor, etc. Daniel M Alongi, “Mangrove Forests: Resilience, Protection from Tsunamis, and Responses to Global Climate Change” (2008) 76 *Estuarine, Coastal and Shelf Sci* 1 at 6 (ScienceDirect).

coastal forestry promotion³¹⁸), and the protection of other coastal ecosystems. While soft armouring may be less expensive than hard armouring, it may require constant upkeep and monitoring, and like hard armouring it may be impractical to implement on a large scale.³¹⁹

There are several adaptation measures some of which can be classified under the three broad groupings of retreat, accommodate and protect, while others can be categorized as miscellaneous, all of which can be utilized to secure CCCA. And this is so because, CCCA is three-dimensional - it addresses the right to development and enhancement of human capabilities, it seeks to protect and enhance the resiliency of coastal ecosystems, and finally, it addresses climate change impacts. Below an analysis of different CCCA measures is carried out based upon the three-dimensional facet of CCCA.³²⁰

³¹⁸ See also Keith Forbes & Jeremy Broadhead, *The Role of Coastal Forests in the Mitigation of Tsunami Impacts*, RAP Publication 2007/1 (Bangkok: FAO Regional Office for Asia and the Pacific, 2007).

³¹⁹ In the case of beach nourishment, as the sea level rises and as more sand is scoured away by wave action, cheaper sand resources may get exhausted and nourishment may cease to be cost-effective. Neumann et al, *supra* note 296 at 19.

³²⁰ The above assessment and method for scoring is reflective of the author's subjective opinion based on his personal understanding of coastal climate change adaptation. It is accordingly acknowledged that an alternative assessment and method for scoring is possible.

Table 1: CCCA Measures and SCD

ADAPTATION MEASURES	SUSTAINABLE COASTAL DEVELOPMENT								
	RIGHT TO DEVELOPMENT AND ENHANCEMENT OF ADAPTIVE CAPABILITIES How does this measure advance right to development?			COASTAL ENVIRONMENTAL PROTECTION How does it advance environmental protection?	CLIMATE CHANGE IMPACTS Which particular climate change impact does it address?				
	Enhancing livelihood opportunities	Protecting human health	Accessing ecosystems goods and services	Enhancing coastal ecosystem resilience	Sea level rise	Temperature variations	Ocean acidification	Extreme weather events	Erratic Precipitation patterns
The creation of MPAs and sanctuaries ³²¹	√			√	√	√	√	√	
Wetland restoration ³²²	√	√	√	√	√		√	√	
Use of water-cooling and desalination plants ³²³	√	√		√	√				√
Use of grey water ³²⁴			√	√					√
Planting of sea grass ³²⁵	√	√	√	√			√	√	

³²¹ Egypt, *Egypt Second National Communication under the United Nations Framework Convention on Climate Change* (Cairo: Egyptian Environmental Affairs Agency, 2010) at 91.

³²² *Ibid* at 88.

³²³ World Water Assessment Programme, *Managing Water under Uncertainty and Risk*, vol 1, The United Nations World Water Development Report 4 (Paris: UNESCO, 2012) at 58 (coastal desalination plants discharge brine into neighboring waters, with negative impacts on coastal marine ecology). The disadvantages of desalination include the use of large quantities of energy, which can increase GHG emissions, and the process also harms marine life. Angela Haren Kelley, "Seawater Desalination: Climate Change Adaptation Strategy or Contributor?" (2011) 38 *Ecology L Currents* 40 at 44-45 (QL).

³²⁴ Arizona has the best greywater legislation in the world. RF Michael Snodgrass, Note, "The Reuse of Household Water: A Small Step Toward Sustainable Living and Adaptation to Climate Change" (2010) 22 *Geo. Int'l Env'tl L Rev* 591 (QL) (outlining the features of greywater laws and use in the US, Australia and the Middle East and advocates the widespread use of grey water. Mauritius, *Second National Communication under the United Nations Framework Convention on Climate Change* (Vacoas: Government of Mauritius, 2010) at 81 [Mauritius, *Second National Communication*].

³²⁵ Saudi Arabia, *Second National Communication: Kingdom of Saudi Arabia* (2011) at 104 [Saudi Arabia, *Second National Communication*].

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	RIGHT TO DEVELOPMENT AND ENHANCEMENT OF ADAPTIVE CAPABILITIES How does this measure advance right to development?			COASTAL ENVIRONMENTAL PROTECTION How does it advance environmental protection?	CLIMATE CHANGE IMPACTS Which particular climate change impact does it address?				
	Enhancing livelihood opportunities	Protecting human health	Accessing ecosystems goods and services	Enhancing coastal ecosystem resilience	Sea level rise	Temperature variations	Ocean acidification	Extreme weather events	Erratic Precipitation patterns
Rainwater harvesting ³²⁶	√	√	√						√
Use of renewable energy sources ³²⁷	√	√	√	√	√	√	√	√	√
Facilitating inland migration of coastal ecosystems by removing barriers ³²⁸		√	√	√	√			√	
Rehabilitation of coral reefs ³²⁹	√	√	√	√	√	√	√	√	

³²⁶ Saint Lucia, *Second National Communication on Climate Change for Saint Lucia* (Saint Lucia: Ministry of Physical Development and the Environment, 2011) at 152; Cook Islands, National Environment Service, *Cook Islands Second National Communication under the United Nations Framework Convention for Climate Change* (Cook Islands: National Environment Service, 2011) at 49, 52 [Cook Islands, *Cook Islands Second National Communication*].

³²⁷ Alfred Micallef & Charles V Sammut, *The Second Communication of Malta to the United Nations Framework Convention on Climate Change* (Malta: Ministry for Resources and Rural Affairs, 2010) at 341.

³²⁸ Israel, *Second National Communication*, *supra* note 2 at 93.

³²⁹ *Ibid* at 23 (prevention of marine pollution from land sources to reduce stress on coral reefs); Solomon Islands, *Initial National Communications under the United Nations Framework Convention on Climate Change*, at 30, online: UNFCCC <<http://unfccc.int/resource/docs/natc/slbnc1.pdf>> [Solomon Islands, *Initial National Communications*].

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	RIGHT TO DEVELOPMENT AND ENHANCEMENT OF ADAPTIVE CAPABILITIES How does this measure advance right to development?			COASTAL ENVIRONMENTAL PROTECTION How does it advance environmental protection?	CLIMATE CHANGE IMPACTS Which particular climate change impact does it address?				
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Floating homes ³³⁰	√	√	√		√			√	
Improving coastal medical health facilities to deal with epidemics such as malaria, cholera, and dengue fever ³³¹	√	√			√			√	
Destroying insect breeding sites ³³²		√							
Preventing introduction of invasive invasives ³³³	√	√	√	√		√			

³³⁰ In the village of Massbommel on the banks of River Mass, in Netherlands, 37 water floating homes have been created. UNDP, *Human Development Report 2007/2008: Fighting Climate Change: Human Solidarity in a Divided World* (New York: UNDP, 2005) at 165.

³³¹ Robin Kundis Craig, “A Public Health Perspective on Sea-Level Rise: Starting Points for Climate Change Adaptation” (2010) 15:2 *Widener L Rev* 521 at 534(QL).

³³² Singapore, National Environment Agency, *Singapore's Second National Communication under the United Nations Framework Convention on Climate Change* (Singapore: National Environment Agency, 2010) at 32.

³³³ Israel, *Second National Communication*, *supra* note 2 at 81.

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Shoreline armouring, which includes construction of dykes, sea walls, breakwaters, flood protection systems, ripraps and groins, and their constant upkeep and refurbishment ³³⁴	√	√			√			√	
Restoring degraded coastal environments ³³⁵	√	√	√	√	√	√	√	√	√
Floodplain management ³³⁶	√	√	√	√	√	√	√	√	√
Land-use planning ³³⁷	√	√	√	√	√	√	√	√	√

³³⁴ Suriname, *First National Communication under the United Nations Framework Convention on Climate Change* (Suriname: National Institute for Environment and Development (NIMOS), 2005) at 54 [Suriname, *First National Communication*]; Egypt, *Egypt Second National Communication*, *supra* note 321 at 89 (emphasising the need to strengthen the Mohamed Ali Wall).

³³⁵ Micallef & Sammut, *supra* note 327 at 269.

³³⁶ Grannis, *supra* note 278 at 20-22.

³³⁷ *Section B Programs Containing Measures to Facilitate Adequate Adaptation to Climate Change*, at 401, online: MCTI <http://www.mct.gov.br/upd_blob/0215/215085.pdf>.

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	Enhancing livelihood opportunities	Protecting human health	Accessing ecosystems goods and services	Enhancing coastal ecosystem resilience	Sea level rise	Temperature variations	Ocean acidification	Extreme weather events	Erratic Precipitation patterns
Disaster management ³³⁸	√	√		√	√			√	√
Insurance ³³⁹	√				√			√	√
Mapping coastal resources and monitoring coastal areas ³⁴⁰			√	√	√		√	√	√
Sand banking and dune protection ³⁴¹	√		√	√	√			√	
Sharing experiences and know-how among coastal nations ³⁴²	√	√	√	√	√	√	√	√	√

³³⁸ Mauritius, *Second National Communication*, *supra* note 324 at 86. Tonga, Lu'isa Tu'i'afitu-Malolo, ed, *Second National Communication* (Nuku'alofa, Tonga: Second National Communication on Climate Change Project, 2012) at 120 [Tonga, Tu'i'afitu-Malolo].

³³⁹ Seychelles, Ministry of Environment & Transport, *Initial National Communication under the United Nations Framework Convention on Climate Change* (Seychelles: Ministry of Environment & Transport, 2000) at 89 [Seychelles, *Initial National Communication*].

³⁴⁰ One of the adaptation measures adopted by China is to strengthen its coastal monitoring system by using satellite remote sensing. China, *Initial National Communication on Climate Change* (Beijing, 2004) at 71 [China, *Initial National Communication*]. Israel, *Second National Communication*, *supra* note 2 at 93 (advocating the continued monitoring of changes to coastal cliffs, by high resolution photogrammetric mapping and by airborne laser mapping).

³⁴¹ Egypt, *Egypt Second National Communication*, *supra* note 321 at 88; Seychelles, *Initial National Communication*, *supra* note 339; see also Saudi Arabia, *Second National Communication*, *supra* note 325.

³⁴² The lessons learned, the principles, standards, and good practices, developed over the years, courtesy, the diverse ICZM projects implemented in almost all the coastal regions of the world are highly relevant in developing climate change adaptation responses appropriate to SLR and other climate change impacts on the coastal zone. James Tobey et al, "Practicing Coastal Adaptation to Climate Change: Lessons from Integrated Coastal Management" (2010) 38 Coastal Mgmt 317 at 317; Bahrain, Public Commission for the Protection of Marine Resources, Environment and Wildlife, *Bahrain's Second National Communication under the United Nations Framework on*

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	Enhancing livelihood opportunities	Protecting human health	Accessing ecosystems goods and services	Enhancing coastal ecosystem resilience	Sea level rise	Temperature variations	Ocean acidification	Extreme weather events	Erratic Precipitation patterns
Regulating population migration to vulnerable areas and re-settlement ³⁴³	√	√	√	√	√	√	√	√	√
Public participation in coastal management and decision-making ³⁴⁴	√	√	√	√	√			√	
Creating public awareness regarding the possible impacts of SLR ³⁴⁵		√	√	√	√	√	√	√	√

Climate Change (Bahrain, 2012) at 28 (advocating regional cooperation among neighboring countries to share information on the regional impacts of development activities on sediment transport).

³⁴³ Seychelles, *Initial National Communication*, *supra* note 339 at 88; Nigeria, Ministry of Environment, *Nigeria's First National Communication under the United Nations Framework Convention on Climate Change* (Abuja: Ministry of Environment, 2003) at 89 (advocating resettlement); Solomon Islands, *Initial National Communications*, *supra* note 329.

³⁴⁴ Bahrain, *Bahrain's Second National Communication*, *supra* note 342.

³⁴⁵ Bahrain, General Commission for the Protection of Marine Resources, Environment & Wildlife, *Bahrain's Initial Communications to the United Nations Framework Convention on Climate Change Volume I: Main Summary Report* (Bahrain: General Commission for the Protection of Marine Resources, Environment & Wildlife, 2005) at 23 [Bahrain, *Initial Communications to the UNFCCC*].

ADAPTATION MEASURES	SUSTAINABLE COASTAL DEVELOPMENT								
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	Enhancing livelihood opportunities	Protecting human health	Accessing ecosystems goods and services	Enhancing coastal ecosystem resilience	Sea level rise	Temperature variations	Ocean acidification	Extreme weather events	Erratic Precipitation patterns
Regulating groundwater extraction ³⁴⁶	√	√	√	√	√				√
Protecting fisheries ³⁴⁷	√		√			√			
Climate proofing ³⁴⁸	√	√	√	√	√	√	√	√	√
Maintaining drainage systems to prevent silt formation ³⁴⁹	√	√	√	√	√				

³⁴⁶ *Ibid.*

³⁴⁷ Korea, *Korea's Third National Communication under the United Nations Framework Convention on Climate Change, Low Carbon, Green Growth*, at 113, online: UNFCCC <<http://unfccc.int/resource/docs/natc/kornc3.pdf>>. In addition to the usual measures such as total allowable catch, fishing effort and gear limitations, and closed season, South Africa is implementing the ecosystem approach to fisheries, the code of conduct for responsible fisheries, and individual quota rights. South Africa, Department of Environmental Affairs, *South Africa's Second National Communication under the United Nations Framework Convention on Climate Change* (Pretoria, South Africa: The Department of Environmental Affairs, 2001) at 141 [South Africa, *Second National Communication*].

³⁴⁸ Climate proofing is defined as

. . . identifying risks to a development project, or any other specified natural or human asset, as a consequence of both current and future climate variability and extremes, and ensuring those risks are reduced to acceptable levels through long-lasting and environmentally sound, economically viable and socially acceptable changes implemented at one or more of the following stages in the project cycle: planning, design, construction, operation and decommissioning.

³⁴⁹ Cook Islands, *Cook Islands Second National Communication*, *supra* note 326 at 45. Seychelles, *Initial National Communication*, *supra* note 339 at 88.

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	Enhancing livelihood opportunities	Protecting human health	Accessing ecosystems goods and services	Enhancing coastal ecosystem resilience	Sea level rise	Temperature variations	Ocean acidification	Extreme weather events	Erratic Precipitation patterns
Establishing observation and early warning systems ³⁵⁰		√			√	√	√	√	√
Establishing set-back zones ³⁵¹	√	√			√			√	
Land acquisition ³⁵²		√		√	√			√	
Mangrove re-generation, coastal forestry and setting up green belts ³⁵³	√	√	√	√	√	√	√	√	

³⁵⁰ United Arab Emirates, Ministry of Energy, *Second National Communications to the Conference of the Parties of United Nations Framework Convention on Climate Change* (Abu Dhabi: Ministry of Energy, 2010) at 29 (calls for the establishment of a Coastal Adaptation Center). China, *Initial National Communication*, *supra* note 340 (proposing to strengthen its coastal monitoring system, particularly, satellite remote sensing and geographical information systems).

³⁵¹ South Africa, *Second National Communication*, *supra* note 347 at 142; Solomon Islands, *Initial National Communications*, *supra* note 329.

³⁵² David Ownes, “Land Acquisition and Coastal Resource Management: A Pragmatic Perspective” (1983) 24:4 *Wm & Mary L Rev* 625 at 630 (QL).

³⁵³ On-going adaptation measures include measures like re-forestation and cutting down trees affected by disease. Mauritius, *Second National Communication*, *supra* note 324 at 91.

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Controls on the over-harvesting of inert materials from coastal zones ³⁵⁴	√		√	√	√				
Improving livelihood opportunities of coastal communities ³⁵⁵	√	√	√		√	√	√	√	
Protecting lagoons, coral reefs, salt marshes, mud flats and wildlife habitats ³⁵⁶	√	√	√	√	√	√	√	√	√

³⁵⁴ See Vanuatu, *National Communication to the Conference of the Parties to the United Nations Framework Convention on Climate Change* (1999) at 34; see also Cape Verde, *Second National Communication on Climate Change of Cape Verde: United Nations Framework Convention for Climate Change* (Cape Verde: Ministry of Environment Rural Development and Marine Resources, 2010) at 84.

³⁵⁵ J Campbell, E Whittingham & P Townsley, “Responding to Coastal Poverty: Should we be Doing Things Differently or Doing Different Things?” in Chu Thai Hoanh et al, eds, *Environment and Livelihoods in Tropical Coastal Zones: Managing Agriculture–Fishery–Aquaculture Conflicts* (Oxon: CAB International, 2006) 274 at 286 (‘alternative livelihoods’ is the new mantra for many in the coastal management world).

³⁵⁶ For instance, see Antigua and Barbuda, *Antigua and Barbuda's Second National Communication on Climate Change* (2009) at 139, online: UNFCCC <<http://unfccc.int/resource/docs/natc/antnc2.pdf>> (advocating the constitution of MPAs).

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	Enhancing livelihood opportunities	Protecting human health	Accessing ecosystems goods and services	Enhancing coastal ecosystem resilience	Sea level rise	Temperature variations	Ocean acidification	Extreme weather events	Erratic Precipitation patterns
Controlling land-based sources of marine pollution ³⁵⁷	√	√	√	√		√	√		
Sensitizing the general public and coastal communities on possible impacts ³⁵⁸	√	√			√	√	√	√	
Strengthening law enforcement ³⁵⁹	√	√	√	√	√		√		

³⁵⁷ Israel, *Second National Communication*, *supra* note 2 at 93.

³⁵⁸ Tonga, Tu'i'afitu-Malolo, *supra* note 338.

³⁵⁹ Egypt, *Egypt Second National Communication*, *supra* note 321 at 91. China has enacted national and local laws on the sea, revised its marine environmental protection law and has published regulations on the marine environmental protection, mangrove protection and coral reef protection) China, *Initial National Communication*, *supra* note 340 at 70.

ADAPTATION MEASURES	SUSTAINABLE COASTAL DEVELOPMENT								
	RIGHT TO DEVELOPMENT AND ENHANCEMENT OF ADAPTIVE CAPABILITIES How does this measure advance right to development?			COASTAL ENVIRONMENTAL PROTECTION How does it advance environmental protection?	CLIMATE CHANGE IMPACTS Which particular climate change impact does it address?				
	Enhancing livelihood opportunities	Protecting human health	Accessing ecosystems goods and services	Enhancing coastal ecosystem resilience	Sea level rise	Temperature variations	Ocean acidification	Extreme weather events	Erratic Precipitation patterns
Recognizing traditional coastal management practices and know-how ³⁶⁰	√	√	√	√	√	√	√	√	√
Inter-linking issue-based sectoral management by a more holistic process ³⁶¹	√		√	√	√	√	√	√	√
Formulating guidelines and legislation for ICZM implementation ³⁶²	√	√	√	√	√	√	√	√	√

All of the above identified coastal adaptation measures are being implemented in different coastal countries. Apart from the three-dimensional impact of these adaptation

³⁶⁰ It is the natural-resource dependent poor communities in developing countries that are particularly vulnerable to climate change. They have traditional knowledge in agriculture, hunting, fishing, and use of medicinal plants. Many of these communities have been exposed to different kinds of environmental changes and have developed coping strategies. This wisdom can be utilized to support adaptation. Mirjam Macchi, "Indigenous and Traditional Peoples and Climate Change", Issues Paper (IUCN, March 2008) at 7.

³⁶¹ Israel, *Second National Communication*, *supra* note 2 at 93 (incorporate climate change implications in the land-use planning of the coastal area).

³⁶² Bahrain, *Initial Communications to the UNFCCC*, *supra* note 345; Suriname, *First National Communication*, *supra* note 334; Egypt, *Egypt Second National Communication*, *supra* note 321 at 89; Saudi Arabia, *Second National Communication*, *supra* note 325 at 107-8; Mozambique, Ministry for Co-ordination of Environmental Affairs, *Mozambique Initial National Communication under UN Framework* at 76-81.

measures, a discernible proposition that emerges is that practically, all these adaptation measures further SCD and can be accommodated and implemented via an ICZM programme. This aspect is elaborated in the next chapter.

5.6 CONCLUSION

As the discussion clarifies, the international climate change adaptation law is at a crossroads. There is a growing adaptation deficit, and the backbone of the international legal regime on climate change adaptation is weak. In fact, the climate change adaptation regime being reflected in the provisions of the various treaties as well as in the work of the different COPs and in financing programmes, etc. do not produce a composite framework supportive of adaptation actions. Instead, the inconsistent and diffused obligations preclude the formation of a holistic approach to climate change adaptation. All the same, it is clear that adaptation to the adverse consequences of climate change is an integral pillar of the climate change regime as it rebuilds confidence in communities by reducing the negative impacts of climate change and in certain cases it draws advantage from possible opportunities. It represents one of the most plausible ways to cope with impacts of climate change over the next few decades. Countries will have to expend aggressive efforts to combat climate change by investing resources on both low-carbon development in terms of mitigation and adaptation. However, most countries, particularly those in the developing world, do not have the necessary resources to meet their development needs let alone the additional burdens of adapting to climate change. And this may require the re-writing of the rules on international climate change adaptation.

As far as coastal climate change adaption is concerned, an ever-rising sea, the ferocity and increasing occurrence of extreme weather events, and an increasing surge in people settling in coastal areas all signal the urgent need for coastal climate change adaption. And as seen, CCCA is a three-dimensional process that addresses the right to development and enhancement of human capabilities, protects and enhances the resiliency of coastal ecosystems, and addresses climate change impacts. Therefore CCCA demands a twin-track approach, where measures must bolster coastlines while at the same time help people increase their adaptive capacities. As revealed, coastal adaptation

is a dynamic process with no ‘silver bullet’ solution that can be applied across the board. The development of a particular response depends on the circumstances of each coastal region, and adaptation responses have to be practical, flexible and sustained. A major chunk of the coastal zone climate change adaptation measures delineated in this chapter are presently being implemented via land-use management planning tools, and reference is rarely made to the larger ICZM objectives and goals. If sustainable coastal development is to be attained, this necessarily needs to change and CCCA measures (even if they continue to be part of land use planning or other strategies) must be sufficiently integrated to be a necessary component of an ICZM programme. This message is elaborated in the next chapter.

6.1 INTRODUCTION

The conceptual foundations of integrated coastal zone management (ICZM) can be traced to the mid-1960s, in the establishment of the San Francisco Bay Conservation and Development Commission, which formed as a result of a growing awareness that the environmental issues pertaining to the coast required a distinctive response.¹ Initially known simply as coastal zone management (CZM), the concept got a boost with the declaration of the US federal *Coastal Zone Management Act, 1972*.² A decade later, the term ‘integrated coastal zone management’ emerged and pilot programmes were initiated in the coastal countries of Ecuador, Sri Lanka, and Thailand by the U.S. Agency for International Development, and the Coastal Resources Center at the University of Rhode Island played an important role in its popularization.³ However, it was not until the Earth Summit, with its Chapter 17 of Agenda 21 (which can be considered as the Rosetta Stone of sustainable coastal development (SCD) for providing valuable insights into how sustainable development is to be operationalized for the marine and coastal environment), that the utility of ICZM was acknowledged.⁴ Chapter 17 of Agenda 21 also called upon coastal states to formulate and implement coastal management programmes,⁵ leading to an upsurge in ICZM activities.

¹ Chua Thia-Eng, *The Dynamics of Integrated Coastal Management: Practical Applications in the Sustainable Coastal Development in East Asia* (Quezon City: GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas, 2006) at 14 [Thia-Eng, *Dynamics of Integrated Coastal Management*].

² Pub L No 92-583, 86 Stat 1280 (codified as amended at 16 USC §1451-1464 (West 1985 & Supp 1999)).

³ Jens Sorensen, “National and International Efforts at Integrated Coastal Management: Definitions, Achievements, and Lessons” (1997) 25:1 Coastal Mgmt 3 at 13 [Sorensen, “National and International Efforts”]; see also Chua Thia-Eng, “Essential Elements of Integrated Coastal Zone Management” (1993) 21 Ocean & Coast Mgmt 81 at 82 [Thia-Eng, “Essential Elements”] (outlining the essential features of a regional project by the Southeast Asian Nations in 1986 sponsored by USAID to address coastal environmental degradation issues).

⁴ James Tobey & Richard Volk, “Learning Frontiers in the Practice of Integrated Coastal Management” (2002) 30 Coastal Mgmt 285 at 288.

⁵ Nicholas A Robinson, ed, *Agenda 21 & The UNCED Proceedings*, vol 4, 3rd series, International Protection of the Environment (New York: Oceana Publications, Inc, 1993) at 307, ch 17, ¶17.6(b); see also Biliiana Cicin-Sain, “Earth Summit Implementation: Progress Since Rio” (1996) 20:2 Mar Pol’y 123 at 126-7 (ScienceDirect).

Another major catalyst was the significant rise in investments on coastal and marine related projects by multilateral and bilateral donor agencies.⁶ While in 1993, there were only 57 nations that were engaged in CZM activities, by 2002, the number had doubled, and nearly 95 coastal nations or semi-sovereign states had some sort of ICZM activities in place. Interestingly, the majority of these programmes were from the developing world.⁷

Despite the absence of a dedicated international treaty on ICZM, regular references occurring in a large number of international environmental agreements have cumulatively become a central organizing force that helps tie together different coastal and marine management efforts at national levels.⁸ Even some of the treaties entered prior to the United Nations Conference on Environment and Development (UNCED) indirectly influenced the development of ICZM.⁹ As well, programmes such as the International Coral Reef Initiative,¹⁰ the Programme of Action for the Protection of the Marine Environment from Land-Based Activities,¹¹ the Programme of Action for the Sustainable

⁶ In Latin America, between 1992 and 2000, international donors invested nearly USD1.3 billion in coastal management. The World Bank strategy for coastal and marine areas involves investments to the tune of USD500 million in Africa and USD175 million in lending operations in the Asia-Pacific region. The ADB has invested USD1.2 billion for marine resources projects in the Asia-Pacific region. Stefano Belfiore, "The Growth of Integrated Coastal Management and the Role of Indicators in Integrated Coastal Management: Introduction to the Special Issue" (2003) 46 *Ocean & Coast Mgmt* 225 at 226 (ScienceDirect); see also Maren Lau, "Integrated Coastal Zone Management in the People's Republic Of China – An Assessment of Structural Impacts on Decision-Making Processes" (2005) 48 *Ocean & Coast Mgmt* 115 at 117 (ScienceDirect). Despite China not having certain fundamental preconditions to implement an ICZM programme like a functioning legislative system, high degree of public participation, and an independent coordinating agency, the Chinese government has also decided to implement ICZM. *Ibid.*

⁷ Jens Sorensen, *Baseline 2000 Background Report: The Status of Integrated Coastal Management as an International Practice*, Coastal Zone Canada Association, Baseline 2000 (2nd Iteration, 2002) at 3-1 [Sorensen, *Baseline 2000*].

⁸ Some of the major ones include: the *Convention on Biological Diversity*, 1992, the *UN Framework Convention on Climate Change*, 1992, the *Bonn Convention on the Conservation of Migratory Species of Wild Animals*, 1979, the *Bern Convention on the Conservation of European Wildlife and Natural Habitats*, 1979, the *Convention on Environmental Impact Assessment in a Trans-boundary Context*, 1991 and the *Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters*, 1998, the *United Nations Convention on the Law of the Sea*, 1982, and the *Ramsar Convention on Wetlands*, 1971.

⁹ *United Nations Convention on the Law of the Sea*, 10 December 1982, 1833 UNTS 397, 21 ILM 1261 (entered into force 16 November 1994) [LOSC], pmb1.

¹⁰ *International Coral Reef Initiative: An Informal Partnership to Preserve Coral Reefs around the World*, online: ICRI <<http://www.icriforum.org/>>.

¹¹ UNEP, *Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities*, UNEP(OCA)/LBA/IG.2/7 (5 December 1995).

Development of Small Island Developing States,¹² and the Plan of Implementation of the 2002 World Summit for Sustainable Development¹³ have underlined the benefits of an integrated approach to coastal management.

This chapter begins with an attempt to define the concept of ICZM. As will be seen, various definitions on ICZM proposed by academics and international organisations will be utilised to capture the underlying essence of the concept. The discussion in the next section then proceeds to examine the structure of an ICZM process. As mentioned earlier, ICZM is the basic methodological tool to secure SCD. Accordingly, the central pillars in terms of its core principles that help to operate an ICZM process are described. Even though ICZM has been in vogue for some time now, coastal areas continue to be degraded. Some of the major criticisms against this concept are examined in section 6.4. Thereafter, the central thesis of this part, namely, the utility of linking coastal climate change adaptation (CCCA) within an ICZM process is described in section 6.5. The discussion concludes by re-emphasizing the utility of ICZM.

6.2 DEFINING ICZM

Various definitions have been offered to describe ICZM.¹⁴ Leading academics define ICZM as

a continuous and dynamic process by which decisions are taken for the sustainable use, development, and protection of coastal and marine areas and resources. ICM acknowledges the interrelationships that exist among coastal and ocean uses and the environments they potentially affect, and is designed to overcome the fragmentation inherent in the sectoral management approach.

ICM is multi-purpose oriented, it analyzes implications

¹² For the text of the Programme of Action for the Sustainable Development of Small Island Developing States, see UNGA, *Report of the Global Conference on the Sustainable Development of Small Island Developing States: Bridgetown, Barbados, 25 April-6 May 1994*, A/CONF. 167/9 (October, 1994) at 6.

¹³ “Plan of Implementation of the World Summit on Sustainable Development” in UN, *Report of the World Summit on Sustainable Development Johannesburg, South Africa, 26 August-4 September 2002*, A/CONF.199/20* (New York: UN, 2002) at 7 [*Johannesburg Plan of Implementation*].

¹⁴ At minimum, 29 key guidance documents have been produced over the past decade and a body of knowledge is there on important integrated coastal management principles. Sorensen, *Baseline 2000*, *supra* note 7 at annex F.

of development, conflicting uses, and interrelationships between physical processes and human activities, and it promotes linkages and harmonization among sectoral coastal and ocean activities.¹⁵

Similarly, for Chua Thia-Eng,

ICZM is a resource management system, which employs an integrative, holistic approach and an interactive planning process in addressing the complex management issues in the coastal area. It could serve as the blueprint for attaining the goals and objectives of sustainable development by: maintaining the functional integrity of the coastal resource systems; reducing resource-use conflicts; maintaining the health of the environment; facilitating the progress of multi-sectoral development.¹⁶

Jens Sorensen relies on the definition agreed upon at the five-day workshop of ICZM practitioners from 28 countries, in Charleston, USA, in 1989. The main purpose of the workshop was to review the progress of ICZM. It was decided that ICZM is “a dynamic process in which a coordinated strategy is developed and implemented for the allocation of environmental, socio-cultural, and institutional resources to achieve the conservation and sustainable multiple use of the coastal zone.”¹⁷ Furthermore, it was decided that an ICZM process should have the following five attributes: 1) it should be a process that is spread over a considerable period of time; 2) there has to be a governance arrangement to establish policies for making allocation decisions; 3) this governance arrangement should use one or more management strategies to rationalize and systemize allocation decisions; 4) the management strategies should be selected based on a systems perspective which recognizes the interconnections among coastal systems; and, 5) there should be a geographic boundary that extends from the ocean environment across the transitional shore environments to some inland limit.¹⁸

The European Union broadly defines ICZM as:

¹⁵ Biliiana Cicin-Sain et al, “Education and Training in Integrated Coastal Management: Lessons from the International Arena” (2000) 43 *Ocean & Coast Mgmt* 291 (ScienceDirect) [Cicin-Sain et al, “Education and Training”].

¹⁶ Thia-Eng, “Essential Elements”, *supra* note 3 at 84.

¹⁷ Jens Sorensen, “The International Proliferation of Integrated Coastal Zone Management Efforts” (1993) 21 *Ocean & Coast Mgmt* 45 at 49.

¹⁸ *Ibid* at 49-50.

a dynamic, continuous and iterative process designed to promote sustainable management of coastal zones. ICZM seeks, over the long-term, to balance the benefits from economic development and human uses of the Coastal Zone, the benefits from protecting, preserving, and restoring Coastal Zones, the benefits from minimizing loss of human life and property, and the benefits from public access to and enjoyment of the Coastal Zone, all within the limits set by natural dynamics and carrying capacity.

The word 'Integrated' in ICZM refers both to the integration of objectives and to the integration of the multiple instruments needed to meet these objectives. It means integration of all relevant policy areas, sectors, and levels of administration. It means integration of the terrestrial and marine components of the target territory. ICZM is integrated in both time and space, and is inherently multi-disciplinary. ICZM should certainly not be just pigeon-holed under 'environment'.

Although ICZM refers to 'management', in fact, the ICZM process covers the full cycle of information collection, planning, decision-making, management and monitoring of implementation. 'Planning' is thus intended in its broadest sense, to mean strategic policy development, rather than only land use planning or other sectoral planning¹⁹

For the World Bank, ICZM is:

[a] process of governance and consists of the legal and institutional framework necessary to ensure that development and management plans for coastal zones are integrated with environmental (including social) goals and are made with the participation of those affected. The purpose of ICZM is to maximize the benefits provided by the coastal zone and to minimize the conflicts and harmful effects of activities upon each other, on resources and on the environment.²⁰

The GESAMP defines

¹⁹ EC, *Towards a European Integrated Coastal Zone Management (ICZM) Strategy: General Principles and Policy Options A Reflection Paper* (Luxembourg: Office for Official Publications of the European Communities, 1999) at 16.

²⁰ Jan C Post & Carl G Lundin, eds, *Guidelines for Integrated Coastal Zone Management*, Environmentally Sustainable Development Studies and Monographs Series No 9 (Washington, DC: The World Bank, 1996) at 1.

[i]ntegrated Coastal Management (ICM) [a]s a process that unites government and the community, science and management, sectoral and public interests in preparing and implementing an integrated plan for the protection and development of coastal ecosystems and resources. The overall goal of ICM is to improve the quality of life of human communities who depend on coastal resources while maintaining the biological diversity and productivity of coastal ecosystems.²¹

The Mediterranean ICZM protocol, the first supra-national binding legal instrument on ICZM²² that binds parties that border the Mediterranean sea, defines it as a dynamic process for the sustainable management and use of coastal zones, taking into account at

the same time the fragility of coastal ecosystems and landscapes, the diversity of activities and uses, their interactions, the maritime orientation of certain activities and uses and their impact on both the marine and land parts.²³

From the above, it is apparent that ICZM is a fairly established idea in coastal governance and management. It seeks to control the unabated destruction of the coastal environment and achieve holistic and SCD through sound proactive planning to restore the health and productivity of coastal ecosystems. It has as its central tenet the objective of improving the quality of life of coastal communities, so that they derive the maximum benefits from the functions and values provided by coastal ecosystems.²⁴

In achieving these objectives, ICZM marks a break from past management efforts by helping to disentangle the gridlock characterizing the coastal management systems of most countries. This is a transformation based on multidisciplinary and participatory approaches, building on traditional and modern coastal management practices.²⁵ Essentially, it is a proactive response (in contrast to reactive and ad hoc approaches), and

²¹ IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP & Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP), *The Contributions of Science to Integrated Coastal Management Food and Agriculture Organization of the United Nations*, GESAMP Rep Stud No 61 (Rome, 1996).

²² Julien Rochette, Raphaël Billé & IDDRI, *Analysis of the Mediterranean ICZM Protocol: At the Crossroads between the Rationality of Provisions and the Logic of Negotiations* [nd] at 4, online: CIRCLE-MED <http://www.circle-med.net/doc/ICZM_Med_IDDRI.pdf>.

²³ *Protocol on Integrated Coastal Zone Management in the Mediterranean*, [2009] OJ L 34/19, [ICZM Protocol], art 2(f).

²⁴ For the various definitions of ICZM, see *supra* notes 14-23 and accompanying text.

²⁵ *Ibid.*

it emerges as an iterative and discursive process that seeks to harmonize the multitude of sectoral, economic, social and environmental policies and plans that operate in the coastal landscape and the various coastal stakeholders through a comprehensive and systematic integration to ensure that there is concerted action to achieve SCD.²⁶ In sum, ICZM exhibits five defining features namely: 1) it is a dynamic process imbued in adaptive management; 2) it is a roadmap to the ultimate objective of SCD; 3) it seeks to secure spatial integration, i.e., integration between the dry and wet sides of the coast; 4) it is based on bottom-up and decentralised approaches to coastal management; and 5) ICZM does not displace sectoral management; rather it harmonizes the different sectoral efforts in a web to produce a more holistic response.

Before proceeding further, as seen in chapter three in relation to the Indus and the Ganges-Brahmaputra delta, rivers play a major role in maintaining coastal health.²⁷ There is in fact growing clamour to link ICZM with river basin or catchment management, christened as “Integrated Coastal Area and River Basin Management.”²⁸ Similarly, activities further off-shore, for example fisheries exploitation, offshore oil and sediment extraction, shipping, oil and other toxic chemical spillage, etc. can severely impact the coastal environment and therefore there is also a tendency to approach ICZM as part of a broader “Integrated Maritime Policy,” particularly to fit this management process “with newer (and better funded) oceans-based initiatives, such as maritime or marine spatial planning.”²⁹ While drawing linkages with other process has relevance and can contribute to sustainable development, all these tools are unique processes by themselves and are independent of each other.

²⁶ *Ibid.*

²⁷ For more information regarding the role played by rivers in maintaining the health of deltas, see Ch 3, Parts 3.2.2 & 3.2.3.

²⁸ See Ramsar, Resolution VIII.4: *Principles and guidelines for incorporating wetland issues into Integrated Coastal Zone Management (ICZM)*, prin 8, online: Ramsar <http://www.ramsar.org/cda/en/ramsar-documents-resol-resolution-viii-4/main/ramsar/1-31-107%5E21494_4000_0_>.

²⁹ Aldo Chircop & Ryan O’Leary, "Legal Frameworks for Integrated Coastal and Ocean Management in Canada and the European Union: Some Insights from Comparative Analysis" 13:3 (2012) *Vt J Env'tl L* 425 at 442 (HeinOnline); see also EC, *Proposal for a Directive of the European Parliament and of the Council Establishing a Framework for Maritime Spatial Planning and Integrated Coastal Management* [2013] 0074 (COD) at 8 [EC, *Proposal for a Directive*].

6.3 DECODING ICZM: THE DEVIL IS IN THE DETAILS

Being dynamic and nebulous, ICZM can take various forms, depending on the circumstances and issues that confront a country's coastline, the nature of its coastal resources and biodiversity, and its developmental priorities. This picture is complicated by an absence of a dedicated and binding international legal instrument on ICZM to provide the fundamental rules of the practice.³⁰ Still, certain common traits unique to it can be discerned from guidance documents, academic writings, regional protocols and other instruments, in addition to national ICZM action plans and strategies. A few of these are relayed here in order to develop a structure for an ICZM process in the succeeding paragraphs.

A unique feature of the ICZM is that it primarily envisages a partnership between various stakeholders for effective coastal management. As noted above, it is the general despondency over the perceived inability of the convention-based approaches to realize sustainable development goals that led to the emergence of Type-II partnerships at the international level, which has as its central feature the confluence and co-ordination of actions by multiple actors.³¹ Akin to this approach, ICZM reflects current thinking on how SCD is to be achieved by providing a platform for a range of players to come together and pool their resources and management efforts to plan strategically and holistically for coastal zones.³² The central feature of the ICZM process is that its conceptual foundations are based on sustainability principles, which guides its

³⁰ For a discussion on ICZM and its recognition in international environmental law, see Ch 7, Part 7.2.

³¹ For more discussion on the partnership approach to sustainable development, see Ch 4, Part 4.2.1.

³² Significantly, out of the nearly 349 partnerships several under the Commission for Sustainable Development are relevant to coastal management and to coastal environmental protection. A few are: the Adriatic Sea Integrated Coastal Areas and River Basin Management System Pilot Project; African Process for the Development and Protection of the Marine and Coastal Environment in Sub-Saharan Africa; Application of Nuclear and Non-nuclear Techniques for the Monitoring and Management of Harmful Algal Blooms in the Benguela Coastal Region; Asian-Pacific Coastal Zone Environment Assessment; Coastal Community Environmental Education Program (White Water to Blue Water); Community Development for Sustainable Water and Environmental Management in Coastal Populations of the Caribbean Sea (White Water to Blue Water); International Network of Practitioners and Academics to Support Implementation of Coastal and Ocean Management Programs; Partnerships in the local implementation of coastal strategies and integrated coastal management programs in East Asia; and Seawater Forest Initiative. For further information, see *Partnerships for Sustainable Development - CSD Partnerships Database*, online: UN Division for Sustainable Development <http://webapps01.un.org/dsd/partnerships/public/partnerships/title_al_1_1.html>.

development and implementation. Before proceeding further, the following observation on “principles” is noteworthy:

Principles are derived from our fundamental values and beliefs about how humans should behave. They are an attempt to encode how values and norms can be expressed in decision-making and some actions. It is useful to divide principles into two categories – those that are substantial, i.e., based on deep beliefs that guide our vision for the future and thus the way that we approach governance; and those that are procedural, i.e., that guide the way we interact, make decisions and do business on a daily basis.³³

Usually, an ICZM programme provides the design for the management of multifarious issues, and these are built around core sustainability principles. Some illustrations that demonstrate the importance of sustainability principles in working an ICZM process will follow.

In their treatise, Biliana Cicin-Sain and Robert W. Knecht trace these principles to two primary sources. The first are those collectively identified in the Earth Summit, and the second source emanates from key international agreements that are specifically related to the special character of the coasts and the oceans.³⁴ Chua Thia-Eng locates four fundamental, 23 substantive, and seven procedural principles.³⁵ Based on UNCED’s Agenda 21, the World Bank identifies the following primary principles for ICZM: precautionary, polluter pays, proper resource accounting, transboundary responsibility, and intergenerational equity.³⁶ The European Union emphasizes the following: the

³³ Robin Mahon, Lucia Fanning & Patrick McConney, “Principled Ocean Governance for the Wider Caribbean Region” in Lucia Fanning, Robin Mahon & Patrick McConney, eds, *Towards Marine Ecosystem-based Management in the Wider Caribbean*, MARE Publication Series No 6 (Amsterdam: Amsterdam University Press, 2011) 27 at 30; Philippe Sands, “International Law in the Field of Sustainable Development: Emerging Legal Principles” in Winfried Lang, ed, *Sustainable Development and International Law*, International Environmental Law and Policy Series (London: Graham & Trotman/ Martinus Nijhoff, 1995) 53 at 54-55 (drawing out the distinctions between principles and rules).

³⁴ Biliana Cicin-Sain & Robert W Knecht, *Integrated Coastal and Ocean Management: Concepts and Practices* (Washington, DC: Island Press, 1998) at 52; Biliana Cicin-Sain, “Sustainable Development and Integrated Coastal Management” (1993) 21 *Ocean & Coast Mgmt* 11 at 32-34 [Cicin-Sain, “Sustainable Development”].

³⁵ Thia-Eng, *Dynamics of Integrated Coastal Management*, *supra* note 1 at 90.

³⁶ Post & Lundin, eds, *supra* note 20 at 6.

precautionary principle, inter- and intra-generational equity, adaptive management and reliance on sound science, respecting the carrying capacity of ecosystems, and wide-stakeholder involvement.³⁷ The Mediterranean ICZM protocol also identifies certain general principles of ICZM, namely, preventing damage to the coastal environment, formulation of land use strategies, plans and programmes, utilising ecosystems approach to coastal planning and management, the principle of spatial integration, respect to the carrying capacity, preventing the negative effects of natural disasters and of development, transparency in the decision-making process, participation by stakeholders, and avoidance of urban sprawl.³⁸

The recent publication, “A Handbook for Measuring the Progress and Outcomes of Integrated Coastal and Ocean Management”³⁹ identifies the environment and development principles, such as the right to develop; inter-generational equity; environmental assessments; precautionary approach; polluter-pays principle; and openness and transparency in decision-making as being central to this process.⁴⁰ The Integrated Coastal Zone Management Action Plan for Guyana, 2000, presupposes the involvement of government at all levels, along with conservation of common property resources, planning and managing land and sea uses in combination, the importance of multi-use management and traditional management, and the need for environmental impact assessment (EIA).⁴¹ In its framing of ICZM, the Integrated Coastal Zone Management Action Plan for Kenya, 2010-2014, proposes the ecosystem-based approach, participatory and inclusive approaches, application of the precautionary and polluter pays principles, use of the best available science and adaptive management, promotion of stewardship, and balancing development and conservation objectives as

³⁷ See EC, *Recommendation of the European Parliament and of the Council of 30 May 2002 concerning the implementation of Integrated Coastal Zone Management in Europe*, (2002/413/EC) [2002] OJ L 148/24 at 25, ch 2.

³⁸ *ICZM Protocol*, *supra* note 23, art 6.

³⁹ Sherry Heileman, ed, *A Handbook for Measuring the Progress and Outcomes of Integrated Coastal and Ocean Management*. Intergovernmental Oceanographic Commission Manuals and Guides, 46, ICAM Dossier, 2 (Paris: UNESCO, 2006) (English).

⁴⁰ *Ibid* at 7.

⁴¹ Guyana, Environmental Protection Agency, *Integrated Coastal Zone Management Action Plan* (Guyana: EPA, 2000).

essential guiding principles.⁴² The Canada’s Ocean Strategy recognises ecosystem-based management, sustainable development, precautionary approach, conservation, duty and shared responsibility for supporting the sustainable development of marine resources, flexibility, and inclusiveness as principles that guide the integrated management approach.⁴³

From the above, it emerges that in opening the ICZM toolbox, a repertoire of sustainability principles are available to support and provide guidance to work the ICZM process. State parties that wish to implement ICZM must commit themselves to these principles; however, they still have freedom to develop and tailor their actions according to local conditions, needs, concerns, and aspirations.⁴⁴ These principles can be arranged in three tiers, two of which can be further divided (see Figure 3 below).

⁴² Ministry of Environment and Mineral Resources & NEMA, *Integrated Coastal Zone Management (ICZM) Action Plan for Kenya, 2010-2014: Towards Integrated Management of Kenya’s Coastal and Marine Resources* [nd] at 48-49.

⁴³ Canada, *Canada’s Oceans Strategy: Our Oceans, Our Future* (Ottawa: Fisheries and Oceans Canada, 2002) at 9-10. Even though these principles have been articulated as essential to integration in an ocean management context, many of these hold relevance to integration as understood for coastal zone management.

⁴⁴ Integrated coastal management is not nation specific. Sorensen, “National and International Efforts”, *supra* note 3 at 4.

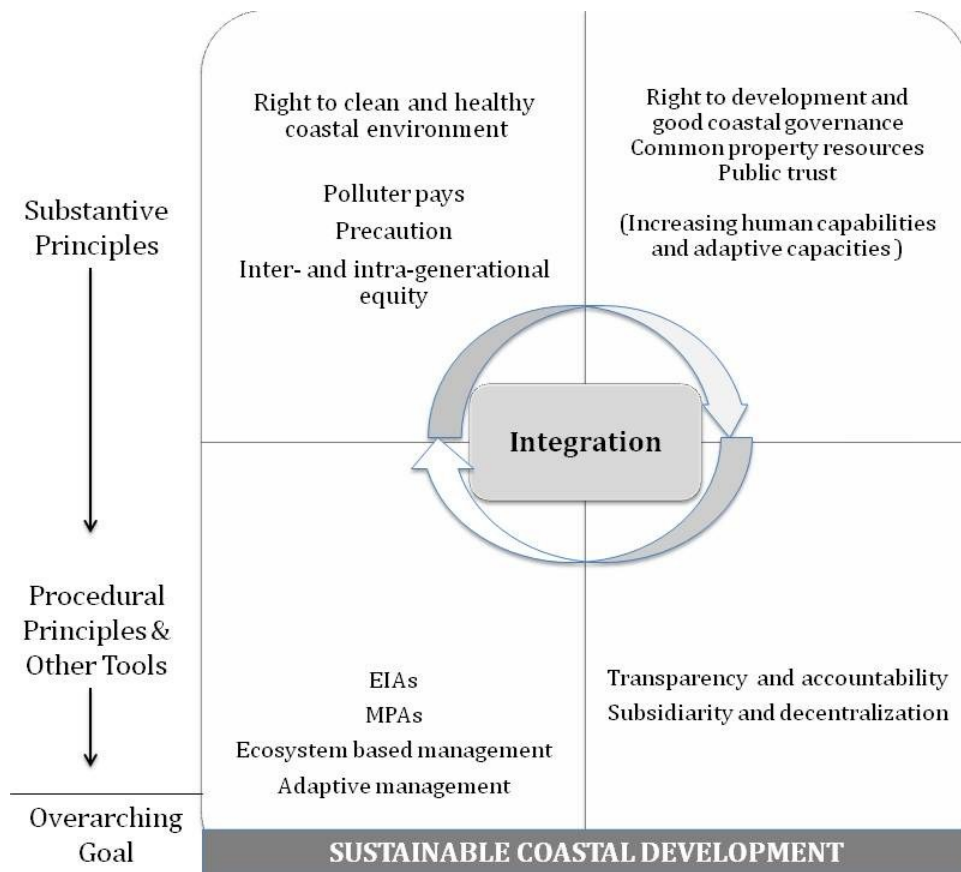


Figure 3: A Principled Approach to ICZM

In the first layer, we have the substantive principles, followed by the procedural principles and other tools.⁴⁵ The first and second layers lead to the overarching goal of SCD in the third tier. All of these principles and tools are inter-linked and complement each other to form the building blocks of the ICZM process. No one principle is superior to the other and the sidelining of one can derail the march towards SCD.⁴⁶ This being

⁴⁵ Chua Thia-Eng identifies four fundamental principles, namely, inter- and intra- generational equity, integration, eco-system based management and adaptive management. In addition, there are 23 substantive and seven procedural principles and they include environment protection, right to a healthy environment, polluter pays principle, prevention of environmental harm, precautionary principle, biodiversity conservation, protected areas, protection of species at risk, ecological scale, right to develop, right to exploit natural resources, customary rights, good governance, principles of transparency, accountability, participation, subsidiarity, principle of international partnership and cooperation, duty to cooperate in the spirit of global partnership, principle of common but differentiated responsibilities, poverty eradication, food security and public health and sanitation. The procedural principles are EIA, resource valuation, decentralization, conflict resolution, full disclosure, information, conflict resolution, liability and compensation. Thia-Eng, *Dynamics of Integrated Coastal Management*, *supra* note 1 at 89.

⁴⁶ *Ibid* at 89-90.

said, for greater clarity and purpose, certain principles can be prioritized over others and some can be grouped together to create a specific hierarchy of norms. The most important feature of this matrix is that all of these principles are linked together by integration, which emerges as the cornerstone of ICZM.⁴⁷ These aspects are explained next.

As can be discerned from Figure 3, integration emerges as the fundamental axiom of ICZM.⁴⁸ To understand the need for integration and its role in this scheme, it is necessary to examine its background. For a long time, the contours of natural resources governance regimes, including that of coastal and ocean management, were based on the basic principle that resources were plentifully available and that they presented a vast source which could support free use and universal exploitation. As well, it was believed that natural systems had an almost absolute capacity to assimilate and cleanse the wastes that were produced. Since the technology for intense utilization had not been developed then, there was nothing inconsistent in this principle, and this in turn led to the “single resource or single sector approach” to management.⁴⁹

Accordingly, the different activities in the coastal landscape were considered in isolation from one another and sectoral regulatory regimes began to develop independently along these lines.⁵⁰ Under these conventional prototypes, coastal governance fell to several government departments that operated largely on sectoral lines, each conferred with a limited range of responsibilities in a particular geographical area.⁵¹ However, as ocean uses began to multiply and the number of people depending on coastal and marine resources began to burgeon, it became evident that the silo-based

⁴⁷ Post & Lundin, eds, *supra* note 20 at 6.

⁴⁸ Integration is “the central defining concept” in ICZM. Jean Poitras, Robert Bowen & Jack Wiggin, “Challenges to the Use of Consensus Building in Integrated Coastal Management” (2003) 46 *Ocean & Coast Mgmt* 391 (ScienceDirect).

⁴⁹ Cicin-Sain et al, “Education and Training”, *supra* note 15 at 293.

⁵⁰ See Matthew Heemskerk, “National Efforts at Integrated Coastal Zone Management: The Canadian, Australian and New Zealand Experiences”, Notes, (2001) 10 *Dal J Leg Stud* 158 at 163 (HeinOnline).

⁵¹ For instance, in Mozambique different agencies are involved in coastal management. The most important ones are the Ministry of the Co-ordination of Environmental Affairs (coastal/marine environments), the Ministry of Transports and Communications (coastal shipping), the Ministry of Agriculture and Fisheries (fisheries, coastal parks and coastal agriculture), the Ministry of Industry, Commerce and Tourism (industrial effluents and tourism), the Ministry of Public Works and Housing (coastal construction), the cities and local municipalities (multiple powers and responsibilities). Their mandates are unclear, conflicting and overlapping. Mozambique, Ministry for Co-ordination of Environmental Affairs, *Mozambique Initial National Communication under UN Framework Convention on Climate Change* (Ministry for Co-ordination of Environmental Affairs, 2003) at 76-77.

sectoral approach was untenable and fell far short of desired outcomes.⁵² By their very nature, sectoral, single-sector management approaches do not consider the unique characteristics of the coastal area or that actions initiated by one sector may deleteriously impact other sectors.⁵³ In sum, it was clear that sectoral management was incapable of reversing the negative forces at play in coastal zones. This failure called for an entirely new approach, which ultimately led to integration.⁵⁴

Basically, integration refers to the integration of aims, goals, objectives and all management-related efforts across different sectors, disciplines, agencies, and stakeholders to produce a holistic response to the ills that plague our coasts. There are five main dimensions to integration in ICZM: (1) intersectoral integration (involving integration among the various agencies that manage different coastal and marine sectors, like fisheries, oil and gas development, ports and harbours); (2) intergovernmental integration (integration between the national, provincial and local levels of government); (3) spatial integration (integration between the land and ocean components of the coastal zone); (4) science-management integration (integration between different disciplines particularly management and science); and, (5) international integration (especially in cases such as nation-sharing maritime borders or international disputes, like transboundary marine pollution).⁵⁵

However, it must be noted that integration does not completely preclude sectoral management. Certain issues are best handled when carried out on a sectoral basis, like those relating to fisheries, water pollution, marine protection, wetlands and mangrove conservation, and estuary protection.⁵⁶ In recognizing this aspect, ICZM seeks to strengthen the sectoral management regimes and ensure that they function under an overarching framework that views the coast as a system that links the different sectoral

⁵² Cicin-Sain et al, "Education and Training", *supra* note 15 at 293; see also Yoshifumi Tanaka, "Zonal and Integrated Management Approaches to Ocean Governance: Reflections on a Dual Approach in International Law of the Sea" (2005) 19:4 Int'l J Mar & Coast L 483 (HeinOnline).

⁵³ Thia-Eng, "Essential Elements", *supra* note 3 at 81.

⁵⁴ See *Declaration of the United Nations Conference on the Human Environment*, 16 June 1972, 11:6 ILM 1416 [*Stockholm Declaration*], prin 13. "In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it." *United Nations Conference on Environment and Development: Rio Declaration on Environment and Development*, 14 June 1992, 31:4 ILM 874 [*Rio Declaration*], prin 4; Robinson, ed, *supra* note 5, ch 17, ¶17.5(a).

⁵⁵ Cicin-Sain et al, "Education and Training", *supra* note 15 at 292.

⁵⁶ Cicin-Sain & Knecht, *supra* note 34 at 2.

management regimes and decision-making apparatus to produce consistent decisions and greater efficiency. By doing so, it fosters dialogue, cooperation and coordination between and among the various agencies and departments. As has been pointed out,

[i]ntegration presupposes a multi-dimensional approach, a search for all the cogs in the wheel so that the management decision is ostensibly relevant, efficient, and hopefully equitable and effective in result. Integration has reinforced the problem-oriented approach, i.e., in the sense of an approach that looks at a problem with all its component issues, in context.⁵⁷

Multi-sectoral management does have importance and can play an important role in ensuring the intelligent and sustainable use of the coast, if the diverse actions are linked in a common seamless web to eliminate duplication of work, provide for optimal use of scarce resources, and ensure economies of scale.⁵⁸ ICZM balances the need for integration and sectoral management by not breaking down the silos completely. The attempt is rather to harmonize sectoral programmes and provide for greater co-ordination between government departments and agencies that have jurisdiction over various aspects of the coastal zone.⁵⁹ In doing so, it steers towards SCD and produces an atmosphere that encourages optimal interaction between the different players to produce sustainable and rational cross-sectoral responses.⁶⁰

This brings us now to the first tier, which comprises the substantive principles essential to work the ICZM process. There are two types of substantive principles: those that foster the right to a clean coastal environment, and those that promote the right to development.⁶¹ The procedural principles, which constitute the second layer, support the operation of the substantive ones. The substantive right to environmental protection (more precisely, the right to a healthy and clean coastal environment) is often treated as a human right. It was first articulated in the Stockholm Declaration at the Stockholm

⁵⁷ Aldo Chircop, "Teaching Integrated Coastal Management: Lessons from the Learning Arena" (2000) 43:4-5 *Ocean & Coast Mgmt* 343 at 352 (ScienceDirect).

⁵⁸ For instance, see FAO, *Code of Conduct for Responsible Fisheries* (Rome: FAO, 1995) art 10 (advocating integration of fisheries into coastal area management).

⁵⁹ Cicin-Sain, "Sustainable Development", *supra* note 34 at 31.

⁶⁰ While fishery managers will be concerned about fishery allocations and related issues, for an integrated coastal zone manager, the focus will be on the impacts of land based sources of marine pollution on fishing grounds, the impact of unscientific fishing practices, etc on coastal biodiversity. *Ibid* at 31.

⁶¹ Thia-Eng, *Dynamics of Integrated Coastal Management*, *supra* note 1 at 90.

Conference in 1972.⁶² Subsequently, the Rio Declaration, the Declaration on Rights of Indigenous Peoples, the *African Charter on Human and People's Rights* (the Banjul Charter),⁶³ the Additional Protocol to the American Rights,⁶⁴ and a host of other instruments also underscore the importance of the right to a clean and healthy environment.⁶⁵ Even though this right has widespread recognition at the international level, its development and drawing connections with other human rights is still imprecise and it remains doubtful whether this right is part of customary international law.⁶⁶

At the same time, recognizing the centrality of this human right in effectuating the right to life has led certain countries to incorporate it into their national constitutions.⁶⁷ In others, national judiciaries have broken new ground by reading this right into their constitutional scheme, such as their Bill of Rights.⁶⁸ Coastal communities may be able to rely on this right to further the overall objective of protecting their coastal environment.⁶⁹ However, it must be emphasized that this right is not an abstraction; the polluter pays and precautionary principles, as well as the inter- and intra-generational equity, all play vital roles in securing a clean and healthy environment.

⁶² See *Stockholm Declaration*, *supra* note 54, prin 1.

⁶³ “[A]ll peoples shall have the right to a general satisfactory environment favorable to their development.” See 27 June 1981, OAU Doc CAB/LEG/67/3 rev 5, 21 ILM 58 (entered into force 21 October 1986), art 24.

⁶⁴ *Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights: Protocol of San Salvador*, 17 November 1988, 28 ILM 161 (entered into force 16 November 1999) art 11(1).

⁶⁵ Humans “are entitled to a healthy and productive life in harmony with nature.” See *Rio Declaration*, *supra* note 54, prin 1.

⁶⁶ While certain authors conclude that it has emerged as a principle of customary international law, others state that it may be still on its way to emerge as customary international law. Nickie Vlavianos, *The Intersection of Human Rights Law and Environmental Law*, Environmental Education for Judges and Court Practitioners (Calgary: Canadian Institute of Resources Law, 2012) at 3-4.

⁶⁷ For instance, see *Constitution of the Republic of South Africa*, 1996, (S Afr), No 108 of 1996, s 24.

⁶⁸ For instance, the Supreme Court of India, in 1991, through a process of judicial interpretation read into article 21 of its Constitution, a human right to a protected environment. In a country where the most serious consequences of environmental degradation fall primarily on the poor, the illiterate and the impoverished, this development opened the legal gateways to a more effective remedy and since then, the writ courts in India have been flooded with public interest litigations seeking to secure a human right to a clean environment. For more details, see Michael R Anderson, “Individual Rights to Environmental Protection in India” in Alan E Boyle & Michael R Anderson, eds, *Human Rights Approaches to Environmental Protection* (Oxford: Clarendon Press, 1996) 199 at 199-25.

⁶⁹ For an overview of how the constitutional and human rights to a protected environment can contribute to the protection of the coastal zone and lead to the development of coastal law, see generally Tony George Puthucherril, “Operationalising Integrated Coastal Zone Management and Adapting to Sea Level Rise through Coastal Law: Where Does India Stand?” (2011) 26:4 Int'l J Mar & Coast L 569.

In economic terms, pollution is improper cost allocation, where the impacts of the costs of production on resources such as water, air, and marine life are not accounted for in the product price.⁷⁰ The earlier view was that, since these resources were not scarce, all had rights to utilize them freely, and producers could discharge wastes into these resources without accounting for their use, the costs of which would be transferred to future users.⁷¹

With time, most societies began to realize that using air or water not only involves a cost but that this needs to be adequately reflected in the product price. Failure to do so was a distortion that could lead to overproduction, market failure, and ultimately, the destruction of the resource.⁷² The only way to rectify this market failure is to ensure an internalization of external costs so that the full environmental and social costs are reflected in the product price. The idea here is that environmentally harmful products will cost more and therefore consumers will prefer less polluting goods and services, ultimately creating incentives for efficient and sustainable resource utilization and management.⁷³

The above summarizes the underlying theme of the polluter pays principle, which is now widely accepted as a means to impose liability on the wrongdoer or the polluter, who is now under an obligation to remedy the damage caused to the environment by internalizing the pollution costs.⁷⁴ In line with what has been stated, this principle demands that the financial costs of preventing and remedying the damage caused by

⁷⁰ Ursula Kettlewellt, "The Answer To Global Pollution? A Critical Examination of the Problems and Potential of the Polluter-Pays Principle" (1992) 3 *Colo J Int'l Env'tl L & Pol'y* 429 at 431 (HeinOnline).

⁷¹ *Ibid.*

⁷² *Ibid.*

⁷³ *Ibid.* at 432; see also Boris N Mamlyuk, "Analyzing the Polluter Pays Principle through Law and Economics" (2009) 18 *Se Env'tl LJ* 39 at 45 (QL). Sumudu A Atapattu, *Emerging Principles of International Environmental Law* (New York: Transnational Publishers, 2006) at 442.

⁷⁴ OECD, *Guiding Principles Concerning International Economic Aspects of Environmental Policies*, Doc C(72)128 (26 May 1972), 11 ILM 1172; *European Communities: Council Recommendation on the Application of the Polluter-Pays Principle*, 7 November 1974, OJ No C 112, 20 December 1973, 14 ILM 138; *Rio Declaration*, *supra* note 54, prin 16; see also EC, *Consolidated Version of the Treaty Establishing the European Community*, [2002] OJ, C 325/35 at 108, art 174(2); see *Johannesburg Plan of Implementation*, *supra* note 13 at 7, ¶15(b) (adopting and implementing policies and measures aimed at applying, the polluter-pays principle); *2001 Stockholm Convention on Persistent Organic Pollutants*, 22 May 2001, 2004 ATS 23, 40 ILM 532 (entered into force 17 May 2004) pmb1 (reaffirming principle 16 of the Rio Declaration); UNECE, *Convention on the Protection and Use of Transboundary Watercourses and International Lakes*, 17 March 1992, 31 ILM 1312, art 2(5)(b) (entered into force 6 October 1996).

pollution should lie with the undertaking that has caused the pollution and that the state should not bear the costs involved in preventing or in carrying out remedial action, as this would practically shift the negative externality to the taxpayer.⁷⁵ The next key principle is that of precaution, followed by inter- and intra-generational equity, all of which have been explained earlier.⁷⁶

This now brings us to the procedural principles that work the substantive ones. Ecosystem-based management has been defined as “structuring societal behavior in ocean and coastal systems [to] promote ecosystem health and resilience while allowing sustainable uses of goods and services.”⁷⁷ The underlying idea behind this unique management paradigm has widespread recognition and application in various resource management sectors like the “sustainable forest management”⁷⁸ and “responsible fisheries” approaches.⁷⁹ It is premised on the basic idea that the ecosystem is treated as the primary unit for management.⁸⁰ This replaces traditional modes of natural resources management that are organized around particular uses and resources, which also fails to address the interdependence and complex interactions between and among humans, animal and plant communities and their physical environments.⁸¹ This approach gained recognition under the Rio Declaration, which called upon states “to conserve, protect and restore the health and integrity of the Earth’s ecosystem.”⁸²

⁷⁵ Mamlyuk, *supra* note 73 at 42.

⁷⁶ For a discussion on these concepts, see Ch 5, Part 5.3.1.

⁷⁷ Richard Burroughs, *Coastal Governance* (Washington, DC: Island Press, 2011) at 223; see also Robert Kay & Jacqueline Alder, *Coastal Planning and Management*, 2d ed (Oxon: Taylor & Francis, 2005) at 63.

⁷⁸ See UNGA, *Report of the United Nations Conference On Environment and Development (Rio De Janeiro, 3-14 June 1992) Annex III Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests*, A/CONF.151/26 (Vol. III), 14 August 1992, online: United Nations <<http://www.un.org/documents/ga/conf151/aconf15126-3annex3.htm>>.

⁷⁹ The 1995 Code of Conduct for Responsible Fisheries contains many principles that are based in the ecosystem approach. In 2003, the Food and Agricultural Organization brought out the “Fisheries management: the ecosystem approach to fisheries” to support the implementation of an ecosystem based approach to the Code of Conduct for Responsible Fisheries. FAO, *Fisheries Management: 2. The Ecosystem Approach to Fisheries*, FAO Technical Guidelines for Responsible Fisheries 4, Suppl 2 (Rome: FAO, 2003).

⁸⁰ *Ibid.*

⁸¹ Stephen Bloye Olsen, “A Practitioner's Perspective on Coastal Ecosystem Governance” in Erlend Moksness, Einar Dahl & Josianne Støttrup, eds, *Integrated Coastal Zone Management* (Oxford: Wiley-Blackwell, 2009) 253 at 257.

⁸² *Rio Declaration*, *supra* note 54, prin 7.

As well, Agenda 21 observes that oceans and adjacent coasts form “an integrated whole that is an essential component of the global life-support system.” These ideals require new techniques for marine and coastal area management and development – techniques that are “integrated in content and are precautionary and anticipatory in ambit . . . ”⁸³ It is in this context that the COP to the Convention on Biological Diversity, 1992 (CBD) identified 12 principles to operationalize the ecosystem approach, which can be applied to work the ICZM process.⁸⁴

Due to the complex and highly dynamic nature of coastal ecosystems and the absence of adequate scientific knowledge to decipher these complex non-linear processes and interactions, ICZM programmes have to be embedded in adaptive management, which is essentially a process of learning-by-doing.⁸⁵ In its simplest form, it is expressed as continuing cycles of action and reflection. At the fundamental level, it involves the use of “reversible management interventions, careful monitoring of impacts, and continual

⁸³ Robinson, ed, *supra* note 5, ch 17, ¶17.1.

⁸⁴ The ecosystem approach is central to the implementation of the three primary objectives of the CBD, namely, conservation, sustainable use and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. In strengthening and providing content to the ecosystem approach, the Conference of Parties to the CBD plays an important role. AIDEnvironment, National Institute for Coastal and Marine Management/Rijksinstituut voor Kust en Zee (RIKZ), Coastal Zone Management Centre, *Integrated Marine and Coastal Area Management (IMCAM) Approaches for Implementing the Convention on Biological Diversity*, CBD Technical Series No 14 (Montreal: Secretariat of the CBD, 2004). Decision V/6 identifies 12 complementary and inter-linked principles and others as operational guidance to reflect upon the common level of understanding of the ecosystem approach. For the text of the COP 5 Decision V/6: Ecosystem Approach, see *Annex III: Decisions Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Fifth Meeting, Nairobi, 15-26 May 2000*, UNEP/CBD/COP/5/23, 66 at 103. For the text of the Decision VI/12, see *Annex I: Decisions Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Sixth Meeting The Hague, 7-19 April 2002*, UNEP/CBD/COP/6/20, 70 at 180. It recognizes “the necessity to apply the ecosystem approach in national policies and legislation” and emphasizes the need to develop regional guidelines for its application. See *ibid.* UNEP & CBD, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Seventh Meeting VII/11. Ecosystem Approach*, UNEP/CBD/COP/DEC/VII/11, 13 April 2004, online: Convention on Biological Diversity <<http://www.cbd.int/doc/decisions/cop-07/cop-07-dec-11-en.pdf>>. UNEP & CBD, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Ninth Meeting IX/7. Ecosystem Approach*, UNEP/CBD/COP/DEC/IX/7, 9 October 2008, online: Convention on Biological Diversity <<http://www.cbd.int/doc/decisions/cop-09/cop-09-dec-07-en.pdf>> at 1 (reiterated the need to apply the ecosystem approach and “should be regarded as a process where learning by doing is the priority need”).

⁸⁵ Stephen Olsen, James Tobey & Meg Kerr, “A Common Framework for Learning from ICM Experience” (1997) 37:2 *Ocean & Coast Mgmt* 155 at 158 (ScienceDirect); see also Kay & Alder, *supra* note 77 at 65.

assessment and refinement of management practice as information increases.”⁸⁶ Often treated as supportive of the precautionary approach,⁸⁷ it effectively combats issues of uncertainty⁸⁸ and is recognized in several international environmental law instruments.⁸⁹

Another important procedural principle that works towards balancing environmental and developmental considerations is environment impact assessment. This is a process that draws together expert qualitative assessment regarding a project’s predicted environmental and societal consequences in scientific form and outlines measures for modifying or mitigating them. The ex-ante consideration of these relevant factors is also based on public hearings, where relevant inputs are obtained from various actors, such as those directly affected by the project, environmental NGOs, and experts. All of these opinions then have to be properly evaluated by the relevant decision-making body before the final decision.⁹⁰

Several international environmental law treaties emphasize the need for EIAs. Prominent examples include the *United Nations Convention on the Law of the Sea, 1982* (LOSC),⁹¹ UNFCCC,⁹² CBD,⁹³ the *United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses*,⁹⁴ and the *Convention on Environmental Impact Assessment in a Transboundary Context*.⁹⁵ National laws and

⁸⁶ Minna Pyhälä, Anne Christine Brusendorff & Hanna Paulomäki, “The Precautionary Principle” in Malosia Fitzmaurice, David M Ong & Panos Makouris, eds, *Research Handbook on International Environmental Law* (Glos: Edward Elgar Publishing Ltd, 2010) 203 at 220.

⁸⁷ *Ibid.*

⁸⁸ *Ibid.*

⁸⁹ For instance, see UNGA, *Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks*, 4 August 1995, A/CONF 164/37, 8 September 1995, 34 ILM 1542 (entered into force 11 December 2001) [*Straddling Fish Stocks Agreement*], art 6(3).

⁹⁰ Neil Craik, *The International Law of Environmental Impact Assessment Process, Substance and Integration* (Cambridge: Cambridge University Press, 2008) at 4; *Convention on Environmental Impact Assessment in a Transboundary Context*, 25 February 1991, 30 ILM 802 (entered into force 10 September 1997) [*Espoo Convention*].

⁹¹ See *LOSC*, *supra* note 9, arts 204 -206.

⁹² *United Nations Conference on Environment and Development: Framework Convention on Climate Change*, 19 June 1993, 31 ILM 849 (adopted at New York 9 May 1992) [*UNFCCC*], art 4(1).

⁹³ *United Nations Conference on Environment and Development: Convention on Biological Diversity, 1993*, 5 June 1992, 31 ILM 818 (entered into force 29 December 1993) [*CBD*] art 14; *Convention on Biological Diversity*, online: CBD Home <<http://www.cbd.int/>>.

⁹⁴ *UN: Convention on the Law of the Non-navigational Uses of International Watercourses*, 21 May 1997, 36 ILM 700 [*UN Watercourses Convention*], art 12.

⁹⁵ See generally *Espoo Convention*, *supra* note 90.

judicial opinions have also outlined the importance of carrying out EIAs.⁹⁶ Given the economic potential of coastlines, EIA becomes an important instrument for ensuring that development proceeds in an orderly manner without jeopardizing the resilience of natural ecosystems.

As coastal waters and their surrounding environs harbor marine habitats that are rich in biodiversity, protecting and conserving these areas is essential. Marine protected areas (MPAs)⁹⁷ is an important tool that helps to protect the resilience of the ecosystems as well as reduce the vulnerability of biodiversity and ecosystem services in light of SLR, climate change impacts, and other anthropogenic activities.⁹⁸ There are several legal instruments at the international level that encourage MPA creation and management. Specifically, article 194(5) of the LOSC calls on states to adopt measures “to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life.” This provision can be interpreted as conferring powers on states for MPA creation.⁹⁹ Agenda 21, one of the major products of the Rio Conference, also articulates the importance of constituting MPAs.¹⁰⁰

⁹⁶ For instance, at the international level, the ICJ has observed
[i]t may now be considered a requirement under general international law to undertake an environmental impact assessment where there is a risk that the proposed industrial activity may have a significant adverse impact in a transboundary context, in particular, on a shared resource. Moreover, due diligence, and the duty of vigilance and prevention which it implies, would not be considered to have been exercised, if a party planning works liable to affect the régime of the river or the quality of its waters did not undertake an environmental impact assessment on the potential effects of such works.

⁹⁷ *Case Concerning Pulp Mills on the River Uruguay (Argentina v Uruguay)*, [2010] ICJ Rep 14, ¶204. “Marine and coastal protected area’ means any defined area within or adjacent to the marine environment, together with its overlying waters and associated flora, fauna and historical and cultural features, which has been reserved by legislation or other effective means, including custom, . . .” See UNEP & CBD, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Seventh Meeting: VII/5: Marine and Coastal Biological Diversity*, UNEP/CBD/COP/DEC/VII/5, 13 April 2004, at 2; *Decision I/CP.10: Buenos Aires Programme of Work on Adaptation and Response Measures*, FCCC/CP/2004/10/Add.1, 17-18 December 2004, ¶¶5-14, online: UNFCCC <<http://unfccc.int/resource/docs/cop10/10a01.pdf>> .

⁹⁸ Kristina M Gjerde & Anna Rulska-Domino, “Marine Protected Areas beyond National Jurisdiction: Some Practical Perspectives for Moving Ahead” (2012) 27 Int’l J Mar & Coast L 351 at 354 (HeinOnline).

⁹⁹ There are also other provisions that are relevant to the process.

¹⁰⁰ Robinson, ed, *supra* note 5, ch 15, ¶15.5(g) (promotes conservation of biological diversity in general, including “in situ conservation of ecosystems and natural habitats”). Chapter 17 emerges as the “international basis upon which to pursue the protection and sustainable development of the

Perhaps even more pertinent to the issue is the CBD, which provides for the establishment of “protected areas or areas where special measures need to be undertaken to conserve biological diversity.”¹⁰¹ In addition, the Ramsar Convention,¹⁰² the *Convention on the Conservation of Migratory Species of Wild Animals*,¹⁰³ the *International Convention for the Prevention of Pollution from Ships* (MARPOL),¹⁰⁴ and the *Convention Concerning the Protection of the World Cultural and Natural Heritage*¹⁰⁵ also fortify MPA creation.

Two notable trends are the network approach and the linking of MPA management with an ICZM process. In giving effect to the traditional saying that “the whole is greater than the sum of the parts,” in a marine environment protection context, an ecological network of MPAs seeks to connect individual pieces of the larger ecosystem either ecologically or functionally, but not necessarily physically, so as to achieve a set of broader network objectives.¹⁰⁶ In so doing, greater resilience is built to deal with external threats; particularly those relating to climate change, thereby providing for more sustainable coastal and marine environment management. Despite the call from the

marine and coastal environment and its resources” (¶17.1). It specifically promotes integrated management of marine areas (¶17.5) and the “[c]onservation and restoration of altered critical habitats” (¶17.6(h)). Most explicitly, Chapter 17 encourages signatories to “undertake measures to maintain biological diversity and productivity of marine species and habitats under national jurisdiction,” including the “establishment and management of protected areas” (¶17.7).

¹⁰¹ *CBD*, *supra* note 93, art 8(a). “Protected area” is defined as “a geographically defined area, which is designated or regulated and managed to achieve specific conservation objectives” (art 2).

¹⁰² It supports the establishment of MPAs in coastal wetlands with mangroves, coral reefs, and sea grass beds.

¹⁰³ The CMS calls upon parties to provide immediate protection for migratory species included in Appendix I; and conclude agreements for the conservation and management of migratory species included in Appendix II. See *Convention on the Conservation of Migratory Species of Wild Animals (Bonn)*, 23 June 1979, 19 ILM 15 (entered into force 1 November 1983) art 2.

¹⁰⁴ See *International Convention for the Prevention of Pollution from Ships*, 2 November 1973, 1340 UNTS 184, 12 ILM 1319 as modified by the *Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships of 1973*, 17 February 1978, 1340 UNTS 61, 17 ILM 546 (entered into force 2 October 1983) annexes I, II & V (provides for the designation of “special areas” by the International Maritime Organization for the prevention of sea pollution); see also IMO, *Guidelines for the Designation of Special Areas under Marpol 73/78*, IMO Doc A 22/Res 927 (IMO, 15 January 2002).

¹⁰⁵ *Convention Concerning the Protection of the World Cultural and Natural Heritage*, 16 November 1972, 1037 UNTS 151, 11 ILM 1358 (entered into force 17 December 1975). A number of MPAs are world heritage sites, including the Great Barrier Reef in Australia, the Galapagos Islands in Ecuador, the Sunderbans in India and in Bangladesh. UNESCO & WHC, *World Heritage Marine Programme*, online: UNESCO World Heritage Convention <<http://whc.unesco.org/uploads/activities/documents/activity-13-20.pdf>>.

¹⁰⁶ See generally Gov’t of Canada, Fisheries and Oceans Canada, *National Framework for Canada’s Network of Marine Protected Areas* (Ottawa: Fisheries and Oceans Canada, 2011).

World Summit on Sustainable Development, 2002, for the “establishment of marine protected areas consistent with international law and based on scientific information, including representative networks by 2012,” progress has been dismal.¹⁰⁷

The wisdom behind linking MPAs with ICZM is based on the finding that MPAs are greatly affected by the spill-over effects of human activities that take place well beyond the physical boundaries that demarcate the MPA. Moreover, “these exogenous activities often have greater impact on the resources of the MPA than those carried out within the protected area,”¹⁰⁸ and there is an increasing tendency to work an MPA management scheme within an ICZM process.¹⁰⁹ This latter endeavor is no easy feat, since the management mechanisms for both sets of tasks may be vastly different. Nevertheless, creating linkages is an important step towards SCD.

In addition there are several other principles and tools that can foster the right to clean and healthy environment like the use of best science,¹¹⁰ land use planning and zoning,¹¹¹ full cost allocation,¹¹² etc.

The second prong of SCD is the right to develop. Even though traces of this right can be seen in numerous international instruments,¹¹³ its precise connotations remain controversial.¹¹⁴ As noted earlier, one primary reason for this is the changing conception

¹⁰⁷ IUCN, *Establishing Marine Protected Area Networks: Making it Happen, A Guide for Developing National and Regional Capacity for Building MPA Networks: Non-Technical Summary Report* (WCPA/IUCN, 2007).

¹⁰⁸ Thia-Eng, *Dynamics of Integrated Coastal Management*, *supra* note 1 at 252.

¹⁰⁹ Biliiana Cicin-Sain & Stefano Belfiore, “Linking Marine Protected Areas to Integrated Coastal and Ocean Management: A Review of Theory and Practice” (2005) 48 *Ocean & Coast Mgmt* 847 (ScienceDirect) (identifying nine principles to link MPAs to integrated coastal and ocean management).

¹¹⁰ Mahon, Fanning & McConney, *supra* note 33 at 36.

¹¹¹ For instance, see *ICZM Protocol*, *supra* note 23, art 20.

¹¹² Mahon, Fanning & McConney, *supra* note 33 at 35.

¹¹³ For further details, see the Charter of United Nations, 1945, the International Bill of Human Rights, the Declaration on the Right to Development, 1986, the Rio Declaration, the Vienna Declaration on Human Rights, the Copenhagen Declaration on Social Development, 1995, the Beijing Declaration and Platform for Action, 1995 and the African Charter on Human and People’s Rights, 1981.

¹¹⁴ But see *Centre for Minority Rights Development (Kenya) and Minority Rights Group International on behalf of Endorois Welfare Council v Kenya*, 276 / 2003, online: Human Rights Watch <http://www.hrw.org/sites/default/files/related_material/2010_africa_commission_ruling_0.pdf> [*Centre for Minority Rights Development (Kenya)*]. It was alleged that in 1973 the Government of Kenya forcibly removed the Endorois from their ancestral lands around the Lake Bogoria and that promises for rehabilitation remained on paper. One of the core issues before African Commission on Human and Peoples’ Rights related to the right to development. The Commission held that the state had violated the right to development of the Endorois as there was no empowerment of this community. “It is not sufficient for the Kenyan Authorities merely to give food aid to the Endorois. The

of “development,” which is now understood as enhancement of human capabilities.¹¹⁵ An essential condition to enhancing human development is that environmental pollution and degradation should be addressed in particular as they relate to the poor.¹¹⁶

Yet the poor also contribute significantly to environmental degradation. Indeed, India’s former Prime Minister, Indira Gandhi, declared at the Stockholm Conference “poverty is the biggest polluter.”¹¹⁷ Poverty exacerbates environmental degradation, which in turn contributes to poverty, creating a vicious cycle.¹¹⁸ Thus, for development to be sustainable, it is essential that poverty alleviation become focal to the discourse of coastal development.

In most developing nations, particularly, in coastal South Asia, coastal resources are treated as part of common property regimes over which the community members have usufructuary rights.¹¹⁹ Since many coastal communities depend on fishing for their dietary, livelihood, and leisure requirements, the right of public access to beaches and other coastal areas is undeniably critical. However, due to increasing demands on coastal space for developmental activities, the importance of this right is often overlooked and coastal communities are fast losing physical and visual access to coastal zones they previously enjoyed, affecting both their right to livelihood and their well-being.¹²⁰

It is in this scenario that one has to appreciate the need to protect common property resources and its importance in poverty reduction and in increasing the adaptive capacities of coastal communities. And here the ancient Roman law doctrine of public trust, which is based on the idea that certain common properties are held by the state in

capabilities and choices of the Endorois must improve in order for the right to development to be realized” (¶283). It was affirmed that the “... state bears the burden for creating conditions favorable to a people’s development ... The ... State ... is obligated to ensure that the Endorois are not left out of the development process or benefits” (¶298).

¹¹⁵ For more on this topic, see Ch 4, Part 4.2.1.

¹¹⁶ *Centre for Minority Rights Development (Kenya)*, *supra* note 114.

¹¹⁷ Akash Kapur, “Letter from India: Pollution as Another Form of Poverty”, *The New York Times* (8 October 2009) online: <<http://www.nytimes.com/>>.

¹¹⁸ Rajendra Ramlogan, *Sustainable Development: Towards a Judicial Interpretation*, David Freestone, ed, 9 Legal Aspects of Sustainable Development (The Netherlands: Martinus Nijhoff, 2011) at 14.

¹¹⁹ See Daniel W Bromley & Michael M Cernea, *The Management of Common Property Natural Resources: Some Conceptual and Operational Fallacies* (Washington, DC: World Bank Publications, 1989) at 16.

¹²⁰ See *Fomento Resorts & Hotels v Minguel Martins* (2009) CA No 4154 of 2000 (India) ¶¶36, 40-41 online: Indian Kanoon <<http://www.indiankanoon.org/doc/1238478/>>. Relying on the doctrine of public trust, it was held that Fomento Resorts and Hotels was under a statutory obligation to maintain access to the beach without obstruction of any kind. *Ibid.*

trusteeship for the free and unimpeded use of the general public has great value.¹²¹ Under Roman law, these resources were either owned by none (*res nullius*) or owned by all in common (*res communis*).¹²² In recent years, there has been a growing interest in the untapped potential of this doctrine as an important tool for coastal resource management. Specifically, it can play significant roles in poverty alleviation by securing community rights over common property resources.¹²³ The doctrine of public trust found acceptance in English common law. A sovereign could own these resources but the ownership was limited in nature, as the Crown could not grant these properties to private owners if it interfered with public interests in navigation or fishing.¹²⁴ Interestingly, these restrictions did not hinder the government, which could, by virtue of the police power, enlarge or diminish public rights for a legitimate public purpose.¹²⁵ Public trust found fertile legal ground in the United States where, in addition to state legislatures, state courts have gone to great lengths to expand and entrench it.¹²⁶ This doctrine also has recognition in several other national legal systems.¹²⁷

¹²¹ “*Quaedam enim naturali jure communia sunt omnium, quaedam publica, quaedam universitatis, quaedam nullius.*” Some things are in common by the law of nature; some are public; some universal; and some there are, to which no man can have a right. Justinian further observes, “Things common to mankind by the law of nature, are the air, running water, the sea, and consequently the shores of the sea; no man therefore is prohibited from approaching any part of the seashore, whilst he abstains from damaging farms, monuments, edifices, etc. which are not in common as the sea is.” Inst Divi Justiniani D.I.T.8. C.xIi.T.I. §1. (Thomas Cooper ed, translated by George Harris, 1812).

¹²² Douglas M Johnston & David L VanderZwaag, “The Ocean and International Environmental Law: Swimming, Sinking, and Treading Water at the Millennium” (2000) 43 Ocean & Coast Mgmt 141 at 142 (ScienceDirect).

¹²³ Ralph W Johnson et al, “The Public Trust Doctrine and Coastal Zone Management in Washington State” (1992) 67 Wash L Rev 521 (QL).

¹²⁴ Paul A Barresi, “Mobilizing the Public Trust Doctrine in Support of Publicly Owned Forests as Carbon Dioxide Sinks in India and the United States” (2012) 23 Colo J Int’l Envtl L & Pol’y 39 at 48 (HeinOnline).

¹²⁵ Joseph L Sax, “Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention” (1970) 68 Mich L Rev 471 at 476 (HeinOnline).

¹²⁶ *Illinois Central Railroad Co v People of the State of Illinois*, 146 US 387 (1892). In 1869, the Illinois legislature made a substantial grant of submerged lands along the shores of Lake Michigan to the Illinois Central Railroad. Subsequently, the Legislature repealed the grant. The state of Illinois sued to quit title. The court held that the title of the state in the land in dispute was a title different in character from that which it held in lands intended for sale, for it was a title held in trust - for the people of the state that they may enjoy the navigation of the water, carry on commerce over them and have liberty of fishing therein free from obstruction or interference of private parties. The abdication of the general control of the state over lands in dispute was not consistent with the exercise of the trust, which required the government to preserve such waters for public use. *Ibid.* *National Audubon Society v Superior Court of Alpine County*, 33 Cal 3d 419. Mono Lake, the second largest lake in California, is saline containing no fish but it supports a large population of brine shrimp, which feed vast numbers of nesting and migrating birds. In 1940, the Division of Water Resources granted the Department of Water and Power of the City of Los Angeles a permit to

Basically, the doctrine of public trust rests on the assumption that certain resources like air, sea, waters, the coasts, and the forests have great importance to the people as a whole and that it would be unjustified to convert them into a subject of private ownership. Accordingly, to benefit the people at large, the implication is that the government holds these resources in trust and that they should be made freely available to all, irrespective of “their economic status or circumstance.”¹²⁸ The doctrine enjoins upon the government to protect the resources for the enjoyment of the general public rather than to permit their use for private ownership or for commercial purposes.¹²⁹ While public trust confers a wide mandate upon the government to secure the management and protection of natural resources, it also has considerable potential to act as a bulwark against unbridled sovereign power enjoyed by the state in respect of natural resource management, particularly to prevent the government from transferring public trust resources to private entities in violation of the trust.¹³⁰ National courts have often relied on public trust to ensure that the state performs its trustee functions in good faith.¹³¹ Public trust doctrine has greater recognition at the national level than at the international level.

appropriate virtually the entire flow of four of the five streams flowing into the lake. As a result of these diversions, the level of the lake dropped, its surface area diminished, gulls abandoned the lake and the scenic beauty and the ecological values were imperiled. The plaintiffs relying on the public trust doctrine filed a lawsuit against the water diversions. The California supreme court explained the concept of public trust doctrine in the following words: “The public trust is . . . an affirmation of the duty of the State to protect the people's common heritage of streams, lakes, marshlands and tidelands, surrendering that right of protection only in rare cases when the abandonment of that right is consistent with the purposes of the trust . . .” Accordingly, the court concluded that the plaintiffs could rely on the public trust doctrine to seek reconsideration of the allocation of the waters of the Mono basin. *Ibid.*

¹²⁷ For instance, see *National Environmental Management: Integrated Coastal Management Act*, (S Afr), No 24 of 2008, s 12 (state is the public trustee of all coastal property).

¹²⁸ James M Olson, “Navigating the Great Lakes Compact: Water, Public Trust, and International Trade Agreements” [2006] MS L Rev 1103 at 1113 (HeinOnline).

¹²⁹ Joseph L Sax, “Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention” (1970) 68 Mich L Rev 471 at 473 (HeinOnline).

¹³⁰ For an understanding of how the public trust doctrine is applied in 12 different countries as a doctrine of ecological protection incorporating the principles of precaution, sustainable development, and intergenerational equity, see Michael C Blumm & Rachel D Guthrie, “Internationalizing the Public Trust Doctrine: Natural Law and Constitutional and Statutory Approaches to Fulfilling the Saxion Vision” (2012) 45 UC Davis L Rev 741 at 807 (HeinOnline).

¹³¹ *Ibid* at 760-807 (an overview of public trust doctrine judicial decisions in various countries).

An effective way of managing the coastal zone is by strengthening good coastal governance, which lies at the heart of SCD.¹³² Good coastal governance is “the process in which public, private and civil society actors organize themselves and coordinate with each other to make decisions and distribute rights, obligations and authority for the use of shared coastal resources.”¹³³ It commits states to transparent decision-making procedures, accessibility to information, ensures due process and respect for the rule of law, protects human rights, and secures participatory decision-making, strengthens empowerment, representativeness, inclusivity, comprehensiveness, decentralization, cooperation and greater accountability.¹³⁴

Under traditional modes of coastal governance, the management is often constrained by fiat issued by external forces, with little or no stakeholder consultation and participation.¹³⁵ ICZM seeks to rectify this asymmetry by providing a platform to secure meaningful public participation and consultation in all stages of decision-making.¹³⁶ The involvement of coastal communities in a programme that affects their lives and livelihoods via co-management and greater participation is a sine qua non that enhances

¹³² Kofi Annan former UN Secretary-General notes, “[g]ood governance is perhaps the single most important factor in eradicating poverty and promoting development.” UNDP, *Human Development Report 2002: Deepening Democracy in a Fragmented World* (New York: UNDP, 2002) at 51. In the context of sustainable development, good governance means respecting the Rio Principles. Kamal Hossain, “Evolving Principles of Sustainable Development and Good Governance” in Konard Ginther, Erik Denters & Paul JIM de Waart, eds, *Sustainable Development and Good Governance* (Netherlands: Martinus Nijhoff, 1995) 15 at 21.

¹³³ USAID & University of Rhode Island Coastal Resources Center, *A World of Learning in Coastal Management: A Portfolio of Coastal Resources Management Program Experience and Products* (Rhode Island: Coastal Resources Center, 2002) at 3.

¹³⁴ Mahon, Fanning & McConney, *supra* note 33 at 31; see also *ILA New Delhi Declaration of Principles of International Law Relating to Sustainable Development*, Resolution 3/2002 adopted at the 70th Conference of the International Law Association (New Delhi 2-6 April 2002), UN Doc A/CONF.199/8, (9 August 2002), prin 6. See *Gunaratne v The Homagama Pradeshiya Sabha* (3 April 1998), App No 210/97(FR) of 4 March 1998 (Sri Lanka SC) (Amerasinghe, J holding that “Publicity, transparency and fairness are essential if the goal of sustainable development is to be achieved”).

¹³⁵ In Spain, for long, particularly in the Cantabria region, coastal management was in the hands of a single stakeholder, namely the national government. J Areizaga et al, “Improving Public Engagement in ICZM: A Practical Approach” (2012) 109 *J Envtl Mgmt* 123 at 123 (ScienceDirect). Under authoritarian regimes, ICZM is an oxymoron as its basic principles namely, integration, reform and genuine participation, are absent in the overall governance arrangements. Laura Tabet & Lucia Fanning, “Integrated Coastal Zone Management under Authoritarian Rule: An Evaluation Framework of Coastal Governance in Egypt” (2012) 61 *Ocean & Coast Mgmt* 1 at 2 (ScienceDirect).

¹³⁶ EC, Alan Pickaver et al, eds, *Our Coast: ICZM in Europe, Integrated Coastal Zone Management Participation Practices in Europe* (Luxembourg: Publications Office of the EU, 2010) at 10.

its legitimacy and contributes significantly to its long-term success and sustainability.¹³⁷ Moreover, by empowering local coastal communities that have the greatest stake in maintaining the health of coastal areas and resources, ICZM helps to build human and institutional capacity at all levels.

Another aspect of the traditional CZM prototype is that the initiative is based on a top-down, centralized, and bureaucratically heavy approach. Often, the bureaucracy is found to be too slow, fraught with red-tape, and unable to efficiently manage the resource.¹³⁸ In line with the need for better coastal governance, ICZM seeks to provide for greater and more effective coordination between the different sectors across multiple scales, in line with the principle of decentralized decision-making and subsidiarity, ensuring compatibility between the national and local levels of government. In effect, ICZM facilitates decentralized multi-stakeholder, consensus-based decision-making by providing a framework and a process for realizing grass-roots level democracy in coastal zones.¹³⁹

The above discussion reveals that ICZM coalesces around a cluster of fundamental sustainability principles that must work together to move coastal management towards the ultimate goal of SCD. And here the attempt has been to identify some of the more relevant principles to an ICZM process. It must be noted that the lists are not exhaustive of all the principles and strict compartmentalization of the same is also not possible. There is bound to be overlaps and these principles can straddle from one end of the spectrum (the right to clean and healthy coastal environment) to the other (the right to development and good coastal governance) and *vice versa*. This task is easier said than done, as there can be numerous roadblocks that restrict the maturing of an ICZM

¹³⁷ *Ibid.*

¹³⁸ See *Sanju Panda (Advocate) v Orissa*, (2002) [2002] 2 OLR 189 (Orissa HC) (highlighting the blatant violation of the coastal law and the criminal negligence by the authorities who failed to perform their statutory duties).

¹³⁹ See generally Jason M Patlis, Maurice Knight & Jeff Benoit, "Integrated Coastal Management in Developing, Decentralizing Countries: The General Paradigm, the U.S. Model and the Indonesian Example" in Elisabeth Mann Borgese, Aldo Chircop & Moria McConnell, eds, *Ocean Yearbook*, vol 17 (Chicago: University of Chicago Press, 2003) 380. The authors sound a word of caution regarding decentralization, which can create more problems due to budgetary constraints, lack of capacity at local levels, etc. Accordingly, the paper forwards a voluntary, incentive-based programme for decentralization. *Ibid.*

programme. Prior to detailing these obstructions, we will first examine the general steps in an ICZM process.

In its most primary and essential form, an ICZM programme consists of five phases. The first is the programme initiation, which is an exercise that involves the identification and analysis of critical issues that affect the coastal environment and set the demand for an ICZM programme.¹⁴⁰ The second phase is programme preparation, which involves the development of the objectives and the preparation of the plan, policies and actions.¹⁴¹ Phase three relates to formalization and adoption of the programme, which can be via a law, a decree or an interagency agreement. It also includes the securing of funds.¹⁴² Implementation forms the focus in phase four, and phase five is dedicated to a formal evaluation.¹⁴³ However, the five-step programme does not always proceed in a linear sequence. At times, certain phases may have to be addressed before others.¹⁴⁴ Indeed, for the programme to work without compromising its effectiveness, it may be necessary to revisit stages and make appropriate changes to ensure compliance with the identified stages.¹⁴⁵

Typically, an ICZM programme matures through the successive completion of management cycles, which is a time-consuming process. An initial cycle contemplated at the national scale may take somewhere between eight to 15 years, while a demonstration project that is targeted at a single bay or an urban area will take half this time.¹⁴⁶ Each of these cycles is called a “generation” of an ICZM project or programme. Typically, the first cycle deals with a few urgent issues that are restricted to a specific geographic area.

¹⁴⁰ Olsen, Tobey & Kerr, *supra* note 85 at 155; Heileman, ed, *supra* note 39 at 9. Priority actions include assessing socio-environmental, and institutional issues; identifying stakeholders and their interests; inviting review and response; selecting issues; and defining goals. See Stephen B Olsen, Kem Lowry & James Tobey, *The Common Methodology for Learning: A Manual for Assessing Progress in Coastal Management*, Coastal Management Report #2211 (Narragansett, USA: Coastal Resources Center, 1999) at 15 [Olsen, Lowry & Tobey, *The Common Methodology*].

¹⁴¹ Olsen, Tobey & Kerr, *ibid* at 160. Heileman, ed, *ibid* at 9. Priority actions include, documenting baseline conditions, conducting scientific research on selected management questions, public awareness programmes, involving stakeholders in the planning process, developing the management plan, the institutional framework, and testing implementation strategies on a pilot scale. See Olsen, Lowry & Tobey, *The Common Methodology*, *ibid* at 23.

¹⁴² Olsen, Tobey & Kerr, *ibid* at 8.

¹⁴³ *Ibid* at 160.

¹⁴⁴ Olsen, Lowry & Tobey, *The Common Methodology*, *supra* note 140 at 8.

¹⁴⁵ *Ibid*.

¹⁴⁶ *Ibid*.

Subsequently, through adaptive learning, the geographic dimensions may expand to include new and more complex elements.¹⁴⁷

ICZM is a process that helps to secure the more efficient use of coastal resources for economic development, reconciling short-term economic forces with long-term environmental concerns. However, an ICZM process may involve several dimensions, making it highly specialized and difficult to grasp, let alone implement. Specificity and intricacy require that coastal countries have sufficient capacity to develop an ICZM programme based on sustainability principles and unique contexts. Unfortunately, this is rarely the case, particularly in developing countries, which often find themselves hamstrung by capacity and institutional constraints.¹⁴⁸ As alluded to earlier, a major reason for this situation is the absence of an international overarching treaty on this subject and an international agency to oversee and support national ICZM implementation. The much-needed consistency and guidance could have been achieved had there been an international treaty and an international body to consolidate and standardize the various practice rules.¹⁴⁹

6.4 ICZM: A BALANCING ACT

As laudable as it appears, ICZM cannot be considered the ultimate solution to the coastal management quagmire. While the intention in this sub-part is not to disparage the usefulness of this methodology, a closer look at this paradigm is nonetheless merited. As Jens Sorensen points out, “[i]ntegrated coastal management is now practiced all over the globe and it is part of the rhetoric for sustainable development. For many who have been following the ICM star for decades, the optimism is now guarded because they have found out that ICM is a long swim against the current.”¹⁵⁰ Another commentator states:

[t]he continued iteration of an integrated

¹⁴⁷ *Ibid.*

¹⁴⁸ Due to the paucity of material and human resources in the northwest African region, it is difficult to implement coastal management. The problem is compounded by lack of adequate support and assistance from international institutions. See generally Maria Snoussia & El Hafid Tabet Aoul, “Integrated Coastal Zone Management Programme Northwest African Region Case” (2000) 43 *Ocean & Coast Mgmt* 1033 (ScienceDirect).

¹⁴⁹ For a discussion on the role of international environmental law in facilitating ICZM, see Ch 7, Part 7.2.

¹⁵⁰ Sorensen, “National and International Efforts”, *supra* note 3 at 3.

approach as a ‘general good’ is infrequently challenged. Indeed, any such challenge might be considered to be heretical. However, such an uncritical approach may lull us into a false security that integration provides a panacea for our ill-managed oceans. This is simply not true.¹⁵¹

The most trenchant criticism of ICZM lies in its nebulous character, which, like its objective (sustainable development), “makes it difficult to nail down precisely.”¹⁵² Certainly, a major allure of ICZM is that there are no right or wrong approaches, a condition which affords each country substantial freedom to design an ICZM programme that best reflects its needs and interests.¹⁵³

Some countries seek rehabilitation of beleaguered coastal environments, while others focus on terrestrial sources of marine pollution.¹⁵⁴ Apart from this malleability due to contextual variations, an ICZM programme can also be delivered in a wide variety of ways. However, the advantages held out by its protean nature can also turn into an Achilles heel.

ICZM remains vaguely defined at the operational level of management. As referred to earlier, there are five dimensions to ICZM integration, and putting these into practice is not easy.¹⁵⁵ As Biliana Cicin-Sain states

[b]ringing together and harmonizing the perspectives of divergent sectoral government agencies, of different levels of government (each with their own interests, mandates, and perspectives), and of different disciplines (each with different outlooks, language, and methodologies) represents a most challenging set

¹⁵¹ Richard A Barnes, “Some Cautions about Integrated Oceans and Coastal Management” (2006) 8 *Envtl L Rev* 247 at 247-48 (HeinOnline).

¹⁵² Chircop, *supra* note 57 at 345.

¹⁵³ Selina M Stead & Derek J McGlashan, “A Coastal and Marine National Park for Scotland in Partnership with Integrated Coastal Zone Management” (2006) 49 *Ocean & Coast Mgmt* 22 at 38 (ScienceDirect).

¹⁵⁴ For instance “Integrated Protection and Management of Coastal Zones” is NAPA priority project no 3, which seeks to increase the resistance capacity of coastal zones “to climate change, through integrated management of the coastal resources.” This project, has four components, namely, reinforcement of stakeholder capacity; protection activities; research on utilization of inert materials in the coastal zone; and, finally, mobilization, information and sensitization. Cape Verde, Ministry of Environment and Agriculture, National Meteorology and Geophysics Institute & UNFCCC, *National Adaptation Programme of Action on Climate Change 2008-2012* (Executive Version, December 2007) at iii.

¹⁵⁵ Cicin-Sain et al, “Education and Training”, *supra* note 15 at 292.

of tasks.¹⁵⁶

Attaining integration requires that personnel appointed to the task be adequately trained. This calls for capacity building, political support, and constant monitoring and evaluation.¹⁵⁷ A major critique is that, in most coastal countries, particularly those in the developing world, ICZM programmes are constrained by the lack of sustained political support, finance and capacity, systemic failures, and institutional obstacles.¹⁵⁸

A nation's political instability and lack of public awareness are other factors that can derail a programme. Complicating matters further are constitutional constraints (i.e., constitutional amendments may be to operationalize decentralized management or provide for spatial integration) that may hamper integration between sectors of human activity at different spatial scales.¹⁵⁹ For instance, there is a division of responsibility between the various levels of government at the land-sea divide, making this aspect of integration difficult to implement in practice. Again, in unitary systems of governance, it is comparatively difficult to decentralize management authority to local governments that function in coastal zones.

Notwithstanding their drawbacks, ICZM programmes can nevertheless improve the quality of life of coastal communities.¹⁶⁰ Rather than replace sectoral responsibilities, the programmes link up and coordinate actions among different sectors, and also fill in the gaps to ensure that decision-makers do not work at cross purposes. By envisaging wide stakeholder participation, decentralized decision-making, and good science and management practices, ICZM smoothes the process by clarifying and providing guidance on resource use and allocation.

¹⁵⁶ *Ibid.*

¹⁵⁷ See generally Brian R Crawford, J Stanley Cobb & Abigail Friedman, "Building Capacity for Integrated Coastal Management in Developing Countries" (1993) 21 *Ocean & Coast Mgmt* 311 at 337.

¹⁵⁸ See Robin McCall & Talia Choy, "Integrated Coastal Zone Management (ICZM) in Guyana: Development Barriers, Opportunities and Recommendations" in Erlend Moksness, Einar Dahl & Josianne Støttrup, eds, *Integrated Coastal Zone Management* (Oxford: Wiley-Blackwell, 2009) 219 at 229-33 (outlining some of the major barriers in the implementation of ICZM in Guyana).

¹⁵⁹ In this context, the success of ICZM programmes will depend greatly upon the constitutional framework of a country. ICZM presupposes greater public participation. In unitary/federal systems, it will be difficult to implement an ICZM programme, if the constitution or the legal system does not formally provide recognition to public participation and community based institutions.

¹⁶⁰ Chua Thia-Eng, Danilo Bonga & Nancy Bermas-Atrigenio, "Dynamics of Integrated Coastal Management: PEMSEA's Experience" (2006) 34 *Coastal Mgmt* 303 at 304.

Additionally, by empowering local communities and providing them with increased access and decision-making power over resources management, ICZM provides an opportunity to attain all of these aspirations by maximizing benefits of current and future development through careful and rational planning. Competing demands over land and natural resources are balanced, potential conflicts among users are resolved, development is promoted in areas away from sensitive locations, and the impacts of existing activities that may be harmful to the environment are mitigated.

Moreover, the adaptive capacities of coastal communities are augmented, placing them in a better position to adjust to climatic impacts. Thus, despite its weaknesses, ICZM emerges as the master plan for SCD, and the growing international recognition of this concept is a testament to this fact.

6.5 LINKING COASTAL CLIMATE CHANGE ADAPTATION TO ICZM: TWO SIDES OF THE SAME COIN?

To be effective and results-oriented, adaptation strategies must be flexible with spatial and temporal scales.¹⁶¹ Designing an appropriate adaptation response is a complex task that may require a mix of different options. Inevitably, there will also be a certain amount of overlap.¹⁶² Another important aspect is that most SLR adaptation measures are primarily viewed as interventions that emanate as part of land-use planning and generally are the responsibility of local governments.¹⁶³ When these land-use tools are applied to coastal zones, local governments, particularly those in the developing world, find themselves ill equipped to work out the operational specifics of a programme with far-reaching implications. For instance, Bangladesh implemented the Coastal Embankment Project, which produced immediate benefits in terms of bringing more areas under cultivation. But since adequate heed was not paid to proper engineering and the larger environmental implications, within a decade, the protection structures were identified to

¹⁶¹ Charles T O'Reilly, Donald L Forbes & George S Parkes, "Defining and Adapting to Coastal Hazards in Atlantic Canada: Facing the Challenge of Rising Sea Levels, Storm Surges, and Shoreline Erosion in a Changing Climate" in Aldo Chircop & Moira McConnell, eds, *Ocean Yearbook*, vol 19 (Chicago: The University of Chicago Press, 2005) 189 at 206.

¹⁶² J Dronkers et al, eds, *Report of the Coastal Management Subgroup: Strategies for Adaption to Sea Level Rise* (Geneva: IPCC, Response Strategies Working Group, 1990) at 8.

¹⁶³ see Jessica Grannis, *Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use* (Georgetown Climate Center, 2011) at 2-4 (outlining 18 different land use tools to respond to SLR).

be a major cause for water logging and drainage congestion leading to annual economic losses of about USD5 million, apart from other environmental impacts.¹⁶⁴ The poor maintenance of the embankments compounded these issues.¹⁶⁵

Again, in certain cases, coastal populations may have to be relocated to areas that lie outside the jurisdiction of that particular local government. Leaving such critical decisions to local governments can lead to fragmented and uncoordinated responses that can frustrate the larger national goals for climate change adaptation. Thus, it is necessary that interlinkages be established and an operational command that involves governments at all levels put in place to respond to challenges.

At the same time, it must also be pointed out that CCCA is not solely about utilizing land-use tools. The objective of all CCCA measures is to increase resilience, which is the most crucial element in climate change adaptation.¹⁶⁶ In coastal adaptation semantics, coastal resilience refers to the capacity of coastal communities and natural systems to prevent or cope with climate change impacts and SLR.¹⁶⁷ Coastal resilience can be fortified by decreasing the probability of hazard occurrence through managed retreat, protection, accommodation, or facilitating recovery when impacts do occur.¹⁶⁸ This is only part of the technique to increase resilience, which can of course be rejuvenated by increasing the socio-economic capacity of coastal communities to prepare for SLR and climate change impacts on coastal zones, while still retaining opportunities for coastal development.¹⁶⁹

In other words, adapting to SLR and other climate change impacts should not be limited solely to building codes, buffer zones, and set back lines. Rather, it is an abstruse

¹⁶⁴ Dipak Kamal, *Biodiversity Conservation in the Coastal Zone of Bangladesh* (MMM Thesis, Dalhousie University, 1999) [unpublished] at 48-49; see also Banglapedia, *Embankment* online: BANGLAPEDIA <http://www.banglapedia.org/HT/E_0049.H TM>; see also Bangladesh, Ministry of Environment & Forest, *Initial National Communication under the United Nations Framework Convention on Climate Change (UNFCCC)* (Dhaka: Ministry of Environment & Forest, 2002) at 30.

¹⁶⁵ Flow regulators were not incorporated into the design of existing embankments and some were not built as per the design. This led to saline flooding, particularly in the Khulna-Jessore area. Kamal, *ibid* at 55-56. Polders were constructed to protect agricultural land in the coastal zone in the 1960s. Since there were not sufficient number of sluice gates, the polders magnify water logging. *Ibid* at 63.

¹⁶⁶ RF McLean & Alla Tsyban, "Coastal Zones and Marine Ecosystems" in James J McCarthy et al, eds, *Climate Change 2001: Impacts, Adaptation, and Vulnerability* (Cambridge: Cambridge University Press, 2001) 335 at 368.

¹⁶⁷ *Ibid*; *Sea level and coastal hazards are on the rise, placing natural and human communities at great risk: Coastal Resilience can help*, online: Coastal Resilience <<http://coastalresilience.org/>>.

¹⁶⁸ McLean & Tsyban, *ibid*.

¹⁶⁹ *Ibid*.

task that is contingent upon an enlightened approach to CZM, and one that seeks to improve the adaptive capacities of coastal communities by bettering residents' lives and helping them move towards SCD. This is in addition to the element identified earlier, namely, decreasing the probability of hazards by employing managed retreat, protection and accommodation. This measure can operate independently as part of land-use planning, but it definitely has to work within the broader context of CZM. A few illustrations are offered below to support this point.

Marine fisheries are a vital economic resource in most coastal countries. Close to 95 per cent of the world's catch is concentrated in coastal waters and in the 200-mile exclusive economic zone of maritime states.¹⁷⁰ Nowadays, the fishing industry aspires to catch more fish than at any time in the past. The paradox is that, despite their efforts, they end up catching fewer fish due to overfishing, the use of harmful fishing practices, fish migrations caused by rising water temperatures, destruction of marine habitats, and widespread pollution of oceanic waters, all of which have negatively impacted the sustainability of several fisheries. There have been dramatic fish stock collapses in several parts of the world, a crisis that has been aggravated by severe climatic anomalies. It is therefore imperative that sufficient numbers of commercially important fish species be maintained, since artisanal fisheries are dependent on the stock of such species for their livelihood and dietary requirements.

However, the primary response to these developments is to further limit access to fishery resources, which puts disadvantaged low-income coastal communities in deeper distress, rendering many of these fishery-based subsistence economies obsolete.¹⁷¹ In the long run, these developments also impact national economic growth. All of this necessitates a dovetailing of coastal climate adaptation measures with fisheries management, which will produce a more holistic response to offset adverse economic impacts, especially when managerial decisions relating to fishing are being made.¹⁷²

¹⁷⁰ *Ibid* at 369.

¹⁷¹ In respect of fisheries management, Namibia faces the challenge of the warming of the Benguela current and migration of fisheries. In such a situation, the question is whether Namibia should invest in fish processing. See also UNDP, *Human Development Report 2007/2008: Fighting Climate Change: Human Solidarity in a Divided World* (New York: UNDP, 2005) at 172.

¹⁷² *Ibid* at 370. Some of the prominent adaptation measures suggested include aquaculture, modification and improvement of technology related to the fishing industry, management of the fish trade industry, creation of marine biosphere reserves, and protected areas for marine mammals. *Ibid*.

Similarly, implementing retreat and the consequent relocation of coastal communities is an exceptionally difficult and costly affair, particularly when alternative land is limited due to coastal squeeze. For impoverished coastal communities, relocation is practically impossible, as they do not have the financial wherewithal to ensure a smooth relocation. Moreover, operationalization of retreat options produces significant socio-economic and cultural implications, particularly in cases where there is complete abandonment of existing coastal settlements during relocation. The loss of a traditional environment could severely disrupt livelihoods and cultural legacies and produce social instability.¹⁷³

Migration can lead to further societal and economic tensions, particularly when there are people already inhabiting the place of relocation. It is thus imperative that the emphasis of CCCA should be to ensure that adaptive capacities of impoverished coastal communities are strengthened so they can re-locate to new areas with minimal inconvenience and disruption. Generally, the lifestyles of coastal inhabitants are intrinsically linked to the coasts; therefore, if adaptation options are to generate substantial results, the interests of those being relocated must be served by including them in the preparation and implementation phases of retreat.

As explained in Part 1, maintenance of and access to freshwater supplies is a critical requirement if coastal areas are to remain habitable. With rising seas, there is the possibility of salinity ingress and contamination of both surface sources and ground water aquifers. It is thus necessary that “proactive adaptation measures” be adopted, such as regulating the commercial extraction of groundwater from coastal fossil aquifers, adopting large-scale rainwater harvesting measures in coastal areas, and regulating point and non-point discharges into water bodies. An integrated approach that combines water planning and management with CZM can reduce the undesirable impacts of SLR on water sources.

When a resource is overexploited or an ecosystem degraded, there is not only a reduction in its principal and inherent functions, but a ripple effect significantly lowers the performance of other subsidiary functions. For example, when a large swathe of mangroves is cleared to make way for a thermal power plant, apart from the recycling

¹⁷³ For a discussion regarding climate change refugees and internally displaced, see Ch 2, Part 2.4.

and basic amenity functions that mangroves perform (which are lost forever), there is an indirect impact on several other related aspects. These include the loss of a breeding ground for fish, which can indirectly affect the food chain and livelihood prospects of those who live and work in the area. Even though the establishment of a thermal power plant after cutting down mangroves may result in large financial payoffs in the short term, it will, over time, contribute to greater environmental damage, increase climate change vulnerability, and adversely impact the local subsistence economy, thereby reducing the capacity of local communities to adapt to the harmful consequences of climate change. In most cases, it cannot be assumed that the short-term economic benefits outweigh the long-term costs of such environmental disruptions.

As our climate changes, oceans rise, and wind and wave action become more intense, coastal lands that once housed the mangroves may become inundated unless costlier and expensive hard structures are erected. This would at once wipe out a significant portion of the economic benefits accrued by the operation of the thermal power plant. Moreover, erecting hard structures on the coastline is no guarantee of foolproof protection and generally does not match the natural protection afforded by the mangroves.¹⁷⁴ Thus, it becomes a necessary predicate to the implementation of the thermal power project that the impact of SLR be considered and the potential of ecosystems to keep a rising sea at bay be factored in. In short, present-day coastal development and its ability to respond to rising sea levels and climate change will determine the success and effectiveness of long-term adaptation options.¹⁷⁵ Accordingly, it is essential that adaptation concerns be integrated into the broader milieu of coastal planning and management (see Figure 4).

¹⁷⁴ Environmental Justice Foundation, *Mangroves: Nature's Defence against Tsunamis* (London: Environmental Justice Foundation, 2006) at 7-13.

¹⁷⁵ Luitzen Bijlsma et al, "Coastal Zones and Small Islands" in Robert T Watson, Marufu C Zinyowera & Richard H Moss, eds, *Climate Change 1995: Impacts, Adaptations, and Mitigation of Climate Change: Scientific-Technical Analyses, Contribution of Working Group II to the Second Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 1996) 289 at 312.

Integrating Coastal Climate Change Adaptation into the ICZM Process

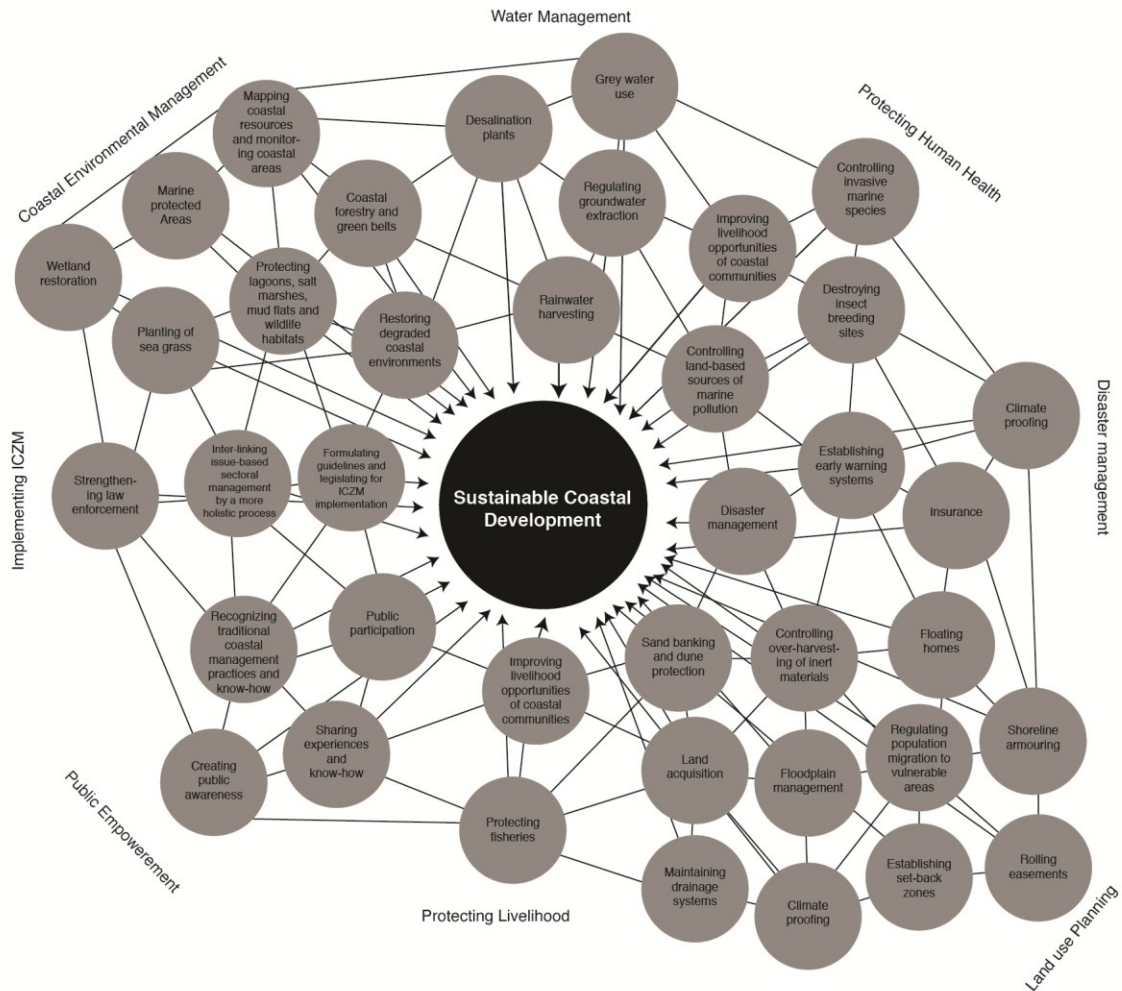


Figure 4: Sustainable Coastal Development: Integrating Climate Change Adaptation Into the ICZM Process

In the above figure, the 42 adaptation measures identified in the previous chapter are grouped under eight heads. And, as can be seen, it is possible to draw linkages between the different adaptation measures. In certain instances, the relationship between the measures, can be very strong (as in the case of marine protected areas and wetland protection), while in others, it can be weak (destroying insect breeding sites and insurance). But in all cases, since these adaptation measures promote coastal environment

protection, development and adaptation, they can be interlinked and implemented via an ICZM web to foster the central goal of SCD.

Effective adaptation to climate change and SLR requires a flexible coastal management strategy that incorporates and integrates short-term goals (e.g., maintenance of all natural functions of coastal ecosystems at sustainable levels) with long-term ones (adaptation to climate change and SLR through retreat, accommodate and protect) to realize the primordial objective of SCD.¹⁷⁶ Such an effort should also include the development of sufficient capacity for disaster management.¹⁷⁷

ICZM has international recognition as the most viable and appropriate methodological response to deal with SLR and other climate change impacts on coastal zones, including other short- and long-term multiple threats like rapid degradation of coastal resources and widespread coastal pollution.¹⁷⁸ ICZM, the IPCC observes is, “the most appropriate process to deal with climate change, sea-level rise and other current and long-term coastal challenges.”¹⁷⁹ Successful adaptation to SLR essentially involves the implementation of a judicious blend of structural and non-structural measures (“multiple lines of defence strategy”)¹⁸⁰ with the overwhelming majority being aimed at improving the adaptive capacities of coastal communities and coastal resilience. This can be accomplished through ICZM, and the best possible manifestation of the ICZM approach is through the preparation and implementation of ICZM plans.

Even though the primary objective of ICZM is to address ways to reconcile contending claims over scarce coastal resources, with the specter of climate change and SLR, the dimension of ICZM stands to change considerably. Rather than merely providing ways to manage competing uses over the coastal zone and the resources

¹⁷⁶ *Ibid.*

¹⁷⁷ Richard J Nicholls & Poh Poh Wong, “Coastal Systems and Low-Lying Areas” in ML Parry et al, eds, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2007) 315 at 341.

¹⁷⁸ *Ibid* at 340.

¹⁷⁹ *Ibid*; see also Adalberto Vallega, *Fundamentals of Integrated Coastal Management* (Dordrecht: Kluwer Academic Publishers, 1999) at 17. The IPCC observes, “[t]he most appropriate process to address current and long-term coastal management issues, including habitat loss, degradation of water quality, changes in hydrological cycles, depletion of coastal resources, and adaptation to sea level rise and other impacts of global climate change.” *Ibid.*

¹⁸⁰ John Lopez et al, *Comprehensive Recommendations Supporting the Use of the Multiple Lines of Defense Strategy to Sustain Coastal Louisiana 2008 Report (Version I)* (2008) at 28.

contained therein, future coastal planning to be relevant must provide for CCCA. Being a methodology to facilitate the attainment of SCD, ICZM will have to, in addition to CCCA, facilitate mitigation goals where feasible, promote development in line with social justice and equity and protect the coastal environment. In fact, so critical is the role of ICZM in providing for CCCA, that scholars have suggested, “ICZM must become “Adaptive” CZM (ACZM) ... Since relative sea-level rise of a meter or more is predicted during the coming century as polar glacial ice melts, nations should prioritize developing ACZM policies and practices.”¹⁸¹

To bolster the success of adaptive responses, it is necessary that ICZM be a considered factor in all ongoing and future planning and decision-making programmes relating to coastal zones. In the same vein, any effort targeted at SCD that does not consider the effects of climate change and SLR will also not achieve the desired results. Overlaying CCCA measures onto ICZM programmes will enable them to reinforce each other. Furthermore, concepts integral to ICZM (e.g., planning, adaptive management, environmental protection, community participation, decentralized decision-making, etc.) must be applied to CCCA processes. Both CCCA and ICZM seek to ensure that coastal and marine ecosystems are functioning and continue to remain healthy. This is extremely important; since functional coastal ecosystems can provide a range of amenities and values, like storm protection, flood mitigation, shoreline stabilization, erosion control, water storage, groundwater recharge, and nutrient and pollutant retention. In light of these benefits, there is growing recognition of the approach, evident in the attempts by annex-I and non-annex-I countries (including LDCs), who are developing ICZM plans as part of their adaptation programmes.¹⁸²

¹⁸¹ Nicholas A Robinson, “IUCN as Catalyst for a Law of the Biosphere: Acting Globally and Locally” (2005) 35 *Envtl L* 249 at 288 (QL). It must be noted that this thesis and more importantly the present chapter demonstrates, to realize SCD, it is necessary to inter-link and implement CCCA actions via an ICZM process. In this regard, semantics and images are useful and relevant, and there is reason in rechristening ICZM as ACZM. However, for purposes of clarity, it is felt that describing the practice as ACZM will obfuscate the underlying intent and ideas behind these apparently discrete concepts and therefore throughout this study they will be described independently even though the idea of this thesis is essentially encapsulated by the term ACZM.

¹⁸² For instance, NAPA priority project no. 17 entitled Development of an Integrated Coastal Zone Management Plan for the Sierra Leone seeks to ensure economic development and preservation of ecosystems. Sierra Leone, Sierra Leone Government & UNDP, *National Adaptation Programme of Action (NAPA): Final Report* (Government of Sierra Leone Ministry of Transport and Aviation, 2007) at 85-86.

Incorporating a CCCA dimension into ICZM does not radically alter its nature. In viewing ICZM through a climate change lens, certain important factors or “needs” should be considered. These include: (1) the need for a greater emphasis on environmental protection and a greater reliance on nature-based coastal protection strategies and measures; (2) the need to factor in the issue of uncertainty associated with climate change impacts on coastal zones; (3) the need for a longer planning horizon;¹⁸³ (4) the need to augment livelihood opportunities by ensuring equitable and sustainable allocation of coastal resources to fortify the adaptation capacities of coastal communities; (5) the need to preserve and improve the resilience, productivity and biological diversity of coastal ecosystems so that coastal ecosystems can absorb climate change impacts and support greater economic and livelihood opportunities; and, (6) the need to provide for integrated decision-making through a holistic system that links multi-purpose management efforts and reduces conflicts associated with sectoral management.

CCCA is not solely about building sea walls, climate-proofing, and moving people out of harm’s way. It is also about augmenting the capacities of coastal communities to manage climate-change-related impacts, improving their quality of life, protecting coastal resources, and ensuring that economic development proceeds in a manner that does not jeopardize the resilience of coastal ecosystems. Thus, it is clear from the above that there is considerable utility in linking coastal zone climate change adaptation to an ICZM process. Having both the capacity to make decisions regarding CZM and the resources through ICZM constitutes a firm foundational response option for addressing the consequences of SLR.¹⁸⁴

¹⁸³ James Tobey et al, “Practicing Coastal Adaptation to Climate Change: Lessons from Integrated Coastal Management” (2010) 38 Coastal Mgmt 317 at 317

¹⁸⁴ EC, *Proposal for a Directive*, *supra* note 29 at 8, art 8(2)(f) (stating that ICM strategies are to provide for mitigation and adaptation to climate change). For an overview of the importance of ICZM as an adaptation strategy see Cambodia, Ministry of Environment, *Cambodia’s Initial National Communication under the United Nations Framework Convention on Climate Change* (Cambodia: Ministry of Environment, 2002) at 41; Bahrain, General Commission for the Protection of Marine Resources, Environment & Wildlife, *Bahrain’s Initial Communications to the United Nations Framework Convention on Climate Change Volume I: Main Summary Report* (Bahrain: General Commission for the Protection of Marine Resources, Environment & Wildlife, 2005) at 46; Tanzania, Vice President’s Office, *Initial National Communication under the United Nations Framework Convention on Climate Change (UNFCCC)* (Tanzania: Vice President’s Office, 2003) at 45; Egypt, *Egypt Second National Communication under the United Nations Framework Convention on Climate Change* (Cairo: Egyptian Environmental Affairs Agency, 2010) at 89;

6.6 CONCLUSION

In sum, it is clear that ICZM was developed as the plausible functional response to re-invigorate and re-negotiate the way in which we manage our coasts, providing substance and form to the concept of SCD. ICZM is increasingly being proffered as the principal proactive tool to forge the appropriate balance between competing coastal uses and demands seeking to create synergetic and positive relationships between the myriad of players and sub-sectors that have stakes in the coastal zone. Traditional sectoral coastal management responses have not always provided a comprehensive package of solutions that are sufficiently inter-linked and consequently have not been able to prevent or even slow the trend of degradation. From a functional perspective, ICZM seeks to re-orient, re-work and link the divergent multi-dimensional management efforts currently at play in coastal zones to produce more holistic solutions that recognize the zones' unique features. Additionally, it seeks to create more opportunities for livelihood, to increase productivity of existing activities, to promote equitable growth, and to improve the resilience of coastal ecosystems. Like a "Christmas tree" with a myriad display of decorations, several courses of action with diverse goals and objectives can all hang together in an ICZM programme.

More importantly, ICZM offers an efficacious approach that can dovetail land-use-planning-based climate adaptation objectives with its own repertoire, addressing the problems posed by SLR and other climate change impacts more effectively and holistically. Adherence to such an approach is needed not merely because there is the need to stave off coastal communities from impending catastrophes, but more importantly because there are several low-hanging fruits that can be utilized to promote the welfare of coastal communities.

The multiple benefits that can accrue to coastal inhabitants by following such an approach are very high. If our coastal management efforts are not directed towards harnessing these benefits, (which, can help alleviate a number of the adverse impacts identified), these opportunities may be lost forever, and the problems compounded. The

Seychelles, Ministry of Environment & Transport, *Initial National Communication under the United Nations Framework Convention on Climate Change* (Seychelles: Ministry of Environment & Transport, 2000) at 88.

present approach in most countries is hard armouring, which, as pointed out earlier, is a myopic fix. Designing adaptive responses that do not take into account the need for an integrated approach will considerably reduce, or even negate, chances of success. As parallel tracking adaptation and ICZM can threaten the long-term viability and sustainability of these efforts, it is imperative that existing systems be reconfigured in such a way that a broader scheme for ICZM implementation (i.e., one that harmonizes and integrates coastal climate adaptation) is devised. Of course, this does not mean that by adopting such a course of action we will be able to reign in the negative dynamic and revert back to an ideal situation and that we can continue with a ‘business as usual’ approach of emitting more GHGs. Actions may have to be taken on a wide range of fronts, including measures aimed at stricter mitigation. Nevertheless, the utility of linking adaptation with ICZM, which can make perceptible changes on the ground, cannot be discounted.

In building this enlightened and judicious architecture for CZM laws and legal frameworks play an important role. An enabling legislative environment provides the imprimatur to work an ICZM programme and can also help us move towards a more sustainable pattern of coastal development by setting out the parameters for the exercise of rights and the observance of duties by stakeholders. These aspects are dealt with in the next part.

PART III

THE LEGAL FRAMEWORK FOR SUSTAINABLE COASTAL DEVELOPMENT

This part addresses the primary research question that this thesis seeks to address, namely: what role can coastal laws play in facilitating ICZM implementation in South Asia to balance coastal development with coastal environment protection and coastal climate change adaptation? In fact, its objective is twofold: 1) to understand the importance of dedicated coastal law statutes to facilitate ICZM implementation by balancing the troika of interests namely, coastal development, coastal environment protection and coastal climate change adaptation and mitigation; and 2) to provide relevant information to help in the identification of certain essential legal principles that can inform coastal law development and legal reform, particularly from the perspective of coastal climate change adaptation for South Asia, which will be carried out in the next part. Divided into two chapters, the first, namely, chapter seven, examines *inter alia* some of the national experiences in legislating ICZM and adapting to sea level rise to reveal a heterogeneous range of conceptions of how ICZM programmes and CCCA can be implemented through the legal route. However, as prelude to this examination of national experiences, the highpoints in the development of ICZM at the international level is set out. The next chapter, i.e., chapter eight carries the analysis forward by proposing a theoretical justification for coastal zone management law and through a SWOT it offers a compelling case for a coastal management legislation to underpin and support the ICZM process and to juxtapose CCCA onto an ICZM programme. Drawing from previous chapters, it explores some of the salient features in ICZM law development throughout the ages and explicates possible future trends where the core of ICZM law will be devoted to addressing, supporting and implementing CCCA issues.

CHAPTER 7 OPERATIONALISING INTEGRATED COASTAL ZONE MANAGEMENT AND ADAPTING TO SEA LEVEL RISE THROUGH DEDICATED COASTAL LAWS: RELEVANT INTERNATIONAL ENVIRONMENTAL LAW AND A FEW NATIONAL EXPERIENCES

7.1 INTRODUCTION

Ever since the 1992 Rio Earth Summit, integrated coastal zone management (ICZM) has widely been touted as a panacea to most of the problems that endanger the sustainable development of coastal areas, resources and communities.¹ Clearly, as highlighted in part two, the uniqueness of ICZM is that it goes beyond the conventional silo-based approaches that lead to working at cross-purposes and wastage of resources (i.e., inept management) by providing a more solid and integrated foundation to engage and bring together various constituencies and stakeholders for effective coastal decision-making. The data reveals that there is an impressive growth in the number of ICZM programmes.² In this regard, many significant gains have been achieved outside the traditional institutional management frameworks and formal arrangements for coastal governance.³

All the same, in a majority of coastal nations and in South Asia in particular, the degradation of coastlines, depletion of coastal resources and loss of coastal space continue.⁴ Despite several well thought out ICZM plans and programmes currently in place, most coastal areas and littoral environments are fast deteriorating.⁵ The *raisons d'être* for the inability of ICZM in many of these coastal countries to stem the tide of environmental degradation are many and varied.⁶ One important factor that can hamper the implementation of ICZM programmes is the lack of appropriate legislative support.⁷

¹ Nicholas A Robinson, ed, *Agenda 21 & The UNCED Proceedings*, vol 4, 3rd series, International Protection of the Environment (New York: Oceana Publications, Inc, 1993) at 307, ch 17, ¶17.3.

² See Jens Sorensen, *Baseline 2000 Background Report: The Status of Integrated Coastal Management as an International Practice*, Coastal Zone Canada Association, Baseline 2000 (2nd Iteration, 2002) at 3-1 [Sorensen, *Baseline 2000*].

³ *Ibid.*

⁴ For an overview of the state of coastal environmental degradation in South Asia, Ch 3, Part 3.2.

⁵ See UNGA, *Oceans and the Law of the Sea: Report of the Secretary General: Addendum, A/59/62/Add.1*, 29 (18 August 2004) ¶97.

⁶ Despite Bangladesh recognising the utility and importance of ICZM, degradation of its coastlines continue. For more details see, Ch 2, Part 2.2.3.

⁷ *Ibid.*

However, this is not to suggest that enacting a dedicated coastal statute will *per se* put the house back in order, as lawmaking only lays down a normative framework. Nevertheless, as the subsequent discussion points out, a dedicated coastal legislation can play a vital role in determining and sustaining an ICZM process.

The implementation of ICZM and coastal climate change adaptation brings forth in its wake a series of legal issues for which, as the previous chapters demonstrate; no across-the-board solutions can be applied. Likewise, the implementation of the three broad adaptation responses in relation to SLR (accommodation, retreat, and protection) also involves substantial legal questions. Issues can arise in relation to retreat⁸ and resettlement,⁹ construction of coastal protection and other structures, their subsequent failure and liability,¹⁰ expropriation of private property,¹¹ etc., which may require legal

⁸ An important legal technique used to implement retreat is rolling easements. See *Severance v Patterson*, 2010 Tex LEXIS 854 (Tex, 2010); *Severance v Patterson*, 2011 Tex LEXIS 779 (Tex, 2011); *Severance v Patterson*, 2012 Tex LEXIS 260 (Tex, 2012); see also Part 7.3.1.3, below, for more details.

⁹ Coastal communities forced to resettle may litigate to recover damages from those who have contributed to the problem of GHG emissions. *Native Village of Kivalina v ExxonMobil Corp*, 663 F Supp (2d) 863 (ND Cal, 2009). J Peter Byrne & Jessica Grannis, “Coastal Retreat Measures” in Michael B Gerrard & Katrina Fischer Kuh eds, *The Law of Adaptation to Climate Change: U.S. and International Aspects* (Illinois: American Bar Association, 2012) 267 at 295.

¹⁰ *Avenal v State*, 2004 La LEXIS 2984 (La SC, 2004) [*Avenal*]. The operation of Caernarvon freshwater diversion structures designed to abate saltwater intrusion and marine tidal invasion altered salinity levels, which destroyed oyster grounds. The trial court awarded damages, which was subsequently reversed. Held: The oyster fishermen are not entitled to compensation as harmless clauses in their leases exempted state liability. *Ibid*.

The Army Corps of Engineers dredged the Mississippi River Gulf Outlet (MRGO), a shipping channel namely, between New Orleans and the Gulf of Mexico through virgin coastal lands. Certain levees alongside the channel and around the city and certain floodwalls were also constructed. In the original design there was no provision for armouring. It was only in the 1980s that armouring carried out. But by then the channel widened considerably, enabling Hurricane Katrina to generate a peak storm surge that breached the levees leading to flooding. Contending that it was the Corps's negligence in maintaining the channel that led to widespread damage, the plaintiffs sued to recover for damages. In the United States District Court Eastern District of Louisiana it was found that neither the *Flood Control Act, 1928*, nor the discretionary-function exception to the *Federal Tort Claims Act, 1948*, protected the government from the suit; and therefore it was held that some of the plaintiffs proved the government's full liability. *In re Katrina Canal Breaches Consol Litigation*, 647 F Supp (2d) 644 (ED La, 2009). This was taken in appeal to the United States Court of Appeals, Fifth Circuit. *In Re Katrina Canal Breaches Litigation*, 673 F (3d) 381 (5th Cir 2012). A three-judge bench speaking through Jerry E. Smith held that the government enjoyed immunity only from damages caused by floodwaters released on account of flood-control activity or negligence therein. Katrina-related flooding was caused not by flood-control activity, but by the MRGO, a navigational channel whose design, construction, and maintenance could not be characterized as flood-control activity. Therefore, the *Flood Control Act, 1928*, did not clothe the government with any immunity against liability for the flooding. As well, the discretionary function exception under the *Federal Tort Claims Act, 1948*, did not apply since under the *Berkovitz-Gaubert* test, the government

adjudication. Due to incompatibility between many existing laws and jurisprudence and new situations, these may prove dysfunctional, necessitating a reevaluation of the fundamentals.

The “anticlimactic”¹² decision of the United States Supreme Court in *David H. Lucas v. South Carolina Coastal Council*¹³ involving an interpretation of the takings clause is demonstrative of this incompatibility.¹⁴ As well, fundamental precepts of

enjoyed immunity only where its discretionary judgments are susceptible to public-policy analysis. In the instant case, only objective scientific principles were involved and not any public-policy considerations. “The Corps misjudged the hydrological risk posed by the erosion of MRGO’s banks. Therefore, the government should not enjoy DFE immunity against the resultant flooding.” *Ibid* at 391. Against this the United States government filed a petition for rehearing and in a surprise move the very same three-judge panel withdrew this opinion and substituted it with a new one, which favoured the government. *In Re: Katrina Canal Breaches Litigation*, 696 F (3d) 436 (5th Cir 2012). Even though the court was unwilling to disturb its earlier holding in relation to *Flood Control Act, 1928*, the court found that the discretionary function exception would apply to the Corps’s actions, holding that “the Corps’s failure to armor timely Reach 2 is shielded by the DFE.” *Ibid* at 451. This was so because there was “ample record evidence indicating the public-policy character of the Corps’s various decisions contributing to the delay in armoring Reach 2.” *Ibid*. And this completely insulated the government from liability. *Ibid* at 454. By indulging in this U-turn within a span of six months, the court effectively shut the doors to a large section of plaintiffs who were practically victims of a mass tort due to the improper upkeep of the MRGO.

Byron Shire Council v Vaughan, Vaughan v Byron Shire Council, (2009), [2009] NSWLEC 88 and (No 2) [2009] NSWLEC 110. Due to wave action and storm surge there was substantial erosion of the beach front of the respondents and the property was unprotected. Thereafter, the respondents’ contractor deposited large rocks on the road in anticipation of moving these to the respondents’ land to create a barrier to prevent further erosion. This work to create a rock riprap was sought to be enjoined on the ground that development consent was not obtained and that there was no road approval under the Roads Act. Consequently, the work was a trespass and a potential public nuisance. Against this, the respondents argued that the riprap was protected under the development consent granted by the council, which operated in rem to support the present works. Rejecting the arguments, the Land and Environment Court pointed out that the work done in isolation on the Respondents’ land will result in potentially adverse impacts on neighbouring properties in the immediate vicinity and more generally along the Belongil spit and accordingly the work was enjoined.

¹¹ Land acquisition is an essential tool for effective management of coastal areas and should be integrated into coastal management systems. David Ownes, “Land Acquisition and Coastal Resource Management: A Pragmatic Perspective” (1983) 24:4 Wm & Mary L Rev 625 at 630 (HeinOnline).

¹² See generally Richard A Epstein, “*Lucas v South Carolina Coastal Council*: A Tangled Web of Expectations” (1993) 45 Stan L Rev 1369 (QL).

¹³ *David H Lucas v South Carolina Coastal Council*, 505 US 1003 (1992).

¹⁴ The factual matrix reveals that one David H. Lucas purchased two vacant oceanfront lots in a highly unstable area to build homes in South Carolina. Because of the instability, the South Carolina Coastal Council issued permits for two rock revetments, which were placed close to Lucas’s property. At the time, when Lucas purchased these parcels, he was not legally obliged to obtain a permit from the Coastal Council. Subsequently, in 1988, the South Carolina Legislature enacted the *Beachfront Management Act*, which barred Lucas from building any permanent habitable structure on his lots. Lucas instituted an action, asserting that the restrictions constituted a taking of his property without just compensation since it deprived him of all economically viable use of his

common law detailing rights enjoyed by littoral property owners (e.g., the right to use, access, and an unobstructed view of the water, and the right to receive accretions and relictions to the littoral property) may require modifications, particularly to facilitate coastal adaptation programmes like beach restoration and nourishment.¹⁵ As sea levels rise, it may become necessary to remove and relocate people and investments from areas that are hazard-prone to safer zones. In implementing a retreat strategy, the government may have to acquire coastal lands and proscribe private development on a massive scale,

property. The lower court agreed and awarded Lucas just compensation, which was reversed by the Supreme Court of South Carolina which held that governmental regulation of the use of property to prevent serious public harm did not amount to a regulatory taking and therefore compensation was not due. The Supreme Court of South Carolina ruled that when a regulation is designed to prevent “harmful or noxious uses” of property, no compensation is payable under the takings clause, regardless of the regulation’s effect on property value. This holding brought the matter before the Supreme Court of United States, which ruled against this decision to hold that a regulation that deprives a property owner of all “economically viable uses of his land” forms a regulatory taking that requires just compensation. The United States Supreme Court remanded the matter back to the South Carolina Supreme Court, which then directed the S.C. Coastal Council to compensate Lucas and take title to the lots. The Lucas decision has far-reaching implications for coastal climate change adaptation responses, raising more questions than providing answers. *Ibid*; see also Pat A Cerundolo, “The Limited Impact of Lucas v. South Carolina Coastal Council on Massachusetts Regulatory Takings Jurisprudence”, Comment, (1998) 25:2 BC Envtl Aff L Rev 431 at 484 (HeinOnline); Dana Beach & Kim Diana Connolly, “A Retrospective on Lucas v. South Carolina Coastal Council: Public Policy Implications for the 21st Century” (2003) 12:1 Se Envtl LJ 1 at 14 (HeinOnline).

¹⁵ The city of Destin and Walton County applied for permits to restore parts of a beach eroded by hurricanes under the *Florida’s Beach and Shore Preservation Act, 1961*. The project envisioned depositing dredged sand. Under the Act, once a beach restoration “is determined to be undertaken,” the concerned board can determine “an erosion control line” which is fixed to replace the fluctuating mean high-water line (defined as the average reach of high tide over the preceding 19 years) which was then treated as the ordinary boundary between private beach-front and state-owned land. Under common law, accretions are basically additions that occur gradually and imperceptibly and the littoral owner automatically take title to the dry land added to his/her property. However, once the erosion-control line is recorded, the common law ceases to increase upland property by accretion. This was challenged by Stop the Beach Renourishment, Inc., a non-profit corporation formed by beachfront property bordering the project area. While the District Court of Appeal concluded that the permits eliminated two of the petitioner’s littoral rights, namely, the right to receive accretions to their property and the right to have contact of their property with the water and therefore was an unconstitutional taking, the Florida Supreme Court faulted the court of appeal. Against this, the matter was brought before the US Supreme Court, which while entering into a jurisprudential analysis over the existence of judicial takings rejected a fifth and fourteenth amendment takings claim on the ground that the Florida law did not guarantee littoral property owners water contact and that even though the Florida law does guarantee littoral property owners an interest in accreted sand, it was subordinate to the right of the state to fill in the submerged land and thereafter make use of the dry land. “The right to accretions was ... subordinate to the State’s right to fill.” *Stop the Beach Renourishment, Inc v Florida Dep’t of Environmental Protection* (2010) USSC 08-1151, 130 S Ct 2592 (2010) at 26. “[T]here are a plethora of unresolved legal issues that can serve to derail the reliance on beach restoration as a sea level rise adaptation strategy.” Donna R Christie, “Sea Level Rise and Gulf Beaches: The Specter of Judicial Takings” (2011) 26:2 J Land Use & Envtl L 313 at 327 (HeinOnline).

or impose severe restrictions on the bundle of property rights, requiring the payment of compensation. Since the number of claimants may run into hundreds of thousands in South Asia, the fiscal consequences of such an exercise can be severe and may even empty government coffers, fundamentally restricting their ability to implement retreat. As well, landowners may approach the government for compensation in cases where their properties are claimed by a rising sea. As the law stands in some of the South Asian coastal countries, expropriation of private property is a highly contested legal issue and attempts by national governments to acquire private property have generally been frowned upon.¹⁶

Of late, in acknowledgement of the impending dangers posed by a degraded coastal environment and rising seas, the wheels of coastal law reform have been set in motion in several countries. New coastal law regimes are being developed and existing ones refurbished. This serves to build the capacity to enable implementation of programmes for sustainable coastal management in a more effective and legalistic manner.¹⁷ Given the universality of the problem of inexorable sea level rise (SLR) and climate change, coastal law reform is an issue that will confront most coastal countries, particularly those that seek to achieve sustainable coastal development and coastal climate change adaptation through ICZM.

Although it has become fashionable to plead for law reform and enacting legislations in the event of crises as reactive responses, these are short-term fixes, especially in the case of coastal South Asia in the environmental law arena. Certainly, it is necessary to enact coastal laws in order to cope with the new situations, but legislative time and resources are limited, so existing legal regimes should be examined to determine whether they can cover the point or not. In certain cases, an existing law with a few minor modifications may be able to respond to the impending crisis. However, coastal

¹⁶ For instance, in India alone, it is reported that in the 60 years following India's independence, 60 million have been displaced due to development projects. Kate Hoshour & Jennifer Kalafut, "A Growing Global Crisis Development-Induced Displacement & Resettlement", Issue Paper (San Francisco: International Accountability Project, 2007) at 1. Relief and rehabilitation has been tardy and to rectify this situation, for long there has been a proposal to replace the antiquated *Land Acquisition Act, 1894*, via the Land Acquisition, Rehabilitation And Resettlement Bill, 2011. (No 77 of 2011, India). However, this Bill is yet to become a law.

¹⁷ See Part 7.3, below, for national legislative experiences on coastal law making. For coastal law building exercises in South Asia, see also Ch 2, Part 2.2.

management under archaic laws even if revamped may continue to be inimical to sustainable coastal development imperatives and may even lead to irresponsible coastal use practices.

In building a legal edifice for coastal management and coastal climate change adaptation for South Asia, this chapter explores attempts at legislating coastal management at national and sub-national levels in different countries and is divided into two parts. As prelude to the examination of national efforts, section 7.2 chronicles the corpus of international environmental law on ICZM briefly charting the development of this concept at the international level. International environmental law plays an important role in the development of national legislations by setting common standards, which are often appropriately reflected, in these national legislations and programmes. The intention here is to highlight the weaknesses in the evolving international environmental law on ICZM, which heightens the need to strengthen the fledging international environmental law on this subject and it also underscores the importance of national models on ICZM legislation. In a similar vein, the vagueness in the international environmental regime on ICZM also increases the relevance of regional approaches to ICZM implementation. Section 7.3 presents synopsis reports describing the salience of the prescriptive details of the national legal frameworks for coastal environment and resources management.

While it is useful to know that attempts are currently underway in several countries to develop a legislative basis for ICZM implementation, a comprehensive analysis of different countries' practices is beyond the scope of the present study. Nonetheless, certain key examples of coastal countries will be used to illustrate the diverse and innovative ways in which the instrumentality of law can be employed to further ICZM implementation and CCCA. While some of these coastal countries, exhibit considerably mature legislative models on ICZM that harmonizes and admirably incorporates CCCA within its ambit; there are others where the linkages and the use of the legal mode leave much to be desired. Nevertheless, all these countries have been chosen because they exhibit different approaches, including diverse ways of using laws and legal systems to implement ICZM programmes and promote coastal climate change adaptation in a wide variety of settings. The discussion also analyzes the implications of the relevant

provisions in these coastal laws for coastal climate change adaptation and how they facilitate ICZM implementation. Each of these case studies concludes with a brief commentary on the novelty of the legal framework, the challenges faced in putting these into practice and the relevance of the experience to coastal South Asia.

7.2 INTERNATIONAL ENVIRONMENTAL LAW AND INTEGRATED COASTAL ZONE MANAGEMENT

The importance of the coast as an invaluable piece of real estate is now the growing focus of international environmental law.¹⁸ In fact, the need to afford special protection to the coastal environment received heightened recognition at the path-breaking United Nations Conference on the Human Environment 1972, known as the Stockholm Conference.¹⁹ To achieve “a more rational management of resources” and “to improve the environment”, the Stockholm Declaration and Action Plan on the Human Environment calls upon states to “adopt an integrated and coordinated approach to their development planning”²⁰ In the same year, the US Congress passed the pioneering *Coastal Zone Management Act, 1972*, which is the first major coastal law in the world that calls upon coastal states to develop and implement coastal zone management plans.²¹ Since then, ICZM has developed apace all over the world, and there has been a proliferation of an assortment of ICZM laws and programmes.

At the international level, seminal recognition of integration in the ocean law context is traceable to the 1982 *United Nations Convention on the Law of the Sea* (LOSC).²² Though not articulated in precise terms, there are several provisions in the LOSC that can be interpreted as providing valuable support to spur the ICZM mandate. For instance, the preamble to the LOSC proclaims the core principle of integration and the unity of the oceans (supportive of a related tool, namely, marine spatial planning) in

¹⁸ The focus in this part is on multilateral international agreements that have a global focus irrespective of the hard or soft law nature.

¹⁹ Incidentally the United States enacted the *Federal Coastal Zone Management Act* in the same year. For more discussion, see Part 7.3.1, below.

²⁰ *Declaration of the United Nations Conference on the Human Environment*, 16 June 1972, 11:6 ILM 1416, prin 13.

²¹ *Coastal Zone Management Act of 1972*, Pub L No 109-58 (codified as amended at 16 USC §1451-1465 (2005)) [*USCZMA*].

²² *United Nations Convention on the Law of the Sea*, 10 December 1982, 1833 UNTS 397, 21 ILM 1261 (entered into force 16 November 1994) [*LOSC*].

the following: “the problems of ocean space are closely inter-related and need to be considered as a whole.”²³ In addition, the scheme regarding demarcation of maritime zones securing state control and responsibility over ocean areas is relevant in articulating a state responsibility for the development of ICZM programmes.²⁴ Again, Part XII spells out state responsibility for the protection and preservation of the marine environment, which is also significant from an ICZM perspective.

In the meantime, environmental protection as a fundamental objective gave way to the broader goal of sustainable development that emphasized the integrated nature of environmental protection and economic development with the 1987 Brundtland Report. This marked shift in perspective found reflection in determining the ultimate objective of ICZM programmes as well. The Brundtland report also emphasized the importance of assisting developing countries “to strengthen their legal and institutional frameworks needed for integrated management of coastal resources.”²⁵ In the 1992 United Nations Conference on Environment and Development (UNCED) at Rio, sustainable development became the cornerstone of the new paradigm. The UNCED also proved to be a watershed in entrenching and energizing the operation of ICZM principles at the international level. It introduced the concept of “principled decision-making” to ocean and coastal governance. One of its principal outcomes, the set of 27 principles popularly known as the Rio Declaration on Environment and Development, offers a beacon of light for coastal nations by articulating environmental notions integral to an ICZM process.²⁶ Another UNCED document, is Agenda 21: Programme of Action for Sustainable Development, a 40-chapter global plan of action in which “Chapter 17 - Protection of the Oceans, All Kinds of Seas, Including Enclosed and Development of Their Living Resources” (Chapter

²³ *Ibid.*

²⁴ “National responsibility for the development of ICZM programs stems from state responsibility and control over ocean areas at international law.” Matthew Heemskerk, “National Efforts at Integrated Coastal Zone Management: The Canadian, Australian and New Zealand Experiences”, Notes, (2001) 10 Dal J Leg Stud 158 (HeinOnline).

²⁵ World Commission on Environment & Development, *Our Common Future* (Oxford: Oxford University Press, 1987) at 266 [World Commission on Environment & Development].

²⁶ States are called upon to ensure sustainable development of the resource by taking a precautionary approach to prevent environmental degradation by following an integrated ecosystem approach to oceans governance by preventing pollution, by undertaking environmental assessments, and by seeking public inputs and inputs from local and aboriginal populations. *United Nations Conference on Environment and Development: Rio Declaration on Environment and Development*, 14 June 1992, 31:4 ILM 874.

17) aims to advance the objective of ensuring that “[c]oastal States commit themselves to integrated management and sustainable development of coastal areas and the marine environment under their national jurisdiction.”²⁷ To respond to the challenges posed by climate change and SLR, coastal states are also called upon to formulate contingency plans.²⁸ As well, Chapter 12 of Agenda 21, which deals with the management of fragile ecosystems, defines the term to include wetlands, small islands and certain coastal areas and therefore holds relevance to an ICZM process.²⁹

The UNCED also resulted in two Conventions that exerted their influence in highlighting the ICZM imperative. The first is the *United Nations Framework Convention on Climate Change, 1992*, which, in articulating “commitments,” calls upon parties to “develop and elaborate appropriate and integrated plans for coastal zone management.”³⁰ This is perhaps the only hard law instrument that expressly recognises ICZM and its value as a necessary adaptive tool to meet the challenges posed by climate change and SLR. Integrated marine and coastal area management approaches (such as Integrated Marine and Coastal Area Management, Integrated Coastal Management and ICZM) have recognition as the most efficient tool to implement the terms of the *Convention on Biological Diversity, 1992*, (CBD) (yet another UNCED product) in relation to “the conservation and sustainable use of marine and coastal biodiversity.”³¹ Despite its relevance, the CBD text does not specifically address ICZM. Nevertheless, it spurred the Jakarta Mandate on Marine and Coastal Biodiversity, which is essentially a programme of action that seeks to address issues concerning coastal and marine environments. It further commits state parties to marine and coastal biodiversity conservation and “[e]ncourages the use of integrated marine and coastal area management as the most suitable framework

²⁷ It identifies 14 specific management related activities for the coastal areas. Robinson, ed, *supra* note 1 at 310-11, ch 17, ¶17.6(a)-(n).

²⁸ *Ibid*, ¶17(6)(e).

²⁹ *Ibid* at 184, ch 12, ¶12.1

³⁰ *United Nations Conference on Environment and Development: Framework Convention on Climate Change*, 19 June 1993, 31 ILM 849 (adopted at New York 9 May 1992) [UNFCCC] art 4(1)(e); see also *Protocol on Integrated Coastal Zone Management in the Mediterranean*, [2009] OJ L 34/19, pmb1.

³¹ AIDEnvironment, National Institute for Coastal and Marine Management/Rijksinstituut voor Kust en Zee (RIKZ), Coastal Zone Management Centre, *Integrated Marine and Coastal Area Management (IMCAM) Approaches for Implementing the Convention on Biological Diversity*, CBD Technical Series No 14 (Montreal: Secretariat of the Convention on Biological Diversity, 2004) at 3.

for addressing human impacts on marine and coastal biological diversity” and for promoting its conservation and sustainable use.³² Furthermore, it also “[e]ncourages Parties to establish and/or strengthen, where appropriate, institutional, administrative, and legislative arrangements for the development of integrated management of marine and coastal areas, and their integration within national development plans.”³³

Chapter 17 of Agenda 21 also served as a stepping-stone for future environmental and development policies and influenced several other global conferences that helped to develop and entrench the concept. For instance, it invited the UNEP Governing Council to convene an intergovernmental meeting on the protection of the marine environment from land-based activities.³⁴ Accordingly, the Conference in Washington (1995) led to the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities³⁵ and the Washington Declaration,³⁶ both instruments affirming the utility of ICZM. In addition, the recently adopted (2012) “Manila Declaration on Furthering the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities,” emphasized “the need for integrated watershed and coastal management in efforts to achieve the effective sustainable management of land-based activities.”³⁷ The parties also resolved to “comprehensive, continuing and adaptive action within a framework of integrated coastal management relevant to respective national and regional priorities.”³⁸

³² *COP 2 Decision II/10, Conservation and Sustainable Use of Marine and Coastal Biological Diversity*, ¶2, online: Convention on Biological Diversity, Decisions, COP 2 Decisions <<http://www.cbd.int>>.

³³ *Ibid*, ¶3.

³⁴ Robinson, ed, *supra* note 1 at 317, ch 17, ¶17.26.

³⁵ UNEP, Intergovernmental Conference to Adopt a Global Programme of Action for the Protection of the Marine Environment from Landbased Activities, *Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities*, UNEP(OCA)/LBA/IG.2/7 (5 December 1995).

³⁶ The Washington Declaration recognized “the importance of integrated coastal area management ... as means of coordinating programmes aimed at preventing marine degradation from land-based activities with economic and social development programmes.” See *Declaration on the Protection of the Marine Environment from Landbased Activities (Washington)*, 23 October-3 November 1995, 6 RECIEL, 883.

³⁷ UNEPGC, *Manila Declaration on Furthering the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities: Note by the Executive Director*, UNEP/GCSS.XII/INF/10 (9 February 2012).

³⁸ *Ibid* at 3.

The Global Conference on Sustainable Development of Small Island Developing States at Barbados (influenced by Chapter 17) in 1994 resulted in a comprehensive Programme of Action for the Sustainable Development of Small Island Developing States, emphasizing the importance of ICZM in several of its articles.³⁹ ICZM has been identified in numerous other international agreements as being key to the agenda for the sustainable development of coastal areas and resources. The FAO Code of Conduct for Responsible Fisheries, 1995, in article 10 emphasizes the need to integrate fisheries into coastal area management through the use of ICZM.⁴⁰

As well, other instruments expressly recognize the utility of the ICZM methodology. First in line is the Ramsar Convention, since most coastal zones fall under the definition of the term “wetland,”⁴¹ and coastal wetlands will play major roles in dealing with the problems posed to coastal areas by SLR.⁴² The different conferences of parties to the Ramsar Convention have articulated the relationship between the convention and ICZM.⁴³ The goal of the Ramsar Strategic Plan 2009-2015 is the “wise use of all wetlands,” calling upon parties to increase recognition of the significance of wetlands in coastal protection and in ICZM.⁴⁴ The “Principles and guidelines for incorporating wetland issues into Integrated Coastal Zone Management” is definitely the

³⁹ “Annex II: Programme of Action for the Sustainable Development of Small Island Developing States” in UN, *Report of the Global Conference on the Sustainable Development of Small Island Developing States*, Global Conference on the Sustainable Development of Small Island Developing States, A/CONF.167/9 (6 May 1994).

⁴⁰ FAO, *Code of Conduct for Responsible Fisheries* (Rome: FAO, 1995) art 10; see also *ibid*, art 6.9.

⁴¹ Wetlands include areas “... with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres.” *Convention on Wetlands of International Importance Especially as Waterfowl Habitat*, 2 February 1971, 996 UNTS 245, 11 ILM 963 (entered into force 21 December 1975) [*Ramsar Convention*], art 1.

⁴² Conference of the Contracting Parties, *The Changwon Declaration on Human Well-being and Wetlands*, Res X.3, Ramsar, 10th Mtg, (2008) at 4; see generally Conference of the Contracting Parties, *Res VIII.3: Climate Change and Wetlands: Impacts, Adaptation, and Mitigation*, Res VIII.3, Ramsar, 8th Mtg, (2002).

⁴³ Even though the Ramsar Convention text does not directly refer to ICZM, some of the COP decisions provide guidance to parties for ICZM implementation.

⁴⁴ See Ramsar Convention Secretariat, *The Ramsar Strategic Plan 2009-2015: Goals, Strategies, and Expectations for the Ramsar Convention’s Implementation for the Period 2009 to 2015*, 4th ed, Ramsar Handbooks for the Wise Use of Wetlands, vol 21 (Gland: Ramsar Convention Secretariat, 2010) at 14, strategy 1.4.

most pertinent acknowledgement of ICZM by the Ramsar regime.⁴⁵ Other key instruments pertinent to ICZM development and implementation are the *Convention on the Law of the Non-Navigational Uses of International Watercourses, 1997*,⁴⁶ the *Bonn Convention on the Conservation of Migratory Species of Wild Animals, 1979*,⁴⁷ the *Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995*,⁴⁸ the *Convention for the Protection of the World Cultural and Natural Heritage, 1972*.⁴⁹ Even the marine

⁴⁵ "Annex: Principles and Guidelines for Incorporating Wetland Issues into Integrated Coastal Zone Management (ICZM)" in Conference of the Contracting Parties, *Wetland Issues in Integrated Coastal Zone Management (ICZM)*, Res VIII.4, Ramsar, 8th Mtg, (2002) 5.

⁴⁶ 21 May 1997, 36 ILM 700, arts 20 (calling upon states to individually or jointly protect and preserve the ecosystems of international watercourses), 23 (calling upon watercourse states to take individually or jointly measures to protect and preserve the marine environment, including estuaries). Both these articles can be interpreted to impose obligations upon watercourse states to protect the coastal ecosystems such as deltas and estuaries.

⁴⁷ See generally *Convention on the Conservation of Migratory Species of Wild Animals (Bonn)*, 23 June 1979, 19 ILM 15 (entered into force 1 November 1983).

⁴⁸ Avoidance of adverse impacts on the marine environment, preservation of biodiversity, maintaining the integrity of marine ecosystems and minimizing the risks of long-term or irreversible effects of fishing operations are recurring themes. See UNGA, *Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks*, 4 August 1995, A/CONF 164/37, 8 September 1995, 34 ILM 1542 (entered into force 11 December 2001).

⁴⁹ It seeks to protect natural heritage, defined to consist of "physical and biological formations, which are of outstanding universal value from the aesthetic or scientific point of view." It also includes, "geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from the point of view of science or conservation." *Convention Concerning the Protection of the World Cultural and Natural Heritage*, 16 November 1972, 1037 UNTS 151, 11 ILM 1358 (entered into force 17 December 1975), [*World Heritage Convention*] art 2. It calls upon parties to the utmost of its own resources and, where appropriate, with international assistance and co-operation, to identify, protect, conserve, present and transmit to future generations cultural and natural heritage that belongs to it. *Ibid*, art 4. An important feature of the World Heritage Convention is that it sets up an Intergovernmental Committee for the Protection of the Cultural and Natural Heritage of Outstanding Universal Value. *Ibid*, art 8. This body maintains a 'World Heritage List' of properties of cultural and natural heritage. *Ibid*, arts 3, 11(2). Presently, the List includes 962 properties. *World Heritage List*, online: UNESCO <<http://whc.unesco.org/>>. Several coral reefs, mangroves, and other coastal wetlands find place in the World Heritage List. *Ibid*. The practical implications that ensue inscription of a property in the List is that a variety of technical and financial assistance for its maintenance and upkeep is made available. *World Heritage Convention, ibid*, arts 13(1), 22. Another important feature of this convention is that it provides for the creation of a List of World Heritage in Danger (Danger List). *Ibid*, art 11(4). Once a property finds place in the Danger List then it is given priority in securing international assistance. UNESCO *World Heritage Centre, Operational Guidelines for the Implementation of the World Heritage Convention*, WHC.12/01,

environmental protection instruments that emanate from the International Maritime Organisation can indirectly support objectives central to ICZM implementation.⁵⁰

There are several other soft law instruments that stress the importance of the integrated approach. In its Johannesburg Plan of Implementation, the World Summit on Sustainable Development emphasized the integrated nature of problems posed by ocean space. It points out:

Oceans, seas, islands and coastal areas form an integrated and essential component of the Earth's ecosystem and are critical for global food security and for sustaining economic prosperity and the well-being of many national economies, particularly in developing countries.⁵¹

(Paris: Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage, 2012) ¶236.

⁵⁰ Some of the prominent ones are: *International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969*; *International Convention on Civil Liability for Oil Pollution Damage 1969*; *International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971*; *London Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter, 1972*; *International Convention for the Prevention of Pollution from Ships, 1973/78 (MARPOL)*; *International Convention for the Safety of Life at Sea, 1974*; *International Convention on Salvage, 1989*; *International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990*; *International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, 1996*.

The International Maritime Organization plays a role in conserving these ecosystems through designations like sensitive areas and particularly sensitive sea areas. Under the MARPOL Annexes, certain sea areas have been designated as special areas. For more details, see *Special Areas under MARPOL*, online: IMO, Our Work, Marine Environment, Pollution Prevention, Special Areas Under MARPOL <<http://www.imo.org/Pages/home.a.spx>>; IMO, Resolution A.982(24) Adopted on 1 December 2005 (Agenda item 11) Revised Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas, 24th Sess, A 24/Res 982 (6 February 2006). A Particularly Sensitive Sea Area (PSSA) is an area that needs special protection through action by IMO because of its significance for recognized ecological, socio-economic, or scientific attributes where such attributes may be vulnerable to damage by international shipping activities. To be identified as a PSSA, the area should meet at least one of the following criteria, namely, ecological; social, cultural, and economic; and scientific and educational. As far as ecological criteria is concerned, the following are the elements: uniqueness or rarity, critical habitat, dependency, representativeness, diversity, productivity, spawning or breeding grounds, naturalness, integrity, fragility, and biogeographic importance. *Ibid*, ¶¶4.4.1-4.11. Once an area is designated as PSSA, then specific measures are employed to regulate maritime activities in that area such as routeing, installation of vessel traffic services, and strict application of MARPOL discharge and equipment requirements for ships. Some PPA's identified include the Great Barrier Reef, Australia (designated as a PSSA in 1990); the Sabana-Camagüey Archipelago in Cuba (1997); Paracas National Reserve, Peru (2003), and the Galapagos Archipelago, Ecuador (2005). For further details, see *Particularly Sensitive Sea Areas*, online: IMO <<http://www.imo.org/ourwork/environment/pollutionprevention/pssas/Pages/Default.a.spx>>.

⁵¹ "Plan of Implementation of the World Summit on Sustainable Development" in UN, *Report of the World Summit on Sustainable Development* at 22, ¶30.

Accordingly, to ensure the sustainable development of the oceans, the need to implement “integrated coastal management” and “integrated coastal area management plans” is imperative.⁵² The Ministers and heads of delegations who met at the World Ocean Conference at Manado in 2009 to deliberate the effects of climate change on the ocean and related threats negotiated the Manado Ocean Declaration, which re-affirmed the importance of integrated coastal and ocean management in promoting resilience and fundamental to climate change adaptation.⁵³ The Parties also affirmed the need to implement integrated coastal and ocean management⁵⁴ and develop environmentally sound policies for the same based on reliable scientific assessments and internationally agreed goals, particularly for the most vulnerable communities that fully depend on marine resources for their livelihood.”⁵⁵ Again, at the recently concluded Rio+20 held 20 years after the Rio Earth Summit, the importance of integrated approaches was reiterated.⁵⁶

Even though Chapter 17 offered a compelling case on the need for ICZM, it was silent on its necessary elements, methodology, and range of forms that an ICZM process should take to address the various socio-economic, environmental and political concerns that determine a nation’s coastal management strategy. Moreover, it did not explain how such a process should be implemented, i.e., the formulation, adoption and actual operation of an ICZM programme.⁵⁷ Consequently, a number of international bodies spent their energies to further define, interpret, clarify and refine the ICZM concept. Prominent are the guidelines on ICZM issued by the Food and Agriculture Organisation,

⁵² *Ibid*, ¶30(e), (g).

⁵³ *Manado Ocean Declaration*, 14 May 2009, online: NOAA Office of General Counsel <<http://www.gc.noaa.gov/>>.

⁵⁴ *Ibid*, ¶3.

⁵⁵ *Ibid*, ¶7.

⁵⁶ It calls for “holistic and integrated approaches to sustainable development which will guide humanity to live in harmony with nature and lead to efforts to restore the health and integrity of the Earth’s ecosystem.” UN RIO+20 United Nations Conference on Sustainable Development, *The Future We Want*, A/CONF.216/L.1*, 19 June 2012, ¶40.

⁵⁷ Biliiana Cicin-Sain, Robert W Knecht & Gregory W Fisk, “Growth in Capacity for Integrated Coastal Management Since UNCED: An International Perspective” (1995) 29:1-3 *Ocean & Coast Mgmt* 93 at 102 (ScienceDirect).

the World Coast Conference, the World Bank, IUCN, OECD, and the UNEP, which sets standards and principles to guide ICZM development, which countries can then adopt.⁵⁸

7.2.1 Remarks

Two decades have elapsed since the Rio Earth Summit ushered ICZM to the centre stage of coastal zone management efforts. Since its official inauguration, ICZM has been emphasized and recognized in innumerable multilateral instruments that deal with marine environment protection and conservation. Despite these successive iterations, and the coastal countries of South Asia being parties to most of these international environmental law instruments,⁵⁹ ICZM remains largely rooted in the countries of this region as a set of diverse pilot and demonstration projects.⁶⁰ There is tardiness and the national governments in South Asia have floundered in translating the growing body of international environmental law that can trigger obligations in respect of implementing ICZM.

A primary reason for this situation is that, international environmental law relevant to ICZM is set at two levels. The first are the core legal instruments directly relevant to ICZM implementation like the UNFCCC, the CBD, the Ramsar Convention, the Watercourses Convention, while the remaining ones like the LOSC, the Bonn Convention, the World Heritage Convention and the marine environment protection

⁵⁸ See generally John R Clark, *Integrated Management of Coastal Zones*, FAO Fisheries Technical Paper, No 327 (Rome: FAO, 1992) at 581; Jan C Post & Carl G Lundin, eds, *Guidelines for Integrated Coastal Zone Management*, Environmentally Sustainable Development Studies and Monographs Series No 9 (Washington, DC: The World Bank, 1996); OECD, *Recommendation of the Council on Integrated Coastal Zone Management*, C(92)114/FINAL (23 July 1992). Acclaimed ICZM practitioners Biliana Cicin-Sain and Robert W. Knecht in analysing these five sets of guidelines have distilled what they term as “consensus guidelines” which provide “a reasonable characterization of the ICM concept as it is understood today.” Cicin-Sain, Knecht & Fisk, *ibid* at 103.

⁵⁹ The coastal countries of South Asia are parties to most of these international agreements that are relevant to ICZM implementation. In fact all the South Asian coastal countries are parties to the LOSC, the Ramsar Convention, the World Heritage Convention, the UNFCCC and the CBD.

⁶⁰ Even in other coastal regions, the situation is more or less similar. For instance, see Ch 3, Part 3.2. In identifying constraints that hamper effective implementation of the ICZM Protocol for the Mediterranean, the Action Plan points out that ICZM still remains localised and is relatively short-term and project based. Consequently, there has to be major ‘up scaling’. Priority Actions Programme, *Action Plan for the Implementation of the ICZM Protocol for the Mediterranean 2012–2019*, PAP/NFP/2011/2, Draft (2011) at 9 [*Action Plan for ICZM Protocol*]; Brian Shipman & Tim Stojanovic, “Facts, Fictions, and Failures of Integrated Coastal Zone Management in Europe” (2007) 35 Coastal Mgmt 375 at 376.

instruments of the IMO have only peripheral value. In the case of the latter, these instruments prescribe a range of tools that are not necessarily ICZM intended, but these can play supportive roles in triggering obligations for coastal management.

Again, while there have been frequent evocations to transcend sectoral policies and move towards a more integrated format for the management of oceans and related land space, the preponderance of ICZM prescriptions at the international environmental level remains within the realm of soft-law instruments that are hortatory in nature and entail no obligation of adherence; therefore, their normative scope is limited, since implementation is voluntary.⁶¹ Regardless of these shortcomings, soft-law instruments and non-binding statements on ICZM provide several opportunities⁶² in terms of guidance and to focus the spotlight on the need to develop national-level ICZM legal frameworks, policies and programmes.⁶³ Often treated as a precursor to the development of hard-law instruments, soft-law instruments are now emerging as a preferred tool, due to their innately flexible nature and easy utility.⁶⁴ Many of the coastal countries in South Asia are favorably disposed to adopting such instruments. To translate some of these prescriptions into action, most of the coastal countries of South Asia and even those beyond have initiated ICZM pilot programmes and projects, often with financial assistance from international agencies and foreign governments. However, as chapter three demonstrates, these countries have yet to develop mechanisms to link and coordinate their pilot programmes

⁶¹ Nicholas A Robinson, "IUCN as Catalyst for a Law of the Biosphere: Acting Globally and Locally" (2005) 35 *Envtl L* 249 at 288 (QL).

⁶² For more details, see Cormac Cullinan, *Integrated Coastal Management Law: Establishing and Strengthening National Legal Frameworks for Integrated Coastal Management*, FAO Legislative Study, No 93 (Rome: FAO, 2006) at 39 & 40.

⁶³ Optimists view soft law as a permissive way to build hard law; a useful intermediate step to hard law. To skeptics, hard law has greater potential than soft law. Combinations of soft and hard law options may produce the most effective strategies in promoting international norms relating to the environment, labour and social governance. John J Kirton & Michael J Trebilcock, "Introduction: Hard Choices and Soft Law in Sustainable Global Governance" in John J Kirton & Michael J Trebilcock, eds, *Hard Choices, Soft Law: Voluntary Standards in Global Trade, Environment and Social Governance*, Global Environmental Governance (England: Ashgate Publishing, Ltd, 2004) 3 at 27-28.

⁶⁴ Tim Stephens, *International Courts and Environmental Protection*, Cambridge Studies in International and Comparative Law (Cambridge: Cambridge University Press, 2009) at 6 (noting that states might agree to a non-binding or to imprecise standards has attractions since it does not impose absolute fetters on state autonomy).

and scale up these experiences to a national level, thereby hampering the programmes' efficacy and leading to squandering of resources.⁶⁵

As well, the non-binding exhortations have not furthered the development of the ICZM agenda in the way expected, given the widespread degraded state of the coastlines, nor has the accretion of divergent soft-law rules produced a substantial legal framework. Moreover, most of the above-referred international instruments were developed at a time when climate change and SLR were not issues of concern and therefore the stipulations that they prescribe are incapable of responding to these new challenges.

There is as yet no global convention or international body on ICZM that lays down binding and specific rules of the practice. In other words, there is an absence of an exclusive hard-law treaty on ICZM that offers a template to guide its implementation. The lack of such a specific hard-law instrument poses considerable challenges in integrating the different resource management sectors and in implementing ecosystem-based approaches to coastal management at national levels. This has led to considerable tension and conflicting claims among resource users. In this regard, one of the primary suggestions of the Coastal Zone Management Subgroup of the Intergovernmental Panel on Climate Change in its "Suggested Ten-Year Timeline for the Implementation of Comprehensive Coastal Zone Management Plans"⁶⁶ was a recommendation calling for the adoption of a protocol by 1992 to "provide a framework for international and multinational cooperation in dealing with the full range of concerns related to impacts of sea level rise and climate change impacts on the coastal zone."⁶⁷ However, thus far, nothing has been achieved in this regard.

⁶⁵ For more details, see Ch 3, Part 3.2.

⁶⁶ Intergovernmental Panel on Climate Change, *Climate Change: The IPCC Response Strategies* (Washington DC: Island Press, 1991) at 141.

⁶⁷ *Ibid* at 139. As far as the possible elements of such a protocol are concerned, it has been suggested that signatories endeavor to develop a comprehensive coastal management programme before the year 2000. While affording priority to vulnerable areas, parties were to provide support to be given to institutions that conduct research on sea level rise and other impacts of climate change on the coastal zone; foster international cooperation in efforts to monitor sea level rise and other impacts of climate change on the coastal zone; contribute to systematic mapping and resource assessment of coastal zones to identify functions and critical areas at risk; support international initiatives to provide information and technical assistance to cooperating countries for the preparation of coastal management programmes; contribute to the exchange of information, expertise and technology between countries pertaining to sea level rise responses and other impacts of climate change on the coastal zone; promote public and political awareness of the implications of sea level rise and other

Irrespective of the fact that that even without a global hard law instrument on ICZM, large sums of money have been expended and ICZM enjoys widespread popularity. Still, a hard law on ICZM can offer new vigour and leverage in terms of its binding nature, the range of tools it can prescribe, and can provide for incentives like technical and resource support for ICZM implementation, etc. As well, given the weak adaptive capacities available with developing countries to manage the problems posed by climate change (particularly SLR), a hard-law instrument can help in numerous ways to, for instance: secure funding for ICZM projects; encourage sharing of data and resources; facilitate technology transfer; and help build capacity by promoting adaptive management. A hard law treaty can also provide for the monitoring and evaluation of various ICZM models and programmes, collation of information, and the building upon the knowledge and experience gained. As well, it can establish reporting systems and lay down explicit targets, timetables on key issues of implementation, and create new structures to monitor implementation. Overall, enacting an international treaty on ICZM can help develop the least common denominator set of rules on ICZM that can help bring consistency in the practice.

Nevertheless, there is no evidence to prove that hard-law international agreements are more effective in securing compliance at national levels, given the long drawn-out process of negotiations that precedes the conclusion of a hard-law treaty and the oftentimes indeterminate nature of its text, reservations and flexible clauses.⁶⁸ An international treaty is not a self-implementing instrument; it can only fill in the normative gaps and support the development of national laws and programmes that will facilitate on-the-ground implementation. Work has to be carried out at the national levels to

impacts of climate change on the coastal zone; manage the coastal zone so that environmental values are preserved whenever possible; avoid taking measures that are detrimental to the coastal zones of adjoining states; provide emergency relief to coastal nations struck by storm surge disasters; establish a secretariat supported by a small advisory group to facilitate the implementation of the protocol agreements. *Ibid* at 140.

⁶⁸ Mar Campins-Eritja & Joyeeta Gupta, “The Role of “Sustainability Labelling” in the International Law of Sustainable Development” in Nico Schrijver & Friedl Weiss, eds, *International Law and Sustainable Development: Principles and Practices*, Developments in International Law, vol 51 (Leiden: Martinus Nijhoff, 2004) 251 at 260. For instance, see *United Nations Conference on Environment and Development: Framework Convention on Climate Change*, 19 June 1993, 31 ILM 849 (adopted at New York 9 May 1992) [UNFCCC], art 15 (rules relating to amendment of the convention), art 22 (dealing with ratification and accession), art 23 (entry into force) & art 25 (withdrawal from the convention).

facilitate implementation. Under international law, a basic rule is that a treaty is not binding on a country unless that country accedes to it and ratifies that instrument.⁶⁹ Consequently, many hard-law treaties have been unable to muster the requisite support to convert them into a potent legal force at the national and international levels.⁷⁰

Furthermore, implementation in several instances has been jeopardized by states pursuing their own interests and paying only lip service to their international commitments. In certain international treaties (for instance, the LOSC), there has also been a lack of an enforcement mechanism to monitor and ensure compliance. It must be pointed out in the spirit of fairness that in many cases, even though states may be favorably disposed towards a treaty, they may, for practical and economic considerations (e.g., countries may resist signing new agreements that call upon states to assume responsibilities that may apply breaks on their economic growth) be reluctant to assume new responsibilities and instead shield themselves behind a veil of state sovereignty.⁷¹ In fact, in many pressing areas (e.g., land-based sources of pollution), we have yet to witness the development of hard rules at the global level. Consequently, a hard law international treaty on ICZM seems to be far-fetched for the moment. With these broad observations on the state of the international environmental law on ICZM and prospects for its future evolution, the succeeding discussion examines a few national approaches on legislating ICZM.

7.3 OPERATIONALISING INTEGRATED COASTAL ZONE MANAGEMENT AND ADAPTING TO SEA LEVEL RISE THROUGH DEDICATED COASTAL LAWS: SELECTED NATIONAL EXPERIENCES

Even though the concept of ICZM is embedded in several international environmental law instruments, and is supported by considerable sustainable development texts, the

⁶⁹ *Vienna Convention on the Law of Treaties*, 1155 UNTS 331, 8 ILM 679 (entered into force 27 January 1980) arts 11, 14 & 15.

⁷⁰ For instance, see International Conference on the Safe and Environmentally Sound Recycling of Ships: Agenda Item 8, Adoption of the Final Act and Any Instruments, Recommendations and Resolutions Resulting from the Work of the Conference: Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009, Text Adopted by the Conference, IMO/SR/CONF/45, 19 May 2009 (opened for signature 1 September 2009).

⁷¹ For instance, see Oliver K Jull, “Canada Withdraws from Kyoto Protocol to Avoid Non-Compliance Penalties” *Bulletin – CBA National International Law Section Newsletter* (April 2012).

majority of these instruments as seen are exhortative in nature and they primarily serve to highlight the need and importance of ICZM. International environmental law relating to ICZM has yet to move beyond its open-ended and amorphous nature to lay down the specific legal rules of the practice. Beyond any international law treaty, each state has the sovereign right to design and enact its own coastal laws to manage and reconcile conflicts. Transforming ICZM from rhetorical statements into actual practice and in effectuating CCCA is the key challenge. Several coastal states have responded to these problems by implementing ICZM through their coastal laws. And these national laws relating to coastal management are essentially rooted in national circumstances. It must be noted that there are a large number of coastal countries with federal/unitary systems of government that have cast legal cloaks over their coastal management programmes as well as adaptation to SLR and coastal climate change. The salience of a few of these legislative experiences are explained below to demonstrate the growing importance of law in supporting ICZM; and second, to show how coastal laws can be utilised to respond to SLR and other climate change impacts. More importantly, by fleshing out the experiences of certain countries in legislating for the coastal zone, the intention is to synthesize from these national reports certain principles on coastal law making that can serve as guideposts for the coastal law reform agenda suggested for South Asia in the next part.

In essence, a federal state is one where a constitution (usually a written one) divides sovereignty (in terms of powers, jurisdiction, and revenue) between two or more autonomous sets of governments, namely, at the national and subnational (state and sometimes even at the municipal or village) levels. Depending on the constitutional legislative scheme, potentially both the national and subnational levels of government may be able to exercise jurisdiction over different aspects that deal with the narrow band of land and water at the coast. This aspect will be evident from the following national case studies: United States, Australia, Canada and South Africa. On the other hand, in a unitary state, the entire country is treated as one unit for governance purposes and generally governance is entrusted to only one monolithic centralised entity. Even in cases where there could be subnational units in a unitary setup, these could exercise only such

powers, which the central government chooses to delegate as in the case of New Zealand, Belize, Barbados, Cuba, Kenya, and United Kingdom.

The discussion here is divided into two sub-sections: the legislative experiences of coastal countries, namely, United States (considerable experience on ICZM and its federal nature),⁷² Australia (federal nature and protection of aboriginal rights),⁷³ South Africa (a comparatively new coastal law and the integrated nature of the law)⁷⁴ and New Zealand (a unique approach where coastal management is viewed as a sub-set of a larger sustainable resources management process, and a unitary system),⁷⁵(three federal states and a unitary state); will be closely scrutinised. Thereafter, a broad brush will be utilised to provide a synoptic overview on the ICZM and CCCA legislative experiences of Canada, Cuba, Kenya, Belize, Barbados, Israel, and United Kingdom (one federal and rest unitary states). All these high-, medium-, and low-income countries represent unique coastal features and circumstances, and exhibit diverse and innovative approaches in the use of legal mechanisms to facilitate ICZM and CCCA implementation.

It must be noted that coastal law reform in a country, as in other areas where laws have not developed sufficiently, may rely on the comparative law methodology, where coastal states would do well to learn from the experiences of other states.⁷⁶ Generally, the emphasis is on borrowing lessons learned from more mature jurisdictions that have close legal affinity in terms of legal systems and legal culture with the country concerned, for example, India borrowing from the experience of the United Kingdom through the umbilical cord of the common law lineage. However, in the environmental law arena, the notion that legal transplants have to take place within a group of countries that share a common legal system is fast becoming redundant. This is due to the profound influence and transcendental nature of sustainable development and its principles. Accordingly, jurisdictional, cultural and other differences in legal systems are fast losing relevance and the emphasis is fast shifting to understanding how different countries operationalise the

⁷² *USCZMA*, *supra* note 21.

⁷³ See generally Rachel Baird & Donald R Rothwell, eds, *Australian Coastal and Marine Law* (Sydney: The Federation Press, 2011).

⁷⁴ *National Environmental Management: Integrated Coastal Management Act*, (S Afr), No 24 of 2008 [SA, *Integrated Coastal Management Act*].

⁷⁵ See generally *Resource Management Act 1991* (NZ), 1991/69 [NZRMA].

⁷⁶ Robinson, ed, *supra* note 1 at 286-92 (highlighting the importance of comparative methodology in ICZM).

amorphous concept of sustainable development. This implies that a common law country like India may have lessons to learn from a civil law country and *vice versa*.⁷⁷

7.3.1 Coastal Zone Management and Coastal Climate Change Adaptation in the United States

Coastal zones and resources are critically important to the United States, as they support a large percentage of the American population and economy. The NOAA points out that, in 2010, over 123 million people, or 39 per cent of the US population, lived in coastal shoreline communities.⁷⁸ The coasts also provide a number of other valuable services, like storm protection, the annual worth of these services being around USD23 billion.⁷⁹ In addition, it is reported that in 2011 alone, the coastal counties accounted for nearly half of this country's gross domestic product, generating 51 million jobs.⁸⁰

Nevertheless, and despite the presence of strong laws, management systems and progressive institutions, US coastlines are showing clear signs of increasing degradation and nearly 166 dead zones have been identified.⁸¹ While the annual net benefit to the U.S. economy from goods and services provided by coral reefs is USD1 billion, 75 per cent of the coral resources in the Atlantic, Caribbean and Gulf of Mexico are in poor or fair

⁷⁷ To carry out a review of the *Coastal Regulation Zone Notification, 1991*, the central government in India constituted a committee under the chairmanship of Dr. M.S. Swaminathan. In developing the reform agenda and the concept of ICZM, this committee referred to the best practices in United States of America, the United Kingdom, Canada, The Netherlands, Australia, Spain, Brazil, Thailand, Malaysia, China, and Sri Lanka and to those developed by international agencies like the OECD, World Bank, etc. India, *Report of the Committee to Review the Coastal Regulation Zone Notification 1991* (Chairman: MS Swaminathan, New Delhi: Ministry of Environment & Forests, 2005) at 19-29.

⁷⁸ US, National Oceanic and Atmospheric Administration & U.S. Census Bureau, *National Coastal Population Report: Population Trends from 1970 to 2020*, NOAA State of the Coast Report Series (np: National Oceanic and Atmospheric Administration, 2013) at 4.

⁷⁹ US, NOAA Office of Ocean and Coastal Resource Management, *Adapting to Climate Change: A Planning Guide for State Coastal Managers* (Silver Spring, MD: National Oceanic and Atmospheric Administration, 2010) at 6.

⁸⁰ National Oceanic and Atmospheric Administration, *Economy: The Coast – Our Nation's Economic Engine*, online: National Oceanic and Atmospheric Administration, Coastal Economy <<http://stateofthecoast.noaa.gov/>>.

⁸¹ National Oceanic and Atmospheric Administration, *Ecosystems: Nutrient Pollution and Hypoxia - Everything is Upstream of the Coast*, online: National Oceanic and Atmospheric Administration, Ecosystems <<http://stateofthecoast.noaa.gov/>>.

health.⁸² Invasive species continue to spread,⁸³ wetlands are under threat from coastal development,⁸⁴ and oil spills wreak havoc on the coastal and marine environments.⁸⁵ These management challenges are now compounded by climate change and rising sea levels.⁸⁶

As mentioned in chapter five, coastal climate change adaptation responses can be classified into the three broad categories of retreat, accommodate and protect. In implementing these measures, a raft of legislations, executive orders and coastal management programmes that emanate at the local, state, and federal levels of government are relevant.⁸⁷ For instance, the Army Corps of Engineers play important roles in carrying out coastal adaptation. Sections 9 and 10 of the *Rivers and Harbors Act, 1899* are relevant in facilitating hard armouring.⁸⁸ In addition, the *Clean Water Act, 1972* the *National Flood Insurance Act, 1968*, and the *Coastal Barrier Resources Act, 1982* are also pertinent to coastal climate change adaptation.⁸⁹ More importantly, an assortment of tools such as land-use planning, property takings, rolling easements and public trust

⁸² National Oceanic and Atmospheric Administration, *Ecosystems: Coral Reef Ecosystems - Critical Coastal Habitat*, online: National Oceanic and Atmospheric Administration, Ecosystems, Cora Reef <<http://stateofthecoast.noaa.gov/>>.

⁸³ In The Great Lakes, nearly 185 non-native aquatic species have been established. From 2000-2010, the economic loss suffered by this region due to the invasive Zebra mussels is about USD5 billion. National Oceanic and Atmospheric Administration, *Ecosystems: Invasive Species Disrupt Coastal Ecosystems and Economies*, online: National Oceanic and Atmospheric Administration, Ecosystems <<http://stateofthecoast.noaa.gov/>>.

⁸⁴ National Oceanic and Atmospheric Administration, *Ecosystems: Wetlands – Critical Coastal Habitat*, online: National Oceanic and Atmospheric Administration, Ecosystems, Wetlands <<http://stateofthecoast.noaa.gov/>>.

⁸⁵ For the chronology of the accident, see BP (Firm), *Deepwater Horizon Accident Investigation Report* (Houston: BP, 2010) at 21-29.

⁸⁶ National Oceanic and Atmospheric Administration, *Climate: Vulnerability of Our Nation's Coasts to Sea Level Rise*, online: National Oceanic and Atmospheric Administration, Climate, Coastal Vulnerability <<http://stateofthecoast.noaa.gov/>>; see also James E Neumann et al, *Sea-level Rise & Global Climate Change: A Review of Impacts to U.S. Coasts* (np: Pew Center on Global Climate Change, 2000).

⁸⁷ For instance, see *South Carolina Beachfront Management Act, 1988*, SCC tit 48-39 §§250-360; *Shoreline Management Act, 1971*, Wash RC §90.58 (1971).

⁸⁸ See also David Lawrence Hankey, “Sections 9 and 10 of the Rivers and Harbors Act of 1899: The Erosion of Administrative Control by Environmental Suits” [1980] Duke LJ (HeinOnline) 170; see also Robert RM Verchick & Joel D Scheraga, “Protecting The Coast” in Michael B Gerrard & Katrina Fischer Kuh eds, *The Law of Adaptation to Climate Change: U.S. and International Aspects* (Illinois: American Bar Association, 2012) 235 at 242.

⁸⁹ For more details, see generally Kristen M Fletcher, “Managing Coastal Development” in Donald C Baur, Tim Eichenberg & Michael Sutton, eds, *Ocean and Coastal Law and Policy*, 1st ed (Chicago: American Bar Association, 2008) 147 [Fletcher, “Managing”].

doctrines have been refashioned to regulate coastal development and facilitate coastal climate change adaptation.⁹⁰

The cornerstone in this assortment of laws, executive orders, tools and strategies that promote coastal climate change adaptation is the coastal law regime, which has at its apex the Federal *Coastal Zone Management Act, 1972* (CZMA). This law provides a legal foundation for the development of coastal management and for coastal climate change adaptation. Before delving into its nuances, it must be pointed out that conflicts have emanated between the federal and state governments in US regarding jurisdiction over offshore waters since her infancy.⁹¹ The discovery of offshore mineral resources accentuated the acrimony, leading to several rounds of litigation and legislative battles that finally culminated in the *Submerged Lands Act, 1953*.⁹² This law granted the states jurisdiction over activities up to three nautical miles offshore,⁹³ which was an extremely important legal development from the perspective of ICZM implementation. States that had jurisdiction over the dry segment of the coastal zone were no longer handicapped in exercising jurisdiction over the wet side of the coastal zone, and could thereby facilitate and implement spatial integration.

⁹⁰ For instance, in the *Avenal* decision, the public trust doctrine was relied upon for support. It was held that

[w]e find ... the implementation of the Caernarvon coastal diversion project fits precisely within the public trust doctrine. The public resource at issue is our very coastline, the loss of which is occurring at an alarming rate. The risks involved are not just environmental, but involve the health, safety, and welfare of our people, as coastal erosion removes an important barrier between large populations and ever- threatening hurricanes and storms. Left unchecked, it will result in the loss of the very land on which louisianians reside and work, not to mention the loss of businesses that rely on the coastal region as a transportation infrastructure vital to the region's industry and commerce. The state simply cannot allow coastal erosion to continue; the redistribution of existing productive oyster beds to other areas must be tolerated under the public trust doctrine in furtherance of this goal.

Avenal, *supra* note 10 at 23; see also Verchick & Scheraga, *supra* note 88 at 254-55.

⁹¹ Fletcher, "Managing", *supra* note 89 at 150.

⁹² *Submerged Lands Act, 1953*, 43 USC §§1301-15 (1952).

⁹³ *Ibid*, §1312 (the seaward boundary of the coastal state is a line three geographical miles distant from its coast line). However, the seaward boundaries of Florida (in the Gulf of Mexico coast), Texas and Puerto Rico extend to nine nautical miles from the coastline. NOAA, *Maritime Zones and Boundaries*, online: NOAA <http://www.gc.noaa.gov/gcil_maritime.html>

The first part of this section on the US legislative position is devoted to analyzing the salience of the prescriptive rules of the CZMA, examining how this law provides a basis for coastal zone management programmes and gauging how far this legislation supports coastal climate change adaptation. The second part examines the coastal management programmes of California and Texas, and the third part sums up some of the important lessons the US experience offers which can facilitate the development of the omnibus coastal law in the next chapter.

7.3.1.1 Coastal Zone Management Act, 1972: A Classical Example of Co-operative Coastal Federalism

The 1969 Stratton Commission report, *Our Nation and the Sea*, emphasized the need to protect the coastal zones – the “[n]ation’s most valuable geographic feature”⁹⁴ – thereby setting the stage for subsequent coastal zone management efforts. Three years later (October 12, 1972), the US Congress passed the CZMA, which was signed into law by President Nixon (October 27, 1972). The primary purpose of this legislation was to ensure proper “coordination and cooperation”⁹⁵ between the federal government and coastal states by encouraging them to prepare and implement coastal zone management programmes (CZMP). In line with the principles of US federalism, coastal zone management in the United States operates at the federal and state levels, with states forming the principal implementing agency.⁹⁶ In fact, the CZMP envisages “a unique federal/state partnership” that provides a strong foundation for preserving, protecting, developing and, whenever possible, restoring the coastal environment.⁹⁷ Even though participation in the programme is voluntary, there are “important cultural, economic, political, and environmental differences among the participating states and territories”, and consequently “variety in the scope, focus, structure, and authorities states use to

⁹⁴ US, Commission on Marine Science, Engineering, and Resources, *Our Nation and the Sea: A Plan for National Action: Report* (Washington, DC: US Government Printing Office, 1969) at 49.

⁹⁵ *USCZMA*, *supra* note 21, §1452 (entitled, “Congressional declaration of policy (Section 303)”).

⁹⁶ The major reason as to why the states were chosen as the principal implementing body was because historically and constitutionally in the US it was the states that had primary jurisdiction over land. “Review of U.S. Ocean and Coastal Law: The Evolution of Ocean Governance Over Three Decades, Appendix 6 to the Final Report” in U.S. Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century: Final Report* (Washington, DC, 2004) at 20 [“Review of U.S. Ocean and Coastal Law”].

⁹⁷ US Dep’t of Commerce, *Coastal Zone Management Program Strategic Plan: Improving Management of the Nation’s Coastal Areas FY 2007–2012*, at 1 online: US Dep’t of Commerce, Ocean & Coastal Resource Management <<http://coastalmanagement.noaa.gov/>>.

achieve the national goals of the CZMA.”⁹⁸ The CZMA outlines nine areas of national concern that must be addressed in the programmes, including SLR impacts.⁹⁹ In fact, the CZMA specifically recognizes that “global warming may result in a substantial sea level rise with serious adverse effects in the coastal zone,” and that “coastal states must [therefore] anticipate and plan for such an occurrence.”¹⁰⁰ Accordingly, an important aspect which the coastal management programme must provide for is “the management of coastal development to minimize the loss of life and property caused by improper development in flood-prone, storm surge, geological hazard, and erosion-prone areas and in areas likely to be affected by or vulnerable to sea level rise, land subsidence, and saltwater intrusion.”¹⁰¹

The Office of Coastal Resource Management (OCRM) in the National Oceanic and Atmospheric Administration (NOAA), a branch of the US Department of Commerce, has to review and approve these state-sponsored programmes.¹⁰² In doing so, the attempt is not to undermine state authority but rather to fortify it by encouraging and assisting states to assume greater planning and regulatory powers and roles in respect of coastal zones and resources that fall within their jurisdiction. Section 1454 authorizes the Secretary of Commerce to provide grants to states to assist them in developing their management programmes. These grants are available as long as the state incorporates the various enumerated requirements that are found in the statute. In addition, there are other funds, like the Coastal Zone Management Fund and the Coastal Zone Enhancement Grants, which states can access for enumerated coastal zone-related matters.¹⁰³ It is reported that nearly 34 states have approved coastal management programmes that address a wide range of issues, including coastal hazards and climate change.¹⁰⁴

Once the NOAA certifies a state programme, the second level is set in motion. The CZMA requires that activities carried out or approved by the federal government

⁹⁸

Ibid.

⁹⁹

USCZMA, supra note 21, §1456b(2).

¹⁰⁰

Ibid., §1451(1).

¹⁰¹

Ibid., §1452(2)(B).

¹⁰²

Ibid., §§1454-55.

¹⁰³

Ibid., §§1456a, 1456b.

¹⁰⁴

US, Dep’t of Commerce, *Coastal Programs: Partnering with States to Manage Our Coastline* online: Dep’t of Commerce, Our Programs, Coastal Management Program <<http://coastalmanagement.noaa.gov/>>.

have to be consistent with the state's approved programme. The federal consistency provisions based on an "effects test" broadly apply to two categories of federal activities. First, it requires that actions by the federal agencies be consistent "to the maximum extent practicable" with "enforceable policies" of the state's CMP and second, it requires that activities by third parties who receive federal permits or licenses for activities that affect a state's coastal zone obtain state certification that their activities are consistent with a state's coastal management programme.¹⁰⁵ The federal consistency provisions are often hailed as the "cornerstone of the CZMA program and a primary incentive for states' participation," as it provides "states with an important tool to manage coastal uses and resources and to facilitate cooperation and coordination with Federal agencies."¹⁰⁶ Apart from the coastal zone management programme, the CZMA also provides for the National Estuarine Research Reserve System.¹⁰⁷

7.3.1.1.1 Comments

A product of the "environmental decade" (the period between the late 1960s to the mid 1970s) in the United States, the *Coastal Zone Management Act, 1972* (CZMA) was one of the major legislations, the key in a package of environmental laws designed to introduce a national focus into natural resources management. In several respects, the CZMA was unique, as it sought to streamline implementation by coastal states through a voluntary programme rather than establishing mandatory compliance standards. Moreover, unlike other federal environmental laws that espoused a top-down approach to coastal management, the focus of the CZMA is primarily on a bottom-up and voluntary approach.¹⁰⁸ In the subsequent discussion, some of the features of the Californian and Texas model on coastal management that draws sustenance from the CZMA are set forth.

7.3.1.2 California

¹⁰⁵ *USCZMA*, *supra* note 21, §1456; see also Joseph Romero, "Uncharted Waters: The Expansion of State Regulatory Authority Over Federal Activities and Migratory Resources under the Coastal Zone Management Act" (2008) 56 *Naval L Rev* 137 at 144 (HeinOnline); "Review of U.S. Ocean and Coastal Law", *supra* note 96 at 21-25.

¹⁰⁶ US, Office of Ocean and Coastal Resource Management, *Federal Consistency Overview* (Maryland: United States Department of Commerce, 2009) at 3-4.

¹⁰⁷ *USCZMA*, *supra* note 21, §1461.

¹⁰⁸ Byrne & Grannis, *supra* note 9 at 290.

California boasts one of United States's longest coastlines, on which nearly 85 per cent of the state's population live and work.¹⁰⁹ The annual value of the ocean-dependent economy is estimated to be about USD46 billion.¹¹⁰ However, studies predict that, by the end of this century,¹¹¹ the sea level will rise by about 20-55 inches,¹¹² resulting in considerable flooding, inundation and destruction of infrastructure.¹¹³ Apart from this phenomenon, rising ocean water temperatures are putting aquatic species in great stress, leading to their migration¹¹⁴ and the possible eventual collapse of the fishing industry.¹¹⁵

In response to these present and looming crisis scenarios, California has legislated separate legal frameworks and attendant institutional mechanisms to plan for and manage its ocean coastline. The California Coastal Program, which was approved by NOAA in 1978, has three segments: the California Coastal Commission manages development along the California coast; in the San Francisco Bay, the responsibility is placed on the San Francisco Bay Conservation and Development Commission; and a third agency, the California Coastal Conservancy, purchases, protects, restores and enhances coastal resources and provides access to the shore. Legislative support for the programme flows from the *California Coastal Act, 1976* [*California Coastal Act*], the *McAteer-Petris Act, 1965* and the *Suisan Marsh Preservation Act, 1977*.¹¹⁶ In this sub-section, analysis is devoted to an examination of the *California Coastal Act*.

Under this Act, the term 'coastal zone' includes land and water segments where the seaward area extends to the outer limit of the state's jurisdiction. On the landward

¹⁰⁹ US, California Natural Resources Agency, *2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008* (California Natural Resources Agency, [nd]) at 65. Between 1980 and 2003, California's coastal population increased by 1,179 persons every day to touch a total of 9.9 million people. *Ibid.*

¹¹⁰ *Ibid.*

¹¹¹ *Ibid.*

¹¹² *Ibid* at 3.

¹¹³ The levee system protects large parts of the low-lying areas in the City of Santa Cruz against a 100-year flood. If the sea levels were to rise by one foot, the anticipated 100-year flood event in Santa Cruz would occur every 10 years, placing the system under considerable stress. *Ibid* at 68.

¹¹⁴ The Humboldt squid, which used to be an occasional visitor is now a permanent resident in central California's coastal waters. *Ibid* at 66.

¹¹⁵ Squid landings decreased from 110,000 metric tons in 1996-1997 to just 1,000 metric tons during the course of the El Niño season. *Ibid.*

¹¹⁶ US, Dep't of Commerce, *Ocean and Coastal Management in California: California's Coastal Program* online: Dep't of Commerce, My State, California <<http://coastalmanagement.noaa.gov/>>.

side, it is generally 1,000 yards inland from the mean high tide line.¹¹⁷ A dexterous piece of coastal legislation, the *Act* details several normative prescriptions that capture the essence of sustainable coastal development. Accordingly, the law seeks to secure maximum public access and provide for recreational opportunities.¹¹⁸ There are also detailed provisions on protecting the marine environment, the idea being that “[u]ses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters.”¹¹⁹ The *California Coastal Act* incorporates provisions to deal with the problems posed by climate change and SLR. In particular, the mandate of section 30253 is that

[n]ew development shall...[a]ssure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.¹²⁰

From the legislative language, it is clear that new developments must not proceed in a manner that can interfere with coastal processes or create or magnify coastal hazards. The inference here is that new development must be sufficiently set back from the shoreline such that hard armouring may not be required in the future. However, coastal landowners continue to build in the close vicinity of the shoreline, subverting the legislative intent behind the provision.¹²¹ In this context, section 30235 is relevant, as it provides for the construction of hard armouring structures (like revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls) to protect existing structures and public beaches from erosion, to eliminate or mitigate the adverse impacts on local shoreline sand supply, and to serve coastal-dependent uses, even if it alters the natural shoreline processes. Another important feature of the California model is the integral nature of land-use

¹¹⁷ *California Coastal Act of 1976*, 20 PRC §30103 [*Cal CA*, 2013].

¹¹⁸ Cal Const art X, §4; *ibid*, §§30210-14, 30220-24.

¹¹⁹ *Cal CA*, 2013, *ibid*, §30230.

¹²⁰ *Ibid*, §30253(b); see also *ibid*, §30233.

¹²¹ Todd T Cardiff, “Conflict in the California Coastal Act: Sand and Seawalls” (2001) 38 Cal WL Rev 225 at 226-27 (HeinOnline).

planning in this process. Land-use planning, as mentioned in earlier chapters, is an extremely important tool to respond to the problems posed by SLR.

The California Coastal Commission is the primary regulatory body envisaged under the law entrusted with the power to implement the Act in all areas except those that are reserved to the San Francisco Bay Conservation and Development Commission.¹²² It exercises oversight functions over federal activities that affect the coastal zone. Chapter 5 of the *Coastal Act* explains how the Coastal Commission's jurisdiction relates to and integrates with its sister state agencies.¹²³ The highlight of the *Coastal Act* is that it provides a decentralized format and envisages that the functions in relation to the coast are divided between a state and local government partnership (15 counties and 60 cities) for coastal management. Accordingly, the commission is also tasked with the duty to make decisions regarding coastal development permit decisions and review the local coastal programmes (LCPs) prepared by local governments.¹²⁴

As a first step, the Act charges localities with the responsibility to submit "local coastal programs" (LCP), including a detailed land use plan (LUP), to the Commission describing how they will comply with the overall stipulations.¹²⁵ The Commission reviews each of the LCPs and the LUPs for consistency with the *Act*, and a public hearing is held. Subsequently, the documents are either accepted or rejected (zoning ordinances, zoning district maps, and any other required implementing actions). Should the LCP be accepted, it is then treated as certified¹²⁶ and the Coastal Commission functions as an appellate authority for the coastal zone management decisions made by these local bodies. Notwithstanding LCP certification status, the Commission retains original jurisdiction over activities that take place in areas like tidelands, submerged lands, and public trust lands, as the jurisdiction of local bodies ends at the mean high tide line. The certified LCPs and zoning provisions apply primarily to the terrestrial segment of the coastal zone.¹²⁷

¹²² *Cal CA, 2013, supra* note 117, §30330.

¹²³ *Ibid*, §§30410-20.

¹²⁴ For more details, see Margaret Elizabeth Peloso, *Adapting to Rising Sea Levels* (PhD Dissertation, Department of Environment, Duke University, 2010) [unpublished] at 140-42.

¹²⁵ *Cal CA, 2013, supra* note 117, §§30500, 30510 & 30512.

¹²⁶ *Ibid*, §30512(a).

¹²⁷ Deborah A Sivas & Margaret R Caldwell, "A New Vision For California Ocean Governance:

In sum, rather than pass special regulations to address sea level rise, California, like most other states in the US, have modified or adapted current regulatory mechanisms to deal with this problem.¹²⁸ This, however, is the primary weakness of the approach. Margaret Peloso points out that in the absence of an overarching policy to deal with SLR and coastal armoring in California, the Commissioners are forced to inevitably,

piggyback these larger issues on to individual permit applications. Such an approach leads to frustration because the Commission continues to have the same debate each time an armoring permit comes up because there is currently no other forum in which to have this discussion. The repeated analysis of large-scale sea level rise issues in individual permits wastes the time and resources of both the Commission and its Staff, and it has not proven effective in slowing the pace of armoring along the coast.¹²⁹

The murky and oftentimes conflicting division of management responsibilities between the state coastal commission and local governments has led to tensions. Local coastal governments are strongly predisposed to permit extensive local development for more revenue and political support.¹³⁰ As well, local coastal governments resent the coastal commission's original jurisdiction over seawalls, as they feel that it can lead to the bypassing of the local permitting process.¹³¹ Moreover, left to their own devices, local governments are constrained from implementing planned retreat at the local level, since the practical dimensions of this process are too large, complex, and expensive.¹³²

Concerted action to respond to SLR is fast emerging. One major step in this regard is the Governor's Executive Order, which directs state agencies to consider a range of SLR scenarios for the years 2050 and 2100 "to assess project vulnerability, reduce expected risks, and increase resiliency to sea-level rise."¹³³ Guidance documents have

Comprehensive Ecosystem-Based Marine Zoning" (2008) 27 Stan Env'tl LJ 209 at 231 (HeinOnline).

¹²⁸ See generally US, California Coastal Commission, *Overview of Sea Level Rise and Some Implications for Coastal California* (2011).

¹²⁹ Peloso, *supra* note 124 at 156.

¹³⁰ *Ibid* at 158.

¹³¹ *Ibid*.

¹³² *Ibid* at 159.

¹³³ US, Office of the Governor of the State of California, *Executive Order S-13-08* (14 November 2008) ¶5.

been developed to inform and assist coastal communities and state agencies in crafting responses to SLR.¹³⁴ More recently, the Resolution of the California Ocean Protection Council on Sea-Level Rise, 2011 calls upon state agencies and non-state entities implementing projects or programmes based on state funds or on state property to follow the science-based recommendations developed by the Coastal and Ocean Resources Working Group for the Climate Action Team.¹³⁵

7.3.1.3 Texas

With 367 miles of Gulf beaches and more than 3,300 miles of bays and estuaries, Texas has one of the longest coastlines in the United States.¹³⁶ Nearly 25 per cent of Texans (5.7 million people) live in the 18 coastal counties¹³⁷ and more than one-third of the state's population and a major chunk of its economic activity (including the petrochemical industry and refining capacity) are situated in the coastal zone.¹³⁸ Texas also suffers a high rate of coastal erosion, with 64 per cent of its coastline eroding at an average rate of about six feet per year.¹³⁹ The primary reason for this erosion is the reduced flow of sediments due to damming of rivers and the construction of structures such as seawalls and groins.¹⁴⁰ A series of legislations are directly applicable to coastal management, a few of which are discussed below.

The Texas legislature responded to the federal CZMA 1972 with the *Coastal Public*

¹³⁴ See generally US, California Emergency Management Agency & California Natural Resources Agency, *California Adaptation Planning Guide: Planning for Adaptive Communities* (np: 2012); see also US, *State of California Sea-Level Rise Guidance Document* (March 2013), online: State of California: Ocean Protection Council <<http://www.opc.ca.gov/>>.

¹³⁵ See generally California Ocean Protection Council, *Resolution of the California Ocean Protection Council on Sea-Level Rise* (11 March 2011), online: California State Lands Commission <<http://www.slc.ca.gov/>>.

¹³⁶ US, *Coastal Erosion Planning & Response Act (CEPRA): Report to the 80th Texas Legislature* (Austin: Texas General Land Office, 2007) at I [CEPRA Report 2007].

¹³⁷ *Ibid* at I-1.

¹³⁸ The coastal zone supports 40 per cent of the national petrochemical industry, 25 per cent of the national petroleum-refining capacity, two liquefied natural gas facilities and three of the 10 busiest seaports in the United States. US, *A Report to the 82nd Legislature: Coastal Erosion Planning & Response Act* (Austin: Texas General Land Office, 2011) at 1.

¹³⁹ For more details, see generally Texas General Land Office, *Coastal Erosion*, online: Texas General Land Office, What We Do, Caring for the Coast, Coastal Erosion <<http://www.glo.texas.gov/>> [TGLO, *Coastal Erosion*].

¹⁴⁰ *CEPRA Report 2007*, *supra* note 136 at I-4.

Lands Management Act, 1973 (TCPLMA)¹⁴¹ The TCPLMA calls upon the Commissioner of the General Land Office¹⁴² to “develop a continuing comprehensive coastal management program”¹⁴³ and to act as the lead agency to “coordinate and implement” these programmes in cooperation with other state agencies that have duties over coastal matters.¹⁴⁴ The TCPLMA also specifies the elements of the coastal management programme, which includes an assessment of the effects of shoreline erosion, evaluating ways to control erosion, and restoring areas detrimentally affected by shoreline erosion.¹⁴⁵ The importance of public hearings in developing coastal management programmes and the need to review and amend them in light of new information or changed circumstances (adaptive management) is stressed.¹⁴⁶

Another important coastal law is the *Texas Coastal Coordination Act, 1991* (TCCA),¹⁴⁷ which calls upon the commissioner to adopt goals and policies of the coastal management programme¹⁴⁸ and establishes a coastal coordination advisory committee.¹⁴⁹ In unison with its implementation regulations, the TCCA creates a foundational frame for coastal zone management.¹⁵⁰ Accordingly, the Texas Coastal Management Program (TCMP) has been developed, whose purpose is to:

improve the management of the state’s coastal resources and to ensure the long-term ecological and economic productivity of the coast, all within the framework of the federal Coastal Zone Management Program. The TCMP is a ‘networked’ program linking the regulations, programs, and expertise of state, federal, and local entities that manage various

¹⁴¹ NRC §§33.003-33.176 (1973) [*TCPLMA*].

¹⁴² *Ibid*, §33.004 (2). A major portion of coastal property in Texas is privately owned and as steward of the coastal zone, it is the Texas General Land Office that administers the coastal management regime. In doing so, it deals with diverse subjects like oil spills, environmental protection, permit assistance, coastal erosion, open beaches, coastal construction, hurricanes, education and outreach, and grants and funding. Texas General Land Office, *Caring for the Coast*, online: Texas General Land Office, What We Do, Caring for the Coast <<http://www.glo.texas.gov/>>.

¹⁴³ 33 *TCPLMA*, *ibid*, §33.052(a).

¹⁴⁴ *Ibid*, §33.052(b).

¹⁴⁵ *Ibid*, §33.053.

¹⁴⁶ *Ibid*, §§33.055 & 33.054.

¹⁴⁷ 33 *NRC* §201 (1973).

¹⁴⁸ *Ibid*, §33.204 (a).

¹⁴⁹ *Ibid*, §33.2041.

¹⁵⁰ See 31 *TAC* §§501, 503-506.

aspects of coastal resource use.¹⁵¹

The TCMP identifies the main areas for enhancing management¹⁵² as developing beach and dune systems and coastal hazard areas along the Gulf shoreline, and identifies two “encouragement policies” to address SLR: getting local governments to incorporate sea-level rise into new development, and “sediment bypassing.”¹⁵³ The NOAA approved the Texas Coastal Management Program in 1996, and its management falls with the GLO Coastal Division.¹⁵⁴

In addition to the acts outlined above, other statutes like the *Dune Protection Act, 1973*, the *Open Beaches Act, 1959*, and the *Coastal Erosion Planning and Response Act, 1999*,¹⁵⁵ are also relevant here. Historically, a system of vegetated and unvegetated sand dunes provided a protective barrier against the action of sand, wind, and water.¹⁵⁶ However, the modification of the dunes destroyed their effectiveness and posed “a real danger to natural resources and to the health, safety and welfare of persons living, visiting, or sojourning in the area.”¹⁵⁷ Given this situation, *the Dune Protection Act* (Dunes Act) was enacted to protect them¹⁵⁸ by providing for a dune protection line¹⁵⁹ and prohibiting damaging, destroying, or removing¹⁶⁰ “a sand dune or portion of a sand dune...within a critical dune area.”¹⁶¹ In cases where it is necessary to carry out these

¹⁵¹ US, Office of Ocean & Coastal Resource Management, Dep't of Commerce & State of Texas, *Combined Coastal Management Program and Final Environmental Impact Statement for the State of Texas* (Office of Ocean & Coastal Resource Management, State of Texas, 1996) at part II I-2.

¹⁵² These areas are “(1) government accountability, responsiveness, and coordination; (2) dredging in bays and estuaries; (3) development on beach and dune systems and coastal hazard areas along Gulf shorelines; and (4) development in coastal wetlands and other aquatic sites.” *Ibid* at part I-10.

¹⁵³ This is to be envisaged in the construction and retrofitting of dams on rivers that flow into the coastal zone, and in structures like jetties, groins, etc. which can disrupt sediment transport to the coast. *Ibid* at part II 6-20.

¹⁵⁴ *Ibid* at part II 3-6.

¹⁵⁵ This law seeks to provide funding to coastal communities for projects that arrest or slow down the deleterious effects of coastal and shoreline erosion. Generally, beach nourishment, shoreline stabilization, habitat restoration and protection, and dune restoration are some of the areas that are funded. TGLO, *Coastal Erosion*, *supra* note 139; Texas General Land Office, *The Coastal Erosion Planning and Response Act*, online: Texas General Land Office, What We Do, Caring for the Coast, Grants & Funding <<http://www.glo.texas.gov/>>.

¹⁵⁶ 63 NRC §63.001(2) (1973).

¹⁵⁷ *Ibid*, §63.001(5).

¹⁵⁸ *Ibid*, §63.001(6).

¹⁵⁹ *Ibid*, §63.012.

¹⁶⁰ *Ibid*, §63.014.

¹⁶¹ *Ibid*, §63.091.

prohibited acts, a permit had to be obtained.¹⁶²

As far as responding to SLR is concerned, a unique feature of the Texas approach is the concept of “rolling easements.”¹⁶³ The Texas beaches have a long history of supporting public use.¹⁶⁴ In 1958, the Texas Supreme Court in *JW Luttet v The State of Texas*¹⁶⁵ found that the state owned only the wet sand portion of the beach and that private landowners had ownership rights over the dry sand portion above the mean high tide line. In other words, *Luttet* established the common law landward boundary of state-owned beaches at the mean high tide line. There was public opposition against the holding and the Legislature feared that *Luttet* might encourage “overanxious developers to fence the seashore”, since a few private landowners had already “erected barricades upon many beaches, some of these barricades extending into the water.”¹⁶⁶

It was to assuage such fears that, in 1959, the Texas Legislature enacted the *Open Beaches Act, 1959* (TOBA).¹⁶⁷ The TOBA, which applies to the beaches that border the Gulf of Mexico, codifies the common law on the subject and affords indirect recognition to the concept of rolling easement. In outlining the public policy that guides its operation, TOBA provided that the public (individually and collectively) has the “free and unrestricted right of ingress and egress” over state-owned beaches. The public can exercise this right over a larger area (includes private property) from the mean low tide line to the line of vegetation, if it has acquired this right by way of customary usage or by easement through prescription and dedication.¹⁶⁸ The vegetation line is the “the extreme seaward boundary of natural vegetation which spreads continuously inland.”¹⁶⁹ Beaches were also classified into “wet” and “dry”, where a “wet beach” is the area from mean low

¹⁶² *Ibid*, §63.051.

¹⁶³ Richard J McLaughlin, “Rolling Easements As a Response to Sea Level Rise in Coastal Texas: Current Status of the Law After *Severance v. Patterson*” (2011) 26 J Land Use & Envtl L. 365 at 390 (HeinOnline).

¹⁶⁴ *Ibid* at 369.

¹⁶⁵ 324 SW 2d 167 (Tex Sup Ct 1958).

¹⁶⁶ US, Joint Beach Development Committee, *The Beaches and Islands of Texas: A Report to the 57th Legislature* (Texas: Joint Beach Development Committee, 1961) at 1.

¹⁶⁷ 61 NRC §61 (1959) [*TOBA*].

¹⁶⁸ *Ibid*, §61.011(a). Due to the liberal interpretation of TOBA, the public has acquired easements by prescription or dedication along large segments of the state’s gulf-facing beaches. McLaughlin, *supra* note 163 at 371.

¹⁶⁹ *Ibid*, §61.001(5).

tide to mean high tide and is under the tidal waters for some time during the day.¹⁷⁰ The area from mean high tide to the vegetation line is the “dry beach.”¹⁷¹ Since wet beaches are all owned by the state of Texas and held by the state in public trust, there was no dispute regarding the public’s right of use.¹⁷² Although dry beaches can be privately owned, they can still be treated as part of the “public beach” if a right to public use is established.¹⁷³

In short, it is clear that “[p]ublic beaches include Gulf-front wet beaches, state-owned dry beaches and private property in the dry beaches on which a public easement has been established.”¹⁷⁴ The Act protects public access by prohibiting construction of any obstruction, barrier, or restraint that interferes with public’s right to access the beach.¹⁷⁵ Further, the Act codified a policy of a rolling beach easement: any structure that encroaches upon the public beach as the result of a natural event is subject to removal.¹⁷⁶

Depending on ebb and flow of the tides and other movements, the mean low tide, mean high tide, and vegetation line can oscillate. The recent decision by the Texas Supreme Court in *Carol Severance v. Jerry Patterson, Commissioner of The Texas General Land Office*¹⁷⁷ has practically capped the evolution of the concept of rolling easements in the state. As will be seen, the decision has wide ramifications to coastal climate change adaption efforts as well. Carol Severance purchased the property at issue, which was subsequently devastated by heavy winds following Hurricane Rita. At the time of the purchase, Severance received a TOBA-mandated disclosure explaining that due to natural factors such as shoreline erosion the property could in due course be located on a public beach and if that happened, the state could sue to forcibly remove the structure. No easement was ever established on the disputed property, Kennedy Drive, even though a public easement for the use of a privately owned parcel seaward of the Kennedy Drive preexisted the purchase. The hurricane winds pushed the vegetation line

¹⁷⁰ *Severance v Patterson*, 370 SW 3d 705 (Tex Sup Ct 2012) [*Severance* (2012)].

¹⁷¹ *Ibid.*

¹⁷² *Ibid.*

¹⁷³ *TOBA*, *supra* note 167, §61.001(8).

¹⁷⁴ *Ibid.*; see also *Severance* (2012), *supra* note 170.

¹⁷⁵ *TOBA*, *ibid.*, §61.013(a).

¹⁷⁶ *Ibid.*, §61.0183; see also McLaughlin, *supra* note 163 at 374.

¹⁷⁷ *Severance v Patterson*, 345 SW 3d 18 (Tex Sup Ct 2010) [*Severance* (2010)]. This opinion was withdrawn and substituted subsequently. *Severance* (2012), *supra* note 170 at 712.

landward with the consequence that the house now stood completely seaward of the vegetation line. In such circumstances, as the house was now located on the “public beach”, the state sought an enforcement action to remove it. Severance sued officials on the ground that in attempting to enforce a public easement without proving its existence, infringed her constitutional rights under the Fifth and Fourteenth Amendments and her substantive due process rights.¹⁷⁸ Here, the primary legal issue was whether the public’s easement in the beach rolled further inland onto Severance’s parcel of land.¹⁷⁹

In deciding this “game of semantics,”¹⁸⁰ Justice Wainwright for the majority distinguished movements by accretion and erosion from movements by avulsion, finding that while gradual movements can shift the easement’s boundaries, sudden movements do not.¹⁸¹ However, the ratio was severely criticized, leading to a rehearing and a subsequent decision, which practically reiterated the earlier position. At the time of the rehearing, it was once again contended that the legal distinction between avulsion and erosion was immaterial. The court tossed this argument out once again and emphasized that the Texas law recognized the distinction between avulsion and erosion and that the “[g]radual movement of the vegetation line and mean high tide line due to erosion or accretion, as opposed to avulsion, has very different practical implications.”¹⁸² In other words, what this meant was that

when a beachfront vegetation line is suddenly and dramatically pushed landward by acts of nature, an existing public easement on the public beach does not “roll” inland to other parts of the parcel or onto a new parcel of land. Instead, when land and the attached easement are swallowed by the Gulf of Mexico in an avulsive event, a new easement must be established by sufficient proof to encumber the newly created dry beach bordering the ocean.¹⁸³

In short, the ratio is that in the event of avulsion, the easements do not “roll” onto

¹⁷⁸ *Severance* (2012), *ibid* at 720.

¹⁷⁹ *Ibid*.

¹⁸⁰ *Severance* (2010), *supra* note 177 at 39 (Justice David M Medina dissenting opinion).

¹⁸¹ See generally *ibid* (majority judgment by Justice Wainwright).

¹⁸² *Severance* (2012), *supra* note 170 at 723.

¹⁸³ *Ibid* at 708.

previously unencumbered private beachfront parcels and therefore the state is not relieved from the legal requirement of proving or purchasing an easement nor from the constitutional requirement of compensation since a taking had occurred. So also, advising in a disclosure that the state can enforce an easement on privately owned beachfront property does not dispose of the owner's rights.

Severance holds far-reaching ramifications even for coastal climate change adaptation. With SLR and extreme weather events and storm surges expected to batter the coastlines, it is moot whether the decision of the Texas Supreme Court is right in law and in fact and is sufficiently precautionary. Those who purchase beachfront properties generally have knowledge that there is an implied risk (*caveat emptor*) that their property may eventually, or suddenly, recede into the seas and when this does happen, the property can lose its private character to become public. As well, in the context of climate change and SLR, what rolling easement accomplishes is not merely providing an opportunity to the public the right to use and enjoy the beach; but rather, it actually seeks to protect the littoral private property owner from undesirable risks posed by water and the winds. By holding that the easement does not roll with avulsion the court has introduced uncertainty into the law. The fact that the state now has to compensate the owner, if it decides to burden the land with an easement fundamentally restricts the government's ability to effectively respond to the crisis wrought by rising sea levels.¹⁸⁴

Even though rolling easements are associated with public access, they also frequently crop up as a valuable tool to address some of the problems posed by SLR. They encourage the removal of hazardous structures, thereby ensuring public safety and eliminating the possibility of coastal squeeze to prevent the inland migration of coastal ecosystems. However, as part of a strategy for coastal climate change adaptation, it must be pointed out that rolling easements have inherent limitations, as they can only be used in areas where there is plentiful land (like rural areas) to facilitate inland migration.¹⁸⁵

7.3.1.4 Remarks

Through this brief overview of the US approach on coastal zone management law making

¹⁸⁴ Val Perkins, "Future of Texas Open Beaches Act Clouded by Supreme Court Decision", *Houston Lawyer* 49:6 (May/June 2012) 39 at 41.

¹⁸⁵ McLaughlin, *supra* note 163 at 390.

and implementation and its capacity to further coastal climate change adaptation, certain noteworthy points, relevant to coastal South Asia, particularly to the federal states of India and Pakistan are apparent. And this is so because in both these countries it is the national governments that has jurisdiction and sovereign rights over the different maritime zones measured seaward of the baselines, except in matters relating to fishing over the territorial seas belt.¹⁸⁶ The absence of state jurisdiction (to any extent) over maritime waters seaward of the baseline (the wet side of the coastal zone) is a significant legal handicap that prevents the state governments in India and in Pakistan (the states incidentally has jurisdiction over the dry side of the coastal zone) from carrying out spatial integration (land-sea integration). In contrast, first and foremost, the states in the United States generally have jurisdiction out to three nautical miles offshore, and this has considerably facilitated spatial integration implementation. A related feature is that even though state jurisdiction ends at the three-mile limit, the requirement of federal consistency practically enables the states to influence actions that take place even beyond its jurisdictional remit.¹⁸⁷ Secondly, the US legislative model on coastal management is a classic example of coastal cooperative federalism in action where coastal management operates as multilayered process, which has at its apex the federal *Coastal Zone*

¹⁸⁶ See article 297 of the Constitution of India which states that all lands, minerals and other things of value underlying the ocean within the territorial waters, or the continental shelf, or the exclusive economic zone, of India shall vest in the Union and be held for the purposes of the Union. In addition all other resources of the exclusive economic zone of India shall also vest in the Union and be held for the purposes of the Union. Again, article 297(3) provides that the limits of the territorial waters, the continental shelf, the exclusive economic zone, and other maritime zones, of India shall be such as may be specified, from time to time, by or under any law made by Parliament. Entry 57 of List I of the Seventh Schedule to the Constitution of India provides that the Central Government has jurisdiction over fishing and fisheries beyond territorial waters, while Entry 21 of List II, ensures state jurisdiction over fisheries. By implication since Entry 57 of List I, provides that the Central Government has jurisdiction over fishing and fisheries beyond territorial waters, Entry 21 of List II can be read to secure coastal states jurisdiction over matters relating to fishing over territorial waters and nothing more. In addition, there are several other entries that fortify the powers over the Central Government in respect of offshore waters (see Entries 25 (maritime shipping); 26 (lighthouses); 27 (ports); 28 port quarantine, etc.). In accordance with the powers conferred by article 297(3) the Central Government has enacted the *Territorial Waters, Continental Shelf, Exclusive Economic Zone and Other Maritime Zones Act, 1976*. This law by virtue of section 3 (1) secures sovereignty of India over the territorial waters and to the seabed and subsoil underlying, and the airspace over, such waters. As far as Pakistan is concerned, section 2(1) of the *Territorial Waters and Maritime Zones Act, 1976* secures the sovereignty of Pakistan over its territorial waters. Similarly, Entry 36 of the Federal Legislative List of the Fourth Schedule to the Constitution of Pakistan secures to the federal government jurisdiction over Fishing and fisheries beyond territorial waters.

¹⁸⁷ *USCZMA, supra* note 21, §1456 (entitled, “Coordination and cooperation (Section 307)”).

Management Act, 1972. Here, the flagship provisions are the requirement on the part of the states to prepare coastal management programmes, the provision of federal funding for the development of these programmes and the federal consistency provision which ensures that the federal agencies adhere to a state’s approved coastal plan. This two-tier process practically implements the concept of cooperative federalism in coastal management by envisaging federal/state partnership based on a decentralized format. In fact the CZMA operates between two continuums – at one end, it is all about sustainable coastal development, and on the other, it is federal consistency and overall the legal gravitational force exerted by the CZMA ensures that the different state coastal management programmes while operating in their individual spheres move in their assigned legal orbits to collectively address “the broad spectrum of coastal issues identified by the Congress.”¹⁸⁸

An important proposition that emerges from the case studies of California and Texas is that California’s decentralized approach to coastal management strengthens the stewardship roles shared by the state and local government entities. The striking feature of the California model is the development and operation of two separate legal and management regimes within the same state for the bay-shore and ocean shoreline. This is recognition that it is imprudent to prescribe one common management framework, as in Sri Lanka, ignoring diversity of the coastal environment. The Texas model shares similarities with California and reveals considerable potential in utilizing the concept of rolling easements. Despite the dictum in *Severance*, the utility of rolling easements in ensuring that coastal ecosystems are not lost due to coastal squeeze must be not ignored. Even though the concept of rolling easements is yet to find roots in coastal South Asia, it may prove useful for these coastal states to implement the concept of rolling easements via their coastal laws as a possible strategy to respond to SLR impacts and to ensure continued public access to coastal areas. And in doing so, it is necessary that an appropriate balance is struck between privately owned coastal realty interests and the larger public good.

7.3.2 Australia

¹⁸⁸ “Review of U.S. Ocean and Coastal Law”, *supra* note 96 at 20.
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Being the world's largest island but smallest continent, Australia's ocean coast extends about 36,000 kilometers through a broad range of climatic zones.¹⁸⁹ Its coastal areas are home to a diverse array of sensitive ecosystems and more than eighty-five per cent of its population, related infrastructure, and economic activities.¹⁹⁰ All the state capitals are located within the coastal zone.¹⁹¹ It is no exaggeration to say that Australia has metamorphosized into a "coastal society."¹⁹² Like most other coastal countries, marine pollution, introduction of invasive species and increasing urbanisation are pressing problems along the Australian coastline.

Climate change impacts and SLR are issues of growing concern in Australia. Already seawater intrusion has been reported in several coastal locations in Queensland, South Australia, Victoria and Western Australia, and there is growing reliance on desalination to offset the water woes that confront these regions.¹⁹³ Out of an existing 711,000 residential buildings situated close to the water, between 157,000 and 247,600 properties risk potential inundation in the event of a 1.1 meter rise in sea level.¹⁹⁴ Further, residential buildings estimated at AUD41-63 billion (2008 replacement value) risk inundation.¹⁹⁵ Other climate change issues facing coastal areas include reduced

¹⁸⁹ Australia, Dep't of Climate Change, *Australia's Fifth National Communication on Climate Change: A Report Under the United Nations Framework Convention on Climate Change* (Australia: Dep't of Climate Change, 2010) at 17 [*Australia's Fifth National Communication*]; Natural Resource Management Ministerial Council, *National Cooperative Approach to Integrated Coastal Zone Management: Framework and Implementation Plan* (Canberra: Dep't of Environment & Heritage, 2006) at 6 [NRMCC, *National Cooperative Approach*].

¹⁹⁰ For instance, it is estimated that the Great Barrier Reef Marine Park contributed nearly AUD5.4 billion, (tourism industry and commercial and recreational fishing) in 2006-07 and providing full-time employment to approximately 53,800 people. See Australia, Dep't of Climate and Energy Efficiency, Factsheet, "Climate Change - potential impacts and costs: Queensland" [nd], online: Dep't of Climate and Energy Efficiency, Impacts of Climate Change, Queensland <<http://www.climatechange.gov.au/>>.

¹⁹¹ Australia is surrounded by the Indian Ocean to the west, the Southern Ocean to the south, the Pacific Ocean to the east, and the Gulf of Carpentaria and the Arafura Sea to the north. Nine major habitats and ecosystems make up Australia's coastline and the physical features of the coastline are extraordinarily due to the tropical, subtropical, temperate and sub-Antarctic climates. See Alison Gill et al, "The Challenges of Integrating Tourism into Canadian and Australian Coastal Zone Management" (2003) 26 *Dalhousie LJ* 85 at 91 (HeinOnline).

¹⁹² *Australia's Fifth National Communication*, *supra* note 189 at 111.

¹⁹³ Australia, State of the Environment 2011 Committee, *Australia State of the Environment 2011: Independent Report to the Australian Government Minister for Sustainability, Environment, Water, Population and Communities* (Canberra: DSEWPac, 2011).

¹⁹⁴ Australia, Dep't of Climate Change, *Climate Change Risks to Australia's Coast: A First Pass National Assessment* (Dep't of Climate Change, 2009) at 71.

¹⁹⁵ *Ibid.*

precipitation and reduced run-off to coastal rivers and streams resulting in higher salinity concentrations in estuaries.¹⁹⁶ Climate change is also adversely affecting migratory bird species (e.g., heat stress),¹⁹⁷ coral reefs (increased sea surface temperatures),¹⁹⁸ and mangroves (inundation).¹⁹⁹

7.3.2.1 Federalism and Distribution of Powers in the Coastal Zone

Politically, Australia is a combination of a constitutional monarchy, a federal state, and a parliamentary democracy. As a federal state, legislative powers in Australia are divided between the Commonwealth and the state or territory governments,²⁰⁰ with residuary powers of legislation granted to the states. If a matter is not listed under either sections 51 and 52 of the Australian Constitution, it generally falls within the legislative competence of the state, enhancing their power to legislate in respect of ICZM and coastal climate change adaptation.²⁰¹ Further, states have enacted legislation creating and empowering councils (decentralization).

Initially, the Commonwealth adopted a passive posture in terms of coastal and ocean management, particularly within the three nautical mile territorial sea, where it was generally considered that the states had jurisdiction.²⁰² This afforded the states leeway in respect of coastal environmental management.²⁰³ In responding to changes in the international law of the sea and growing interest in offshore hydrocarbon development at the domestic level, the Commonwealth began to take a more active stance in ocean and coastal matters. This culminated in the enactment of the *Seas and Submerged Lands Act*,

¹⁹⁶ Since 1985, 23 of the 27 most common species of water bird have declined in the Coorong coastal estuarine system by at least 30 per cent. *Ibid* at 52.

¹⁹⁷ *Ibid* at 54.

¹⁹⁸ Already, there is a decline in coral calcification and growth of around 13 per cent since 1990 around the Great Barrier Reef. *Ibid* at 58.

¹⁹⁹ *Ibid* at 62.

²⁰⁰ See *Commonwealth of Australia Constitution Act 1900* (Cth).

²⁰¹ If the federal parliament and a state parliament pass conflicting laws on the same subject, then the federal law overrides the state law, or the part of the state law that is inconsistent with it. *Ibid*, s 109. The constitution allows the parliament to override a territory law at any time. *Ibid*, s 122.

²⁰² This was the position despite the Commonwealth having powers under external affairs (section 51 (xxix)) and fisheries (section 51(x)), “fisheries in Australian waters beyond territorial limits” of the Australian constitution. Rachel Baird, “The National Legal Framework” in Rachel Baird & Donald R Rothwell, eds, *Australian Coastal and Marine Law* (Sydney: The Federation Press, 2011) 45 at 46.

²⁰³ Donald R Rothwell & Rachel Baird, “Australia’s Coastal and Marine Environment” in Rachel Baird & Donald R Rothwell, eds, *Australian Coastal and Marine Law* (Sydney: The Federation Press, 2011) 1 at 2.

1973.²⁰⁴ The Act affirmed the sovereignty of the Commonwealth over the territorial sea, the contiguous zone, the exclusive economic zone, and the continental shelf.²⁰⁵ The validity of this legislation was impugned by six states in *New South Wales v. Commonwealth* (“*Seas and Submerged Lands Act case*”),²⁰⁶ *inter alia*, on the ground that the states had ownership or legislative power over the marginal seas adjacent to their coasts to the extent seaward of three miles.²⁰⁷ However, the Australian High Court upheld the *vires* of the law as a “valid exercise of legislative power with respect to external affairs.”²⁰⁸

It was affirmed that the jurisdiction of the states ended with the boundary of each of the states.²⁰⁹ It was also clarified that the Crown had jurisdiction and dominion over the territorial sea, and that it had never surrendered the same to the colonies. In the alternative, it was held that even if the colonies possessed sovereign and proprietary rights over the territorial sea, they relinquished these rights upon the establishment of the Australian Commonwealth.²¹⁰

[T]he colonies in 1900 had neither proprietary rights in, nor legislative power over, the territorial waters which washed their shores, nor in or over the subjacent soil or superjacent airspace except in so far as they had legislative power to enact extra-territorially operating laws. Nor did they have any rights in the continental shelf and incline.²¹¹

Rather than settling the law, this decision led to a period of uncertainty.²¹² The stalemate was resolved in 1979 when the Commonwealth and the states entered into an agreement to strengthen co-operative federalism by settling contentious and complex offshore

²⁰⁴ *Ibid* at 2-3. This legislation can be traced to the external power under section 51(xxix) of the Australian constitution. Baird, *supra* note 202 at 46-47.

²⁰⁵ See generally *Seas and Submerged Lands Act 1973* (Cth) [*SSLA 1973*].

²⁰⁶ [1975] HCA 58, 135 CLR 337 (HC) [*Seas and Submerged Lands Act case*].

²⁰⁷ *Ibid*, ¶11.

²⁰⁸ *Ibid*, ¶26.

²⁰⁹ *Ibid*, ¶46; see also *SSLA 1973*, *supra* note 205, s 14

²¹⁰ Edward A Fitzgerald, “New South Wales v. Commonwealth: The Australian Tidelands Controversy” (1991) 14 Loy LA Int’l & Comp L Rev 25 at 34 (HeinOnline).

²¹¹ *Seas and Submerged Lands Act case*, *supra* note 206, ¶34.

²¹² See generally *Pearce v Florenca*, [1976] HCA 26, 135 CLR 507 (HC) (upholding the application of state fisheries laws in the territorial sea).

constitutional issues.²¹³ The Offshore Constitutional Settlement provided that the Commonwealth Parliament will pass legislation to give each state the same powers with respect to the adjacent territorial sea (including the seabed) as it would have if the waters were within the limits of the state.²¹⁴ It was implemented with the following Commonwealth legislation: the *Coastal Waters (State Title) Act, 1980*,²¹⁵ and the *Coastal Waters (State Powers) Act, 1980*.²¹⁶ These laws give the states property in the seabed and legislative powers over coastal waters up to three nautical miles, thereby setting a stage for cooperative federalism in Australian coastal and ocean management. State government control over the three nautical mile territorial sea and the landward side of the coast practically facilitates ICZM implementation.²¹⁷ Each states' coastal zone management statute defines the term coastal zone to recognize the land-sea continuum.²¹⁸

7.3.2.2 Aboriginal Rights and Coastal Management

Coastlines and oceans have considerably shaped indigenous culture in Australia, particularly the Torres Strait Islanders,²¹⁹ and attempts are ongoing to protect their traditional ways of life and livelihood, which in a large measure depends on the sea and on coastal resources.²²⁰ For long, *terra nullius* was a central tenet of Australian law that determined the relationship between the indigenous peoples and the Australian

²¹³ See generally Attorney General's Dep't, *Offshore Constitutional Settlement: A Mile Stone in Co-operative Federalism* (Canberra: Australian Gov't Publishing Service, 1980).

²¹⁴ *Ibid* at 6.

²¹⁵ *Coastal Waters (State Title) Act 1980* (Cth), s 4.

²¹⁶ *Coastal Waters (State Powers) Act 1980* (Cth), s 3(1).

²¹⁷ This has considerably influenced Australia's fishing law as well. Under the *Fisheries Management Act, 1991*, the coastal waters of a state or internal territory are spread out to three nautical miles of territorial sea from the baselines. What this implies is that states have responsibility for fisheries within three nautical miles of the baselines and thereafter from three nautical miles to 200 nautical miles responsibility is of the Commonwealth. *Fisheries Management Act 1991* (Cth), s 5(1)(a)(i).

²¹⁸ The *New South Wales Coastal Protection Act, 1979*, defines the term as the area within the coastal waters of the State, the area of land and waters that lie between the western boundary of the coastal zone as shown on the maps and the landward boundary of the coastal waters of the State, and the seabed, the subsoil and the airspace. *Coastal Protection Act 1979* (NSW), s 4 [*NSWCPA*]. Similarly, the *Queensland Coastal Protection and Management Act, 1995*, defines coastal zone to include Queensland waters and land as indicated on the coastal zone map, the airspace and subsoil. *Coastal Protection and Management Act 1995* (Qld), s 15 [*Queensland CPMA 1995*].

²¹⁹ See Australia, *Australia's Oceans Policy* (Canberra, 1998) at 8.

²²⁰ For instance, see generally *Treaty between Australia and the Independent State of Papua New Guinea Concerning Sovereignty and Maritime Boundaries in the Area Between the Two Countries, Including the Area Known as Torres Strait, and Related Matters*, (18 December 1978), 1985 ATS 4 (entered into force 15 February 1985).

government. The doctrine arose from the “great voyages of European discovery” which opened to European nations the prospect of occupying new and valuable territories already inhabited by “backward peoples.”²²¹ It basically implied that the indigenous peoples had no legal title to the land at the time of the colonial settlement and that title to all land as well as territorial sovereignty was vested with the British Crown which had the discretion to do what it pleased under its prerogative powers.²²² *Terra nullius* received a virtual deathblow in *Mabo v Queensland (No 2)*,²²³ a landmark decision²²⁴ even beyond Australia.²²⁵ *Mabo* introduced into common law the concept of native title. As Brennan J expounds:

[w]hat the Crown acquired was a radical title to land and a sovereign political power over land, the sum of which is not tantamount to absolute ownership of land. Until recent times, the political power to dispose of land in disregard of native title was exercised so as to expand the radical title of the Crown to absolute ownership but, where that has not occurred, there is no reason to deny the law’s protection to the descendants of indigenous citizens who can establish their entitlement to rights and interests which survived the Crown’s acquisition of sovereignty.²²⁶

In other words, what this implies is that "following the colonization of Australia, the Crown acquired territorial sovereignty but not absolute ownership over the land. ... [T]he ownership that the Crown retained over the land was a radial title which could be burdened by the native title encumbrance where native title had not been

²²¹ *Mabo v Queensland (No 2)*, [1992] HCA 23, 175 CLR 1 (HC) ¶33 [*Mabo*].

²²² David Ritter, “The “Rejection of Terra Nullius” in *Mabo*: A Critical Analysis” (1996) 18 Sydney L Rev 5 at 7-13 (HeinOnline).

²²³ *Mabo*, *supra* note 221.

²²⁴ “The *Mabo* case is the Australian judiciary’s ... most significant attempt to integrate the claims of justice, Aboriginal human rights, international law, and Australian common law in a single decision.” Gerry Simpson, “*MABO*, International Law, *Terra Nullius* and The Stories of Settlement: An Unresolved Jurisprudence” (1993) 19:1 Melb UL Rev 195 at 196 (HeinOnline).

²²⁵ For instance, see the decision of India’s Supreme Court in *Samatha v AP* (1997), [1997] 8 SCC 191 (India SC). Relying on *Mabo*, an argument was made that all lands within the tribal area belonged to the tribals and that it was during the British rule that the tribals were denied of their rights over the lands and, therefore, it was justified to hold that the lands within the entire tribal area belonged only to them and that the state has no authority or power over the said land. However, this argument was not pressed. *Ibid.*

²²⁶ *Mabo*, *supra* note 221, ¶55.

extinguished.”²²⁷ Subsequently, native title was statutorily incorporated into the *Native Title Act, 1993*.²²⁸ The Act is superior to the common law doctrine as propounded in *Mabo*, which primarily dealt with land rights, and casts doubts on whether native title could lie against internal and coastal waters.²²⁹ The *Native Title Act* statutorily extends this concept to include rights and interests over both land and to waters. In sum, it is clear that a coastal law cannot remain impervious to the larger general legal framework. Recognition of the rights of the indigenous peoples, their traditions and customs, is an important aspect, which the coastal laws of South Asia will have to take note of and provide effect to.

7.3.2.3 Legislating ICZM and Promoting Coastal Climate Change Adaptation

While state, territory and local governments propel ICZM and coastal climate change adaptation (through coastal legislation, building codes and land use planning regulations), as stewards of the national economy, the Commonwealth also has an important role in facilitating ICZM and coastal climate change adaptation. This may take the form of direct action or by playing the role of a facilitator by providing leadership and coordinating national reform efforts. Among the coastal states, New South Wales, Victoria, Queensland and South Australia have coastal management legislation. The following analysis examines the coastal legislation of Queensland and New South Wales to understand how these laws provide for ICZM implementation and coastal climate change adaptation.

7.3.2.3.1 New South Wales

²²⁷ Samantha Hepburn, “Native Title in Coastal and Marine Waters” in Rachel Baird & Donald R Rothwell, eds, *Australian Coastal and Marine Law* (Sydney: The Federation Press, 2011) 296 at 297.

²²⁸ It reads

[t]he expression native title or native title rights and interests means the communal, group or individual rights and interests of Aboriginal peoples or Torres Strait Islanders in relation to land or waters, where:

(a) the rights and interests are possessed under the traditional laws acknowledged, and the traditional customs observed, by the Aboriginal peoples or Torres Strait Islanders; and

(b) the Aboriginal peoples or Torres Strait Islanders, by those laws and customs, have a connection with the land or waters; and

(c) the rights and interests are recognised by the common law of Australia.

See (Cth), s 223(1).

²²⁹ Hepburn, *supra* note 227 at 299.

The basic objective of the *New South Wales Coastal Protection Act, 1979* (NSW Coastal Act) is to protect the coastal environment to ensure intra-and inter-generational equity.²³⁰ The Act empowers councils to create coastal zone management plans²³¹ to protect and preserve beach environments and beach amenity; promote undiminished public access to beaches, headlands and waterways; manage estuaries; and provide for emergency actions in the event of beach erosion.²³² The plans also provide for risk management from general coastal hazards as well as related climate change impacts.²³³ In cases where the plans propose the construction of coastal protection works (funded by the council or by private landowners), arrangements must be made for their maintenance and for managing their associated impacts.²³⁴ As noted in chapter five, armouring, while protecting coastal property, can lead to increased erosion elsewhere and can adversely impair public access. The Act sets out detailed procedures for drawing up of coastal zone management plans²³⁵ and encourages public consultation.²³⁶ The Minister for Climate Change and the Environment has issued “Guidelines for Preparing Coastal Zone Management Plans,” including measures to deal with coastal risk management.²³⁷

The NSW Coastal Act also sets out rules concerning the granting of development consent for coastal protection works.²³⁸ To reduce the “red tape” that has restricted the ability of landowners to place temporary coastal protection works around their properties, the *Coast Protection Amendment Act, 2012*, has engrafted liberal provisions into the coastal law allowing owners to place sandbags as temporary coastal protection works²³⁹

²³⁰ *NSWCPA*, *supra* note 218, s 3.

²³¹ *Ibid*, s 55B.

²³² *Ibid*, s 55C.

²³³ *Ibid*.

²³⁴ *Ibid*.

²³⁵ *Ibid*, s 55D.

²³⁶ *Ibid*, s 55D-J.

²³⁷ Australia, Dep’t of Env’t, Climate Change & Water NSW, *Guidelines for Preparing Coastal Zone Management Plans* (Sydney South: Dep’t of Env’t, Climate Change & Water NSW, 2010) at 10-15.

²³⁸ *NSWCPA*, *supra* note 218, s 55M; see also *ibid*, s 4(1) (defining *coastal protection works* to mean “activities or works to reduce the impact of coastal hazards on land adjacent to tidal waters and includes seawalls, revetments, groynes and beach nourishment”).

²³⁹ Temporary coastal protection works are defined as not including sand taken from a beach or a sand dune adjacent to a beach, rocks, concrete construction waste or other debris. *Ibid*, s 55P(1). The owner of land must at the time when the temporary coastal protection work is placed on land must notify the council and others of the same. *Ibid*, s 55X; see also *Coastal Protection Regulation 2011* (NSW), part 3; see generally Australia, Dep’t of Env’t, Climate Change & Water, NSW, *Code of*

and dispenses with, requirements for planning and associated approvals in placing these works.²⁴⁰ However, landowners have a duty to maintain temporary coastal protection works.²⁴¹ Temporary coastal protection works can also be erected upon public lands for a period not exceeding two years.²⁴² However, if the temporary coastal protection work increases erosion in the beach or in its adjacent properties, unreasonably limits public access, or threatens public safety or ceases to be a temporary coastal protection work, it can be ordered to be altered, repaired or removed.²⁴³ Similarly, owners or occupiers of land can be ordered to remove materials and structures unlawfully placed on beaches.²⁴⁴

New South Wales has also adopted a coastal policy framework that balances and coordinates coastal management efforts.²⁴⁵ Goal 2 of the Policy deals with climate change and emphasizes the need to consider physical and ecological processes and hazards when assessing development applications.²⁴⁶ The NSW Coastal Planning Guideline: Adapting to Sea Level Rise, 2010, promotes ecologically sustainable development and a precautionary approach on accommodating SLR into land use planning and development assessment.²⁴⁷ The Guideline is based around six coastal planning principles for SLR adaptation in three broad areas: identifying coastal areas at risk,²⁴⁸ strategic and land use planning in coastal areas,²⁴⁹ and development assessment (for both proponents and planning authorities) in coastal areas.²⁵⁰

Practice under the Coastal Protection Act 1979 (Sydney South: Dep't of Env't, Climate Change & Water, NSW, 2011).

²⁴⁰ *NSWCPA*, *supra* note 218, s 55O.

²⁴¹ *Ibid*, s 55R.

²⁴² *Ibid*, ss 55T(1), 55U, 55VA.

²⁴³ *Ibid*, s 55ZC.

²⁴⁴ *Ibid*, s 55ZA.

²⁴⁵ See generally Australia, *NSW Coastal Policy 1997: A Sustainable Future for the New South Wales Coast* (NSW: 1997) (entitled "Part A: The Policy") [*NSW Coastal Policy 1997*]. It must be noted that the Coastal Policy has considerable legal force. The minister for planning has issued a direction under section 117 of the Environmental Planning and Assessment Act 1979 which states that in preparing local environmental plans relating to the coastal zone, local councils are to give effect to the coastal policy. See "Direction No.6 – Coastal Protection" in Australia, NSW: Dep't of Planning, *Section 117 Ministerial Directions Issued Under the Environmental Planning and Assessment Act 1979*, New South Wales Planning Reforms (2005) at 7.

²⁴⁶ *NSW Coastal Policy 1997*, *ibid* at 46, ¶2.1.3 (entitled "Part B: Implementation").

²⁴⁷ Australia, *NSW Coastal Planning Guideline: Adapting to Sea Level Rise* (NSW: Dep't of Planning, 2010) at 1.

²⁴⁸ The following two principles guide this section: principle 1- assessing and evaluating coastal risks taking into account NSW sea level rise planning benchmarks; principle 2 - advising public on coastal risks to ensure that there is informed land use planning and development decision-making.

The NSW Sea Level Rise Policy Statement, 2009 was prepared to support consistent adaptation to projected SLR impacts. It prescribed SLR planning benchmarks, relative to the 1990 mean sea level, of 0.4 meters by 2050 and 0.9 meters by 2100.²⁵¹ However, uncertainty associated with climate change has hampered the ability of local councils to consider local conditions when determining the impact of future climate change related hazards.²⁵² In a marked departure from established policy, the NSW Government has begun to re-write the rules of coastal engagement. A series of far-reaching coastal reforms (stages I and II) are being introduced, including the establishment of a Coastal Ministerial Taskforce “to ensure that NSW has the most appropriate plans, legislation and other arrangements in place to manage coastal erosion and other coastal hazards, both now and into the future.”²⁵³ One of the most important changes adopted is to do away with the statewide SLR planning benchmarks, rendering the NSW Sea Level Rise Policy Statement redundant. Local councils are now empowered to determine SLR projections to meet local conditions.²⁵⁴ Together with the *Coastal Protection Amendment Act, 2012*, these are the major changes introduced by stage I reforms.²⁵⁵ In stage II, a review of the *Coastal Protection Act, 1979* and additional measures to improve support to councils and landowners is expected.²⁵⁶

7.3.2.3.2 Queensland

Ibid at 4-7.

²⁴⁹ Principle 3 - through appropriate strategic and land use planning avoid intensifying land use in coastal risk areas; principle 4 - consider options to reduce land use intensity in coastal risk areas where feasible. *Ibid* at 8-12.

²⁵⁰ Principle 5 - minimise exposure of development to coastal risks; principle 6 - implementing appropriate management responses and adaptation strategies, taking into account environmental, social and economic impacts of each option. *Ibid* at 3.

²⁵¹ Australia, *NSW Sea Level Rise Policy Statement* (Sydney South: Dep’t of Env’t, Climate Change & Water, NSW, 2009) at 4.

²⁵² For more details on coastal reforms, see NSW, Environment & Heritage, *Stage 1 Coastal Reforms Q&As*, online: NSW, Environment & Heritage <<http://www.environment.nsw.gov.au/>> [*Stage 1 Coastal Reforms Q&As*].

²⁵³ *Ibid*; see also Chris Hartcher, Minister for Resources and Energy Special Minister of State Minister for the Central Coast, Media Release, “NSW Moves Ahead on Coastal Management” (8 September 2012).

²⁵⁴ See *Sea Level Rise*, online: NSW, Environment & Heritage <<http://www.environment.nsw.gov.au/>>; see also *Stage 1 Coastal Reforms Q&As*, *ibid*.

²⁵⁵ For more details on other actions under stage I, see *Stage 1 Coastal Reforms Overview*, online: NSW Government, Env’t & Heritage <<http://www.environment.nsw.gov.au/>>.

²⁵⁶ *Stage 1 Coastal Reforms Q&As*, *supra* note 252.

Blessed with 9,500 kilometers of coastline, and with more than 80 per cent of Queenslanders living on the coast, the coastal areas play a vital role in the well-being of this state.²⁵⁷ Rapid population growth and SLR pose the greatest challenges to the coastal environment of Queensland, home of the Great Barrier Reef. The *Coastal Protection and Management Act, 1995*,²⁵⁸ includes within its ambit mitigation of SLR and climate change impacts by providing for the broader issue of coastal hazards. One of its objectives is to ensure that land use and development decisions protect life and property from coastal hazards.²⁵⁹ It achieves its diverse objectives through preparing of the coastal plan; declaring coastal management districts and erosion prone areas, and providing for monitoring, reporting and review requirements.²⁶⁰ It empowers the minister to prepare a coastal plan, which is a statutory instrument²⁶¹ describing how the coastal zone is to be managed.²⁶² Generally, the plan identifies coastal resources, the policies for coastal management, and is to have regard to aboriginal traditions and island customs of Torres Strait Islanders.²⁶³ The minister is required to consider the effects of climate change on coastal management when preparing the state coastal management plan.²⁶⁴ The coastal plan generally has a lifespan of 10 years²⁶⁵ and is to be developed with public input.²⁶⁶ In preparing the coastal plan, the minister is to take into account public access to the foreshore.²⁶⁷

Several requirements in this coastal law indirectly further coastal climate change adaptation. The Act empowers the minister to constitute any area within the coastal zone as a coastal management district if it requires protection or management.²⁶⁸ In these

²⁵⁷ See generally Australia, Dep't of Environment and Resource Management, *Queensland Coastal Plan* (Brisbane: Dep't of Environment and Resource Management, 2012).

²⁵⁸ *Queensland CPMA 1995*, *supra* note 218, pmbl.

²⁵⁹ *Ibid*, s 3(c).

²⁶⁰ *Ibid*, s 4.

²⁶¹ *Ibid*, s 35.

²⁶² *Ibid*, ss 20-21(1).

²⁶³ *Ibid*, s 4(b).

²⁶⁴ *Ibid*, s 21(2)(a).

²⁶⁵ *Ibid*, s 33(1)(b).

²⁶⁶ *Ibid*, s 4(b).

²⁶⁷ *Ibid*, s 21(2)(b).

²⁶⁸ *Ibid*, s 54. Before an area is declared as a coastal management district, the following factors has to be considered, namely, the area's vulnerability to sea or wind erosion induced effects, whether the area should be kept in an undeveloped state to maintain or enhance the coast or coastal resources, public access to a foreshore, existing land tenure, aboriginal traditions and island customs, the need

coastal management districts, the chief executive is empowered to approve coastal protection²⁶⁹ and tidal protection²⁷⁰ notices. Similarly, the chief executive can also declare areas that are subject to erosion or tidal inundation within the coastal zone to be an “erosion prone area” depicted on a map or plan.²⁷¹ The Act proscribes the damaging of coastal vegetation and dunes²⁷² and subjects the quarrying of materials to a permit system.²⁷³ Additional rules assist in the assessment of development applications in the coastal zone.²⁷⁴ Factors such as public access to the foreshore, water quality of wetlands, integrity of dune systems, littoral drift, tidal inundation, estuarine processes, and natural surface runoff must be considered.²⁷⁵

Pursuant to the *Coastal Protection and Management Act 1995*, the Queensland Coastal Plan has been prepared and is in effect from February 2012. The Plan has two parts: the State Policy for Coastal Management and the State Planning Policy 3/11: Coastal Protection (which has been replaced by the Draft Coastal Protection State Planning Regulatory Provision: Protecting the Coastal Environment (8 October 2012), under the *Sustainable Planning Act, 2009*).²⁷⁶ The State Policy for Coastal Management applies to coastal land and the resources therein and provides direction on coastal land

to conserve, protect or rehabilitate coastal ecological systems or geomorphic features of the area, etc. See also *ibid*, s 56.

²⁶⁹ A coastal protection notice is generally issued to a person to take “reasonable action” to protect land, or to stop activities that cause adverse effects on coastal resources or wind erosion. A coastal protection notice may require the person to build or maintain works, not to alter geographical features of the land, to protect vegetation native to the coastal management district, to do things necessary to protect land from wind erosion, etc. *Ibid*, s 59.

²⁷⁰ To protect public safety or to prevent adverse consequences on coastal resources, a tidal works notice can be issued to repair the relevant works or remove the relevant works or structure and to restore the site as nearly as practicable to its former condition. *Ibid*, s 60.

²⁷¹ *Ibid*, s 70.

²⁷² For more details, see *ibid*, s 69 (minor damage that occurs in the course of the ordinary use of land is exempted).

²⁷³ See generally *ibid*, part 5.

²⁷⁴ See generally *ibid*, part 6.

²⁷⁵ *Ibid*, s 104(2).

²⁷⁶ *Sustainable Planning Act 2009* (Qld) (seeks to promote ecological sustainability by managing the process and effects of development). Queensland is currently undertaking a full review of its coastal plan including the State Planning Policy 3/11: Coastal Protection (SPP). As the SPP was found not supportive of economic growth, its operation has been suspended. In the interim, the Draft State Planning Regulatory provision came into effect on 8 October 2012 and it traces its existence to the *Sustainable Planning Act, 2009*. It replaces the SPP and it operates for 12 months (from 8 October 2012) or until repealed earlier. See generally Australia, *Draft Coastal Protection State Planning Regulatory Provision: Protecting the Coastal Environment October 2012* (Brisbane Qld: Dep't of State Development, Infrastructure and Planning, 2012) [*Draft SPRP*].

management to meet the objectives set out by the coastal law.²⁷⁷ Implemented by managers of state and local government controlled coastal land and private coastal landowners, it also applies to community groups, research organisations, and businesses.²⁷⁸ Policy outcomes in erosion prone areas include ensuring that natural coastal processes are able to transpire without interruption²⁷⁹ and that infrastructure avoids or minimizes erosion.²⁸⁰ Only essential infrastructure providing a public service can be located on state coastal land.²⁸¹

The Draft Coastal Protection State Planning Regulatory Provision refocuses coastal management to maximize economic growth²⁸² and applies to the development of planning documents (local planning schemes, regional plans, etc.) and in the assessment of development applications.²⁸³ Evaluation of planning documents is to be based on mapped coastal hazard areas that identify the level of potential risk to life and property (including SLR impacts).²⁸⁴ Coastal hazard maps allow for a SLR of 0.8 meter and a ten per cent increase in the maximum potential intensity of cyclones by 2100.²⁸⁵ A hierarchy of approaches has been identified to address the impact of coastal hazards: avoidance, planned retreat, accommodation, and finally, protection.²⁸⁶

Emphasis is placed on retaining undeveloped areas for high risk coastal areas. In developed areas vulnerable to storm tide inundation, or areas where there is a development commitment, future development must address vulnerability of the area to SLR and storm tide inundation.²⁸⁷ Local governments must put in place counter-disaster plans to address these coastal hazards, and secure access to and protect evacuation routes.²⁸⁸ Similar guidance rules have been provided in relation to locating development

²⁷⁷ Australia, Dep't of Environment and Resource Management, *Queensland Coastal Plan* (Brisbane: Dep't of Environment and Resource Management, 2012) at 3.

²⁷⁸ *Ibid* at 4.

²⁷⁹ *Ibid* at 6.

²⁸⁰ *Ibid* at 7.

²⁸¹ *Ibid* at 14.

²⁸² See generally *Draft SPRP*, *supra* note 276.

²⁸³ *Ibid* at 6.

²⁸⁴ *Ibid* at 7.

²⁸⁵ *Ibid* at 16.

²⁸⁶ *Ibid* at 7-8.

²⁸⁷ *Ibid* at 9.

²⁸⁸ *Ibid*.

in erosion prone areas.²⁸⁹ In such areas, primacy is afforded to a retreat strategy; however, if the area is developed such that this option is no longer feasible, then property protection works can be utilised to defend land uses and infrastructure.²⁹⁰ In developed areas, structural engineering and stabilisation works (e.g., artificial reefs, banks, wrecks, breakwaters and groynes) are to be initiated only as a last resort when erosion presents an immediate threat to public safety or property and to infrastructure that is not expendable.²⁹¹ However, such works should not impact the natural cycles of erosion and accretion of beaches.²⁹² Rules have also been laid down regarding land-based aquaculture,²⁹³ dredging activities within coastal waters,²⁹⁴ nature conservation,²⁹⁵ and the management of areas of high ecological significance.²⁹⁶

7.3.2.4 Leadership Role of the Commonwealth Government

While the overall strategic direction for coastal management in Australia is determined by the principles of ecologically sustainable development, as mentioned earlier, being a federal state, coastal management is diffused between the national, state and in certain cases the local governments. As has been stated, “coastal management in Australia is fractured by commonwealth, state, regional and local government responsibilities and there is no coordinated coastal legislation or coastal policy but rather a complex mix of legislation, plans and policies.”²⁹⁷ The practical realities of implementing ICZM and coastal climate change adaptation is illuminating the need for greater uniformity and co-ordination in state practice. As is clear from the above discussion, there is divergence in the way in which ICZM and coastal climate change adaptation is conceived and implemented in Australia’s coastal states. For instance, in Queensland, coastal climate change adaptation emanates primarily as part of planning law; in NSW it has its grounding in the coastal law. While divergence in approach is to be respected, coastal

²⁸⁹ *Ibid.*

²⁹⁰ *Ibid* at 10.

²⁹¹ *Ibid.*

²⁹² *Ibid.*

²⁹³ *Ibid* at 13-14.

²⁹⁴ *Ibid* at 14-15.

²⁹⁵ *Ibid* at 10-11.

²⁹⁶ *Ibid* at 11-12.

²⁹⁷ Neil Lazarow et al, eds, *Coastal Management in Australia: Key Institutional and Governance Issues for Coastal Natural Resource Management and Planning* (Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management (Queensland: Coastal CRC, 2006) at ix.

ecosystems and climate change impacts can span jurisdictional boundaries. Any such divergence has to be accommodated within the framework of certain common parameters. It falls to the Commonwealth government to ensure that there is consistency in ICZM practice and coastal climate change adaptation implementation throughout the continent. This can be secured through the development of common frameworks and guidance documents to provide advice and support to activities that contribute to responses at the state level. Accordingly, the Commonwealth Government, in conjunction with the state and territory jurisdictions, has developed a Framework for a National Cooperative Approach to Integrated Coastal Zone Management, 2003. This is “a high level strategic instrument” that sets the stage for “national cooperation” for coastal management and seeks to accomplish ecologically sustainable outcomes over the next decade.²⁹⁸ This national cooperative approach stands to benefit all Australians (socially, economically, and environmentally). The Framework identifies six priority areas and focuses on “national collaboration” in meeting the challenges posed by climate change.²⁹⁹ Two specific responses top this agenda: developing the science of climate change in relation to the coastal zone³⁰⁰ and “managing and adapting to impacts and opportunities.”³⁰¹ In this regard, the Framework identifies the importance of integrating climate change adaptation initiatives “with existing coastal zone conservation, planning and management processes.”³⁰² Furthermore, it also calls upon the Natural Resources Policies and Programs Committee and the Marine and Coastal Committee to develop information, guidelines and tools for coastal zone managers and planners on climate change risks, liability and adaptation options and to share these outcomes.³⁰³

Climate change adaptation is a core pillar in the Australian government’s climate change strategy. The coast is a national priority area for action.³⁰⁴ The choice of the most appropriate coastal climate change adaptation measure depends largely upon data for an enhanced understanding of coastal vulnerability. Accordingly, the National Climate

²⁹⁸ NRMCC, *National Cooperative Approach*, *supra* note 189 at 10.

²⁹⁹ *Ibid* at 16.

³⁰⁰ *Ibid* at 37.

³⁰¹ *Ibid* at 39.

³⁰² *Ibid*.

³⁰³ *Ibid*.

³⁰⁴ See generally Australia, *Adapting to Climate Change in Australia: An Australian Government Position Paper* (np: Dep’t of Climate Change, 2010).

Change Adaptation Framework highlights the need for more information to fill-in critical gaps in current understandings and knowledge about possible impacts that inhibit effective adaptation. In building adaptive capacity, the framework identifies potential measures, including developing a climate change and fisheries action plan, and developing a national web-based “Oz Coasts Portal” of information, maps, tools and other products relating to the coast and climate change.³⁰⁵ Additional coastal climate change adaptation initiatives have been undertaken including a national coastal risk assessment,³⁰⁶ coastal adaptation decision pathways projects,³⁰⁷ establishment of the Coasts and Climate Change Council with the mandate to advise “the Government on coastal adaptation issues and reform priorities.”³⁰⁸ The Council’s recommendations to date include integrating climate change into national agendas such as managing natural disaster risks, the insurance and banking sectors, identifying nationally significant hotspots, and creating government and private sector partnerships for adaptation planning in nominated hot spots.³⁰⁹ There is also a growing jurisprudence highlighting the need to take into account the risks posed by climate change and SLR in line with the precautionary approach when deciding on whether or not to situate development in coastal areas or note.³¹⁰

7.3.2.5 Discussion

³⁰⁵ Australia, Dep’t of Climate Change & Energy Efficiency, *National Climate Change Adaptation Framework*, online: Dep’t of Climate Change & Energy Efficiency, What the Government is Doing, A-Z of Government Programs and Initiatives, National Climate Change Adaptation Framework <<http://www.climatechange.gov.au/>>.

³⁰⁶ See generally Australia, Dep’t of Climate Change & Energy Efficiency, *Climate Change Risks to Coastal Buildings and Infrastructure A Supplement to the First Pass National Assessment* (np: Dep’t of Climate Change & Energy Efficiency, 2011).

³⁰⁷ For more details, see Australia, Dep’t of Climate Change & Energy Efficiency, *Coastal Adaptation Decision Pathways projects*, online: Dep’t of Climate Change & Energy Efficiency, <<http://www.climatechange.gov.au/>>.

³⁰⁸ Australia, Dep’t of Climate Change & Energy Efficiency, *Coasts and Climate Change Council*, online: Dep’t of Climate Change & Energy Efficiency, Climate Change, Australia’s Coasts and Climate Change, Adapting to Coastal Climate Change, Coasts and Climate Change Council <<http://www.climatechange.gov.au/>>.

³⁰⁹ Australia, Dep’t of Climate Change & Energy Efficiency, online: Dep’t of Climate Change & Energy Efficiency, *Council advice to Minister Combet - December 2011* <<http://www.climatechange.gov.au/>>.

³¹⁰ For an overview of the case-law, see Ch 5, notes 68-73.

Like the United States, Australia also offers compelling lessons to coastal South Asia in terms of operationalising ICZM and coastal climate change adaptation. In part due to the Offshore Constitutional Settlement, and subsequent legislative developments, the states have secured jurisdiction over a significant belt of the coastal waters. Apart from the residuary powers of legislation, this facet of the Australian model has helped in the entrenchment and implementation of ICZM and coastal climate change adaptation at the state level. Under both the NSW *Coastal Protection Act, 1979*, and the Queensland *Coastal Protection and Management Act, 1995*, ICZM is practiced through a principled approach and implemented through the preparation of coastal zone management plans. From the experiences of the two states, it is clear that there can be great divergence in coastal management and adaptation rules and the overall approaches adopted to work them. While variance is to be respected, there is the need for their greater harmonization and for more integrated management responses rooted in sustainable coastal development. Overarching common frameworks to facilitate the development of national cooperative approaches for both ICZM and coastal climate change adaptation are critical in this regard.

The recent reforms to the Australian coastal law model, in particular those related climate change adaptation are particularly useful. Since it is not possible for any state to fortify large stretches of coastline and moreover large segments of the coastline can be in private hands, the NSW Coastal Act has adopted a pragmatic approach by empowering individual property owners to set up environmentally friendly temporary coastal protection works. However, these may not be of much help in the event of a large storm surge, or intense flooding. The Australian model also highlights the uncertainties of climate change and its broader implications for policy development for coastal climate change adaptation. In this regard, while the Australian states reviewed here had developed state-wide applicable benchmarks in relation to SLR as the basis for future coastal development, they have both abandoned the statewide approach. NSW has gone to the extent of empowering local councils to develop their benchmarks based on local conditions. Given the considerable uncertainty and variability in projections of future SLR, this provides local councils with greater flexibility to respond to future coastal hazards. While there is merit in such an approach, there is a danger that this policy will

contribute to a diversity of sea-level rise benchmarks across the different local jurisdictions and complicate a precautionary response to protect critical coastal processes that might be better met at the statewide or even national level. In a South Asian context, due to the inadequacies in the nature of the data available in relation to SLR, and the limited jurisdiction and resources available with the local bodies, it may be practically counter-productive to entrust determination of sea-level rise benchmarks to the different local bodies.

The centrality afforded to the interests of aboriginal groups in coastal management is another notable feature of the Australian model. It must be pointed out that even though the problems of the indigenous peoples in Australia vary vastly from that of those in South Asia, an important lesson deducible is that a coastal law can be a potent instrument in securing the rights of indigenous coastal communities, in particular their longstanding relationship to the oceans, coastal spaces and other coastal and marine resources.

7.3.3 South Africa

South Africa is an acclaimed leader in advocating and popularising ICZM law on the African continent.³¹¹ Surrounded by the waters of the Atlantic, the Indian and the Southern oceans, the South African coastline extends 3,650 kilometers.³¹² The coastline has a diverse landscape, and climate sensitive natural resources. Nearly 40 per cent of South Africa's population lives within 100 kilometers of the coast,³¹³ with over seven million living in the coastal cities of Cape Town, Durban, Port Elizabeth, and East London. These four cities are experiencing rapid population growth and their populations are likely to double in the next 25 to 30 years.

Like most other coastal regions, climate predictions and projections are not sanguine for South Africa. Tide gauge measurements show that the sea level has risen by

³¹¹ See Dep't of Environmental Affairs, *South Africa's Integrated Coastal Management Act Shortlisted for the 2012 World Future Policy Award for Exemplary Coastal and Ocean Policies*, online: Dep't of Environmental Affairs <<https://www.environment.gov.za/content/home>>.

³¹² South Africa, Dep't of Environmental Affairs, *National Climate Change Response Green Paper* (2010) at 30.

³¹³ South Africa, *National Climate Change Response White Paper* (np, 2011) at 23 [*SA Climate Change White Paper*]. Dep't of Environmental Affairs and Tourism, *Environment Outlook: A Report on the State of Environment of South Africa* (Dep't of Environmental Affairs and Tourism, 2006) at 173 [*State of Environment of South Africa Report*].

approximately 1.2 millimeters annually over the last three decades. It is predicted that by 2020 there could be a 12.3 centimeter rise, increasing to 24.5 centimeters by 2050 and 41 centimeters by 2080.³¹⁴ Sea-surface temperatures have increased by about 0.25 degree Celsius per decade over the past four decades.³¹⁵ Erratic precipitation patterns have reduced freshwater flows into estuaries, which has increased the concentration of pollutants in the coastal zone and limited their ability to support natural biota, particularly the prawn trawl fishery.³¹⁶ The National Climate Change Response White Paper, 2011 notes that geographically, as there is very little natural shelter in coastal areas, the South African coastline is exposed to strong wave action and to storms that erode the coastlines and increase flooding.³¹⁷

During the apartheid period, South Africa was basically a unitary state with centralized powers.³¹⁸ As in South Asia, a primary legacy of colonial rule and the apartheid regime was a skewed system of benefit sharing of common pool resources. The rights to benefit and use coastal resources were prerogatives that could be enjoyed only by a privileged few.³¹⁹ The *Sea Shore Act, 1935*, declared “the State President to be the *owner* of the sea-shore and the sea within the territorial waters of the Republic”³²⁰ Coastal zone management during that period was resource-centric, top-down in approach, and fragmented. As a result, “the value of coastal ecosystems as a cornerstone for development was not sufficiently acknowledged in decision-making.”³²¹

With the fall of apartheid and the inauguration of a new constitution in 1996, “command and control” gave way to “co-operative government”³²² based on a quasi-

³¹⁴ *State of Environment of South Africa Report, ibid* at 178.

³¹⁵ *Ibid.*

³¹⁶ *Ibid* at 177.

³¹⁷ *SA Climate Change White Paper, supra* note 313.

³¹⁸ Jan Glazewski & Marcus Haward, “Towards Integrated Coastal Area Management: A Case Study in Co-operative Governance in South Africa and Australia” (2005) 20 *Int'l J Mar & Coast L* 65 at 69 (HeinOnline).

³¹⁹ South Africa, *White Paper for Sustainable Coastal Development in South Africa* (np: Dep't of Environmental Affairs & Tourism, 2000) ¶2.2.2 [*SA White Paper SD*]

³²⁰ See *Sea-Shore Act, 1935*, (S Afr), No 21 of 1935, long title [emphasis added]; see also *SA, Integrated Coastal Management Act, supra* note 74, pmbl.

³²¹ *SA White Paper SD, supra* note 319 (executive summary).

³²² *Constitution of the Republic of South Africa, 1996*, (S Afr), No 108 of 1996, ch 3 [*Constitution of South Africa*] (entitled co-operative government).

federal system of government.³²³ The South African Constitution³²⁴ re-wrote the rules on environmental justice by securing for all the right “to an environment ... not harmful to their health or well-being” and “to have the environment protected, for the benefit of present and future generations.”³²⁵ The *National Environmental Management Act, 1998*, entrenched the environmental rights guaranteed by the Constitution. Growing recognition of the economic value of coastal ecosystems as a cornerstone for national economic development propelled calls for a new coastal law imbued in equity with emphasis on sustainable coastal development.³²⁶

The series of reforms that led to the re-writing of the coastal law regime and a new era for coastal management can be traced to the 2000 White Paper for Sustainable Coastal Development in South Africa.³²⁷ The White Paper set out four cornerstones for coastal management efforts: 1) recognise the economic value of coastal ecosystems for economic development; 2) adopt a people-centric approach to sustainable coastal development; 3) promote a holistic way of thinking that involves co-ordinated and integrated coastal management; and 4) implement a facilitatory style of management involving co-operation, encourages participation, and shared responsibility of those with an interest in the coastal zone.³²⁸ The White Paper called for the drafting of a new coastal management act based on these principles.³²⁹

The *National Environmental Management: Integrated Coastal Management Act, 2008*,³³⁰ (ICM Act), as its title suggests, is a statute within the framework of the *National Environmental Management Act, 1998*. It is based on an understanding that there is the need for “a new co-operative and participatory approach to managing the coast.”³³¹ And, in broad terms, this cooperative approach is to be achieved through ICZM, which is viewed as “an evolving process that learns from past experiences,” taking into “account

³²³ Glazewski & Haward, *supra* note 318 at 69.

³²⁴ Morné Van der Linde, ed, *Compendium of South African Environmental Legislation* (Pretoria: Pretoria University Law Press, 2006) at 31.

³²⁵ *Constitution of South Africa*, *supra* note 322, s 24.

³²⁶ Bruce C Glavovic , “A New Coastal Policy for South Africa” (2000) 28:3 *Coast Mgmt* 261 at 263.

³²⁷ *SA White Paper SD*, *supra* note 319 (foreword by Minister of Environmental Affairs and Tourism).

³²⁸ See generally *ibid*, executive summary.

³²⁹ *Ibid*, ¶9.3.2.

³³⁰ See generally *SA, Integrated Coastal Management Act*, *supra* note 74.

³³¹ *Ibid*, pmb1.

the functioning of the coastal zone as a whole” and seeking “to co-ordinate and regulate the various human activities that take place in the coastal zone ... to achieve its conservation and sustainable use.”³³² Integrated management of the coastal zone is essential to achieving the constitutional commitment to improve the quality of life of all citizens and to protect the natural environment for the benefit of the present and future generations.³³³

The ICM Act is based on principles integral to sustainability.³³⁴ In a marked departure with the past and to set right the inequitable state-centric and resource intensive approach to coastal management, the law incorporates the concept of trusteeship. The state is treated only as a trustee of the coastal zone,³³⁵ not the owner of all coastal resources.³³⁶ Moreover, the Minister is to provide sufficient information on matters relating to the protection and management of the coastal zone to the general public to enable them to make an informed decision as to the extent to which the state has fulfilled its trusteeship duties.³³⁷

The ICM Act has four dimensions: a comprehensive definition of the coastal zone; institutional administrative mechanisms; tools for coastal conservation and for the sustainable use of coastal resources; and measures to adapt to a rising sea. These aspects are detailed below.

7.3.3.1 Defining the Coastal Zone

Since the ICM Act focuses on regulating human activities that take place within the coastal zone,³³⁸ an understanding of what constitutes the coastal zone is vital. Generally, the definition of the coastal zone depends largely upon what a particular country considers as being essential elements. The ICM Act defines the “coastal zone”³³⁹ as “the area comprising coastal public property, the coastal protection zone, coastal access land

³³² *Ibid.*

³³³ *Ibid.*

³³⁴ Some of the major principles are co-operative governance, integration and participation. *Ibid.*, s 2.

³³⁵ *Ibid.*, s 3(a).

³³⁶ For the earlier contrary legal position, see *supra* notes 318-21 and accompanying text.

³³⁷ *SA, Integrated Coastal Management Act*, *supra* note 74, s 93(1).

³³⁸ *Ibid.*, s 2(c).

³³⁹ *Ibid.* at ch 2.

and coastal protected areas, the seashore, coastal waters and the exclusive economic zone and includes any aspect of the environment on, in, under and above such area.”³⁴⁰

Of all the enumerated elements, *coastal public property*³⁴¹ is perhaps the most important as it reflects a people-centric approach to coastal management. Ownership over coastal public property is vested with the citizens, which in its turn is held by the state in trust for them.³⁴² As public trustee, the state has to ensure that coastal public property is “used, managed, protected, conserved and enhanced” in a way that promotes the interests of the community as a whole and therefore there are limits on the rights which a state can exercise *vis-à-vis* coastal public property.³⁴³ The state must also adopt reasonable legislative and other measures to conserve and protect this property for the benefit of the present and future generations. The ICM Act goes a step further and accords right of access and the right to use and enjoy coastal public property to all natural persons (over and above citizens). However, the state can restrict access or use of any part of the coastal public property. Generally, no fees can be charged for the enjoyment of these rights.³⁴⁴ Even though the management of coastal public property is imbued by the concept of public trust, the Minister can grant leases (for buildings, roads, barriers or structures) or concessions (for coastal resources) over coastal public property.³⁴⁵

To ensure that the public can gain access to coastal public property *via* “public access servitudes”, municipalities can make by-laws designating strips of land as *coastal access land*. Notably, the environmental impact must first be assessed in consultation with interested and affected parties. There are rules concerning the terms of public

³⁴⁰ *Ibid* at ch 1.

³⁴¹ Coastal public property basically consists of coastal waters (internal and territorial waters and estuaries), any island (artificial and natural) in coastal waters, lands submerged by coastal waters, the seashore, state owned admiralty reserve, state lands that are declared to be coastal public property, any natural resource on or in any coastal public property, and those found in the exclusive economic zone or the continental shelf, and any harbour, work or installation on coastal public property owned by the state. In addition, the Minister can declare any state owned property as coastal public property and can also acquire private property for the purpose of declaring it as coastal public property. *Ibid*, ss 7-9.

³⁴² *Ibid*, s 2(c).

³⁴³ It is legally stipulated that the state cannot sell, attach or acquire by prescription coastal public property. *Ibid*, s 11(2).

³⁴⁴ *Ibid*, s 13(3).

³⁴⁵ *Ibid*, ss 65-66.

access³⁴⁶ and the Minister retains the right to prohibit a person from carrying out (or even intending to do) an activity that can adversely impair the rights of natural persons to gain access to or use coastal public property.³⁴⁷

The *coastal protection zone*³⁴⁸ includes land adjacent to coastal public property or that plays a significant role in coastal ecosystems measured from the ‘high water mark’ (HWM) and extending 100 meters inland (developed urban areas zoned as residential, commercial, or public open space), or 1,000 meters inland (undeveloped or rural areas).³⁴⁹ The goal in this zone is to protect ecological integrity; natural character; economic, social and aesthetic value; and people, property and economic activities from the risks and threats which may arise from coastal hazards.³⁵⁰

7.3.3.2 Institutional Mechanisms to Administer the Law and Public Participation

Successful ICZM implementation is predicated upon the presence of effective institutional mechanisms. In line with the federal system of governance, the ICM Act provides a three-tier institutional framework based on “co-operative coastal governance.”³⁵¹ The primary authorities under the ICM Act are Minister for Environmental Affairs and Tourism (national level) and the MEC (Member of the Executive Council of a coastal province, responsible for the designated provincial lead agency).³⁵² Both have wide powers including the hearing of appeals and making of regulations.³⁵³ The Act also provides for the creation of coastal committees, which are treated as the “embodiment of co-operative coastal governance.”³⁵⁴ At the national level, the National Coastal Committee³⁵⁵ “promote[s] integrated coastal management ... and

³⁴⁶ *Ibid*, ss 29 & 20.

³⁴⁷ *Ibid*, s 59(5).

³⁴⁸ *Ibid*, s 16.

³⁴⁹ L Celliers et al, *A User-friendly Guide to South Africa’s Integrated Coastal Management Act* (Cape Town: Dep’t of Environmental Affairs and SSI Engineers and Environmental Consultants, 2009) at 23.

³⁵⁰ *SA, Integrated Coastal Management Act, supra* note 74, s 17.

³⁵¹ *Constitution of South Africa, supra* note 322.

³⁵² *SA, Integrated Coastal Management Act, supra* note 74, s 1.

³⁵³ *Ibid*, ss 83-84, 90 & 94.

³⁵⁴ Celliers et al, *supra* note 349 at 36.

³⁵⁵ For the composition, see *SA, Integrated Coastal Management Act, supra* note 74, ss 26 & 35(1).

effective co-operative governance.”³⁵⁶The MEC establishes provincial coastal committees to promote ICZM and to coordinate and implement the provincial coastal management programme.³⁵⁷ There is also provision for municipal coastal committees, which would implement the ICM Act and their municipal coastal management programme.³⁵⁸ Any member of the public having appropriate expertise can be appointed as voluntary coastal officers to perform such duties and exercise such powers as is assigned to it by the MEC for the conservation and protection of coastal public property.³⁵⁹

Public participation, an essential cog in the ICZM process, is contemplated at several stages: the formulation of the estuarine management plan,³⁶⁰ the imposition of fees for accessing coastal public property,³⁶¹ and prior to the adoption of the national,³⁶² provincial,³⁶³ and municipal coastal management programmes,³⁶⁴ and even post adoption.³⁶⁵ Section 53 of the ICM Act mandates certain obligations in relation to “consultation and public participation.”³⁶⁶

7.3.3.3 Tools for Coastal Conservation and Ensuring the Sustainable Use of Coastal Resources

The ICM Act envisages five strategies for coastal conservation and sustainable use of coastal resources: 1) coastal management; 2) protection of coastal environment; 3) marine and coastal pollution control; 4) protection to estuaries; and 5) public access to coastal resources. These are elaborated below:

The ICM Act identifies two practical tools to achieve coastal management, namely, the coastal management programme (CMP) and coastal planning schemes.³⁶⁷ The Act

³⁵⁶ *Ibid*, s 35(3).

³⁵⁷ *Ibid*, s 39.

³⁵⁸ *Ibid*, s 42.

³⁵⁹ *Ibid*, s 43.

³⁶⁰ *Ibid*, s 34.

³⁶¹ *Ibid*, s 13.

³⁶² *Ibid*, s 44(2).

³⁶³ *Ibid*, s 46(2).

³⁶⁴ *Ibid*, s 48(2).

³⁶⁵ *Ibid*, s 44(3).

³⁶⁶ Following three steps are contemplated, namely, consultation with the appropriate government officials, reasonably accessible publication or broadcasting of intent, and notification in the government gazette providing sufficient information, so that the public can submit written representation or objection to proposed actions within a period of 30 days.

³⁶⁷ Celliers et al, *supra* note 349 at 42.

envisages a cascading hierarchical system of CMPs: a national CMP³⁶⁸ (developed by the Minister³⁶⁹) at the apex that provides strategic and overarching direction on integrated coastal management³⁷⁰; provincial CMPs (developed by the MEC³⁷¹) consistent with the national CMP;³⁷² and individual municipal CMPs³⁷³ consistent with both the provincial and national CMPs.³⁷⁴ Roughly corresponding to the federal nature of the South African polity, this system accommodates and harmonizes local development imperatives with national objectives and, more importantly, craft “management responses” that are sensitive to the “natural, social and economic differences along the ... coastline.”³⁷⁵

The Act called for the system of CMPs to be in place by the end of 2013 and includes provisions for regular review.³⁷⁶

*Coastal planning schemes*³⁷⁷ define areas within the coastal zone or coastal management area that can be used exclusively for a specific purpose or activity³⁷⁸ or can restrict or prohibit certain activities or uses.³⁷⁹ Coastal planning schemes are to be developed in tandem with the ICM Act, national and coastal management programmes, and estuarine management plans. Generally, the minister, the manager of a coastal protected area, the MEC, the municipality, and the management authority of a special management area can establish coastal planning schemes in this hierarchical order.³⁸⁰

The ICM Act provisions on the coastal environment include the duty to avoid causing adverse effects to the coastal environment and to remediate environmental damage.³⁸¹ To secure this interest, there are provisions for coastal protection,³⁸² repair or

³⁶⁸ SA, *Integrated Coastal Management Act*, *supra* note 74, ss 44-45.

³⁶⁹ *Ibid*, s 44

³⁷⁰ *Ibid*, s 45(1)(a).

³⁷¹ *Ibid*, s 46.

³⁷² *Ibid*, s 47(1)(c)(i).

³⁷³ *Ibid*, s 48.

³⁷⁴ *Ibid*, s 49(1)(b)(i).

³⁷⁵ Celliers et al, *supra* note 349 at 42.

³⁷⁶ SA, *Integrated Coastal Management Act*, *supra* note 74, ss 44(1)(b), 54(1), (5), (5)(b) & 55(1).

³⁷⁷ *Ibid*, s 56(1).

³⁷⁸ *Ibid*, s 56(1)(a)(i).

³⁷⁹ *Ibid*, s 56(1)(b).

³⁸⁰ *Ibid*, ss 56-57.

³⁸¹ *Ibid*, s 58; see also *National Environmental Management Act*, (S Afr), No 1540 of 1998, s 28.

³⁸² Coastal protection notice is issued by the Minister (or a delegate) if there is reason to believe that a person is carrying out, or intends to carry out, an activity that may negatively affect the coastal zone. Specifically, such a notice can instruct measures to build, maintain or demolish any works, close off access to coastal public property, protect indigenous fauna, etc. *Ibid*, s 59.

removal notices,³⁸³ and detailed rules concerning environmental authorization for coastal activities.³⁸⁴ There are also provisions for *special management areas* for areas with unique environmental, cultural or socio-economic conditions.³⁸⁵

Land-based sources of marine and coastal pollution are a significant problem in South Africa. An estimated 63 ocean outfalls discharge daily about 800,000 cubic meters of sewage and industrial effluents into the sea seriously affecting marine environmental quality.³⁸⁶ The ICM Act regulates the discharge of effluents into coastal waters and controls ocean dumping and incineration of wastes at sea.³⁸⁷

The South African coastline is dotted with 343 estuaries.³⁸⁸ The ICM Act calls for the establishment of “a system of integrated coastal and estuarine management” on the basis of a national estuarine management protocol (which establishes the minimum requirements for estuarine management plans). This protocol is to be developed by the Minister in concurrence with the Minister of Water Affairs.³⁸⁹

7.3.3.4 Coastal Climate Change Adaptation

Section 62 of the ICM Act superimposes additional regulatory requirements on the three levels of government in respect of their land use laws as applied to the coastal zones to give effect to provisions in Section 17 to protect “people, property and economic activities from risks arising from dynamic coastal processes, including the risk of sea-level rise.” Several provisions of the Act directly and indirectly enumerate ways to deal with SLR. These provisions can be grouped under three broad adaptation strategies: setback lines, rolling easements, and overlay zones.

One of the most important tools for SLR adaptation is setback lines. To ensure public safety and to protect the coastal zone and property and to preserve aesthetic

³⁸³ SA, *Integrated Coastal Management Act*, *ibid*, s 60.

³⁸⁴ *Ibid*, ss 63-64.

³⁸⁵ *Ibid*, s 23(1)-(2).

³⁸⁶ See generally UNEP & UN Habitat, *Coastal Area Pollution the Role of Cities: Involvement, Influence, Implementation* (Nairobi: United Nations Environment Programme, 2005).

³⁸⁷ SA, *Integrated Coastal Management Act*, *supra* note 74, ss 69-70.

³⁸⁸ Burghard W Flemming, “Geographic Distribution of Muddy Coasts” in Terry R Healy, Ying Wang & Judy-Ann Healy, eds, *Muddy Coasts of the World: Processes, Deposits and Functions*, 1st ed (Amsterdam: Elsevier Science BV, 2002) 99 at 145.

³⁸⁹ SA, *Integrated Coastal Management Act*, *supra* note 74, s 33(2).

values, the MEC is empowered to establish or change coastal setback lines, which are set out in municipal zoning maps. These regulations can prohibit or restrict the construction of buildings wholly or partially seaward of the coastal setback line.³⁹⁰ Municipal CMPs must address coastal erosion and accretion.³⁹¹

The ICM Act provides that in cases where the HWM (dynamic HWM) moves inland due to coastal erosion, sea level rise, etc. and remains so for three years, the owner loses ownership of any land situated below the HWM, and is not entitled to compensation from the state.³⁹² Essentially, these are rolling easements. The Minister (or delegate) can issue a coastal protection notice if an activity is deemed to harm the coastal zone, thereby prohibiting environmentally damaging activity and providing instructions to protect the environment.³⁹³ In a similar vein, the repair or removal notice can be issued for a structure that has been unlawfully erected, constructed or upgraded or has the potential to adversely impact the coastal environment.³⁹⁴ In certain situations, the Minister can temporarily occupy land (even private property) within the coastal zone to respond to emergency situations.

7.3.3.5 Discussion

Although it is early to draw conclusive lessons from the South African experience in ICZM, its coastal law is one of the first attempts that captures the broad parameters of ICZM and sets out one of the most modern and forward-looking ICZM laws in existence. A worthy precedent,³⁹⁵ it should influence similar legislative initiatives and is particularly relevant to the South Asian context due to the inequities in accessing coastal resources in that region. As well, from a function-oriented perspective, the South African coastal law sets out an integrated, decentralised, ecosystem-based, adaptive and precautionary

³⁹⁰ *Ibid*, s 25(1)(b).

³⁹¹ *Ibid*, s 49(2)(c)(v).

³⁹² *Ibid*, s 14(5)(b).

³⁹³ *Ibid*, s 59.

³⁹⁴ *Ibid*, s 60.

³⁹⁵ South Africa, Dep't of Environmental Affairs, Media Release, "South Africa's Integrated Coastal Management Act shortlisted for the 2012 World Future Policy Award for exemplary coastal and ocean policies" (5 September 2012), online: Dep't of Environmental Affairs, Media Releases <<https://www.environment.gov.za/>>.

approach. It integrates sustainable development principles into a legislative format relevant to the coastal context. Another important feature of the South African legislative approach is that it incorporates coastal climate change adaptation responses to SLR. The approach is based on the fundamental principle that through efficient and integrated management, it is possible to manage and reduce the impacts of non-climate stressors (such as habitat destruction, haphazard development, and land-based sources of pollution) on the coastal environment. This increases the resilience of the coastal environment in coping with climate change impacts. The recent proposal to amend the ICM Act is a reminder that coastal law making is a complex endeavour that requires constant fine-tuning.³⁹⁶ In sum, there are several notable lessons for other coastal states to learn from the South African legislative ICZM model.

7.3.4 New Zealand

Urban development and related infrastructure in **New Zealand** is located primarily in its coastal areas.³⁹⁷ With rising sea levels, this infrastructure is vulnerable to coastal erosion and inundation. As elsewhere, climate change will also affect New Zealand's coastal margins.³⁹⁸ Adapting to these risks is a significant challenge to the government and authorities with jurisdiction over the coastal zone.

New Zealand's comprehensive legally-mandated ICZM program is facilitated by its constitutional dynamic and, more importantly, its holistic approach to resource management. Authority for ICZM flows primarily from the *Resource Management Act, 1991* (RMA),³⁹⁹ which promotes "the sustainable management of natural and physical resources."⁴⁰⁰ This path-breaking legislation was the product of one of the largest law reform exercises in this country.⁴⁰¹ The Act has three striking features: 1) while the general legislative approach towards natural resources management is to provide separate

³⁹⁶ For the text see, National Environmental Management: Integrated Coastal Amendment Bill, 2013, Notice 1046 of 2012, online: South Africa Gov't Online <<http://www.info.gov.za/view/DownloadFileAction?id=180951>>.

³⁹⁷ New Zealand, Ministry for the Env't, *Coastal Hazards and Climate Change: A Guidance Manual for Local Government in New Zealand*, 2d ed (Wellington: Ministry for the Env't, 2008) at 1.

³⁹⁸ For more details on impacts, see *ibid* at 28-40.

³⁹⁹ *NZRMA*, *supra* note 75.

⁴⁰⁰ *Ibid*, s 5(1).

⁴⁰¹ New Zealand, Ministry of the Env't, *Your Guide to the Resource Management Act* (2006), at 5, online: Ministry of the Env't <<http://www.mfe.govt.nz/publications/rma/>>.

legal rules for the management of critical natural resources like land, air and water, the RMA lays down an overarching framework for the management of all resources; 2) even though the country follows a unitary system of government,⁴⁰² where the national government exercises control over natural resources, this statute devolves some control to local communities, viewing them as “the best judges of their own environmental problems, and how to go about dealing with them;” and 3) rather than laying down “hard and fast rules” regarding which activities are permissible or not, the RMA adopts an “effects based” approach, that is, environmental effects of a proposed activity will be used to determine whether or not it is approved.⁴⁰³

The RMA defines the “coastal marine area” as “the foreshore, seabed, and coastal water, and the air space above the water,” where the seaward boundary is the outer limits of the territorial sea and the landward boundary is the line of mean high water springs,⁴⁰⁴ integrating the land-sea boundary. New Zealand’s decentralised government system is reflected in the RMA⁴⁰⁵ through a partnership involving the Crown and the regional and district councils.⁴⁰⁶ The law also includes provisions for both mitigation (e.g., discharge of greenhouse gases⁴⁰⁷) and adaptation⁴⁰⁸ to climate change impacts. SLR is treated as a ‘natural hazard’ and falls within the ambit of the rules to respond to natural hazards.⁴⁰⁹ The Act also prohibits the dumping and incineration of wastes in the coastal marine area

⁴⁰² See generally New Zealand is a unitary state, and does not have a written constitution. New Zealand, Constitutional Advisory Panel, *New Zealand’s Constitution: The Conversation So Far* (Wellington: Secretariat, Constitutional Advisory Panel, 2012).

⁴⁰³ *NZRMA*, *supra* note 75.

⁴⁰⁴ *Ibid*, s 2.

⁴⁰⁵ The *Local Government Act, 1989*, rationalized the governance structure, to provide for a central government, followed by regional councils with primary responsibility for the management of common property resources and territorial local authorities responsible for land use. Robert A Makgill & Hamish G Rennie, “A Model for Integrated Coastal Management Legislation: A Principled Analysis of New Zealand’s Resource Management Act 1991” (2012) 27 *Int’l J Mar & Coast L* 135 at 147 [Makgill & Rennie, “A Model for ICM Legislation”].

⁴⁰⁶ Cullinan, *supra* note 62 at 116.

⁴⁰⁷ *NZRMA*, *supra* note 75, s 70A.

⁴⁰⁸ *Ibid*, s 7(i).

⁴⁰⁹ Natural hazard is defined as “any atmospheric or earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire, or flooding) the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment.” *Ibid*, s 2; see also *ibid*, ss 30(1)(c)(iv) (stating that the regional councils can control the use of land for the purpose of avoiding or mitigating natural hazards) & 31(1)(b)(i) (territorial authorities can control the use, development, or protection of land, for the purpose inter alia of the avoidance or mitigation of natural hazards).

(unless permitted by a resource consent),⁴¹⁰ imposes a duty to avoid unreasonable noise,⁴¹¹ and restricts certain uses in the coastal marine area, including prohibiting the depositing “in, on, or under any foreshore or seabed any substance in a manner that has or is likely to have an adverse effect on the foreshore or seabed”⁴¹² unless permitted by a national environmental standard, or by the regional or proposed regional coastal plan or by a resource consent. This provision could restrict individual property owners from armouring their property. The RMA embodies the ecosystem-based⁴¹³ and precautionary approaches,⁴¹⁴ seeks to maintain and enhance public access to the coastal marine area,⁴¹⁵ protects customary rights⁴¹⁶ and indigenous vegetation,⁴¹⁷ secures public participation,⁴¹⁸ and promotes a catchment-based approach.⁴¹⁹

Importantly, the RMA calls for a New Zealand Coastal Policy Statement.⁴²⁰ To be issued by the Minister of Conservation in accordance with the broad principles provided in the RMA, the Statement will guide local authorities in their day-to-day management of the coastal environment.⁴²¹ It will include “objectives and policies” on a diverse range of issues, from implementing New Zealand’s international obligations relating to the coastal environment, to securing public access and protecting protected customary rights.⁴²² The Act also includes provisions for regional coastal plans.⁴²³

⁴¹⁰ *Ibid*, s 15A, B (discharge of harmful substances from ships or offshore installations) & C (prohibiting dumping or storing of radioactive wastes, radioactive matter and toxic or hazardous waste in coastal marine area).

⁴¹¹ *Ibid*, s 16.

⁴¹² *Ibid*, s 12(1)(d).

⁴¹³ *Ibid*, s 5(2)(b)-(c); see also Makgill & Rennie, “A Model for ICM Legislation”, *supra* note 405 at 148.

⁴¹⁴ *NZRMA*, *ibid*, s 12(1).

⁴¹⁵ *Ibid*, s 229(b) (provides for an esplanade reserve or an esplanade strip to facilitate public access).

⁴¹⁶ For instance, see *ibid*, ss 6(e) & 85A.

⁴¹⁷ *Ibid*, s 86B(3)(b).

⁴¹⁸ For instance, see *ibid* s 39 (public hearings without unnecessary formality).

⁴¹⁹ Under section 30(1)(a), the regional councils have responsibility for the integrated management of the natural and physical resources of the region. And this includes land and the coastal and marine area in the region. Makgill & Rennie, “A Model for ICM Legislation”, *supra* note 405 at 148-49.

⁴²⁰ *NZRMA*, *supra* note 75, s 56.

⁴²¹ *Ibid*, s 57.

⁴²² *Ibid*, s 58.

⁴²³ *Ibid*, s 64. The purpose of the regional coastal plan is to assist a regional council, in conjunction with the Minister of Conservation, to achieve the purposes espoused by the RMA in relation to the coastal marine area of that region. *Ibid*, s 63(2).

The first NZCPS was issued in 1994 and was subsequently revised and updated in 2010 following an elaborate process of consultation and review.⁴²⁴ Most importantly with regard to coastal climate change adaptation, the NZCPS calls for coastal hazard risk management measures to taking climate change impacts into account.⁴²⁵ The NZCPS underscores the need to adopt the precautionary approach for the “use and management of coastal resources potentially vulnerable” to climate change effects.”⁴²⁶ A range of response options to SLR are identified and grouped under two heads. The first options seek to protect existing development and include relocation or removal of existing development or structures at risk, identifying the consequences of pursuing a do-nothing option, and risk management.⁴²⁷ While emphasizing the role that natural defences can play in protecting the coastal environment,⁴²⁸ the NZCPS recognises the utility of hard protection structures where necessary to protect existing infrastructure.⁴²⁹ In such cases, shoreline hard armouring must minimise adverse effects on the coastal environment.⁴³⁰ The second options deal with future impacts. As a first step, the policy calls for identification and prioritisation of areas likely to be affected by coastal hazards, including SLR over at next 100 years.⁴³¹ The policy suggests risk reduction methods, including abandonment and managed retreat.⁴³² Where land reclamation is necessary, the policy provides detailed rules on how it is to be carried out.⁴³³

7.3.4.1 Discussion

The New Zealand experience on ICZM is comprehensive and the RMA propels this country onto a “sustainable management”⁴³⁴ trajectory. Core features that enhance

⁴²⁴ See generally Johanna Rosier, *Independent Review of the New Zealand Coastal Policy Statement: A Report Prepared for the Minister of Conservation* (Palmerston North: Massey University, 2004).

⁴²⁵ New Zealand, Dep’t of Conservation, *New Zealand Coastal Policy Statement 2010* (Wellington: Dep’t of Conservation, 2010) objective 5.

⁴²⁶ *Ibid*, policy 3.

⁴²⁷ *Ibid*, policy 27.

⁴²⁸ *Ibid*, policy 26.

⁴²⁹ *Ibid*, policy 27(c).

⁴³⁰ *Ibid*, policy 27 (3)

⁴³¹ *Ibid*, policy 24.

⁴³² *Ibid*, policy 25.

⁴³³ *Ibid*, policy 10.

⁴³⁴ *NZRMA*, *supra* note 75, s 5(2); see also Makgill & Rennie, “A Model for ICM Legislation”, *supra* note 405 at 144 (explaining reasons as to why the focus is on sustainable management and not on sustainable development).

sustainability and relevant to coastal law reform agenda for South Asia include recognition of customary rights, a catchment-based approach, and decentralised coastal management. This legislation is based on the philosophy that all elements of the environment are interrelated and that natural resource management should be integrated.⁴³⁵ In addition, several prescriptions in the law support coastal climate change adaptation. While there is considerable merit in such an approach and it is workable in New Zealand, it may be difficult to transplant certain aspects of this legal model to other coastal countries that have poor governance systems like those in the South Asian region. There is the danger that coastal zone management and coastal climate change adaptation can get lost in a subterfuge of rules. Already there have been amendments to the RMA and, in a South Asian context (as the Indian experience discussed previously reveals); frequent amendments can introduce an element of uncertainty in the long-run. Furthermore, the New Zealand coastal management regime draws on other legislations as well.⁴³⁶

In sum, while the RMA is definitely a comprehensive code on resources management, subsuming coastal management, it may be difficult to develop such a

⁴³⁵ NZRMA, *ibid*, s 30(1)(a) (providing that one of the functions of the regional council is to achieve the integrated management of the natural and physical resources), s 31(1)(a) (territorial authorities to achieve integrated management of the effects of the use, development, or protection of land and associated natural and physical resources); see also Makgill & Rennie, “A Model for ICM Legislation”, *supra* note 405 at 154.

⁴³⁶ For instance, see generally *Marine and Coastal Area (Takutai Moana) Act 2011* (NZ), 2011/3. The Court of Appeal in 2003 held in *Attorney-General v Ngāti Apa* [2003] 3 NZLR 643, that the Māori land court had jurisdiction to determine claims of customary ownership over the foreshore and seabed areas. In response, the *Foreshore and Seabed Act, 2004*, was enacted. It was widely perceived that the policy underlying this act violated the *Treaty of Waitangi*, and severely discriminated the whānau, hapū, and iwi. Accordingly, the *Marine and Coastal Area (Takutai Moana) Act, 2011* was enacted which repealed the *Foreshore and Seabed Act, 2004* and restored customary interests. This law radically alters the position by removing Crown ownership, and it declares the coastal marine area as commons incapable of ownership, and protects public use rights (access, recreation, navigation and fishing) and re-establishes the right of Maori to claim customary marine use rights and title. See Robert A Makgill & Hamish Rennie, “The Marine and Coastal Area Act 2011” [2011] Resource Mgmt J 1; Makgill & Rennie, “A Model for ICM Legislation”, *ibid* at 135, n 51.

The *Civil Defence Emergency Management Act, 2002*, *Local Government Act, 2002*, *Public Works Act, 1981*, *Building Act, 2004* are also relevant. *Building Act, 2004*, states that a building consent authority can refuse to grant a building consent for construction of a building, or major alterations to a building, if the land on which the building work is situated is subject to one or more natural hazards or the building work is likely to accelerate, worsen, or result in a natural hazard on that land or any other property. Here, natural hazard includes erosion and inundation. *Building Act 2004* (NZ), 2004/72, s 71.

comprehensive approach in other countries like those in South Asia where an RMA-like legislation may not necessarily lead to effective coastal management. In contrast, South Africa has developed an overarching integrative legal framework under the *National Environmental Management Act, 1998*. Several independent legal codes elaborate the rules relating to the different facets of resources management, including the *ICM Act, 2008*,⁴³⁷ under this overarching frame. Rather than clumping different aspects of resource management under a single piece of legislation (which, as mentioned above may work in countries with developed systems of governance and need not necessarily do so in others), the intricate and complex management issues for each resource need to be legislated separately while being harmonized under an integrated common framework. This will help ICZM law to respond more positively to coastal climate change related crises.

7.3.5 Other Legislative Experiences on Coastal Management and Coastal Climate Change Adaptation

Surrounded by the Arctic, Atlantic, and Pacific oceans, and the shores of the Great Lakes, **Canada** has more coastal area than any other country in the world.⁴³⁸ Nearly seven million Canadians live in coastal areas and many depend on ocean resources and services for their livelihood.⁴³⁹

Studies show that nearly 7,000 kilometers of the Canadian coastline are highly sensitive to SLR and other climate change impacts.⁴⁴⁰ Eighty per cent of the coastline of Nova Scotia, New Brunswick and Prince Edward Island are moderate to highly sensitive

⁴³⁷ As is evident from the title, the *National Environmental Management: Integrated Coastal Zone Management Act, 2008*, is a “specific environmental management Act” brought out under the overarching umbrella legislation - the *National Environmental Management Act 1998*. Accordingly, the ICM Act has to be “read, interpreted and applied” in conjunction with the NEMA 1998. Furthermore, in case of any conflicts relating to its implementation, the same has to be determined as per NEMA 1998. *SA, Integrated Coastal Management Act, supra* note 74, s 5; see also *National Environmental Management: Biodiversity Act, 2004*, (S Afr), No 10 of 2004, ss 6, 7; *National Environmental Management: Waste Act, 2008*, (S Afr), No 59 of 2008, s 5; *National Environmental Management: Protected Areas Act, 2003*, (S Afr), No 57 of 2003, s 5.

⁴³⁸ Canada has the longest coastline in the world of 240,000 kilometers. Donald S Lemmen & Fiona J Warren, eds, *Climate Change Impacts and Adaptation: A Canadian Perspective* (Ottawa: Climate Change Impacts and Adaptation Directorate, 2004) at 115.

⁴³⁹ *Ibid.*

⁴⁴⁰ This includes much of the Maritime Provinces, a large part of the Beaufort Sea coast and the Fraser Delta region of British Columbia. *Ibid.*

to SLR.⁴⁴¹ In Charlottetown, since 1911, the sea level has risen about 32 centimeters, posing risks to urban infrastructure.⁴⁴² In Newfoundland and Labrador, climate change has increased the potential of landslides in coastal communities at the base of steep slopes.⁴⁴³ SLR is predicted to overwhelm the 243 kilometers of dykes that protect an estimated 17,500 hectares of land in the Bay of Fundy region in Nova Scotia.⁴⁴⁴ In the Arctic coastal regions, the changes wrought by climate change and SLR will be more intense.⁴⁴⁵ Under the Canadian Constitution (the *Constitution Act, 1867*), the provinces and territories have jurisdiction over land (through their power over property and civil rights);⁴⁴⁶ and the federal government exercises jurisdiction over the ocean space that generally begins from the ordinary low water mark stretching seaward to the end of the exclusive economic zone (200 nautical miles).⁴⁴⁷ The division of legislative powers over the dry and wet segments of the coastal zone exerts tremendous influence in shaping ICZM development in Canada. However, still, the exact demarcation of jurisdiction in terms of the distribution of powers and the boundary in terms of low and high water mark between the federal and provincial governments remains controversial.⁴⁴⁸

Coastal climate change adaptation in Canada is part of a larger approach to integrated management as espoused by the *Oceans Act, 1996* (Oceans Act).⁴⁴⁹ Pioneering legislation on oceans management, the Oceans Act is comprehensive and targeted to sustainable development of oceans and their resources and to this end; it gives effect to

⁴⁴¹ *Ibid* at 118.

⁴⁴² *Ibid* at 119.

⁴⁴³ *Ibid* at 120.

⁴⁴⁴ *Our Coast: Live, Work, Play, Protect: The 2009 State of Nova Scotia's Coast Technical Report*, at 169, online: Nova Scotia: Canada <<http://www.gov.ns.ca/coast/>> [*Nova Scotia's Coastal Report*].

⁴⁴⁵ See generally Tim Williams, "The Arctic: Environmental Issues", *In Brief*, Publication No 2008-04-E, (Ottawa: Library of Parliament, 2008).

⁴⁴⁶ *Constitution Act, 1867* (UK), 30 & 31 Vict, c 3, s 92(13), reprinted in RSC 1985, App II, No 5.

⁴⁴⁷ Meinhard Doelle et al, "The Regulation of Tidal Energy Development Off Nova Scotia: Navigating Foggy Waters" (2006) 55 UNBLJ 27 at 36 (HeinOnline) (referring to two Supreme Court of Canada decisions namely, *B.C. Offshore Minerals Reference* and the *Georgia Strait Reference*, where in determining the extent of the provincial territory prior to confederation it was held that it ended at the low water mark, in the absence of a legislative enactment to the contrary and to certain other exceptions); see also Richard Kyle Paisley et al, "Integrated Coastal Management (ICM): A Brief Legal and Institutional Comparison Among Canada, the United States and Mexico" (2004) 9 Ocean & Coastal LJ 195 at 198-01 (QL).

⁴⁴⁸ Aldo Chircop & Ryan O'Leary, "Legal Frameworks for Integrated Coastal and Ocean Management in Canada and the European Union: Some Insights from Comparative Analysis" (2012) 13:3 Vt J Envtl L 425 at 432, n 30 (HeinOnline).

⁴⁴⁹ Lemmen & Warren, eds, *supra* note 438 at 124; *Oceans Act*, SC 1996, c 31 [*Oceans Act*].

an ecosystem and precautionary approach. From the perspective of coastal management, the law calls upon the minister to take the “lead and facilitate the development and implementation” of a national strategy and integrated management plans for estuaries, coastal and marine waters, and coastal ecosystems.⁴⁵⁰ In developing these documents, the minister has to collaborate with the provincial and territorial governments, other agencies, ministries and departments and more importantly with affected Aboriginal peoples and coastal communities.⁴⁵¹ The Oceans Act also provides for marine protected areas in the internal and territorial waters and in the exclusive economic zone.⁴⁵²

Pursuant to this legislative mandate, Canada has adopted an oceans strategy,⁴⁵³ which sets out “the overall strategic framework” for ocean-related programmes and policies, and is guided by the principles of sustainable development, integrated management, and the precautionary approach.⁴⁵⁴ The strategy will inform the development and implementation of integrated management plans. Apart from identifying and explaining the essential elements,⁴⁵⁵ and the principles that guide integrated management,⁴⁵⁶ the strategy underscores the need for collaboration.⁴⁵⁷ In recognising that “ecosystems nest within other ecosystems”, the integrated management-planning framework as contemplated by the strategy extends from large ocean management areas (LOMAs)⁴⁵⁸ to small coastal management areas (CMAs).⁴⁵⁹ The primary intent of CMAs is to help communities play a stronger role in issues that affect their future “by matching local capabilities and development priorities to the

⁴⁵⁰ *Oceans Act, ibid*, ss 29, 31.

⁴⁵¹ *Ibid*.

⁴⁵² *Ibid*, s 35.

⁴⁵³ See generally Fisheries & Oceans Canada, *Canada's Oceans Strategy: Our Oceans, Our Future: Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada* (Ottawa: Fisheries & Oceans Canada, 2002) [*Canada's Oceans Strategy*]. Canada has also adopted an Oceans Action Plan which propounds that “[i]ntegrated [m]anagement [p]lanning is at the heart of new, modern oceans governance and management.” Canada, *Canada's Oceans Action Plan: For Present and Future Generations* (Ottawa: Communications Branch, 2005) at 13.

⁴⁵⁴ *Canada's Oceans Strategy, ibid* at i.

⁴⁵⁵ *Ibid* at 7-8.

⁴⁵⁶ *Ibid* at 9-10.

⁴⁵⁷ “Collaboration is the governance model proposed for Integrated Management.” *Ibid* at 11.

⁴⁵⁸ Eastern Scotian Shelf Integrated Management Area covers more than 325,000 square kilometers off the coast of Nova Scotia; the Gulf of St. Lawrence would comprise another Large Ocean Management Area, as would the Beaufort Sea in the Arctic. *Ibid* at 16.

⁴⁵⁹ *Ibid* at 19-20.

opportunities and carrying capacities of the local ecosystem.”⁴⁶⁰ While most of these management issues fall within provincial, territorial or community jurisdiction, the federal Department of Fisheries and Oceans is the facilitator.⁴⁶¹ Some of the provinces have taken the lead in coastal management and coastal climate change adaptation. Some of these efforts may mature into coastal legislations. For instance, Nova Scotia has gathered baseline data and developed a report that provides an overview of the province’s coastal areas and resources and its overall state.⁴⁶² Based on this, a coastal strategy has been developed that identifies six critical issues concerning coastal management including, SLR and storm events.⁴⁶³ Further, it spells out six actions to ensure that people and property are protected from coastal hazards.⁴⁶⁴ Local governments are also taking the lead in implementing coastal climate change adaptation. For instance, the Halifax Regional Municipality (HRM), Nova Scotia, has developed a Regional Municipal Planning Strategy, 2006 that recognises the problem of rising sea levels and storm surges and, as interim measure, prohibits all residential development on the coast within a 2.5-meter elevation above the ordinary high water mark through the applicable land use by-law.⁴⁶⁵

If one were to remove the veneer of the Oceans Act, it is clear that essentially this law provides a framework for modern oceans management.⁴⁶⁶ As good as it is as an oceans law, when viewed from a coastal law prism, its shortcomings are glaring. Some of its most striking limitations from this perspective are that 1) it does not define the term coastal zone; 2) measures to tackle SLR are conspicuous by their absence; 3) it offers limited means to resolve jurisdictional conflicts between the federal and provincial levels of government on coastal management issues; and 4) even though there is provision for

⁴⁶⁰ *Ibid* at 19.

⁴⁶¹ *Ibid* at 20.

⁴⁶² See generally *Nova Scotia’s Coastal Report*, *supra* note 444.

⁴⁶³ See generally *ibid* at 160, ch 7.

⁴⁶⁴ These actions include establishment of coastal development standards, setbacks, increasing awareness about coastal hazards, and assessing the vulnerability of communities to coastal hazards. *Ibid* at 14-15.

⁴⁶⁵ Halifax Regional Municipality, *Regional Municipal Planning Strategy* (2006) at 29.

⁴⁶⁶ *Canada’s Oceans Strategy*, *supra* note 453 at i-iv; see also Tim Hall et al, “Advancing Objectives-based, Integrated Ocean Management Through Marine Spatial Planning: Current and Future Directions on the Scotian Shelf off Nova Scotia, Canada” (2011) 15:2 *J Coast Conservation* 247-55.

marine protected areas, these are mainly contemplated in ocean space with no connection to the coast or land. Thus, the *Oceans Act*, as is presently cast, at best provides a foundation for the management of the wet side of the coastal zone or the ocean space. A primary reason for this emphasis on integrated oceans management is the dynamic exerted by Canadian federalism, and it can even be argued that this law is inadequate to promote ICZM objectives and may not *stricto sensu* qualify as a coastal law. However, this is not to suggest that the law is totally dismissive of ICZM objectives. Despite challenges and shortcomings, the *Oceans Act* has several notable elements that can facilitate ICZM implementation in coastal South Asia: emphasis on integration, estuarine management, creation of marine protected areas, and their network, adoption of a principled approach to ocean management, creation of national strategy, enhanced government coordination and stakeholder engagement, and the development of integrated management plans. This law clearly supports marine spatial planning, even though this term is not specifically mentioned.⁴⁶⁷ More importantly, as will be seen in the following chapter, there is now increasing focus on moving efforts towards linking ICZM with marine spatial planning to secure the sustainable use and management of ocean and coastal spaces. Even though this aspect finds no express mention in the *Oceans Act*, the tools and approaches that this law provides is essentially geared towards attaining this objective.⁴⁶⁸ Another interesting facet of the Canadian approach is that even though the federal government has not indulged in creeping jurisdiction, there is a clear attempt by the federal government to influence the management agenda for the dry side as well. For example, under Canada's *Oceans Strategy*, the framework for integrated management extends from LOMAs to CMAs and memorandum of understandings between the federal and provincial governments.⁴⁶⁹ However, coastal zone management and coastal climate

⁴⁶⁷ Email from Scott Coffen-Smout (19 August 2013) [on file with the author].

⁴⁶⁸ Gulf of Maine Council on the Marine Environment, *Coastal and Marine Spatial Planning in the Gulf of Maine*, online: Gulf of Maine Council on the Marine Environment <<http://www.gulfofmaine.org/2/wp-content/uploads/2011/11/CMSP-Fact-Sheet-FINAL.pdf>>; see also Gulf of Maine Council on the Marine Environment, *Coastal and Marine Spatial Planning: Committees and Programs*, online: Gulf of Maine Council on the Marine Environment, *Coastal and Marine Spatial Planning: Committees and Programs* <<http://www.gulfofmaine.org/2/>>.

⁴⁶⁹ Already, the federal government and some of the provincial governments like British Columbia have entered into memorandum of understandings (MOU) to overcome jurisdictional barriers that hamper implementation. In 2011, an MOU was entered into with Nova Scotia. Chircop & O'Leary, *supra* note 448.

change adaptation are provincial domains. Nevertheless, the jurisdictional impediments that Canada faces and its attempt to circumvent the same through its nested approach to integrated management offers useful lessons to other coastal countries (particularly to the federations in coastal South Asia) that seek to implement ICZM and are constitutionally constrained because of the split jurisdiction over the land-sea divide.

SLR is already taking a toll on the 600 kilometer **Kenyan** coastline. In many areas, coastal fisheries have collapsed and life in fishing villages is increasingly difficult; villages with poor adaptive capacity rely on garbage to build sea walls to keep the rising sea at bay. Breeding havens for mosquitoes and contributing to the outbreak of diseases like dysentery, villagers believe that they are “better off taking medicine[s] than losing [their] houses to the sea.”⁴⁷⁰ ICZM initiatives in Kenya emerged from the 1993 Workshop and Policy Conference on Integrated Coastal Area Management in Eastern Africa, which recommended the establishment and development of ICZM to manage the multiple and complex issues facing the coastal zones of the region. Since then, Kenya has made rapid strides in operationalising ICZM.⁴⁷¹ Prior to this, Kenya had enacted the *Coast Development Authority Act, 1990*. It provided for the establishment of the Coast Development Authority (CDA) “to plan and co-ordinate the implementation of development projects in [the] whole of the Coast Province and the exclusive economic zone and for connected purposes.”⁴⁷² The CDA has far-reaching authority including, acquisition of land,⁴⁷³ development of long-range development plans,⁴⁷⁴ and construction of works for the protection and utilization of the water and the soil.⁴⁷⁵ This provision could be interpreted as empowering the CDA to carry out armouring works to protect the coastal zone from SLR. The *Environmental Management and Co-ordination Act, 1999* (EMCA) provides the foundation for ICZM in Kenya. Section 55 obliges the authority “in consultation with the relevant lead agencies” to prepare a survey of the coastal zone and thereafter, based on the results, “an integrated national coastal zone management

⁴⁷⁰ Odhiambo Joseph, “Kenyan village battered by rising tides”, *BBC News* (6 February 2007) online: BBC News < <http://www.bbc.co.uk/news/>>.

⁴⁷¹ UNEP & NEPAD, Kenya, *State of the Coast Report 2007: Towards An Integrated Management of Kenya’s Coastal And Marine Resources, Draft 1* (np, [nd]) at 90.

⁴⁷² *Coastal Development Authority Act, 1990*, (Kenya), No 20 of 1990, pmb1.

⁴⁷³ *Ibid*, s 16.

⁴⁷⁴ *Ibid*, s 8(b).

⁴⁷⁵ *Ibid*, s 8(g).

plan.”⁴⁷⁶ The national coastal zone management plan is to be reviewed at least every two years.⁴⁷⁷ Pursuant to this mandate, Kenya developed its first ICZM Action Plan for the period 2011–2015. The Action Plan identifies priority themes and activities that encompass coastal climate change adaptation, including “Environmental Risks and Management of Shoreline Changes.”⁴⁷⁸ Two strategic objectives have been proposed in this regard: minimizing shoreline change impacts and mainstreaming climate change mitigation and adaptation measures into coastal development plans and programmes.⁴⁷⁹ The document identifies strategies to effectuate these objectives.⁴⁸⁰ The Kenyan experience may lead to gridlock since its ICZM plan, which includes coastal adaptation measures, is based not on the coastal management legislation but rather it draws its legislative support from the *Environmental Management and Co-ordination Act, 1999*. The incongruity of this disconnect between the coastal law and the coastal management plan, may become more evident once Kenya begins to implement its ICZM plan. Issues contemplated under the plan may require legal support that a general environmental statute may be unable to provide for and lead to gridlock.

Seventy per cent of **Israel**’s population lives within 15 kilometers of the Mediterranean coastline, the economic nerve center of Israel. By 2050, the sea level along the Israeli coast is expected to rise by some 0.5 meter, and by 2100 it is expected to reach a meter.⁴⁸¹ Apart from inundation and destruction of coastal property,⁴⁸² there is also the possibility of increased cliff slumping⁴⁸³ and coastal aquifer contamination.⁴⁸⁴

⁴⁷⁶ See *Environmental Management and Co-Ordination Act, 1999*, (Kenya), No 8 of 1999, s 55(2), (4).

⁴⁷⁷ *Ibid*, s 55(3).

⁴⁷⁸ Kenya, National Environment Management Authority, *Integrated Coastal Zone Management Action Plan for Kenya, 2011-2015* (Nairobi: NEMA, [nd]) at 41.

⁴⁷⁹ *Ibid* at 42.

⁴⁸⁰ For instance, to minimize the impacts of shoreline change, the plan calls for the development and implementation of a shoreline management plan for the entire coast. Again to mainstream climate change mitigation and adaptation measures into coastal development plans and programmes, the document calls for the development of early warning systems, sharing and dissemination of knowledge and technology, etc. *Ibid* at 42-43.

⁴⁸¹ Israel, Ministry of Environmental Protection, *Israel’s Second National Communication on Climate Change Submitted under the United Nations Framework Convention on Climate Change* (Jerusalem: Ministry of Environmental Protection, 2010) at 80.

⁴⁸² *Ibid*.

⁴⁸³ *Ibid* at 82.

⁴⁸⁴ *Ibid*.

Increasing sea surface temperatures are expected to spread invasive species.⁴⁸⁵ Israel has introduced measures to adapt to these impacts.⁴⁸⁶ Coastal management, as well as measures to adapt to climate change impacts, in the have evolved primarily through the land use planning system. Early initiatives include setting up of the Coastal Waters Committee under the 1965 Planning and Building Law, the establishment of inter-ministerial committees, creation of the Marine Pollution Prevention Fund, environmental impact assessment regulations under the 1982 Planning and Building Law, and preparation of the 1983 Mediterranean Coast Masterplan.⁴⁸⁷ In 2004, Israel promulgated the *Law for the Protection of the Coastal Environment*, which defines “coastal environment” as the area that extends 300 meters inland and seaward to the limit of the territorial waters, including natural and landscape resources, cultural assets, and antiquities.⁴⁸⁸ Essential features of this coastal law include prohibiting and reducing damage to the coastal environment;⁴⁸⁹ securing a public right of way over the entire length of the shore area;⁴⁹⁰ imposition of fees for coastal environment protection;⁴⁹¹ powers to remediate environmental damage;⁴⁹² and appointment of inspectors to supervise compliance.⁴⁹³ The Israeli coastal law offers very little to facilitate coastal climate change adaptation apart from its emphasis on reducing or prohibiting damage to the coastal environment. However, the Israeli model is an excellent example of how a coastal law can focus on protecting cultural heritage, in particular antiquities, in the coastal zone. In other parts of the world, particularly in South Asia, coastal areas house archeologically important monuments and other structures that are rarely protected (many archeological monuments and sites are under threat due to rising sea levels) despite these

⁴⁸⁵ *Ibid* at 84.

⁴⁸⁶ *Ibid* at 93.

⁴⁸⁷ See generally Valerie Brachya, “Integrated Coastal Management in Israel” in Biliana Cicin Sain, Igor Pavlin & Stefano Belfiore, eds, *Sustainable Coastal Management: A Transatlantic and Euro-Mediterranean Perspective* (Dordrecht: Kluwer Academic Publishers, 2002) 113; see also Stephen Fletcher, “The Evolution of Coastal Management Policy in the State of Israel” (2000) 24 Mar Pol’y 395 (ScienceDirect).

⁴⁸⁸ *Law for the Protection of the Coastal Environment Law 2004* (No 5764 of 2004, Israel), s 2.

⁴⁸⁹ *Ibid*, ss 3-4.

⁴⁹⁰ However, fencing is permissible if done in accordance with a plan or permit. *Ibid*, s 5.

⁴⁹¹ *Ibid*, s 6.

⁴⁹² *Ibid*, s 9.

⁴⁹³ *Ibid*, s 12.

countries being parties to the World Heritage Convention.⁴⁹⁴ The emphasis in Israeli law on cliff protection is also noteworthy as eroding wave and wind action can be expected to intensify due to SLR and other climate change processes. The South Asian coastal countries can benefit considerably from the Israeli experience on both these counts. It is important that coastal nations as part of their ICZM plans develop measures to protect their coastal heritage as well.

The small island state of **Barbados** is one of the world's most densely populated countries. As in other island states, the impacts of SLR that are of concern are coastal erosion, inundation, and saltwater intrusion into the coastal aquifers.⁴⁹⁵ Coastal erosion triggered interest in coastal management in the mid-1970s.⁴⁹⁶ The Barbados *Coastal Zone Management Act, 1998* (Barbados CZMA), provides for more effective management, conservation and enhancement of coastal resources. It calls for the development of a coastal zone management plan and delimitation of coastal zone management areas.⁴⁹⁷ Drafted under the authority of the Director of the Coastal Zone Management Unit, these measures are subject to public enquiry and revision prior to implementation. In cases where a person is aggrieved by the management plan, an appeal can be made to the Coastal Management Appeal Tribunal.⁴⁹⁸ The management plan is subject to review every five years,⁴⁹⁹ and all Authorities are to have regard to this plan while exercising functions under the coastal zone management related function.⁵⁰⁰ Section 8 of the Barbados CZMA requires that all authorities exercising any coastal related functions have regard for the coastal management plan. The Act also contains provisions for the preservation and enhancement of marine areas, and the Minister is empowered to protect

⁴⁹⁴ For instance, see Kem Lowry & HJM Wickremeratne, "Coastal Area Management in Sri Lanka" in EM Borgese, N Ginsburg & JR Morgan, eds, *Ocean Yearbook 7* (Chicago: The University of Chicago Press, 1988) 263 at 275.

⁴⁹⁵ Christine Wellington & Rawleston Moore, eds, *Barbados' First National Communications to the United Nations Framework Convention on Climate Change* (UNFCCC) (Barbados: Ministry of Physical Development Environment, 2001) at 26.

⁴⁹⁶ For more details, see Barbados, Coastal Zone Management Unit, *History of the Coastal Zone Management Unit and the Development of the Process of Integrated Coastal Zone Management in Barbados* online: CZMU, History <<http://www.coastal.gov.bb/>>.

⁴⁹⁷ *Coastal Zone Management Act 1998* (No 39 of 1998) part II.

⁴⁹⁸ *Ibid*, s 13(3).

⁴⁹⁹ *Ibid*, s 11.

⁵⁰⁰ *Ibid*, s 8.

marine areas.⁵⁰¹ In these restricted areas, underwater parks can be set up.⁵⁰² The Act includes measures for coral reef and beach protection; prohibits the use of explosives, poisons or noxious substances for harvesting coral or fish; prohibits the fouling of foreshore; and offers a scheme for offences and penalties.⁵⁰³ The primary weakness of the Barbados *Coastal Zone Management Act, 1998*, is that it is a very simple legislation, and may not suffice as a model for countries that have more complex systems of governance. Moreover, this coastal law does not provide any specific and direct measures for coastal climate change adaptation. However, its provisions for beach and coral reef protection indirectly contribute to the cause. Notable and relevant to coastal South Asia are also the provisions on public enquiry.

With a coastline of 5,746 kilometers, including more than 4,000 keys and islets and unique coastal biodiversity, SLR will also affect Cuba,⁵⁰⁴ and more frequent natural disasters like hurricanes.⁵⁰⁵ Decree-Law 212, “Coastal Zone Management,”⁵⁰⁶ (currently under review) establishes the boundaries of the coastal zone and the zone of protection on the basis of coastal typology⁵⁰⁷ and emphasizes “protection and sustainable use of the coastal zone” in accordance with ICZM principles.⁵⁰⁸ The Ministry of Science, Technology and Environment is the primary authority that administers the coastal law,⁵⁰⁹ the Ministry of Economics and Planning is responsible for the national land use policy and establishes the coastal zone boundaries and controls land use and urbanization in the

⁵⁰¹ *Ibid*, s 17.

⁵⁰² *Ibid*, ss 18 & 19.

⁵⁰³ *Ibid*, ss 22-29.

⁵⁰⁴ Nearly six per cent of the surface area of the main Island will be completely submerged and furthermore and out of a total of 245 coastal settlements, 87 will be partially or completely affected with 34 completely inundated, displacing about 18,500 persons. As well, 84 per cent of the total number of beaches (291) will also be affected. See generally Daniel Whittle & Daylin Muñoz-Nuñez, “Sea Level Rise Policies in Cuba” (PowerPoint presented to the International Conference on Sea Level Rise in the Gulf of Mexico, Corpus Christi, Texas, 1-3 March 2010).

⁵⁰⁵ *Ibid*. Cuba has in place an excellent system for disaster risk reduction and disaster management. In 2008, despite hurricanes Gustav, Ike and Paloma causing substantial damages to the tune of 10 billion dollars the death toll was only seven. Oxfam, *The Climate Changes, Threatens and Demands Adaptation: A Look at the Cuban Experience of Protection against Climate Change*, Oxfam Research Report (np, Oxfam International, 2010) at 14.

⁵⁰⁶ See generally *Decree-Law Number 212: Coastal Zone Management*, 8 August 2000 (Cuba).

⁵⁰⁷ See generally *ibid*, sections two & three.

⁵⁰⁸ *Ibid*, art 1.

⁵⁰⁹ *Ibid*, art 7; see also *Ibid*, art 8.

coastal zone.⁵¹⁰ The Decree secures the public the right to unrestricted use of the coastal zone for common purposes free of charge,⁵¹¹ envisages a special environmental regulatory regimen for keys and peninsulas, and establishes a system of land-based and marine signals prior to the execution of any construction project of activity that affects the coastal zone or the zone of protection.⁵¹² Article 15.1 states “[t]he coastal zone shall preferably remain unoccupied, authorization given only for the development or the execution of activities or facilities that due to their own nature do not allow any other location ...”⁵¹³ Article 16 prohibits certain activities in the coastal zone like extraction of aggregates and final disposal of solid and liquid wastes; the construction of new facilities is subject to certain conditions and permissions.⁵¹⁴ Further, protective works against SLR should not damage the coastal zone or affect beaches⁵¹⁵ or pollute the marine environment or alter the water flow.⁵¹⁶ Cuban coastal law recognises the dynamic nature of the coastal environment. Accordingly, boundary determination of the coastal zone is not static; it fluctuates and is determined with reference to the typology of the coastal feature (beaches, river mouths, cliffs, etc.). The law prescribes varying distances from each particular feature to fix the coastal boundary, for example, in the case of river mouths, the coastal zone extends 300 meters inland from the mouth of the river, and for coastal cliffs, only 20 meters inland from its summit not exceeded by tides or penetration by the sea.⁵¹⁷ As the sea level rises, coastal zones will move inland and baselines may also recede leading to a curious situation of the maritime zones of Cuba shrinking in size.⁵¹⁸ As it stands, the international law of the sea does not provide guidance on how to deal with these far-reaching changes in a nation’s maritime estate. Despite these issues, it is commendable that Barbados and Cuba, both small island developing states, despite

⁵¹⁰ *Ibid*, art 9.

⁵¹¹ *Ibid*, ch III.

⁵¹² *Ibid*, art 23.1-4.

⁵¹³ *Ibid*, art 15.2.

⁵¹⁴ *Ibid*, arts 16-17.

⁵¹⁵ *Ibid*, art 20(a).

⁵¹⁶ *Ibid*, art 20(c).

⁵¹⁷ *Decree-Law Number 1: Concerning the Breadth of the Territorial Sea of the Republic of Cuba*, 24 February 1977 (Cuba), art 4.

⁵¹⁸ Cuba uses a system of straight lines to link the outermost points of the coast, islands, islets, keys and drying reefs to determine the baseline. *Ibid*, art 2. For a discussion on rising sea levels, ambulating baselines and shrinking maritime territories, see also Ch 2, Part 2.3.

their comparatively poor land to coast ratio have dedicated coastal laws to predicate their coastal management efforts. The experiences of both these SIDS in relation to coastal law making and implementation offers lessons (in particular, the strategies in these coastal laws to deal with coral reef protection, SLR) to the small island developing state in South Asia, namely, the Maldives, and to the island nation of Sri Lanka.

With 50 per cent of its population settled along its 220 long kilometer coastline,⁵¹⁹ the coastal regions and the resources therein are crucial to the development of **Belize**. This coast is predominantly low-lying, increasing the vulnerability of coastal communities⁵²⁰ and the economy to SLR and other climate change impacts.⁵²¹ Tropical cyclones are hitting land with increasing frequency and their intensity in degree is expected to increase.⁵²² Rising sea surface temperatures have led to large-scale coral bleaching events, reducing the presence of commercial fish spawning aggregations.⁵²³ The Belize barrier reef reserve system, a renowned world heritage site, is under considerable stress from climate change, overfishing, unsustainable development practices, disease, and pollution.⁵²⁴ The 1999 *Coastal Zone Management Act*⁵²⁵ defines the coastal zone as “the area bounded by the shoreline up to the mean high-water mark on its landward side and by the outer limit of the territorial sea on its seaward side, including all coastal waters”⁵²⁶ and provides for the creation of a Belize Coastal Zone Management Authority (Belize CZMA).⁵²⁷ Key functions of this Authority are the preparation and review of the coastal zone management plan, guideline development, and advisory

⁵¹⁹ Belize, Ministry of Forestry, Fisheries, & Sustainable Development *Belize Integrated Coastal Zone Management Plan* (Coastal Zone Management Authority & Institute, 2013) at 119 [*Belize ICZM Plan*].

⁵²⁰ Belize, *Second National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change* (Belmopan, 2009) at 59.

⁵²¹ *Belize ICZM Plan*, *supra* note 519 at 118. Climate change is adversely affecting the economic prospects held out by coastal tourism. Snorkeling and diving and other activities will be impacted due to heat stress, erosion and declining reef health. *Ibid* at 118, 199.

⁵²² *Ibid* at 114.

⁵²³ *Ibid* at 118.

⁵²⁴ See generally Climate Justice, Petition to the World Heritage Committee Requesting Inclusion of Belize Barrier Reef Reserve System, in the List of World Heritage in Danger as a Result of Climate Change and for Protective Measures & Actions (15 November 2004), online: Climate Justice, Belize, UNESCO cases <<http://www.climatelaw.org/cases/country>>.

⁵²⁵ *Coastal Zone Management Act*, (Belize), No 5 of 1998.

⁵²⁶ *Ibid*, s 2.

⁵²⁷ *Ibid*, s 3.

functions.⁵²⁸ The law created the Coastal Zone Management Institute, which supports the University of Belize in developing educational programmes on coastal zone management.⁵²⁹ The 2013 Integrated Coastal Zone Management Plan, the heart of the Act,⁵³⁰ was developed through incremental steps, beginning with a strategy outlining over-arching national objectives. The Plan envisions a “sustainable future where healthy ecosystems support and is supported by thriving local communities and a vibrant economy.”⁵³¹ Coastal climate change adaptation is an essential component of the plan. Climate change adaptation measures are to be included in strategic management plans by all sectors and it is encouraged through inter-agency cooperation, public awareness campaigns, and developing the capacity of the Belize CZMA and the Institute.⁵³² The experience from Belize reveals that developing an ICZM plan is no easy task with a hiatus of almost 15 years before the plan was released. The Belize coastal law has several interesting features, the most important being the linkage between the coastal law and the ICZM plan, which has coastal climate change adaptation as a prime area of focus. More importantly, for coastal South Asia, the emphasis on developing capacity ordained by the coastal law of Belize, including academic university level educational programmes on coastal management will be an important pathway for capacity building and to spread the message of coastal management and conservation.

Presently, the sovereign state of the **United Kingdom** comprises four countries, namely, England, Scotland, Wales and Northern Ireland. Since 1991, powers have been devolved to Scotland, Wales and Northern Ireland, and significant strides have been made in decentralizing power to local governments.⁵³³ In addition, the overarching frame of the European Union also has a perceptible impact on the evolving constitutionalism in this country. These constitutional changes, has significantly diluted the unitary character of United Kingdom even though it is not quite federal and these have impacted ICZM implementation in the United Kingdom. Adoption of the EU Recommendation on Integrated Coastal Zone Management in 2002 popularized ICZM efforts in the UK,

⁵²⁸ *Ibid*, s 5.

⁵²⁹ *Ibid*, s 10(c).

⁵³⁰ *Ibid*, s 23.

⁵³¹ *Belize ICZM Plan*, *supra* note 519 at 134.

⁵³² *Ibid* at 120.

⁵³³ For instance, see generally *Localism Act 2011* (UK), c 20.

especially the requirement that member states develop national strategies and report on progress to the European Commission by 2006.⁵³⁴ Since then ICZM efforts have matured and each of the four constituent countries have tailored solutions to deal with problems in their coastal zones.⁵³⁵ One ICZM initiative has been the development of “A strategy for promoting an integrated approach to the management of coastal areas in England,”⁵³⁶ which seeks to integrate coastal policies and provide a clear strategic direction to coastal managers. The enactment of the *Marine and Coastal Access Act, 2009*,⁵³⁷ which indirectly supports ICZM and climate change adaptation in the marine area is one of the most important legal developments in this regard. This Act provides for the preparation of the marine policy statement and marine plans,⁵³⁸ marine licensing,⁵³⁹ designation of marine conservation zones and networks,⁵⁴⁰ and coastal access.⁵⁴¹ The provisions on marine nature conservation and fisheries help to ensure that marine ecosystems are resilient to climate change impacts and the focus on developing renewable energy projects enhances mitigation of climate change effects.⁵⁴² A plethora of other legislation supports coastal climate change adaptation including the *Climate Change Act, 2008*,⁵⁴³ which calls upon the Secretary of State to develop programmes on climate change

⁵³⁴ EC, *Recommendation of the European Parliament and of the Council of 30 May 2002 Concerning the Implementation of Integrated Coastal Zone Management in Europe*, (2002/413/EC) [2002] OJ L 148/24, ch VI.

⁵³⁵ See the Welsh Gov't, *Making the Most of Wales' Coast: The Integrated Coastal Zone Management Strategy for Wales* (2007), online: Welsh Government <<http://wales.gov.uk/?lang=en>>; UK, Dep't of the Env't, Northern Ireland, *Marine Bill*, online: DOENI, As Introduced, <<http://www.doeni.gov.uk/>>; *Marine (Scotland) Act*, ASP 2010, c 5.

⁵³⁶ See generally UK, DEFRA, *A Strategy for Promoting An Integrated Approach to the Management of Coastal Areas in England* (London: Dep't for Environment, Food & Rural Affairs, 2008). (UK), c 23.

⁵³⁸ See generally *ibid*. The UK marine area has been divided into several marine-planning regions (s 49) and for most of these regions there is provision for a marine plan authority (s 50), who prepares marine plans (s 51). Basically, a marine plan details the authority's policies for the sustainable development of the area (s 51(3)(b)).

⁵³⁹ *Ibid*, part 4.

⁵⁴⁰ *Ibid*, ss 116, 123.

⁵⁴¹ Ensuring coastal access is a critical feature of this law. It contemplates a route (the English coastal route) for the whole of the English coast along which the public can make recreational journey on foot or by ferry. In addition, a margin of land along the length of the English coast has to be made accessible to the public, which they can enjoy in conjunction with the English coastal route. *Ibid*, s 296.

⁵⁴² *Ibid*, parts 5-7.

⁵⁴³ See generally *Climate Change Act 2008* (UK).

adaptation.⁵⁴⁴ With the completion of a UK Climate Change Risk Assessment,⁵⁴⁵ a national adaptation programme is presently under development.⁵⁴⁶ Other unique UK coastal climate change adaptation measures include a flood management programme and coastal erosion risk management strategy under the *Flood and Water Management Act, 2010*.⁵⁴⁷ The Strategy calls for the development of shoreline management plans.⁵⁴⁸ To date twenty-two plans have been developed that incorporate SLR projections and long-term plans for coastal defences.⁵⁴⁹ In areas where it is unviable to build community protection, individual property owners can protect their homes by utilising “property-level protection.”⁵⁵⁰ The UK has adopted a comprehensive approach to ICZM implementation via the *Marine and Coastal Access Act, 2009*. Even though it does not deal directly with ICZM, it envisages the holistic and integrated management of the UK coast through novel legislative tools like marine spatial plans and creation of networks of marine protected areas. This law also indirectly addresses coastal climate change adaptation. Even though the potential for ICZM to manage coastal climate change adaptation has not been fully realized, flood management in the coastal zone is an option that is worthy of exploration by other coastal states, and in coastal South Asia, this is particularly useful for a country like Bangladesh which finds large parts of its landmass submerged under the water, almost every year.

7.3.5.1 Discussion

⁵⁴⁴ *Ibid*, s 58.

⁵⁴⁵ See generally DEFRA, *UK Climate Change Risk Assessment: Government Report* (Norwich: The Stationery Office, 2012).

⁵⁴⁶ For more details, see *National Adaptation Programme*, online: GOV.UK, Climate Change, Adapting to Climate Change, Detail: National Adaptation Programme <<https://www.gov.uk/government/policies>>.

⁵⁴⁷ (UK), c 29, s 7(1). The Environment Agency must report to the minister about flood and coastal erosion risk management. *Ibid*, s 18(1); see also UK, DEFRA & EA, “Understanding the Risks, Empowering Communities, Building Resilience: The National Flood and Coastal Erosion Risk Management Strategy for England Presented to Parliament pursuant to Section 7 of the Flood and Water Management Act 2010” (np, 2011).

⁵⁴⁸ UK, DEFRA, *Adapting to Coastal Change: Developing a Policy Framework* (London: Dep’t for Environment, Food & Rural Affairs, 2010) at 11.

⁵⁴⁹ UK, Houses of Parliament, “Sea Level Rise”, Post Note, No 363 (2010) at 4. For an overview of the different shoreline management plans, see *Shoreline Management Plans - the second generation (SMPs)*, online: Environment Agency, Research, Planning <<http://www.environment-agency.gov.uk/>>.

⁵⁵⁰ See generally Environment Agency, *Prepare your property for flooding*, online: Environment Agency, Home and Leisure, Floods <<http://www.environment-agency.gov.uk/>>.

From the above *tour d'horizon* on the legislative experiences on coastal zone management, it is amply clear that states differ in their legislative approaches to ICZM and coastal climate change adaptation. While some of these coastal laws are mundane in nature, couched with a high degree of generality, others are more detailed legal codes that offer comprehensive guidance for coastal zone management. Several problems, the least of which relates to the lack of compatibility to respond to new challenges, persist in these approaches. In fact, many of the laws discussed here are outdated and do not reflect current realities.⁵⁵¹

While some specifically deal with SLR and coastal climate change adaptation, others are more indirect. And from the perspective of ICZM implementation, both federal and unitary states exhibit certain difficulties in implementing ICZM. As seen, in federal states due to the split jurisdiction over the land-sea continuum federal states generally find themselves jurisdictionally handicapped in implementing land-sea integration.⁵⁵² While this may not be an issue in unitary states, here the primary difficulty is centralization of authority (this is also a problem in some of the federal states). Apart from New Zealand and the UK, the decentralization dimension of ICZM is weak in the unitary coastal states studied here. Even in small states there can be diversity of coastal ecosystems, geographical features, development and urbanisation levels, and coastal community interests, and coastal resource uses that would benefit from decentralized management. While there is merit in developing a unified approach on how the coastline is to be managed, coastal diversity must be respected. Accordingly, there should be provision for a national framework in unitary states that sets out broad national objectives under which there can be minor plans for local areas and regions. Public participation and

⁵⁵¹ It must be pointed out that while the ICZM plans are more dynamic and reflect current realities, if the ICZM plan is based on a law, then it can go only thus far as is provided for by the coastal law and no further. Therefore it is necessary for the coastal law also to be reflective of new developments and changes.

⁵⁵² As seen, generally, provinces have jurisdiction over the dry side of the coastal zone and the national government has jurisdiction over the wet side. This bifurcation of powers can render integration difficult to achieve. For instance, under Canadian law, it is the federal government that has primary jurisdiction over the oceans, while it is the provinces that have more landward jurisdiction, effectuated primarily through their powers over property and civil rights. Potentially, there is room for conflict. However in line with the spirit of “cooperative federalism”, the Federal Government has entered into memorandum of understanding (MoU) to promote ICZM with British Columbia and Nova Scotia. Similar arrangements with other provinces are expected to follow. See also Chircop & O’Leary, *supra* note 448.

involvement of local communities is *sine qua non* for the success of ICZM programmes and for augmenting adaptive capacities. Coastal laws, irrespective of unitary or federal character must work to ensure public participation, stakeholder involvement and decentralize coastal management. This is necessary because advocating public participation, and stakeholder involvement for coastal zone management without ensuring concomitant decentralization of powers defeats the very intent of this exercise.

Again the various case studies of the coastal countries identified in the previous and present chapters, reveal that while there can be a sophisticated array of legislative instruments to work coastal management, certain legislative approaches to ICZM are discernable. These are: 1) a national legislative approach to coastal zone management, which can be sub-classified into three – a unified national legislation and usually a single ICZM plan based on that legislation for the whole country,⁵⁵³ a more co-operative approach where the federal and provincial governments legislate on coastal management and where the provinces pattern their coastal law on the national legislation,⁵⁵⁴ where the states/provinces have enacted coastal legislations and the national government assumes a more active⁵⁵⁵ or passive role;⁵⁵⁶ 2) where ICZM is part of a more comprehensive scheme for natural resources management;⁵⁵⁷ 3) where the coastal law is geared primarily towards land use planning/zoning;⁵⁵⁸ 4) where the accent is more on resources utilization;⁵⁵⁹ 5) where the emphasis is towards a people oriented approach to coastal management and decentralization of coastal governance.⁵⁶⁰ However, these are not exhaustive of all models and it may be practically impossible to pigeonhole the different legislative approaches due to the diversity of issues that a coastal law deals with.

⁵⁵³ As seen this is usually the case in unitary systems like Sri Lanka, New Zealand, Barbados. Despite being a federation, India and South Africa also have unified coastal laws.

⁵⁵⁴ See Part 7.3.1.1, above, for more on the cooperative approach as followed in the US.

⁵⁵⁵ For instance, in Australia, the Commonwealth has developed guidelines on ICZM implementation to work a unified vision. See Part 7.3.2, above.

⁵⁵⁶ For instance, in Pakistan, the states of Sindh and Balochistan have enacted their own coastal laws and role of the federal government is more passive. For more details, see Ch, 3, Part 3.2.2.

⁵⁵⁷ For instance, the sustainable development oriented approach is evident in the NZRMA. The United Kingdom *Marine and Coastal Access Act, 2009*, reflects marine spatial planning approach.

⁵⁵⁸ For instance, see generally *Coastal Regulation Zone Notification* (N, SO19(E), 2011, India).

⁵⁵⁹ *Coast Conservation Act 1981* (No 57 of 1981, Sri Lanka), as amended by *Coast Conservation (Amendment) Act 1988* (No 64 of 1988, Sri Lanka) and *Coast Conservation (Amendment) Act 2011* (No 49 of 2011, Sri Lanka).

⁵⁶⁰ See the experiences of South Africa and New Zealand above, for more on this point.

Nevertheless, the coastal laws examined above and in the previous chapters exhibit certain definite defining features, captured by the table below.

Table 2: Selected Coastal Laws and Their Defining Features

Coastal Law	Defining Features
<p><i>Australia</i></p> <p><i>Queensland Coastal Protection and Management Act, 1995</i></p> <p><i>New South Wales Coastal Protection Act, 1979</i></p>	<p>Framework for a National Cooperative Approach to Integrated Coastal Zone Management, 2003</p> <p>Regard to aboriginal traditions & island customs in preparing coastal plan; Protecting life & property from coastal hazards; Climate change to be considered in preparing the state coastal management plan; Constitution of coastal management districts; Queensland Coastal Plan 2012</p> <p>Preparation of coastal zone management plans; Risk management from coastal hazards and climate change impacts; Temporary coastal protection works</p>
<p><i>Barbados Coastal Zone Management Act, 1998</i></p>	<p>Coastal zone management plan, Coral reef & beach protection, Prevents fouling of foreshore</p>
<p><i>Belize Coastal Zone Management Act, 2000</i></p>	<p>Establishment of Coastal Zone Management Institute to carry out research & support academic programmes on coastal management</p>
<p><i>Canada Oceans Act, 1996</i></p>	<p>Integrated approach on oceans management; Network of marine protected areas; Oceans strategy; Nested approach</p>
<p><i>Cuba Decree-Law Number 212-2000</i></p>	<p>Public access; Variable definition to the coastal zone; Environmental regulatory regimen for keys & peninsulas; Protective works against SLR not to damage the coastal zone</p>
<p><i>EU Recommendation on ICZM, 2002</i></p> <p><i>European Union Directive of the European Parliament and of the Council Establishing a Framework for Maritime Spatial Planning and</i></p>	<p>Eight ICZM principles, National stocktaking & development of national strategies</p> <p>Linking marine spatial planning with ICZM; Integrated coastal management</p>

<i>Integrated Coastal Management, 2013 (proposed)</i>	strategies to account for mitigation & adaptation to climate change; Public participation; Cooperation with member states & other countries
Coastal Law	Defining Features
<i>India Coastal Regulation Zone Notification, 2011</i>	Zoning; Marine pollution control, Public access; Critically vulnerable coastal areas; Hazard Lines
<i>Israel Law for the Protection of the Coastal Environment, 2004</i>	Protection to antiquities; Cliff protection
<i>Kenya</i> <i>Coast Development Authority Act, 1990</i> <i>Environmental Management and Co-ordination Act, 1999</i>	Coast Development Authority Survey & an integrated national coastal zone management plan (ICZM Action Plan for the period 2011–2015)
<i>Mediterranean Protocol on ICZM, 2008</i>	Island management; Setback lines, no-construction zones; Public participation; Transboundary envtl. Assessments; Development & implementation of a common regional ICZM framework
<i>New Zealand Resource Management Act, 1991</i>	Sustainable management; Controls on incineration & dumping & on noise; Climate change mitigation; Restrictions on the use of the coastal marine area; Provision for Coastal Policy Statement, & regional coastal plans
<i>Pakistan</i> <i>Sindh Coastal Development Authority Act, 1994</i> <i>Balochistan Coastal Development Authority Act, 1998</i>	Preparation of Master Plan; Acquisition of property Balochistan Coastal Development Authority; the Chief Minister of the Province plays an imp. role; Applies to 30 kms. inland from the tide line
<i>South Africa National Environmental Management: Integrated Coastal Management Act, 2008</i>	Sustainable coastal development; Public access; Marine pollution; Zoning overlay; Setback lines; Decentralised coastal management; Estuarine management

Coastal Law	Defining Features
<p><i>Sri Lanka Coast Conservation and Coastal Resource Management Act 1981 (as amended in 2011)</i></p>	<p>Coastal zone vests in the Republic; Permit system; New tools like Coastal access plan,</p> <p>Affected areas, Beach park, Special management areas, prohibition on coral mining & filling up of land & water bodies; Spatial integration</p>
<p><i>United Kingdom Marine and Coastal Access Act, 2009</i></p>	<p>Marine policy statement & marine plans; Marine licensing, Marine conservation zones & networks, & Coastal access</p>
<p><i>United States Coastal Zone Management Act, 1972</i></p>	<p>Cooperative coastal federalism; Federal consistency; Coastal zone management programs</p>
<p><i>California Coastal Act, 1976</i></p>	<p>Decentralized format; Local coastal programmes; Protection of the marine environment; Hard armoring in certain cases</p>
<p><i>Texas (Coastal Coordination Act 1991 Dune Protection Act, Open Beaches Act, and Coastal Erosion Planning and Response Act, 1999)</i></p>	<p>Several legislations on coastal management; Rolling easements; Texas Coastal Management Program; Dune Protection; Public Access</p>

Another point in our discussions is that there is a persistent large disjoint between the different national approaches in applying ICZM principles and also in the degree to which ICZM and coastal climate change adaptation has been set in terms of coastal legislation. This chapter and the previous ones clearly reveal that nations have their own understanding of what coastal zone management and coastal climate change adaptation are, depending on their needs and development imperatives. Accordingly, there can be a pluralism of approaches in legislating ICZM (to include coastal climate change

adaptation) despite the danger that, in certain cases, these national approaches need not necessarily reflect ICZM objectives in their true sense.⁵⁶¹ In short, the diversity of national situations renders it hard to effectuate legal transplants and cross pollination of some of the legislative models (examined in this chapter) on ICZM implementation into South Asia or into other regions as well. What this implies is that while there is a core set of principles and elements that represent the skeletal frame of an ICZM-friendly coastal law (also promotive of coastal climate change adaptation) that can be applied across the board irrespective of jurisdictional differences, the various national approaches adopted by these countries cannot necessarily be the subject of a legal transplant. In other words, in giving effect to these principles/elements (to be identified in the next part for the coastal South Asian nations), states in their own coastal legislations will have to temper them depending on their national context.

7.4 CONCLUSION

In sum, two points clearly emerge from the above analysis. The first is that even though we have countless conventions and soft-law instruments that underscore the importance of ICZM, these conventional instruments are confined primarily to the realm of soft law to engender and promote an integrated approach to coastal zone management. The diktats in these soft-law instruments are primarily exhortative in nature and may not be adequate to compel nations to move in the direction of sustainable coastal development through ICZM. Since ICZM is dynamic and highly contextual, there are no off-the-rack legal models that can be applied across the board and furthermore, there is no specific ICZM template that provides direction to coastal states. While this increases the need for an international instrument that identifies basic principles of ICZM law setting out a template that helps to harmonize coastal climate change adaptation with an ICZM process, an exclusive international instrument on ICZM seems far-fetched for the moment, which increases the relevancy of national and even regional level approaches on ICZM.

⁵⁶¹ Even though Sri Lanka has a pioneering coastal legislation, the fact that it does very little to further decentralization considerably waters down its effectiveness as an ICZM law. For more details on this topic, see Ch 3, Part 3.2.4.

Second, from these different legislative reports, it is clear that laws and legislative frameworks play an important role in promoting and facilitating ICZM implementation and CCCA and that there is untapped potential for law to leverage ICZM and coastal CCCA. Optimally, a coastal law emerges as a potential antidote against unsustainable coastal development and protects resiliency of coastal ecosystems. Accordingly, mooring an ICZM process onto a dedicated legal framework, particularly in the South Asian context, makes preeminently good sense as it can help to rectify the dystopian management scenario that characterizes the South Asian coastline at present. While some of these case studies broadly suggest how South Asian countries should move forward in utilizing legal instruments, others offer practical methods for coastal states that are looking for ways to protect coastal resources before they are lost forever to the rising seas. These national reports will be relied upon in the subsequent chapters, to progressively build the elements of a regional regime on ICZM implementation in coastal South Asia, one that implements CCCA via the ICZM methodology. And it must be noted that the intention is not to effectuate legal transplants (emphasised earlier), but rather, based on this survey and synthesis, a common vocabulary and certain legal principles central to ICZM implementation and CCCA will be distilled, to initiate coastal law reform at a regional level in South Asia.

8.1 INTRODUCTION

In several of the earlier ICZM initiatives, the importance of law and legal frameworks were not appreciated and the propping up of ICZM was left to technocrats, resource managers, scientists, and so on, who believed that ICZM was more of a scientific or a management tool.¹ While science and management are definitely two core pillars of an ICZM programme, there is a third one as well – law.² Consequently, even in cases where the most brilliant coastal management programmes and plans were produced, non-recognition of the legal dimension has hampered progress.³

The primary objective of this chapter is to explain the role of law in operationalising ICZM and CCCA. Divided into three sections, section 8.2, which appears next, offers a theoretical rationale for law and dedicated coastal law statutes in supporting the management of coastal areas and resources. In achieving this objective, reference will be made among others, to Garrett Hardin's tragedy of the commons and Elinor Ostrom's polycentrism to articulate the centrality of law in coastal management. Utilising the discussions in this and in the preceding chapter, in section 8.3, a Strength, Weakness, Opportunity and Threats (SWOT) analysis is carried out to assess the prospect of implementing ICZM and in securing the more important objective of coastal climate change adaptation for sustainable coastal development through the instrumentality of law. Section 8.4 analyzes some of the trends in coastal law-making and will assess the prospects of the future of coastal law-making. The study concludes by reiterating the importance of a dedicated legal instrument to support ICZM implementation and CCCA.

¹ Robert Beckman & Brady Coleman, "Integrated Coastal Management: The Role of Law and Lawyers" (1999) 14:4 Int'l J Mar & Coast L 491 (HeinOnline).

² See generally Cormac Cullinan, *Integrated Coastal Management Law: Establishing and Strengthening National Legal Frameworks for Integrated Coastal Management*, FAO Legislative Study, No 93 (Rome: FAO, 2006).

³ A classical example is the situation of Bangladesh. For more details, see Ch 3, Part 3.2.3.

8.2 UNDERSTANDING A THEORETICAL BASIS OF LAW FOR COASTAL ZONE MANAGEMENT

In articulating a theoretical foundation to underscore the importance of law for coastal commons management, particularly from a coastal South Asian perspective, this section draws support from one of the most influential academic writings on common property resources (*res communis*) management -- Garrett Hardin's, the tragedy of the commons. To a certain extent, it will also rely on welfarist theories to justify a legal frame and it examines the need for a coastal law from the perspective of sustainable coastal development and good coastal governance.

Though traceable to Aristotle's observation that whatever "is common to the greatest number has the least care bestowed on it," where "[e]veryone thinks chiefly of his own, hardly at all of the common interest,"⁴ Hardin's thesis revolutionized ideas relating to common property resources management. He believed that individuals acting in self-interest in seeking to maximize profits emanating from the maximum use of a common resource would destroy collective wealth, since they have no incentive to conserve and protect the resource.⁵ The tragedy of the commons envisages a situation that teaches us that individuals in their self-interest will consume, deplete and degrade a common resource that belongs to all, right up to the point of its disintegration. In other words, all share the cost of the exploitative actions of the appropriator who indulges in over-exploitation to the detriment of others. In the process, externalities are imposed upon each other while the benefit goes entirely to the appropriator.⁶ Hardin's commons fable has been applied to explain the degradation of a wide variety of common property resources such as fish,⁷ forest,⁸ water resources,⁹ and even to spectrum¹⁰ and knowledge¹¹ – resources that are used by all yet which no-one can truly claim as his or her own.

⁴ Aristotle, *Politics*, HWC, Davis, ed, translated by Benjamin Jowett (New York: Cosimo Classics, 2008) at 57.

⁵ Shi-Ling Hsu, "What is a Tragedy of the Commons? Overfishing and the Campaign Spending Problem" (2005) 69 *Alb L Rev* 75 at 78-79 (QL).

⁶ *Ibid* at 77.

⁷ *Ibid*.

⁸ See generally Kirsten Westerland, "Nepal's Community Forestry Program: Another Example of the Tragedy of the Commons or a Realistic Means of Balancing Indigenous Needs with Forestry Conservation" (2007) 18 *Colo J Int'l Envtl L & Pol'y* 189 (HeinOnline).

Hardin illustrates the tragedy by forwarding a pastoral setting of cattle grazing. To draw maximum advantage of the free-grazing opportunity, cattle owners have an incentive to increase the size of their herds.¹² At some point, the aggregate effect of such individual decisions is that the grazing will exceed the capacity of the commons and degradation will set in.¹³ By continuing to increase the number of animals which graze on the commons, the benefit derived from the grass eaten by each additional animal goes entirely to the animal's owner (the appropriator), but the 'externalized costs' (or, to put it simply, 'the burden' which ensues) will be shared by all persons who use the commons.¹⁴ Thus, allowing people unlimited use of common resources can lead to imminent degradation and destruction of the resource. To quote Hardin:

Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit -- in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all.¹⁵

Experiences with natural resources management, particularly in South Asia, have borne out Hardin's theory.¹⁶ If natural resources are held in common, costs and benefits get externalized, leading to wastage.¹⁷ Hardin does not believe that such a tragedy can be avoided solely through the efforts of a few conscientious and responsible citizens; thus, to avert and overcome the depletion of the commons, Hardin advocates the need to put in

⁹ Tony George Puthucherril, "Riparianism in Indian Water Jurisprudence" in Ramaswamy R Iyer, *Water and the Laws in India* (New Delhi: SAGE Publications Pvt Ltd, 2009) 97 at 116.

¹⁰ See generally Philip J Weiser & Dale N Hatfield, "Policing the Spectrum Commons" (2005) 74 *Fordham L Rev* 663 (HeinOnline).

¹¹ For more details, see generally Charlotte Hess & Elinor Ostrom, eds, *Understanding Knowledge as a Commons: From Theory to Practice* (Cambridge: MIT, 2007).

¹² Garrett Hardin, "The Tragedy of the Commons" (1968) 162:3859 *Sci* 1243 at 1244 (JSTOR).

¹³ *Ibid.*

¹⁴ *Ibid.*

¹⁵ *Ibid.*

¹⁶ Tony George Puthucherril & Lekshmi Vijayabalan, "The Law and Practice on Ground Water Conservation and Management – A Case Study with Specific Reference to the State of Kerala" (Paper delivered at the National Workshop on Water Quality Management and Conservation: Role of the Legal System, National Law School of India University, Bangalore, 16 August 2002) [unpublished]. For more details on the over-exploitation of groundwater commons, see also Ch 2, Part 2.5.1.

¹⁷ Richard J Pierce, "State Regulation of Natural Gas in a Federally Deregulated Market: The Tragedy of the Commons Revisited" (1987) 73 *Cornell L Rev* 15 at 16 (QL).

place coercive laws and taxing devices to ensure protection of common property.¹⁸ To quote, “if ruin is to be avoided in a crowded world, people must be responsive to a coercive force outside their individual psyches, a ‘Leviathan,’ to use Hobbes’s term.”¹⁹ In fact, Hardin offered two options to correct the tragedy -- privatization or government intervention.²⁰ The underlying idea behind his argument is that open access need not necessarily result in overexploitation and degradation; rather, it is only when measures are not put in place to regulate access that overexploitation sets in. In other words, unregulated open access is a potential factor that may lead to resource exploitation and abuse. Accordingly, it has been suggested that a more appropriate euphemism for Hardin’s thesis is the “tragedy of a mismanaged commons.”²¹

While law has traditionally been vigorous in affording protection to secure bodily integrity and private property rights, it has been slow in securing the commons. Nevertheless, government regulation through the instrumentality of law (*Leviathan* as a possible way) is an important pathway to prevent the tragedy of rapacious exploitation and degradation of the common pool.²² Law is an essential tool to regulate human activities, to prevent competition, free-riding, over-harvesting and ultimately the degradation of the commons. This is the rationale behind the enactment of wildlife protection laws, forest conservation laws, fisheries legislations, water laws, etc. and coastal law is no exception to this.

¹⁸ Kirsten Westerland, “Nepal’s Community Forestry Program: Another Example of the Tragedy of the Commons or a Realistic Means of Balancing Indigenous Needs with Forestry Conservation?”, Note & Comment, (2007) 18 Colo J Int’l Envtl L & Pol’y 189 at 195 (QL).

¹⁹ G Hardin, “Political Requirements for Preserving our Common Heritage” in HP Brokaw, ed, *Wildlife and America: Contributions to an Understanding of American Wildlife and its Conservation* (Washington DC: Council on Environmental Quality, 1978) 310.

²⁰ Charlotte Hess & Elinor Ostrom, “Introduction: An Overview of the Knowledge Commons” in Charlotte Hess & Elinor Ostrom, eds, *Understanding Knowledge as a Commons: From Theory to Practice* (Cambridge: MIT, 2007) 3 at 11 [Hess & Ostrom, “Introduction”].

²¹ Bonnie J McCay, *Oyster Wars and the Public Trust: Property, Law, and Ecology in New Jersey History* (Tucson: University of Arizona Press, 1998) at 189.

²² See Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action*, Political Economy of Institutions and Decisions (New York: Cambridge University Press, 1990) at 8-9 (providing an overview of opinions by different authors on the need for greater government control on natural resource systems); see also Amy Sinden, “The Tragedy of the Commons and the Myth of a Private Property Solution” (2007) 78 U Colo L Rev 533 at 553 (HeinOnline).

Apart from legal regulation of the commons, Hardin also advocated privatization of common property as a tool to overcome the tragedy.²³ It has been suggested “the only way to avoid the tragedy of the commons in natural resources and wildlife is to end the common-property system by creating a system of private property rights.”²⁴ However, privatization of common property resources is not akin to privatizing a utility like a state-owned airline company, for such a step can accentuate economic and social inequities and throw life out of gear for millions particularly, in South Asia. Already the coastal communities in this region are struggling to ensure that they continue to enjoy public access to coastal spaces.²⁵ As well, to ensure sustainable coastal development, it is necessary that the commons, which in many countries is increasingly passing on to private hands, be managed in a manner that furthers “the greatest happiness of the greatest number.”²⁶

While benefit-maximization lies at the heart of the utilitarian principle, and despite being a theory of welfare, there is an element of injustice implicit, particularly in the context of distribution of scarce resources. Between two claimants for a resource, utilitarianism informs us to prefer the one who stands to draw maximum benefit from the

²³ This seems to be the pattern for coastal development in the province of Nova Scotia in Canada, where private owners own nearly 80 per cent of the coast. Nova Scotia, *Coastal Development: The 2009 State of Nova Scotia's Coast Report*, online: Nova Scotia Canada <http://www.gov.ns.ca/coast/documents/state-of-the-coast/WEB_CD.pdf>.

²⁴ Ostrom, *supra* note 22 at 12 (quoting Robert J Smith who states that the only way to avoid the tragedy of the commons in natural resources is to create private property rights).

²⁵ *Ibid* at 22. In India, since time immemorial, common lands have inhered in village communities. Known by different names like *grama sabha* land, *gram panchayat* land, *poramboke* land, etc. these public utility lands were used for the common benefit of the villagers for centuries. Even when states passed legislations that expressly vested such lands in the state, the implied understanding was that this did not *per se* divest the common rights of villagers over the land. This was the legal position for long and subsequently states through local laws handed over the management of these lands to the *gram sabhas/gram panchayats*. These lands are generally treated as inalienable to preserve their status as community land. However, in exceptional cases, the *gram sabhas/gram panchayats* could lease these lands to landless labourers and to the members of scheduled castes and scheduled tribes. However, in large parts of the country common village lands are being grabbed by unscrupulous elements and in many cases it is done with the active connivance of the state. In many states there is not an inch of land left for the common use of village communities, even though the same may exist on paper. *Jagpal Singh v Punjab*, (2011) [2011] (11) SCC 396 (India SC). In this case the order of the collector and the *gram panchayat* who illegally regularized unauthorized constructions on a village pond that was forcefully occupied by unscrupulous elements was set aside. *Ibid*.

²⁶ Jeremy Bentham, JH Burns & HLA Hart, *A Fragment on Government* (Cambridge: Cambridge University Press, 1988) at xiv.

resource.²⁷ It is in this context that we have to approach egalitarian welfarist theories, which give “absolute priority ... to improving the welfare of someone who is worse off, as opposed to improving the welfare of someone who is better off.”²⁸ Here, “prioritarianism,” which seeks to mix the benefit-maximizing principle of utilitarianism with the equalizing principle of welfare egalitarianism, assumes relevance.²⁹ In seeking to secure “prioritarianism,” legal intervention in the form of a coastal law may be necessary to iron out inequitable creases to ensure maximization of benefits, giving equal weight to the welfare of all, particularly to the welfare of impoverished coastal communities. Coastal law exists for the promotion of the common good of the coastal community and therefore has the trappings of social welfare legislation as well.

In contrast to what was advocated by Hardin, Elinor Ostrom, a leading scholar on common property resources, contends that individuals naturally organize themselves on the basis of internally agreed-upon rules.³⁰ In so doing, they resolve common-pool resource problems without the dominance of a central government or reliance on private property rights to ensure sustainable management of resources.³¹ Based on this premise, Ostrom advocated a third solution to ensure the sustainable utilization of commonly held resources without degrading them – management by the community, or “polycentrism.”³²

²⁷ Mark S Stein, “Nussbaum: A Utilitarian Critique” (2009) 50:2 BCL Rev 489 at 490, 493 (HeinOnline) (referring to utilitarianism as the unweighted maximization principle); see also Selene Brett, “Rawls Theory of Justice and His Criticism of Utilitarianism” (1994) UCL Jurisprudence Rev 59 at 65-66 (HeinOnline).

²⁸ Stein, *ibid* at 492.

²⁹ *Ibid* at 493.

³⁰ Elinor Ostrom, Roy Gardner & James Walker, *Rules, Games, & Common-Pool Resources* (US: University of Michigan Press, 1994) at 5.

³¹ *Ibid*.

³² See Escotet Foundation, *Interview with Nobel Laureate Elinor Ostrom*, online: ESCOTET FOUNDATION, Blog, Foundation News <<http://escotet.org/>>. It is

the idea that there should be multiple centers of management authority for resources because the rule-sets for different governance systems (say, the federal government, local government, and participatory commons) can each play important, differentiated roles. In a polycentric system, the principle of *subsidiarity* holds that governance should occur at the lowest, most decentralized level possible in order to be locally adaptive; one-size-fits-all governance structures tend to be less effective, less flexible, and more coercive.

David Bollier, “The Future of International Environmental Law: A Law of the Ecological Commons?” in Jonathan C Carlson, Geoffrey WR Palmer & Burns H Weston, eds, *International Environment Law and World Order: A Problem-Oriented Coursebook* 3d ed (Minnesota: West

By utilizing the “institutional analysis and development framework,”³³ she identified eight design principles that underlined successful commons self-governance, namely: 1) a clearly demarcated CPR; 2) the necessity for congruence between governance structure and attendant rules with local needs and conditions; 3) the participation of most resource appropriators in decisions made through collective-choice arrangements; 4) a system for self-monitoring the behavior of members; 5) punishment of violations with graduated sanctions; 6) low-cost and easy-to-access conflict resolution mechanisms to address issues; 7) the acknowledgement by external authorities of resource appropriators’ right to self-govern; and 8) the organization and enforcement of rules through multiple layers of nested enterprises in the case of larger common-pool resources.³⁴

Prior to colonization, most non-Western societies, like those in South Asia, were grounded on the concept of communal rather than individualistic rights, and activities were regulated primarily by informal rather than the formal laws and diktats (non-state law). Religion, customs, usages, traditions, and kinship played an important role in determining the tenor of common property management.³⁵ This aspect could be seen in ancient Indian jurisprudence, where certain rudimentary elements of the concept of public trust were predominant.³⁶ Kings were often regarded as trustees of resources like land, water, forests, etc., and it was their *dharma* to promote and foster communal ownership and utilization of resources.³⁷

Group, 2012) I-Ch 14-p 1 at 12-13.

³³ Bollier, *ibid* at 12.

³⁴ Hess & Ostrom, “Introduction”, *supra* note 20 at 7.

³⁵ Ostrom, *supra* note 22 (referring to the rules developed in the fishing village of Mawelle in Sri Lanka relating to the use of beach seines). Even though outside the formal legal process, villages still continue to play an important role in regulating artisanal fishing. See generally Maarten Bavinck, “Caste Panchayats and the Regulation of Fisheries along Tamil Nadu’s Coromandel Coast” (2001) 36:13 *Economic & Political Weekly* 1088 (JSTOR).

³⁶ Participatory natural resources management where the community managed and preserved sacred groves, village tanks, and pasture lands was a major feature of ancient Indian society. Even though it was the temples or the kings that generally owned tanks, their management was left to the users. Arabinda Mishra et al, *Common Property Water Resources: Dependence and Institutions in India’s Villages* (New Delhi: TERI Press, 2008) at 14.

³⁷ In ancient India, kings were more than a trustee; since the king had to sacrifice his own personal comforts and interests for the welfare of his subjects. AS Altekar, *State and the Government in Ancient India* (Delhi: 2001) at 379. The principle of trusteeship of earth resources is evident from the following sermon delivered by Mahinda, son of Emperor Asoka to the Sri Lankan king Devanampiya Tissa, while was on a hunting trip. The sermon eventually led to the Sri Lankan king embracing Buddhism. Mahinda sermonized: “O great King, the birds of the air and the beasts have

With colonialism, there was a sea change in the legal position. Driven by the necessity to exploit natural resources in its colonies, new legal doctrines like the *act of state* were developed by English courts.³⁸ Under this principle, any inhabitant could make good in the municipal courts established by the new sovereign only those rights which the new sovereign recognised through his/her officers. Rights guaranteed and enjoyed under the predecessor rulers held no legal sanctity.³⁹ Even if in a treaty of cession it was stipulated that certain rights could be enjoyed, this could not *per se* confer a valid and sound title, which could be enforced in the new ruler's municipal courts.⁴⁰ As a result, customary rights hitherto enjoyed by local communities over resources management could continue only if these were not anachronistic to the economic interests and designs of the new sovereign and that of the market.⁴¹ Legislative initiatives have also lent a hand to fortify state monopoly. Soon, the British began to exercise a stranglehold control over natural resources in its colonies in South Asia not as a proprietor but as a sovereign.⁴²

as equal a right to live and move about in any part of the land as thou. The land belongs to the people and all living beings; thou art only the guardian of it." Justice Weeramantry identifies this as the first principle of modern environmental law. *Case Concerning Gabčíkovo-Nagymaros Project (Hungary/Slovakia)*, [1997] ICJ Rep 7 at 101-02 (separate opinion of vice-president Weeramantry).
³⁸ Applying these principles the claim of the appellants that they were proprietors of certain lands, which in 1860 was ceded to the British government by the *Peshwa* under a treaty was dismissed. *Vajesingji Joravarsingji v Secty of State for India in Council*, (1924), [1924] LR 51, Ind App 357.

³⁹ *Ibid.*

⁴⁰ *Ibid.*

⁴¹ For instance, see AM Bhattarai, "Developing Decentralised Institutions: Towards a Legal Framework" in Anil Agarwal, Indira Khurana & Sunita Narain, *Making Water Everybody's Business* (New Delhi: Centre for Science and Environment, 2001) 333 at 333-35. In Bangladesh, it is reported that there were 13,000 public inland fisheries known as *Jalmohals*. During the British colonial rule, in 1793, the 'permanent settlement' was affected to settle these fisheries with a view to maximize state revenue from feudal lords. In turn, the feudal lords could impose nominal fees from the fishers for fishing rights and access to common pool resources. This system continued till the enactment of the *State Acquisition and Tenancy Act, 1950*, which is "[a]n Act to provide for the acquisition by the State of the interests of rent-receivers and certain other interests in land in Bangladesh and to define the law relating to tenancies to be held under the State after such acquisition and other matters" Accordingly, the *Zamindar* (feudal lord system) was abolished and these fisheries became government property under the administrative control of the ministry of land. Naisruddin Md Humayun, *Can Community-Based Participation of Coastal Fishers Contribute to Sustainable Management and Development of Coastal and Marine Fisheries Resources of Bangladesh?* (MMM Thesis, Dalhousie University, 2004) [unpublished] at 23-24.

⁴² For instance, in the water law context, beginning with the *Northern India Canal and Drainage Act, 1873*, numerous enactments have established public ownership of surface waters and government control of their use, development and distribution. This fundamental principle is incorporated in all irrigation statutes. Further, under Indian Law as groundwater is treated as a chattel attached to land, the government in exercise of its sovereign powers of eminent domain could acquire a land laden with groundwater. See also Alice Jacob, "Modernisation of Indian Water Laws" (1977) 1 *Academy*

Another important development that virtually re-wrote the rules of societal engagement was the introduction of European feudal ideas into these societies.⁴³

Even after de-colonization, this major paradigm shift in natural resources management still continues to hold roots in South Asia.⁴⁴ The constructive role essayed by individuals and local communities in natural resources management for thousands of years witnessed steady erosion due to pervasive state management. Consequently, the traditional wisdom accumulated over this long period is slowly being lost.⁴⁵ In fact, the

L Rev 154 at 157. These far reaching legal changes are not limited to South Asia alone. In Africa, for instance, pastoral land is held in trust by the living for future generations and pastoralists are considered as custodians of the commons. However, this concept is now little understood in Africa by national governments and by funding agencies. Customary pastoral land tenure systems have been replaced and lands, which were, once managed sustainably, are being alienated and degraded and the root cause of many of these changes can be traced to colonialism. For instance, in Uganda, the *Crown Lands Ordinance, 1903*, transformed land tenure by empowering British colonial authorities to alienate customary lands and issue freehold and leasehold titles. Even after de-colonization, African states continue to utilise legislative instruments to further disempower pastoral communities by taking over their lands. Charles R Lane, ed, *Custodians of the Commons: Pastoral Land Tenure in East and West Africa* (London: Earthscan, Publications Ltd, 1998) at 1-19.

⁴³ Even before the British rule, feudalism was prevalent in Indian society. However, it underwent a radical transformation during the British rule and by the time of India's independence there were nearly three well established land revenue systems, namely, the *Zamindari*, the *Ryotwari* and *Mahawari*. The cumulative effect of this societal restructuring tainted with inequity was that local communities were alienated from their land and natural resources. For more details, see Urmila Sharma & Sanjeev Kumar Sharma, *Indian Political Thought* (New Delhi: Atlantic Publishers and Distributors, 1996) at 66; MH Qureshi & S Aparna, "Quest for Land Reforms in Kerala" in Noor Mohammad, ed, *Socio-Economic Dimensions of Agriculture*, New Dimensions in Agricultural Geography, vol 3 (New Delhi: Concept Publishing Co, 1992) 109 at 109-10.

⁴⁴ The Constitution of India provides for the continuance of laws in force in the territory of India immediately before its commencement unless the same has been altered, amended or repealed by a competent legislature or other competent authority. *Constitution of India 1950*, art 372 [*Constitution of India*]. Accordingly, several colonial legislations that fortify state monopoly over natural resources to the exclusion of communities continue to operate to this day. The *Northern India Canal and Drainage Act, 1873*, states that "the state government is entitled to use and control for public purposes the waters of all rivers and streams flowing in natural channels, and of all lakes and other natural collections of still water" (No 8 of 1873, India), pmb1.

The *State Acquisition and Tenancy Act, 1950*, abolished the feudal system in respect of public inland fisheries in Bangladesh. However, for more revenue the government continued to lease the *Jalmohals* by leasing fishing rights to the elite and influential persons through open tender. To increase profits, the lease-holders encouraged overexploitation, and the fishers were treated as mere labourers working on low wages at the mercy of the leaseholders. Humayun, note 47 at 24.

⁴⁵ Aarthi Sridhar, "Eminent domain, absolute doubt: Crusade for Goa's comunidades" *Infochange* (December 2010), online: Infochange, News & Features <<http://infochangeindia.org/>>. In the coastal state of Goa, India, there are nearly 223 *comunidades* covering nearly 70 per cent of the state. The term *comunidade* was given by the Portuguese to village communities, which prior to this contact were known as *gaunkars*. The Portuguese entered into a treaty with the *gaunkars* to protect their lands and also guaranteed continuation of their customary laws. All through these periods, the records state that the sovereignty of the *comunidade* was recognised and their absolute ownership over their lands was unquestioned. The Portuguese, also codified these customary laws - *Codigo*

tragedy of the loss of the commons mindset in such societies has resulted in the dilution of communal rights, the intrusion of the idea of private property, the reliance on market-based economic systems for resources management, the pursuit of more intensive models for economic development and, more recently, attempts to reconfigure and integrate subsistence economies into a so-called globalised economy.⁴⁶ While a legalistic, adversarial and formal approach to resources management definitely has merits, in terms of prescribing a legal frame for resources management and in securing entitlements over the same, in certain cases, these formal legalistic regimes can inadvertently exclude local communities from enjoying entitlements over resources. Often, local and traditional coastal communities in South Asia find themselves as having limited *de facto* control over resources and rarely do they have any *de jure* rights over these resources, as these are generally controlled by the state under its sovereign powers.⁴⁷ Consequently, autochthonous communities find themselves dangerously perched from a legal point of view, as whatever usufructuary rights they enjoy over resources can easily be trampled

Das Comunidades. Even though this system was primarily concerned with agricultural protection, it also afforded protection to the *ramponkars* – the traditional shore seine fisherfolk of Goa. Despite its patriarchal, this system had several positives. However, these systems have been pushed to the periphery by new formal systems. For more details, see *ibid*.

Similarly, in the water management context, the constructive role-played by individuals and local communities for thousands of years is steadily eroding due to pervasive state management. A controversy of far-reaching consequence erupted in the Indian state of Rajasthan, over the ownership of rainwater. The villagers of *Lava ka Baas*, initiated a scheme to harvest rain. They build a *johad* (traditional check dam) with technical support from *Tarun Bharat Sangh*, a non-governmental organisation. The structure was built on the community grazing lands of *Lava ka Baas*. Trouble erupted when the *gram panchayat* invited the chief minister of the state to inaugurate the structure. The water bureaucracy found that the structure violated a 1910 Agreement between princely states of *Alwar* and *Bharatpur*, both of which were now part of the state of Rajasthan. Furthermore, as the villagers did not seek permission from the Irrigation Department before construction of the dam, it was found that there was violation of the *Rajasthan Irrigation and Drainage Act, 1954*. *Tarun Bharat Sangh* was given 15 days to remove the structure, failing which action was to be taken. Timely intervention by the then Chief Minister of Rajasthan stopped the demolition. Appalling was the attitude of the then Rajasthan irrigation minister Ms. Kamla Beniwal who went out of her way to lay claim for the irrigation department over every drop of water received through rain. She has been reported as saying that, “Water resources do not belong to people or to the society. They belong to the government.” Report, “Who owns the river?” *Down To Earth* (31 July 2001), online: [Down To Earth](http://www.downtoearth.org.in/) <<http://www.downtoearth.org.in/>>; Tony George Puthucherril, *Water Resources Management Law: A Case Study with Reference to the State of Kerala* (M Phil Thesis, WB National University of Juridical Sciences, India, 2003) [unpublished].

⁴⁶ The evils of unbridled capitalism and socio-economic deprivation are the root cause of insurgency in India. *Nandini Sundar v Chattisgarh*, (2011) [2011] AIR SC 2839 (India SC).

⁴⁷ A classical example of such an approach is evident in the *Wildlife Protection Act, 1972*; see also Scheduled Tribes (Recognition of Forest Rights) Bill, 2005 (No 158 of 2005, India), statement of objects and reasons.

upon by the state and extinguished.⁴⁸

While the right to access resources is an overwhelming necessity determined by the need to survive and progress, community rights are often viewed as anathema to conservation objectives.⁴⁹ There is now a growing realization⁴⁹ that this approach has several flaws, and there is a tendency to revert back to more community-based and decentralized management systems and afford recognition to non-state law.⁵⁰ Such measures can definitely secure livelihood opportunities, augment adaptive capacities and, more importantly, contribute to sustainable coastal development.⁵¹ As alluded to in

⁴⁸ It has been reported from India that large developmental activities – from housing to ports – have encroached the habitats of fisherfolk and affected their livelihoods in *Versova* in Mumbai city, *Machlipattanam* on the Andhra Pradesh coast and *Mundra* in Gujarat. India, Ministry of Environment & Forests, *Final Frontier: Agenda to Protect the Ecosystem and Habitat of India's Coast for Conservation and Livelihood Security, Report of the Expert Committee on the Draft Coastal Management Zone (CMZ) Notification, Constituted by the Ministry of Environment and Forests, Under the Chairmanship of Prof. MS Swaminathan* (New Delhi: Ministry of Environment & Forests, 2009) at 18 [India, Ministry of Environment & Forests, *Final Frontier*].

⁴⁹ For instance, Jambudwip is a small island declared as a reserved forest that lies in the estuary of the Hooghly river along the Bay of Bengal coast. This island belongs to India and was used since 1960s by fishers as a convenient transit point to dry the fish. Satellite imagery showed that despite over these long years of use, the island lost only 200 hectares of mangrove forest, out of its 2,000 hectares. Despite pleas by the fishing community (since nearly 10,000 fishers used to use this island) that they be permitted to continue to use the island, the Supreme Court of India based on the report of the Central Empowered Committee disallowed fishers from using the island, ostensibly to protect the mangroves. See generally MK Jiwrajka for Central Empowered Committee, *Report on Jambudwip* (New Delhi: CEC, 2002) see also India, Ministry of Environment & Forests, *Final Frontier*, *ibid* at 23.

⁵⁰ For instance in Bangladesh, to manage the *Jalmohals*, community-based fisheries management project was developed as a participatory fisheries management programme implemented in two phases (1996-2001 and 2001-2006). This project has the overall objective to sustainably improve the livelihoods of poor people dependent on aquatic resources. Iqbal Kabir & S Rizwana Hassan, *Legal Issues Pertaining to Community Based Fisheries Management*, Conference Paper 05, (Bangladesh: Bangladesh Environmental Lawyers' Association, [nd]) at 6. The need for community based management approaches is gaining currency in other parts of the world as well. For instance, see *Constitution of the Republic of South Africa*, 1996, (S Afr), No 108 of 1996, s 152 (outlining the objectives of local government).

⁵¹ For instance, when India decided to revamp its coastal law, the *Coastal Regulation Zone Notification, 1991*, and in light of the strong opposition to the draft Coastal Management Zone Notification, (SO No1070(E), of 2008), the national government appointed an expert committee under the chairmanship of M.S. Swaminathan to advise on the policy and legal framework for the ICZM. Considering the fact that fisherfolk in India are fast losing control over coastal resources, this committee recommended the enactment of a special legislation to protect the rights of traditional fisherfolk. This is perhaps the primary reason that has led to the present impasse as far as securing the rights of the fisherfolk are concerned. Had the principles of this law also been incorporated into the *Coastal Regulation Zone Notification, 2011*, the approach could have been more holistic. The draft Traditional Coastal and Marine Fisherfolk (Protection of Rights) Act, 2009, recognises the following as the rights of fisherfolk: right of ownership and access to areas, traditional rights customarily enjoyed by the traditional fisherfolk, right of access to biodiversity and

chapter six, decentralized community-based management is an integral component of ICZM programmes and offers an interesting paradigm to the management of common-pool coastal resources, which entails fewer conflicts and is more sustainable in the long run.⁵² While there is merit in empowering local communities and giving them a larger say in natural resources management, and in affording recognition to non-state law (customary law), due to the peculiar social milieu in South Asia (where the undercurrents of the caste system and patriarchal norms, though proscribed at a normative level, still persist),⁵³ it is possible that women and communities belonging to lower castes can be excluded from decision-making processes and from enjoying their rightful share of coastal resources. Consequently, to ensure that all communities are adequately represented and the management process is more inclusive, reliance has to be placed on social engineering role of law to correct inequities in societal relations.⁵⁴

community right to intellectual property and traditional knowledge, etc. The draft law calls upon the state governments to provide for schools, hospitals, net mending yards, disaster warning centres, roads, etc. For the text of the draft document, see *Traditional Coastal and Marine Fisherfolk (Protection of Rights) Act, 2009*, s 3, online: Ministry of Environment & Forests <<http://moef.nic.in/>>. Another vital provision provides that the *panchayat* can determine the nature and extent of individual or community rights or both that are enjoyed by traditional fisherfolk. They are to prepare a map delineating the area along with a list of attendant rights accruing to the fisherfolk and are also to pass a resolution to that effect. The concerned state government constitutes an Executive Committee to examine the resolution passed by the *panchayat* and thereafter it prepares a record of the rights accorded to traditional fisherfolk. *Ibid*, s 5.

⁵² Laurent Mermet & Raphaël Billé, “Integrated Coastal Management at the Regional Level: Lessons from Toliary, Madagascar” (2002) 45 *Ocean & Coast Mgmt* 41 (ScienceDirect).

⁵³ Low caste Hindus were traditionally involved in full time fishing and developed institutions to protect and conserve fisheries but with the entry of landless, marginal and unemployed Muslim farmers, the fishing dynamics is changing. Humayun, *supra* note 41 at 24. The Indian Constitution abolishes untouchability and its practice in any form. *Constitution of India*, *supra* note 44, art 17; see also the *Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act 1989* (No 33 of 1989, India); Bavinck, *supra* note 35 (pointing out that sea fishing is primarily a caste based occupation); see also *Arumugam Servai v. State of Tamil Nadu*, (2011) 6 SCC 405 (decrying and declaring illegal *Khaap Panchayats* which encourages the honour killings of those who indulge in inter-caste marriages).

⁵⁴ The social engineering role of law can be utilised to support measures aimed at affirmative action. In the present case, this can take the form of reservations in local bodies to women and to minorities and other lower castes. The experience of India in this regard is illustrative. Even though Mahatma Gandhi described villages as being the heart and soul of India, Dr. B.R. Ambedkar, the father of India’s Constitution was of the opinion that village republics were the primary reason for its ruination. The village according to him was “... a sink of localism, a den of ignorance, narrow mindedness and communalism.” Consequently, the Constitution of India as it originally stood provided no recognition to villages in the scheme of governance, except as an unenforceable directive in article 40. Almost four decades later, in 1993, the Constitution was amended *via* the *Constitutional (Seventy-Third Amendment) Act, 1992* to introduce Part IX into the Constitution providing recognition to local self-government institutions (*panchayati raj institutions*) in the

Laws and related institutional mechanisms play important roles in facilitating sustainable development. As chapter 8 of Agenda 21 states:

8.13. Laws and regulations suited to country-specific conditions are among the most important instruments for transforming environment and development policies into action, not only through “command and control” methods, but also as a normative framework for economic planning and market instruments. Yet, although the volume of legal texts in this field is steadily increasing, much of the lawmaking in many countries seems to be ad hoc and piecemeal, or has not been endowed with the necessary institutional machinery and authority for enforcement and timely adjustment.

8.14. While there is continuous need for law improvement in all countries, many developing countries have been affected by shortcomings of laws and regulations. To effectively integrate environment and development in the policies and practices of each country, it is essential to develop and implement integrated, enforceable and effective laws and regulations that are based upon sound social, ecological, economic and scientific principles. It is equally critical to develop workable programs to review and enforce compliance with the laws, regulations and standards that are adopted. Technical support may be needed for many countries to accomplish these goals. Technical cooperation requirements in this field include legal information, advisory services and specialized training and institutional capacity-building.

8.15 The enactment and enforcement of laws and regulations (at the regional, national, state/provincial

governance scheme. The *Constitution (Seventy-Third Amendment) Act 1992*, (India), online: India Code: Legislative Department <<http://indiacode.nic.in>>. Taking into account caste realities, this amendment introduced article 243D which reserves seats to Scheduled Castes and the Scheduled Tribe members and to their women. Similarly, offices of the chairpersons in the *panchayats* are to be reserved for the Scheduled Castes, the Scheduled Tribes and women in such manner as the state legislatures may by law determine. The amendment also introduced eleventh schedule (article 243G), which confers substantial law making powers on these bodies some of which are relevant to coastal management (e.g., fisheries, soil conservation, social forestry and farm forestry, minor irrigation, water management and watershed development, poverty alleviation programmes, maintenance of community assets). See also The Constitution (One Hundred and Eighth) Amendment Bill, 2008 proposes to amend the Constitution to reserve 33 per cent of all seats in the *Lok Sabha* (House of the People), and in all state legislative assemblies for women. There is strong opposition to this amendment and it is still hanging in the air. (No XXX-C of 2008, India).

or local/municipal level) are also essential for the implementation of most international agreements in the field of environment and development, as illustrated by the frequent treaty obligation to report on legislative measures.

In fact the role of law in facilitating development can be assessed on the basis of the following five models. The first is the idea of law as an instrument to secure social control. Here law is viewed from a minimalist perspective and is treated as a “pre-condition for security and stability rather than a salient feature of development strategies.”⁵⁵ Secondly, the idea of rule of law as formal legality requires limitations on state power and accountability on the part of governments. Moreover, formal legality “requires that law should be general, prospective, public, clear, and certain.”⁵⁶ In the third model, law is regarded as a facilitator of *laissez faire* and free markets. Even though the core idea is that least state intervention is the sole pathway to wealth creation, since the 1990’s, even in free market societies, the instrumentality of law in facilitating development is gaining greater importance, particularly in protecting property rights, securing enforcement of contracts, facilitating commerce, and promoting foreign direct investment. This new role received an entirely new dimension with the emergence of the idea that market reform has to be in consonance with human rights, good governance and democracy. In other words, liberalism stands “chastened.”⁵⁷ As far as the fourth model is concerned, law is treated as multifunctional phenomenon, i.e., it is “... relevant to development in various ways at a number of levels.”⁵⁸ Finally, in the rights-based approach, certain human rights such as right to life, the right to live in a clean environment, are treated as enforceable legal rights in contra-distinction to these being classified as unenforceable moral rights.⁵⁹

A coastal law comports to nearly all the above the identified models. On the one hand, it can provide necessary pre-conditions for security and stability in the coastal zone, while on the other; it can be multifunctional catering to and harmonizing a wide

⁵⁵ William Twining, *General Jurisprudence: Understanding Law from a Global Perspective*, (Cambridge: Cambridge University Press, 2009) at 330-32.

⁵⁶ *Ibid* at 332-36.

⁵⁷ *Ibid* at 336-40.

⁵⁸ *Ibid* at 340-46.

⁵⁹ *Ibid* at 346-48.

range of interests. It can promote rule of law by ensuring that coastal governance is subject to rules and there is accountability. In a similar vein, it can promote the operation of free markets in line with chastened liberalism, and more importantly, it can facilitate a rights based approach to coastal management, seeking to secure *inter alia*, the rights of coastal communities to live in a clean coastal environment and the right to livelihood.⁶⁰ In short, coastal law plays a pivotal role in facilitating development. As well, a legal framework can facilitate the implementation of several of the core principles of sustainable development, like the precautionary principle, the polluter pays and inter-generational equity.⁶¹

Theoretical justification for a coastal law can also be drawn from “good environmental governance,” which has universal recognition as being *sine qua non* for sustainable development.⁶² This implies the need for nurturing democratic institutions responsive to people’s needs, affording respect to the rule of law, implementation of anti-corruption measures, promotion of gender equality, ensuring decentralization, balancing economic development, with sound environmental management and social justice. When viewed from the perspective of the coastal zones, “good coastal governance” essentially conveys an identical message⁶³ and it is in this context that one has to approach the concept of ICZM. Here coastal governance sets out the agenda within which management (ICZM) has to occur.⁶⁴ In strengthening good governance, laws and legal frameworks

⁶⁰ See generally chapters 3 and 7 for more on the role of law as a tool to further development.

⁶¹ See *Federal Sustainable Development Act*, SC 2008, c 33; For a coastal law that implements sustainable development principles see *National Environmental Management: Integrated Coastal Management Act*, (S Afr), No 24 of 2008 [SA, *Integrated Coastal Management Act*].

⁶² “Plan of Implementation of the World Summit on Sustainable Development” in UN, *Report of the World Summit on Sustainable Development Johannesburg, South Africa, 26 August-4 September 2002*, A/CONF.199/20* (New York: UN, 2002) at 8, ¶4. “[E]ffective governance at the local, subnational, national, regional and global levels representing the voices and interests of all is critical for advancing sustainable development.” UN RIO+20 United Nations Conference on Sustainable Development, *The Future We Want*, A/CONF.216/L.1*, 19 June 2012, ¶76.

⁶³ See generally Stephen Bloye Olsen, “A Practitioner’s Perspective on Ecosystem Coastal Governance” in Erlend Moksness, Einar Dahl & Josianne Støttrup, eds, *Integrated Coastal Zone Management* (Oxford: Wiley-Blackwell, 2009).

⁶⁴ *Ibid* at 253. Olsen states that

governance probes, the fundamental goals and the institutional processes and structures that are the basis for planning and decision making. Governance addresses the values, policies, laws and institutions by which a set of issues is addressed. Management, in contrast, is the process by which human and

play a critical role and good coastal governance is no exception to this. This is so because, “[e]nvironmental [g]overnance comprises the rules, practices, policies and institutions that shape how humans interact with the environment.”⁶⁵

8.2.1 Remarks

One of the major points that emerge from the above analysis, is that to prevent the tragedy of the coastal commons, recourse can be had to the regulatory and coercive nature of law. Here, law prescribes rules for regulating the management of the coastal commons to ensure that all users conduct themselves rationally, that free-riders are eliminated, and that the resource is sustainably utilized not only for the present but also for the future. A second major point is that while privatization is as yet another mode to prevent the tragedy, in certain situations this can lead to undesirable consequences and inequities, necessitating legal intervention. In securing the greatest happiness of the greatest number of people in respect of coastal areas and resources, a coastal law in line with prioritarianism has to ensure that the interests of those in the lowest rung are also accommodated. A third point is that sustainable coastal development and good coastal governance also mandate the need for a legal basis to translate several postulates enshrined in a management process into specific actions (e.g., construction of a sea wall and acquisition of private property for the same, regulating marine and coastal pollution and related punishments).

In sum, the simplest argument for an exclusive coastal law framework, then, is that since the ultimate objective of the state is to maximize the welfare and wellbeing of its citizens, in consonance with *pareto* optimality and to eliminate rent seeking, the coastal law has to ensure that people are made better off or at least leaving none worse off. In such a situation, a coastal law emerges as an expression of the reasonable expectations of a coastal community, an instrument to avoid harm while seeking to advance the rights of

material resources are harnessed to achieve a known goal within a known institutional structure.... Governance ... questions the fundamental goals of human society and sets the stage within which management occurs....[T]he transformations underway in our planet's coastal regions must therefore be defined as challenges of governance rather than the more traceable and familiar challenges of management. *Ibid* at 257-58.

⁶⁵ UNEP, *Environmental Governance*, Brochure, online: UNEP, Environmental Governance, Publications <<http://www.unep.org/>>.

the community residents to life, property, a clean and healthy coastal environment, development, and overall well-being. Thus at least at a theoretical level there is sufficient rationale that law and legal frameworks can play an important role in facilitating an ICZM process. Based on this theoretical analysis, and on the national case studies alluded to in the previous chapter, we proceed to further appreciate the importance of a legal framework for coastal management via a SWOT.

8.3 THE NEED FOR AN ICZM LEGAL FRAMEWORK: SWOT ANALYSIS

Two questions that invariably crop up in discussions on coastal law reform are, firstly, “Can any purpose be served by adding new laws onto the environmental law statute book?” and secondly, “Why do we need a dedicated coastal law, when there is already a potpourri of legislations and rules to govern different aspects of the coastal environment?”⁶⁶

Poor internalization of the laws, ineffective enforcement due to lack of personnel, lax monitoring, and absence of resources are often cited as main reasons for the sorry state of environmental and resources legislation enforcement, particularly in an economically developing region like South Asia. In such a scenario, will a new coastal law make any path-breaking changes or will it also be reduced to a paper tiger hamstrung by ills that plague the system? Most South Asian countries have generally been parsimonious in enacting environmental and natural resources laws. In India, for example, apart from a few antiquated colonial legislations that had only indirect application to the environment, there were no environmental protection laws *per se* for a long time.⁶⁷ The proverbial leap of faith occurred only after the Stockholm Conference and later with the Bhopal gas leak tragedy (similar is the case with several other

⁶⁶ The doctoral committee posed these two critical questions. Both these complement one of the primary research questions that guides this thesis, namely, “Do laws and legislative frameworks play any role in promoting and facilitating the implementation of ICZM and CCCA, thereby contributing to SCD? And, if yes, what is that role?” See Ch 1, Part 1.3.

⁶⁷ The three countries in the Indian sub-continent, namely, India, Pakistan and Bangladesh due to their common colonial past even now (subject to country based amendments) share some of the British introduced legislations that have an environmental basis. Prominent among them are: the *Forest Act, 1927* and *Fisheries Act, 1897*. For the text of the *Forest Act, 1927*, as applicable in India, Pakistan and Bangladesh, see *Indian Forest Act, 1927* (16 of 1927, India); *Forest Act, 1927* (XVI of 1927, Pakistan); *Forest Act, 1927* (XVI of 1927, Bangladesh). For the text of the *Fisheries Act, 1897* as applicable in India and Pakistan, see *Indian Fisheries Act, 1897* (4 of 1897, India); *Fisheries Act, 1897* (IV of 1897, Pakistan).

countries).⁶⁸ Since then, the corpus has increased and there has been a growing penchant to rely on the instrumentality of law as response to environmental problems, even though the process of environmental law-making was not linear and steady.⁶⁹

Today, India has a considerable volume of environmental legislations. However, given the tardy nature of legal reform and the slackness exhibited by the administrative machinery in balancing development and environmental protection, attention turned towards the third limb of the state - the judiciary - to further the cause of environmental justice. This has spurred some of the finest judicial law-making by one of the most powerful constitutional courts in the world. The presence of laws in the statute book⁷⁰ enabled citizens to approach law courts through the public interest litigation route for orders even in the nature of ‘continuing mandamus’ to ensure compliance with the laws.⁷¹

⁶⁸ Following Stockholm, the 42nd constitutional amendment, 1976, added entries 17A and 17B to List III of the Seventh Schedule dealing with forests and protection of wild animals and birds. It also added article 48A to the Constitution, which speaks about protection and improvement of environment and safeguarding forests and wildlife. The ministry of environment and forests was established at the central government level, and since then there has been a spate of legislative activity on the environment front. One of the most prominent environmental laws, the *Environment (Protection) Act, 1986* was enacted under entry 13, list I of schedule VII of article 253 of the *Constitution of India, 1950*. Its preamble clearly states that it was enacted to implement the decisions taken at the United Nations Conference on the Human Environment 1972. The Bhopal Gas Leak tragedy also influenced the development of India’s environmental law. See generally Bharat Desai, “The Bhopal Gas Leak Disaster Litigation: An Overview” in *Asian Yearbook of International Law*, vol 3 (The Netherlands: Martinus Nijhoff Publishers, 1994) 163; *Bano v Union Carbide Corp*, US Dist LEXIS 4097 (SD NY, 2003); *Charanlal Sahu v India*, (1989), [1990] 1 SCC 613 (India SC); Marc Galanter, “Legal Torpor: Why So Little Has Happened in India After the Bhopal Tragedy” (1985) 20 Texas Int’l LJ 273 (HeinOnline); Daniel Barstow Magraw, “The Bhopal Disaster: Structuring a Solution” (1985) 57 U Colo L Rev 835 at 836 (HeinOnline).

⁶⁹ Some of the major environmental laws are: *Water Act, 1972*, the *Air Act, 1981*, *Hazardous Waste Management and Handling Rules, 1989*, and the *Coastal Regulation Zone Notification, 1991*.

⁷⁰ Even in the absence of environmental laws covering a point, the writ courts could deal with the matter. Two important developments to secure judiciary sponsored environmental justice has been the demise of the strict rule of standing and the consequent expansion of the concept of *locus standi*. Judicial ingenuity infused new meaning and content into article 21 of India’s constitution. Life no longer meant mere animal existence; rather it means the right to live with human dignity and all that goes along with it. Since enjoyment of pollution free air and water is absolutely essential for the existence and full enjoyment of life, the right to a clean environment was also held to be a part of article 21. The effect of this human right approach to environmental adjudication has been that if any act impinges the right to a clean and healthy environment, it affords the common man a swift and efficacious remedy under articles 32 and 226 (recourse to the writ courts). State and non-state actors also began to be hauled up in the courts to redress environmental wrongs. *Maneka Gandhi v India*, (1978), [1978] AIR 597 (India SC); *Francis Coraile Mullin v Administrator, Delhi*, (1981), [1981] 1 SCC 608 (India SC); *MC Mehta v India*, (1986), [1987] AIR 1086 (India SC) (*Oleum Gas Leak Case*).

⁷¹ Generally, once a judgment is delivered it is left to the executive to implement it. However, many a time, the executive ignores the judgement and does not initiate steps rendering it a dead letter. This

Moreover, since the right to a clean environment is treated as a fundamental human right, citizens are better protected in matters relating to environmental degradation.⁷² Public interest litigation allows standing to anyone who has an arguable interest even in environmental protection matters. The net effect is that there is considerable awareness amongst the general public about the need to protect the environment. Most people do believe that, despite the imperative of economic development, a cleaner environment improves the quality of their lives, and these beliefs have been firmly entrenched as environmental values in Indian society. Even in Pakistan and in Bangladesh, public interest litigation has emerged as an important tool to secure environment justice.⁷³

Nonetheless, corruption, bureaucratic apathy, poorly drafted laws that provides more routes to escape the legal dragnet,⁷⁴ ambivalence by the state in providing necessary resources and capacity to the state pollution control boards (tasked with the duty to implement most of the pollution laws) are primary factors that have reduced the efficacy

has forced aggrieved parties to bring the matter again before the courts. It was in such a situation that the court came up with the innovation of *continuing mandamus* to ensure implementation of its orders. The technique adopted is simple: rather than concluding the matter, the court keeps it alive by issuing a series of directions from time to time and monitors compliance of its orders by the executive. Continuing mandamus ensures that agencies perform their statutory functions. Practically, the court takes over the role of the executive. One of the landmark cases in this regard is *TN Godavarman Thirumulpad v India*. Way back in 1995, a writ petition was filed in the Supreme Court of India to protect a part of the Nilgiris Forest from deforestation. This matter was clubbed with several other petitions expanding its scope from deforestation to one that dealt with the overall forest governance in the country. The first major order was handed down in 1996, and even though the Supreme Court has been criticized for overreach, more than 2,000 interlocutory applications have been admitted and several hundred orders (some in the nature of judicial legislations) have been issued and a central empowered committee has been created, which virtually manages India's forests. For more details, see *TN Godavarman Thirumulpad v India*, (1996), [1997] 2 SCC 267 (India SC) (defining the term forest); *TN Godavarman Thirumulpad v India*, (1997), [1997] 3 SCC 312 (India SC) (appointment of High Power Committee); *TN Godavarman Thirumulpad v Ashok Khot*, (2006), [2006] 5 SCC 1 (India SC) (sentencing to imprisonment the Principal Secretary of the Forest Department, Maharashtra state and the minister in-charge for committing willful contempt of court orders that directed closure of un-licensed saw mills, veneer and plywood industries); *TN Godavarman Thirumulpad v India*, [2012] Writ Petition (C) N0 202 (India SC) (protection of wild boar); see generally Armin Rosencranz & Sharachchandra Lélé, "Supreme Court and India's Forests", Commentary, (2008) 43:5 Economic & Political Weekly 11 (JSTOR).

⁷² See *supra* note 70.

⁷³ See generally Jona Razzaque, "Linking Human Rights, Development, and Environment: Experiences from Litigation in South Asia" (2007) 18 Fordham Env'tl L Rev 587 (HeinOnline).

⁷⁴ India has had a dismal record in implementing its coastal law. For more details, see Ch 3, Part 3.2.1; see also Tony George Puthucherril, "Operationalising Integrated Coastal Zone Management and Adapting to Sea Level Rise through Coastal Law: Where Does India Stand?" (2011) 26 Int'l J Mar & Coast L 569 (SwetsWise).

of environmental laws in India and in the South Asian region.⁷⁵ Merely because implementation concerns exist, using this as a ruse to prevent the adding of new laws on resources management on the statute book is fallacious. In fact this problem can be viewed at two levels: the first is the lack of laws to address a particular issue and the second is poor implementation. This study is concerned only with the former case, and clearly, lawmaking is necessary to fill-in the gaps in national legal systems, to strengthen institutions in place or those that are emerging, and to rationalize and streamline efforts towards sustainable coastal development.

As for the second question (regarding the need for a dedicated coastal law), it must be pointed out that to operationalize ICZM, *via*, the legal route, two options are available. The first is the non-legislative model (Bangladesh is a classical example of such an approach), where implementation is based on an ICZM plan or policy/strategy.⁷⁶ Here, integration between the different sectoral approaches to coastal management are affected through these policy guidelines and related prescriptions. On the face of it, even though this can be termed as a non-legislative approach, recourse to existing laws and regulations is still available to steer the policy. Implementation is primarily cooperative and voluntary and is considered to be more economical, as it entails utilizing existing tools to kick-start the programme. However, in most cases the policy or plan of action is a statement of lofty ideals and therefore its implementation may prove difficult. As well, there could be an assortment of legal statutes governing different aspects of coastal areas and resources, like laws relating to fishing and aquaculture, land-use planning and development, marine pollution, water use, protection of the environment, forestry, biodiversity conservation, etc.⁷⁷ While these sectoral laws may impinge upon different aspects of coastal zone management, they may not necessarily form a composite code that can further integration. In fact, they may even entrench sectoral management by failing to take into account that the coastal environment requires an altogether different and a distinctive legal response.⁷⁸

⁷⁵ MC Mehta, “The Accountability Principle: Legal Solutions to Break Corruption’s Impact on India’s Environment”, Book Excerpt, (2006) 21 J Env’tl L & Litig 141 at 142-43 (HeinOnline).

⁷⁶ See Ch 3, Part 3.2.3. For details regarding the non-legislative approach to coastal management in the Maldives, see also Part 3.2.5.

⁷⁷ *Ibid.*

⁷⁸ *Ibid.* Even though the Coastal Zone Policy, 2005 of Bangladesh was a significant step in implementing ICZM, it could not avert a large number of management-related problems that

The complexity posed by this wide array of laws applicable to coastal areas does not end here. Depending on the nature of the governance structure a country follows (countries are generally categorized into federal or unitary), laws could flow from either a single tier or from two tiers, i.e., from both the federal and provincial levels of government (and in certain cases, even from a third tier, if there is a robust system of local-self government).⁷⁹ Again, it may be not practicable to implement an ICZM plan in cases where it warrants restrictions on the freedom of fishers to fish or restrictions on developing coastal land by owners. Similarly, controls in the matter of situating industries on coastal properties are untenable unless and until these measures have adequate statutory backing, since it may affect several basic rights, like the right to livelihood, property, community rights, resources, etc.⁸⁰ In sum, utilizing an existing and diffused legal framework to support ICZM is fraught with dangers, and there is even the possibility that the programme can collapse under its own weight, since conflicting interests may pull the legal patchwork in different directions.

While it is clear that laws and legal frameworks play a central role in operationalizing the ICZM process, a related question is whether we should repeal or amend existing coastal legislation to attune it to ICZM objectives or enact an entirely new law. As mentioned in the introduction to this chapter, rather than making extensive amendments to existing laws, it would be advisable for a country to enact a specific ICZM-friendly statute, setting out the fundamentals required for the development and operation of an ICZM process. Coastal management under archaic and disparate laws, however re-engineered, may generally be inimical to sustainable coastal development and lead to irresponsible coastal use practices. Ultimately, however, the choice depends upon the nation concerned.

The discussion in the preceding chapter provides ample background to underline the importance of a coastal law to implement an ICZM process and to build necessary linkages between coastal environment protection, development and coastal climate

affected the coastal zone; a major one, being the inability to harmonize sectoral policies, plans and laws. See also Kazi Shakila Islam, Xiong-Zhi Xue & Mohammed Mahabubur Rahman, "Successful Integrated Coastal Zone Management (ICZM) Program Model of a Developing Country (Xiamen, China) – Implementation in Bangladesh Perspective" (2009) 2 J Wetlands Ecology 35-41.

⁷⁹ For instance, see generally *SA, Integrated Coastal Management Act*, *supra* note 61.

⁸⁰ *Ibid*, s 9 (power to acquire land).

change adaptation. By utilising a SWOT analysis, the importance of basing ICZM practice in terms of legislation is elucidated further.

8.3.1 Strengths

The most important strength held out by a coastal law is that it helps to reduce the rhetoric of sustainable coastal development into precise practice, even in light of the constantly changing coastal environment. Coastal legislation ensures that the various coastal management efforts do not detract from the central path of sustainable development, and thereby sets sustainable coastal development in motion. In short, a coastal law emerges as an expression of a long-term commitment by the state to sustainable development imperatives.⁸¹ Through specific provisions in the law, it provides an enabling environment to help balance environmental protection, coastal development and coastal climate change adaptation and mitigation.⁸² In this regard, a coastal law helps to implement a principled approach to resource management by engrafting several of the principles integral to sustainable development, e.g., the polluter pays principles, the precautionary approach, the public trust doctrine, inter and intra-generational equity, public participation, environmental impact assessments (all of which have significant legal connotations) onto an ICZM process.⁸³

Another advantage of a coastal statute is that it ensures clarity, consistency and efficiency in terms of express legal parameters to work towards sustainable coastal development. The predominant situation in most coastal countries is that coastal management (or, for that matter, environmental management) emerges as a reactive response to specific crises and issues. In absence of these triggers, a sustained engagement to coastal planning and management involving a broader range of actors and stakeholders is rarely accomplished. This *ad hoc* approach can be eliminated through a coastal law. As the Latin maxim says: *ignorantia juris non excusat*, or ignorance of law is

⁸¹ For instance see *SA, Integrated Coastal Management Act*, *supra* note 61. For more on sustainable coastal development, see also Ch 4, Part 4.3.

⁸² For instance, see *SA, Integrated Coastal Management Act*, *ibid*; see also *New Coastal Zone Management Act 1988* (No 39 of 1998, Barbados) [*Barbados CZMA 1998*]. Parties are to endeavour to ensure that their national legal instruments include criteria for sustainable use of the coastal zone. *Protocol on Integrated Coastal Zone Management in the Mediterranean*, [2009] OJ L 34/19, art 8(3) [*ICZM Protocol*].

⁸³ For instance, see *ICZM Protocol*, *ibid*, art 6.

no excuse, implying that people ought to know the law.⁸⁴ Laying down the norms of coastal zone management in black and white legal terms helps multi-level stakeholders plan appropriate activities and avoid conflict.

A related *forte* is that the instrumentality of law helps to view coastal management from the prism of rights and duties, as it can guarantee formal rights and duties and addresses a wider geographical area. The coastal ecosystem is a dynamic whole composed of several subsets of ecosystems. Hence, to effectively regulate a portion of a system, it is necessary to understand and respect its role and function within the whole.⁸⁵ An ICZM law can help secure both the micro- and macro-management of coastal resources.⁸⁶

Implementation of ICZM requires the involvement of a series of government departments and statutory agencies among others. As mentioned earlier, ICZM does not seek to displace sectoral management; rather, the emphasis is to link the different sectoral management initiatives to ensure that decisions in respect of the coastal zone are holistic. Although the need for integration between different agencies can be worked out even in the absence of a law, it may not be possible to secure integration in the long-run, since most government departments zealously guard their turf and strive to maintain the *status quo ante*, all the more so in the absence of an express and compelling legal requirement. The idea is not that one level of government displaces another, but that an atmosphere for co-operative coastal management is created, and here coastal legislation can play an important role. In fact, a coastal law can create an umbrella agency to implement ICZM and assign roles to the heads of major departments that have stakes in the coastal zone to sit on the body as members.⁸⁷ Such an approach can help achieve integration and, by providing for multi-stakeholder participation, can also foster representativeness.

⁸⁴ James A Ballentine, *A Law Dictionary* (New Jersey: The Law Book Exchange, Ltd, 2005) *sub verbo* “*ignorantia juris non excusat*.”

⁸⁵ Cullinan, *supra* note 2 at 10.

⁸⁶ *Ibid* at 8.

⁸⁷ For instance, the *Belize CZMA*, establishes a Coastal Zone Management Authority, an Advisory Council and a Coastal Zone Management Institute. See *Coastal Zone Management Act*, (Belize), No 5 of 1998 [*Belize CZMA*]. The *Barbados New Coastal Zone Management Act, 1998*, provides that the National Conservation Commission has to prepare a draft coastal zone management plan and a draft order delimiting a coastal zone management area. *Barbados CZMA 1998*, *supra* note 82.

Additionally, a coastal law can help secure increasing roles for the government by streamlining and coordinating the management process. In fact, a coastal law would emerge as the expression of a resolute commitment by the state to protect and preserve life and property in line with the principle, that *salus populi est suprema lex* (public welfare is the highest law) and to protect, preserve and restore, degraded coastal ecosystems and marine habitats as part of good stewardship. However, coastal management is no longer the exclusive prerogative of the government. A variety of private players, corporate houses, tourist operators, right down to the artisanal fisher have stakes in the coastal zone. In several coastal countries, like those in South Asia, there is asymmetry in power relations between these players, and this factor cannot simply be ignored in coastal management. By providing an environment for effective coordination between all stakeholders avoids attrition, a legal framework prioritizes the divergent interests at play in the coastal zone, sets right asymmetries in power relations, and eliminates rent-seeking opportunities.

All too often have decisions been pushed down the throats of local communities by external managers and coastal bureaucracies who have no understanding of the ground realities. A coastal law can provide for local participation and engagement and help tap a vast reservoir of knowledge and practical experience into ICZM programmes, which can then become community-oriented. Public participation in ICZM affords greater legitimacy and will produce more tangible on-the-ground results. In fact, it must not be forgotten that many significant gains in natural resources management and conservation have been achieved by empowering local communities, instilling in them a sense of ownership and providing them with considerable decision-making powers and opportunities. These do, nonetheless, run a threat of non-inclusiveness, as is the case in South Asia, where certain communities (due to caste dynamics) and women may be excluded from management. In this regard, a coastal law can serve as an instrument of empowerment (promoting affirmative action) due to the inclusive nature of its mandate

by securing the involvement of coastal communities and residents in the management process in terms of their guaranteed rights.⁸⁸

At its core, coastal management is all about regulating human behaviour in relation to the coastal environment, and the absence of a dedicated legislative framework can lead to a situation of ineffective regulation. Coastal residents may indulge in unsustainable activities that can damage the coastal ecosystem, reducing its resiliency and thereby affecting the larger community. For instance, harmful chemicals may be dumped into the coastal waters or people may overharvest fish stocks or carry out other destructive practices, like cyanide poisoning.⁸⁹ Maintenance of environmental quality is critical for coastal health and maintaining the coast's aesthetic qualities. As well, some of the uses of the coastal zone may have to be prioritized and restrictions imposed on development of the coastal zones.

In all of these potential situations, it would be necessary that such actions be rewarded with punishments, (in certain cases, incentives can be offered to goad people to desist from acts harmful to the environment) as they affect larger societal interests. By generating a list of prohibited acts with attendant sanctions, a coastal law can discipline the diverse interests and ensure that they act to further sustainable coastal development. In other words, due to the complexities of the issues raised, coastal zone management has to be based on rule of law,⁹⁰ and here a system of sufficiently punitive penalties can ensure better compliance.

As the Indian experience discussed in chapter three points out, in the absence of a well-drafted coastal legislation, litigation will become an increasingly common method to resolve coastal related disputes, and many of the gains that could be secured can be diminished due to the inability of the judicial process to appreciate the nuances of sustainable coastal development. An important strength held out by a coastal law is that it facilitates recourse to judicial review of executive actions in terms of the parameters

⁸⁸ See generally *Resource Management Act, 1991*(NZ), 1991/69 [NZRMA]; *SA, Integrated Coastal Management Act*, *supra* note 61.

⁸⁹ There are conflicts in the coastal zone between artisanal and industrial fishers, shrimp farmers and paddy cultivators, shrimp farmers and local communities, fishers and shrimp fry collectors in Bangladesh. See Dipak Kamal, *Biodiversity Conservation in the Coastal Zone of Bangladesh* (MMM Thesis, Dalhousie University, 1999) [unpublished] at 83.

⁹⁰ Beckman & Coleman, *supra* note 1 at 521.

established by the coastal law.⁹¹ The judicial process tends to be more organized when it is based on legislation. Coastal zone management implies that discretionary decisions by the government be subjected to judicial scrutiny in terms of the coastal law. A legal framework can help create synergetic relationships between the different stakeholders so that conflicts of interest are reconciled.

8.3.2 Weaknesses

As far as the downside is concerned, when ICZM flows from a legal framework, it generally becomes structured and less flexible. Even though it is generally the role of ICZM plans to reflect current realities, an ICZM plan can go only thus far as what the legislation mandates. Accordingly, a coastal law cannot remain static but must evolve and adapt according to changes in the natural environment and in the human sphere. This inherent inflexibility of law can be a potential barrier to hindering the realization of adaptive management. Again, the possibility of carrying out far-reaching changes to coastal legislation in light of new challenges and opportunities will be less, as it can involve the lengthy process of carrying out amendments.⁹²

Designing laws with aspirational and laudable goals does not mean that laws actually accomplish what was intended. Merely enacting a coastal law will not *per se* resolve the problem of degraded coastlines and adapt to climate change impacts. Ultimately, it boils down to an issue of effective implementation of the legal mandate to prevent undesirable outcomes.⁹³ Implementation of normative prescriptions is necessary to induce good coastal governance and to push implementation concerns onto center stage. But effective implementation is only a part of the problem; the first step (and the concern of this study) is the need for a sound normative foundation to engender and promote ICZM programmes and coastal climate change adaptation.

A tangible law and its associated principles may lead to disputes and judicial interference in the coastal zone management process. While judicial intervention has merits, it can also prove disadvantageous and may, in certain situations, lead to

⁹¹ *ICZM Protocol*, *supra* note 82, art 14(3).

⁹² For instance, only two amendments have been carried out to the Sri Lanka's coastal management statute in its nearly three-decade existence. In sharp contrast, India's *Coastal Regulation Zone Notification, 1991*, which is a piece of delegated legislation, in its two decade existence has seen nearly 25 amendments. For more details, see Ch 3, Parts 3.2.1 & 3.2.4.

⁹³ See *supra* notes 66-75 and accompanying text.

convoluted litigation that consumes time and resources and renders the process inchoate, expensive and ineffective.⁹⁴ Law has the potential to facilitate the ICZM process as well as the capacity to inhibit it.⁹⁵ As pointed out earlier, ICZM is inter-disciplinary and multi-dimensional in nature, and involves the three areas of management, science, and the law. Accordingly, coastal law drafting is a highly technical and specialised process that requires a finely-tuned balance between these three disciplines. An inappropriately drafted legislation will not only hamper the process of ICZM implementation but may eventually lead to a situation where the law is used in a manner that does not conform to the spirit, thereby derailing it.⁹⁶

Perhaps the most unavoidable weakness that can disrupt ICZM implementation via a coastal law is constitutional dynamics. Indeed, this factor has led to stagnation of ICZM efforts in several countries.⁹⁷ In federal systems, it is the constitution that determines the nature of relations between the national and subordinate (provincial and/or local) governments and the contours of coastal governance apparatus. In most of the federal constitutions examined, and even in unitary systems, a daunting challenge in enacting a coastal law relates to the constitutional division of powers and the absence of a specific legislative head of power on coastal zone management in the enumerated lists.⁹⁸ Different facets of coastal zone management (pollution, fisheries, water sharing, property, land-use planning in the coastal zone, oil and gas reserves, tourism, major and minor ports, etc.) are divided between the federal and provincial governments and in certain cases some of these may even be reserved to local self-governments.⁹⁹ Consequently, there is no coordinated coastal legislation or coastal policy. Rather, coastal zone management appears to be sourced on a fractured legal response of a complex mix of legislation, plans and policies administered at different levels.

⁹⁴ For more details on judicial process and coastal management in India's context, see Ch 3, Part 3.2.1.

⁹⁵ See generally John Gibson, "Integrated Coastal Zone Management in the European Union" (2003) 31 *Coast Mgmt* 127.

⁹⁶ A classical example is India's coastal law. See Ch 3, Part 3.2.1.

⁹⁷ For more details regarding constitutional dynamics and its impact on coastal management, see generally Ch 7.

⁹⁸ *Ibid.*

⁹⁹ See generally *NZRMA*, *supra* note 88.

As well, in most cases, the management of the landward component of the coastal zone falls within the legislative competence of the states/provinces while the seaward component is generally within the legislative competence of the federal government. The power of the state/provincial and local governments often does not extend into the sea areas off the coast. Even if it does, the jurisdiction of the state/provincial and local government usually varies between a few hundred meters to three nautical miles. As seen in the previous chapter, an essential aspect of ICZM is spatial integration, i.e., integrating the management regimes of the land-sea continuum. Since, the jurisdiction over these two areas falls within the competence of two or possibly even three levels of government, it may be extremely difficult to implement spatial dimension to coastal management.

8.3.3 Opportunities

Ossifying the multi-dimensional policy agenda of ICZM in terms of a coastal law can help offset inertia and apathy in coastal management and set an ICZM process for sustainable coastal development in motion. An important opportunity held out by an ICZM process is that it helps promote the development of adaptive capacities to respond to SLR and other climate change impacts.¹⁰⁰ This is an extremely important development, given that coastal climate change adaptation in most developing countries is presently restricted to the building of sea walls and placing boulders to counteract a rising sea.¹⁰¹ A coastal law is not merely natural resources management or environmental legislation but has a social welfare dimension, particularly in developing economies that depend on coastal resources to sustain and boost their economy. Another important opportunity afforded by a coastal law is that it can trigger conservation imperatives in relation to specific coastal resources. For instance, it can spur the management of ground water aquifers, coastal wetlands and mangroves.¹⁰² Since ICZM implies spatial integration, the legislation can facilitate close interlinks with other management tools like marine spatial

¹⁰⁰ For the South African experience on the point, see Ch 7, Part 7.3.3.4.

¹⁰¹ See Ch 3, note 197 and accompanying text.

¹⁰² For instance, see *The Coastal Regulation Zone Notification* (N, SO114(E) 1991, India) [CRZN, 1991]; *Coastal Regulation Zone Notification* (N, SO19(E), 2011, India) at 4 [CRZN, 2011]. They contain provisions that regulate the extraction of groundwater from the coastal zone. In addition, several of the coastal states have enacted their own groundwater management legislations. For instance, see *The Kerala Ground Water (Control and Regulation) Act 2002* (No 19 of 2002, India), *The Karnataka Ground Water (Regulation and Control of Development and Management) Act, 2011* (No 25 of 2011, India).

planning.¹⁰³ It is worth recalling some of the considerations of chapter three, where it was shown that rivers play a major role in conserving the health of estuaries and deltas and therefore linkages may also have to be drawn with river management.¹⁰⁴ A coastal law provides an opportunity to trigger action on these fronts as well.

8.3.4 Threats

Most threats that impair the effectiveness of a coastal law are those that are germane to an ICZM process. Change is constant in coastal zones: What is land today can become submerged tomorrow, and therefore it is extremely difficult to lay down hard and fast rules regarding coastal environmental management. Furthermore, as coastal laws have to operate in the foreground of uncertain variables, such laws, along with the ICZM process, have to be based on good science,¹⁰⁵ yet this is rarely the case in developing countries. The lack of sound scientific input emerges as the most threatening challenge to the stability of an ICZM legal framework.¹⁰⁶ Another related threat is that ICZM implementation requires a cadre of officials knowledgeable in the ICZM process. Embedded in adaptive management, ICZM implementation requires constant monitoring based upon ground realities, which, as stated above, keep changing. Accordingly, the officials who are tasked with the duty to implement the ICZM process should have the expertise to be able to lead, monitor, and steer the process through uncertainties and over longer time scales to produce tangible results. This requires that the pool of officials who are deputed for the task be properly trained in the implementation aspects of ICZM, which is rarely the case.¹⁰⁷

In South Asia, there are no dedicated programmes on ICZM education, which has considerably weakened the development of ICZM capacity in this region. As well, transfer policies of government can affect the process, as trained officials may be

¹⁰³ EC, *Proposal for a Directive of the European Parliament and of the Council Establishing a Framework for Maritime Spatial Planning and Integrated Coastal Management* [2013] 0074 (COD) at 8 [*Directive for MSP and ICM*].

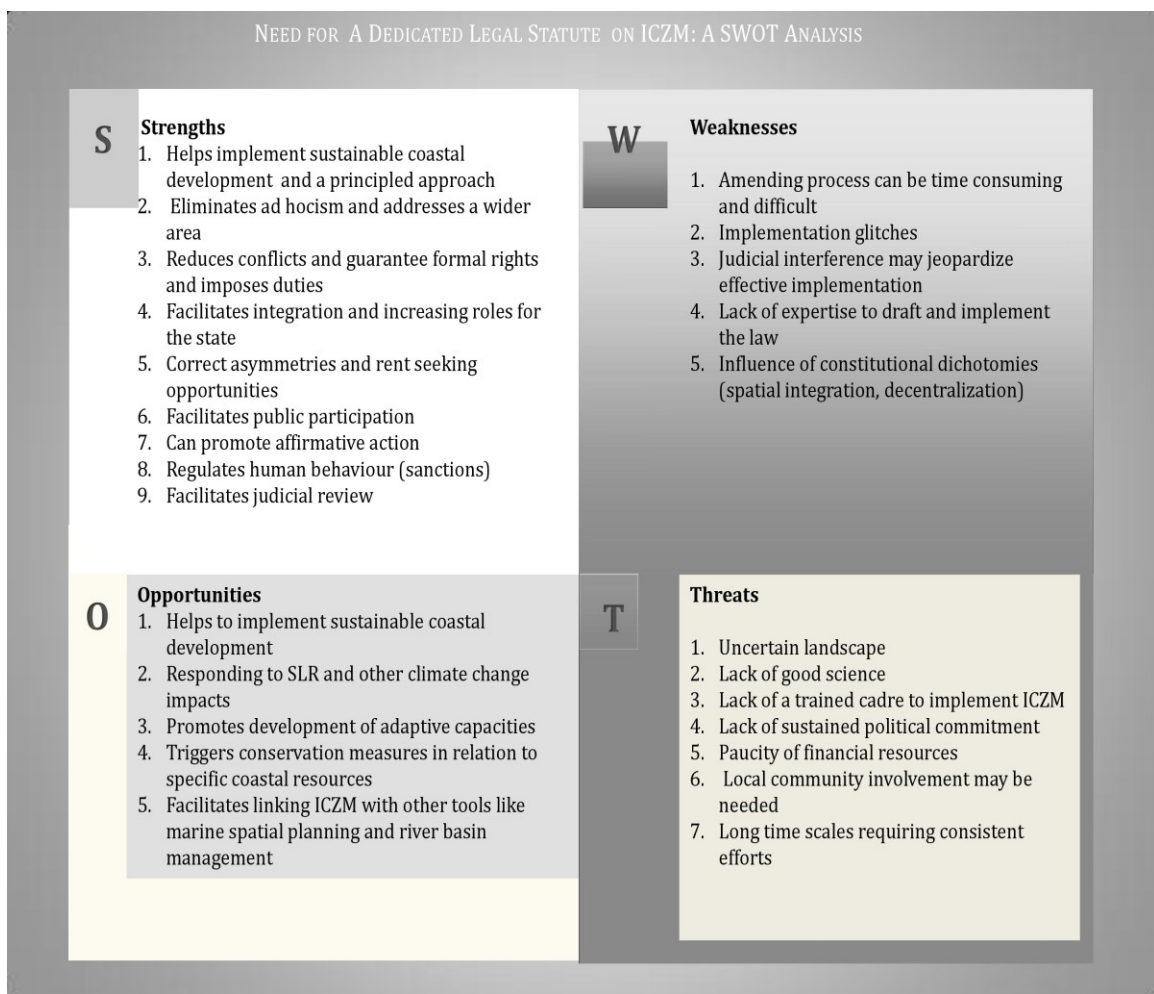
¹⁰⁴ For instance, see *SA, Integrated Coastal Management Act*, *supra* note 61, s 33 (calls for the creation of the National Estuarine Management Protocol and estuarine management plans).

¹⁰⁵ For instance, see Belize CZMA providing for the creation of the Coastal Zone Management Institute to conduct studies on marine science and to support the University of Belize in providing courses and educational programmes related to the coastal zone. *Belize CZMA*, *supra* note 87, ss 8, 10.

¹⁰⁶ See generally Biliiana Cicin-Sain & Robert W Knecht, *Integrated Coastal and Ocean Management: Concepts and Practices* (Washington DC: Island Press, 1998) ch 7.

¹⁰⁷ For instance, see *ICZM Protocol*, *supra* note 82, art 15 (emphasizing the training accept).

transferred to other jobs, leaving programmes in the lurch midway. Other factors that can potentially derail the ICZM process are the lack of adequate funding and sustained political support.¹⁰⁸ Since lawmakers require tangible results on shorter scales to keep their constituencies in good humor, and as the ICZM process is based on longer time scales, committed political support may wane and thus impair ICZM implementation.¹⁰⁹ Even in coastal states that do not have dedicated coastal laws, coastal management is embedded within existing legal structures. Accordingly, there is the danger that a coastal law may be frowned upon as it may be seen as introducing yet another new layer of regulatory complexity.



¹⁰⁸ Cicin-Sain & Knecht, *supra* note 106 at 125-29 & 166-68.

¹⁰⁹ Lucia Fanning, "Evaluating Effectiveness of ICZM: Identifying and Addressing Ongoing Challenges" (Lecture in Integrated Coastal Zone Management, LAWS 2041.03 delivered at Schulich School of Law, Dalhousie University, Winter Term, 2009-2010, 30 March 2010), [unpublished].

Table 3: Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis on the Importance of a Legal Framework to Support ICZM

This SWOT analysis served to highlight some of the strengths that can accrue to a coastal management process by enacting a dedicated coastal statute. It is also evident that the enactment of a coastal law opens the doors to several opportunities, the most important of which is the development of climate change adaptation on several other fronts. At the same time, while there are threats and weakness, these are not insurmountable. In sum, irrespective of whether implemented by statutory or non-statutory means, it is clear that law is integral to an ICZM process and there is a strong case to implement ICZM by basing it upon a dedicated coastal statute.

The principal purpose of this chapter is to explain the role of law as a progressive force to implement ICZM methodology. The discussion and the SWOT here clearly answer the central research question that this study raises, namely whether law and legal frameworks are essential cogs to work an ICZM programme. From the time of its design to full implementation, ICZM involves and attracts legal questions and issues. In responding to and resolving these questions and issues, a coastal law would balance environmental protection, human development, coastal climate change adaptation and, where relevant, even mitigate through the ICZM methodology to move towards more sustainable forms of coastal development.

Coastal law-making to operationalize ICZM is by far a superior approach to help stem the accelerating degradation of the coastal environment and help countries and regions adapt to SLR and other climate change impacts. Indeed, a dedicated coastal law statute is a valuable springboard that aids the establishment of a management system to support an integrated approach to managing human uses of coastal areas, facilitate the development of resilient coastal communities and ecosystems, and promote adaptation to SLR and other climate change impacts to achieve the overall goal of sustainable coastal development. In sum, a legal framework that facilitates the ICZM process is of utmost importance if any sustained ICZM effort is to succeed. The preamble to the South African ICM law reiterates these aspects when it observes that

the conservation and sustainable use of the coastal zone requires the establishment of an innovative legal

and institutional framework that clearly defines the status of coastal land and waters and the respective roles of the public, the State and other users of the coastal zone ... facilita[ting] ... a new co-operative and participatory approach to managing the coast.¹¹⁰

To recapitulate some of the important points that have emerged in terms of the need for a coastal law, it is clear the principal rationale behind an ICZM law is to “establish a governance system that enables, facilitates and supports an integrated approach to managing human uses of coastal areas.”¹¹¹ In playing a catalytic role in ensuring coastal sustainability, it creates new institutions and provides a blueprint to sustain a symbiotic relationship between humans, the coastal environment and its resources. Moreover, it seeks to preserve a conservation ethic and sustain the myriad of interactions that take place in the coastal environment between humans and the environment and to streamline the predominantly sectorally organized administrations and coastal management efforts in a seamless web to move towards sustainable coastal development. Specifically, a coastal law offers better prospects to persist with an ICZM programme, as it helps to implement the substantive principles and procedural rules to work an ICZM process at different levels and scales and create synergies between multiple stakeholders and sectoral responses through new institutions and processes and facilitates conflict management. It also accommodates and facilitates coastal climate change adaptation, taking into account coastal hazards and adaptive capacities of coastal communities. In short, there is considerable scope for a coastal legislation to underpin the ICZM process, as such a law would enable a management process to proceed on the basis of specific legal language.

8.4 ICZM LAW THROUGH THE AGES: WHERE FROM HERE?

With its emphasis on problem solving, ICZM provides a blueprint that delineates a framework prescribing how humans should interact with the coastal environment in an ecologically sustainable fashion. As mentioned earlier, since governing human behaviour in relation to the coastal zone lies at the heart of an ICZM process and law is one of the central forces to regulate human behaviour, it is natural for coastal states to enact coastal

¹¹⁰ SA, *Integrated Coastal Management Act*, *supra* note 61, pmb1.

¹¹¹ Cullinan, *supra* note 2 at 9.

legislations or re-engineer their coastal laws to sustain an ICZM process.¹¹² Consequently, there has been proliferation of legislative reform initiatives in several countries to support the implementation of ICZM programmes.¹¹³

As can be deduced from the different chapters and the national reports on the state of the coastal management, while the catalogue of problems that affect the coastal environment are more or less similar, differences arise in terms of the degree of these impacts, such as the environmental problems that confront the coastline, climate change impacts, variations in SLR, population pressures, the dependence on coastal resources for economic development, etc. Accordingly, the legal responses vary from country to country, both in terms of the nature and scope of the legislations and the administrative apparatuses established to enforce the legal mandate. It is also apparent that there are three primary phases in the development of coastal law. In the first phase, extending from the enactment of the first coastal law, the US federal *Coastal Zone Management Act, 1972*, to the *Sri Lankan Coast Conservation Act, 1981*, right down to the Rio Earth Summit of 1992, the emphasis was on highlighting the importance of coastal law and its emergence as a tool distinct from environmental law to facilitate the management of a composite area and the conservation of the environment and resources found therein. These coastal legislations seek to implement integration by providing for the creation of a coastal zone management authority (sometimes for more than one authority) and the development ICZM plans.¹¹⁴ Recourse is also had to the punitive role of law to secure compliance with its terms.¹¹⁵ More importantly, some of these coastal laws provide for land-sea integration as well.¹¹⁶

¹¹² “[I]ntegrated coastal management should be an evolving process ... that seeks to co-ordinate and regulate the various human activities that take place in the coastal zone in order to achieve its conservation and sustainable use.” *SA, Integrated Coastal Management Act*, *supra* note 61, pmb. Penal sanctions can be imposed for those who violate the law. *Ibid.*

¹¹³ For national and regional experiences on coastal law making, see Chs 3, 7 & 9.

¹¹⁴ For an overview on how coastal laws lead to the preparation of ICZM plans, see generally Ch 7. For more details on how Sri Lanka's coastal law prompts the development of ICZM plans, see also Ch 3, Part 3.2.4.

¹¹⁵ For instance, see *Coast Conservation Act 1981* (No 57 of 1981, Sri Lanka), s 29 [*Sri Lanka CCA 1981*].

¹¹⁶ For instance, see *ibid*, s 42 (defining coastal zone to mean “that area lying within a limit of three hundred metres landwards of the Mean High Water line and a limit of two kilometers seawards of the Mean Low Water line ...”).

With the Rio Earth Summit, which underscored the importance of sustainable coastal development as the ultimate objective of all our efforts in the coastal zone and the central role played by ICZM in its attainment, we enter the second stage of coastal law development. In this phase (1992-2013), while continuing to build on earlier efforts, the objectives of ICZM were re-cast as achieving sustainable development goals and adopting a principled approach to coastal management. There are several coastal legislations that fall into this mould and some of the coastal laws developed in the first phase were re-engineered to reflect sustainability. A classic example of a coastal law that advances sustainable coastal development is the South African ICM Act.

While continuing to layer and build upon earlier initiatives, the accent in the third phase is on linking ICZM with other management initiatives like marine spatial planning, thereby broadening the ambit considerably to facilitate Integrated Coastal and Oceans Management or Coastal and Marine Spatial Planning. Even though rudiments of the third phase can be seen in Canada's *Oceans Act, 1996* and the UK *Marine and Coastal Access Act 2009*, and received concrete form with the establishment of the it is the proposed EU Directive on Marine Spatial Planning¹¹⁷ that specifically heralds the third epoch, since earlier initiatives had discounted the ICZM element. The overwhelming majority of legislative approaches straddle between the first and second phases and it may take a number of years for the majority of nations to graduate to the third phase because they already find implementing ICZM daunting.

¹¹⁷ EC, *Proposal for a Directive of the European Parliament and of the Council Establishing a Framework for Maritime Spatial Planning and Integrated Coastal Management* [2013] 0074 (COD).

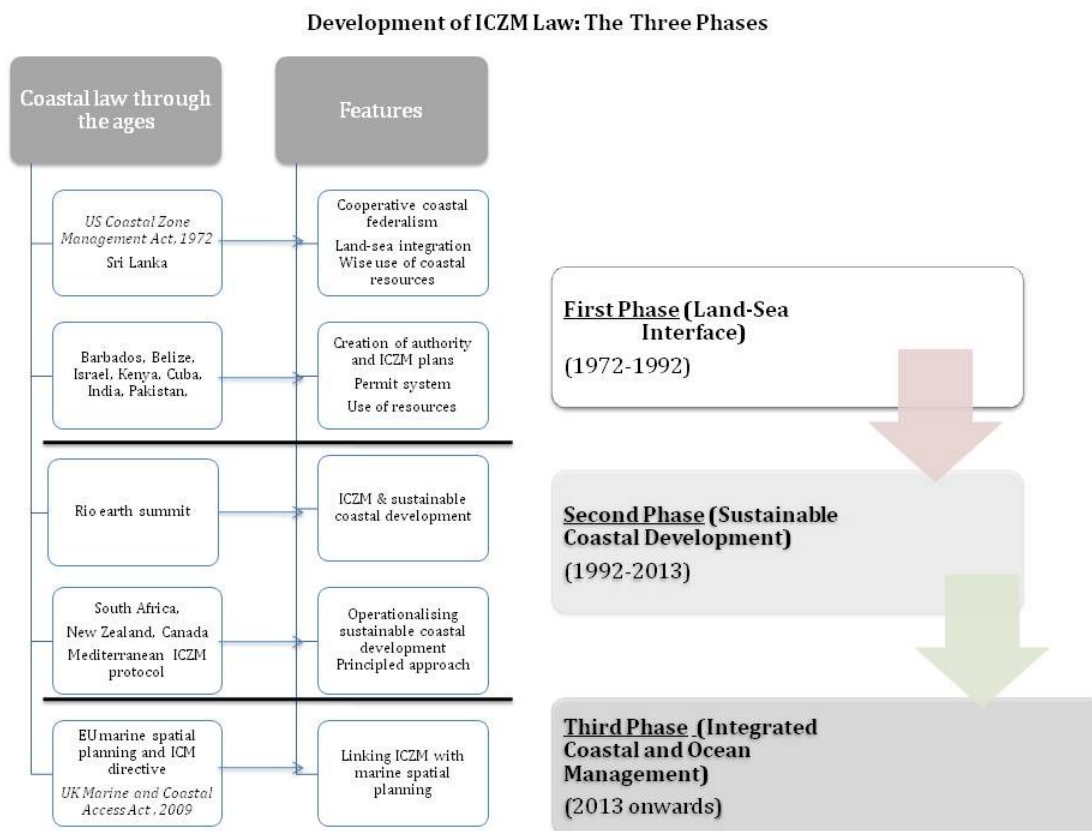


Figure 5: The Three Phases of ICZM Development

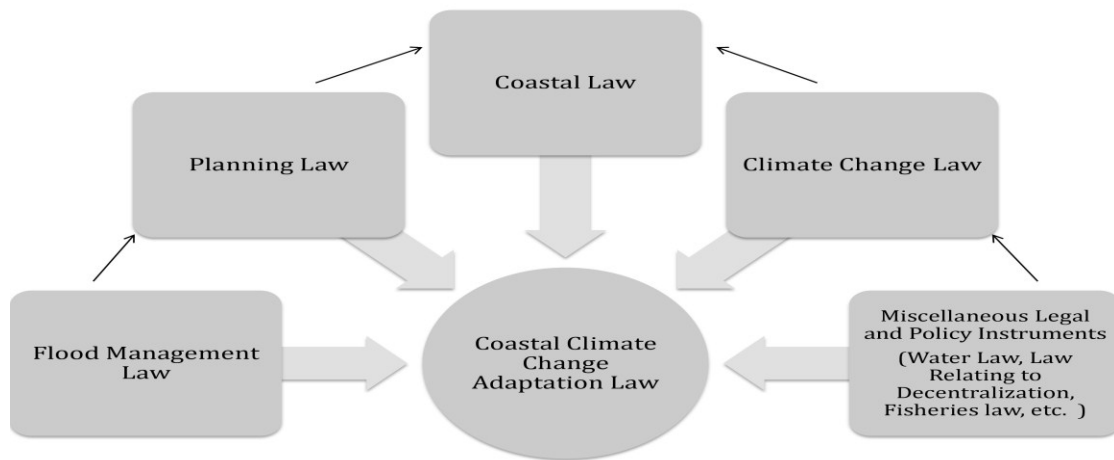
Another notable aspect is that coastal climate change adaptation law is a generic term that encompasses a raft of legislations broadly groupable under four heads, namely, climate change legislation, planning legislation, flood management legislation and coastal legislation and several other legal and policy instruments also come in handy.¹¹⁸

Some countries have specific climate change legislation.¹¹⁹ These mostly deal with climate change mitigation, and they are set at a high level of generality and rarely do they cover coastal climate change risks. Still legislations that fall into this genre do create an

¹¹⁸ Water laws and fishing laws may have relevance to coastal climate change adaptation. An example of a Water Law relevant to CCCA is the *Andhra Pradesh Water, Land and Trees Act, 2002* incorporating mandatory provisions on rain water harvesting, groundwater management, improving tree cover, surface water management, etc. See generally (No 10 of 2002, Andhra Pradesh, India).

¹¹⁹ For instance, see *Climate Change Act 2010* (Vic); *Climate Change (State Action) Act 2008* (Tas); *Climate Change and Greenhouse Emissions Reduction Act 2007* (SA); *Climate Change Act 2008* (UK) [CCAUK].

atmosphere that can spur CCCA actions.¹²⁰ As far as planning legislations are concerned, these may also not explicitly refer to climate change impacts, nevertheless, these laws may indirectly address the point by requiring that coastal climate change risks be considered in planning decisions.¹²¹ However, in certain situations the planning instruments may be more explicit in providing express rules to respond to SLR and coastal hazards.¹²² Again flood management legislations may also be relevant to CCCA law as it may address the point of coastal flooding.¹²³ Similar to climate change, flood management and planning law, coastal legislations (evident from the case studies step out in the previous chapter) may also not necessarily consider all possible dimensions posed by climate change risks and provide an itinerary of all appropriate CCCA actions. Still, coastal laws by virtue of the fact that it exclusively deals with the coastal environment and which unlike the other branches plays a major role in enhancing the adaptive capacities of coastal communities renders it the keystone of this broad legislative canvas to facilitate CCCA actions. Therefore it is necessary to integrate this broad legislative canvass for more enhanced coastal climate change adaptation actions.



¹²⁰ CCAUK, *ibid*, part 4.

¹²¹ For instance Australia's *Draft Coastal Protection State Planning Regulatory Provision: Protecting the Coastal Environment October 2012*, contains measures to deal with SLR and coastal hazards and traces its origin to the *Sustainable Planning Act, 2009*. See generally Australia, *Draft Coastal Protection State Planning Regulatory Provision: Protecting the Coastal Environment October 2012* (Brisbane Qld: Dep't of State Development, Infrastructure and Planning, 2012).

¹²² *Ibid*.

¹²³ *Flood and Water Management Act, 2010* (UK), c 29, s 7 (providing for a national flood and coastal erosion risk management strategy for England).

Figure 6: The Elements of Coastal Climate Change Adaptation Law

In fact the most important element discernable from the US federal *Coastal Zone Management Act, 1972* to the proposed 2013 EU Directive on Marine Spatial Planning and ICZM is the express or implied recognition that SLR is a major issue that can hamper sustainable coastal development objectives.¹²⁴ Some of the legislative initiatives examined previously expressly recognize the problems of climate change and SLR and provides for the development of specific tools such as zoning,¹²⁵ setback lines,¹²⁶ etc. In other initiatives, the response strategy is camouflaged by the subtleties of the text, for example, coastal hazards,¹²⁷ coastal erosion,¹²⁸ coastal risk management,¹²⁹ etc. which are interpreted broadly to include SLR. While it is possible to respond to SLR by treating it as a sub-set of coastal hazards and coastal erosion, these can also impose some significant limitations as SLR and coastal climate change adaptation requires a composite management strategy.

A coastal legislation need not necessarily detail all aspects relating to coastal climate change adaptation. Specific references may be limited to only a few key provisions. Particularly critical is the legal requirement that climate change and SLR be taken into account when preparing coastal zone management plans.¹³⁰ In addition, the coastal legislation may place definite limitations on the ability of the state/private property owners to indulge in concrete fortification of the coasts,¹³¹ provide preference to

¹²⁴ For instance, see Pub L No 109-58 (codified as amended at 16 USC §1451-1465 §1451(1) (2005)) (the congress finds that “[b]ecause global warming may result in a substantial sea level rise with serious adverse effects in the coastal zone, coastal states must anticipate and plan for such an occurrence.”); see also *ibid*, §1452(2)(B); see also *Directive for MSP and ICM, supra* note 103, art 8(2)(f) (adaptation to climate change) & art 8 (integrated coastal management strategies to consider adaptation to climate change).

¹²⁵ For instance, see generally *CRZN, 1991, supra* note 102; *CRZN, 2011, supra* note 102.

¹²⁶ For instance, see *SA, Integrated Coastal Management Act, supra* note 61, s 25 (dealing with establishment of coastal set-back lines).

¹²⁷ *Coastal Protection Act 1979* (NSW), s 55C(1)(f) [*NSWCPA*].

¹²⁸ *Sri Lanka CCA 1981, supra* note 115, s 42 (defining coast conservation to mean the protection and preservation of the coast from sea erosion or encroachment by the sea).

¹²⁹ *NSWCPA, supra* note 127, s 55C.

¹³⁰ For instance, see *Coastal Protection and Management Act 1995* (Qld), ss 20-21(2) (calling upon the minister to consider the effect of climate change on coastal management in preparing the coastal plan).

¹³¹ For instance, see *NSWCPA, supra* note 127, part 4C (providing for the constitution of temporary coastal protection works in the form of sand bags).

soft armouring (due to the obvious environmental benefits),¹³² recognize a version of rolling easements to facilitate inland migration of ecosystems,¹³³ impose overlay zoning requirements,¹³⁴ require that future rises in sea level be taken into account in the design features and in the implementation of a project so that it will not be rendered unfit or contribute to hazards during its lifespan due to SLR and other coastal hazards,¹³⁵ emphasize on sediment bypassing,¹³⁶ provide for permitting requirements¹³⁷ and environmental impact assessments in situating development,¹³⁸ and ensure the maintenance of public access to the foreshore.¹³⁹ As part of a holistic response to climate change and SLR, the coastal law can also require the state to take measures to increase natural resiliency of coastal ecosystems to ensure living and vibrant shorelines. In this regard, the coastal law can specify protection of habitats, provide for the creation of marine protected areas and their networks to protect stressed species,¹⁴⁰ impose restrictions on coastal aquaculture and fishing practices that can degrade the environment,¹⁴¹ provide for the maintenance of water quality and controls on marine pollution,¹⁴² utilise penal provisions to secure coastal environmental protection (prohibiting the destruction of corals),¹⁴³ etc. Such measures help to reduce anthropic stresses on coastal ecosystems and provides them with more windows to respond naturally to increasing sea surface temperatures and the lowering in the pH conditions (ocean acidification). All these seem to be the best possible ways to counteract the crises since, as explained earlier; climate change and SLR are steeped in uncertainty. In short, the coastal law emerges as an enabling legislation that can facilitate ICZM

¹³² See *ICZM Protocol*, *supra* note 82.

¹³³ For more on rolling easements, see Ch 7, Part 7.3.1.3.

¹³⁴ *SA, Integrated Coastal Management Act*, *supra* note 61, s 62.

¹³⁵ For a discussion on this topic in relation to Australia, see Ch 7, Part 7.3.2.

¹³⁶ US, Office of Ocean & Coastal Resource Management, Dep't of Commerce & State of Texas, *Combined Coastal Management Program and Final Environmental Impact Statement for the State of Texas* (Office of Ocean & Coastal Resource Management, State of Texas, 1996) at part II 6-20.

¹³⁷ *Sri Lanka CCA 1981*, *supra* note 115, s 14.

¹³⁸ *Ibid*, s 16.

¹³⁹ *SA, Integrated Coastal Management Act*, *supra* note 61, s 18 (designating coastal access land to secure public access to coastal public property).

¹⁴⁰ *Oceans Act*, SC 1996, c 31, s 35 (constitution of marine protected areas).

¹⁴¹ *NZRMA*, *supra* note 88.

¹⁴² *SA, Integrated Coastal Management Act*, *supra* note 61, s 69; see also *ibid*, ss 70-72; *NZRMA*, *ibid*, s 15.

¹⁴³ For instance, see *Barbados CZMA 1998*, *supra* note 82, s 22 (prohibition on harvesting of coral).

implementation, and this process should be moulded to facilitate *inter alia* coastal climate change adaptation as well.

Another proposition that emerges is that ICZM and its anchorage coastal law endorses coastal climate change adaptation and sustainable coastal development in two ways. The first is a more express and direct route, where the law may prescribe specific tools and measures to counteract the challenges posed by climate change and SLR.¹⁴⁴ Second, even if the law does not contain anything express and direct to deal with sea level rise, it can promote and build the adaptive capacities of coastal communities, increase the resiliency of coastal ecosystems, and reduce vulnerability by providing for efficient management of coastal areas, resources and ecosystems.¹⁴⁵ In this context, the relevance of a coastal law as social welfare legislation assumes greater significance.

In the coming years, SLR and other climate-change-related impacts (coastal hazards) are predicated to worsen. This portends that a large number of coastal states will have to devote resources to ensure enhanced management of the coastal areas and respond to coastal hazards. In fact, for many coastal countries (like those in South Asia), the mandate of the coastal law will have to go beyond a narrower view that focus solely on resource utilization and environmental impacts to the more boarder coastal climate change adaptation and sustainable coastal development. Already, SLR has catapulted the importance of ICZM as a central tool for sustainable development and coastal climate change adaptation like never before. Definitely, this aspect will emerge as the central focus of all management efforts, and coastal laws will have to necessarily provide for an appropriate legal environment to operationalize these efforts.

Most coastal countries and their legal and coastal management frameworks are perched at an interesting point in their evolution. As has been stated “[l]aws written in and designed for the 20th century will need to be updated to reflect new ideas about climate change in the 21st century.”¹⁴⁶ This is particularly true about coastal laws. And in preparing for the future, which is uncertain, it is possible that countries may loose several

¹⁴⁴ *SA, Integrated Coastal Management Act, supra* note 61. For a discussion on coastal climate change adaptation as embodied in a coastal law, see generally Ch 7.

¹⁴⁵ See *Barbados CZMA 1998, supra* note 82; *Sri Lanka CCA 1981, supra* note 115.

¹⁴⁶ US, California Natural Resources Agency, *2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008* (California Natural Resources Agency, [nd]) at 65.

current economic opportunities. Unfortunately, most coastal countries even while wanting to adapt to climate change impacts are unwilling to forsake these economic opportunities, ignoring the fact that these can in due course have high potential to place coastal communities, ecosystems, infrastructure and development in greater jeopardy. A precautionary approach and the principle of inter-generational equity would entail that in sprucing up their coastal laws, it is advisable for coastal countries to err on the side of caution, even if this pre-supposes prioritization and forsaking of certain development opportunities. In fact, this takes us back to one of the propositions alluded to in the part II based on the discussions in “Our Common Future” that in certain circumstances no-development can actually be a sign of development.¹⁴⁷ Only development (short- and long-term) that can respond to expected SLR and climate change impacts through risk-management minimizing future hazards, and augmenting adaptive capacities of coastal communities and maintaining the biological productivity of the coastal environment should be sited along the coast.

8.5 CONCLUSION

Even though ICZM has finally come of age, the coastal environments in most parts of the world continue to deteriorate. There is continuous loss of coastal biodiversity, persistence of poverty, loss of livelihood opportunities, and increasing pestilence. The challenges posed by climate change on coastal zones continue to loom like a Damocles sword over our heads to compound this negative image. It is within the context of this overall scenario that we have to appreciate the need for a coastal law to streamline ICZM implementation and secure coastal climate change adaptation. Moreover, if ICZM is to make its full contribution to sustainable coastal development, it is essential that coastal managers find practical ways to integrate gender and equity concerns, respect inclusiveness, reduce poverty, ensure food security, provide for greater citizen involvement in decision-making, improve coastal resilience, reduce vulnerability and provide for coastal climate change adaptation, within the scheme of the programme. And what better way to do so than through the instrumentality of law?

¹⁴⁷ See Ch 4, note 54 and accompanying text.

In drawing the foregoing sections together (namely, the theoretical justification for a coastal law, the SWOT analysis for a coastal law, and future trends in ICZM law-making) certain points emerge. First, a coastal law is definitely a harbinger of change for degraded coastlines and an essential prerequisite to propel the move towards sustainable coastal development. Legislation is key to an ICZM process, as it can help in the ordering of priorities, provide legitimacy, introduce oversight, seek to draw benefits from synergistic relationships that it creates between the stakeholders, level out inconsistencies and eliminate rent-seeking, ultimately streamlining the process and helping to resolve jurisdictional conflicts and prevent cross-sectoral decision making.

In essence, a coastal law regulates human behaviour and human interaction with the coastal environment, with the objective of promoting the wellbeing of existing and future generations of coastal communities. A coastal law helps to balance competing human demands relating to the use of the coast and its resources and provides a framework to resolve conflicts among coastal users and coastal management institutions through a co-operative and co-ordinated approach. In addition, it attempts to secure equitable access to the coastal environment and its resources. ICZM is based on fundamental sustainability principles, and as this chapter demonstrates, it is no exaggeration to state that an ICZM law helps to translate these principles into practice.

While simply enacting new coastal laws is hardly a guarantee that coastal management will be effective and sustainable in the long-run, a legislative reaction in the form of an omnibus legal framework does provide a minimum guarantee that contemporary coastal management decisions will start with a more integrated picture of the coastal zone, within which coastal climate change adaptation decisions can be predicated and implemented. Under the ICZM legal rubric, depending upon other factors there is an increase possibility that the efficacy of coastal management programmes can be increased considerably.

In the end, the time has come to identify and provide legal recognition to the essential principles and elements of an ICZM-friendly law (promotive of coastal climate change adaptation, environment protection and development) which the coastal nations in the South Asian region can utilize to enact/re-engineer their respective national-level coastal laws. In this regard, the national case studies (discussed in the previous chapters)

and these broad incantations on different facets of coastal law making provide sufficient fodder. Since the coastal countries of South Asia are each unique in terms of their national capacities to implement ICZM and coastal climate change adaptation, a regional level instrument that identifies the core legal principles/elements for a national coastal law seems to be the best way forward, as the next part will attest. In sum, logic and experience dictate that coastal South Asia and other coastal regions that face increasing environmental degradation and SLR need to resort to legislative means as a primary method to bolster management efforts, and that there is utility in underpinning an ICZM programme with a dedicated legal framework. Without adequate legal backing, ICZM is akin to a rudderless ship desperately trying to stay the course. The legal mapping in this chapter and the preceding one demonstrates that a dedicated coastal law that addresses coastal resources use and issues such as coastal hazards and SLR is definitely a suitable frame to support the ICZM management process and to overlay coastal climate change adaptation onto this process contributes to sustainable coastal development.

PART IV

NEW DIRECTIONS FOR COASTAL MANAGEMENT REGIONAL REGIME-BUILDING IN SOUTH ASIA

As described earlier, the coastal zone is a unique ecosystem that has distinct characteristics primarily due to the interaction of the landmass with the surrounding seas and oceans. Activities in one part of the coastal environment have the potential to impact other regions and it may not be possible to parcel coastal regions, water and ocean currents. In the process, the coastal environment of a particular country may be connected to others in the same region and sometimes even beyond. In certain cases, the rate of exploitation and degradation of natural resources may be so high or the impact of certain environmental harms so grave as in the case of climate change and SLR that the environmental damage that originates in one country can no longer be confined to its own borders. The possibility of spillovers negatively affecting the environmental quality of other countries is a high possibility. This increases the need and relevancy of regional regimes grounded in the socio-economic and political realities of the entire region to manage such issues. The objective of this part is to develop this theme further. Divided into two chapters, the first one, namely, chapter nine examines the state of regional coastal and marine cooperation in coastal South Asia and analyses lessons that can be drawn from other regional coastal management regimes on ICZM. Drawing from the previous parts of this study, chapter ten articulates a vision for a regional regime on ICZM for South Asia. It spells out certain elements that can inform the development of a prospective regional regime on coastal cooperation in South Asia.

CHAPTER 9

REGIONAL REGIME BUILDING ON ICZM AND COASTAL CLIMATE CHANGE ADAPTATION IN SOUTH ASIA

9.1 INTRODUCTION

Environmental regionalism is one of the pivotal approaches identified in the legendary Stockholm Conference, which recommended that "... the attention of Governments be drawn to the need to consult bilaterally or regionally whenever environmental conditions or development plans in one country could have repercussions in one or more neighboring countries."¹ The Stockholm Declaration emphasised that "[a] growing class of environmental problems, because they are regional or global in extent ... will require extensive cooperation among nations ... in the common interest."² The Brundtland Report reiterated this with its call for "[i]n some areas ... especially among developing countries, new regional and subregional arrangements will be needed to deal with transboundary environmental resource issues."³ Principle 27 of the 1992 Rio Declaration, the UNFCCC,⁴ CBD,⁵ Johannesburg Plan of Action,⁶ and the recently concluded Rio+20 reaffirmed the regional dimension of sustainable development and its complementary and facilitative role in translating sustainable development policies into action at the national

¹ "Recommendations for Action at the International Level" in UNGA, *Report of the United Nations Conference on the Human Environment held at Stockholm, 5-16 June 1972* (New York: United Nations, General Assembly, 1972) at 6C, recommendation 3.

² *Declaration of the United Nations Conference on the Human Environment*, 16 June 1972, 11:6 ILM 1416 [*Stockholm Declaration*], ¶7.

³ World Commission on Environment & Development, *Our Common Future* (Oxford: Oxford University Press, 1987) at 315.

⁴ For instance, see *United Nations Conference on Environment and Development: Framework Convention on Climate Change*, 19 June 1993, 31 ILM 849 (adopted at New York 9 May 1992) [UNFCCC], art 4(1)(b) (parties to implement regional programmes containing measures to mitigate climate change).

⁵ The CBD stresses the importance of regional cooperation among states, intergovernmental organizations and the non-governmental sector for conserving biological diversity and to ensure the sustainable use of its components. *United Nations Conference on Environment and Development: Convention on Biological Diversity*, 1993, 5 June 1992, 31 ILM 818 (entered into force 29 December 1993), pmbli; see also *ibid*, art 20(3) (developing country parties to avail of financial resources relating to the implementation of the CBD through regional channels).

⁶ "Plan of Implementation of the World Summit on Sustainable Development" in UN, *Report of the World Summit on Sustainable Development Johannesburg, South Africa, 26 August-4 September 2002*, A/CONF.199/20* (New York: UN, 2002) at 20, ¶4 (advocates strengthening institutional arrangements for sustainable development at the regional level).

level.⁷

Regional approaches to marine environmental protection have proven to be most useful because ocean resources and uses are inherently transboundary in nature.⁸ LOSC provides the necessary impetus to tackle marine environmental problems with a regional focus.⁹ Regionalism in marine environment protection has been nurtured under the aegis

⁷ UN RIO+20 United Nations Conference on Sustainable Development, *The Future We Want*, A/CONF.216/L.1*, 19 June 2012, ¶¶97-103.

⁸ Philip Saunders, “Maritime Regional Cooperation: Theory and Principles” in Mark J Valencia, ed, *Maritime Regime Building: Lessons Learned and Their Relevance for Northeast Asia*, vol 36, Publications on Ocean Development (The Hague: Martinus Nijhoff Publishers, 2001) 1 at 4.

⁹ *United Nations Convention on the Law of the Sea*, 10 December 1982, 1833 UNTS 397, 21 ILM 1261 (entered into force 16 November 1994) [LOSC], arts 61–70, 116–20, 122–23, 237, 311 & part XII. The LOSC can accommodate regional approaches to certain problems, including protection of the marine environment. Article 197 of the LOSC mandates cooperation between states “on a global basis and, as appropriate, on a regional basis, directly or through competent international organizations” and this is in relation to “formulating and elaborating international rules, standards and recommended practices and procedures consistent with this Convention, for the protection and preservation of the marine environment, taking into account characteristic regional features.” In addition, if the Arabian Sea and the Bay of Bengal can be characterised as semi-enclosed seas, Part IX of the LOSC assumes greater relevance. This is because rather than prescribing a single regime for the whole area, it can prompt the creation of at least two separate sub-regional regimes; one for the Arabian Sea and the other for the Bay of Bengal. In setting the agenda for co-operation, article 123 emphasizes the need for corporation between states bordering semi-enclosed seas in exercise of their rights and in the performance of their duties under the LOSC with regard to living resources, the marine environment and scientific research, either directly or through an appropriate regional organization. Even though article 123 uses the term ‘should’ and not the mandatory ‘shall’ as seen in article 197 of the LOSC, the article still retains relevance as it is clear that article 197 relates to the norm-making function of states, while article 123 is directed towards implementation of the norms. For more details, see Nilufer Oral, *Regional Co-operation and Protection of the Marine Environment under International Law: The Black Sea*, David Freestone, ed, 16 Legal Aspects of Sustainable Development (The Netherlands: Martinus Nijhoff, 2013) at 39. The importance of cooperation in protecting the marine environment has been stressed in ITLOS jurisprudence. In the MOX plant case, Ireland argued that by failing to share information and by refusing to carry out a proper environmental assessment with regard to the possible consequences for the Irish Sea arising out of the commissioning of the MOX plant, the United Kingdom did not cooperate with Ireland in protecting the marine environment of the Irish Sea and thereby was in breach of articles 123 and 197 of the LOSC. *In the Dispute Concerning the Mox Plant, International Movements of Radioactive Materials, and the Protection of the Marine Environment of the Irish Sea (Ireland v United Kingdom)*, Request for Provisional Measures and Statement of Case of Ireland (9 November 2001) (International Tribunal for the Law of the Sea) ¶¶56-81. In its order, the International Tribunal for the Law of the Sea called upon Ireland and the United Kingdom to cooperate by entering into consultations to exchange information, monitor effects and devise appropriate measures to prevent pollution of the marine environment which might ensue from the operation of the MOX plant. For the text of the order, see generally *The Mox Plant Case (Ireland v United Kingdom)*, 10, Order (3 December 2001) (International Tribunal for the Law of the Sea). Considering that the duty to cooperate is a fundamental principle in the prevention of pollution of the marine environment under Part XII of the LOSC and general international law, Malaysia and Singapore were directed to cooperate by establishing a group of independent experts to study the effects of Singapore’s land reclamation and to propose appropriate measures to deal with any adverse effects and to exchange information regarding possible risks on a regular basis. [See also](#) *Case Concerning Land Reclamation*

of the UNEP Regional Seas Programme.¹⁰ The first regional seas treaty was the 1976 *Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution*. Since then, 13 Regional Seas Programmes involving 143 countries and a complex network of treaties, protocols, action plans, institutional arrangements and trust funds have been established.¹¹

Climate change and SLR have far-reaching implications for the future development and progress of coastal South Asia. In fact, all these developing countries in relation to their coastal zones face the twin challenges of addressing the negative impacts of climate change through CCCA while at the same time promoting socio-economic development. However, as pointed out in chapter one, South Asia is one of the least integrated regions in the world. Several long-standing disputes have soured the spirit of co-operation and prevented concerted action to common challenges. This section explains the need for a regional framework on ICZM to help place South Asian coastal countries on the trajectory of SCD. In doing so, section 9.2 opens with a discussion of the history and the purposes behind the various institutional mechanisms presently available at the regional/sub-regional level in South Asia. It will then point out to some of the impediments that have practically stalled the development of a spirit of regional co-operation from a coastal management perspective. Critical here is the issue of transboundary water sharing, since the health of two of the world's largest deltas (the Indus and the Ganges-Brahmaputra) and consequently their respective coastal regions depend considerably on the quantity of water available to hydrate and de-salinate these deltas. Section 9.3 will explain the significance of a regional approach to ICZM implementation by drawing on the experiences of the Mediterranean and the European

by Singapore in and Around the Straits of Johor (Malaysia v Singapore), 12, Order (8 October 2003) 23 (International Tribunal for the Law of the Sea) ¶¶92, 106; Alan Boyle, "Globalism and Regionalism in the Protection of the Marine Environment" in Davor Vidas, ed, *Protecting the Polar Marine Environment: Law and Policy for Pollution Prevention* (Norway: Cambridge University Press, 2000) 19 at 22. Boyle also notes that the terms region or regional has not been defined in any convention text and points out that the term can be understood in three possible ways – formal, which focuses on the physical and geographical character, such as an enclosed or semi-enclosed sea; functional concentrating on the patterns of use like resource exploitation, navigation, fisheries, defence, and political based upon the decision of a group of states to cooperate, which also includes an element of geographical propinquity. *Ibid* at 26.

¹⁰ Julien Rochette & Raphaël Billé, "ICZM Protocols to Regional Seas Conventions: What? Why? How?" (2012) 36 Mar Pol'y 977 (ScienceDirect) [Rochette & Billé, "ICZM Protocols"].

¹¹ UNEP, *About*, online: UNEP, Home, About <<http://www.unep.org/>>.

Union. These regimes play crucial roles in influencing the development of national level ICZM responses and in adapting to SLR in their respective areas of operation. Section 9.4 explores some of the underlying precepts of the regime theory of international relations to explain state practice and will offers insights on why South Asia is so disaggregated and what factors can prompt the discursive forces and divergent interests of these coastal states to converge to further common objectives at least in terms of ICZM and CCCA implementation. In addition, the importance of a regional approach to ICZM and CCCA in South Asia is re-emphasised through a SWOT analysis in section 9.5.

9.2 REGIONAL AND SUB-REGIONAL FRAMEWORKS PROMOTIVE OF ICZM AND COASTAL CLIMATE CHANGE ADAPTATION AT THE SOUTH ASIAN LEVEL AND FACTORS THAT HAVE HAMPERED REGIONAL COOPERATION

9.2.1 Regional and Sub-Regional Frameworks on Coastal Management in South Asia

9.2.1.1 The South Asian Seas Regional Programme

It was to address issues relating to the accelerated degradation of the world's oceans and coastal areas through "sustainable management and use of the marine and coastal environment, by engaging neighboring countries in comprehensive and specific actions to protect their shared marine environment,"¹² that the United Nations Environment Programme (UNEP) in 1974 pursuant to the Stockholm Conference, launched the Regional Seas Programme. Since then, the UNEP has created 13 Regional Seas Programmes involving the participation of more than 143 countries.¹³ Generally, these different programmes function through an action plan, supported by a convention.¹⁴

In 1981, the South Asian countries established the South Asia Co-operative Environment Programme (SACEP) as an inter-governmental organization "to promote and support protection, management and enhancement of the environment in the

¹² UNEP, *Regional Seas Programme: About*, online: UNEP, Regional Seas Programme, About Regional Seas <<http://www.unep.org/regionalseas/>>.

¹³ *Ibid.*

¹⁴ *United Nations Environment Programme Mediterranean Action Plan for the Barcelona Convention*, online: UNEP/MAP <<http://www.unepmap.org/>>.

region.”¹⁵ At the request of the South Asian coastal countries, in the following year, the Governing Council of UNEP designated the South Asian Seas as an area for close collaboration between the UNEP, the SACEP, and the concerned governments for the formulation of an action plan for the environmental protection of this region under the banner of the Regional Seas Programme.¹⁶ The “Action Plan for the Protection and Management of the Marine and Coastal Environment of the South Asian Seas Region” or the South Asian Seas Action Plan (SASAP) was adopted in March 1995, and it entered into force in February 1997.¹⁷

All five coastal countries of South Asia participate in SASAP with SACEP serving as the Action Plan secretariat.¹⁸ Periodic meetings of representatives of the governments of member states review progress in the implementation of the action plan and they decide on future priorities as well as on the financial and institutional arrangements to support these activities.¹⁹ The primary intent of the SASAP “is to protect and manage the marine environment and related coastal ecosystems of the region in an environmentally sound and sustainable manner.”²⁰ Interestingly, it focuses primarily on four core areas: ICZM,²¹ oil spill contingency planning, human resource development, and the environmental effects of land-based activities.²² The document reiterates the endorsement that ICZM is “a priority element for environmentally sound and sustainable development

¹⁵ For an overview on the SACEP, see *About Us: An Overview*, online: SACEP, About SACEP, An Overview <<http://www.sacep.org/>>. For the text of the Colombo Declaration on the South Asia Co-Operative Environment Programme (SACEP), see *Documents: MoUs & LoAs/ Declarations*, online: SACEP, Documents: MoUs & LoAs/ Declarations, The Colombo Declaration On the South Asia Co-Operative Environment Programme (SACEP) <<http://www.sacep.org/>>. The Colombo Declaration on SACEP of 1981 and the articles of association of the SACEP set the legal foundation for this organisation. The organizational framework is as follows: a Governing Council, Consultative Committee, National Focal Points, Subject Area Focal Points, and the Secretariat. The Governing Council is constituted by Ministerial level representation.

¹⁶ *Action Plan for the Protection and Management of the Marine and Coastal Environment of the South Asian Seas Region*, ¶1, online: SACEP <<http://www.sacep.org/>> [SASAP].

¹⁷ *Ibid.*

¹⁸ *Ibid.*, ¶18.

¹⁹ *Ibid.*, ¶19.

²⁰ UNEP, *Regional Seas Programme: South Asian Seas – Governing Instruments*, online: UNEP, Regional Seas Programme, Non-UNEP Administered Programmes, South Asian Seas, Governing Instruments <<http://www.unep.org/>> [UNEP, *Regional Seas Programme*].

²¹ The following activities have been identified for staged implementation by South Asian member states, namely, coastal profiling; analysis and forecasting; definition of goals and strategies; integration of detailed plans and management policies, and finally implementation of plans. *SASAP*, *supra* note 16 at 7-8.

²² *Ibid.* at 9-11.

of marine and coastal areas in the region” and identifies certain activities for “staged implementation.”²³ Even though there is no regional convention to guide its actions, the SASAP follows existing global environmental and maritime conventions and considers the *United Nations Convention on the Law of the Sea, 1982* as its “umbrella Convention.”²⁴ Even after the adoption of the Action Plan under the SASP, only limited progress, if any, has been achieved in operationalizing ICZM in the member countries.²⁵ The reasons for this are easy to find, an important one being the absence of a specific regional convention and related protocols to lead the Action Plan.²⁶ In contrast, 10 out of the 13 Regional Seas programmes are guided by regional conventions.²⁷ For instance, the Regional Seas Programme for the Eastern African region²⁸ is guided by the *Nairobi Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Western Indian Ocean, 1985* (Nairobi Convention).²⁹ Consisting of

²³ *Ibid* at 7-8.

²⁴ UNEP, *Regional Seas Programme: South Asian Seas*, online: UNEP, Non-UNEP Administered Programmes, South Asian Seas <<http://www.unep.org>>.

²⁵ Even though a central pillar of the SASP, the lack of political will and commitment on the part of concerned states, has prevented the development of a regional regime on land based sources of marine pollution. Daud Hassan, *Protecting the Marine Environment from Land-Based Sources of Pollution: Towards Effective International Cooperation* (Hampshire: Ashgate Publishing Ltd, 2006) at 162.

²⁶ See *ibid*. The conventions provide the “key legal basis” for implementing the action plans. See Michael A Jacobson, “The United Nations’ Regional Seas Programme: How Does it Measure Up?” (1995) 23 *Coastal Mgmt* 19 at 21.

²⁷ Apart from the South Asia Seas, the East Asian Seas and the Northwest Pacific have no regional conventions. The East Asian Seas has an Action Plan for the Protection and Development of the Marine and Coastal Areas of the East Asian Region 1981 (revised in 1994) to guide actions and the Northwest Pacific has an Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region, 1994 to guide actions. For more details on conventions and protocols by regional seas area, see Jacobson, *ibid* at 22-23.

²⁸ Also referred to as the Western Indian Ocean, it extends from Somalia in the north to South Africa in the south, covering 10 states (five island states in the Western Indian Ocean and five mainland states). The contracting parties are Comoros, France, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, Tanzania and the Republic of South Africa. *Welcome to the Nairobi Convention*, online: UNEP <<http://www.unep.org/nairobiconvention/>>. Coastal South Asia enjoys many similarities with the Nairobi Convention Area, which is also an economically developing area extending to more than 5,000 kilometers of coastline, accommodating nearly 180 million people and is home to a wide range of coastal ecosystems. See Doris Mutta, “Nairobi Convention” (PowerPoint presented to the 1st African Regional Targeted Workshop for GEF IW Projects Rhodes University, Grahamstown, South Africa, April 2–4 2012). The fact that the parties to the Nairobi Convention are in the process of developing an ICZM protocol makes this regime endearing for the purposes of the present study.

²⁹ The Nairobi Convention was signed in 1985 and came into force in 1996. This convention was amended and adopted in April, 2010. For the text, see “Final Text of the Amended Nairobi Convention for the Protection, Management and Development of the Marine and Coastal

34 articles, the primary emphasis of the Nairobi Convention is pollution control (land based,³⁰ vessel-source,³¹ dumping,³² transboundary movement of hazardous wastes,³³ airborne pollution,³⁴) and bio-diversity protection.³⁵ In securing these interests, the Nairobi Convention spells out the need for co-operation,³⁶ environmental impact assessment,³⁷ and measures to prevent environmental damage due to engineering activities like land reclamation and dredging.³⁸ In addition, this convention emphasizes the need to develop rules to fix liability and compensation “for damage resulting from pollution of the Convention area.”³⁹ Another significant feature of the Nairobi Convention is that it recognises the threat of climate change and SLR.⁴⁰

Despite the beneficence of this treaty, as in many other marine regions, the coastal environment of the Nairobi Convention Area is fastly degrading due to human pressures and unsustainable development practices.⁴¹ Presently, work is ongoing to “revitalize” the Nairobi regime and in this regard the most important provisions that enable this convention to retain relevance and emerge as a living document are the ones that provide for bi-annual meetings of contracting parties to review its implementation⁴² and the power to adopt additional protocols.⁴³ In other words, the Nairobi Convention follows a

Environment of the Western Indian Ocean, Adopted in Nairobi, Kenya on 31 March 2010, UNEP(DEPI)/EAF/PPP.6/8a/Suppl” in UNEP, *Final Act of the Conference of the Plenipotentiaries for the Adoption of the Amended Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Western Indian Ocean, Adopted in Nairobi, Kenya on 31 March 2010*, UNEP(DEPI)/EAF/PPP.6/10/Suppl [“Amended Nairobi Convention”].

³⁰ *Ibid*, art 7.

³¹ *Ibid*, art 5.

³² *Ibid*, art 6.

³³ *Ibid*, art 9.

³⁴ *Ibid*, art 10.

³⁵ *Ibid*, art 11.

³⁶ *Ibid*, arts 12 & 15.

³⁷ *Ibid*, art 14.

³⁸ *Ibid*, art 13.

³⁹ *Ibid*, art 16.

⁴⁰ “[I]mpacts of climate change on marine and coastal environment resulting in, inter alia, sea-level rise, increase of sea water temperature, ocean acidification, weather and climate variability that affect or are likely to affect coastal communities.” *Ibid*, pmb1.

⁴¹ See generally David M Dzidzornu, “Marine Environmental Protection Under the Nairobi and Abidjan Regimes: Working Toward Functional Revitalization?” in Aldo Chircop, Scott Coffen-Smout & Moira McConnell, eds, *Ocean Yearbook*, vol 26 (Leiden: The Netherlands, 2012) 381 [Dzidzornu, “Marine Environmental Protection”].

⁴² “Amended Nairobi Convention,” *supra* note 29, art 18; see also *ibid*, art 27 (dealing with compliance and enforcement).

⁴³ *Ibid*, art 19.

framework approach to maintain its dynamic nature and accordingly, the parties have adopted three protocols⁴⁴ that have increased the relevancy of this regional regime. There is also proposal to develop a new protocol on ICZM as a potential anti-dote to degraded coastlines.⁴⁵ In fact, amendments to the Nairobi Convention and the new protocols have extended and deepened the “normative reaches,” of the regime and advanced their “regulatory comprehensiveness.”⁴⁶ In short, by providing for a robust regional legal framework to coordinate the efforts of member states to plan and develop programmes to sustainably protect, manage and develop the coastal and marine environment and its resources, the Nairobi Convention has been able to enhance the functional effectiveness of this regional regime and create an atmosphere of awareness regarding the importance and need for sustainable coastal and marine development.

9.2.1.1.1 Discussion

As set out above, of the 13 Regional Seas Programmes, regional conventions and other legal instruments guide 10, and apart from South Asia, the East Asian Seas and the Northwest Pacific also have no regional conventions. Even though, the LOSC is the overarching legal instrument that guides SASAP implementation,⁴⁷ South Asian coastal countries are hamstrung by capacity constraints and have not been able to implement the SASAP by working out the LOSC prescriptions relevant to SASAP implementation. For instance, Part XII of the LOSC deals with the “protection and preservation of the marine

⁴⁴ UNEP, *Final Act of the Conference of the Plenipotentiaries for the Adoption of the Protocol for the Protection of the Marine and Coastal Environment of the Western Indian Ocean from Land-Based Sources and Activities, Adopted in Nairobi, Kenya on 31 March 2010*, UNEP(DEPI)/EAF/CP.6/11/Suppl; “Protocol Concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region” in UNEP, *Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region and Related Protocols* (New York: UN, 1985) 19; “Protocol Concerning Co-operation in Combating Marine Pollution in Cases of Emergency in the Eastern African Region” in UNEP, *Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region and Related Protocols* (New York: UN, 1985) 33.

⁴⁵ See generally UNEP, *Proposed Fifth Draft Integrated Coastal Zone Management Protocol to the Amended Nairobi Convention*, UNEP(DEPI)/EAF/LTWG5/3 (3 August 2011); see also “Decision CP7/3: Development of a Protocol on Integrated Coastal Zone Management” in UNEP, *Adopted Decisions for COP7*, UNEP(DEPI)/EAF/CP.7/5/en (14 December 2012) at 3; Rochette & Billé, “ICZM Protocols”, *supra* note 10 at 977, 979.

⁴⁶ Dzidzornu, “Marine Environmental Protection”, *supra* note 41 at 384.

⁴⁷ UNEP, *Regional Seas Programme*, *supra* note 20.

environment,” and sets out general provisions for controlling all sources of marine pollution and specific provisions for certain types of marine pollution. In giving effect to these provisions, the SASAP has an annex; namely, annex IV devoted to the protection of the marine environment from land-based activities. However, the South Asian coastal countries have not been able to make much headway in regulating and controlling LBSMP. As has been pointed out in the Bay of Bengal sub-region, “[d]ue to institutional, strategic and financial constraints, international recommendations policies and strategies related to LBSMP are not implemented in this Sub-region.”⁴⁸ Similarly, a study dealing with stocktaking of marine protected areas⁴⁹ points out that, in South Asia, “MPAs are far from being fully ecologically representative ..., since most were declared before the importance of these concepts was fully understood. Some 60% of MPAs lie in the Maldives and the Andaman and Nicobar Islands, most of which are very small sites ...”⁵⁰

Even though Regional Seas Programmes based on the convention-protocol approach may not have resulted in healthy oceans and coasts,⁵¹ it has nevertheless underscored the importance and utility of cooperation at the regional level. It has produced greater awareness and in certain situations even led to the development of dynamic, responsive and cooperative regimes and the use of systemic, ecosystem-based and integrated approaches to the problems that confront the marine environment. More importantly, the convention-protocol approach infuses new life into the regime, and helps it to retain vitality by bringing about normative alignment with evolving environmental

⁴⁸ Hassan, *supra* note 25.

⁴⁹ Even though marine protected areas are not *per se* an LOSC prescription, several provisions in the LOSC, fortify the ability of coastal states to establish marine protected areas. Robin Kundis Craig, “Protecting International Marine Biodiversity: International Treaties and National Systems of Marine Protected Areas” (2005) 20 J Land Use & Envtl L 333 at 361 (HeinOnline). As well, the SASAP as part of “environmental management” emphasises “[c]o-operation in the establishment and management of national protected coastal and marine habitats, in the establishment of a regional network of protected areas, in joint activities to protect coastal ecosystems ...” *SASAP*, *supra* note 16, ¶10.12.

⁵⁰ UNEP-WCMC, *National and Regional Networks of Marine Protected Areas: A Review of Progress*, Regional Seas (UNEP, 2008) at 69.

⁵¹ “[T]here does not always exist a positive relationship between well-designed institutional arrangements based on the Convention-Protocol approach and an effective clean-up of regions affected by marine pollution for which the arrangements are designed.” See generally Suh-Yong Chung, “Is the Convention-Protocol Approach Appropriate for Addressing Regional Marine Pollution?: The Barcelona Convention System Revisited” (2004) 13 Penn St Envtl L Rev 85 at 103 (HeinOnline) [Chung, “Is the Convention-Protocol Approach”].

principles and norms and the biannual meetings of the Conference of parties helps to modulate the convention according to changing needs and circumstances.⁵² Furthermore parties are goaded to adopt stricter regulatory standards and controls at the national level.

As seen earlier, the first Regional Seas initiative based on the framework convention-protocol approach was the Barcelona Convention System targeted towards ensuring a clean up of the region's marine pollution. Since its inauguration, the system has evolved with the adoption of action plans and additional protocols. This format has influenced other regional seas programs, particularly those that are sponsored by the United Nations Environment Program, which was instrumental in the establishment of the Barcelona Convention System. Despite these developments, the Mediterranean regime is widely considered as a "regime of low effectiveness" due to its "low problem-solving capacity."⁵³ Still, this does not mean that this regime is devoid of merits. In this regard, the following observation on the Mediterranean regime is instructive:

As a laboratory for regime-building, the Mediterranean offers many useful insights ... While it may be true that the Mediterranean is not cleaner today and it is true that objectives and standards have frequently not been met or postponed, the process of co-operation has attained value *per se*, whether it produces results or not ... The regime provides principal and subsidiary fora in which regional States can address common issues with discrete 'arm-wrestling'. This might explain why regime members continue to be active members, periodically renew vows of regional solidarity, participate and stake their claim to benefits generated, commit resources, and more recently commit to a new type of governance characterized by less *dirigisme* and more civil society participation ...⁵⁴

⁵² In contrast, the meetings of the parties of the South Asian region are more bureaucratic and are limited to reviewing its action plan.

⁵³ See Jon Birger Skjærseth, "The Effectiveness of the Mediterranean Action Plan", in Edward L. Miles et al, eds. *Environmental Regime Effectiveness: Confronting Theory with Evidence* (Cambridge: The MIT Press, 2002) at 311; see also Chung, "Is the Convention-Protocol Approach", *supra* note 51 (referring to the system's inability to guarantee effective implementation of its policies, the hard-law based approach which led to the acceptance of low standards and finally the lack of financial resources that hampered the fructification of the regime).

⁵⁴ Aldo Chircop, "The Mediterranean: Lessons Learned" in Mark J Valencia, ed, *Maritime Regime Building: Lessons Learned and Their Relevance for Northeast Asia*, vol 36, Publications on Ocean Development (The Hague: Martinus Nijhoff Publishers, 2001) 27 at 44.

At least in the South Asian context, when the South Asian Seas programme is contrasted with the framework convention-protocol approach of the Mediterranean, East Africa and other regions, it is clear that the South Asian Regional Seas Programme is devoid of the beneficence that accrues to parties that follow the framework convention-protocol approach. There is thus an element of merit in advocating for the implementation of the South Asian Regional Seas Programmes via a regional convention like instrument and related protocols.⁵⁵ When the underlying intent of the LOSC principles is juxtaposed in a regional context via a regional convention, the implementation tends to be more contextual, binding and relevant.⁵⁶

9.2.1.2 The SAARC, ICZM and Coastal Climate Change Adaptation

The most obvious and ambitious initiative to foster regionalism in South Asia received fillip with the establishment of the SAARC in 1985.⁵⁷ Within two years, environmental issues, including climate change and natural disaster management, emerged as potential candidates for cooperation.⁵⁸ Presently, the SAARC Environment Ministers meets periodically to take stock of progress and to enhance regional cooperation in the areas of environment,⁵⁹ climate change⁶⁰ and natural disasters.⁶¹ Another important highlight in

⁵⁵ Jacobson, *supra* note 26.

⁵⁶ “States shall cooperate . . . , as appropriate, on a regional basis, . . . in formulating and elaborating international rules, standards and recommended practices and procedures consistent with this Convention, for the protection and preservation of the marine environment, taking into account characteristic regional features.” *United Nations Convention on the Law of the Sea*, 10 December 1982, 1833 UNTS 3, 21 ILM 1261 (entered into force 16 November 1994), art 197.

⁵⁷ For an overview of SAARC, see Lawrence Sáez, *The South Asian Association for Regional Cooperation (SAARC): An Emerging Collaboration Architecture* (Oxon: Routledge, 2011) at 8-29. The following countries are members of the SAARC: Afghanistan, Pakistan, India, Bhutan, Nepal, Bangladesh, Sri Lanka and Maldives. The following countries have observer status: European Union, China, United States, Japan, South Korea, Mauritius, Iran, Australia, and Myanmar. *South Asian Association for Regional Corporation*, online: SAARC <<http://www.saarc-sec.org/>>.

⁵⁸ SAARC, *Area of Cooperation*, online: SAARC, Areas of Cooperation, Environment <<http://www.saarc-sec.org/>> [SAARC, *Area of Cooperation*].

⁵⁹ *Ibid* (role of SAARC in environmental cooperation).

⁶⁰ See *infra* notes 75-79.

⁶¹ Subsequent to the Indian Ocean tsunami, a Special Session of the SAARC Environment Ministers was held at Malé, in 2005. It adopted the Malé Declaration, which establishes a collective response to large-scale natural disasters. Thereafter, a comprehensive framework on Disaster Management (2006-2015) aligned with the Hyogo Framework of Action (2005-2015) was adopted to address the

the development of the environmental agenda is the SAARC Environment Action Plan adopted at the Third Meeting of the environment ministers at Male in 1997.⁶² This plan identified key concerns and set out parameters and modalities for regional cooperation. It also cast the primary responsibility regarding its implementation on member states through the National Action Plans on Environment,⁶³ along with several other measures,⁶⁴ including the creation of a regional treaty on environmental cooperation.⁶⁵

Consisting of 12 articles, the primary objective of the SAARC Convention on Cooperation on Environment (SAARC Environment Convention) is to “promote cooperation among the Parties in the field of environment and sustainable development, on the basis of equity; reciprocity and mutual benefit, taking into account the applicable policies and legislation in each Member State.”⁶⁶ The Convention identifies the potential areas for cooperation, including climate change and management of coastal and coral reefs, river-ecosystems, and seawater and freshwater quality.⁶⁷ In all cases, the cooperation extends to the exchange of best practices and knowledge, capacity-building, and transfer of eco-friendly technologies.⁶⁸ This takes the form of collaboration between parties, academic and research institutions, the SAARC regional centers, private sector institutions and civil society, and any other form as agreed to by the parties.⁶⁹

The SAARC Environment Convention contemplates the creation of a Governing Council comprised of the environmental ministers of Member States who are to meet once every two years⁷⁰ to provide inter alia policy directions and guidance. Additionally,

specific needs of disaster risk reduction and management in South Asia. The SAARC has also established a Disaster Management Centre based in New Delhi in 2006. SAARC, *Area of Cooperation*, *supra* note 58.

⁶² OP Goel, *India and SAARC Engagements*, vol 1 (New Delhi: Gyan Publishing House, 2004) at 41.

⁶³ *Ibid* at 42.

⁶⁴ The SAARC Coastal Zone Management Center established in 2004, the SAARC Forestry Center in 2007, and the South Asia Environment Outlook, 2009, are some of the steps taken to implement the Action plan.

⁶⁵ Goel, *supra* note 62 at 42. A SAARC Convention on Cooperation on Environment as stipulated under Item 17 (Legal Framework) of the Action Plan was signed during the Sixteenth SAARC Summit (Thimphu, 28-29 April 2010). SAARC, *Area of Cooperation*, *supra* note 58.

⁶⁶ *SAARC Convention on Cooperation on Environment*, Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka, 29 April 2010, art I.

⁶⁷ *Ibid*, art II.

⁶⁸ *Ibid*.

⁶⁹ *Ibid*, art III.

⁷⁰ *Ibid*, art V.

they are to adopt recommendations, plans and programmes on the areas identified for cooperation, commission studies and scientific data collection, and facilitate technology transfer.⁷¹ Decisions are to be unanimous.⁷² To assist the Governing Council and to ensure the “full and effective implementation of the Convention, provision is made for yearly meetings by senior officials.⁷³ Disputes, if any, in relation to the interpretation or application of the Convention, are to be settled by recourse to negotiation.⁷⁴ Even though the SAARC Environment Convention has yet to enter into force, it is obvious that it represents an important milestone, given the tenacious nature of relations between the member states in effectuating regional cooperation on environmental matters.

The SAARC Member States affords high priority to issues related to climate change. In “[n]oting the urgency of the immediate need for dealing with the onslaught of climate change including sea level rise,”⁷⁵ the SAARC Environment Ministers, through the Dhaka Declaration on Climate Change 2008, agreed to initiate and implement programmes and measures for adaptation and also called upon Annex-I parties to provide additional resources to fulfill their commitments enshrined in the UNFCCC.⁷⁶ Additionally, the SAARC developed an Action Plan on Climate Change, whose objective is to secure regional cooperation and south-south support for technology and knowledge transfer.⁷⁷ One of the major thematic areas identified in this document is adaptation to climate change impacts such as SLR, salinity intrusion, and coastal and soil erosion.⁷⁸ In acknowledging that the impacts of climate change transcend national boundaries, and that, for the SAARC, developing countries climate change represents a dual challenge of addressing its negative impacts and pursuing socio-economic development, the Thimphu Statement on Climate Change, 2010, emphasizes the need for a regional response to

⁷¹ *Ibid.*

⁷² *Ibid.*, art V.3.

⁷³ *Ibid.*, art V.2.

⁷⁴ *Ibid.*, art VII.

⁷⁵ SAARC Environment Ministers Dhaka Declaration on Climate Change, Dhaka, 3 July 2008, at 2, online: SAARC Workshop, Workshop Document, SAARC Declaration on Climate Change at Dhaka <http://www.nset.org.np/climatechange/inside_background.php>.

⁷⁶ *Ibid.* at 2.

⁷⁷ *SAARC Action Plan on Climate Change*, ¶B, online: SAARC Workshop, Workshop Document, SAARC Action Plan on Climate Change <http://www.nset.org.np/climatechange/inside_background.php> (entitled “Objectives of the SAARC Action Plan on Climate Change”).

⁷⁸ *Ibid.*, ¶C (entitled “Thematic Areas of the Regional Action Plan on Climate Change”).

climate change impacts.⁷⁹ In this regard, it calls for the establishment of an Inter-governmental Expert Group on Climate Change to develop policy direction and guidance for regional cooperation and this body is to meet twice a year to review the implementation of this statement.⁸⁰ Even while stressing the importance of adaptation, the plan does not articulate specific adaptation actions.⁸¹ However, the statement suggests the creation of two important bodies: 1) a SAARC Inter-governmental Marine Initiative (supported by the SAARC Coastal Zone Management Center) “to strengthen the understanding of shared oceans and water bodies in the region and the critical roles they play in sustainable living”; and 2) a SAARC Inter-governmental Climate-related Disasters Initiative (SAARC Disaster Management Center) to integrate Climate Change Adaptation with disaster risk reduction.⁸²

The SAARC nations have developed common positions on climate change, an indication that these nations realise the usefulness of regional cooperation in this area.⁸³ These common positions point out that South Asia’s low-lying areas, long coastlines, island regions, and flood plains are vulnerable to climate change.⁸⁴ Due to these vulnerabilities and the inadequate means and limited capacities available to South Asian countries, developed countries are called upon to commit to ambitious and binding GHG emission reduction targets and to provide adequate financial resources for adaptation,

⁷⁹ *Thimphu Statement on Climate Change*, Sixteenth SAARC Summit Thimphu, 28-29 April 2010, SAARC/SUMMIT.16/15, online: SAARC Home, Declarations, Statements <<http://www.saarc-sec.org>> [*Thimphu Statement on Climate Change*]. Parties are to ensure the timely implementation of the Thimphu Statement on Climate Change. Seventeenth SAARC Summit, ADDU Declaration, “Building Bridges” (14 November 2011), ¶6, online: SAARC, ADDU Declaration <http://www.saarc-sec.org/updates/index.php?page_no=3/>.

⁸⁰ *Thimphu Statement on Climate Change*, *ibid*, ¶¶(ii), (xvi).

⁸¹ *Ibid*, opening recital.

⁸² *Ibid*, ¶¶(x), (xiv).

⁸³ *SAARC Statement on Climate Change United Nations Climate Change Conference (COP15) Copenhagen, Denmark, 7-18 December 2009*, online: SAARC, Areas of Cooperation, Environment, COP Meetings, Related Documents, COP 15 SAARC Statement <http://saarc-sec.org/areaofcooperation/detail.php?activity_id=32> [*SAARC Statement on Climate Change*]; *Common SAARC Position: United Nations Climate Change Conference (COP 16/CMP 6) Cancun, Mexico, 29 November–10 December 2010*, online: SAARC, Areas of Cooperation, Environment, COP Meetings, Related Documents, Common SAARC Position for COP16 <http://saarc-sec.org/areaofcooperation/detail.php?activity_id=32> [*Common SAARC Position*].

⁸⁴ See generally *Common SAARC Position*, *ibid*.

NAPA development, capacity building, and technology development and transfer in order to combat climate change.⁸⁵

Arguably, the most important development under the SAARC regional framework⁸⁶ that offers the best prospect for ICZM and CCCA development is the establishment of the SAARC Regional Coastal Zone Management Centre in 2005, with its head office at Malé. The primary objective of this centre is to “promote cooperation in planning, management and sustainable development of the coastal zones, including research, training and promotion of awareness in the region.”⁸⁷ India has taken steps to create a “National Centre for Sustainable Coastal Management.”⁸⁸ Such specialised research bodies will help in the creation of epistemic communities in the South Asian region which can facilitate the development of the science of ICZM, its policy, management and legal dimensions that can facilitate via regional regimes.

9.2.1.2.1 Discussion

Even though decades have passed and several discussions have been held, tangible results have not been produced at the SAARC level. The foregoing clarifies that the regional prescriptions on ICZM and CCCA in South Asia are still in their embryonic stage. Presently, ICZM is embodied in a patchwork of lofty ideals and political statements that merely underline the need and importance of the methodology, with no specific roadmaps on how these statements are to be translated into practice. Despite having a rather broad mandate to further regional cooperation, neither platform (i.e., the South Asian Regional Seas Programme with its SASAP and the SAARC) has been able to make substantial headway in spreading the message or mainstreaming coastal climate change adaptation. Given the state of ICZM in South Asia, it is clear that the SASAP, with its emphasis on ICZM development and implementation, has generally been ignored by the member

⁸⁵ SAARC Statement on Climate Change, *supra* note 83.

⁸⁶ Charter of the South Asian Association for Regional Cooperation, 1985, ¶1, online: SAARC Disaster Management Centre <<http://saarc-sdmc.nic.in/pdf/charter.pdf>>.

⁸⁷ Objectives, online: SCZMC <<http://www.sczmc.org/objectives/>>.

⁸⁸ For further information, see *National Centre for Sustainable Coastal Management*, online: NCSCM <<http://ncscm.org/>>; see also *The International Centre for Climate Change & Development*, online: ICCCAD <<http://centers.iub.edu.bd/icccad/>>.

states. At the same time, the SAARC in its almost three decades of existence, has been able to move ahead in terms of facilitating economic integration. It has succeeded as a positive and dynamic regional institution to foster cooperation in such matters. However there is the possibility that economic integration cannot be truly attained by remaining oblivious to environmental and social issues. Even though the SAARC has formulated a basic frame for the development of environmental cooperation, disputes between states appear as stumbling blocks to cooperation and has virtually prevented it from addressing contentious issues like transboundary water sharing. Another lacuna in the regional regime is that, despite the South Asian region having one of the lowest carbon footprints in the world (India being the sole exception), the focus of regional efforts is on mitigation when it should be on adaptation.⁸⁹ While it is definitely heartening to note that these countries are working together to develop a common stance at climate change negotiations vis-à-vis mitigation (and in the process underscoring the value and importance of cooperation), very few steps have been taken in terms of augmenting cooperation for climate change adaptation when it is amply clear that this region will bear the brunt of climate-change-related impacts, including SLR. As discussed previously in this study, South Asia is one of the most densely populated regions in the world and an overwhelming majority of the population lives in poverty. Thus, even slight changes in climate can prove particularly catastrophic due to poor adaptive capacity. Moreover, climate change impacts fall disproportionately on the poor, the disadvantaged, women, and traditional artisanal fishers because their subsistence economies depend primarily on coastal resources, which are becoming scarcer. Consequently, governmental efforts are often directed to raise the living standards of the people and since climate change adaptation is essentially an extension of good developmental practice, it would be apposite if these countries were to invest in mainstreaming climate change adaptation in existing developmental efforts and here a regional regime can play a significant role in fostering climate change adaptation, particularly, CCCA.

⁸⁹ With 24.6 per cent of the world population, the CO₂ emissions in South Asia is only 7.8. per cent of the total CO₂ emissions. The US with just above 4.0 per cent of the world population, contributes 21.1 per cent of the CO₂ emissions. UNDP, *Unequal Carbon Footprints: Shares of Emissions and Population*, online: UNDP <<http://hdr.undp.org/en/statistics/data/climatechange/shares/>>. The Thimphu statement emphasizes that South Asia should become a world leader in low-carbon technologies and renewable energy. *Thimphu Statement on Climate Change*, *supra* note 79.

As pointed out earlier, in addressing environmental, climate change and natural disaster management issues, the SAARC has steered clear of contentious issues like transboundary water resources sharing.⁹⁰ The distrust and recalcitrant attitude of these countries has prevented realisation of the full potential that could accrue through regional integration. The subsequent discussion will explicate some of the key tensions that have prevented regional cooperation from maturing in South Asia. But before proceeding in this direction, a note on some of the other programmes and arrangements that have relevance to the region is provided. An interesting aspect in these arrangements is that, some of the players are from countries that fall beyond the South Asian region, and some of the countries in the coastal South Asian region are excluded. And this is due to due to the unique nature of the marine ecosystem to be conserved.

In effectuating large marine ecosystem (LME) management in the Bay of Bengal region, eight countries, namely, Bangladesh, India, Indonesia, Malaysia, the Maldives, Myanmar, Sri Lanka and Thailand that practically encircle the Bay of Bengal, many of whom lie beyond the physical borders of coastal South Asia, have joined forces for the Bay of Bengal Large Marine Ecosystem Project (BOBLME). The BOBLME involves working together to improve regional management of the Bay of Bengal environment and its fisheries.⁹¹ The Global Environment Facility, the Norwegian Agency for Development Cooperation, the Swedish International Development Cooperation Agency, the Food and Agriculture Organization of the United Nations (FAO), and the National Oceanic and Atmospheric Administration, supports this project and the FAO is the implementing agency. Presently, the parties are in the process of developing a Strategic Action Programme for the Bay of Bengal to help member states to collectively address and remediate concerns. This Strategic Action Programme will be unveiled by 2014.⁹² Apart from the BOBLME, there are also other programmes relevant to the region like

⁹⁰ James Kraska, "Sustainable Development is Security: The Role of Transboundary River Agreements as a Confidence Building Measure (CBM) in South Asia" (2003) 28 Yale J Int'l L 465 (QL).

⁹¹ *The Bay of Bengal Large Marine Ecosystem Project*, online: boblme <<http://www.boblme.org/index.html>>; see also Philomène Verlaan, "Current Legal Developments: Bay of Bengal" (2006) 21 Int'l J Mar & Coast L 111.

⁹² See also *The Bay of Bengal Large Marine Ecosystem Project: The Next Steps*, Brochure [nd], online: boblme <<http://www.boblme.org>>.

Mangroves for the Future initiative, which is co-chaired by the International Union for the Conservation of Nature and the UNDP. This programme has Bangladesh, India, Indonesia, Maldives, Pakistan, Seychelles, Sri Lanka, Thailand and Vietnam as member countries.⁹³ Then there is also a proposal to set up an Indo-Bangla Sundarbans Ecological Forum, to take up joint management programmes to protect the Sundarbans mangrove forest.⁹⁴

9.2.2 Transboundary Disputes and the Scuttling of the Regimes

The coastal countries of South Asia are joined together by common historical and cultural roots that date back thousands of years. Following de-colonization of South Asia, the exodus of refugees from both sides of the border, protracted disputes over the future of Kashmir,⁹⁵ the strident stance by member states over common problems and the four wars fought between the two nuclear powers of India and Pakistan have left seemingly indelible scars, precluding regional cooperation. For instance, intractable disputes over their un-delimited maritime boundaries between the coastal nations of India and Pakistan in relation to the Sir Creek⁹⁶ and between India and Bangladesh persist,⁹⁷ with the

⁹³ For more details, see *Mangroves for the Future: Investing in Coastal Ecosystems*, online: Mangroves for the Future <<http://www.mangrovesforthefuture.org/>>.

⁹⁴ *Asia-Pacific Human Development Report: One Planet to Share: Sustaining Human Progress in a Changing Climate* (New Delhi: Routledge, 2012) at 109.

⁹⁵ “Kashmir has been referred to as the most dangerous place on earth.” See The Carter Center, *The Kashmiri Conflict: Historical and Prospective Intervention Analyses: November 19-21, 2002*, Special Conflict Report (Atlanta: The Carter Center, 2003) at 2 (foreword by Jimmy Carter).

⁹⁶ Throughout their history, India and Pakistan have had an uneasy relationship. The bone of contention is the northern Himalayan State of Kashmir. This has spilt over to their land and maritime boundaries in the Arabian Sea. The maritime dispute between India and Pakistan centres on Sir Creek, a 60-mile-long fluctuating tidal channel or estuary in the marshes of the Rann of Kutch that separates the Indian State of Gujarat from the Pakistani Province of Sindh. After the 1965 war between India and Pakistan, Pakistan claimed that half of the Rann of Kutch along the 24th parallel is Pakistani territory. India objected, claiming that the boundary runs roughly along the northern edge of the Rann. The matter was referred to an international tribunal for arbitration, the Indo-Pakistani Western Boundary Case Tribunal. In its Award, the tribunal almost completely upheld India’s claim to the entire Rann, conceding small sectors to Pakistan. Both countries accepted the decision. However, the boundary of Sir Creek, from its head in the marshy lands of the Rann to its mouth in the Arabian Sea, and the maritime boundary between India and Pakistan, are undemarcated, as they agreed not to refer this part to the tribunal for adjudication. The dispute is ongoing. While Pakistan claims that the boundary along Sir Creek should lie along its eastern edge, India, relying upon the ‘thalweg’ or the mid-channel principle, believes that it should be along the middle of the creek. Pakistan’s contention is that the creek is not navigable and thus the mid-channel

possible presence of substantial offshore hydrocarbon deposits furthering the antagonism. As well, controversy persists regarding determination of the outer limits of the extended continental shelf, primarily in the Bay of Bengal region.⁹⁸ All this has left maritime

principle does not apply. The non-demarcation of maritime boundaries causes immense hardship to fishermen in both countries, as they often find themselves on the wrong side of the border. Tony George Puthucherril, "India's Ocean Policy" in Biliana Cicin-Sain, David VanderZwaag & Miriam C Balgos, eds, *Integrated National and Regional Ocean Policies: Comparative Practices and Future Prospects* (United Nations University Press [in press]) [Puthucherril, "India's Ocean Policy"]].

⁹⁷ The stability of the maritime boundary between India and Bangladesh in the Bay of Bengal remains undetermined. This is mainly due to the divergent methods of delimitation of the maritime zones proposed by both India and Bangladesh and the conflicting claims of both countries over New Moore (South Talpatty) island, which emerged in the estuary of the border river, Haribhanga, after a devastating cyclone in 1970. While India wants the maritime boundary to be determined by the equidistance method, Bangladesh prefers use of the equitable method. To mitigate the drawbacks of a receding coastline, Bangladesh, through its Territorial Waters and Maritime Zones Act, 1974, has adopted the depth method to draw its baselines from the straight lines drawn by joining certain outer points at a depth of 60 feet. This step practically converts nearly 6,200 square nautical miles of its potential EEZ into internal waters and has been rejected outright by its immediate neighbours, India and Myanmar. In December 2009, Bangladesh requested that the International Tribunal for the Law of the Sea (ITLOS) appoint an arbitral tribunal to settle this maritime boundary dispute. In February 2010, the President of the ITLOS appointed a three-member arbitral tribunal to settle the maritime delimitation dispute. As far as New Moore Island is concerned, India claims that since the main channel of this river flows to the east of New Moore, the island belongs to India. On the other hand, Bangladesh maintains that it flows to the west, rendering the island an integral part of its territory. However, it seems that the dispute over this island has been settled by global warming as the island has been submerged by rising waters. RC Sharma & PC Sinha, *India's Ocean Policy* (New Delhi: Khanna Publishers, 1994) at 113-19; see also ITLOS, Press Release, ITLOS/Press 198, "Arbitral Proceedings Between Bangladesh and India New Arbitrator Appointed" (19 July 2013). For an overview on the legal position of islands in delimiting inter-state boundaries in rivers, see generally Hiran W Jayewardene, *The Regime of Islands in International Law*, Shigeru Oda, ed, 15 Publications on Ocean Development (The Netherlands: Martinus Nijhoff Publishers, 1990) at 193; "Disputed Bay of Bengal island 'vanishes' say scientists", *BBC News* (24 March 2010), online: BBC News <<http://news.bbc.co.uk>>; Puthucherril, "India's Ocean Policy", *ibid*; see also Kisei Tanaka, "Indo-Bangladesh Maritime Border Dispute: Conflicts Over a Disappeared Island ICE Case Studies", No 270 (December 2011), online: American University <<http://www1.american.edu/ued/ICE/taplatti.html>>.

⁹⁸ The LOSC provides scientific and technical criteria (articles 76-85 and Annex II (Statement of Understanding Concerning a Specific Method to be Used in Establishing the Outer Edge of the Continental Margin)) regarding delineation of the outer limits of the continental shelf beyond 200 nautical miles from the baselines of a coastal state. Specifically, taking into the inequity that could befall upon those states that seek to establish the outer edge of the continental margin in the southern part of the Bay of Bengal, consequent to the application of article 76 of the LOSC, it was provided that the outer edge of the continental margin in this area could be established by straight lines not exceeding 60 nautical miles connecting fixed points at which the sediment thickness is not less than one kilometer. See "Final Act of the Third United Nations Conference on the Law of the Sea: Annex II: Statement of Understanding Concerning a Specific Method to be Used in Establishing the Outer Edge of the Continental Margin" in UNCLOS, Commission on the Limits of the Continental Shelf, *Scientific and Technical Guidelines of the Commission on the Limits of the Continental Shelf* CLCS/11/Add. 1 (3 September 1999). The Statement also addresses the special geographic circumstances in determining the outer edge of the continental margin in the Southern part of the

boundaries in the Indian sub-continent un-delimited, which has impeded the progress of regional cooperation in ocean and coastal management. Similarly, the construction of the Sethusamudram link canal,⁹⁹ the commissioning of the Koodankulam nuclear reactor in

Bay of Bengal. India has made a submission under article 76 (8) to the Commission on the Limits of the Continental Shelf regarding the establishment of the outer limits of its continental shelf that lie beyond the 200 nautical miles, in three regions, namely, in the eastern offshore region in the Bay of Bengal (the outer limits are defined by straight lines not exceeding 60 nautical miles in length connecting 452 fixed points), in the western offshore region of Andaman islands and in the western offshore region in the Arabian sea. As a coastal state in the southern part of the Bay of Bengal, India seeks to make a separate second partial submission of information and data to support its claims over the outer limits of continental shelf. See generally India, “The Indian Continental Shelf: Partial Submission to the Commission on the Limits of the Continental Shelf, Pursuant to Article 76, Paragraph 8 of the United Nations Convention on the Law of the Sea: Part I Executive Summary” (np, 2009). The Union of Myanmar, Bangladesh and the Sultanate of Oman have objected to this. For the respective submissions, see Oceans & Law of the Sea United Nations, *Commission on the Limits of the Continental Shelf (CLCS) Outer Limits of the Continental Shelf Beyond 200 Nautical Miles from the Baselines: Submissions to the Commission: Submission by the Republic of India*, online: Oceans & Law of the Sea United Nations, Commission on the Limits of the Continental Shelf, Submissions and Recommendations, India <<http://www.un.org/Depts/los/index.htm>>. The relevant part of the submission of Bangladesh notes as follows:

The Government of Bangladesh believes [that India’s] assertion is not supported by morphological, geological or tectonic evidences. Scientific research and analyses have established that the morphology of the seabed in the Bay of Bengal is marked by a regional slope where water depth gradually increases in a seaward direction from north to south. This characteristic contradicts the notion of an eastward prolongation of India’s continental landmass, or a westward prolongation of the landmass of the Andaman Islands ... The characteristic also underscores the reality that the seabed in the northern and central Bay of Bengal owes much of its shape and composition to the high volumes of sediments that has emerged mostly from or across the landmass of Bangladesh over geological time. The entire central part of the Bay is known to overlie oceanic crust ... Hence for any State that borders upon the Bay of Bengal, the only natural prolongation that can be claimed is the one that arises from the accumulation of sediments over this oceanic crust in the seaward direction of its flow. In consideration of its location and shape of the sedimentary wedge, the accumulated sediments therefore comprise the exclusive natural prolongation of Bangladesh.

Oceans & Law of the Sea United Nations, *Permanent Mission of Bangladesh to the United Nations*, No PMBNY-UNCLOS/2009, ¶2.c, online: Oceans & Law of the Sea United Nations, Commission on the Limits of the Continental Shelf, Submissions and Recommendations, India, Bangladesh <<http://www.un.org/Depts/los/index.htm>>.

⁹⁹

At present, India does not have a continuous navigation channel connecting its east and west coasts. Adam’s Bridge, also called Ram Sethu, is a discontinuous chain of sandbars that connects the Indian sub-continent to Sri Lanka. Consequently, ships from the west coast of India and other western hemisphere countries that are headed to the east coast of India or towards East Asia must navigate

India,¹⁰⁰ and the recent voices of opposition in the state of Tamil Nadu in India who perceive the settlement over the Katchatheevu isle in the Palk Strait between the Government of India and Sri Lanka in 1974 as a unilateral act of cession by the Government of India, have the potential to upset India-Sri Lanka relations.¹⁰¹ Additional impediments to cooperation include the diversion of the waters of the River Ganges by India *via* the Farakka Barrage,¹⁰² the inability to conclude the Tessta water-sharing

around the Sri Lankan coast. The Sethusamudram Ship Channel Project (Sethu Canal) proposes dredging a channel through the shallows between India and Sri Lanka. This would provide ships direct passage through India's territorial waters, eliminate the need to circumnavigate Sri Lanka, and save ships up to 424 nautical miles and 30 hours of sailing. However, the Sethu Canal would run within 20 kilometers of the Gulf of Mannar Marine Biosphere Reserve. See generally Tony George Puthucherril, "Ballast Waters and Aquatic Invasive Species: A Model for India" (2008) 19 *Colo J Int'l Envtl L & Pol'y* 381 (QL); *O Fernandes v Tamil Nadu Pollution Control Board* (17 December 2004), WP No 33528 (Madras HC).

¹⁰⁰ PTI, "Sri Lankan group alleges radiation leaks at Kudankulam N-plant", *The Indian Express* (2 March 2013), online: [The Indian Express <http://www.indianexpress.com>](http://www.indianexpress.com). Press Trust of India, "Lanka to complain to international watchdog about India's nuclear plants" *NDTV [of India]* (9 April 2012), online: [NDTV <http://www.ndtv.com>](http://www.ndtv.com).

¹⁰¹ C Raja, "Island Lost", *The New Indian Express* (10 September 2013), online: [The New Indian Express <http://newindianexpress.com/cities/chennai/>](http://newindianexpress.com/cities/chennai/); see also *Agreement between Sri Lanka and India on the Boundary in Historic Waters between the Two Countries and Related Matters*, 26 & 28 June 1974, (entry into force 10 July 1974) arts 4-6.

¹⁰² Bangladesh and India share nearly 54 rivers. Both these countries have only one treaty, which concerns sharing the Ganges. Disputes over the sharing of Ganges waters have a long history, one that antedates the founding of Bangladesh. In 1951, when Bangladesh was East Pakistan, the then Government of Pakistan protested with the Indian government over India's proposal to construct the Farakka barrage. While Pakistan demanded prior consultation before India proceeded with any scheme to divert the waters, India was averse to any negotiated settlement and even went to the extent of not recognising the Ganges as an international river. In 1964, ignoring the opposition of Pakistan, India proceeded with the Farakka barrage. This project which involved the construction of a 2,245-meter-long barrage across the main channel of the Ganges and a feeder canal 38 kilometers long, 150 meters wide, and six meters deep was designed to divert a maximum of 40,000 cusecs from the flow of the Ganges into the Bhagirathi River, which later becomes the Hooghly. Following Bangladesh's independence from Pakistan in 1971, with India's active military support, the Farakka project, which was still under construction, became a bone of contention and both countries decided to establish a joint river commission. In 1975, India sought Bangladesh's agreement to test-run a feeder canal that led to an agreement valid for only 41 days to allow the commissioning of the barrage. Furthermore, this agreement also allowed India to divert 11,000 cusecs of flow into the feeder canal in April and 16,000 cusecs in May, 1975. Even though the agreement expired after 41 days, India continued with its diversions, paving the way for yet another agreement in 1977, this one for five years. This agreement fixed the quantum of water that India was to release to Bangladesh during the dry season (from January 1 through May 31). The "interim" character of this arrangement continued through the conclusion of several memorandums of understanding until 1988, when negotiations came to a standstill. The deadlock continued for almost a decade during which time there was no agreement between these two countries. Finally, in 1996, the two countries concluded a more permanent and historic deal in the form of a 30-year treaty on sharing the Ganges at Farakka. Salman MA Salman & Kishor Uprety, *Conflict and Cooperation on South Asia's International Rivers: A Legal Perspective*, Rudolf V Van Puymbroeck, ed, Law, Justice and Development Series (Washington, DC: World Bank, 2003) at 135. Farakka remains a bone of contention between India

agreement between India and Bangladesh,¹⁰³ and the transfer of the waters of the Kishenganga River, again by India, for a hydro-electric project, which seemingly conflicts with this country's obligations under the Indus treaty.¹⁰⁴ There is also India's proposal to interlink some of its major rivers to meet its ever-growing water demands,¹⁰⁵ which will considerably shape the way in which regional cooperation for ICZM will evolve in due course in South Asia and how lower riparian nations will be able to adapt to a rising sea. As well, the political instability in the majority of the South Asia coastal

and Bangladesh as Bangladesh believes that it is the water diversion at Farakka by India that reduced the freshwater flow in the dry season increasing the salinity. Bangladesh, Ministry of Environment & Forest, *Initial National Communication under the United Nations Framework Convention on Climate Change (UNFCCC)* (Dhaka: Ministry of Environment & Forest, 2002) at 30. There have been proposals to conclude another water sharing treaty in relation to the River Teesta between India and Bangladesh. However, these remain in limbo. See PTI, "Bangladesh hopeful of Teesta water-sharing treaty" *The Hindu [of India]* (29 September 2012), online: The Hindu <<http://www.thehindu.com/>>.

¹⁰³ Md Nurul Islam, Md Ashfaque Azam & QR Islam, "Teesta River Water Sharing: A Case Study in Teesta Barrage Project" online: WaterTech <<http://www.watertech.cn/english/islam.pdf>>.

¹⁰⁴ It calls upon India to "let flow all the waters of the Western rivers and not permit any interference with those waters." *Indus Waters Treaty, 1960*, Pakistan and India, 19 September 1960, (1961) 55:3 AJIL 797 (ratifications exchanged 12 January 1961), art III(2). In a Partial Award, the Court of Arbitration unanimously decided that while India could divert water for the Kishenganga Hydro-Electric Project, India is under an obligation to maintain a minimum flow of water in the Kishenganga/Neelum River. *In The Matter of the Indus Waters Kishenganga Arbitration (Pakistan v India)* (2013), (Court of Arbitration), (Arbitrators: Stephen M Schwebel, Franklin Berman KCMG QC, Howard S Wheeler FEng, Lucius Caflisch, Jan Paulsson, Bruno Simma, Peter Tomka) at 201.

¹⁰⁵ The inter-linking of rivers project envisages the transfer of water from surplus basins or sub-basins to water-deficient areas, thereby providing freshwater to arid regions. Even though the genesis of this project can be traced back to the British, it was 1994 when the Supreme Court of India took notice of an interlocutory application filed by the amicus curiae referring to an address by the then President of India which emphasized the need for networking of rivers. The court directed that the interlocutory application be treated as an independent writ petition and passed in 2002, directing the interlinking of rivers. Accordingly, the central government directed the constitution of a high-powered task force to build national consensus, work out detailed plans, and complete the entire work of linking the rivers by 2016. However, there was no progress on the matter and it was in such circumstances of inaction that a new petition was instituted and the supreme court breathed new life into the proposal. In an elaborate judgement, the court spoke on the benefits that could accrue to the country if this project was implemented in a time-bound manner. It was also pointed out that since "[h]uge amounts of public money have been spent at the planning stage itself . . . it will be travesty of good governance and the epitome of harm to public interest if these projects are not carried forward with a sense of sincerity and a desire for its completion." *In Re Networking of Rivers* (27 February 2012), WP Civil No 512 of 2002 (India SC), ¶59, online: Indian Kannon <<http://indiankannon.org/doc/41857247/>>. Accordingly, a mandamus was issued directing the Union of India to constitute a "Special Committee for Inter-linking of Rivers." The committee was directed to "take firm steps and fix a definite timeframe to lay down the guidelines for completion of feasibility reports or other reports and shall ensure the completion of projects so that the benefits accrue within reasonable time and cost" (¶59(X)). Furthermore, the committee was to submit a bi-annual report to the union cabinet with status-cum-progress reports and relevant decisions. Finally, the court also directed the committee to take up the Ken-Betwa project for implementation and in the event of non-compliance; the amicus curiae could move a contempt petition before the supreme court. *Ibid.*

countries also casts shadows over the development of regional co-operative regimes. Apart from India, democracy and democratic institutions are yet to mature and sink its roots deep in the other coastal countries in South Asia. In recent years, the rise of extremism and terrorism has produced growing instability in the region and there is an increasing tendency in the region to hold India responsible for all of the ills that plague these countries.¹⁰⁶

9.3 REGIONAL APPROACHES TO LEGISLATING ICZM: EMERGING REGIMES ELSEWHERE

The problems that affect the coastal and marine space are primarily nation- and region-specific, and even though some of these are common issues (like marine pollution, introduction of invasives, SLR, etc.), there can be differences in terms of the degree of impact and the level of preparedness to respond. Consequently, it may be difficult for nations to agree on a common global format for ICZM that has an across-the-board legal force. There is also the danger that, in attempting to balance divergent interests and in the ensuing trade-offs, an international treaty on ICZM may be set at a high degree of generality, which will likely not further the cause. While a soft-law instrument prescribing an ICZM template may not be farfetched, it could nonetheless raise implementation concerns.

It is within this context that the need for regional-level binding instruments on ICZM gains relevance. A regional-level hard-law instrument on ICZM can enable neighbouring countries to engage in comprehensive and specific actions to protect shared coastal and marine environments and resources by taking into account the ecology, development, and other specificities of the region. More importantly because of its binding nature, it can help forge forces at the regional level to respond to specific and unique challenges that affect a particular region, pool resources, and facilitate the exchange of information.¹⁰⁷ Already, we have a binding Mediterranean ICZM protocol,

¹⁰⁶ Ashok Swain, “South Asia Its Environment and Regional Institutions” in Lorraine Elliott & Shaun Breslin, eds, *Comparative Environmental Regionalism* (Oxon: Routledge, 2011) 76 at 87 (pointing out that many countries in this region consider India to be a “regional bully”).

¹⁰⁷ Raphaël Billé & Julien Rochette, *Feasibility Assessment of an ICZM Protocol to the Nairobi Convention to the Parties of the Nairobi Convention* (IDDRI, 2010) at 7.

the “first supra-State legal instrument”¹⁰⁸ on ICZM that has force at the regional level of the Mediterranean. The European Union has also made rapid strides in implementing ICZM at the regional level. The Eastern African Region is in the process of developing a binding protocol on ICZM as is the Baltic and the Black sea regions.¹⁰⁹ This section examines certain regional level approaches to legislating ICZM and focuses on the Mediterranean Regional Seas Programme and ICZM initiatives by the European Union.

9.3.1 The Mediterranean Protocol on Integrated Coastal Zone Management

Enclosed by the continents of Africa, Europe and Asia, 21 countries apportion the Mediterranean coastline,¹¹⁰ which is about 46,000 kilometers long.¹¹¹ The basin has supported great civilizations and even today the sea and its coasts form the “lifeblood of the region.”¹¹² The list of problems that plague the coastal and marine health are the same as elsewhere: large concentration of populations, loss of marine habitats, marine pollution, unsustainable fisheries, invasive species, and climate change.¹¹³

Before delving into the details of the Mediterranean experience on legislating ICZM, it is necessary to understand the background to the Mediterranean Regional Seas Programme. Adopted in 1975 by sixteen Mediterranean states and the European Community, it was based on an action plan that originally targeted marine pollution prevention and was intended to assist national governments in formulating and implementing anti-pollution policies. In 1976, the parties adopted the legally-binding

¹⁰⁸ Julien Rochette & Raphaël Billé, *Analysis of the Mediterranean ICZM Protocol: At the Crossroads Between the Rationality of Provisions and the Logic of Negotiations* (IDDRI, 2010) at 4, online: CIRCLE-MED <http://www.circle-med.net/doc/ICZM_Med_IDDRI.pdf> [Rochette & Billé, *Analysis of the Mediterranean ICZM Protocol*].

¹⁰⁹ See generally Billé & Rochette, *supra* note 107; see Helsinki Commission, Helcom Recommendation 24/10: Implementation of Integrated Marine and Coastal Management of Human activities in the Baltic Sea Area, 25 June 2003, online: Helsinki Commission, Recommendations, Valid Recommendations <http://www.helcom.fi/home/en_GB/welcome/>; see also BSC, Strategic Action Plan for the Environmental Protection and Rehabilitation of the Black Sea, 17 April 2009, online: The Commission on the Protection of the Black Sea Against Pollution: Permanent Secretariat, Official Documents, Legal Documents <<http://www.blacksea-commission.org/>>.

¹¹⁰ UNEP/MAP, *State of the Mediterranean Marine and Coastal Environment* (Athens: 2012) at 9.

¹¹¹ *Ibid* at 39.

¹¹² *Ibid* at 17.

¹¹³ The population, which was 95 million in 1979, grew to 143 million in 2000 and this could reach 174 million by 2025. *Ibid* at 26. There are nearly thousand non-indigenous aquatic species in the Mediterranean with a new species being introduced on average once every 10 days. *Ibid* at 56. The western Mediterranean waters are experiencing a substantial warming trend and there is significant SLR in the Eastern Mediterranean as well. *Ibid* at 62.

Barcelona Convention,¹¹⁴ which was amended in 1995 to align it with, *inter alia*, the Rio Declaration and Agenda 21,¹¹⁵ and significantly, a broader commitment to integrated coastal planning and management.¹¹⁶ In 1995 the Action Plan for the Protection of the Marine Environment and the Sustainable Development of the Coastal Areas of the Mediterranean (MAP Phase II) was adopted to replace the Mediterranean Action Plan of 1975.¹¹⁷ Seven protocols to the convention have been adopted, including the one on ICZM.¹¹⁸ Article 4.3(e) of the Barcelona Convention calls on contracting parties “to promote the integrated management of the coastal zones, taking into account the protection of areas of ecological and landscape interest and the rational use of natural resources.”¹¹⁹ MAP Phase II identified “integrated coastal area management” as “the standard approach for tackling the problems affecting Mediterranean coastal areas.”¹²⁰ To this end, national and sub-national legislation was to be enacted and institutional capacities created or strengthened. The cumulative experience gained from several pilot projects enhanced capacity and contributed to the draft text of the ICZM protocol, which

¹¹⁴ *Convention for the Protection of the Mediterranean Sea against Pollution*, 16 February 1976, 15 ILM 290 (entered into force 12 February 1978, revised in Barcelona, Spain, on 10 June 1995 as the *Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean*, entered into force on 9 July 2004), pmbi.

¹¹⁵ In particular, the amendment in its preamble refers to the UNCED, 1992 and the LOSC 1982. For the full text of the amended Barcelona Convention, see *Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean*, online: European Environment Agency <<http://www.eea.europa.eu/>> [*Amended Barcelona Convention*].

¹¹⁶ This is evident from the title, which now refers to “protection of the marine environment and the coastal region of the Mediterranean.” *Ibid.*

¹¹⁷ “Action Plan for the Protection of the Marine Environment and the Sustainable Development of the Coastal Areas of the Mediterranean (MAP Phase II)” in UNEP & MAP, *Mediterranean Action Plan and Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols*, (Informal Document) Revised (Athens: UNEP, 1997) 1 at 1-31 [“Action Plan MAP Phase II”].

¹¹⁸ *Protocol on integrated coastal zone management, 2008; Protocol for the prevention and elimination of pollution of the Mediterranean sea by dumping from ships and aircraft or incineration at sea, 1995; Protocol concerning cooperation in preventing pollution from ships and, in cases of emergency, combating pollution of the Mediterranean sea, 2002; Protocol for the protection of the Mediterranean sea against pollution from land-based sources and activities, 1996 ; Protocol concerning specially protected areas and biological diversity in the Mediterranean, 1995; Protocol for the protection of the Mediterranean sea against pollution resulting from exploration and exploitation of the continental shelf and the seabed and its subsoil, 1994; Protocol on the prevention of pollution of the Mediterranean sea by transboundary movements of hazardous wastes and their disposal, 1996.* For more details and the texts of these instruments, see UNEP, *Mediterranean Action Plan for the Barcelona Convention*, online: UNEP MAP, About MAP, Protocols <<http://www.unepmap.org/>>.

¹¹⁹ *Amended Barcelona Convention*, *supra* note 115.

¹²⁰ “Action Plan MAP Phase II”, *supra* note 116, ¶¶1.4-1.5.

after six years of negotiations and refinements, was signed on 21 January 2008.¹²¹ The Madrid Protocol on Integrated Coastal Zone Management (protocol) entered into force in March 2011. To date, it is the only legal instrument at the international level that provides a normative foundation for ICZM development.¹²² An Action Plan for the Implementation of the ICZM Protocol for the Mediterranean 2012 – 2019 has been developed to strengthen the capacity of contracting parties to implement the protocol and promote ICZM at the regional and global levels.¹²³ With its 40 articles arranged into seven parts, the protocol imposes binding obligations on signatory states to operationalize ICZM at a regional level and to strengthen regional cooperation in this regard.¹²⁴ The recognition that as “irreplaceable ecological, economic and social resource[s]” that face increasing anthropogenic pressures and climate change risks, coastal zones and fragile coastal ecosystems have to be managed on the basis of an integrated approach at the level of the Mediterranean basin.¹²⁵ The intention is to halt and reverse degradation trends and to reduce biodiversity loss so as to ensure preservation of coastal resources and their sustainable development.¹²⁶ The seaward limit of the coastal zone is defined as the external limit of the territorial waters;¹²⁷ the landward limit is left to the individual parties to determine.¹²⁸ The protocol text can be grouped under three broad heads: 1) sustainable coastal management; 2) strengthening coastal governance; and 3) facilitating the regional approach.

9.3.1.1 Sustainable Coastal Management

¹²¹ See Rochette & Billé, “ICZM Protocols”, *supra* note 10 at 978-79.

¹²² Albania, Algeria, Croatia, France, Greece, Israel, Italy, Malta, Monaco, Montenegro, Morocco, Slovenia, Spain, Syria, Tunisia, and the European Union have signed the Protocol, and Albania, Croatia, France, Montenegro, Morocco, Slovenia, Spain, Syria, and the European Union have ratified this instrument. For more details, see *Protocol on Integrated Coastal Zone Management in the Mediterranean: Ratification Score*, online: Priority Actions Programme, ICZM Protocol, Ratification Score <<http://www.pap-thecoastcentre.org/>>.

¹²³ See generally Priority Actions Programme, *Action Plan for the Implementation of the ICZM Protocol for the Mediterranean 2012–2019*, PAP/NFP/2011/2, Draft (2011) at 9 [*Action Plan for ICZM Protocol*].

¹²⁴ *United Nations Conference on Environment and Development: Framework Convention on Climate Change*, 19 June 1993, 31 ILM 849 (adopted at New York 9 May 1992), art 4(1)(e); see also *Protocol on Integrated Coastal Zone Management in the Mediterranean*, [2009] OJ L 34/19, art 1 [*ICZM Protocol*].

¹²⁵ *Ibid*, pmb1.

¹²⁶ *Ibid*.

¹²⁷ *Ibid*, art 3(1)(a).

¹²⁸ *Ibid*, art 3(1)(b).

The exceptional biodiversity and ecosystem services of the coastal regions in the Mediterranean are threatened by socio-economic development. Accordingly, the protocol seeks to protect specific coastal ecosystems, promote sustainable coastal resources use, manage economic activities, and risk in the coastal zone. Mediterranean coastal zones are “the common natural and cultural heritage” of the people and thus must be preserved and used “judiciously for the benefit of present and future generations.”¹²⁹ Specific provisions protect coastal ecosystems like wetlands and estuaries,¹³⁰ marine species and habitats,¹³¹ coastal forests,¹³² dunes,¹³³ coastal landscapes,¹³⁴ islands,¹³⁵ and cultural heritage including underwater cultural heritage.¹³⁶ The protocol also identifies implementation instruments and tools like environmental impact assessment,¹³⁷ land policy including planning,¹³⁸ economic, financial and fiscal measures,¹³⁹ codes of good practice,¹⁴⁰ and

¹²⁹ *Ibid*, pmbi.

¹³⁰ Parties are to take into account the environmental, economic and social function of wetlands and estuaries in their national coastal strategies, plans and programmes; regulate and if necessary, prohibit activities that adversely affect wetlands and estuaries, and undertake their restoration. *Ibid*, art 10(1).

¹³¹ Parties are to adopt measures to ensure protection and conservation through legislation, planning and management of marine and coastal areas, particularly those hosting habitats and species of high conservation value. *Ibid*, art 10(2)(a).

¹³² Parties are to adopt measures to preserve or develop coastal forests and woods, particularly those located outside specially protected areas *Ibid*, art 10(3).

¹³³ Parties are to preserve and rehabilitate in a sustainable manner dunes and bars. *Ibid*, art 10(4).

¹³⁴ In defining ICZM, it is emphasized that the fragility of coastal ecosystems and landscapes should be considered. *Ibid*, art 2(f). One of the objectives of ICZM is to preserve the integrity of coastal landscapes. *Ibid*, art 5(d). Parties are to ensure that the sustainable use and management of coastal zones preserves landscapes. *Ibid*, art 8(1). They are also to adopt measures to ensure protection of coastal landscapes through legislation, planning and management. *Ibid*, art 11(1).

¹³⁵ Parties are to take into account the specific characteristics of the island environment, promote environmentally friendly activities in such areas and adopt special measures to ensure participation of inhabitants in the protection of coastal ecosystems based on local customs and knowledge. *Ibid*, art 12.

¹³⁶ Parties are to adopt individual or collective measures to preserve and protect the cultural heritage of coastal zones including underwater cultural heritage. The emphasis is on situ conservation, and elements of underwater cultural heritage if removed are to be preserved, not traded, sold or bartered. *Ibid*, art 13.

¹³⁷ Parties are to ensure environmental impact assessments, for public and private projects likely to have significant environmental effects on the coastal zone. *Ibid*, art 19(1)(p). They are to ensure strategic environmental assessments for plans and programmes that can affect the coastal zone. *Ibid*, art 19(2).

¹³⁸ Parties are to adopt appropriate land policy instruments and measures, including planning. *Ibid*, art 20(1). They can also *inter alia* adopt mechanisms for the acquisition, cession, donation or transfer of land to the public domain and institute easements on properties. *Ibid*, art 20(2).

¹³⁹ *Ibid*, art 21.

¹⁴⁰ Parties are to promote codes of good practice. *Ibid*, art 9(1)(e).

carrying capacity.¹⁴¹ Parties are to “strengthen or formulate” a national ICZM strategy¹⁴² and prepare coastal implementation plans and programmes (the primary instruments to implement the national strategy).¹⁴³ These have to be consistent with the ICZM objectives and principles identified in the protocol and the common regional framework for ICZM in the Mediterranean.¹⁴⁴ The protocol also secures freedom of access to the sea and the shore.¹⁴⁵

In drafting the protocol, it is clear that the parties were cognizant of the impacts of SLR. In defining the objectives of ICZM, the protocol seeks to “prevent and/or reduce the effects of natural hazards and in particular of climate change.”¹⁴⁶ Accordingly, there are several provisions relating to risk management¹⁴⁷ that are pertinent to SLR and coastal climate change adaptation. Within their national strategy for ICZM, parties are to carry out “vulnerability and hazard assessments of coastal zones and take prevention, mitigation and adaptation measures to address the effects of natural disasters, in particular of climate change.”¹⁴⁸ As well, parties are to “anticipate the impacts of coastal erosion through the integrated management of activities, including adoption of special measures for coastal sediments and coastal works.”¹⁴⁹ These provisions recognize at an international level the importance and ability of ICZM to encompass coastal climate change adaptation.

To prevent and mitigate the negative impacts of coastal erosion, parties are to adopt “necessary measures to maintain or restore the natural capacity of the coast to adapt to

¹⁴¹ *Ibid*, art 6(b). Parties are to define indicators of development to ensure sustainable use of coastal zones and reduce pressures that exceeds the carrying capacity. *Ibid*, art 9(1)(e). Environmental assessments are to consider the cumulative impacts on the coastal zones, paying attention to their carrying capacities as well article. *Ibid*, art 19(3).

¹⁴² It includes an analysis of the existing situation; objectives; priorities; identification of ecosystems that need management; identification of relevant actors and processes; measures to be taken and their cost; institutional instruments and legal and financial means available; and an implementation schedule. *Ibid*, art 18(2). In particular, the strategy should address wetlands and estuaries (art 10(1)(a)), islands (art 12(b)), and prevention of natural hazards (art 22).

¹⁴³ *Ibid*, art 18(1). Coastal plans and programmes shall implement the national strategy at the appropriate territorial level and they may be self-standing or integrated in other plans or programmes. *Ibid*, art 18(3).

¹⁴⁴ *Ibid*, arts 17, 18(1).

¹⁴⁵ *Ibid*, art 8(3)(d).

¹⁴⁶ *Ibid*, art 5(e).

¹⁴⁷ *Ibid*, part IV.

¹⁴⁸ *Ibid*, art 22.

¹⁴⁹ *Ibid*, art 23(3).

changes, including those caused by the rise in sea levels”¹⁵⁰ while minimizing any negative impacts of such measures (e.g., adjacent coastal damage due to hard armouring).¹⁵¹ Parties are also to share scientific data on the “state, development and impacts of coastal erosion.”¹⁵² The protocol also calls for planned retreat by providing for setback lines and no construction in a 100 meter coastal zone.¹⁵³ The protocol stipulations on coastal protection and management are only baseline standards and do not displace stricter ones that could be adopted under national or international instruments or programmes.¹⁵⁴

9.3.1.2 Strengthening Coastal Governance

Coastal governance measures in the protocol include integration, ensuring the flow of information, and promoting public and stakeholder participation and decision-making.¹⁵⁵ The ICZM protocol recognizes the most important dimension of integration, that is, spatial,¹⁵⁶ as well as inter-sectoral,¹⁵⁷ institutional,¹⁵⁸ inter-disciplinary,¹⁵⁹ and international¹⁶⁰ facets. Recognizing that a pre-condition precedent for meaningful public participation is access to information, the protocol calls on parties to promote interdisciplinary scientific research on ICZM, to further knowledge and to contribute to public information,¹⁶¹ and to inform the public of the geographic scope of the protocol¹⁶² and provide them with “access to the information derived from monitoring and

¹⁵⁰ *Ibid*, art 23(1).

¹⁵¹ *Ibid*, art 23(2).

¹⁵² *Ibid*, art 23(4).

¹⁵³ *Ibid*, art 8(2).

¹⁵⁴ *Ibid*, art 4(3).

¹⁵⁵ Rochette & Billé, *Analysis of the Mediterranean ICZM Protocol*, *supra* note 108 at 18.

¹⁵⁶ The marine part and the land part forms part of a single entity. *ICZM Protocol*, *supra* note 124, art 6(a).

¹⁵⁷ *Ibid*, arts 5(f), 7(2).

¹⁵⁸ Parties are to ensure institutional coordination through appropriate bodies or mechanisms, where needed to avoid sectoral approaches. *Ibid*, art 7(1)(a). They are to organize appropriate coordination between various authorities competent for both the marine and the land parts of coastal zones. *Ibid*, art 7(1)(b).

¹⁵⁹ Parties are to provide for interdisciplinary scientific research on ICZM. *Ibid*, art 15(3).

¹⁶⁰ *Ibid*, art 28 (spells out transboundary cooperation); art 29 (transboundary environmental assessment).

¹⁶¹ *Ibid*, art 15(3).

¹⁶² *Ibid*, art 3(3).

observation mechanisms and networks.”¹⁶³

Parties are to carry out awareness-raising activities and develop educational programmes and training on ICZM at the national, regional or local level.¹⁶⁴ Public participation can, *inter alia*, take the form of consultative bodies, inquiries, public hearings and partnerships.¹⁶⁵ Notably, participation is contemplated throughout the ICZM process.¹⁶⁶ Since the protocol confers rights, in line with the *ubi jus ibi remedium* principle (where there is a right, there ought to be a remedy), stakeholders can challenge decisions, acts or omissions through mediation, conciliation or through administrative or legal processes.¹⁶⁷

9.3.1.3 Facilitating a Regional Approach

In concert with the Barcelona Convention, the protocol recognizes that inter-state cooperation is the cornerstone of regionalism and provides that the “[p]arties shall establish a common framework for the integrated management of the Mediterranean coastal zone and shall take the necessary measures to strengthen regional co-operation.”¹⁶⁸ These measures include information exchange,¹⁶⁹ training and research,¹⁷⁰ and scientific and technical assistance.¹⁷¹ The protocol emphasizes regional and international co-operation in responding to natural disasters,¹⁷² protecting coastal landscapes (transboundary),¹⁷³ implementing common programmes on marine habitat protection,¹⁷⁴ and ICZM education.¹⁷⁵ The protocol also sets out rules for transboundary environmental assessments,¹⁷⁶ national strategies, plans and programmes in contiguous

¹⁶³ *Ibid*, art 16(4).

¹⁶⁴ *Ibid*, art 15(1)-15(2).

¹⁶⁵ *Ibid*, art 14(1).

¹⁶⁶ *Ibid* (provides for participation in the formulation and implementation of coastal strategies, plans and programmes).

¹⁶⁷ *Ibid*, art 14(3).

¹⁶⁸ *Ibid*, art 1.

¹⁶⁹ Exchange of information can take the form of sharing scientific data on coastal erosion, best environmental practices, demonstration projects on ICZM, etc. *Ibid*, arts 23-24, 27.

¹⁷⁰ *Ibid*, art 25 (training of scientific, technical and administrative personnel in ICZM).

¹⁷¹ This can extend to accessing environmentally sound technologies and their transfer. *Ibid*, art 26.

¹⁷² *Ibid*, art 24.

¹⁷³ *Ibid*, art 11(2).

¹⁷⁴ *Ibid*, art 10(2)(b).

¹⁷⁵ *Ibid*, art 15(2).

¹⁷⁶ *Ibid*, art 29.

coastal zones,¹⁷⁷ and development and implementation of a common regional ICZM framework.¹⁷⁸ Parties are also called on to participate in the Mediterranean coastal zone network.¹⁷⁹

9.3.1.4 Discussion

The Mediterranean Protocol is potentially the most important supranational legal instrument that demonstrates integration at the regional level. The protocol breaks with other instruments and offers a legally binding template for ICZM implementation. It promotes collaboration and coordination, economic development, coastal climate change adaptation to achieve sustainable coastal development. It challenges contracting party states to manage and protect their coastal zone and deal with environmental challenges arising from climate change. This unique legal instrument will be of assistance to regions seeking to develop similar legal instruments on ICZM. Perhaps the most important recognition to this regional approach came with its ratification by the European Commission in 2010.¹⁸⁰ This has considerably enhanced its relevance and is recognition of its vision for sustainable coastal development.

Innovative provisions of the protocol broaden the scope of ICZM by introducing the need to protect coastal landscapes. By referencing inter-generational equity, the protocol emphasizes the need for long-term utilization of coastal resources. The protocol juxtaposes obligations under the World Heritage Convention and the Ramsar Conservation and other international environmental law instruments into the coastal management scenario. Island management, which is particularly relevant in the Mediterranean Sea, and protection of coastal wetlands, estuaries, marine habitats, and coastal forests are other ecosystems that are encompassed in the protocol. Its strategy of linking climate change related processes with risk management in the coastal zone is a practical response to SLR.

¹⁷⁷ *Ibid*, art 28.

¹⁷⁸ *Ibid*, art 17.

¹⁷⁹ *Ibid*, art 16(2).

¹⁸⁰ See generally *Council Decision of 13 September 2010 concerning the conclusion, on behalf of the European Union, of the Protocol on Integrated Coastal Zone Management in the Mediterranean to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (2010/631/EU)*, [2010] OJ, L 279/1.

Despite the protocol, and on-going work to harmonize national legal and institutional frameworks with the protocol,¹⁸¹ ICZM in the Mediterranean region still remains “localised and relatively short-term and project based.”¹⁸² As well, “there are only a few isolated examples of specific legislation or established institutional frameworks in place for either the implementation of ICZM or the Protocol itself.”¹⁸³ Based on these situations, there is realization of the need to scale up ICZM implementation in the region. Second, it is also an indication as to the practical difficulties that confronts nations while implementing and scaling up ICZM implementation.

9.3.2 The European Union

The diverse coastal frontages of the European Union stretch to 185,000 kilometers¹⁸⁴ and are vital to the European economy.¹⁸⁵ It is estimated that close to 200 million people live in the coastal region with nearly 90 per cent situated within 50 kilometers of the coast.¹⁸⁶ Degradation of coastal zones,¹⁸⁷ the effects of climate change, SLR, coastal erosion and flooding, the decline in fisheries and related avocations,¹⁸⁸ population growth, and the

¹⁸¹ For more details, see *Regional MedPartnership Workshop on Harmonizing the National Legal and Institutional Framework with the ICZM Protocol*, online: Priority Actions Programme <http://www.pap-thecoastcentre.org/regional_medpartnership_workshop/>. For an understanding on how the Croatian legal system complies with the provisions of the Protocol, see generally Julien Rochette & Guillaume Du Puy-Montbrun, *Analysis of the Croatian Legal Framework in Relation to the Provisions of the Protocol on ICZM in the Mediterranean* ([np]: PAM, 2012).

¹⁸² *Action Plan for ICZM Protocol*, *supra* note 123 at 9.

¹⁸³ *Ibid* at 10.

¹⁸⁴ European Environment Agency, *10 Messages for 2010 Coastal Ecosystems* (Copenhagen: European Environment Agency, 2010) at 2 [EEA, *10 Messages*].

¹⁸⁵ The economic value of assets that lie within 500 meters of Europe’s seas is somewhere between €500-1,000 billion. EC, *The Challenge of Climate Change to the European Coastal Areas: State of Coasts in the Context of the Global Climate Change*, online: European Commission, Environment, ICZM, State Coast <<http://ec.europa.eu/>>.

¹⁸⁶ See generally EC, Directorate-General Envnt, *Consultation Document: Hearing on Integrated Coastal Zone Management* (Brussels, 30 May 2011) [EC, *Consultation Document*].

¹⁸⁷ Nearly 70 per cent of Europe’s coastline of some 90,000 kilometers is highly threatened. Peter Burbridge & Sarah Humphrey, “Introduction to Special Issue on the European Demonstration Programme on Integrated Coastal Zone Management” (2003) 31 *Coastal Mgmt* 121.

¹⁸⁸ In 2006, nearly 75 per cent of the fishing sector’s annual catch (nearly five billion tonnes) was caught from the north-east Atlantic waters, and 11 per cent came from the Mediterranean and Black Seas. EEA, *10 Messages*, *supra* note 184 at 7.

pressures of economic development¹⁸⁹ are all affecting the “environmental and social equilibria” of Europe’s coastal zones.¹⁹⁰

The European Union (EU) has adopted cross-border actions to stem the tide of coastal degradation. Beginning with Protection of the Coastline Resolution of 1973, a series of documents like the Model Law on Coastal Protection, the Code of Conduct for Coastal Zones, and the European Coastal Charter were approved.¹⁹¹ The 1992 Earth Summit popularized ICZM in Europe. In the very same year, and subsequently in 1994, resolutions acknowledging the importance of an integrated approach in coastal areas were adopted.¹⁹² Thereafter, a demonstration programme on Integrated Coastal Zone Management (1996-1999), which involved thirty-five projects, was implemented.¹⁹³ Its findings spurred the European Parliament and Council to adopt the Recommendation on Integrated Coastal Zone Management in 2002.¹⁹⁴

9.3.2.1 The EU Recommendation on Integrated Coastal Zone Management

The recommendation identifies three core principles for sound coastal planning: 1) a broad framework for ICZM development; 2) development of national strategies; and 3) reporting and review requirements. The Recommendation highlights the need for a

¹⁸⁹ Nuclear power stations affect coastal and marine waters. In 2003, rising water temperatures affected many estuarine species in the Gironde estuary. As well, salt-water intrusion has been reported in 10 coastal countries in Europe. *Ibid* at 7. Europe lost nearly 65 per cent of its coastal wetlands since 1900. *Ibid* at 9.

¹⁹⁰ EC, *Recommendation of the European Parliament and of the Council of 30 May 2002 Concerning the Implementation of Integrated Coastal Zone Management in Europe*, (2002/413/EC) [2002] OJ L 148/24, pmb1 [EC, *ICZM Recommendation*].

¹⁹¹ For the text, see Committee Responsible for the Activities of the Council of Europe in the Field of Biological and Landscape Diversity, *Model Law on Sustainable Management of Coastal Zones and European Code of Conduct for Coastal Zones*, Nature and Environment Series, (np: Council of Europe Publishing, 2000); EC, EU Policy on Integrated Coastal Management, *The History of EU Integrated Coastal Management Policy*, EC <<http://ec.europa.eu/environment/iczm/backgrund.htm>>.

¹⁹² See generally EC, *Council Resolution of 25 February 1992 on the Future Community Policy Concerning the European Coastal Zone*, [1992] OJ, C 59/1; see generally EC, *Council Resolution of 6 May 1994 on a Community Strategy for Integrated Coastal-Zone Management*, [1994] OJ, C 135/2.

¹⁹³ For more details on the project, see EC, *Coastal Zone Policy: I.C.Z.M. Demonstration Projects*, online: EC, Environment <<http://ec.europa.eu/environment/iczm/projects.htm>>; see also Stefano Belfiore, “Recent Developments in Coastal Management in the European Union” (2000) 43 *Ocean & Coast Mgmt* 123 (ScienceDirect).

¹⁹⁴ See generally EC, *ICZM Recommendation*, *supra* note 190.

strategic approach to coastal management¹⁹⁵ and sets out eight ICZM principles for effective coastal management.¹⁹⁶ Parties will use these principles to develop their national strategies. As first step, member states are to carry out a national stocktaking to identify the primary actors, laws and institutions that influence coastal management.¹⁹⁷ They will then develop one or more, as appropriate, national strategies to implement ICZM.¹⁹⁸ Coordination with neighbouring countries is emphasized.¹⁹⁹ Member States are to report to the Commission on their experience in implementing the recommendation within 45 months of adoption.²⁰⁰ Thereafter, the Commission reviews the recommendation (within 55 months) and submits an evaluation report accompanied by proposals for any required changes to the European Parliament and Council.²⁰¹

The first stocktaking in 2007 pointed out that while the recommendation considerably influenced the implementation of ICZM and several countries had developed national strategies, the process was moving at a snail's pace. More importantly, "coastal EU Member States regulate coastal use and development in some form ... a mature and well-functioning ICZM involving all relevant levels of governance is still rarely observed."²⁰² Developed largely in 2006, most of the national strategies had only begun to be implemented.²⁰³ The Commission concluded that greater promotion of ICZM was needed, but no further legislation was required.²⁰⁴ It confirmed the validity of ICZM principles and concluded that implementation should progress on the basis of the recommendation.

¹⁹⁵ The strategic approach has to recognize the threat of SLR and other climate change impacts, the need to protect the coastal environment based on an ecosystem approach, land for the public for their recreational purposes, etc. *Ibid*, ch I.

¹⁹⁶ Some of the major ones are: the principles of precaution, intra- and intergenerational equity; adaptive management; integration across sectors and levels of governance, stakeholder involvement, participatory and knowledge-based approach; respecting the carrying capacity of ecosystems. *Ibid*, ch II.

¹⁹⁷ *Ibid*, ch III.

¹⁹⁸ *Ibid*, ch IV.

¹⁹⁹ *Ibid*, ch V.

²⁰⁰ *Ibid*, ch VI(1).

²⁰¹ *Ibid*, ch VI(3).

²⁰² EC, *Communication From the Commission: Report to the European Parliament and the Council: An Evaluation of Integrated Coastal Zone Management (ICZM) in Europe*, COM(2007) 308 Final, (Brussels, 2007) at 4.

²⁰³ *Ibid* at 5.

²⁰⁴ *Ibid*.

Other EU instruments impinge coastal management including the Water Framework Directive, 2000;²⁰⁵ the Habitats and Bird Directives, 1992; the Action Plan “Halting Biodiversity Loss by 2010 – and Beyond”; the Strategic Environmental Assessment Directive, 2001; and the White Paper on Adaptation to Climate Change.²⁰⁶ The EU also ratified the Mediterranean ICZM protocol,²⁰⁷ “a strong signal of commitment from the EU to the protection and sustainable management of the Mediterranean coast.”²⁰⁸ The Integrated Maritime Policy²⁰⁹ and the Marine Strategy Framework Directive²¹⁰ include ICZM as part of a broader integrated maritime management and are aimed at improving marine environment quality by 2020. Such an approach will protect the resource base of marine-related economic and social activities.²¹¹

Following the second stocktake in 2010, the Commission proposed a follow-up

²⁰⁵ See generally EC, *Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 Establishing a Framework for Community Action in the Field of Water Policy*, [2000] OJ, L 327/1 (emphasizing the need for a greater integration of qualitative and quantitative aspects of both surface waters and groundwaters).

²⁰⁶ EC, *Adapting to Climate Change: Towards a European Framework for Action*, White Paper, COM(2009) 147 Final (Brussels, 2009) at 12 (pointing out to the need to respect and strengthen the ICZM recommendation).

²⁰⁷ See generally EC, *Council Decision of 4 December 2008 on the signing, on behalf of the European Community, of the Protocol on Integrated Coastal Zone Management in the Mediterranean to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (2009/89/EC)*, [2009] OJ, L 34/17.

²⁰⁸ See generally EC, Press Release, “Statement by European Environment Commissioner Janez Potočnik following the adoption of the Council decision to ratify the Protocol on Integrated Coastal Zone Management in the Mediterranean” (Brussels: MEMO/10/406, 13 September 2010), online: European Commission, Press Releases Rapid <http://ec.europa.eu/index_en.htm>.

²⁰⁹ For more details, see generally EC, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: An Integrated Maritime Policy for the European Union*, COM(2007) 575 Final, (Brussels, 2007).

²¹⁰ See EC, *Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive)*, [2008] OJ, L 164/19.

²¹¹ The Marine Strategy Framework Directive establishes European marine regions on the basis of geographical and environmental criteria. Member States (in cooperation with other Member States and non-EU countries within a marine region) are required to develop strategies for their marine waters. The first elements of marine strategies are due by 2012 and are required to be updated every six years. The Marine Strategy Framework Directive can facilitate adaptation by ensuring that climate change considerations are incorporated into the marine strategies and by providing a mechanism for regular updating to take account new information. The objective to achieve ‘good environmental status’ will help to develop actions to prevent deterioration in the quality of the marine environment due to climate change. The directive also urges the creation of a network of marine protected areas by 2012 and calls for the wide application of an ecosystem-based approach. *Ibid.*

with a review of the EU ICZM recommendation and possibly a new recommendation proposal.²¹²

9.3.2.2 Linking Marine Spatial Planning with ICZM

Maritime spatial planning is:

a public process for analysing and planning the spatial and temporal distribution of human activities in sea areas to achieve economic, environmental and social objectives that usually have been specified through a political process. Characteristics of marine spatial planning include ecosystem-based, area-based, integrated, adaptive, strategic and participatory.²¹³

In its quest to develop its “blue economy,”²¹⁴ the EU has since 2007, shifted focus to marine spatial planning (MSP) and ICZM was viewed as part of a broader strategy on MSP. In setting out this contemporary direction for coastal zone management, planning and conservation, an Integrated Maritime Policy was developed,²¹⁵ and in March 2013, the EU Commission launched a proposal to establish a framework that links maritime spatial planning and ICZM to enhance the development and sustainability of maritime and coastal based activities and use of coastal and marine resources. This proposal is based on the idea that:

Maritime spatial planning and integrated coastal management are complementary tools. Their geographical scope overlaps in the coastal and territorial waters ... where maritime spatial plans will map existing human activities and identify their most effective future spatial development, while integrated coastal management strategies ensure the integrated management of these human activities. Applied jointly, they both improve sea-land interface planning and

²¹² EC, *Consultation Document*, *supra* note 186.

²¹³ See *Why Marine Spatial Planning (MSP)*, online: Marine Spatial Planning Initiative, Marine Spatial Planning (MSP) <<http://www.unesco-ioc-marinesp.be/>>.

²¹⁴ EC, *Proposal for a Directive of the European Parliament and of the Council Establishing a Framework for Maritime Spatial Planning and Integrated Coastal Management* [2013] 0074 (COD) at 2 [EC, *Proposal for a Directive of the European Parliament*].

²¹⁵ Aldo Chircop & Ryan O’Leary, "Legal Frameworks for Integrated Coastal and Ocean Management in Canada and the European Union: Some Insights from Comparative Analysis" (2012) 13:3 *Vt J Env'tl L* 425 at 442 (HeinOnline).

management.²¹⁶

This draft directive applies to “marine waters and coastal zones.”²¹⁷ The draft directive obliges Member States to establish and implement a marine spatial plan or plans (MSPs) and an integrated coastal management strategy or strategies²¹⁸ based on an ecosystem-based approach.²¹⁹ The MSPs and ICZM strategies have two broad objectives: secure certain economic interests²²⁰ and protect the coastal and marine environment to “ensur[e] climate resilient coastal and marine areas.”²²¹ Minimum specific requirements²²² and common minimum requirements²²³ include public participation²²⁴ and environmental assessments.²²⁵ Specifically, ICZM strategies are to provide for mitigation and adaptation to climate change.²²⁶ Although, the directive provides for a common format, the intention is not to integrate measures but rather to enhance mutual coordination.²²⁷

9.3.2.3 Discussion

The European Union has adopted a rather soft law approach to ICZM implementation and through a series of progressive steps, it has presently cast a regional regime that has its basis in a recommendation. It must be noted that recommendation under the EU hierarchy of instruments enjoys no legal force and therefore it is non-binding and is primarily advisory in nature.²²⁸ Couched in general terms, it offers very little by way of

²¹⁶ EC, *Proposal for a Directive of the European Parliament*, *supra* note 214.

²¹⁷ *Ibid.*

²¹⁸ *Ibid* at 7, art 4.

²¹⁹ The objective is to facilitate co-existence and prevent conflicts between competing sector activities in marine waters and coastal zones. *Ibid*, art 5.

²²⁰ This includes securing energy supply; promoting maritime transport, safety and fostering the sustainable development of fisheries, the aquaculture sector, and related employment; and reducing pollution risks. *Ibid*, art 5(a)-(c).

²²¹ It *inter alia* seeks to ensure the preservation, protection and improvement of the environment, prudent and rational use of natural resources, prevent biodiversity loss and degradation of ecosystem services and reduce marine pollution risks. *Ibid*, art 5(d)-(e).

²²² *Ibid*, arts 7, 8. In establishing integrated coastal management strategies, member states are *inter alia* called upon to consider mitigation and adaptation to climate change. *Ibid*, art 8(f).

²²³ *Ibid*, art 6.

²²⁴ *Ibid*, art 9.

²²⁵ *Ibid*, art 11.

²²⁶ *Ibid*, art 8(2)(f).

²²⁷ *Ibid*, art 6(2)(a).

²²⁸ Recommendations and opinions shall have no binding force. See EU, *Consolidated Version of the Treaty on the Functioning of the European Union*, [2010] C 83/47, art 288 [EU, *Consolidated Version*].

functional guidance and operational specifics. While this has proven to be boon as it conferred considerable discretion on Member States to develop their national strategies based on national circumstances, there has been considerable foot-dragging by some Member States leading to divergent outcomes. Further, given the limited compass of the national stock take exercise, it is doubtful whether states were able to develop ICZM strategies that reflected development priorities and environmental concerns. Nevertheless, the recommendation has increased awareness about the need to integrate and reorient sectoral approaches to sustainable coastal development²²⁹ and moved coastal management in Europe beyond a project-by-project approach.²³⁰ The second stock take reveals a more optimistic picture of future benefits from pursuing the recommendation.

If materializes, the proposal for an MSP directive will offer the EU an important management framework that interlinks ICZM with MSP thereby recognising the nested nature of terrestrial and marine ecosystems. This is nothing short of revolutionary in the quest to attain sustainable coastal development. As well, the fledging regional regime (presently supported by the non-binding recommendation) will be revitalized if the MSP directive is implemented as it has binding legal force. Directives are “binding, as to the result to be achieved, upon each Member State to which it is addressed, but shall leave to the national authorities the choice of form and methods.”²³¹ In other words, directives sets targets and it is up to the Member States to determine how they will attain them. As well, the proposed directive also spells out measures to adapt to SLR.

Even though linking ICZM with MSP has merits, it can compound implementation concerns, particularly in federations where the exclusive jurisdiction at federal and provincial/state level separates the dry and wet components of the coastal zone. Again, it is also possible that in due course, the emphasis would shift to managing the seaward side (as it affords the possibility of exploiting minerals like oil and gas) and there could be less emphasis on the terrestrial components. At least in the near future, many coastal countries like those in South Asia, may find it difficult to link ICZM with MSP as both these tools are insufficiently developed in these countries.

²²⁹ See generally, EC, Directorate-General: Environment, *Report from the Working Group Follow-up to the EU ICZM Recommendation: Version 3, Final*, DGENV.D.3 D(09) (Brussels, 2009).

²³⁰ Burbridge & Humphrey, *supra* note 187 at 124.

²³¹ EU, *Consolidated Version*, *supra* note 228.

It is clear from the Mediterranean and the European Union experiences with ICZM that a regional approach holds inherent advantages over a global approach. And coastal South Asia as well as other coastal regions (despite differences in context) can draw lessons from both the European Union and Mediterranean regions in terms of operationalising a principled approach to coastal management at the regional level. In fact both demonstrate that a regional approach provides an opportunity to respond to specific issues in a more focused and holistic manner taking into account the special needs and circumstances of a particular region. As well, a regional approach also facilitates the implementation of adaptive and ecosystem based management. It is discernible from these regional case studies that a regional approach can induce reform (legislative, policy levels, etc.) at the national level, prompt cooperation and coordination between countries, provide direction to coastal states to internalize appropriate sustainable coastal management practices, enhance capacity to deal with coastal issues, and facilitate coastal climate change adaptation.

9.4 THE REGIME THEORY OF INTERNATIONAL RELATIONS AND PROSPECTS OF REGIONAL REGIME BUILDING ON ICZM IN SOUTH ASIA

Modern regime building began primarily in wake of the First World War, and received impetus with the creation of the United Nations.²³² And, in the environmental law arena, the Stockholm Conference of 1972 set the foundation leading to profusion of environmental regimes.²³³ Basically, regimes provide an atmosphere for collaboration and coordination by laying out the parameters and boundaries for permissible state behaviour. Defined as “sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors’ expectations converge in a given area of international relations,”²³⁴ regimes help to resolve the problems posed by collective goods (eg, a shared ecosystem) where states are goaded to avoid independent decision-

²³² Aldo Chircop, Ted L McDorman & Susan J Rolston, “Introduction: Setting the Stage” in Aldo Chircop, Ted L McDorman & Susan J Rolston, eds, *The Future of Ocean Regime-Building: Essays in Tribute to Douglas M. Johnston* (Leiden: Martinus Nijhoff Publishers, 2009) 25 at 25-27.

²³³ *Ibid.*

²³⁴ SD Krasner, “Regimes and the Limits of Realism: Regimes as Autonomous Variables” in Stephen D Krasner, ed, *International Regimes* (London: Cornell University Press, 1983) 356 at 356.

making, to avoid “free riders.”²³⁵ A more comprehensive definition states that regimes represent “the rules agreed by two or more states, aimed at working collectively on shared problems, even at the short-term risk of suffering relative losses, which are offset by the expectation that all parties will benefit and realize absolute gains.”²³⁶ There are three different schools (realists, neoliberals, and cognitivists) that explain the basic postulates of international regime formation that are germane to the discussion below.

Realists concentrate on power relationships, and they believe that states predominantly interact in an anarchic environment. The realist perspective on international cooperation is reflected primarily in the power-based regime theory, namely, “the theory of hegemonic stability,” which holds the view that strong international regimes are established and maintained by actors who hold a preponderance of power resources,²³⁷ which can be either economic, military or both and is used as a leverage over other states to draw them into the regime.²³⁸ In such cases, the hegemon can be benevolent²³⁹ or coercive.²⁴⁰ However, as and when the strength of the hegemon wanes, correspondingly the regime also weakens.²⁴¹

On the other hand, the neoliberals, or “interest based theories of regimes” argue, “states are rational egoists, who care only for their own (absolute) gains.”²⁴² In other words, states are “self-interested, goal seeking actors,” seeking maximization of individual utility.²⁴³ Despite mistrust, states cooperate to realize their objectives and the role of regimes is to facilitate and coordinate behaviour among states to achieve their

²³⁵ Mark J Valencia, “Regional Maritime Regime Building: Prospects in Northeast and Southeast Asia”(2000) 31 *Ocean Devel & Int’l L* 223 at 225.

²³⁶ Charles W Kegley, *World Politics: Trends and Transformation*, 10th ed (Belmont: Thomson Wadsworth, 2006) at 157.

²³⁷ Andreas Hasenclever, Peter Mayer & Volker Rittberger, *Theories of International Regimes*, 1st ed (UK: Cambridge University Press, 1997) at 90.

²³⁸ Gareth Porter & JW Brown, *Global Environmental Politics* (Boulder: Colorado Westview Pres Inc 1991) at 19.

²³⁹ Under the benevolent leadership model, the hegemon creates and maintains the regime all by itself, and other states are freed from the responsibility to do so. However this does not mean that the free riders draw more benefits than the hegemon. Hasenclever, Mayer & Rittberger, *supra* note 237 at 90-91.

²⁴⁰ In the coercive leadership model, the hegemon uses its superior power to force others to contribute as well. *Ibid* at 91.

²⁴¹ *Ibid* at 89.

²⁴² *Ibid* at 4.

²⁴³ *Ibid* at 23.

desired objectives in particular areas.²⁴⁴ Neoliberalism gives rise to the interest based regime theory and versions like the contractualist, situational structuralist, problem structural and institutional bargaining of which institutional bargaining emerges as most dominant.

The cognitivists depart from the earlier mentioned theories. They emphasize that distribution of knowledge constitutes the identities and shapes the preferences and perceived options of states. The cognitivist theory can be sub-classified into weak cognitivism and strong cognitivism.²⁴⁵ Weak cognitivism is based on three primary assumptions, namely, that the knowledge which actors possess strongly influence their behaviour and expectations in international relations, that policy makers demand high quality information and expert advice in making intelligent decisions and that some understanding of the issue at stake is necessary for expectation to converge, cooperation to take place and for an agreement to be forged. Weak cognitivism assigns significant roles to epistemic communities. Haas defines epistemic communities as

networks of knowledge-based communities with an authoritative claim to policy- relevant knowledge within their domain of expertise. Their members share knowledge about the causation of social or physical phenomena in an area for which they have a reputation for competence, and a common set of normative beliefs about what actions will benefit human welfare in such a domain.²⁴⁶

Leaders and decision-makers may not be aware of the intricacies of the scientific, social and economic implications of problems that confront the environment (and in other contexts as well) and consequently to make informed decisions, they depend on experts.²⁴⁷ “Subsequent discussions and policy debates are . . . informed and bounded by the advice which leaders receive.”²⁴⁸ As international issues become more technical,

²⁴⁴ For more details, see *ibid*, ch 3 at 23-82 (entitled “Interest-based Theories: Political Market Failure, Situation and Problem Structures, and Institutional Bargaining”).

²⁴⁵ *Ibid* at 136.

²⁴⁶ Peter M Haas, “Epistemic Communities and the Dynamics of International Environmental Cooperation” in Volker Rittberger, ed, *Regime Theory and International Relations* (Oxford: Clarendon Press, 1993) 168 at 179.

²⁴⁷ *Ibid*.

²⁴⁸ *Ibid* at 179.

complex, scientific, inter-disciplinary and uncertain, the work of epistemic communities “become the basis of new or changed international practices and institutions and the emerging attributes of a new world order.”²⁴⁹ Epistemic communities play important roles in regime creation.²⁵⁰

Strong cognitivism is based on the following themes, namely, the power of legitimacy, the power of argument, and the power of identity.²⁵¹ The power of legitimacy implies that states cooperate out of a sense of obligation. In other words, they comply with norms and rules, which are perceived, as being legitimate, since not to do so will undermine their own existence in international society. As far as the power of argument is concerned, regimes are formed from the practical discourses amongst states that aim at establishing norms of conduct, their interpretation and application in concrete situations. Regimes are the product of communicative dynamics.²⁵² The power of identity implies that states acquire role-specific understandings and expectations about self by socialization into the inter-subjective structures of the international system. The continued socialization of states within the international system leads to a more collective understanding of themselves in relation to other actors in the system and in the process they become habituated to cooperate and develop collective identities even in face of the dominant strategy of self-interested action to defect.²⁵³

In line with what has been stated above, it is clear that while certain regimes emerge spontaneously, not requiring conscious coordination by participants,²⁵⁴ others are

²⁴⁹ See generally Emanuel Adler & Peter M Haas, “Conclusion: Epistemic Communities, World Order, and the Creation of a Reflective Research Program” (1992) 46:1 Int’l Organization 367.

²⁵⁰ Haas opines that even though the realists espouse a follow the leader approach, due to uncertainty, this may have to be modified. In such situations, regime creation is still the responsibility of the hegemon, however its substance will reflect epistemic concerns. Haas terms it as modified follow-the-leader.” Similarly, in determining institutional bargaining as contemplated by cognitivists, epistemic communities can play important roles and Haas terms the revised model as epistemically informed bargaining. Adler & Haas, *supra* note 249 at 187-90.

²⁵¹ Vernese Inniss, *The Case for an Alternative Approach to Managing the Atmospheric Commons: Small Island States and the Climate Change Regime* (PhD Thesis, University of Delaware, 2003) at 93 [unpublished].

²⁵² *Ibid* at 96.

²⁵³ Hasenclever, Mayer & Rittberger, *supra* note 237 at 190.

²⁵⁴ Oran R Young, “Regime Dynamics: The Rise and Fall of International Regimes” in Oran R Young, *International Cooperation Building Regimes for Natural Resources and the Environment* (New York: Cornell University Press, 1989) 81 at 85.

the product of negotiations.²⁵⁵ Still others can be imposed – “... fostered deliberately by dominant powers or consortia of dominant powers.”²⁵⁶ These developmental sequences are not “mutually exclusive,”²⁵⁷ and “... any attempt to classify actual international regimes rigidly in terms of the three developmental sequences is ... to distort reality and to produce confusion rather than enhance understanding.”²⁵⁸

In sum, the different schools provide a theoretical casing to explain determinative factors namely, power, interest, and knowledge that contribute to regime formation. There are also certain other fundamental propositions that need mention here. Regime formation is not entirely a state sponsored construct, in addition to epistemic communities, other non-state actors can also play crucial roles in regime formation and development.²⁵⁹ Regimes can also take different shapes and forms; some are formal while others informal, some exhortatory, and others impose definite and concrete commitments. Even though not necessarily dependent on treaties, at the heart of all regimes there is necessarily “a cluster of rights and duties.”²⁶⁰ A related but distinct question is about regime effectiveness given that some are effective while others are not.²⁶¹ Generally, regime effectiveness is enhanced when its members abide by its terms, (regime strength) and “a regime is effective to the extent that it achieves certain objectives or fulfills certain purposes.”²⁶² Similarly, regimes “are maintained as long as the patterns of interest that

²⁵⁵ These type of regimes are characterised by 1) conscious efforts to agree on the major provisions; 2) explicit consent on the part of the participants in the regime; and 3) formal expression of the result. *Ibid* at 86-87. Despite bargaining, there can be conflict of interest between parties, and therefore such regimes exhibit a “piecemeal quality” where outstanding issues may be settled subsequently through practice and precedent. *Ibid* at 87.

²⁵⁶ *Ibid* at 88.

²⁵⁷ *Ibid* at 90.

²⁵⁸ *Ibid*.

²⁵⁹ Stephen D Krasner, “Sovereignty, Regimes, and Human Rights” in Volker Rittberger, ed, *Regime Theory and International Relations* (Oxford: Clarendon Press, 1993) 139 at 141.

²⁶⁰ Robert O Keohane, “The Analysis of International Regimes: Towards a European-American Research Programme” in Volker Rittberger, ed, *Regime Theory and International Relations* (Oxford: Clarendon Press, 1993) 23 at 43.

²⁶¹ Certain conditions that can lead to the creation of durable ocean management regimes are identified. These include: pre-existing habits of cooperation; national and regional leadership; capacity building through regional sharing of management capabilities; public awareness; economic development; cultural and political homogeneity; external threats and presence of epistemic communities. Saunders, *supra* note 8 at 10.

²⁶² Hasenclever, Mayer & Rittberger, *supra* note 237 at 2.

gave rise to them remain. When these shift, the character of the regime may change; a regime may even dissolve entirely.”²⁶³

Even though criticised for being a “wooly notion” that produces “more confusion than illumination,”²⁶⁴ regimes have been hailed as “[o]ne of the most creative innovations of the international diplomatic community in the 20th century.”²⁶⁵ With this synoptic understanding of regime dynamics, the remaining sub-sections proceed to analyse the situation in South Asia, utilising the four propositions central to the regime theory, namely, 1) regimes can help eliminate free riders; 2) the creation of epistemic communities promotes regime creation and supports its sustenance; 3) a hegemon can help establish and maintain the continued existence of an international regime; 4) despite an atmosphere of mistrust, states may cooperate to promote their self-interests.

As far as the first proposition is concerned, I will utilise the non-cooperative prisoners’ dilemma, to explain the need for regional cooperation on ICZM and CCA in South Asia to eliminate free-riders.²⁶⁶ As illustration, I take the example of the Sunderbans, a transboundary coastal mangrove shared by two players, namely, Bangladesh and India. Several fishing communities on both sides of the border depend on the Sunderbans for their livelihood. Given the degraded state and the ongoing threats that this ecosystem faces from SLR and other climate change impacts, if both countries cooperate to adopt measures to protect this ecosystem, the net benefits that could accrue to both would definitely be much higher. Suppose there is no cooperation between these two countries, and only Bangladesh implements actions to protect that part of the Sunderbans that lie on its side of the border. In such a situation, even if India does not put in place any measures to protect the ecosystem on its side, given the unique nature of the Sunderbans mangrove, India will still be able to free ride on the payoffs without having

²⁶³ Arthur A Stein, “Coordination and Collaboration: Regimes in an Anarchic World” in Stephen D Krasner, ed, *International Regimes* (London: Cornell University Press, 1983) 115 at 137.

²⁶⁴ “Prologue” in Oran R Young, *International Cooperation Building Regimes for Natural Resources and the Environment* (New York: Cornell University Press, 1989) 9.

²⁶⁵ See Douglas M Johnston, *The Historical Foundation of World Order: The Tower and the Arena* (Leiden: Nijhoff, 2008) at 730.

²⁶⁶ Game theory concepts are being used to enhance our understanding about the maintenance of regimes. Andrew Kydd & Duncan Snidal, “Progress in Game-Theoretical Analysis of International Regimes” in Volker Rittberger, ed, *Regime Theory and International Relations* (Oxford: Clarendon Press, 1993) 112 at 113.

to take upon itself the burden of carrying out investments for conserving the Sunderbans. But for Bangladesh, its unilateral actions on conservation and attendant investments will lead to a situation where the country is saddled with costs that exceed the benefits of the investment.²⁶⁷ Accordingly, Bangladesh may decide not to invest resources for conservation efforts as a do-nothing option makes perfect economic sense. Ultimately, both countries may decide not to adopt any measures to protect the Sunderbans, which is definitely not in the best interests of both. To prevent such eventualities, greater co-operation in the form of a regime, which provides an opportunity for all interested parties to converge so as to assume greater responsibilities to manage and conserve the resource, and adopt measures in this regard makes pre-eminently good sense.

Even though the SAARC has been around for nearly three decades, these decades basically speak about missed opportunities, misdirected efforts, lack of confidence-building measures in core areas, sidetracking of sensitive issues, and a lack of political cohesion, shared vision and mutual trust.²⁶⁸ Still, a positive achievement from the perspective of coastal management has been the establishment of the SAARC Regional Coastal Zone Management Centre with its emphasis on capacity building and creation epistemic communities. The regime theory clearly articulates the utility of epistemic communities and their role in regime creation and its sustenance. It is possible that the SAARC Regional Coastal Zone Management Centre may in due course provide an arena that can bring together coastal management experts, lawyers, policy makers and the scientific community from the South Asian coastal countries and even beyond who can pool in resources and share knowledge which can strengthen respective national efforts in coastal management. Given the absence of academic programmes on ICZM in South Asia, epistemic communities can play critical roles in popularizing ICZM in the respective countries. This can help create awareness in the region and provide an appropriate atmosphere for regime creation on ICZM in South Asia.

²⁶⁷ Michael Finus, *Game Theory and International Environmental Cooperation*, Wallace E Oates & Henk Folmer, eds, New Horizons in Environmental Economics (Glos: Edward Elgar Publishing Limited, 2001) at 22.

²⁶⁸ Way back in 1998, it was remarked that the “SAARC has hardly progressed beyond signs and symbols.” This situation continues even today. Swain, *supra* note 106 at 84.

Another important factor that has hampered regional cooperation in South Asia relates to the prospective role of India, which is viewed as a hegemon in the South Asian region. Four key reasons can be offered to justify India's pre-eminent position in South Asia. First of all, India's central geographical location in the South Asian region renders it the common denominator vis-à-vis the other coastal countries and it has the maximum coastline in this region. Secondly, India has enjoyed strong economic growth in recent years.²⁶⁹ Thirdly, the country has aspirations to play a leadership role in world affairs and is currently vying for a permanent seat in the UN Security Council.²⁷⁰ And fourthly, it has a strong military, a navy with blue water capabilities, and is a nuclear power.²⁷¹ While there is general agreement that India has to play a critical leadership role in forging and operationalizing regional cooperation and in taking forward any regime on CCA and management,²⁷² the fact is that India has been unable to rise to expectations and has not been able to provide necessary leadership. Rather, India views its neighbours with suspicion and fears that these countries may forge alliances against its interests and is also weary about the growing Chinese presence in South Asian waters.²⁷³ The other coastal and non-coastal countries in South Asia view the intransigence on the part of India to deal with pressing outstanding issues and disputes (for instance, seeing the transnational water disputes as a pure bilateral issue rather than approach the matter in a more holistic manner on the basis of integrated basin based river management involving

²⁶⁹ During the period between 2007-2012 (eleventh five year plan), India's average growth rate was 7.9 per cent despite two global crises – one in 2008 and another in 2011. See Prime Minister, "Statement" (Full Planning Commission Meeting on Twelfth Five Year Plan (2012-17) 15 September 2012), online: Planning Commission <http://planningcommission.nic.in/news/pm_speech1509.pdf>.

²⁷⁰ Tony Karon, "India's Security Council Seat: Don't Hold Your Breath" *Time* (10 November 2010) online: Time <<http://www.time.com/time/world/article/0,8599,2030504,00.html>>; Shashi Tharoor, "Security Council Reform: Past, Present, and Future" (2011) 25:4 *Ethics & Int'l Affairs*, online: *Ethics & International Affairs* <<http://www.ethicsandinternationalaffairs.org/>>.

²⁷¹ Staff Writer, *India Military Strength* (11 May 2012) online: GFP, The GFP Top 10, India <<http://www.globalfirepower.com>>.

²⁷² For instance, the Government of India has provided USD1 million to the SAARC Coastal Zone Management Centre to strengthen the centre. *SAARC Ministerial Statement on Cooperation in Environment ("Delhi Statement")* ¶18, online: India Environment Portal <<http://www.indiaenvironmentportal.org.in/files/Delhistatement-Final.pdf>>.

²⁷³ Stewart Watters, "China Encircles India" *The Diplomat* (20 July 2011), online: The Diplomat <<http://thediplomat.com/china-power/china-encircles-india/>>; Raashi Bhatia, "India encircled by China's string of pearls?" *Reuters* (28 July 2009), online: REUTERS <<http://blogs.reuters.com/india/2009/07/28/india-encircled-by-chinas-string-of-pearls/>>.

upstream as well as downstream states) on a bilateral rather than utilize regional mechanisms and forums as a major impediment to the development of long-term sustainable regional solutions.²⁷⁴ As well, India frowns upon third party assistance to resolve some of these major disputes. In this context, it must be noted that the SAARC charter also emphasizes that decisions at all levels are to be based on unanimity and exclude bilateral and contentious issues from deliberations, thereby effectively proscribing the ability of this institution to provide appropriate guidance and solutions.²⁷⁵ In practical terms, this has prevented issues that are bilateral in nature from being raised in its SAARC forums. Whatever may be the case, it is extremely important that India adopt a proactive approach to forge a regional regime and this demands that this country step into the shoes a benevolent hegemon, one which balances its national interests with that of the larger regional interests, willing to make concessions so as to promote regional comity.

Given the dynamics of South Asia, if a regional regime has to germinate and sustain itself over longer time scales, it is clear that the regime emerge spontaneously, facilitated by the parties themselves in promotion of their self-interests, rather than it being imposed. Proponents of regime theory argue that states, as rational actors, engage in regime creation if expected benefits exceed expected costs. Despite having fair knowledge about different coastal processes and the dangers in permitting reckless development, most coastal countries in the South Asian region have generally been unable to adopt a proactive approach towards CZM. Even though, the differences engendered by sovereignty, territorial, maritime boundary and other disputes persist, the bleak ecological prognosis for the region, climate change and SLR provide the impetus for greater cooperation. Apart from this, the burgeoning growth in population, and with more and more people migrating to the coasts for employment and economic opportunities, will place enormous pressure on coastal ecosystems and resources. Certain compelling reasons for greater regional cooperation between the coastal countries of South Asia can be gathered from different the parts of this study and is set out below.

²⁷⁴ Ramasamy R Iyer, "A Maverick View" in Surya P Subedi, ed, *International Watercourses Law for the 21st Century: The Case of the River Ganges Basin* (Hampshire: Ashgate Publishing Ltd, 2005) 47 at 53.

²⁷⁵ See *SAARC Charter*, arts X(1),(2) online: SAARC <<http://www.saarc-sec.org/SAARC-Charter/5/>>.

The most obvious reason is the divergence in capacity and resources available at present to the different coastal countries of South Asia to operationalize ICZM. Due to this, for optimal results, it may be necessary for nations to pool together their resources, which requires cooperation. As the SASAP points out:

The region as a whole has important assets in terms of human and institutional capacity in relevant scientific, economic, social and technological fields and planning experiences. Therefore, specifically targeted regional co-operation activities could boost the exchange of experiences, information, data and expertise in relevant sectors; promote co-operative research programmes and technology transfer; and support the development of suitable planning guidelines, awareness-raising initiatives, scientific and technological means and capacity-building activities.²⁷⁶

Moreover, one of the fundamental principles in the *United Nations Framework Convention on Climate Change*²⁷⁷ is the transfer of financial resources and environmentally sound technologies from Annex II parties and developed country parties to developing country parties, particularly to those that are vulnerable to the adverse consequences of climate change to enable them to meet their requirements under the convention.²⁷⁸ From the perspective of coastal climate change adaptation, already the poorly constructed sea walls in South Asia are posing environmental problems. For instance, the sea wall constructed around the city of Malé entraps water during storm surges, leading to the flooding of the city. To allow the water to escape, a part of the wall had to be dynamited.²⁷⁹ Such incidents highlight the need for new technology and designs and financial assistance. Here, development of a common position by SAARC coastal countries can facilitate the realization of this obligation.

Second, as seas rise, the number of climate refugees will also rise, raising serious issues concerning their relocation and status. South Asia is already plagued by illegal immigration. With Maldives slated to go under the sea and large tracts of coastal

²⁷⁶ SASAP, *supra* note 16 at 7.

²⁷⁷ See generally UNFCCC, *supra* note 4.

²⁷⁸ *Ibid*, art 4.3.

²⁷⁹ See Clive Howard Schofield, *The Trouble with Islands* (LL.M Thesis, The Faculty of Graduate Studies, University of British Columbia, 2009) [unpublished] at 225.

Bangladesh also to be badly affected, the question then is what will happen to these climate refugees? As it is difficult for the poor in these countries to move to distant lands, will the other coastal countries in the region be able to accommodate the refugees, particularly when they themselves will be burdened with their own internally displaced? The problem of climate refugees and the need for a humane response warrants regional cooperation. Third, some of the impelling coastal problems in South Asia are transboundary in nature. For instance, conservation of the Sunderbans mangrove ecosystem requires at least bilateral cooperation between India and Bangladesh. Again, as pointed out, transboundary water sharing can have implications for coastal management and this may require cooperation between the countries in the Indian subcontinent and even beyond²⁸⁰ to ensure that a minimum supply of water is available and to reduce seawater intrusion into deltas and estuaries. Development projects that affect the stability of coastal resources in neighboring states require greater regional cooperation if pragmatic solutions are to be developed. In short, there is a need for greater cooperation for facilitating knowledge sharing, developing capacity, and devising collective responses to meet the challenges posed by climate change and SLR. It is imperative that coastal South Asia to look beyond their disputes and differences to develop the political will and readiness to regionally cooperate on the marine and coastal conservation imperative and this is in the self-interests of these countries.

9.5 BUILDING A REGIONAL REGIME: SWOT ANALYSIS

It is clear that some of the propositions of the regime theory provide rationale for regional regime building on ICZM and CCCA implementation in South Asia. In the succeeding discussion, I will utilise a Strength, Weakness, Opportunities and Threats (SWOT) Analysis to further explicate the need for a regional regime on ICZM and CCCA for South Asia.

9.5.1 Strengths

²⁸⁰ In this context, it must also be noted that transboundary water sharing in South Asia is acquiring new dimensions. China is proceeding to construct three major dams on the River Brahmaputra. This may affect lower riparians like India and Bangladesh and the coastal deltas. See Ananth Krishnan, "China gives go-ahead for three new Brahmaputra dams", *The Hindu [of India]* (30 January 2013) online: The Hindu <<http://www.thehindu.com>>.

Perhaps the most important strength held out by a regional regime is that it can contribute to regional stability and peace. With resources scarce and unable to meet the requirements of an ever-increasing population, climate change and SLR can lead to harsher weather conditions, de-glaciation, flashfloods and reduced water input into the major rivers. Deteriorating quality of life can lead to social instability, which may manifest in the form of war, ethnic strife, etc., something that the countries in this region can ill-afford. These are all issues, which the regional regime can address. As well, a regional regime emerges as an expression of a positive political commitment towards SCD by the countries that subscribe to it. Accordingly, the regime will be able to promote and strengthen the establishment of normative frameworks for ICZM implementation to arrest the ongoing deterioration of coastal ecosystems at the national level by providing guidance and direction to coastal states to develop their own responses. In the same vein, it can help streamline adaptation actions relevant to the coastal zone, particularly to SLR.²⁸¹ Given the unique geographical features and circumstances of coastal South Asia, a regional regime can help integrate actors and actions and prompt the development and use of identical scientific methods and sharing of comparable data. It can ultimately lead to the allotment of resources, the creation of common pools and institutional structures to monitor and facilitate compliance, and the mainstreaming of adaptation into existing developmental efforts.²⁸²

9.5.2 Weaknesses

Even though climate change and SLR provides a trigger for South Asian nations to move towards greater cooperation, one of the most important weakness that can undermine the stability of the putative regional regime on ICZM is the lack of mutual trust amongst the countries in this region. Despite sharing cultural and social homogeneity and common political history, several factors have hampered the growth and development of cooperation between these nations, including their inability to amicably resolve disputes

²⁸¹ See Part 9.3, above, for more details on how regional cooperation can promote CCCA; see also EC, *Protocol on Integrated Coastal Zone Management in the Mediterranean*, [2009] OJ L 34/19 [*ICZM Protocol*].

²⁸² See generally Part 9.4, above, for the discussion on regime formation and how it helps in the elimination of free riders.

regarding non-demarcated terrestrial and maritime boundaries and sharing of resources. Moreover, there is nothing to suggest to the contrary that mutual distrust will not continue to plague the regional regime on ICZM in South Asia.²⁸³

The various regional platforms presently available, namely, the South Asian Seas Regional Seas Programme and the SAARC, have not been able to foster regional cooperation to operationalize ICZM and coastal climate change adaptation.²⁸⁴ Apart from political, and economic differences, South Asia represents a kaleidoscope of governance systems; a few states are unitary (Bangladesh, Sri Lanka, and Maldives), while the remaining are federal (India and Pakistan). In some of these countries, there is a well-developed system of local self-government that is constitutionally ordained, while in others the emphasis is more on centralization. Even religion exerts an important role in determining the contours of governance in these countries.²⁸⁵ This divergence in systems makes the implementation of a regional regime on ICZM, which has overwhelming governance connotations, a difficult prospect, as it will have to cater to these varied contexts.

Additionally, the crushing levels of poverty in the region means less commitment at the regional level in terms of leveraging financial and other scarce resources. Furthermore, there is general emphasis on short-term economic development and an eagerness to reassert sovereignty over natural resources found within national borders.²⁸⁶ This is a serious concern that can undermine the potential of any regional regime. Good coastal governance has to be viewed as a subset of larger governance issues, and South Asia is generally plagued by poor institutional frames that are creaking and corrupt, a

²⁸³ See Part 9.2.2, above, for an overview of some of the pressing trans-boundary disputes that can derail a regional regime.

²⁸⁴ *Ibid.*

²⁸⁵ See *The Constitution of the Democratic Socialist Republic of Sri Lanka, 1978*, art 9 (foremost place to Buddhism); *Constitution of the Republic of Maldives, 2008*, translated by Dheena Hussain, art 2, online: Ministry of Tourism Arts and Culture <<http://www.maldivesinfo.gov.mv/home/upload/downloads/Compilation.pdf>> (which states that the Maldives is a sovereign, independent, democratic Republic based on the principles of Islam); *Constitution of the People's Republic of Bangladesh, 1972*, art 2A (states that the state religion of the republic is Islam); *The Constitution of the Islamic Republic of Pakistan, 1973*, art 2 (points out that Islam shall be the state religion of Pakistan).

²⁸⁶ For more discussion on this issue, see generally Ch 3.

reality that can easily derail a fledging regional regime.²⁸⁷ Consequently, there is an inability to translate many of the legal stipulations into practical policies. The success of ICZM is dependent in large measure on the institutions available at national levels. From a practical consideration, ICZM is challenging to enact in South Asia because of inefficient institutional mechanisms (understaffed bureaucracies, lack of resources and training) to monitor and ensure compliance. At present, there is also mismatch in terms of capacity and the requirements needed to work an ICZM programme.²⁸⁸ In short, coastal South Asia needs a special cadre of officials to lead and implement the programme and this is presently not available.

Another factor is the general poor level of law enforcement, particularly of environmental laws at the respective national levels. Even though all of the countries in the South Asian coastal region have widely subscribed to various international agreements and many have domestic legal frameworks and institutions to correspond to these obligations, national level implementation of environmental law remains poor. One major reason for this is the lack of internalisation of these laws by the population, a large segment of which is functionally illiterate.²⁸⁹ Low public awareness regarding the importance of conserving coastal resources, top-down models, exclusion of coastal communities, and excessive bureaucratisation are factors that can weaken the regime.

9.5.3 Opportunities

Despite threats and weaknesses, there are significant opportunities available to coastal South Asian states to develop and mainstream ICZM via a regional-level instrument. While there are many issues that can prevent cooperation, a regional regime on ICZM can provide an opportunity for countries to coalesce their individual efforts in other

²⁸⁷ In a survey of 7,500 people (between 2010 and 2011) in Bangladesh, India, the Maldives, Nepal, Pakistan and Sri Lanka regarding their views of corruption levels in their respective countries, it was found that in Bangladesh 66 per cent, in India 54 per cent and in Pakistan 49 per cent paid bribe to access government services and that too within a period of 12 months prior to this survey. See generally Deborah Haroon & Finn Heinrich, *Daily Lives and Corruption, Public Opinion in South Asia* (Berlin: Transparency International, 2011).

²⁸⁸ For more details on the implementation of coastal management and problems faced in South Asia, see Ch 3.

²⁸⁹ For more details, see Ch 8, Part 8.3.

contexts that are relevant to ocean and coastal management like marine pollution, creation of a network of marine protected areas, etc. In this regard, regional agencies and institutions can act as a conduit to assist member states in building their capacity, develop sound science, and share their resources in these related areas as well. Another important opportunity held out by a regional regime is that the basic approaches to environmental and coastal problems in South Asia are reactive in nature and generally associated with specific disasters.²⁹⁰ Once the dust raked up in the wake of the disaster settles, there is a return to a business-as-usual approach. A regional instrument on ICZM can stimulate the development of well-articulated responses rather than those that are knee-jerk and short-term quick fixes. A regional regime also provides an opportunity to implement the stipulations enshrined in the various international law instruments, tailoring them to regional requirements.

Already in South Asia, there is the SAARC Coastal Management Center, which can serve as a vehicle to help promote ICZM. A regional regime can revitalize this center and provide a platform to epistemic communities to develop and contribute to the growth of science and technology relevant to CCCA and ICZM implementation. In addition, a regional regime can also lead to unified action in relation to the Conference of the Parties negotiations to the UNFCCC.²⁹¹ In this regard, the coastal nations can pressure the international community to heed the demands for more resources to combat SLR through coastal climate change adaptation. As well, overwhelming predictions of possible climate change impacts and SLR emphasize that South Asia will be one of the worst-hit regions and will be saddled with climate change, internally displaced persons, and climate change refugees numbering in the millions. Coastal South Asia has to develop a strategy to

²⁹⁰ For example, it was after the Indian Ocean tsunami that the coastal nations of South Asia enacted disaster management statutes. Tony George Puthucherril, "Climate Change, Sea Level Rise and Protecting Displaced Coastal Communities: Possible Solutions" (2013) 2 *Global J Int'l L* [unpublished in press] [Puthucherril, "Climate Change"].

²⁹¹ In September 2010, the Bangladeshi Prime Minister, Sheikh Hasina, warned that the mass movement of up to 30 million people in Bangladesh could lead to 'formidable social and even cross-border problems'. She proposed a joint South Asian initiative to mobilize international support under the UNFCCC Protocol to ensure the social, cultural and economic rehabilitation of climate change-induced displaced people. "PM warns of climate refugee crisis", *The Daily Star [of Dhaka]* (5 June 2011) online: [The Daily Star <http://news.priyo.com/story/2010/sep/22/7047-pm-warns-climate-refugee-crisis>](http://news.priyo.com/story/2010/sep/22/7047-pm-warns-climate-refugee-crisis); see also Jane McAdam, "Swimming Against the Tide: Why a Climate Change Displacement Treaty is Not the Answer" (2011) 23:1 *Int'l J Refugee L* 2 at 18.

respond to this looming humanitarian crisis and here the regional regime on ICZM and CCCA is necessarily one of the first steps, as the emphasis is on improvement of adaptive capacity.²⁹²

Presently, the *United Nations Convention on the Law of the Sea, 1982* (LOSC) guides the development of actions under the South Asian Regional Seas Programme, particularly its Action Plan. This has not contributed to the development of a regional focus, and the absence of a specific instrument to support the SASAP has only hampered regional initiatives. In this regard, a regional regime on ICZM can serve as a bridgehead to rectify the disequilibria in capacity and resources and also help create solidarity among the nations to pool resources to implement the concept and coastal climate change adaptation. Moreover, it could provide the opportunity for the parties to come up with a legally-binding regional instrument to support the South Asian Regional Seas Programme, as and when they realize the utility of enhanced cooperation. A regional regime also provides an opportunity for the coastal regions of South Asia to realize some of the goals espoused by the Millennium Declaration, namely, ending poverty and hunger,²⁹³ and ensuring environmental sustainability.²⁹⁴ A regional instrument that is legally binding can also help to mobilize more international funding for ICZM projects for it can “motivate international donors to get more involved in ICZM issues.”²⁹⁵

9.5.4 Threats

Significant threats that can derail a nascent regional regime are the uncertainty implicit in the science of climate change and the fact that the impacts of climate change and SLR are not uniform on the coastal regions of South Asia. Another threat is the lack of regular monitoring of treaty obligations and possible steps to prevent violations. Development of an ICZM regime at the regional level may require expansion of existing institutions or the

²⁹² See also Puthucherril, “Climate Change”, *supra* note 290.

²⁹³ For further information on MDGs “Goal 1: Eradicate Extreme Poverty & Hunger”, see UN, *We can End Poverty 2015*, online: UN <<http://www.un.org/millenniumgoals/Poverty.Shtml>>.

²⁹⁴ See UN, *We can End Poverty 2015: Goal 7: Ensure Environmental Sustainability*, target 7.A, online: UN <<http://www.un.org/millenniumgoals/enviro.html>> (integrating the principles of sustainable development into country policies and programmes and reversing the loss of environmental resources); *ibid*, target 7.B (reducing biodiversity loss).

²⁹⁵ “Rochette & Billé, “ICZM Protocols”, *supra* note 10 at 980.

creation of new ones. As this can be an expensive prospect and may involve curtailment of national sovereignty, states in the South Asian region may not be willing to invest resources, due to other pressing problems and demands. Moreover, there are several outstanding disputes that need to be settled and these can jeopardize regional cooperation on ICZM.²⁹⁶ As well, the absence of a specific instrument to support the implementation of the SASAP has only hampered regional initiatives and has not contributed to the development of a regional focus.²⁹⁷ This can be a potential threat that can prevent the maturing of the regional ICZM regime. Again, there is also the possibility that an over-emphasis on the legal apparatus may lead to complacency in developing other tools and management methods. As Abraham Maslow once said, "... it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail."²⁹⁸ Such an attitude to place faith squarely on legal tools can seriously threaten the stability of the regional regime in the long run. Finally, a general threat that can undermine the stability of a regional regime in the long run is that while some of the Regional Seas Programmes like the Mediterranean have covered considerable distances to protect the coastal and marine environment,²⁹⁹ others like South Asia lag behind even in critical areas like land-based sources of pollution.³⁰⁰ This when the international law on this subject is a patchwork of soft law instruments and rules. Accordingly, a regional approach can lead to disparity in terms of the protections available, contribute to fragmentation and impede the development of international regimes in such core areas.³⁰¹

²⁹⁶ See Part 9.2.2, above, for some of the outstanding issues that prevent the development of regional level regimes in South Asia.

²⁹⁷ See Part 9.2.1.1.1, above.

²⁹⁸ Abraham H Maslow, *The Psychology of Science: A Reconnaissance*, eBook ed (2002) at 15.

²⁹⁹ But see *supra* note 54.

³⁰⁰ See *supra* note 48

³⁰¹ Alan Boyle, "Globalism and Regionalism in the Protection of the Marine Environment" in Davor Vidas, ed, *Protecting the Polar Marine Environment: Law and Policy for Pollution Prevention* (Norway: Cambridge University Press, 2000) 19 at 33; see also Hassan, *supra* note 25 at 185.

<p>S</p> <p>Strengths</p> <ol style="list-style-type: none"> 1. Contributes to regional peace and security and can address transboundary impacts 2. A normative framework for sustainable coastal development 3. Guidance and direction to coastal states to develop national level responses 4. Capacity-building and sharing of resources 5. Creates new institutions at the regional level to monitor and facilitate compliance 6. Streamlines coastal adaptation actions 	<p>W</p> <p>Weaknesses</p> <ol style="list-style-type: none"> 1. Mistrust among countries 2. Inability to translate legal stipulations into practical policies due to varied national contexts 3. Widespread poverty and institutional weakness 4. Poor law enforcement
<p>O</p> <p>Opportunities</p> <ol style="list-style-type: none"> 1. Can spur development of regional cooperation in other other areas 2. Promote development of well-articulated responses to environmental problems 3. Promote implementation of international environmental obligations 4. Utilise the SAARC Coastal Management Center to promote ICZM 5. Influence better outcomes at UNFCCC negotiations 6. Protect climate change refugees 7. Contribute to the development of a regional instrument to support the South Asian Regional Seas Programme and Action Plan 8. Achieve Millennium Development Goals 9. Secure international funding to ICZM projects 	<p>T</p> <p>Threats</p> <ol style="list-style-type: none"> 1. Uncertainty regarding the potential impacts of climate change and SLR 2. Non-commitment of resources 3. Absence of a specific instrument to support SASAP implementation 4. Outstanding disputes 5. Over-emphasis on law may lead to complacency in developing other tools and methods 6. Can contribute to fragmentation and impede the development of international regimes in the area

Table 4: SWOT Analysis: Highlighting the Need for a Regional Regime on South Asia

In short, the strengths and opportunities afforded in adopting a regional focus to ICZM in South Asia are immense. There are several good reasons that militate in favour of regional-level instruments on ICZM (like protocols as adjuncts to the regional seas conventions) and there is considerable optimism over such an approach to ICZM implementation.³⁰² While there are threats and weaknesses, these are not insurmountable. As the SWOT reveals, the biggest weakness that can derail the nascent regional regime are boundary disputes and here the Kashmir dispute emerges as the primary one. A solution to Kashmir would change the scenario considerably and contribute to lasting

³⁰² See generally Julien Rochette & Raphaël Billé, “ICZM Protocols to Regional Seas Conventions: The Wonder Drug for Coastal Sustainable Development?” (PowerPoint presented to the 10th Annual Colloquium of the IUCN Academy of Environmental Law, Baltimore, United States, July 1-5 2012).

peace to South Asia in general and to the Indian sub-continent in particular. Several solutions have been suggested; one of the most important is to declare the existing Line of Control, which divides Kashmir into two, with one part administered by India and the other by Pakistan as the international boundary.³⁰³

9.6 CONCLUSION

The impacts of climate change and SLR interact with existing social, economic and environmental factors to produce catastrophic results. The challenge in South Asia is how to foster SCD while balancing and promoting environmental, social, and economic development objectives in mutually reinforcing ways. At the regional level, the performance of the South Asian Regional Seas Programme and the SAARC also affirms that the parties are more motivated by poverty eradication concerns and their need to quickly develop their national economies than by climate change. Nevertheless, it is necessary that national frameworks be developed and strengthened to propel the coastal regions of South Asia towards more sustainable patterns of coastal development.

As this chapter demonstrates a regional regime on ICZM for South Asia can provide direction to national efforts that need to be accelerated and expanded to place ICZM at the center of the broader environmental agenda to enhance the prospects of adaptation to climate change and SLR. From the above, it is clear that a regional approach and related regime building not only provides an opportunity to implement obligations aimed at domesticating the regional level instrument, but it also promotes the development of appropriate legal and competent management structures. As well, given the limited financial resources and pool of experts, particularly in these developing countries, regionalism could well be an optimal path that can help utilise scarce resources. In this regard, irrespective of differences, a regional approach can facilitate the strengthening of epistemic communities, promote capacity development, facilitate sustained funding, and generate scientific data, particularly in respect of SLR and other climate change impacts. A regional approach can also help parties collaborate to deal with transboundary issues such as pollution control, habitat destruction and even provide

³⁰³ BBC News, "The Future of Kashmir?", online: BBC News <http://news.bbc.co.uk/2/shared/spl/hi/south_asia/03/kashmir_future/html/>.

for environmental impact assessments for development projects that have transboundary impacts. The ultimate pay-off is then to further regional prosperity by building trust and confidence among the coastal countries of this region, developing solutions to problems that have transboundary ramifications, settling maritime boundary disputes, developing better capacity in terms of putting into practice coastal management, strengthening epistemic communities and promoting the sharing of technology and resources.

The overall conclusion here is that an environmental and humanitarian crisis looms large over the destinies of all South Asian coastal countries, a crisis that calls out for immediate attention. As the saying goes, “either we swim together or sink together.” The problems that the countries’ coastlines face in common can best be addressed through regional cooperation. Thus, there is a strong rationale for a regional rather than a sectoral approach on ICZM and coastal climate change adaptation. Also of note, in a rapidly changing world, what happens in South Asian nations will definitely reverberate internationally. Poverty, instability, climate-related pestilence and regional conflicts in South Asia could upset world peace and security. Therefore, rather than raking up the past, the South Asian countries must look towards the future and reinvent the SAARC to become a purposeful instrument for regional cooperation and change. A regional instrument on ICZM implementation that sees augmenting the instrumentality of coastal laws at the respective national levels as its focus is in the collective individual and long-term interests of these countries.

CHAPTER 10 THE FOUNDATIONS FOR A PRINCIPLED APPROACH TO SUSTAINABLE COASTAL DEVELOPMENT IN SOUTH ASIA

10.1 INTRODUCTION

In developing and implementing the sustainable development agenda, in many situations, cooperation between states is considered *sine qua non* and this can take several forms, including cooperation at the regional level.¹ Indeed, as seen in the previous chapter, regional cooperation is an essential construct in several international environmental law treaties as possible pathways to problems that are *sui generis* to a particular region and even to those that may be evident at the global level. Even though climate change and SLR are global problems, certain aspects of these phenomena can have a regional focus as well and may require cooperation between nations at the regional level to develop mitigation and adaptation solutions which can take the form of mandatory emission cuts, the development and sharing of clean carbon and sequestration technologies, water management, transboundary water sharing, biodiversity conservation and coastal management.

As the preceding chapter attests there are several reasons that point to the need for a regional ICZM instrument in the South Asian region. The experiences of India and those of other coastal countries in this region reveal that the situation at the national level does not inspire confidence that these countries have the necessary capacity and resources to operationalize ICZM on a grander scale. Given that the South Asian region will be badly impacted by SLR and other climate change processes, in certain cases, the impacts cannot be contained within national boundaries; there is the possibility of spillovers. This may trigger mass migrations, halt development and aggravate conditions of poverty, and

¹ See United Nations, *Charter of the United Nations*, 26 June 1945, 1 UNTS XVI (entered into force 24 October 1945) [*UN Charter*] art 1. “States and people shall cooperate in good faith and in a spirit of partnership in the fulfillment of the principles embodied in this Declaration and in the further development of international law in the field of sustainable development.” *United Nations Conference on Environment and Development: Rio Declaration on Environment and Development*, 14 June 1992, 31:4 ILM 874, prin 27; Philip Saunders, “Maritime Regional Cooperation: Theory and Principles” in Mark J Valencia, ed, *Maritime Regime Building: Lessons Learned and Their Relevance for Northeast Asia*, vol 36, Publications on Ocean Development (The Hague: Martinus Nijhoff Publishers, 2001) 1 at 1.

therefore it is apposite that at least in relation to coastal zones, current developments on ICZM at the national level in the countries of this region should be taken to the next stage by enacting/reengineering coastal laws to underpin the process. And here a regional-level instrument on ICZM can play an important role in streamlining and strengthening this process.

In the discussion below, drawing from different parts of this study, the agenda of regional regime building for coastal South Asia is taken forward by identifying a minimum set of principles/elements that can inform coastal law-making at the respective national levels in coastal South Asia, seeking to balance and create synergies between coastal environmental protection and economic development and provide for coastal climate change adaptation, all via the ICZM methodology. The chapter concludes by re-emphasizing the utility of a regional approach to ICZM implementation and in securing the more important objective of fastening CCCA onto an ICZM process.

10.2 THE FORM AND SUBSTANCE: WHAT ARE THE PRINCIPLES/ELEMENTS THAT SHOULD INFORM THE REGIONAL INSTRUMENT?

Clearly, there is ample room for improving coastal management in South Asia and there has to be a paradigm shift in the way in which coastal spaces and resources are being managed. And as the propositions in the previous chapter and the SWOT analysis there reveals, there is scope for a regional instrument in South Asia. The question then is: what should the form of this instrument be?

Laws and legal instruments typically evolve incrementally. Even though identifying and adopting the most apt mode for regional cooperation is a matter of choice, a spectrum of options is available to the coastal states to develop a regional regime. Nevertheless, the form and content will depend upon the countries that comprise this region.² Despite the fact that there is no hard-law instrument on ICZM at the international level (which actually increases the need for a regional hard-law instrument as an ideal option, given the unique milieu of the area and the regional dynamics involved), it may be premature

² If “exocratically” developed policies are imposed, these are unlikely to be perceived as legitimate by resource users. Saunders, *ibid*; see also Patrick Christie, “Is Integrated Coastal Management Sustainable?” (2005) 48 *Ocean & Coast Mgmt* 208 at 221 (ScienceDirect).

for the coastal countries to move towards a framework treaty and related institutional arrangements for the present. While treaty-based environmental regimes generate antagonism in this region (as these nations want to preserve their sovereignty), it is clear that soft-law commitments are yet to produce tangible results. Still, for now, and as things stand, it may be expecting too much for coastal South Asia to move towards a hard-law instrument that imposes binding and detailed obligations. At the same time, as a first step to accepting a hard-law regime, it would be ideal for these countries to agree on a set of soft-law principles to guide the development of national legal frameworks relating to the coastal zone, operationalize ICZM, and implement CCCA actions. Consistent with the principles of territorial integrity and permanent sovereignty over natural resources,³ a regional instrument can have its genesis in the good neighbour principle,⁴ which requires information-sharing, notification, consultation, good-faith negotiations, and cooperation in planning projects with potential environmental impacts and responding to emergencies, etc.⁵ In this regard, the attempt should not be to hastily cobble together a regime but to develop it steadfastly through a process of incremental steps.

Already, the South Asian Seas Action Plan (SASAP) has ICZM as one of its central pillars. Even though this document does not *per se* mention that ICZM should be implemented via a legal route, one of the general goals of the SASAP is to “promote

³ General Assembly Resolution 1803 on Permanent Sovereignty over Natural Resources, GA Res 1803 (XVII), UNGA, 17th Sess, Supp (No 17) at 15, UN Doc A/5217 (1962).

⁴ See *Stockholm Declaration of the UN Conference on the Human Environment*, 16 June 1972, UN Doc A/CONF48/14/Rev 1 (1973), 11 ILM 1416, prin 21. On a theory of strict liability and the principle of tort law, *sic utere tuo ut alienum non laedas*, the *Trail Smelter* tribunal held Canada responsible for injury to persons and property in the state of Washington resulting from transboundary emissions of sulfur dioxide. It was held, “no state has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties of persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.” *Trail Smelter Case (US v Canada)*, 3 RIAA 1911 (1941) at 1965. The dispute between Spain and France centered on a French plan to divert boundary waters from their natural flow into Spain thereby creating a reservoir in France. The tribunal affirmed that states, particularly upper riparian states, to negotiate in good faith with other states concerning any intended diversion or other changes in the use of shared water resources. The opinion confirmed that in undertaking a project affecting transboundary resources, a state (France in the case) must always take into consideration the interests of other potentially affected states (Spain). *Lac Lanoux Arbitration (France v Spain)*, 12 RIAA 281 (1957).

⁵ UNEP, *Environmental Law Guidelines and Principles on Shared Natural Resources*, GC Dec No 6/14, 33 GAOR, Supp No 25 at 154, UN Doc A/33/25 (1978), prins 1, 5-7, 9.

policies and management practices for the protection and development of the marine and coastal environment on a national and regional level, including appropriate legislation at the national level.”⁶ Again, it has been pointed out that:

National legislations and regulations pertaining to the protection and management of the marine and coastal environment which are at various stage of development should be reviewed, and when necessary, expanded, updated or strengthened ... National legislations and regulations for the protection and development of marine and coastal resources should be harmonised whenever international uniformity is required to meet the obligations of such legislation ... Technical assistance and advice on the drafting of national legislation for the effective implementation of relevant international agreements should be provided upon request.⁷

The SASAP, as presently worded, does not specify the modalities of how this technical assistance and advice on the drafting of national legislation is to be worked out. Accordingly, in line with a soft co-operative approach, the cluster of principles identified in this chapter as being the nucleus of a coastal law may be embodied in the South Asian Seas Action Plan. In due course, these principles/elements can metamorphose into a hard-law instrument with a stronger regime with a more ambitious mandate to prescribe detailed rules, or there can be a standalone instrument comprising a mixture of both hard- and soft-law elements.

This is only one possible approach (more feasible in the circumstance) to developing a comprehensive regional regime. The pendulum can swing from framework conventions,⁸ to informal management regimes⁹ and intergovernmental forums.¹⁰

⁶ *Action Plan for the Protection and Management of the Marine and Coastal Environment of the South Asian Seas Region*, ¶6.(a), online: SACEP <<http://www.sacep.org/pdf/SAS%20Action%20Plan.pdf>>.

⁷ *Ibid* at 5, part C (entitled “Environmental Legislation”).

⁸ See *Convention for the Protection of the Mediterranean Sea against Pollution*, 16 February 1976, 15 ILM 290 (entered into force 12 February 1978, revised in Barcelona, Spain, on 10 June 1995 as the *Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean*) [*Barcelona Convention*]. “Final Text of the Amended Nairobi Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Western

Whatever the form, a set of principles to operationalize ICZM *via* the SASAP can influence the South Asian coastal countries to move away from their present approach to coastal zone management that is piecemeal in nature, centralized in methodology, and development-oriented in perspective to a more holistic system that is decentralized, people-centric, and sustainable development-friendly. This new approach will help to promote socio-ecological resilience and integrate a wide range of stakeholders in the pursuit of sustainable ocean and coastal development and management. More importantly, a national legal framework based upon these principles can also support adaptive programmes to meet the challenges posed by the impending impacts portended by SLR.

In the subsequent discussion, certain principles/elements have been distilled from the analyses in the preceding chapters that can inform the regional regime on ICZM in South Asia by incorporating them in the SASAP. These are supported by principles and tools embodied in some of the prominent coastal legislations, some of which have been analyzed during the course of this study. In its turn, the SASAP (as modified) can help in designing coherent and holistic legal instruments at the respective national levels to

Indian Ocean, Adopted in Nairobi, Kenya on 31 March 2010, UNEP(DEPI)/EAF/PPP.6/8a/Suppl” in UNEP, *Final Act of the Conference of the Plenipotentiaries for the Adoption of the Amended Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Western Indian Ocean, Adopted in Nairobi, Kenya on 31 March 2010*, UNEP(DEPI)/EAF/PPP.6/10/Suppl.

⁹ The Gulf of Maine Council on the Marine Environment is a US-Canadian partnership of government and non-government organizations working to maintain and enhance environmental quality in the Gulf of Maine. In 1989, the governors and premiers of the US states of Maine, Massachusetts, and New Hampshire and the neighboring Canadian provinces of New Brunswick and Nova Scotia adopted the non-binding Agreement on Conservation of the Marine Environment of the Gulf of Maine Between the Governments of the Bordering States and Provinces, which led to the establishment of this informal regime. *About the Gulf of Maine Council on the Marine Environment*, online: Gulf of Maine Council on the Marine Environment <<http://www.gulfofmaine.org/2/>>; see also Lawrence P Hildebrand & Aldo Chircop, “A Gulf United: Canada-U.S. Transboundary Marine Ecosystem-based Governance in the Gulf of Maine” (2010) 15 *Ocean & Coastal LJ* 339 (QL). The authors point out that, “[a]bsence of formal legal and institutional structures . . . enabled regime participants to conduct business with a relative degree of informality and to adjust regime directions on the basis of consensus and with ease of flexibility.” *Ibid* at 375.

¹⁰ Established in 1996, the Arctic Council is a high level intergovernmental forum that promotes “cooperation, coordination and interaction” among the Arctic States, involving the indigenous communities and other arctic inhabitants on common issues that affect the Arctic. For further details, see Arctic Council, *About the Arctic Council*, The Arctic Council online: Arctic Council <<http://www.arctic-council.org/>>; see also Timo Koivurova & David L VanderZwaag, “The Arctic Council at 10 Years: Retrospect and Prospects” (2007) 40:1 *UBC L Rev* 121.

harmonize various actors and actions in the coastal zone, minimize conflicts, and mitigate environmental problems, thereby leading to sustainable coastal development.

10.2.1 Defining Objectives and Setting out the Principles upon Which the Law is to be Based

At the outset, the coastal law must define the objectives that it seeks to secure and the foundational principles on which it is based. All of our efforts in the coastal zone should be directed towards ensuring development that is sustainable without compromising on the carrying capacity of ecosystems and their ability to cater to the requirements of future generations. Sustainable development emerges as the central pillar of a coastal law around which all other substantive and procedural principles are to be based.¹¹

Thus, SCD and its panoply of related principles should guide coastal law-making. These include: the principle of integration, coordination, the ecosystem based approach, the precautionary approach, the doctrine of public trust, stewardship, the polluter pays principle, community participation, inter-and intra-generational equity, social equity, subsidiarity, sustainable use, conservation, and economic efficiency.¹² These principles do have recognition in the legal systems of the South Asian coastal countries and these can sustain and help work some of the best practices in resources management. Incorporation of the same in a coastal law can help produce an ideal normative climate that can support programmes and plans aimed at sustainable coastal development. As well, the coastal law can serve as an instrument to provide a framework to implement

¹¹ For an overview on the concept of sustainable coastal development, see Ch 4, Part 4.2.1.

¹² Prominent principles identified include, “integrated coastal and estuarine management,” conservation of the coastal environment and maintenance of natural attributes, inter and intra generational equity, co-operative and participatory approach to coastal management. *National Environmental Management: Integrated Coastal Management Act*, (S Afr), No 24 of 2008, pmbl, s 2 [*SA, Integrated Coastal Management Act*]. The *Oceans Act* of Canada identifies the following as essential principles, namely, that the three oceans - the Arctic, the Pacific and the Atlantic, are the common heritage of all Canadians, ecosystem approach, precautionary approach, integrated management of oceans and marine resources. *Oceans Act*, SC 1996, c 31, pmbl [*Oceans Act*]. The *Coastal Zone Management Act, 1998*, of Barbados seeks to secure effective management of the coastal resources, their conservation and enhancement. *Coastal Zone Management Act 1998* (No 39 of 1998) [*Barbados CZMA 1998*]. India's *Coastal Regulation Zone Notification, 2011*, speaks about ensuring livelihood security to the fisher communities, conservation and protection of coastal stretches, its unique environment and its marine area, promoting development through sustainable manner based on scientific principles. (N, SO19(E), 2011, India) [*CRZN, 2011*]; *Coastal Protection Act 1979* (NSW), s 3 [*NSWCPA*]; *Coastal Protection and Management Act 1995* (Qld), s 3.

obligations under international law relating to the coastal and the marine environment.¹³

Among the principles, one that needs special mention is precaution. As pointed out earlier in this study, in certain circumstances, the actual effects of developmental activities on the coastal zone may be uncertain or unknown.¹⁴ This is particularly so given climate change impacts and SLR. Even in the face of this uncertainty, it is necessary to ensure that development activities continue to be environmentally sustainable. The precautionary principle requires the taking of precautionary action that can be either preventive or anticipatory before scientific certainty of cause and effect can be established.¹⁵ To avoid social and economic damage and harm to coastal communities, the coastal law must further a preventive approach rather than a reactionary one. The precautionary approach should be the guiding tenet for all developmental projects, particularly for those that are based in the coastal zone, and here importance must be afforded to environmental impact assessment as a necessary tool to anticipate SLR and the impacts of coastal development on coastal zones and flood plains.¹⁶

10.2.2 Defining the Coastal Zone (Recognising the Land-Sea Continuum)

Since the coastal zone is the marine-terrestrial margin of variable length, there is no universally accepted definition of what constitutes a coastal zone and its determination is essentially left to individual coastal states. However, without a clear and accepted definition of what constitutes the coastal zone, ICZM implementation is fraught with uncertainty. Therefore, the starting point of a coastal law is that it has to define the area of its operation – namely, the coastal zone.

Deciding on and demarcating the coastal zone is no easy task and requires careful

¹³ For instance, see *SA, Integrated Coastal Management Act, ibid*, pmb1. It states that the coastal law seeks to give effect to the South Africa's international obligations. *Ibid; Oceans Act, ibid*, part I (gives effect to the LOSC stipulations relating to maritime territories).

¹⁴ For more details regarding uncertainty and the development of the principle of precaution, see Ch 5, Part 5.3.1.

¹⁵ *Ibid*.

¹⁶ *Coast Conservation Act 1981* (No 57 of 1981, Sri Lanka) s 16 [*Sri Lanka CCA 1981*] (pointing out that those interested in engaging in developmental activities in the coastal zone are to produce environmental impact assessments); see also EC, *Protocol on Integrated Coastal Zone Management in the Mediterranean*, [2009] OJ L 34/19 [*ICZM Protocol*] art 19 (environmental assessment for public and private projects that can environmentally affect the coastal zone) & art 29 (transboundary environmental assessment). The national strategy for the management of estuarine, coastal and marine ecosystems is to be based on sustainable development, integrated management and the precautionary approach. *Oceans Act, supra* note 12, s 30.

planning and deliberation involving all major stakeholders. Moreover, the demarcation of a coastline has to be consistent with relevant international law such as LOSC mandates. While its determination may ultimately be a political decision depending on issues at hand, the coastal zone generally comprises of coastal waters, adjacent lands and related coastal ecosystems like wetlands, deltas, and estuaries.¹⁷ The definitions afforded to the coastal zones under laws reviewed earlier reveal that there cannot be any uniform characterization. Generally, the coastal zone will include coastal waters on the sea-ward side up to three nautical miles of territorial water¹⁸ or, in certain cases, the full extent of the territorial water limit.¹⁹ Or, depending on what the country deems appropriate, it may be extended even further.²⁰ And as far as the land ward side is concerned, it generally stops at the mean high water-mark. While such demarcations are more or less fixed distance definitions; there could also be other relevant factors like physical and biological features, administrative boundaries, constructed landmarks, etc. that can be utilised in determining the coastal zone.²¹ The final decision may be a political one, and the definition may be “hybrid” in nature, but ideally the demarcation should be based on the “degree of coastliness,”²² determined depending on the influence which the landward component of the coastal zone exerts on the seaward areas, and *vice versa*. More importantly, the coastal zone should be a manageable unit.

10.2.3 Creation of Integrated Coastal Zone Management Plans

¹⁷ *SA, Integrated Coastal Management Act, supra* note 12, ch 2; *Law for the Protection of the Coastal Environment Law 2004* (No 5764 of 2004, Israel), s 1 [*Israeli Coastal Law*] (defining coastal environment in section 2 to include seaward to the limit of the territorial waters); *Decree-Law Number 212-2000: Coastal Zone Management*, 8 August 2000 (Cuba), s 2, arts 2-5 [*Cuba CZM*] (dealing with boundaries of the coastal zone) & s 3 (defining the components that compromise the coastal zone).

¹⁸ See *Sri Lanka CCA 1981, supra* note 16, s 42; see *SA, Integrated Coastal Management Act, ibid*, s 1 (including territorial waters); *Coastal Zone Management Act*, (Belize), No 5 of 1998, s 2 [*Belize CZMA*] (coastal zone includes the territorial waters).

¹⁹ *CRZN, 2011, supra* note 12, cl (v); *Israeli Coastal Law, supra* note 17, s 2.

²⁰ For instance, Bangladesh includes its exclusive economic zones as part of its coast. For more details on the experience of Bangladesh in coastal management, see Ch 3, Part 3.2.3; see also *SA, Integrated Coastal Management Act, supra* note 12, s 1 (defining the coastal zone to include the exclusive economic zone).

²¹ Robert Kay & Jacqueline Alder, *Coastal Planning and Management*, 2d ed (Oxon: Taylor & Francis, 2005) at 2-8.

²² *Ibid* at 3.

There are two important dimensions to ICZM implementation – the first is prescriptive and the second is functional. The coastal law does the prescriptive role by laying down the norms of economic development and coastal environmental protection. The functional facet, on the other hand, is secured via an ICZM plan. In fact, SCD can be realized in large measure by designing, developing and implementing a time-bound (implementing short-term and long-term objectives), well-thought-out ICZM plan that dovetails development with environmental considerations and harmonizes various interests in the coastal zone.²³ ICZM plans set out specific goals and objectives, identify the various actors, enumerate the activities that need to be implemented to help secure these goals and objectives, identify coastal ecosystems that need urgent management, specify measures for their upkeep, and, most importantly, spell out an implementation schedule.²⁴ As well, ICZM plans should be utilized to further the implementation of coastal climate change adaptation, such as measures to prevent or mitigate the impacts of natural hazards.²⁵

As these plans do not operate in a vacuum, it is imperative that they be grounded in the legal framework within which they exist, mature, and operate. In fact, a core objective of the coastal law is that it should provide not only for its creation (involving input from coastal communities within a specified time frame), but should also lay out the guidelines describing what achievable actions an ICZM plan should contain and specify the method

²³ For a discussion on linking coastal climate change adaptation within an ICZM process, see Ch 6, Part 6.5; see also *Coastal Development Authority Act 1994* (No XXVIII of 1994, Sindh), ss 12-13 [*Sindh CDA 1994*]; see *Marine and Coastal Access Act 2009* (UK), 2009, s 44 [*UKMCAA*] (dealing with the preparation of marine policy statement); *Resource Management Act 1991* (NZ), 1991/69, ss 56-58 [*NZRMA*] (dealing with New Zealand Coastal Policy Statement) & s 64 (dealing with regional coastal plans).

²⁴ See generally Kenya, National Environment Management Authority, *Integrated Coastal Zone Management Action Plan for Kenya, 2011-2015* (Nairobi: NEMA, [nd]); Sri Lanka, Coast Conservation Department, *Coastal Zone Management Plan, Sri Lanka 2006* (Colombo: Coast Conservation Department of the Ministry of Fisheries and Aquatic Resources Development, 2006) online: Coast Conservation Department <[http://www.coastal.gov.lk/cz mp%20english.pdf](http://www.coastal.gov.lk/cz/mp%20english.pdf)>; see also Belize, Ministry of Forestry, Fisheries, & Sustainable Development *Belize Integrated Coastal Zone Management Plan* (Coastal Zone Management Authority & Institute, 2013) at 114-32.

²⁵ The parties are to develop within the framework of national strategies for ICZM, policies for staving off natural hazards. In particular this includes carrying out vulnerability and hazard assessments of coastal zones and adopting measures that seek to prevent, mitigate and adapt to the effects of natural disasters, in particular climate change. *ICZM Protocol*, *supra* note 16, art 22.

for its implementation.²⁶ As well, depending upon national circumstances (e.g., a federation), the length of the coastal zone, the nature of the coastal resources and population concentration, there could be provision for more than one coastal zone management plan, and in certain situations, even for a hierarchy of plans, beginning with a national plan that prescribes the strategic objectives, provincial level plans and finally plans at the local level.²⁷ Since the natural features, concentrations of coastal populations and coastal resources and the problems that affect coastal areas, including SLR, are not uniform along a coastline, a decentralized and nested format of ICZM plans can lead to better focus and help to develop and accommodate management responses that are sensitive to localized conditions, enabling better implementation of ICZM. As well, to give effect to the dynamic nature of ICZM and to the principle of adaptive management, the plan should be subject to periodical revisions and updates.²⁸

10.2.4 Providing for the Creation of a Lead Agency Responsible for the Implementation of the ICZM Plan and the Principles of Horizontal and Vertical Integration

An important question that needs consideration is whether can we implement ICZM programmes by adroitly employing existing government agencies responsible for shoreline management or is it absolutely essential to create a new institution? Creating a new agency for coastal management in the different South Asian coastal countries is easier said than done. In fact, an important reason as to why several coastal countries have not ventured to establish national-level legal frameworks for ICZM and create institutions for their implementation is due to the jurisdictional complexities such a programme entails and due to the possibility of bureaucratic warfare to protect their turf. Moreover, there is also a risk that re-organizing or the creation of a new lead agency can lead to bureaucratic warfare. Generally, it is the constitution of a country that determines

²⁶ *Oceans Act*, *supra* note 12, s 31. The Barbados coastal law specifically provides that plan should comprise policies, strategies and standards that provide for the management and conservation of coastal resources. *Barbados CZMA 1998*, *supra* note 12, s 4; *Sri Lanka CCA 1981*, *supra* note 16, s 12; *Belize CZMA*, *supra* note 18, s 23.

²⁷ *SA, Integrated Coastal Management Act*, *supra* note 12, ss 44-52 (providing for national, provincial and municipal coastal management programmes); see also EC, *Recommendation of the European Parliament and of the Council of 30 May 2002 Concerning the Implementation of Integrated Coastal Zone Management in Europe*, (2002/413/EC) [2002] OJ L 148/24, ch IV [EC, *ICZM Recommendation*] (calling upon member states to develop a national strategy or, where appropriate, several strategies, to ICZM principles).

²⁸ The plan should be revised once in four years. *Belize CZMA*, *supra* note 18, s 23(9).

the division of powers between the different levels of government.²⁹ As new situations develop, new crises crop up, and the constitution can sometimes unwittingly stymie the development of legal responses.³⁰ Building an ICZM programme or identifying a responsible agency within the existing institutional structure to lead the implementation of ICZM will save administrative costs needed to create a well-functioning new authority. Nevertheless, utilizing an existing institution may not always be sufficiently geared to respond to the scale of the problems. In line with chapter 17 of Agenda 21, which calls upon states to consider establishing or strengthening appropriate or coordinating mechanisms to promote integrated management and sustainable development of marine and coastal areas,³¹ it is imperative that the coastal law provide for the creation or designation of a lead agency to act as the steward of the coast and manage the coastal zone, the environment, its resources and communities and their interactions. It should be the responsibility of this lead agency to ensure that the law is enforced and the vision of coastal sustainability is achieved. As well, the lead agency should also be tasked with the duty of preparing and implementing ICZM plans. In both federal and unitary systems, it is necessary to identify a nodal ministry that should be given the overall responsibility to oversee and implement the programme in consonance with the principle of stewardship. While in unitary systems (Bangladesh, the Maldives, and Sri Lanka), there could be scope only for a single lead agency, in federal systems (India and Pakistan); there could be more than one.³² Whatever be the case, the entity is to be at a higher bureaucratic level than the sectoral agencies to provide necessary direction to harmonize sectoral actions.³³ In regulating development in the coastal zone, the lead agency should act as a one-stop shop issuing development permits and in cases

²⁹ For various national case studies on coastal management, see generally Ch 7, Part 7.3.

³⁰ For more details on effecting decentralisation in unitary systems and the difficulties in implementing ICZM in these countries, see Ch 7, Part 7.3.5.1.

³¹ Nicholas A Robinson, ed, *Agenda 21 & The UNCED Proceedings*, vol 4, 3rd series, International Protection of the Environment (New York: Oceana Publications, Inc, 1993) at 307, ch 17, ¶17.6.

³² See *ICZM Protocol*, *supra* note 16, art 7(1)(a) (parties to ensure institutional coordination through appropriate bodies or mechanisms to avoid sectoral approaches). Parties to organize appropriate coordination between various authorities competent for both the marine and the land parts of coastal zones (art 7(1)(b)); *SA, Integrated Coastal Management Act*, *supra* note 12, ch 5 (providing for a national coastal committee, provincial coastal committees and municipal coastal committees).

³³ Cormac Cullinan, *Integrated Coastal Management Law: Establishing and Strengthening National Legal Frameworks for Integrated Coastal Management*, FAO Legislative Study, No 93 (Rome: FAO, 2006) at 62.

where this is not possible, the legislation should seek to realign existing institutional arrangements to the extent practicable to ensure coordinated decision-making.

Additionally, and in consonance with the principle of integration, the lead agency should be an umbrella entity that acts as a permanent coordination and management mechanism, charged with the duty to coordinate functions of different authorities that have jurisdiction over various aspects of coastal zone management. This agency must also be given suitable power to develop guidelines to overcome overlapping jurisdiction and other institutional and jurisdictional complexities. Apart from the lead agency, the law can also provide for the creation of advisory bodies tasked with the duty to tender advice to the lead agency on matters relating to coastal management so as to enable it to perform its functions in the most effective and scientific manner.³⁴

Being a framework law, it is necessary that the law provide that the authority should also have the power to issue guidelines on a range of issues that affect the coastal zone.³⁵ Such guidelines can cover areas like those dealing with the development of the coastal zone and those related to the protection of land-use planning, management of marine protected areas (including offshore ones that fall within the wet side of the coastal zone), conservation and restoration of degraded coastal ecosystems, creation and management of tourism-related infrastructure, regulation of activities that seek to use foreshore facilities like the aquaculture industry, and control of marine pollution. Such an approach reflects the dynamism inherent in the ICZM process facilitates adaptive management and also helps to respond to the uncertainty inherent in the climate change phenomenon.

10.2.5 Providing for Adaptation Measures to Combat Sea Level Rise

Of all the factors impacting the coastal and oceanic environment, the most grave are climate change and SLR. However, the complexity and uncertainty associated with climate change impacts on coastal zones often act as barriers to effective action. Therefore, the central mission of any coastal law must be to provide a proactive

³⁴ *Belize CZMA*, *supra* note 18, ss 6-7 (dealing with the establishment, composition and functions of the Advisory Council); *Sri Lanka CCA 1981*, *supra* note 16, ss 6-7 (creation of the Coast Conservation Advisory Council and its functions).

³⁵ *Belize CZMA*, *ibid*, s 36; *Barbados CZMA 1998*, *supra* note 12, s 39.

framework of rules and measures that will help coastal managers to adapt to the problems posed by climate change and SLR, factoring in the uncertainty. As mentioned in the earlier sections of this study,³⁶ a coastal law can promote CCCA in two ways: 1) by providing express measures that can be broadly grouped into retreat,³⁷ accommodate³⁸ and protect³⁹ aimed at CCCA and risk management; and 2) by balancing coastal development with coastal environmental protection imperatives thereby improving the adaptive capacities of coastal communities and coastal ecosystem resilience.⁴⁰ The coastal law must provide avenues to implement the three broad adaptation response strategies, namely, accommodate (prescribing minimum ground elevation for new development), retreat, and protect (strengthening sea walls and increase their heights if the need be). However, in doing so, the primary emphasis should always be on soft armoring and accommodation respecting the concept of living shorelines and allowing nature to determine the equilibrium.⁴¹ Hard armoring should be utilized only as a matter of last resort (to protect coastal infrastructure) and, in such cases, the coastal law should embody the fundamental principle that utilizing hard armoring protection should not be at the expense of coastal ecosystems located elsewhere.⁴² The coastal law also emerges as a social welfare legislation to support ICZM, harmonizing the actions of various actors in the coastal zone and providing coastal communities avenues to participate in the ICZM process from the planning stage to its implementation. In so doing, it empowers coastal communities and recognizes their traditional knowledge; in the long-run, these actions can augment their adaptive capacities.⁴³

10.2.6 Land Use Planning, Zoning, and the Power of Acquisition

³⁶ See generally Chs 4-8.

³⁷ *SA, Integrated Coastal Management Act, supra* note 12, s 25 (providing for coastal setback lines).

³⁸ *Ibid*, s 49 (municipal coastal management program to deal with coastal erosion).

³⁹ *Ibid*, s 15(1) (state cannot be compelled to prevent erosion).

⁴⁰ See *NSWCPA, supra* note 12, s 3(h) (encouraging and promoting plans and strategies for coastal climate change adaptation).

⁴¹ US, *Living Shoreline Protection Act*, Md C Ann Envir §16-201 (2008).

⁴² Parties should adopt measures to minimize the effects of coastal works including coastal defence works on coastal erosion. *ICZM Protocol, supra* note 16, art 23(2); *California Coastal Act of 1976*, 20 PRC §30235 [*Cal CA, 2013*]; see also *Cuba CZM, supra* note 17, art 20(a) (protection works are not to cause damage to the coastal zone).

⁴³ For further information on traditional knowledge in support of climate change adaptation, see Ch 5, note 360.

Planning for coastal development is extremely vital given increasing trends towards coastal urbanization, as it helps to correct the abuses of unplanned development. Coastal hazards exact huge costs in terms of lives and money. Despite this, migration to coastal areas in South Asia continues with no signs of abatement, leading to the reshaping of coastal landscapes through the building of new infrastructure like roads and ports, the setting up of industries and facilities for power generation and transmission, and so on. These features are central to the social, economic and cultural well-being of coastal communities and cannot be withheld. However, as cities grow and populations expand in ways that encourage sprawl, mangrove forests may be cleared, wetlands and salt marshes drained, coral reefs destroyed, beaches encroached upon, and rivers and lakes channeled. In the coming decades, it is expected that the development and use of the coastal zone will increase manifold times and that there will be a growing demand for coastal space. This will place unprecedented pressures on coastal areas and resources and encroach into fragile coastal ecosystems. The question that emerges is how can law facilitate the balance between conservation with infrastructural development?

To ensure that development proceeds in a more orderly fashion, and to maximize and obtain optimal benefits from scarce resources and prevent haphazard development, careful planning is pivotal. In this, it is essential that all development projects located in coastal areas as part of their environmental impact assessments mandatorily incorporate future scenarios regarding climate change and SLR into their planning, decision-making and design, and that new development should as far as possible not accentuate existing and future vulnerabilities.⁴⁴ Planning should ensure that coastal areas and resources are used intelligently and are made available not only for the present but also for future generations. It also seeks to curb the establishment of sporadic patterns of settlement and haphazard growth, which often leads to sprawling and slums that pose a strain on coastal resources and degradation of the coastal environment. In the absence of planning, the natural character, landscape values, heritage sites, scenic areas, areas of high biodiversity, etc. may get lost.

⁴⁴ For instance, see New Zealand, Dep't of Conservation, *New Zealand Coastal Policy Statement 2010* (Wellington: Dep't of Conservation, 2010) policy 24 (calling upon authorities to consider SLR and other climate change impacts for over at least 100 years in assessing coastal hazard risk).

Among the range of tools available, land use planning and zoning are the most valuable, as they help to implement careful planning for the shoreline by seeking to balance conflicting demands for coastal land and encouraging the development of sustainable settlements.⁴⁵ Once the boundaries of the coastal zone are determined according to factors such as sensitivity to SLR impacts and the geographical, cultural, historic, ecological and biodiversity uniqueness of a particular area, coastal areas would have to be classified (e.g., appropriate for development, for nature preservation, for protection, etc.). The zoning of the coastal zone involves the earmarking and categorization of the coastal areas into areas for preservation, conservation buffer zones, utilization and development zones. Zoning helps to curb inappropriate growth by categorizing coastal lands into those fit for commercial, residential and industrial development, but it is an arduous task and may not be practical in countries confronted by coastal squeeze. In parceling out and earmarking coastal land, it may be necessary to balance competing interests over these parcels, with the priority given to ensure that any change in land use will not adversely impact coastal communities that are dependent on that land for their livelihood and economic sustenance. Moreover, given that SLR and extensive coastal erosion are major problems for most coastal states, zoning emerges as the best way to ensure that people and valuable infrastructure are not in harm's way.⁴⁶ Existing SLR may prompt nations to create buffer zones to preserve the shore, protect coastal communities, and facilitate the implementation of retreat. In extreme circumstances, development may have to be banned in these zones. Determination of the mean high and low water line and subsequent setback lines will also be necessary. A setback line is a unique, powerful, and practical concept in coastal zone management that essentially demarcates the border between development and environmental protection⁴⁷ and is extremely useful in adapting to SLR.

⁴⁵ *SA, Integrated Coastal Management Act, supra* note 12, ss 62, 17.

⁴⁶ India's *Coastal Regulation Zone Notification, 2011* and its predecessor coastal law, the *Coastal Regulation Zone Notification, 1991* are primarily zoning laws. However, there are flaws in India's approach as the several exemptions practically water down the zoning scheme and more importantly people with very poor adaptive capacities are placed in harm's way. For more details, see Ch 3, Parts 3.2.1.4 & 3.2.1.5.

⁴⁷ *SA, Integrated Coastal Management Act, supra* note 12, s 25.

Beyond zoning and related tools, the emphasis should be to ensure “smart growth development,” a concept that emphasizes development in areas with existing infrastructure and de-emphasizes development in areas less suitable for development.”⁴⁸ Smart growth development in coastal zones would imply the need to situate development in coastal areas most suited for the same, enhancing amenities available to coastal communities by preserving existing natural resources, and saving the cost for new infrastructure (which, if improperly situated, will have to subsequently be dismantled or re-engineered). Again as the sea level rises, it may become necessary to relocate coastal communities out of harm’s way through the acquisition of coastal land. Apart from the state, private owners of coastal land may choose to adopt their own measures to protect their property, like placing sand bags and constructing seawalls, which may not be scientific and can endanger nearby properties. As well, it may become necessary to prohibit rebuilding structures that are damaged by storms and other extreme weather events.⁴⁹ Haphazard land development in coastal areas may have to be re-worked; depending on their vulnerability to SLR, and this implies that the government/agency has the power to acquire private property subject to payment of reasonable compensation.⁵⁰ The government may also have to acquire private property to ensure public access and enjoyment of coastal resources.⁵¹ This is definitely an expensive option, which the states in coastal South Asia may be unable to afford. Again as seen in Chapter seven, as the sea level rises to inundate private coastal property, the question is whether owners can claim compensation from the state in the event of the state refusing to adopt measures to protect the private property or prohibiting the private property owners from raising fortifications to protect other properties. The countries concerned will have to take an individual call

⁴⁸ Stephanie Ramia, “Smart Growth: The Toolbox for Addressing Sprawling Development in Coastal South Carolina” (2010) 9 Se Envtl LJ 173 at 186 (HeinOnline).

⁴⁹ For more details on rolling easements, see Ch 7, Part 7.3.1.3.

⁵⁰ See *Coastal Development Authority Act, 1990*, (Kenya), No 20 of 1990, s 16; *SA, Integrated Coastal Management Act*, *supra* note 12, s 9; *Barbados CZMA 1998*, *supra* note 12, s 20(2). Parties may adopt mechanisms for acquisition, cession, donation or transfer of land to the public domain and institute easements on properties. *ICZM Protocol*, *supra* note 16, art 20(2); *Balochistan Coastal Development Authority Act 1998* (No 1 of 1998, Balochistan), s 15.

⁵¹ *SA, Integrated Coastal Management Act*, *ibid* (empowering the minister to acquire private land for the purpose of declaring it as coastal public property); *ICZM Protocol*, *ibid*, art 20 (public access to the sea); see also UK MCAA, *supra* note 23, part 9 (dealing with coastal access).

on such matters and its coastal law will have to provide for definite rules, lest confusion arise to jeopardize the coastal management regime.⁵²

10.2.7 Recognition of Decentralized Community-based Approaches, Co-management, Providing for Conflict Management and Protecting the Rights of Autochthonous Peoples

Successful implementation of ICZM models depends largely on matured governance systems, clear demarcation of powers between the national, provincial and in certain cases the presence of democratic institutions even at the local government level. These factors are largely absent in most of the South Asian coastal countries, which are often characterized by weak governance and institutional mechanisms and where the trend is towards greater centralization,⁵³ even though decentralized community-based management has widespread recognition in South Asia as a successful paradigm for managing natural resources.⁵⁴ Decentralized community-based management reverses management from a being an almost exclusive ‘top-down’ approach to a more ‘bottom-up’ approach, incorporating local knowledge and experience. It also encompasses the idea is that the community, in its capacity as resource user, becomes involved in developing and implementing the management programme geared towards the sustainable use of the resource, instilling in them a sense of accountability. Such an approach is more in sync with the principle of subsidiarity.⁵⁵ Decentralized community-based management is an essential cog in the ICZM process and therefore institutions and plans to guide ICZM will have to be developed and implemented at the local level as

⁵² See *SA, Integrated Coastal Management Act, ibid*, s 14(5)(a). It provides that if the high water mark (HWM) moves inland of a land unit due to coastal erosion, sea level rise, etc. and remains so for three years, the owner of that land loses ownership of any portion of the land situated below the HWM, and is not entitled to compensation from the state. However, if the movement of the HWM is a reasonable foreseeable consequence caused by an intentional or negligent act or omission by a state organ, then this no-liability rule will not apply. *Ibid*, s 14(5)(b).

⁵³ For instance, despite having enacted a coastal legislation that has prompted the creation of ICZM plans, greater centralization has reduced the efficacy of the coastal management programme in Sri Lanka. For more details, see Ch 3, Part 3.2.4.

⁵⁴ Developing countries should always adopt a community based approach; in contrast, developed countries should adopt a community based approach where local stakeholders attach direct values to coastal quality, and adopt a top down approach where the general population attaches indirect values to coastal quality. Fabio Zagonari, Fabio. “Integrated Coastal Management: Top-Down vs. Community-Based Approaches” (2008) 88:4 *J Envtl Mgmt* 796 (ScienceDirect).

⁵⁵ Marcus B Lane, “Towards Integrated Coastal Management in Solomon Islands: Identifying Strategic Issues for Governance Reform” (2006) 49 *Ocean & Coast Mgmt* 421 at 436 (ScienceDirect).

well.⁵⁶ The success of a coastal zone management programme depends considerably on the level of continuous participation it provides for and secures at the grass-roots level for indigenous and other local communities in decision-making and benefit-sharing.⁵⁷ In other words, ICZM has to be reflective of local sentiment. Even though in many developing countries, particularly those in South Asia, traditional informal governance systems exist side-by-side with the formal mechanisms, these rarely have legal recognition and this is where a major challenge lies (i.e., providing legal sanctity to these informal bodies and as far as possible harmonize the informal with formal structures). Indigenous communities (in South Asia and beyond) have a wealth of coastal zone knowledge about coastal resources, marine habitats, fishing practices, etc., and through these informal community-based management systems have developed their own codes of conduct and resource management rules (e.g., land tenure systems and fishing harvesting practices).⁵⁸ This wisdom, which could be especially useful in devising adaptation measures to deal with climate change impacts and SLR, is more or less dying due to the lack of recognition by formal legal systems.⁵⁹ Accordingly, it is essential that a programme on coastal management, supported by a legal framework, recognize and incorporate these informal mechanisms into the broader scheme for ICZM management if it is to garner greater public support and legitimacy and provide avenues to tap indigenous knowledge, using it in the best possible means for the management of the coastal zone.⁶⁰ Enlisting local communities helps to energize management initiatives, as

⁵⁶ See Ch 6, text accompanying notes 134-39.

⁵⁷ In developing and implementing plans for the integrated management of all activities or measures that affect estuaries, coastal waters and marine waters the minister has to collaborate with affected aboriginal organizations, coastal communities as well. *Oceans Act*, *supra* note 12, s 31.

⁵⁸ One of the traditional fishing practices followed by fishing communities in the state of Tamil Nadu in India, is the construction of the *Kattu Maram* (two trees tied together) or the Catamaran. In the Ramnad region catamaran are made from coral tree wood (*kalyana murungai*). The tree is cut during the crescent moon period and it is kept for 15 days and is treated in fire to remove the outer bark. The woods are arranged and tied with rope horizontally. T Rathakrishnan et al, "Traditional Fishing Practices Followed by Fisher Folks of Tamil Nadu" (2009) 8:4 Indian J Traditional Knowledge 543 at 545. Traditional knowledge plays an important role in sustaining fishing communities elsewhere as well. For instance, in the Solomon islands, it is believed that people who abuse fishing rights will be eaten by guardian sharks. JCK Huang, "Climate Change and Integrated Coastal Management: A Challenge for Small Island Nations" (1997) 37:1 Ocean & Coast Mgmt 95 at 97 (ScienceDirect).

⁵⁹ Traditional knowledge saved ancient tribes on India's Andaman and Nicobar Islands from the worst of the tsunami. Subir Bhaumik, "Tsunami folklore 'saved islanders'", *BBC News* (20 January 2005) online: BBC News <http://news.bbc.co.uk/2/hi/south_asia/4181855.stm>.

⁶⁰ Huang, *supra* note 58.

they are more cognizant of the day-to-day real-life challenges that the coastlines face and can make contributions in myriad ways.

Nonetheless, this does not dispense the involvement of the state in such initiatives, especially with regards to disaster management. In South Asia, patriarchy and hierarchy (as embodied by the caste system) still continue to play important roles in organizing these societies, particularly in rural landscapes.⁶¹ There is a long history of exclusion of women from coastal decision-making processes, even though women play indelible roles in supporting the subsistence economy through the marketing, preserving and selling of fish.⁶² They are also gatherers of natural products like water, firewood, corals, and shells. Despite their central role in supporting coastal economies, women are sidelined to the periphery in the decision-making process. Equity is at the heart of legal regulation of the coastal environment and of its resources. Accordingly, it is imperative that a coastal law recognizes the important role played by women and secures clearer roles to them in the ICZM process.⁶³ Similarly, the caste system though normatively proscribed, still continues to raise its ugly head in these coastal areas, with the consequence that traditional artisanal and other autochthonous fishing communities may sometimes be excluded from the decision-making process.⁶⁴ The law, while affording recognition to informal coastal governance systems and dovetailing them into the ICZM process, will also have to play an important role in securing rights for marginalized communities.⁶⁵

Such affirmative measures can, in practice, strengthen the adaptive capacities of women and marginalized communities. At its core, a coastal law should provide for the empowerment, participation and active engagement of local inhabitants through local

⁶¹ For more on the effects of social dynamics on coastal management, see Ch 8, Part 8.2.

⁶² *Ibid.*

⁶³ See “Plan of Implementation of the World Summit on Sustainable Development” in UN, *Report of the World Summit on Sustainable Development Johannesburg, South Africa, 26 August-4 September 2002*, A/CONF.199/20* (New York: UN, 2002) ¶67(b).

⁶⁴ See Ch 8, Part 8.2.

⁶⁵ *Oceans Act*, *supra* note 12, s 2(1) (saving existing aboriginal or treaty rights of the aboriginal peoples guaranteed under section 35 of the *Constitution Act, 1982*), s 29 & s 31 (involving affected aboriginal organizations in the development of the Oceans Management Strategy and Integrated Management Plans); *NZRMA*, *supra* note 23, s 8 (emphasizing the need to take into account the principles established by the *Treaty of Waitangi*). In achieving the purpose of the NZRMA, the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, *waahi tapu*, and other *taonga* must be taken into account. *Ibid.*, ss 6(e), 8 (emphasizing the need to take into account the principles established by the *Treaty of Waitangi*).

government institutions in decision-making and benefit-sharing.⁶⁶ Furthermore, it should adopt measures to provide for the widest opportunity for public participation⁶⁷ and must implement community-based coastal resources management by devolving management powers over coastal areas, resources and environment to local communities. While providing for decentralized and community-based coastal management, local-level ICZM plans are to be referred to the national-level umbrella agency, which has to ensure that the local plan is in consonance with the national plan and other rules and laws relating to coastal management.⁶⁸ In sum, the importance and recognition of community as the key stakeholder in the coastal management process has to be recognized in absolutely clear terms, as a healthy coast is pivotal to the well-being of coastal communities that depend on coastal resources for their livelihood and security. Without the active support and participation of coastal communities, an ICZM programme is doomed to fail. Here the legal instrument should, without discounting the merits of a top-down approach, foster a bottom-up movement rooted in local community planning actions, the use of traditional knowledge and local expertise, and the steady hand of local government institutions.

10.2.8 Ensuring Public Access to Coastal Resources by Implementing the Doctrine of Public Trust and Rolling Easements

As more and more people, industries and developmental activities gravitate towards the coastal areas of South Asia to capitalize on the economic opportunities that are not available in the hinterland regions, conflicts arise between the different users. For instance, coastal tourism projects tend to move traditional fishing communities away from beachheads. This can have disastrous consequences for these communities, as they may use the beachheads for their fishing operations as well as for cultural and recreation purposes.⁶⁹ Accordingly, one of the more controversial issues that a coastal law may have to grapple with is the need to protect rights hitherto enjoyed by traditional coastal

⁶⁶ *Cal CA, 2013, supra* note 42, §30006.

⁶⁷ Public participation can begin right from the time of the development of the ICZM plan right down to its implementation. *ICZM Protocol, supra* note 16, art 14.

⁶⁸ For instance, see *SA, Integrated Coastal Management Act, supra* note 12, s 47(c)(i) (requiring provincial coastal management programme to be consistent with the national coastal management programme).

⁶⁹ For more details, see India's and Sri Lanka's experience on coastal management, Ch 2, Part 2.2.1, 2.2.4.

communities, especially the right of public access (the right of ingress and egress for work, recreation and living), while at the same time allowing for modern development.⁷⁰ Lawmakers and coastal managers often grapple with the issue of how best to regulate and manage the coastal zone by reducing conflicts amongst the various players, while at the same allowing development and the sustainable management of critical resources and habitats. In certain situations, the state, in exercising its sovereign powers, has displaced coastal communities and transferred coastal resources to private players to facilitate economic development. Such moves have been strongly opposed by coastal communities. Establishing the doctrine of public trust as a central tenet in the management of the coastal zone can be an effective and simple solution to conflicts over coastal resources, including land. As seen, public trust obliges governments to manage certain natural resources in the best interests of their citizens as a fiduciary, without sacrificing the needs of future generations. The public trust doctrine acts a bulwark against discretionary government action: “The state’s fiduciary obligations under the doctrine require not only a respect for the rights of coastal owners but also a focus on protecting the public’s right to access beaches in the future.”⁷¹ Thus, if a coastal law is to promote sustainability, it must be anchored in the concept of public trust.⁷² There is yet another dimension to the issue of increasing privatization of coastal zones. Since private entities generally have superior financial and technological resources, they may implement hard armouring measures to protect their coastal properties and frontage. This can lead to coastal squeeze (preventing the inland migration of coastal ecosystems like wetlands) and other harmful environmental consequences. Therefore, it may become necessary for coastal laws in South Asia to implement a version of the concept of rolling easements, as were developed in U.S. coastal jurisprudence.⁷³

10.2.9 Providing for the Conservation of Coastal Resources and Controlling Coastal Pollution

⁷⁰ *Israeli Coastal Law*, *supra* note 17, s 5 (securing a public right of way); *SA, Integrated Coastal Management Act*, *supra* note 12, ss 20, 29.

⁷¹ F Patrick Hubbard, “The Impact of Lucas on Coastal Development: Background Principles, the Public Trust Doctrine, and Global Warming” (2008) 16 *Se Envtl LJ* 65 at 82.

⁷² The state is the public trustee of coastal public property. *SA, Integrated Coastal Management Act*, *supra* note 12, s 12; see also *ibid*, s 11 (affirming that the ownership of coastal public property vests in the citizens which is held in trust by the state on their behalf).

⁷³ See *supra* note 49.

The conservation and restoration of degraded coastal resources should be high on the agenda of a coastal law. As a first step, it is necessary that the coastal law provide for the identification of coastal resources, their current state, and the degree of dependence of coastal communities on the resources.⁷⁴ Once this task is complete, it becomes easier to draft an appropriate conservation strategy for the resources. In this, ICZM plans assume great importance, as the conservation strategy can be worked through an ICZM plan. In particular, measures should be adopted to protect corals, restrictions (and, where necessary, prohibitions) should be imposed on the extraction of beach sand and other inert materials,⁷⁵ and protection should be afforded to coastal wetlands and mangroves.⁷⁶ Likewise, coastal forests, dunes, other coastal landscapes, islands, coastal antiquities and historical artifacts should be protected.⁷⁷ Here, a coastal law could provide for an assortment of conservation and management tools, such as the creation of protected areas (including networks)⁷⁸ and no-take zones, special management areas, and so on.⁷⁹ Restrictions (or, where necessary, prohibitions) may have to be imposed on fishing and other resource extractive activities, particularly in cases where the extraction practice is unscientific, exceeds the carrying capacity, and is destructive of the resource.⁸⁰ Rules can be also prescribed to prevent or regulate development situated in wetlands, beaches, dune systems, mangroves, coral reefs, etc., so that their natural functions (e.g., storm buffering,

⁷⁴ *Sri Lanka CCA 1981*, *supra* note 16, s 11 (providing for a survey of the coastal zone prior to the preparation of the coastal zone management plan); see also *EC, ICZM Recommendation*, *supra* note 27, ch III (calling upon member states to conduct or update a stocktaking of major actors, laws and institutions that influence coastal zone management).

⁷⁵ Prior authorization is required before excavation and extraction of minerals, including the use of seawater in desalination plants and regulating the extraction of sand. *ICZM Protocol*, *supra* note 16, art 9(2)(e)(i)-(ii).

⁷⁶ For instance, see *CRZN, 2011*, *supra* note 12, ¶7(i) (classifying mangroves as CRZ-I, which envisages a heightened degree of protection to this ecosystem).

⁷⁷ See *ICZM Protocol*, *supra* note 16, arts 10 (protection of specific coastal ecosystems like wetlands, marine habitats, dunes, coastal forests and woods), 11 (protection of coastal landscapes), 12 (protection of islands) & 13 (protection of archeological, historical including underwater cultural heritage).

⁷⁸ *UKMCAA*, *supra* note 23, ss 116-17 (provides for the creation of marine conservation zones for conserving marine flora or fauna, marine habitats and geological and geomorphological interest) & 123 (provides for the creation of a network of conservation sites).

⁷⁹ *Oceans Act*, *supra* note 12, ss 35-36 (dealing with marine protected areas and interim marine protected areas in emergency situations).

⁸⁰ *Barbados CZMA 1998*, *supra* note 12, s 22 (prohibiting the harvesting of corals in the territorial waters and in the exclusive economic zone). Similarly, any person who uses explosives, poison or noxious substances for the purpose of harvesting coral or catching fish is guilty of an offence. *Ibid*, s 27.

support functions, carbon sequestration functions) are preserved.⁸¹

As described earlier, there is close relationship between water management and coastal health, and therefore provisions may have to be crafted to ensure protection to estuaries and deltas.⁸² As seen in the previous chapters, groundwater management in coastal areas is a critical issue, as groundwater can be affected by rising sea levels.⁸³ Therefore, in tandem with water laws and regulations, groundwater management areas may have to be declared and permissible consumptive volumes decided upon when water extraction licenses are granted.⁸⁴ Moreover, as there could be areas where permissible consumptive volume has been reached or exceeded, no new licenses should be granted in such areas. As well, a coastal law should contain provisions to protect cultural and historical heritage sites, including underwater cultural heritage areas found within the coastal zone.⁸⁵

Without a doubt, and as delineated in the preceding chapters, land-based sources of pollution are the primary cause for poor and declining coastal and marine water quality. This not only affects aquatic life and leads to loss of marine habitat, but it adversely impacts human health and the economic well-being of coastal populations. Since legislations at the domestic level on coastal and marine pollution are limited in South Asia,⁸⁶ a coastal law will have to provide for measures that can help to identify, regulate, and mitigate coastal and marine pollution.⁸⁷ However, while it may be next to impossible to identify and conceive of every kind of pollution source and provide measures to manage and regulate them, this can be best achieved by the ICZM plan. In line with the

⁸¹ *Ibid*, s 28 (beach protection); *Israeli Coastal Law*, *supra* note 17, s 4 (prohibiting damage to the coastal environment)

⁸² *SA, Integrated Coastal Management Act*, *supra* note 12, ss 33-34 (providing for the creation of national estuarine management protocol and estuarine management plans); see also *Oceans Act*, *supra* note 12, s 31.

⁸³ For more details regarding the impact of SLR on coastal aquifers, see Ch 2, Part 2.5.1.

⁸⁴ For instance, see *ICZM Protocol*, *supra* note 16, art 9(2)(e)(iii) (emphasizing on the need to monitor coastal aquifers and the interface between fresh and saltwater, which may be affected by extraction of the groundwater).

⁸⁵ *Ibid*, art 13.

⁸⁶ See generally Ch 3, Part 3.2.

⁸⁷ *Sri Lanka CCA 1981*, *supra* note 16, s 25; *SA, Integrated Coastal Management Act*, *supra* note 12, ch 8 (entitled “Marine and Coastal Pollution Control”); *Barbados CZMA 1998*, *supra* note 12, s 29 (prohibiting the fouling of foreshore); see *NZRMA*, *supra* note 23, s 15A-C (dealing with dumping, storage, incineration of harmful substances, radioactive wastes, etc.) & s 16 (duty to avoid unreasonable noise).

‘polluter pays’ principle, those responsible for harmful polluting activities in the coastal zone, must be asked to remedy the damage and by internalizing the costs of their negative actions on the coastal zone.⁸⁸ Such an approach is extremely important, given the fact that oceans are warming and fish species are migrating in search of cooler environs. States must take measures to minimize the adverse effects of water discharges (industrial, thermal and nuclear reactor) and ensure that water temperatures and quality is maintained. It may also be necessary that the law impose obligations on the part of the state and its instrumentalities to provide for the establishment of plants for the treatment of domestic sewage, industrial wastes, etc.⁸⁹

10.2.10 Strengthening and Harmonizing Sectoral Legal Management There may already be a myriad of laws, regulations, and policies applicable to the coastal zone. In fact, sectoral management may be a deeply entrenched phenomenon in several coastal countries and this may not help to promote sustainable coastal development. Sectoral management definitely has its benefits and cannot simply be done away with. Therefore, it is necessary for the coastal law to harmonize its relationship with other laws and policies that have a bearing on the coastal zone,⁹⁰ and this may require amendments to existing laws. Such an approach can help secure better enforcement of the coastal law as well.

10.2.11 Establishing Adequate Financial Arrangements and Ensuring Accountability to the Concerned Legislative Body Successful implementation of the ICZM plan is an expensive undertaking and requires significant and committed fiscal resources adequate to support the magnitude and complexity of the task. Generally, most ICZM projects are implemented via funding from international donor agencies. However,

⁸⁸ SA, *Integrated Coastal Management Act*, *ibid*, s 58; Cal CA, 2013, *supra* note 42, §30231.

⁸⁹ See CRZN, 2011, *supra* note 12 at 12, ¶(IV)(a).

⁹⁰ See SA, *Integrated Coastal Management Act*, *supra* note 12, s 5. It is a “specific environmental management act” brought out under the overarching umbrella legislation - the *National Environmental Management Act, 1998*. Accordingly, this coastal law has to be “read, interpreted and applied” in conjunction with the *National Environmental Management Act 1998*. Furthermore, in case of any conflicts relating to the implementation of the coastal law, the same has to be determined as per the terms in the *National Environmental Management Act 1998*. *Ibid*. See *Israeli Coastal Law*, *supra* note 17, s 15 (stating that the coastal law is a supplement to other laws).

it may happen that once external funding dries up, the project runs into trouble,⁹¹ and so it would be prudent for the law to establish an ICZM fund to provide financial support for the implementation of ICZM plans and for the preservation, conservation, restoration and development of coastal resources and biodiversity.⁹² Apart from sustained government financing, the authority can augment its financial resources by imposing environmental management charges, fees, levies and fines on those who seek to use certain coastal spaces and resources.⁹³ As well, since the government funds the implementation of the ICZM plan, the umbrella agency implementing the ICZM plan should be held accountable to the legislature. Annual reports detailing activities will have to be placed before the legislative body to ensure accountability.⁹⁴ To further regional cooperation, copies of these reports should also be submitted to the SAARC Coastal Zone Management Centre, which will enable sharing of experiences.

10.2.12 Developing Capacity and Enhancing Public Awareness Designing and implementing an ICZM programme requires the use of knowledge and skills from a wide range of disciplines. Different sections of this thesis posit that climate change and SLR are laced in uncertainty and that coastal zone management and adaptations decisions need to be backed up by good and accurate science. While there is overwhelming evidence to affirm that the coastal regions of South Asia will be badly hit by the phenomenon, the exact nature of the impacts are still unclear and most countries continue to grapple with outdated or insufficient data.⁹⁵ In fact a primary impediment that has stalled the advance of most coastal zone management programmes is the lack of knowledge regarding coastal processes and the effects of human activity on them. Generally, there are wide gaps in the available data, particularly on the nature of coastal and marine resources, the extent of

⁹¹ The experience of Bangladesh is illustrative of this aspect. See Ch 3, Part 3.2.3.

⁹² *Sindh CDA 1994*, *supra* note 72, ss 17-18.

⁹³ *Belize CZMA*, *supra* note 18, ss 27 (fees to be levied for using natural resources within the coastal zone), 28 (dealing with sports fishing license fee); *NZRMA*, *supra* note 23, 64A(4A) (imposing coastal occupation charges).

⁹⁴ *Belize CZMA*, *ibid*, s 33; *Sindh CDA 1994*, *supra* note 72, s 19; see also *Coastal Zone Management Act of 1972*, 16 USC §1458 (review of performance, section 312) & §1459 (records and audit, section 313); see also EC, *ICZM Recommendation*, *supra* note 27, ch VI (calling upon member states to report to the commission regarding implementation of the recommendation).

⁹⁵ One major factor that has hampered the development of appropriate responses is the lack of adequate science on the subject. See generally Ch 3.

economic dependence of coastal populations on coastal resources, the rising sea levels, ocean temperature, etc., inhibiting the development of informed decision-making in respect of ICZM planning and management. This situation does not bode well for this region and if this can be rectified this can contribute significantly to the development and stability of environmental regimes.⁹⁶ Therefore, capacity-building, building up profiles of the coastal environment, developing baseline data including SLR planning benchmarks, skills-training, pooling of resources, sharing of data and lessons learned and increasing public awareness emerge as critical issues in coastal management.⁹⁷ Here, the coastal law can provide for the creation of specialized institutions charged with the duty of conducting research, which can inform policy and legal development and implementation.⁹⁸ In developing capacity, all attempts should be made to harness traditional knowledge and blend it with modern science to inculcate a new kind of progressive thinking and develop a cadre of coastal management professionals. The ultimate objective of capacity building efforts is to create a situation where ICZM programmes can be designed, implemented and monitored without any external support.⁹⁹ Public involvement in the ICZM process is extremely important, but this, in large measure, depends upon the public's level of awareness and participation in the programme. To facilitate awareness, local media should be used to spread the message of coastal conservation and public education programmes and efforts to alert coastal communities to the dynamic and the changing natural of the coast should also be instituted. Web-enabled systems should be utilized to publish documents relating to coastal zone management (clearances related to the coastal zone, the ICZM plans, environmental impact assessments, scientific studies, etc.), as this would ensure greater

⁹⁶ *Ibid.*

⁹⁷ See generally Xiamen Huasheng Hong & Xiongzhi Xue, "Building up a Training Base for Integrated Coastal Management through Partnerships in Xiamen" (2006) 49 *Ocean & Coast Mgmt* 685 (ScienceDirect) (discussing the establishment of the International Training Center for Coastal Sustainable Development).

⁹⁸ *Belize CZMA*, *supra* note 18, ss 8-10 (providing for the constitution of the Coastal Zone Management Institute, its objects and functions); see also *Oceans Act*, *supra* note 12, s 42 (dealing with the development of marine sciences); see also EC, *ICZM Recommendation*, *supra* note 27, ch IV(3)(h).

⁹⁹ Biliiana Cicin-Sain et al, "Education and Training in Integrated Coastal Management: Lessons from the International Arena" (2000) 43 *Ocean & Coast Mgmt* 291 at 294 (ScienceDirect).

reach and easy access.¹⁰⁰ There must also be provision for outreach programmes and activities, and people must be educated about the need to maintain healthy coasts and the role that they, as communities, groups and individuals, can play in this regard.¹⁰¹ If public involvement is to be an essential element in the preparation and implementation of the ICZM plans, all relevant documents should be placed in the public domain. ICZM is a dynamic process and therefore is predicated on the efficacious flow of information.¹⁰²

10.2.13 Building Linkages with Disaster Management Policies and Protecting the Health of Coastal Communities The coastal regions of South Asia are disaster prone, and disasters like cyclones have already claimed a very heavy toll in terms of life and property. In the coming years, it is expected that water-borne disasters will be more intense. Accordingly, it is extremely important that measures be adopted to augment critical coastal infrastructure to respond to disasters.¹⁰³ Measures could include the setting up of coastal shelters and dispensaries and the strengthening of all-weather-condition roads and communication lines. In this regard, coastal management should be viewed as a continuum, where coastal management represents the start-point and ends in disaster management. In such situations, coastal management has to be more anticipatory in nature, while disaster management should be viewed as reactive when dealing with post-occurrence impacts. Other measures also need to be adopted, as, for instance, increasing temperatures have led to increased mosquito borne diseases like malaria and dengue fever. In this regard, water stagnation is a major problem that contributes to the health crisis; existing marine and other water regulatory structures, which are in dilapidated conditions, have been found to accentuate the crisis. Hence, governments have to play a more active role in involving local communities to ensure that water stagnation and vectors are eliminated.

¹⁰⁰ CRZN, 2011, *supra* note 12 at 19, ¶IV(c); see also SA, *Integrated Coastal Management Act*, *supra* note 12, s 93(1) (preparation of reports by the minister, so as to enable the public to make an informed decision as to what extent the state has fulfilled its trusteeship duties). Even though illiteracy is a major problem in South Asia, placing these documents on the web, facilitates easy access by NGOs and other players in the coastal zones who in turn can disseminate relevant information to coastal communities that exist even in far-flung areas.

¹⁰¹ ICZM Protocol, *supra* note 16, art 15 (awareness raising, training, education and research).

¹⁰² Cullinan, *supra* note 33 at 151.

¹⁰³ See ICZM Protocol, *supra* note 16, arts 22 (dealing with natural disasters) & 24 (responding to natural disasters); CRZN, 2011, *supra* note 12 at 11, ¶(iii)(j).

10.2.14 Ensuring Compliance and Enforcement of the Law

A coastal law has to be an instrument that eliminates confrontation and competition and favors cohabitation. Environmental pollution and natural resource degradation are potentially violations of a human right, namely, the right to live in a clean and healthy environment. Since one of the primary objectives of a coastal law is to regulate human behaviour and secure human rights, fines and punitive sanctions should be prescribed for violations of the law.¹⁰⁴ And in certain cases incentives must also be offered to promote good behaviour for in terms of costal environmental protection and conservation. Moreover, there is a general perception that good policies and laws for coastal resource management fail due to poor enforcement of these laws. As the issue of enforcement is central to coastal management, it is imperative that coastal laws be implemented both in letter and in spirit. One of the most potent ways to secure the implementation of law and to increase its legitimacy is to ensure community involvement in law enforcement, as ‘feet-on-the-ground’ observers are more cognizant of violations. As well, reliance may also have to be placed on satellite-based monitoring and data to determine the exact nature of the violations.¹⁰⁵

While it is possible for these coastal countries to carry out amendments to their existing coastal laws in order to give effect to the identified principles/elements, this does not necessarily guarantee coherence to the legal frame, as the approach is still piecemeal and can potentially contribute to wasteful activity. In fact, up-scaling of ICZM efforts to make a substantive impact requires a concerted approach in the form of a dedicated coastal law to predicate ICZM practice. The list identified here to support ICZM law-making is by no means exhaustive, as our attempt is only to identify some of the major principles/elements to inform coastal law-making, not to restrict them. A broader fleet of initiatives will surely be needed to promote ICZM. In fact, for optimal results, the ICZM process may have to be linked with other tools like marine spatial planning and integrated

¹⁰⁴ See *Barbados CZMA 1998*, *supra* note 12, ss 40-41; *Sri Lanka CCA 1981*, *supra* note 16, ss 29-30.

¹⁰⁵ For information regarding the utility of satellite technology to identify violations of the coastal law, see Ch 3, note 135.

river basin management.¹⁰⁶

While these principles/elements on coastal law-making (to be pegged onto the SASAP) will guide coastal South Asia, there are certain particular aspects that these countries should take into account in implementing the coastal law reform agenda. Some of these are elucidated next.

As pointed out in chapter three, India enacted its first coastal law, the *Coastal Regulation Zone Notification*, in 1991.¹⁰⁷ Subsequently, 25 amendments were carried out to this law rendering it practically nugatory.¹⁰⁸ Recently, a new coastal law, the *Coastal Regulation Zone Notification, 2011*, was introduced.¹⁰⁹ However, this law is replete with inconsistencies,¹¹⁰ and India represents a classical case where adaptation measures and SCD have been sidelined in favor of short-term economic goals. Accordingly, for India, which has the longest coastline in South Asia, a dedicated statute on ICZM should be enacted to put an end to adhocism that still characterizes the national legal regime on coastal management (amending a statute requires legislative assent, unlike a piece of subordinate legislation that can be amended easily by the executive every now and then). Moreover, if India has to implement a coastal law on the basis of these identified principles, a subordinate legislation may not be the appropriate medium, given the limited remit that this form of lawmaking enjoys.¹¹¹

One of the fundamental tenets in Administrative law is that the Legislature is supposed to discharge essential legislative functions, which are non-delegable. While it can entrust to the executive, the power to make subsidiary legislation, it cannot abdicate essential legislative functions.¹¹² And, before delegating, the Legislature has to enunciate expressly or by implication, the policy and the principles to guide the delegate. The

¹⁰⁶ For a discussion on the utility of linking ICZM with marine spatial planning, see Ch 9, Part 9.3.2.2.

¹⁰⁷ *Declaration of Coastal Stretches as Coastal Regulation Zone (CRZ) and Regulating Activities in the CRZ* (SO 114(E)/1991 India), online: Ministry of Environment & Forests, Government of India <<http://www.envfor.nic.in/legis/crz/crznew.pdf>>.

¹⁰⁸ *Goa Foundation, Goa v Diksha Holdings Private Limited*, (2000), [2000] 2 SCC 97 (India SC).

¹⁰⁹ *Coastal Zone Management Notification 2008* (SO 1761(E)/2008 India), online: Ministry of Environment & Forests, Government of India <[http://www.envfor.nic.in/legis/crz/so-1070\(e\).pdf](http://www.envfor.nic.in/legis/crz/so-1070(e).pdf)>.

¹¹⁰ Tony George Puthucherril, "Operationalising Integrated Coastal Zone Management and Adapting to Sea Level Rise through Coastal Law: Where Does India Stand?" (2011) 26 *Int'l J Mar & Coast L* 569 at 596-604 (SwetsWise).

¹¹¹ For more details on the weaknesses in managing the coastal zone, through subordinate legislations, see Ch 3, Part 3.2.1.5.

¹¹² *Avinder Singh v Punjab*, (1979), [1979] AIR SC 321 (India SC).

Legislature has to retain the essential legislative functions and what can be delegated, is basically the power to implement the legislative intent, the legislative policy, and the purposes and objects of the legislation.¹¹³ The above identified principles for a coastal legislation, has wide legal and policy connotations, and it is doubtful whether the development of the coastal law can be left to the exclusive wisdom of the executive, lest, the subordinate legislation be tantamount to excessive delegation and be struck down on the ground of *ultra vires* the powers of the executive. As the Supreme Court of India observes, “[t]he Legislature is the master of policy and if the delegate is free to switch policy it may be usurpation of legislative power itself.”¹¹⁴

There are also other aspects that need particular consideration in the Indian context. Given the fact that there are unprecedented pressures for more coastal land to promote economic development, and that coastal fishing communities are finding themselves dispossessed of their lands and livelihood, it is necessary that India’s coastal law be imbued in the doctrine of public trust (since the doctrine can normatively restrict the sovereign power of the state). As of now, coastal communities are reluctant to move away from harm’s way (even in the face of SLR), as they feel that coastal lands once cleared will be handed over to private players. Accordingly, India’s coastal law should contain express measures that seek to secure the rights of coastal communities over their resources. This is extremely vital, as such recognition will, in the long run, help build and promote adaptive capacities.¹¹⁵

It is anticipated that both Bangladesh and the Maldives will be devastated by climate change and SLR impacts. Yet, despite grim projections, these nations have not enacted any specific coastal laws. Rather, their approach towards coastal zone management is fragmented and is based on several general environmental laws. As far as Bangladesh is concerned through a non-legislative approach it has been able to cover considerable distances in developing ICZM. However, the absence of a dedicated legislation has hampered the country’s efforts and non-clarity over the precise nature of

¹¹³ *ITC v Assam*, (2007) [2007] 9 VST 250 (Gauhati HC).

¹¹⁴ *Ibid.*

¹¹⁵ See Ch 3, Part 3.2.1 (discussing this aspect in the context of India).

entitlements has led to conflicts between users.¹¹⁶ To counter this, Bangladesh has to enact a dedicated coastal law based on these identified principles, provide a practical definition to the term ‘coast’ (a unit which they can realistically manage) and move in the direction of enhancing the adaptive capacities of coastal communities through ICZM and related legislation.¹¹⁷

For the Maldives, the question is one of base survival, and since the ratio of the land area to the coastal zone is less, the focus here should be more on island management and utilization of the general environmental and resources management laws to manage these coral atolls. The Maldives is currently in the process of developing an ICZM plan; therefore, it would be advisable for this country to peg ICZM practice onto a dedicated coastal law,¹¹⁸ one that gives prominence to conserving the cultural heritage of the islanders along with their local knowledge, customs and traditions. The coastal law should also seek to strike a balance between the robust tourism and fishing industries, the primary economic mainstay with the needs of conservation and environmental protection and preservation of the unique cultural heritage and traditional ways of life.

As far as Sri Lanka is concerned, as was explained, Sri Lanka was one of the first countries in Asia to enact a coastal law, namely, the *Coast Conservation Act, 1981*. While this legal framework is designed to support ICZM programmes,¹¹⁹ it was insufficient to meet the challenges posed by climate change and SLR. This law received a complete overhaul in 2011; however several inconsistencies still continue to haunt it.¹²⁰ Thus, even though Sri Lanka’s coastal law stands on sound legal ground, centralized coastal management and a single ICZM plan to manage all the coastal regions, ecosystems and resources will not in the long-run contribute to sustainable development objectives. There is a growing decentralization deficit that provides little opportunities for public

¹¹⁶ See Ch 3, Part 3.2.3 (discussing this aspect in the context of Bangladesh's experience on coastal management).

¹¹⁷ *Ibid.*

¹¹⁸ The Marshall Islands, which is also facing an existential crisis, has a dedicated coastal law, namely, *Coast Conservation Act, 1988*. See (Marshall Islands), No PL 1988-13 of 1988. SIDS like Barbados and Cuba have coastal management laws to support ICZM implementation and facilitate coastal climate change adaptation.

¹¹⁹ *Ibid* at 608.

¹²⁰ See *Coast Conservation Act* (No 57 of 1981, Sri Lanka), as amended by *Coast Conservation Amendment Act*, No 49 of 2011.

involvement in decision-making and accountability at the lowest levels. Thus, it is necessary that Sri Lanka decentralize its coastal management if it is to truly promote ICZM.¹²¹

As mentioned previously, in Pakistan, coastal zone management is essentially legislated by the provinces, with the federal government playing a lesser role.¹²² Meanwhile, the coastal provinces of both Sindh and Balochistan in Pakistan will have to revamp their coastal laws to incorporate specific measures to control land-based sources of pollution. Since the health of the Indus delta and related ecosystems is in sharp decline, coastal management may have to be linked with integrated river basin management, necessitating a greater role for the national government.¹²³

10.3 CONCLUSION

As seen from the above, a regional approach is particularly important and useful, given the divergence in capacity available to the different coastal countries in South Asia to operationalize and respond to the problems posed by SLR and climate change and the increased possibility that countries will not be able to respond to the challenges singularly. And here, the emphasis of these broad normative principles/elements identified via this exercise is not to secure force-based compliance; rather, the intention is that these principles/elements will enable the South Asian coastal countries to enact/re-engineer coastal laws to underpin their ICZM plans and processes. As well, a legal spine can produce a cascading effect to emerge as a starting reference point for the development of a composite regional regime on ICZM that is sufficiently inter-linked with national efforts to scale them up and propel the agenda of SCD forward.

A long drawn-out negotiation process generally precedes the development of a legal text that has multilateral overtones. Each provision that finds its way into the document is the outcome of a series of compromises and trade-offs, to finally epitomize a unified vision. While it is clear that a radical re-structuring of the coastal laws,

¹²¹ See Ch 3, Part 3.2.4 (for a discussion on Sri Lanka's coastal law experience).

¹²² See Puthucherril, "Adapting to Climate Change", *supra* note 120 at 576-79.

¹²³ See Ch 3, Part 3.2.2, for a discussion on Pakistan's coastal law experience.

management systems and processes is in order in South Asia, this region may not presently be ready to welcome an exclusive regional instrument on ICZM that imposes hard-law binding obligations. For the present, a soft-law instrument will have much greater acceptance and any concerns regarding erosion of state sovereignty can be assuaged. Soft law also provides ample scope and freedom to apply and work these principles/elements to their unique national context (different legal systems). In due course, as coastal South Asia begin to appreciate the importance and utility of a regional co-operative approach to implementing ICZM and CCCA, and as the problems wrought by climate change and SLR intensify and as climate change refugees begin to cross international borders in large numbers and as intense weather events hit the South Asian landmass, and as more and more coastal regions continue to disappear under the raging waves, it is possible that a more ambitious regime may evolve ostensibly to sustain and promote regional stability and welfare. In this regard, the soft-law principles can eventually metamorphose into a hard-law regional instrument, with stronger commitments replete with regional institutional frameworks and mechanisms.¹²⁴

Despite weaknesses, there is considerable potential in the SAARC to facilitate the development of these principles/elements into a more effective regional regime on ICZM and coastal climate change adaptation. Specifically, it can essay a catalytic role in assisting coastal countries in reforming their coastal laws. To increase the relevancy of these principles and to ensure that they secure widespread support, it is necessary that countries contextualize these broad principles in their respective national laws to ensure that they retain relevance with regard to the issues that they face. It is imperative that nations, while indulging in coastal law reform by giving effect to these principles/elements, take into account their own specific institutional frameworks, socio-economic, political and cultural contexts, and developmental needs and aspirations.

Enacting a coastal law is practically a subtle exercise in tightrope walking, which most coastal nations are unable to carry out due to capacity constraints. Hence, a regional instrument to guide national efforts in each of the coastal states to formulate/re-engineer

¹²⁴ See generally Aldo Chircop, David VanderZwaag & Peter Mushkat, "The Gulf of Maine Agreement and Action Plan: A Novel but Nascent Approach to Transboundary Marine Environmental Protection" (1995) 19:4 Mar Pol'y 317 (ScienceDirect) (identifying an incremental approach as one of three main options for regional regime development).

coastal laws at their respective national levels and to develop ICZM plans to work the principle of integration would be especially useful. In particular, the regional instrument must respond to recurrent coastal environmental protection challenges and, more importantly, reduce the risks posed by SLR and climate change through coastal climate change adaptation. The framework must also create the necessary institutional structures, adequately reflecting integration between relevant administrative structures sectorally organized and promoting requisite capabilities, all of which must be geared towards achieving the central objective of sustainable coastal development. Even though there are disputes between the coastal South Asian countries that appear as stumbling blocks to cooperation, the bleak ecological scenario for the region, climate change, and SLR provide the motivation for greater cooperation. It is necessary for coastal South Asia to look beyond the differences engendered by sovereignty, territorial, maritime boundary and other disputes to develop the political will to act on the marine and coastal conservation imperative.

In sum, there exists sufficient rationale for a regional regime on ICZM in South Asia as a probable adaptive strategy to respond to the problems of SLR and climate change impacts. The three primary reasons are: 1) that the international community continues to drag its feet over the issue and has yet to develop a coherent regime on coastal climate change adaptation;¹²⁵ 2) that coastal nations in the South Asian region are unilaterally attempting to deal with these problems (and cannot possibly do so successfully on their own);¹²⁶ and 3) that such a regime will help facilitate the sharing of information and resources to stimulate greater efficiency and effectiveness in coastal governance.¹²⁷ Even though integration has emerged as the buzzword in almost all of the discourses on coastal zone management, is ICZM the ultimate panacea to all the problems that confront our degraded coasts? The answer is an obvious 'No'. Integrated decision-making emerges only as the starting point for a series of other measures that will

¹²⁵ For a discussion on International Environmental Law and ICZM development, see Ch 7, Part 7.2.

¹²⁶ See generally Ch 3, Part 3.2.

¹²⁷ For a discussion on the utility of a regional regime for ICM development, see generally Ch 9.

need to be worked simultaneously to ensure sustainable coastal and ocean development.¹²⁸

This also brings us to a related question as to whether a coastal law will resolve all problems and provide sufficient calibration to our eroding coastlines. Again, the clear answer here is ‘No’. As is often said, “a law is as good as it is enforced.” Merely enacting a coastal law and adding more rules to the statute book is not a solution and will not resolve all problems.¹²⁹ However, carved-in-stone statutes as coastal management and adaptation tools would provide good anchorage, greater stability and consistency, and a degree of mandatoriness that could help moderate the perils associated with climate change and SLR. A legal framework would serve as the bedrock upon which the management superstructure could be built.

¹²⁸ See EC, *Proposal for a Directive of the European Parliament and of the Council Establishing a Framework for Maritime Spatial Planning and Integrated Coastal Management* [2013] 0074 (COD) at 8. Linkages may have to be established with river and watershed management. See generally UNEP, MAP & PAP, *Conceptual Framework and Planning Guidelines for Integrated Coastal Area and River Basin Management* (Split, Priority Actions Programme, 1999). The NZRMA supports a catchment based approach. Robert A Makgill & Hamish G Rennie, “A Model for Integrated Coastal Management Legislation: A Principled Analysis of New Zealand’s Resource Management Act 1991” (2012) 27 *Int’l J Mar & Coast L* 135 at 148.

¹²⁹ For the SWOT analysis, which articulates the need for a coastal law, see Ch 8, Part 8.3.

CHAPTER 11 CONCLUSION

11.1 MOVING TOWARDS SUSTAINABLE COASTAL DEVELOPMENT IN SOUTH ASIA

“This is the worst pain a man can have: to know much and have no power to act.”¹

These sagacious words of Herodotus resonate now more than ever, particularly in South Asia in relation to the need to balance the seemingly conflicting interests of coastal environment protection and economic development. As seen in the preceding chapters, coastal zones represent transitory areas where the oceans, which cover two-thirds of the earth’s surface, meet the remaining one-third land to produce several unique, diverse and productive ecosystems. Consequently, coastal areas, ecosystems and resources are of critical importance to a wide variety of terrestrial and aquatic life forms that includes, at the top, the human species. As coastal populations continue to grow, there is a concomitant rise in associated development activities to cater to the needs of the expanding populace. Often these development activities are not sustainable and some can even lead to increasing pollution and declining coastal resources.²

Countless reports, recommendations, guidelines, plans of action, etc., bemoan the continued desecration of our coastal zones even while offering numerous recommendations to improve the situation.³ Meanwhile, as the experts’ debate and the governments make concessions to developers, the coastal environment continues to deteriorate. It is against this backdrop of coastal degradation that the interrelated issues of climate change and sea level rise (SLR) must be probed, as they are probably the most serious environmental issues confronting the planet today. In fact, SLR and climate change now emerge as the primary drivers for improved coastal management.

While current efforts are to cap temperature rises at two degree Celsius above pre-industrial levels, in all probability we will reach this figure by 2050.⁴ Beyond this temperature rise and timeframe, the climate change phenomenon will become disruptive

¹ John Marincola, ed, *Herodotus: The Histories*, Rev ed (London: Penguin Group, 2003) at 506.

² For an overview on the state of coastal environmental degradation in South Asia, see generally Ch 2; see also Ch 3, Part 3.2.

³ See *ibid.*

⁴ See generally The World Bank, *Turn Down the Heat: Why a 4°C Warmer World Must be Avoided: A Report for the World Bank by the Potsdam Institute for Climate Impact Research and Climate Analytics* (Washington DC: The World Bank, 2012).

and highly dangerous.⁵ To prevent such rises in temperature, deep cuts in emissions will have to be implemented. The truth of the matter is that we have been unable to control anthropogenic emissions, and because of the emissions already spewed into the atmosphere, we have consigned ourselves to a certain degree of warming and consequent impacts from which there is no escape. As stated earlier in this study, anthropogenic emissions, past and present, have profoundly impacted the climate system and have set into motion chaotic changes that will be played out for a very long time. Even if we are able to stabilize the temperatures, the negative consequences of climate change and SLR will persist. And since most countries in the coastal South Asian region are unable to respond to these challenges singularly, greater cooperation and coordination between nations is urgently needed.⁶

Yet, despite the urgency of the situation, the international community continues to drag its feet in its efforts to create binding mitigation targets.⁷ This increases the importance of climate change adaptation, and since developing countries are particularly vulnerable to the adverse consequences of climate change, adaptation is an abstruse task.⁸ Within this less than ideal framework, one has to look for ways to protect our coastal zones and approach the concept of integrated coastal zone management (ICZM) and coastal climate change adaptation (CCCA) which, when put into practice, offer certain viable pathways to contain and manage at least some of the harm posed by SLR and climate change.⁹ Indeed, in regions like South Asia, where millions of people are clumped onto the coastal areas and littoral environments, the situation is even more desperate.¹⁰ Coastal South Asia cannot turn a blind eye to climate change and SLR simply by wishing it away through legislative fiat.¹¹ The challenge before us is to halt or

⁵ *Ibid.*

⁶ For a discussion on the need for regional co-operation in marine and coastal management in South Asia, see Ch 9.

⁷ Greenpeace, “What happened in Doha?: Analysis of the conduct and outcome of the COP 18 climate negotiations” (8 December 2012) online: Greenpeace <<http://www.greenpeace.org/International/Global/international/briefings/climate/Doha2012/QandAoutcomeDoha.pdf>>.

⁸ For more discussion on the complexities of climate change adaptation, see Ch 5.

⁹ For more details on linking ICZM with coastal climate change adaptation, see Ch 6, Part 6.5.

¹⁰ For an overview on the state of coastal management and the challenges in implementing ICZM in South Asia, see Ch 3, Part 3.2.

¹¹ North Carolina, initially contemplated a Bill that sought to determine SLR based on historical data (limited to the time period following the year 1900), the rates which could be extrapolated linearly to estimate future rates of rise not to “include scenarios of accelerated rates of sea-level rise.” See

reverse this process of continual degradation while at the same time ensuring coastal development, environmental protection and CCCA– this, in essence, is the problématique of this thesis.¹²

11.2 WHAT DOES THIS THESIS TELL US?

The spirit of hope pervading this thesis rises above the gloomy backdrop of profound and seemingly hopeless coastal environmental degradation and water-borne disaster. This hopeful spirit suggests that, through careful planning and management, it is possible to moderate at least some of the major impacts and help reduce the costs of SLR and natural hazards in terms of human life and property. As pointed out, in the face of growing economic, social and environmental pressures, sector-by-sector decision-making may prove disastrous.¹³ Moreover, silo management approaches do not consider the unique features of the coastal zone and cannot reverse the destructive trends. It is in this context that ICZM provides a new enlightened paradigm to coastal management.¹⁴

As well, the usual method adopted to moderate climate change impacts on coastal zones is to build hard shoreline armouring, such as sea walls, or to haphazardly install large boulders and rocks along the coastline to halt the ingress of the sea.¹⁵ In fact, in most countries, CCCA measures are viewed as part of land-use planning and thus land-use regulations are utilized to implement these measures. The responsibility to do so then falls on local governments. However, left to their own devices, local governments are generally ill-equipped to meet the challenges posed by such daunting tasks.¹⁶

This thesis argues that while CCCA is crucial to all countries, it is particularly important to those in the developing world (in the present case, the coastal South Asian

US, HB 819, *An Act to Study and Modify Certain Coastal Management Policies*, 2011, GA Sess, NC, 2011, online: NCCF <<http://www.nccoast.org/uploads/documents/CRO/2012-5/SLR-bill.pdf>>. This was subsequently modified following protest from the scientific community and general public. See Scott Huler, “NC Considers Making Sea Level Rise Illegal” (30 May 2012), online: SA Blogs <<http://blogs.scientificamerican.com/>>.

¹² For a discussion on the problématique and the context, see Chs 1, 2 & 3.

¹³ For a discussion on sectoral decision-making in respect of coastal zone management in Bangladesh and Maldives, see Ch 3, Parts 3.2.3 & 3.2.5.

¹⁴ For a discussion on the concept of ICZM, see Ch 6, Part 6.2.

¹⁵ For further information on improperly constructed sea walls in some of the coastal countries of South Asia, see Ch 3, text accompanying note 197; see also Ch 9, text accompanying note 279.

¹⁶ See *National Environmental Management: Integrated Coastal Management Act*, (S Afr), No 24 of 2008, s 49(2)(c)(v) (municipal coastal management programmes have to address coastal erosion).

region), since large sections of the population already live below the poverty line and hence the adaptive capacities of their communities are very low.¹⁷ CCCA is an integral pillar of the climate change regime as it rebuilds confidence in communities by reducing the negative impacts of climate change and draws advantage from possible opportunities.¹⁸ It also represents the only possible way to cope with impacts of climate change over the next few decades. The coastal countries of South Asia will have to expend aggressive efforts to combat climate change by investing resources in adaptation and placing CCCA within the broader narrative of ICZM.¹⁹ Additionally, this thesis posits the importance of law and legal frameworks in operationalising ICZM. It seeks to override skepticism and champion the role of law and legal statutes in supporting and facilitating good coastal governance through ICZM. However, this is not to suggest that ICZM cannot be implemented in the absence of legal support. The thesis emphasizes that a coastal law can help eschew unsustainable development practices and bring order to fragmented and incongruent schemes for coastal management. Accordingly, it is emphasized that there is the need for a legislative burst of energy to operationalize ICZM on grander scales rather than as pilots or at localized levels. It is therefore incumbent upon national governments in the South Asian region to swing into legislative action to anchor their coastal management regimes in socio-economic, environmental and political realities.

The primary argument here is that dedicated legal statutes at national levels are needed to galvanize ICZM implementation and CCCA to address the root causes of both coastal environmental degradation and social injustice.²⁰ While several general laws and policies can be brought to bear on the problem, sectoral-based legal management may not produce optimal results in the coastal zone.²¹ The findings also prove that dysfunctional laws can lead to gridlock in the governance process.²² More and more countries,

¹⁷ For an overview on poor adaptive capacities in South Asia, see Ch 2, Part 2.4; see also Ch 3, Part 3.2.

¹⁸ For more details on coastal climate change adaptation, see generally Chs 5 & 6.

¹⁹ For further discussion on the utility of linking coastal climate change adaptation with ICZM, see Ch 6, Part 6.5. For a discussion on the need for a new approach to coastal management, see also Ch 9.

²⁰ See generally Chs 7 & 8.

²¹ For some of the drawbacks of sectoral coastal management as seen in the Maldives, see Ch 3, Part 3.2.5.

²² For more details on how dysfunctional laws can hamper attainment of sustainable development objectives, see Ch 3, Part 3.2.1.

particularly those in the developed world, are increasingly becoming aware of the need to protect the coastal environment through the instrumentality of law. Of late, there has been a flurry of legislative activity to overhaul the coastal legal landscape to attune it to new realities, primarily SLR. However, in coastal South Asia and in most developing nations, a patchwork of disjointed laws continues to support coastal management, as these countries lack the legislative capacity to develop and implement coastal laws that are truly geared towards sustainable coastal development.²³ As well, these nations also find that the scale of coastal degradation, climate change and SLR increasingly exceeds their currently available resources, tool and methods to carry out coastal management. This is where regional regimes can play a supportive role.

Meanwhile, the key role of coastal law must be underscored, as it serves to identify principles/elements that support a regional roadmap to help coastal countries in South Asia to implement ICZM through the legal route. Although this study offers no illusions that complex management issues confronting the coastal zones can be resolved once and for all by adding more legislation onto the statute book, it nevertheless holds optimism that legislation that implements the predominantly new paradigm of linking ICZM and CCCA enhances our ability and offers us a practical and effective means to resolve and harmonise conflicting interests. In fact, this study calls upon countries to act with foresight to adopt coastal laws to put into practice the enlightened approach to coastal zone management i.e., one that creates linkages between CCCA and ICZM, which lies at the heart of sustainable coastal development.²⁴ An ICZM process that incorporates within its ambit CCCA through the untapped potential of law can strengthen coastal governance. In short, this thesis addresses the central research questions in terms of five concluding statements, namely:

- 1) CCCA is not solely about zoning, building codes, hard armouring, floodplain regulations, setback lines, etc. Rather, it is a twin-pronged process where implementation of the above-mentioned items is only one part of the equation. The second part consists of actions and measures to improve the adaptive capacity of coastal communities and to

²³ For more details, see Ch 3.

²⁴ For an articulation on the need to create linkages between coastal climate change adaptation and ICZM, see Ch 6, Part 6.5.

build the resilience of coastal ecosystems. Therefore, any programme that aims to implement CCCA should address both these aspects if there has to be an effective holistic response to the problem.²⁵

2) The objective of all of our actions in the coastal zone should be geared towards attaining the overarching aspiration of sustainable coastal development (SCD) which, as seen, is a balance between economic development, environmental protection, social and distributive justice and CCCA and mitigation.²⁶

3) ICZM has tantalizing potential to place coastal developmental processes on the trajectory of SCD. It seeks to address a vast array of environmental and resources use issues in relation to the coastal zone, such as the causes and effects of coastal and marine pollution, resource depletion, climate change and protection to ecologically significant areas, livelihood opportunities and enhancing existing ones, and alleviating poverty – all to be secured through a participatory process. In a nutshell, the “enlightened forward-thinking coastal zone management” represented by ICZM offers the best possible solution to our degraded and constantly eroding coastlines, enabling us to deal more effectively with the advancing sea. In the context of SLR and climate change and in achieving this objective, it is necessary to link CCCA actions within ICZM efforts to produce more enlightened and prudent responses to manage the diverse problems that affect our coasts.²⁷

4) Law and dedicated legal instruments can play a central role in supporting and re-engineering coastal zone management to secure sustainable development goals. It is necessary that countries invest resources now to strengthen their coastal legal framework in order to produce optimal results in terms of management. Law is at the heart of any ICZM process, as law lays out rules for ensuring long-term commitment to protect and preserve the coastal environment and its resources in terms of sustainable exploitation, for conflict management. Law also imposes duties, provides prescriptive rules, strengthens good coastal governance and helps sustain the management process, which,

²⁵ See generally Chs 5 & 6.

²⁶ For a discussion on the concept of sustainable coastal development, see Ch 4.

²⁷ For a discussion on the need to link ICZM with coastal climate change adaptation, see Ch 6, Part 6.5.

in its turn, maintains coastal processes and ecological values to the maximum extent possible. As well, it helps build congruence between ICZM and coastal climate change adaptation, and implement ecosystem-based, adaptive management and other principles central to an ICZM process like the precautionary approach, the “polluter pays” principle, environmental impact assessment, and protection to community rights in terms of the doctrine of public trust.²⁸

5) The depth of investigation in this study clearly reveals that, in general, the South Asian coastline is more vulnerable today than at any time in the past and is experiencing rapid changes such as intense cyclonic storms, salinity ingress, sea surges, rising sea surface temperatures and SLR. Moreover, issues relating to coastal management are placed in the backseat and the primary drivers are short-term economic objectives. The impact of all of this on fishing and other traditional coastal communities is enormous, yet these problems are not specific to South Asia alone; however South Asia in several ways represent a microcosm of coastal problems that confront coastlines elsewhere. As it stands, efficient coastal management systems are conspicuous by their absence in most of the South Asian coastal countries. As this study points out the national-level legal frameworks on ICZM are patchy and unable to provide direction.²⁹ Moreover, the institutional capabilities in most of the South Asian countries to implement ICZM are seriously deficient, with existing approaches unable to respond to the scale of the problems posed by climate change. Clearly, ICZM remains at the periphery of coastal management efforts in South Asia, and this is where the challenge lies. Laws, policies and systems for ICZM and CCCA should be put in place to reduce conflict and provide for effective management, with the ultimate aim of sustainable development. In view of this situation, a regional regime on ICZM can go a long way to removing logjams and fostering coastal climate change adaptation.³⁰ As of now, the realpolitik in coastal South Asia prevents the forging of a hard-law, regional-level instrument and associated institutional mechanisms. Presently, a soft-law regional instrument that identifies essential legal principles/elements that can facilitate the enactment of coastal legislations at the respective national level is

²⁸ For a discussion on the pivotal role of law in implementing ICZM, see Ch 7, Part 7.3 & Ch 8.

²⁹ See generally Ch 3, Part 3.2.

³⁰ For an articulation on the need for regional co-operation on coastal management and coastal climate change adaptation, see generally Ch 9.

the need of the hour.³¹

However, it must be emphasized that the intention here is not to campaign for standardization of ICZM law. As noted, there is no specific template on ICZM implementation at the international level. Being highly dynamic and contextual, a model ICZM legal code would be well-nigh impossible to carve into stone and apply to various countries and diverse milieus. In fact any attempt to impose a uniform template will be a futile exercise, given the differences between countries with regards to political and administrative systems, the degree of economic development, the diversity of coastlines and resources, and the nature of environmental problems, including SLR, that manifest differently along coastal zones and environments. Nevertheless, the common challenge of climate change and SLR, which has considerable potential to overwhelm these coastal regions, resources and communities, highlights the need for cooperation and the need for a strategic approach to coastal zone planning and management through the instrumentality of law. Accordingly, even while advocating for a regional instrument on ICZM that prescribes essential principles/elements to assist the development of national level legal frameworks that embody integrated and sustainable development qualities, since the national settings are varied, in developing a regional regime, pre-eminence must be afforded to national interest, and national-level coastal laws must reflect the environmental, economic, political and social realities of the particular country. Accordingly, the idea here is to afford sufficient flexibility and discretion to the different countries that comprise coastal South Asia to determine the structure of their own coastal laws, which nevertheless has to be consistent with the basic principles identified in the regional level instrument.³²

11.3 EPILOGUE

While climate change and tempestuous seas may not result in the total annihilation of life on earth, it is certain that the planet our succeeding generations will inherit will be vastly different from the one we inherited from our forefathers. Sandy beaches, by then, will

³¹ For a more detailed discussion on the possible elements of a regional level instrument on ICZM, see generally Ch 10.

³² *Ibid.*

more or less have completely been replaced by concrete sea walls; most marine species, corals, sea-grass beds, mangroves and other organisms will be specimens for public viewing in museums and aquariums; traditional fisheries will have collapsed; and several island nations will be completely wiped off the map. Drawing from the preceding chapters, it is amply clear that coastal countries in the South Asian region cannot, on their own, effectively or adequately respond to the challenges posed by climate change and SLR. And while the associated rises in air and water temperature, changes in precipitation patterns, SLR, increased storminess, winds, surges in CO₂ concentration, disruptions in ocean circulation are presently taking a toll in South Asia and will only intensify in the near future (depending on the nature and extent of human interference in the coastal ecosystems), the ensuing consequences can be overwhelming if the warning signals are misunderstood and action not initiated. Bold steps are needed to purge systemic weaknesses that impair ICZM implementation in South Asia. Presently, the best bet for these coastal nations is to regulate human activity in the coastal environment through the instrumentality of coastal law. A coastal law offers consistency and helps to bind the shifting sands, enabling fine-tuning of coastal management practices and implementation of coastal climate change adaptation.

In short, there has to be a reorientation towards sustainable coastal development. As this study points out, this can be accomplished in three ways, namely, 1) developing a regional regime on ICZM (to further CCCA and to balance coastal environmental protection and development) and thereby utilize some of the principles/elements identified in this study to strengthen the existing SASAP *vis-à-vis* ICZM implementation; 2) enact/re-engineer national coastal legislations based on the identified principles and develop ICZM plans and programmes; and 3) implement specific CCCA actions and initiate measures to improve the adaptive capacities of coastal communities via the ICZM methodology. It is imperative that coastal nations adopt a proactive approach to coastal management as soon as possible, as the question is not whether the seas will rise but when, which means that preparedness is essential. Acting now rather than later gives countries time to re-model the principles/elements identified in this thesis to their particular circumstances in designing their coastal laws.

At the national level, an omnibus coastal law emerges as the cornerstone of the mosaic that is being suggested. Action is urgently required and any apathy by coastal South Asian states in this regard is tantamount to placing oneself on the path of self-destruction. SCD is no longer an aspiration but an attainable objective, and ICZM, due to its holistic nature that strives to balance CCCA with coastal environmental protection and development, provides the means. In the end, the clarion call for change has been sounded and the movement towards SCD has been initiated. The lessons and schematic map for coastal law reform that this thesis offers are not intended in any way to be iconoclastic; rather, the emphasis is on identifying pragmatic solutions that utilize the legal instrumentality for results. While grounded in a South Asian context, these solutions are applicable to other coastal countries and regions as well. Climate change, SLR, coastal degradation, and coastal urbanisation are themes that cut across national and regional boundaries and will fundamentally reconfigure coastal zones. The costs of inaction can be huge in terms of lives and property. Coastal South Asia has reached a *cul de sac*, and the only way out of this seeming dead end is to work cooperatively to forge regional-level ICZM and coastal climate change adaptation, thereby to strengthen national-level coastal laws, management systems, capacity and implementation.

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1 PRIMARY MATERIALS

1.1 INTERNATIONAL

1.1.1 International Agreements

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APPENDIX - A (Copyright Permission Letter)

From: Ingeborg van der Laan <Laan@brill.com>
Date: Thu, Nov 7, 2013 at 10:33 AM
Subject: RE: Copyright permission
To: Tony George <tonygeorge00@gmail.com>

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With best wishes,

Ingeborg

BRILL NIJHOFF