

**MEXICO'S IMPLEMENTATION OF THE BIODIVERSITY CONVENTION AND  
THE CARTAGENA PROTOCOL IN THE GMO ERA: CHALLENGES IN  
PRINCIPLES, POLICIES AND PRACTICES**

by

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To my beloved daughters Sayaka and Haruka, my wife Keiko, my mother Martha, my grandmother Eloisa, my brother Pepe, and my mother in law Takako.



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## ABSTRACT

Recent developments in genetic modification and the use of Living Modified Organisms (LMOs) in agriculture have ignited a debate over the potential effects of these organisms on biological diversity. This controversy materializes in the clash between the international environmental and trade regimes. Multilateral Environmental Agreements (MEAs), such as the 1992 Convention on Biological Diversity (CBD) focus on the preservation of biological diversity and, in the case of the Cartagena Protocol on Biosafety (Cartagena Protocol), the safe transfer of LMOs. These Agreements encourage States to base national decisions to allow LMO imports on environmental and risk assessments using the precautionary principle. On the other hand the international trade regime under the auspices of the World Trade Organization (WTO) and regional arrangements such as the North American Free Trade Agreement (NAFTA), seek to establish free trade (including trade involving LMOs) by eliminating national level measures that can create trade barriers. However this regime does allow States to enact national protective measures, to preserve human and animal health as well as natural resources, based on scientific evidence.

This Dissertation is concerned with Mexico's implementation of the CBD, the Cartagena Protocol, and implementation challenges this biodiversity-rich country encounters in this endeavor. It argues that the preservation of biological diversity is paramount, not only for the survival of plant and animal species but also for the subsistence of human beings on earth and that the implementation of these environmental Agreements has the potential to preserve such resources. Mexico's failure to preserve its indigenous maize from transgenic maize imports is examined as a case study to highlight the difficulties faced by transitional economy countries: in addition to domestic capacity issues they must also meet their obligations under MEAs and the international trade agreements. This Dissertation suggests that Mexico's difficulties provide some lessons to other countries in implementing these Agreements. It asserts that, although Mexico has embraced the international commitments contained in the CBD and the Cartagena Protocol, the country still faces important legislative, institutional and policy challenges that prevent it from effectively implementing these Agreements. In particular it is argued that the lack of biosafety regulations and long-term environmental policies as well as deficient enforcement systems prevent Mexico from effectively implementing these Agreements.

This Dissertation concludes its analysis of Mexico's implementation of the CBD and the Cartagena Protocol by proposing a number of legal and institutional measures to improve the implementation of these environmental Agreements in Mexico, including the need to strengthen monitoring and enforcement mechanisms in the Cartagena Protocol's Compliance Committee and the enactment of biosafety regulations to support the implementation of Mexico's Biosafety Law on GMOs. It also proposes a number of mechanisms that could be adopted at the global and regional level to assist countries in more effectively implementing their obligations.



## LIST OF ABBREVIATIONS USED

ACM	Assimilative Capacity Model
AIA	Advance Information Agreement
AIDS	Acquired Immune Deficiency Syndrome
BT	Bacillus Thuringiensis
BCH	Biosafety Clearing House
CBD	United Nations Convention on Biological Diversity
CEC	Commission for Environmental Cooperation
DGIF	Directorate for Phyto and Zoo-sanitary Inspection (Mexico)
DNA	Deoxyribonucleic Acid
CIBIOGEM	Inter-Secretarial Commission on Biosafety and Genetically Modified Organisms (Mexico)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CODEX	Codex Alimentarius Commission
COMARNAT	National Consultative Commission of Standardization and the Environment and Natural Resources (Mexico)
CONABIO	National Commission for the Knowledge and Use of Biodiversity (Mexico)
CONACYT	National Council of Science and Technology (Mexico)
CONANP	National Commission of Protected Areas (Mexico)
COP	Conference of the Parties
DPH	Directorate of Plant Health (Mexico)
EC	European Communities
EIS	Environmental Impact Statement

DGIRA	General Directorate of Environmental and Impact Assessments (Mexico)
DICONSA	Food and Distribution Agency (Mexico)
FAO	United Nations Food and Agriculture Organization
GATT	General Agreement on Tariffs and Trade
GM	Genetically Modified
GMOs	Genetically Modified Organisms
ICCPR	International Covenant on Civil and Political Rights
INE	National Institute of Ecology (Mexico)
ISAAA	International Service for the Acquisition of Agri-Biotech Applications
IUCN	World Conservation Union
LMO-FFPs	Transgenic Food, Feed and Processing Products
LPH	Law on Plant Health (Mexico)
LPCCS	Law on the Production, Certification and Commerce of Seeds (Mexico)
LMOs	Living Modified Organisms
MEAs	Multilateral Environmental Agreements
MFNT	Most favoured nation
NAAEC	North American Agreement on Environmental Cooperation
NABI	North American Biotechnology Initiative
NACLE	North American Consortium of Legal Education
NDP	National Development Plan (Mexico)
NAFTA	North American Free Trade Agreement
NAPC	National Phytosanitary Council (Mexico)
NASCO	North Atlantic Conservation Organization

NEPA	National Environmental Protection Act
NGOs	Non Governmental Organizations
NOMs	Mexican Official Norms (Mexico)
NSS	National Service for Sanity, Inoculation and Agro-alimentary Quality (Mexico)
NTP	National Treatment Principle
OECD	Organization for Economic Cooperation and Development
PAN	National Action Party (Mexico)
PIC	Prior Informed Consent
PRI	Institutional Revolutionary Party (Mexico)
PROFEPA	Federal Attorney for Environmental Protection (Mexico)
REMIB	Mexican Network on Biodiversity
SAGARPA	Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (Mexico)
SE	Secretariat of Economy (Mexico)
SEA	Strategic Environmental Assessment
SECTUR	Secretariat of Tourism (Mexico)
SEDESOL	Secretariat of Social Development (Mexico)
SEMARNAT	Secretariat of the Environment and Natural Resources (Mexico)
SEP	Secretariat of Public Education (Mexico)
SENER	Secretariat of Energy (Mexico)
SHCP	Secretariat of Treasury and Public Credit (Mexico)
SNIB	National Biodiversity Information Network (Mexico)
SPS	Agreement on the Application of Sanitary and Phytosanitary Measures

SRE	Secretariat of Foreign Relations (Mexico)
SSA	Secretariat of Health (Mexico)
SUMA	System of Sustainable Preservation Zones (Mexico)
TBT	Agreement on Technical Barriers to Trade
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Programme
UNPF	United Nations Population Fund
WDPA	World Database of Protected Areas
WTO	World Trade Organization
WWF	World Wildlife Fund

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## CHAPTER I

### INTRODUCTION

This Dissertation is concerned with Mexico's implementation of the United Nations Convention on Biological Diversity (CBD)<sup>1</sup> and the Cartagena Protocol on Biosafety to the Convention on Biological Diversity (Cartagena Protocol).<sup>2</sup> These Agreements have the potential to help this developing country preserve its rich biological diversity particularly from the threats posed by biotechnology and Living Modified Organisms (LMOs).<sup>3</sup> Mexico is known for being one of the world's few mega-diverse countries for hosting a great amount of biological diversity. It is considered one of the centers of origin of maize and it places fifth in variety of plants (23, 441 species); fourth in amphibious species (361 species); second in mammals (491 species); and, first in reptiles (804 species).<sup>4</sup> The preservation of Mexico's biological diversity is fundamental

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<sup>1</sup> United Nations Convention on Biological Diversity, June 5, 1992, 31 I.L.M. 818, entered into force Dec. 29, 1993) Mexico ratified the CBD on March 11, 1993, online: < <http://www.cbd.int/doc/legal/cbd-un-en.pdf> >. (accessed June, 4, 2007).

<sup>2</sup> Cartagena Protocol on Biosafety to the Convention on Biological Diversity (Feb. 23, 2000), Entered into force 11 September 2003, online: <<http://www.biodiv.org/biosafe/BIOSAFETY-PROTOCOL.htm>>. (Mexico ratified the Cartagena Protocol on September 11, 2003. (accessed June, 4, 2007).

<sup>3</sup> The CBD and the Cartagena Protocol make use of the term Living Modified Organisms (LMOs). The term LMOs refers organisms that have been modified by the use of biotechnology techniques and to those that are capable of reproducing. Genetically Modified Organisms (GMOs) although, widely used as synonym of LMOs, are not defined in the CBD or the Cartagena Protocol. This term, portrays dormant organisms that have been genetically modified by the use of biotechnology. This Dissertation focuses on living organisms that have been modified by the use of biotechnology techniques and that are capable of replicating and to potentially affect biological diversity. The term GMOs will be employed in this paper to identify broad aspects of genetic manipulation or when specifically mentioned in Mexico's legislation. See IUCN Environmental Law Centre, *An Explanatory Guide to the Cartagena Protocol on Biosafety*, online: < [http://pdf.wri.org/biosafety\\_guide.pdf](http://pdf.wri.org/biosafety_guide.pdf) >. at 56-59 (accessed January, 10, 2007); See also Glowka, L. et al., *A Guide to the Convention on Biological Diversity* (IUCN, Gland and Cambridge, 1994) at 45.

<sup>4</sup> Secretariat of the Environment and Natural Resources (SEMARNAT), Mexico's Environmental Statistics (2005), at 24-25, online: < <http://www.semarnat.gob.mx/informacionambiental/Pages/sniarn.aspx> >. (accessed January, 10, 2007).



in light of the richness of these resources and for their importance to the preservation of biodiversity at the global level.

Biodiversity or variation among species is of paramount importance not only for the survival of species in light of environmental changes, but also for the survival of humans since it provides us with edible and medicinal products essential to our subsistence on earth. Biodiversity contains economic value. Biological resources are employed by biotechnology corporations to manufacture LMOs that can increase agricultural production to alleviate food shortages in many parts of the world. In spite of the importance of biodiversity, the needs of a growing population and invasive species threaten the existence of these resources.

Multilateral Environmental Agreements (MEAs) such as the CBD and the Cartagena Protocol seek, *inter alia*, to regulate LMOs and to preserve biodiversity. The CBD and the Cartagena Protocol strive to preserve the world's biological resources and to ensure the safe introduction of LMOs into the environment. The CBD regulates activities related to biodiversity preservation in the marine and terrestrial sectors. It strives to guide States in building national structures for the preservation of biological diversity, and it encourages them to employ Environmental Impact Assessment (EIA) procedures to assess projects and activities in term of their likely impacts on biodiversity preservation. The Cartagena Protocol regulates the introduction and movement of LMOs across borders. It requires States to follow a documentation procedure when importing these organisms and to employ the precautionary principle and risk assessment when making import decisions. It also employs a Compliance Committee to improve the implementation of this Agreement among member States.

Lack of conclusive scientific evidence with respect to the long term effects of LMOs on biodiversity ignites international conflicts over the regulation of these organisms. The effects of this uncertainty are seen at the international level in the clash between the environmental and international trade regimes. The international trade regime represented by the World Trade Organization (WTO) and regionally by the North American Free Trade Agreement (NAFTA),<sup>5</sup> advocates the elimination of trade barriers including the commercialization of LMOs. It allows States to enact trade restrictive measures to preserve human, animal or plant life or health. However, it requires States to base such protective measures on international standards, scientific evidence and non-discriminatory rules.

LMOs and their potential impact on biological diversity were tangentially addressed in North America under NAFTA's environmental institution, the Commission for Environmental Cooperation (CEC). This Commission produced a Report in which it acknowledged that Mexico has a great number of biological resources. It also pointed to several problems in Mexico's legislation, institutions and policies, such as lack of institutional coordination, lack of protection for native plants, and the failure to enforce a moratorium regarding the introduction of transgenic maize into the country.<sup>6</sup>

This Dissertation argues that the factors found in the CEC's Maize Report such as legislative, policy and institutional challenges prevent Mexico from implementing the

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<sup>5</sup> North American Free Trade Agreement (NAFTA), Dec. 17, 1992, Can.-Mex.-U.S., 32 I.L.M. 298 (entered into force Jan. 1, 1994).

<sup>6</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico: Key Findings and Recommendations, Commission for Environmental Cooperation (CEC), (2004), online: <<http://www.cec.org/maize>>. (accessed May, 2, 2007). This independent report was prepared by the Secretariat of the CEC according to Article 13 of the North American Agreement of Environmental Cooperation (NAAEC).

CBD and the Cartagena Protocol in an effective manner. It also argues that at the international level, a more active role of the CBD Secretariat and the Compliance Committee of the Cartagena Protocol could improve the compliance with these Agreements. It suggests that Mexico's experience in implementing the CBD and the Cartagena Protocol serves as a case study of the challenges transitional economies may face in preserving their biological diversity and implementing these Agreements. It also argues that, at the regional level, a stronger and a more independent CEC could contribute to the observance of Mexico's environmental law including biosafety legislation. It argues that the enactment of supportive regulation in Mexico, long-term planning and streamlining of environmental institutions can improve the implementation of MEAs in Mexico and similarly placed countries.

This Dissertation pursues six objectives. First, it will analyze the magnitude of the obligations in the CBD and the Cartagena Protocol to assess if their implementation is feasible by a developing country like Mexico. Second, it will examine the international trade regime under the auspices of the WTO and NAFTA to see if it allows States to enact measures for the preservation of their biodiversity. It will also analyze potential conflicts between the international trade and environmental regimes and their implication on the preservation of Mexico's biological diversity. Third, it will analyze Mexico's institutions and legislation to see if they reflect the required infrastructure needed to support implementation of the commitments delineated in the CBD and the Cartagena Protocol. Fourth, it will analyze Mexico's environmental policy in search of long-term goals and the necessary institutional coordination that would facilitate the implementation of these environmental Agreements. Fifth, it will assess the extent of implementation of

these two environmental Agreements in Mexico. Sixth, it will propose measures that can be taken to overcome the obstacles standing in the way of Mexico's effective implementation of the CBD and the Cartagena Protocol. Essentially, these obstacles consist of the need for reform of the current legislative and institutional arrangements.

Chapter II will provide an introduction to biodiversity and genetic modification to provide the context for the discussion of the preservation of these resources in light of developments in biotechnology. It will also provide an overview of the evaluation of the concept of 'biodiversity' and its definition as well as tracing its emergence in international environmental law. Furthermore, this Chapter will analyze the importance of preserving biodiversity and discuss potential threats to doing so, such as overpopulation and the introduction of alien species. It will also stress the importance of preserving biodiversity and its role in human survival on earth.

Background information regarding LMOs and Genetically Modified Organisms (GMOs) will be considered in light of the policy interests regarding the utilization of those organisms. This Chapter argues that, although they can increase agricultural production and enhance nutrition, the introduction of LMOs into the environment should be monitored, particularly in light of the lack of scientific evidence regarding their long-term impact on biodiversity. This scientific uncertainty, as will be argued in this Chapter, is an important element that needs to be taken into account in regulating LMOs. Furthermore, this Chapter identifies issues in regulating LMOs at the international, regional and national (Mexican) levels. These issues include the clash between the international trade and environmental regimes in the regulation of these organisms,

regional trade and LMO production in North America and the challenges this poses to preserving Mexico's rich biodiversity.

Chapter III will analyze the CBD and the Cartagena Protocol in order to establish the required institutional, legislative and policy structure needed to implement these Agreements in Mexico. It seeks to demonstrate that LMO regulation under these MEAs clash with the dictates of the international trade regime that operates under the WTO. In short, the international trade regime, in the absence of clear and convincing scientific evidence regarding biological diversity does not encourage adoption of the measures necessary to preserve biodiversity.

The Chapter will also identify and analyze potential issues in the implementation of the CBD and the Cartagena Protocol. Among these are the effectiveness of the Compliance Committee under the Protocol and its potential to aid States overcome obstacles in the implementation of the Protocol at the national level, the broad nature of the provisions of the CBD, the lack of guidelines on the regulation of access to genetic resources and benefit sharing, the lack of guidelines on how to implement the prior informed consent obligation, and problems regarding delimitation of protected areas.

This Chapter will also analyze the failure of the Protocol to regulate transgenic commodities by documentation procedures regarding the movement of LMOs, the lack of guidelines on risk assessment, and problems in implementing the precautionary principle to control the spread of LMOs. The relationship between the Cartagena Protocol and international trade agreements will also be analyzed, emphasizing the potential conflicts between these regimes and their impact on a State's ability to regulate LMOs to preserve biodiversity.

Chapter IV will analyze issues in LMO regulation in North America, particularly those generated by the provisions of the Cartagena Protocol and NAFTA. It will also demonstrate potential hurdles transitional economies face in regulating these organisms. Specifically it will analyze the CEC's Maize Report to highlight the problems Mexico has encountered in preserving its biodiversity and in implementing its international obligations under MEAs. This Chapter will argue that although the CEC's Maize Report focuses on Mexico, it has wider application to transitional economies in the same situation as Mexico in their effort to balance environmental preservation with economic development.<sup>7</sup> (The CEC's Maize Report is employed throughout the dissertation to highlight the hurdles Mexico faces in regulating LMOs and in preserving its biodiversity).

Chapter V centers on an analysis of Mexico's legislation and environmental institutions to assess how well they could translate the CBD and the Cartagena Protocol obligations into reality in Mexico. This is done against the background of regulations on biodiversity preservation and, specifically, regarding the introduction of LMOs in Mexico. Prominent among the domestic legislation analyzed is a 'framework' law, the General Law of Ecological Equilibrium and Environmental Protection (the General Law of Ecological Equilibrium).<sup>8</sup> The Biosafety Law on GMOs is also discussed with a focus on its procedures for authorizing the introduction of LMOs into the environment.<sup>9</sup>

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<sup>7</sup> *Ibid.*

<sup>8</sup> General Law of Ecological Equilibrium (Ley General de Equilibrio Ecológico), Mexican Gazette (DOF) 28-01-1998 reformed by decree DOF 23-02-2005, online: <<http://www.cddhcu.gob.mx/leyinfo/pdf/148.pdf>>. (accessed January, 10, 2007).

<sup>9</sup> Biosafety Law on GMOs, (Ley de Bioseguridad de Organismos Genéticamente Modificados) DOF18-03-2005, online: <[http://www.cddhcu.gob.mx/leyinfo/pdf/Ley\\_BOGM.pdf](http://www.cddhcu.gob.mx/leyinfo/pdf/Ley_BOGM.pdf)>. (accessed January, 10, 2007).

At the institutional level, this Chapter will look at Mexico's institutions that play a role in regulating LMOs and in preserving biological diversity. It will also assess how well they coordinate their functions so as to provide the framework necessary to implement environmental legislation. In essence, this Chapter seeks to demonstrate that relevant environmental institutions interact in an uncoordinated manner and, at times, conflicts arise among them particularly with respect to regulating the introduction of LMOs into the environment.

Given the absence of appropriate legislation and regulations, and in view of the uncoordinated nature of the governing institutions, Chapter VI considers whether necessary changes could be initiated at the policy level to create long-term goals for effective environmental protection in the country. The discussion on this point assesses the effectiveness of Mexico's Federal Law on Planning<sup>10</sup> and the impact of Presidential influence in the initiation of environmental policy and its implementation by the relevant institutions. One aspect of this analysis considers the extent to which institutional coordination is affected by the overriding influence of the President's office. The analysis shows that the root of Presidential control in Mexico's environmental regime is the constitutional basis for federal planning.<sup>11</sup>

At bottom, the planning system not only concentrates final decision-making in the President. It also virtually mandates formulation of short-term objectives. The Chapter therefore demonstrates that for the effective and long-term implementation of the CBD and the Cartagena Protocol, environmental policy evolution under the Presidency in

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<sup>10</sup> Federal Planning Law (Ley Federal de Planeación), DOF-05-01-1983., online: < <http://www.diputados.gob.mx/LeyesBiblio/pdf/59.pdf> >. (accessed January, 13, 2007).

<sup>11</sup> Zamora, Stephen, et al., *Mexican law*, (Oxford: Oxford University Press, 2004) at 34.

Mexico further aggravates the failures of the institutional regime, and does not hold good prospects for appropriate legislative development and implementation.

Chapter VII provides an analysis and critique of the Mexican environmental regime as a whole and seeks to demonstrate that the need to implement the CBD and Cartagena Protocol imposes substantial financial burdens on Mexico and on other transitional economies or developing countries. It also re-emphasizes that Mexico's federal planning system is a major obstacle to long-term policy development. It argues that there is a need for appropriate laws and institutional authority to encourage the effective national implementation of the CBD, the Cartagena Protocol and other MEAs.

Chapter VIII puts forward proposals for international and national measures that could be adopted to improve the implementation of these environmental treaties in Mexico and elsewhere. Concrete proposals include strengthening the Cartagena Protocol's Compliance Committee by incorporating a public complaint procedure and by expanding its monitoring mechanisms. Proposals also include the enactment of regulation to support the Biosafety Law on GMOs, the streamlining of the structure and inter-relations of federal environmental institutions, and the reform of Mexico's planning system to allow for long-term objectives to be set out to support consistent environmental policy development from one Presidential era to the other.



## CHAPTER II

### BIODIVERSITY: AN INTRODUCTION

#### 1. Overview

Philosophers and scientists have attempted to conceptualize the planet's living organisms using different terms. Early characterizations include expressions such as flora and fauna, wildlife and fellow creatures.<sup>12</sup> In the midst of these efforts, the modern concept of 'biodiversity' or biological diversity emerged in the 1980s,<sup>13</sup> gaining widespread attention not only from scientists but also from academics and conservationists. 'Biodiversity' dramatically widens our view of natural resources and life forms on earth.

The concept of 'biodiversity' has been used to describe life on earth, including animals, plants, organisms, the variability among such, and their habitats.<sup>14</sup> There is currently a great deal of controversy over this concept and over its theoretical foundations.<sup>15</sup> Despite the fact that there is an international Convention on Biodiversity and that there seems to be a general consensus regarding this term, some scholars affirm that biodiversity cannot be defined accurately, for it represents more than a scientific

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<sup>12</sup> Takacs, David, *The Idea of Biodiversity: Philosophies of Paradise*, (Baltimore & London: The Johns Hopkins University Press, 1996) at 11.

<sup>13</sup> *Ibid.*

<sup>14</sup> Perlman, Dan L. & Adelson, Glenn, *Biodiversity: Exploring Values and Priorities in Conservation*, (Cambridge, Massachusetts: Blackwell Science, 1997) 7-11.

<sup>15</sup> *Ibid.* at 2-5, 20-23, see also Takacs, David, *supra* note 12 at 41.

concept; specifically, it represents a subjective, ethical viewpoint on how such resources are valued and viewed by human beings.<sup>16</sup>

Despite these debates over terminology, it is accurate to say that there has been a decline in the variety and number of species of plants and animals on earth and that the preservation of these resources directly impacts not only our well-being, but also our survival on this planet.<sup>17</sup>

Two factors can be pointed to as being crucial for the development of the contemporary idea of biodiversity: 1) scientific uncertainty in the field of biological diversity; and, 2) the accelerated rate of extinction of species. First, uncertainty permeates the field of biological resources. Scientists have only been able to document and classify 1.75 million species of plants and animals.<sup>18</sup> Although there is no certainty over the actual number of living organisms on the planet, some hypothesize that the number may range from 5 to 10 million species.<sup>19</sup>

Second, there is consensus among scientists over the accelerated rate of extinction of species since the 1970s. According to some, 24 percent of the world's mammals and 12 percent of birds are considered as threatened species.<sup>20</sup> Also, the red list of an

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<sup>16</sup> Takacs, *supra* note 12 at 2-5. For more on the philosophical debates surrounding the term biodiversity see Bowman, Michael & Redgwell, Catherine (eds), *International Law and the Conservation of Biological Diversity*, (London, the Hague & Boston: Kluwer Law, 1996) at 26-36.

<sup>17</sup> *Ibid.* at 9-11. See also Marjorie, Reaka-Kudla, Wilson, Don E. (eds), *Biodiversity II: Understanding our Biological Resources*, (Washington D.C. Joseph Henry Press, 1997) at 2-5.

<sup>18</sup> UNEP, *Global Biodiversity: Earth's Living Resources in the 21<sup>st</sup> Century*, (Cambridge: World Conservation Press, 2000) at 11.

<sup>19</sup> Bell, David Eugene, "The 1992 Convention on Biological Diversity: The Continuing Significance of U.S. Objections at the Earth Summit" (1993) 26 Geo. Wash. Int'l. L. Rev. 479, at 484. See also Biodiversity II, *supra* note 17 at 1-3.

<sup>20</sup> UNEP, *World Atlas of Biodiversity*, (Berkeley, Los Angeles & London: University of California Press, 2002) at 60-62.

international organization, the World Conservation Union (IUCN), includes 41 percent of the species documented in 2004 as being in danger of extinction.<sup>21</sup>

In addition, the fourth Report on the changing environment issued by the United Nations Environment Programme (UNEP) and world environment experts acknowledges some of the problems biodiversity faces. It also warns that there is a global trend towards the continue overuse of the earth's ecosystem resources.<sup>22</sup> It suggests that consumption and waste production in 2006 exceeded by about 25 percent the earth's capacity.<sup>23</sup>

One of the recent areas of international debate in the preservation of biological diversity is the potential effects of LMOs on such resources. The international debate surrounding this topic will impact not only global and regional efforts to preserve biodiversity but also the commercialization of these products. This debate also has significance in the implementation of Mexico's international commitments to preserve biological resources.

At the international level, biotechnology opponents argue that LMOs have the potential to negatively impact biodiversity by disseminating their traits to organic plants and, therefore, risking their elimination.<sup>24</sup> They also argue that genetically modified (GM) foods have the potential to harm human health when they are manipulated with components of plants that are known to cause allergies such as nuts and peanuts.<sup>25</sup>

Biotechnology advocates, on the other hand, propose that LMOs have the potential to benefit the environment by accelerating food production and by designing

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<sup>21</sup> IUCN Red Lists, Summary Statistics for Threatened Species Globally, (2004), online:< <http://www.redlist.org/info/tables/table1>>. (accessed January, 10, 2007).

<sup>22</sup> UNEP, GEO Year Book : An Overview of our Changing Environment, (2006), Environmental Trends, online:< <http://www.unep.org/geo/yearbook/yb2007/>>. at 2. (accessed January, 11, 2007)

<sup>23</sup> *Ibid.*

<sup>24</sup> GEO-PIE Project "Issues Related to Genetic Engineering," online: <<http://www.geo-pie.cornell.edu/issues/issues.html#issues>>. (accessed January, 11, 2007).

<sup>25</sup> *Ibid.*

seeds that will grow and produce under the most adverse climatic situations. Nutrients and vaccines from modified organisms can also help fight diseases and prevent malnutrition in developing countries.<sup>26</sup>

Also at the international level, conflicting interests over the use of LMOs can be illustrated with complaints before the WTO dispute resolution Panel by the United States of America, Canada and Argentina regarding the European Communities (EC) restrictions on the marketing of transgenic products in Europe from these States since October 1998.<sup>27</sup> The EC's moratorium affected the commercialization of transgenic products by some European States despite the fact that such products had been approved for import and marketing within the EC.<sup>28</sup>

At the regional level, issues of LMO regulation have been raised in the context of NAFTA in the Commission for Environmental Cooperation (CEC) forum.<sup>29</sup> In response to a complaint by Mexican indigenous groups and non governmental organizations (NGOs), this environmental institution produced a Report that addressed issues of biodiversity preservation, biotechnology and trade.<sup>30</sup> It also asserts Mexico's international obligations to protect biodiversity and called on Mexico to adopt appropriate measures to that end.<sup>31</sup> At the national level, biodiversity protection in Mexico is of special importance because it possesses one of the world's richest areas in

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<sup>26</sup> Yan, Li & Kerr, Philip S., "Genetically Engineered Crops: Their Potential Use for Improvement of Human Nutrition", (2002) 60 Nutrition Reviews, 5 at 135 (ProQuest).

<sup>27</sup> WTO Dispute Settlement Panel, European Communities Measures Affecting the Approval and Marketing of Biotech Products WT/DS291/27, WT/DS292/21 and WT293/21, (2003), online: < [http://www.wto.org/english/tratop\\_e/dispu\\_e/dispu\\_subjects\\_index\\_e.htm#gmos](http://www.wto.org/english/tratop_e/dispu_e/dispu_subjects_index_e.htm#gmos)>. (accessed January, 11, 2007).

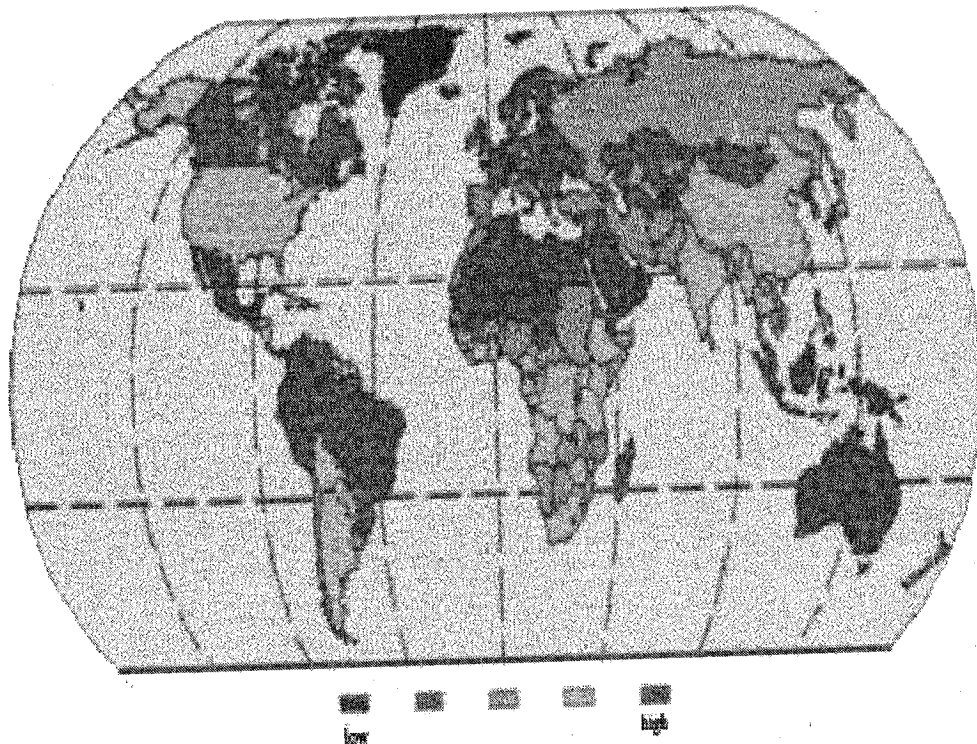
<sup>28</sup> *Ibid.*

<sup>29</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6.

<sup>30</sup> *Ibid.*

<sup>31</sup> *Ibid.*

biological diversity<sup>32</sup> and one of the centers of the origin of maize.<sup>33</sup> Thus the preservation of Mexico's biodiversity will impact the global status of these resources. In addition, Mexico's experience in seeking to preserve its biological resources can aid other transitional economies facing similar challenges to preserve their biological resources.



**Figure 1. Biodiversity at Country Level**

\* Taken from the Secretariat of the United Nations Convention on Biological Diversity's homepage. Online: < <http://www.biodiv.org/gbo1/chap-01.shtml>>. Mexico is portrayed in this map as one of the world's richest regions in biodiversity. (accessed January, 11, 2007).

<sup>32</sup> Global Biodiversity Outlook 1, Status and Trend of Global Biodiversity, biodiversity map of the Convention of Biological Diversity, (2004), online: < <http://www.biodiv.org/gbo/chap-01/chap-01.asp#map1>>. (accessed January, 11, 2007).

<sup>33</sup> *Ibid.* at 23.

In view of the foregoing, the purpose of this Chapter is to analyze introductory concepts and notions related to biodiversity and LMOs, and the importance of biodiversity to human beings and issues in preserving these resources. The rest of the Chapter is organized into three sections. Section 2 deals with introductory concepts of biodiversity and genetic modification. Section 3 analyzes biodiversity, biotechnology and LMOs. Section 4 deals with competing policy interests regarding the use of LMOs at the international, regional and Mexican levels, and Section 5 provides a conclusion.

## **2. The Biological Diversity Concept**

Historically, conservationist efforts to protect the earth's natural resources have been documented as early as 1900 B.C. and 1370 B.C. in Babylon, today modern Iraq, and in Egypt respectively. These early laws focused on the protection of forests and natural habitats.<sup>34</sup> In 1902, the Paris Convention, which was intended for the protection of birds beneficial to agriculture, was concluded.<sup>35</sup> This Convention extended protection to isolated species such as birds during their breeding season or to those in danger of extinction or of scientific interest.<sup>36</sup> Additionally, it sought to protect birds from sources of pollution, such as harm from hydrocarbons, water, insecticides or poisons.<sup>37</sup>

In the 1960s and 1970s, international conventions began developing guidelines and rules to inspire policymakers and to attract international attention to the protection of all natural resources. Internationally, scattered efforts began to gradually evolve and to include essential elements for the preservation of natural resources. The United Nations

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<sup>34</sup> Bowman, Michael & Redgwell, Catherine (eds), *supra* note 16 at 7-8.

<sup>35</sup> Convention for the Protection of Birds Useful to Agriculture, Mar. 19, 1902, 102 B.F.S.P. 969 (entered into force May 11, 1907). For more on the early development on international environmental law see Kiss, Alexandre & Shelton, Dinah, *International Environmental Law*, (Ardsley, New York: Transnational Publishers, 2000) at 303.

<sup>36</sup> *Ibid.* art. 2.

<sup>37</sup> *Ibid.* art. 10.

played an important role as a driving force in the development of multilateral agreements and in creating forums to address the preservation of species, the environment and biological diversity.<sup>38</sup>

International efforts moved more rapidly by way of the Stockholm Declaration of the United Nations Conference on the Human Environment of 1972 (Stockholm Declaration),<sup>39</sup> the World Conservation Strategy of 1980,<sup>40</sup> and the 1982 United Nations Convention on the Law of the Sea (UNCLOS).<sup>41</sup> Also, the National Biodiversity Forum of 1988 and the 1992 United Nations Convention on Biological Diversity are milestones in the protection of biodiversity.<sup>42</sup> Furthermore, in 2002, UNEP's World Summit on Sustainable Development in Johannesburg, South Africa, urged States to reduce biodiversity depletion by the year 2010.<sup>43</sup> Altogether, the aforementioned international efforts and conferences have the merit of being the genesis and the driving forces behind the development of the concept 'biodiversity' and its widespread international use.

## 2.1. Early Developments of the Biodiversity Concept

The foundations and development of the term 'biodiversity' began in the United Nations' Stockholm Declaration of 1972 and in the IUCN's World Conservation Strategy

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<sup>38</sup> Hierlmeier, Jodie, "UNEP: Retrospect and Prospect Options for Reforming the Global Environmental Governance Regime", (2002) 14 Geo. Int'l Env'tl. L. Rev. 767, at 773 -778 (LEXIS).

<sup>39</sup> The Stockholm Declaration on the Human Environment, U.N. Doc. A/CONF.48/14/Rev.1 (1972), reprinted in 11 I.L.M. 1417 (1972), online: < <http://www.unep.org/Documents/multilingual/Default.asp?DocumentID=97&ArticleID=1503>>. (accessed January, 11, 2007).

<sup>40</sup> World Conservation Strategy of 1980, online: < <http://app.iucn.org/dbtw-wpd/edocs/WCS-004.pdf> >. (accessed January, 11, 2007). This Strategy was developed under the theme "Living Resource Conservation for Sustainable Development." For more on the Strategy see IUCN "International Union for the Conservation of Nature and Natural Resources: The Issue of Sustainable Development" (1996) 7 Colo. J. Int'l Env'tl. L. & Pol'y 213.

<sup>41</sup> United Nations Convention on the Law of the Sea (UNCLOS), Dec. 10, 1982, UN Doc. A/CONF.62/122 (1982), reprinted in 21 I.L.M. 1261 (entered into force Nov. 16, 1994).

<sup>42</sup> Reaka-Kudla, Wilson, Don E. (eds), *supra* note 17 at 1-3.

<sup>43</sup> UNEP-Biodiversity, On the Move to 2010, online: <<http://www.unep.org/Themes/Biodiversity/About/index.asp>>. (accessed January, 11, 2007).

of 1980.<sup>44</sup> As is well known, these international efforts were responses to international concerns over the preservation of natural resources.<sup>45</sup> They drew widespread attention to the world's environmental problems, setting the basis for international conservation efforts.<sup>46</sup>

The Stockholm Declaration contributed to the conceptual shaping of biodiversity preservation. It shows a long-term concern for the protection of natural resources. Principle 1, for example, focuses on the need to improve the environment for future generations.<sup>47</sup> This Declaration does not deal in a holistic manner with the problems surrounding biological diversity. However, it focuses on some of its elements such as, water, land, flora, fauna and representative samples of natural ecosystems.<sup>48</sup>

An important factor in the protection of natural resources set out in the Declaration is the recognition of the earth's limited capacity to produce renewable resources for an unlimited time,<sup>49</sup> and the international awareness it created over the effects of toxic substances in such quantities or concentration that could impair the earth's ecosystems.<sup>50</sup> As such, the Declaration set the basis for further agreements on ocean pollution and marine species, and eventually, focused international attention on the effects of degraded environments on human health.<sup>51</sup>

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<sup>44</sup> Myron Nordquist & Moore Norton, John (eds), *The Stockholm Declaration and the Law of the Marine Environment*, (The Hague, London & New York: Martinus Nijhoff Publishers, 2002) at 53, see also Bowman, Michael & Redgwell Catherine (eds), *supra* note 16 at 6-8.

<sup>45</sup> *Ibid.*

<sup>46</sup> *Ibid.*

<sup>47</sup> The Stockholm Declaration, *supra* note 39 see Principle 1.

<sup>48</sup> *Ibid.* Principle 2.

<sup>49</sup> *Ibid.* Principle 3.

<sup>50</sup> *Ibid.* Principle 6.

<sup>51</sup> *Ibid.* Principle 7.



With the support of the World Wildlife Fund (WWF) and UNEP, IUCN developed an international Strategy in 1980 to preserve the world's natural resources.<sup>52</sup> This Strategy has the merit of dramatically broadening the spectrum of environmental protection to include genetic diversity as a focus of protection. Previous to the Strategy, international efforts focused only on plants, animals and ecosystems.<sup>53</sup>

There were three objectives to the 1980 World Conservation Strategy: 1) to maintain essential ecological processes; 2) to preserve genetic diversity; and, 3) to use species and ecosystems in a sustainable manner.<sup>54</sup>

Ecological processes are regarded in the Strategy as those supported by ecosystems and necessary for the survival of humanity, such as food production.<sup>55</sup> The Strategy outlined challenges in the preservation of agricultural, coastal and freshwater ecosystems.<sup>56</sup> Genetic diversity was defined in this Strategy as: "The range of genetic material found in the world's organisms, on which depend the functioning of many of the processes and life-support systems."<sup>57</sup>

The preservation of genetic diversity in the Strategy is considered of paramount importance not only for its role in agriculture, forestry and fisheries production, but also as a moral commitment to stop the depletion and extinction of species.<sup>58</sup> Genetic diversity, according to the Strategy, was disappearing.<sup>59</sup> The Strategy noted that in the Canadian prairies, for example, 75 percent of wheat was produced from only four varieties. This lack of genetic diversity was also seen in livestock where many indigenous

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<sup>52</sup> World Conservation Strategy of 1980, *supra* note 40.

<sup>53</sup> See Stockholm Declaration, *supra* note 39 Principles 1-5.

<sup>54</sup> Kiss, Alexandre, *supra* note 35 at 304-305.

<sup>55</sup> World Conservation Strategy of 1980, *supra* note 40 at 17-24

<sup>56</sup> *Ibid.*

<sup>57</sup> *Ibid.* at 22-24.

<sup>58</sup> *Ibid.*

<sup>59</sup> *Ibid.*

varieties were at risk of extinction. According to the Strategy, the most pressing challenges that species faced were overexploitation and the emergence of introduction of “exotic species.”<sup>60</sup> The Strategy also advocated the sustainable use of natural resources so that society can access them indefinitely.<sup>61</sup>

The 1982 UNCLOS contributed to the development of the term of biodiversity in the marine context with concern for the preservation of ecosystems, habitats and marine life.<sup>62</sup> For example UNCLOS article 194, paragraph 5, provides that measures taken by States to exploit their natural resources “shall include those necessary 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.”<sup>63</sup> It also goes further than previous agreements linking habitat and ecosystem preservation to the survival of marine species.

The publication of many of the works of the National ‘Bio-Diversity Forum’ of 1986 in Washington, D.C., was key to the success and consolidation of the concept of ‘biodiversity’. These articles were published under the title “BioDiversity.”<sup>64</sup> The 1992 CBD was another important development in consolidating the widespread use of this term. It provides a widely-known definition of the concept that encompasses the need to preserve life on earth.<sup>65</sup> The 2002 World Summit on Sustainable Development also contributed to the widespread use of the term ‘biodiversity’ by raising awareness of the status of biological resources. It acknowledged that loss of biodiversity continues and that

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<sup>60</sup> *Ibid.*

<sup>61</sup> *Ibid.*

<sup>62</sup> McConnell, Moira, “GloBallast Legislative Review - Final Report.” (2002 ) GloBallast Monograph Series No. 1. IMO London. at 19, online: < <http://globallast.imo.org/monograph1%20legislative%20review.pdf> >. (accessed June, 5, 2007). See also Dzidzornu, David M., “Coastal State Obligations and Powers Respecting EEZ Environmental Protection under Part XII of the UNCLOS: A Descriptive Analysis” (1997) 8 *Colo.J.Int’l Env’tl. L. & Pol’y.* 283. at 283-284.

<sup>63</sup> UNCLOS, *supra* note 41 art. 194 (5).

<sup>64</sup> Perlman, Dan, *supra* note 14 at 7-11.

<sup>65</sup> CBD, *supra* note 1.

fish stocks were being depleted. It also stressed that desertification claimed increasingly large areas of more fertile land thus threatening species survival.<sup>66</sup> One of the merits of this World Summit is that it acknowledged that to preserve biological resources and to stop their depletion, the CBD had to be implemented and that this treaty was of paramount importance to achieving the sustainable use of these resources.<sup>67</sup>

Overall, the Stockholm Declaration was the beginning of various protectionist efforts at the international and national levels. This Declaration not only shaped the approach to environmental problems, but also impacted positively on other international efforts to create comprehensive international agreements on the matter. The 1980 World Conservation Strategy also changed the manner in which biodiversity was perceived and studied. These international efforts introduced genetic diversity as a component of biodiversity to be included in the spectrum of protection.

UNCLOS' contributions to the concretization of the term of biodiversity were crucial. This Convention shows a more holistic approach to preserving species, including their habitats, ecosystems and surroundings. The work of the Bio-Diversity Forum was of paramount importance for the recognition and widespread attention it drew to this concept. The adoption of the CBD exhibited wide international acceptance of this concept and the commencement of international efforts to preserve such resources. Also the 2002 World Summit on Sustainable Development was important in seeking to engage

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<sup>66</sup> United Nations World Summit on Sustainable Development, The Johannesburg Declaration on Sustainable Development, (2002), online:< <http://daccessdds.un.org/doc/UNDOC/LTD/N02/578/83/PDF/N0257883.pdf?OpenElement>>. at 2. (accessed January, 11, 2007).

<sup>67</sup> United Nations World Summit on Sustainable Development, Plan of Implementation of the World Summit on Sustainable Development (2002), online:< [http://www.un.org/esa/sustdev/documents/WSSD\\_POI\\_PD/English/WSSD\\_PlanImpl.pdf](http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf)> at 26. (accessed January, 11, 2007).

and coordinate government efforts to stop the depletion of biodiversity by encouraging them to implement the CBD.

## 2.2 Defining Biodiversity

Since its birth, 'biodiversity' has been defined in different ways. According to some, there are about eighty-five definitions of this term.<sup>68</sup> Definitions of biodiversity vary from 'variety of life', 'life on earth' to the most comprehensive definition contained in the Biodiversity Convention.<sup>69</sup> Biodiversity for others is a complex concept that can be explained but not defined.<sup>70</sup> In spite of the variations in the definition of the concept, there are certain points on which academics agree.

First, diversity is an essential element in the preservation of species and organisms.<sup>71</sup> Second, biodiversity is closely related to our survival and existence;<sup>72</sup> third, biological resources are being depleted;<sup>73</sup> and lastly, human activities are causing this depletion.<sup>74</sup>

Biodiversity is defined in Article 2 of the CBD as:

The variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.<sup>75</sup>

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<sup>68</sup> Gaston, Kevin & Spicer John, *Biodiversity: An Introduction*, (United Kingdom: Blackwell, 2004) at 3-4.

<sup>69</sup> Perlman, Dan, *supra* note 14 at 7-8. See also CBD, *supra* note 1 art. 2.

<sup>70</sup> *Ibid.* at 11-12

<sup>71</sup> Solbring, O.T. & Endeb Van (eds.), *Biodiversity and Global Change*, (Wallinford, UK: Cab International, 1994) at 41.

<sup>72</sup> Reaka-Kudla, Marjorie & Wilson, Don E., *supra* note 17 at 15-24.

<sup>73</sup> Raven Peter (ed), *Nature and Human Society*, (Washington D.C: National Academy Press, 1997) at 46-60. See also Gaston, Kevin & Spicer, John, *supra* note 68 at 107-109

<sup>74</sup> *Ibid.* at 303-305

<sup>75</sup> CBD, *supra* note 1.

There are two elements in this definition that are especially noteworthy analyzing: variability of organisms and levels of biodiversity. Diversity of organisms can be seen from two angles, namely, the variety of similar species,<sup>76</sup> such as the different types of sharks; and taxonomic diversity, that is the presence of a bigger group in a specie classification. There are seven groups according to which species can be classified: *Kingdom, Phylum, Class, Order, Family, Genus, and Species*.<sup>77</sup>

Humans, for example, belong to the *animalia* kingdom, the *chordate* division, the *mammalian* class, the order of *primate*, the *hominidae* family, the *homo* genus and the *Homo sapiens* specie.<sup>78</sup> Variability among species, according to scientists, is paramount for species survival; the more variety among species, the best opportunity they have to adapt to the environment and to escape from extinction.<sup>79</sup>

The definition of biodiversity found in the CBD exhibits three key elements or levels of diversity: genetic diversity; species diversity; and, ecosystems diversity.<sup>80</sup> Genetic material is considered a blueprint for life because it carries information pertaining to the development and formation of most organisms.<sup>81</sup> Genes are for some the basic form of biodiversity.<sup>82</sup> The information carried by genes present potential use to biotechnology companies since it makes possible the transferring of traits to other organisms.<sup>83</sup>

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<sup>76</sup>Gaston, J. Kevin & Spicer, John, *supra* note 68 at 4-5.

<sup>77</sup> Nixon, Joshua "Taxonomy", Michigan State University, (2006), online: < <http://www.msu.edu/~nixonjos/armadillo/taxonomy.html>>. (accessed January, 11, 2007).

<sup>78</sup> *Ibid.*

<sup>79</sup> Solbring, O.T., *supra* note 71 at 40-41.

<sup>80</sup> Gaston, Kevin & Spicer, John, *supra* note 68 at 5.

<sup>81</sup> McGrath, Kimberly (ed), *The Gale Encyclopedia of Science*, ( Detroit, New York, San Francisco, London, Boston: Gale Group, 2001) at 1661.

<sup>82</sup> Niles, Eldredge, (ed), *Life On Earth: An Encyclopedia of Biodiversity, Ecology and Evolution*, (Santa Barbara California: Abc-Clio, 2002) at 6-7.

<sup>83</sup> *Ibid.*

The differences and variation in genetic material within species is called genetic diversity.<sup>84</sup> The genetic diversity of species or organisms can be assessed by the numbers and types of present genes.<sup>85</sup> Some species of rice, for example, can present from 46,000 to 55,000 genes.<sup>86</sup> Genetic diversity is the key for conservation because higher diversity in organisms may result in greater capacity to adapt to environmental changes, and therefore to survive.<sup>87</sup>

Species diversity refers to the richness and variety of species within a habitat or demographic area.<sup>88</sup> This is the most employed way for measuring biodiversity, probably because it is the simplest and can be performed visually.<sup>89</sup> An area encompassing species richness would ideally include great variation of animals, plants, fungi, and organisms. Species diversity is paramount in the protection of biological diversity for the important role each species plays in maintaining the earth's chemical balance.<sup>90</sup>

Ecosystems are defined in Article 2 of the CBD as "communities of micro-organisms, plants and animals and their interactions with their non-living environment or surrounding."<sup>91</sup> This type of variety refers to the diversity of ecosystems in a given place.<sup>92</sup> An ecosystem can cover a large area, such as a forest or a lake, or a small area, such as the shell of a spider crab, which provides a home for small species.<sup>93</sup> An ecosystem rich in biodiversity is one that hosts great variety of organisms. Recent studies

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<sup>84</sup> Bell, David Eugene, *supra* note 19 at 483.

<sup>85</sup> *Ibid.*

<sup>86</sup> *Ibid.*

<sup>87</sup> *Ibid.*

<sup>88</sup> Niles, Eldredge, *supra* note 82.

<sup>89</sup> *Ibid.*

<sup>90</sup> Bell, Eugene, *supra* note 19 at 484.

<sup>91</sup> See CBD, *supra* note 1 see art. 2.

<sup>92</sup> Australia's Biodiversity, Ecosystems Diversity, (2005), online: < <http://www.amonline.net.au/biodiversity/what/ecosystem.htm> >. (accessed January, 11, 2007).

<sup>93</sup> *Ibid.*

show that biodiversity is interlinked to ecosystems and that it helps them resist droughts and negative environmental effects.<sup>94</sup> Also they show that the absence of biodiversity affects the performance of ecosystems.<sup>95</sup>

### 2.3 The Value of Biodiversity

Although there are philosophical approaches to appreciating biodiversity for its intrinsic value and its preservation for future generations, it is its fundamental role relevant to the existence of the human race that has ignited international efforts to preserve biological resources.<sup>96</sup> Biological diversity is essential for the survival of the human race. It is responsible for sustaining life on earth and regulating atmospheric conditions.<sup>97</sup> Biodiversity provides food for humans. According to scientists, 12,500 species and 200 plants are edible.<sup>98</sup>

Biological diversity is essential for maintaining the earth's balance. Vegetation and plants preserve nutrients and essential elements in the soil.<sup>99</sup> Clearing vegetation not only decreases soil productivity but also affects the stability of climate.<sup>100</sup> Biodiversity plays a role in the survival of ecosystems against environmental shocks. Healthy ecosystems help control most pests and dramatically improve the possibilities of reconstruction in the event of a fire or natural disaster.<sup>101</sup>

Biological resources are, as well, fundamental in protecting human health. According to some, 80 percent of people in developing countries rely on natural

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<sup>94</sup> Gowdy, John, "The Value of Biodiversity: Markets, Society and Ecosystems", (1997) 73 Land Economics at 35. (ProQuest).

<sup>95</sup> *Ibid.*

<sup>96</sup> Bowman, Michael & Redgwell Catherine (eds), *supra* note 16 at 14-16.

<sup>97</sup> Gaston, Kevin & Spicer, John, *supra* note 68 at 98-99.

<sup>98</sup> *Ibid* at 92-93.

<sup>99</sup> Singh, B.K., *Biodiversity: Conservation and Management*, (Jaipur, India: Mangal Deep, 2004) at 70-73.

<sup>100</sup> *Ibid.*

<sup>101</sup> *Ibid.*

medicine.<sup>102</sup> Chemicals from about 110 species of plants are widely used nowadays to preserve human health.<sup>103</sup> Medicines for cancer and the Acquired Immune Deficiency Syndrome (AIDS), for example, are developed from plants.<sup>104</sup> The pharmaceutical industry relies on biological resources for the production of drugs. According to some, plants essential for the production of drugs generated earnings of about 298 million US dollars (USD) in 1998.<sup>105</sup> In 2003, this market represented earning of 148,038 million USD.<sup>106</sup> Also the global pharmaceutical market is expected to increase 5-6 percent in 2007 compared to 2006.<sup>107</sup>

A typical example of the value of biodiversity in the pharmaceutical industry is the agreement between the pharmaceutical company, Merk & Co. Inc., and the National Institute of Biodiversity in Costa Rica. This pharmaceutical company paid the Biodiversity Institute 1 million USD for rights over the utilization of genetic material in that country that could be of use to the pharmaceutical company.<sup>108</sup>

Furthermore, biological resources are essential for the production and manipulation of crops. Germplasm or the genetic material that carries the hereditary characteristics of an organism is employed by biotechnology corporations to manipulate

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<sup>102</sup> Melchias, Gabriel, *Biodiversity and Conservation*, (Enfield New Hampshire: Science Publishers, 2001) at 7-9.

<sup>103</sup> *Ibid.*

<sup>104</sup> Kumar, Har D., *Biodiversity and Sustainable Conservation*, (Enfield, New Hampshire: Science Publishers, 1999) at 118-119.

<sup>105</sup> Organization for Economic Cooperation and Development (OECD), *Selected Studies, Valuation of Biodiversity Benefits*, (Paris, OECD, 2001) at 36.

<sup>106</sup> Vernon, John A., Golec, Joseph H., "The Economics of Pharmaceutical Price Regulation and Importation: Refocusing the Debate," (2006) 32 Am. J. L. and Med. 175. at 189.

<sup>107</sup> Van Arnum, Patricia, *Pharmaceutical Technology*, the Electronic Newsletter of Pharmaceutical Technology, (2006), online: <<http://www.pharmtech.com/pharmtech/article/articleDetail.jsp?id=381692>>. (accessed January, 11, 2007).

<sup>108</sup> Gowdy, John, M., "The Value of Biodiversity: Markets, Society and Ecosystems," (1997) 73 Land and Economics 25. at 29.



commercial crops and for research.<sup>109</sup> Ecotourism is a growing industry around the world. This activity depends largely on the aesthetic value of biodiversity to attract tourists.<sup>110</sup>

## 2.4 Threats to Biodiversity

Environmental studies in the 1970s documented a rapid decline of species creating concerns over the impact of human activities on the environment. Although these findings were limited in scope, they created awareness as to the pace of the exploitation of natural resources.<sup>111</sup> The depletion of species has been traditionally used as an indicator of the destruction of biological diversity. This consideration presents only a partial image of what biodiversity is. An adequate image of biodiversity would consider the repercussion of an activity on the three levels of biodiversity, genetic diversity; species diversity; and, ecosystems diversity.<sup>112</sup> Two factors have proven to broadly impact all levels of biodiversity, namely, overpopulation and invasive species.<sup>113</sup>

Human overpopulation has been pointed to as the most important factor in the depletion of biodiversity.<sup>114</sup> This phenomenon infringes upon ecosystems, species and genetic diversity.<sup>115</sup> An increase in population intensifies the consumption of natural resources, the generation of waste and the transformation of natural ecosystems in urban zones and landing areas.<sup>116</sup> Invasive species are also a powerful factor in the depletion of

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<sup>109</sup> *Ibid.* at 25.

<sup>110</sup> *Ibid.*

<sup>111</sup> UNEP, *World Atlas of Biodiversity*, *supra* note 20 at 60-62. See also Spray L. Sharon & Karen McGlothlin, *Loss of Biodiversity*, (Oxford, UK: Rowman & Littlefield, 2003) at 29-30.

<sup>112</sup> *Ibid.*

<sup>113</sup> *Ibid.*

<sup>114</sup> *Ibid.* at 37.

<sup>115</sup> *Ibid.*

<sup>116</sup> Secretariat of the Environment and Natural Resources (SEMARNAT), Mexico's Environmental Statistics (2005), *supra* note 4 at 24-25.

biological resources. They are introduced to different environments by human beings.

These factors are considered in turn.

#### 2.4.1 Overpopulation

There still exists considerable debate over the role humans have played throughout history in the extinction of species.<sup>117</sup> Some point out that humans' role in the depletion of natural resources and the destruction of biological diversity has been considerable.<sup>118</sup> According to the United States Census Bureau, the world's population has dramatically increased since 1959<sup>119</sup> from an average 1.89 percent per year in previous years to 1.95 percent per year.<sup>120</sup> The decade of the 1960s presented the highest increase, surpassing 2 percent. In 2002, for example, the world hit a record population mark of 6 billion inhabitants.<sup>121</sup> In May of 2007, the world will have a half a billion more people.<sup>122</sup>

The link between overpopulation and environmental degradation was recognized in a United Nations Population Fund's (UNPF) Report on World Population,<sup>123</sup> which affirms that population growth forces 'poor States' to overexploit their natural resources to feed their populations.<sup>124</sup> As population grows, so does proportionately the demand to

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<sup>117</sup> Flannery, T.F., "Debating Extinction," (1999) 283 Science 182. at 182-183.

<sup>118</sup> Singh, *supra* note 99 at 70-73.

<sup>119</sup> U.S. Census Bureau, "Global Population Profile: 2002," online: <http://www.census.gov/ipc/prod/wp02/wp-02.pdf> at 7. (accessed January, 11, 2007).

<sup>120</sup> U.S. Census Bureau, "Total Midyear Population for the World: 1950-2050," online: <http://www.census.gov/ipc/www/worldpop.html>. (accessed January, 11, 2007).

<sup>121</sup> *Ibid.*

<sup>122</sup> U.S. Census Bureau, "World Pop Clock Projection," online: <http://www.census.gov/ipc/www/popclockworld.html>. (accessed January, 11, 2007).

<sup>123</sup> United Nations Population Fund (UNPF), 2004 World Population Report, online: <http://www.unfpa.org/swp/2004/espanol/ch3/page2.htm>. (accessed January, 11, 2007).

<sup>124</sup> *Ibid.*

produce more. Farmers in developing countries are forced to cultivate larger areas.<sup>125</sup> As well, land that holds habitats of animals and plant species is employed not only for agriculture or urban development, but also for the construction of highways.<sup>126</sup> Land transformation is accountable for altering the earth's biological systems.<sup>127</sup> The disruption of ecosystems affects not only organisms and species that depend on the ecosystems, but also their genetic diversity and the way in which they interact with the environment.<sup>128</sup>

Environmental pollution is also a problem that results from overpopulation and the need to dispose of contaminants and waste. This phenomenon seriously harms the environment: polluted lakes, for example, destroy not only fish and marine species, but also the habitats where they live, and in the long run, the genetic variability of those species.<sup>129</sup> The effects of environmental pollution also impact in a negative manner on human beings. In Mexico, for example, a recent study by the CEC on the Mexican border city of Juarez regarding the effects of air pollution on children's health, concluded that "young children are a sector of the population susceptible to environmental threats because of their behavior and a reduced capacity to metabolize toxic substances."<sup>130</sup> It also stressed that children are more susceptible to suffering from the effects of a depleted environment since they possess a limited capacity to metabolize toxic substances.<sup>131</sup>

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<sup>125</sup> Ketover, Anne, "Fouling Our Own Nest: Rapid Population Growth and its Effect on the Environment", (1994), 7 Tul. Envtl. L.J. 431. at 438.

<sup>126</sup> *Ibid.*

<sup>127</sup> Vitousek, Peter, "Human Domination of Earth's Ecosystems," (1997) 277 Science 494. at 494-495.

<sup>128</sup> *Ibid.*

<sup>129</sup> Gaston, Kevin & Spicer, John, *supra* note 68 at 41.

<sup>130</sup> CEC, The Effects of Health Impacts of Air Pollution on Morbidity and Mortality Among Children, (2003), online:< [http://www.cec.org/files/PDF/POLLUTANTS/cdjuarez\\_en.pdf](http://www.cec.org/files/PDF/POLLUTANTS/cdjuarez_en.pdf)>. at 13. (accessed January, 11, 2007).

<sup>131</sup> *Ibid.*

Overall, overpopulation dramatically impacts biological diversity by accelerating the exploitation of species and the production of waste. This phenomenon, unless controlled, is likely to affect not only the existence of species but also the subsistence of human beings on earth.

#### 2.4.2 Invasive Species

Other than habitat destruction, the introduction of “alien species” is considered the most important threat to biodiversity.<sup>132</sup> Some consider this as the threat of the new millennium.<sup>133</sup> Species become invasive when they are transported to a different environment in which they alter ecological systems and prey on native species. These species hold the potential to negatively affect terrestrial and aquatic biological diversity by disrupting and destroying ecosystems and by limiting the ability of native species to exist and reproduce.<sup>134</sup>

During the colonial period, species and crops were transported across continents and introduced into different environments.<sup>135</sup> It is estimated that from 1840 to 1880, more than 60 species of vertebrates were introduced into Australia, and about 1200 insect species to the United States.<sup>136</sup> Nowadays, this transportation of species is facilitated with the increase in international travel and trade.<sup>137</sup>

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<sup>132</sup> Bergmans, Wim & Blom, Esther, *Invasive Plants and Animals: Is there a way out?*, (Netherlands: IUCN, 2001) at 19.

<sup>133</sup> Cox, George W., *Alien Species and Evolution: The Evolutionary Ecology of Exotic Plants, Animals, Microbes, and Interacting Native Species*, (Washington: Island Press, 2004) at 4-5.

<sup>134</sup> *Ibid.*

<sup>135</sup> Singh, *supra* note 99 at 71.

<sup>136</sup> *Ibid.*

<sup>137</sup> McConnell, Moira, *supra* note 62 at 8. See also McNeely, Jeffrey A., “Strangers in Our Midst: The Problem of Invasive Alien Species” (2004) 46 *Environment* 6. at 18.

Ballast water is now considered the most important means of accidental introduction of fish, crab, mollusks, mussels, etc.<sup>138</sup> This can be illustrated with the introduction of the zebra mussel, a specie native to the Caspian Sea of Asia, into the waters of Lake St. Clair, near Detroit in 1998.<sup>139</sup> This mussel can be transported to other places by attaching to ships, to plants and even to marine species such as crayfish.<sup>140</sup> The zebra mussel is far from being controlled<sup>141</sup> and has already spread to the southern parts of the United States and to Ontario and Quebec in Canada.<sup>142</sup>

Similarly, Mexico is afflicted by the threats posed by invasive species. According to Mexico's National Commission for the Knowledge and Use of Biodiversity (CONABIO or the National Biodiversity Commission), 665 species of plants, 77 fish, 10 amphibians and reptiles, 30 birds and 16 mammals in Mexico are considered to be invasive species.<sup>143</sup> The CBD recognizes the challenges posed by these species by providing that States shall prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.<sup>144</sup>

<sup>138</sup> *Ibid.* at 19. About 700 million people cross international borders a year facilitating the potential introduction of species to different habitats. See also McConnell, Moira, *supra* note 62 at 8.

<sup>139</sup> Spray, Sharon, *supra* note 111 at 40-42.

<sup>140</sup> U.S. Army Engineer Research and Development Center (ERDC), Zebra Mussel Information System, online: <<http://el.erd.c.usace.army.mil/zebra/zmis>>. (accessed January, 11, 2007).

<sup>141</sup> Invasive Species in the Great Lake Region, Zebra Mussels, online: <<http://www.great-lakes.net/envt/flora-fauna/invasive/zebra.html#overview>>. (accessed January, 11, 2007). At the international level, guidelines have been elaborated to aid developing countries in addressing and minimizing the transfer of harmful aquatic organisms and pathogens by ships ballast water. For more on this Guidelines see McConnell, Moira, *supra* note 62.

<sup>142</sup> U.S. Army Engineer Research and Development Center (ERDC), *supra* note 140 see Zebra Mussel distribution maps since 1988. This invasive specie has generated a loss of 2.5 billion USD to the Great Lake's fishery from 1998-2000. See McNeely, *supra* note 137 at 23.

<sup>143</sup> National Commission for the Knowledge and Use of Biodiversity (CONABIO), Invasive Species, online: <[http://www.conabio.gob.mx/conocimiento/info\\_especies/especies\\_invasoras/doctos/especiesinvasoras.html](http://www.conabio.gob.mx/conocimiento/info_especies/especies_invasoras/doctos/especiesinvasoras.html)>. (accessed January, 11, 2007).

<sup>144</sup> CBD, *supra* note 1 art. 8(h); For more on the international regime to preserve biodiversity from Harmful Aquatic Organisms, See McConnell, Moira, "Ballast & Biosecurity: The Legal, Economic and Safety Implications of the Developing International Regime to Prevent the Spread of Harmful Aquatic Organisms and Pathogens in Ships' Ballast Water" 17 *Ocean Yearbook* (Chicago: U. of Chicago Press: 2003) 213.

To sum up, it must be noted that the appearance of the concept of biodiversity in the international arena transformed the way in which environmental preservation is perceived. The protection of such a complex resource base requires a holistic approach that takes into account not only species under threat of depletion, but also the disturbance of ecosystems and genetic diversity. The CBD has contributed to the protection of biological resources, among others, by its definition of biodiversity which has been widely recognized, and considered to be a landmark in the conceptual underpinning to environmental protection.

Challenges remain in the effort to preserve biodiversity, particularly relating to population growth and the proliferation of invasive species. As a challenge to the preservation of the environment and resources, the control of overpopulation, or growing populations is a complicated task for governments since they are faced with the dilemma of exploiting natural resources to satisfy the needs of their growing populations while they are also trying to stop the negative effects of environmental degradation and its adverse effects on human health.

Alien species represent a substantial threat to biological diversity. They impinge on the existence of native species, habitats and ecosystems, and in so doing, diminish variability among organisms, thus in turn affecting biological diversity. The challenges posed by overpopulation and invasive species must be addressed not only because they have the potential to impact biological resources and biological diversity but also human health, and survival on earth.

There are other threats to biodiversity, in particular, threats from developments in biotechnology. These are considered in Section 3, next.

### 3. Biotechnology and Biodiversity

Ancient domestication of plants and animals is considered the genesis of modern biotechnology.<sup>145</sup> Genetic manipulation through cross pollination has been performed by farmers for hundreds of years.<sup>146</sup> Such manipulation was limited to sexual compatibility or by the ability of plants to pollinate close relatives.<sup>147</sup> To improve crops, farmers also saved plant seeds which produced their optimum yield.<sup>148</sup> Advances in science were achieved with the discovery of the DNA molecule and its hereditary properties by Gregor Mendel in 1865.<sup>149</sup> Further progress was made in the 1950s when James Watson and Francis Crick deciphered the structure of the DNA.<sup>150</sup> Such developments allowed scientists to manipulate the characteristics of organisms.

Although traditional farmers manipulated crops, the development of biotechnology seems to be inextricable from genetic manipulation. Biotechnology is defined in Article 2 of the CBD as “any technological application that uses biological systems, living organisms or derivatives thereof, to make or modify products or processes for specific use.”<sup>151</sup> Biotechnology is closely related to genetic engineering and to biodiversity. It relates to genetic engineering because it deals with the process of manipulating genes across organisms and species.<sup>152</sup> It also relates closely to biological diversity because biotechnology employs genetic material essential to manipulate

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<sup>145</sup> Kumar, Har D., *supra* note 104 at 18-19.

<sup>146</sup> Gerald, Nelson C., (ed), *Genetically Modified Organisms in Agriculture: Economics and Politics*, (London, U.K: Academic Press, 2001) at 275.

<sup>147</sup> *Ibid.*

<sup>148</sup> Young, Tomme, “Genetically Modified Organisms and Biosafety: A background paper for decision makers and others to assist in consideration of GMO issues”, (2004) 1 IUCN Policy and Global Change Series at 6, 7.

<sup>149</sup> Grace, Eric S., *Biotechnology Unzipped: Promises and Realities*, (Washington D.C: Joseph Henry Press, 1997) at 6-7.

<sup>150</sup> Young, Tomme, *supra* note 145 at 7.

<sup>151</sup> CBD, *supra* note 1 art. 2.

<sup>152</sup> Kumar, Har D., *supra* note 104 at 18-19.

organisms.<sup>153</sup> Thus the existence of biotechnology corporations largely depends on the availability of such biological resources.<sup>154</sup>

Engineering of biotech crops, a sector valued in 2006 at about 6.15 billion USD<sup>155</sup> is expected to grow. Biotechnology is expected to contribute the most to agriculture. This technology is capable of engineering seeds to accelerate production under the most adverse climatic situations.<sup>156</sup> Biotechnology also has the potential to engineer pesticide and herbicide-resistant seeds. In 2005, for example, most of the transgenic crops in the world were designed to be either herbicide or pesticide resistant.<sup>157</sup> Corn and cotton, for example, were designed to contain the soil bacteria, *Bacillus thuringiensis* (Bt).<sup>158</sup>

Herbicide resistant crops (Bt-cotton and Bt-corn) were designed to kill pests such as the corn borer, cotton budworms and bollworms. Soybeans also were engineered with the herbicide glyphosate, in order to protect them from weeds.<sup>159</sup> These three biotech crops continued to be the most widely used by farmers globally in 2006.<sup>160</sup>

Overall, a relationship can be seen between biodiversity and biotechnology. Biodiversity provides biotechnology with particular characteristics of species required to engineer 'improved' organisms. Its preservation is essential for the development of this

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<sup>153</sup> Bosselmann, Klaus, The International Legal Regime Concerning Biotechnology and Biodiversity, (1996) 7 Colo. J. Int'l Env'tl. L. & Pol'y 111. at 116 (LEXIS).

<sup>154</sup> Sanjay, Sharma & Nguan Oliver, "The Biotechnology Industry and Strategies of Biodiversity Conservation: The influence of Managerial Interpretations and Risk Propensity", (1999) 8 Business Strategy and the Environment 1 at 47.

<sup>155</sup> ISAAA, the Global Value of the Biotech Market, (2006), online: < <http://www.isaaa.org/Resources/Publications/briefs/35/executivesummary/default.html>>. (accessed January, 11, 2007).

<sup>156</sup> *Ibid.*

<sup>157</sup> ISAAA, Global Status of Commercialized Biotech/GM Crops in 2005, online: <<http://www.isaaa.org/kc/bin/briefs34/pk/index.htm>>. (accessed January, 11, 2007).

<sup>158</sup> *Ibid.*

<sup>159</sup> *Ibid.* According to the ISAAA, Herbicide Tolerant Soybean accounts for 60 percent of the transgenic crops in 2005, Bt Maize with 13 percent, Bt / Herbicide Tolerant Maize 7 percent and Bt Cotton 5 percent.

<sup>160</sup> ISAAA, Executive Summary, (2006), online: <<http://www.isaaa.org/Resources/Publications/briefs/35/executive summary/default.html>>. (accessed January, 11, 2007).



technology. A closer look at LMOs and genetic manipulation is thus important, as we see next.

### 3.1 Biotechnology, Genetic Manipulation and LMOs

Biotechnology is defined both in the CBD and in the Cartagena Protocol for its central role in the genetic manipulation of organisms. Article 2 of the CBD defines it as a “technological application that employs biological systems, living organisms or derivatives to make or modify products for specific use.”<sup>161</sup> The Cartagena Protocol, on the other hand, expands this definition by outlining specifically the methods involved in genetic manipulation. According to Article 3 (I) of the Protocol, genetic manipulation by means of biotechnology includes the following techniques:

- a. In vitro nucleic acid techniques, including recombinant deoxyribonucleic acid (DNA) and direct injection of nucleic acid into cells or organelles, or
- b. Fusion of cells beyond the taxonomic family, that overcome natural physiological reproductive or recombination barriers and that are not techniques used in traditional breeding and selection.<sup>162</sup>

According to this definition, biotechnology is the genetic manipulation of organisms by injections of DNA and cell fusion. In contrast, traditional cross-breeding techniques such as pollination, tissue culture, ionization or naturally occurring processes are clearly excluded from the sphere of the Protocol.<sup>163</sup>

In addition, the Cartagena Protocol defines ‘living organisms’ as “biological entities that are capable of replicating and transferring genetic material. Viruses and

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<sup>161</sup> CBD, *supra* note 1 art. 2.

<sup>162</sup> Cartagena Protocol, *supra* note 2 art. 3 (1).

<sup>163</sup> IUCN Environmental Law Center, “An Explanatory Guide to the Cartagena Protocol on Biosafety,” *supra* note 3 at 50.

viroids are also considered within the spectrum of this definition.”<sup>164</sup> Living organisms are capable of replicating and transferring heredity traits such as their unique characteristics and properties.<sup>165</sup>

At the center of the Protocol are LMOs. These organisms hold both the promise of alleviating some of the world’s pressing problems and the key to wreaking havoc on the world’s biological resources. LMOs are defined as those organisms that possess a novel combination of genetic material obtained as a result of biotechnology procedures, such as insertion of foreign DNA or a cell fusion process, and those that have the potential of replicating and transferring genetic material.<sup>166</sup>

There are three key elements in this definition: first, LMOs possess unique hereditary patterns and sequences; second, these organisms are alive and have the potential to replicate such patterns in other species; and third, they are the result of modern biotechnology techniques such as injection of DNA or cell fusion process.

Despite the definition contained in the Protocol, in Mexican legislation<sup>167</sup> and academic journals,<sup>168</sup> the term LMOs has been used as a synonym for Genetically Modified Organisms (GMOs). LMOs can be differentiated by employing the definition provided in the Protocol in that they are alive and have the potential of replicating and transferring genetic material. GMOs, on the other hand, while also the result of

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<sup>164</sup> Cartagena Protocol, *supra* note 2 art. 3 (h).

<sup>165</sup> IUCN Environmental Law Center, “An Explanatory Guide to the Cartagena Protocol on Biosafety,” *supra* note 3 at 43.

<sup>166</sup> The Cartagena Protocol, *supra* note 2 See Article 3(g).

<sup>167</sup> See European Union Directive 2001/18/EC on the deliberate release of GMOs into the environment, online: < [http://europa.eu.int/comm/environment/biotechnology/pdf/dir2001\\_18.pdf](http://europa.eu.int/comm/environment/biotechnology/pdf/dir2001_18.pdf)>. (accessed May, 11, 2007). See also Mexican Law on GMOs, online: < [http://www.cddhcu.gob.mx/leyinfo/pdf/Ley\\_BOGM.pdf](http://www.cddhcu.gob.mx/leyinfo/pdf/Ley_BOGM.pdf)>. (accessed May, 11, 2007).

<sup>168</sup> See Nelson, Gerald C., *supra* note 146 ; Pythoud, Francois, “The Cartagena Protocol and GMOs,” (2004), 22 *Nature Biology* 1347. at 1347-1348. See also academic Articles on the Cartagena Protocol which refer to GMOs, online: <<http://www.biodiv.org/doc/lists/bib-art-cpb.pdf>>. (accessed January, 12, 2007).

biotechnology, may not necessarily be alive nor have the potential to transfer their traits.<sup>169</sup>

Despite the concerns over the effects of LMOs on biodiversity, transgenic crop production has been dramatically increasing throughout the world. According to the International Service for the Acquisition of Agri-Biotech Applications (ISAAA), in 2004 the production of transgenic crops grew 20 percent in comparison with 2003.<sup>170</sup> In 2005, the biotechnology industry increased 11 percent with respect to 2004.<sup>171</sup>

In the international trade of transgenic products, North America is one of the leading regions. At the regional level, NAFTA parties dominate the world market in the bio-industry.<sup>172</sup> In a 2004 study commissioned by the ISAAA, the United States ranked first as the world producer of transgenic crops, Canada as the fourth and Mexico as the twelfth.<sup>173</sup> In 2005, however, Mexico increased its production of GM products, moving up to eleventh place globally.<sup>174</sup>

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<sup>169</sup> Cartagena Protocol, *supra* note 2 art. 3 (h).

<sup>170</sup> According to the International Service for the Acquisition of Agri-Biotech Applications (ISAAA) 200 million acres of transgenic crops were cultivated in the world in 2004. See International Service for the Acquisition of Agri-Biotech Applications (ISAAA) online: <<http://www.isaaa.org/>>. at 3. (accessed January, 12, 2007).

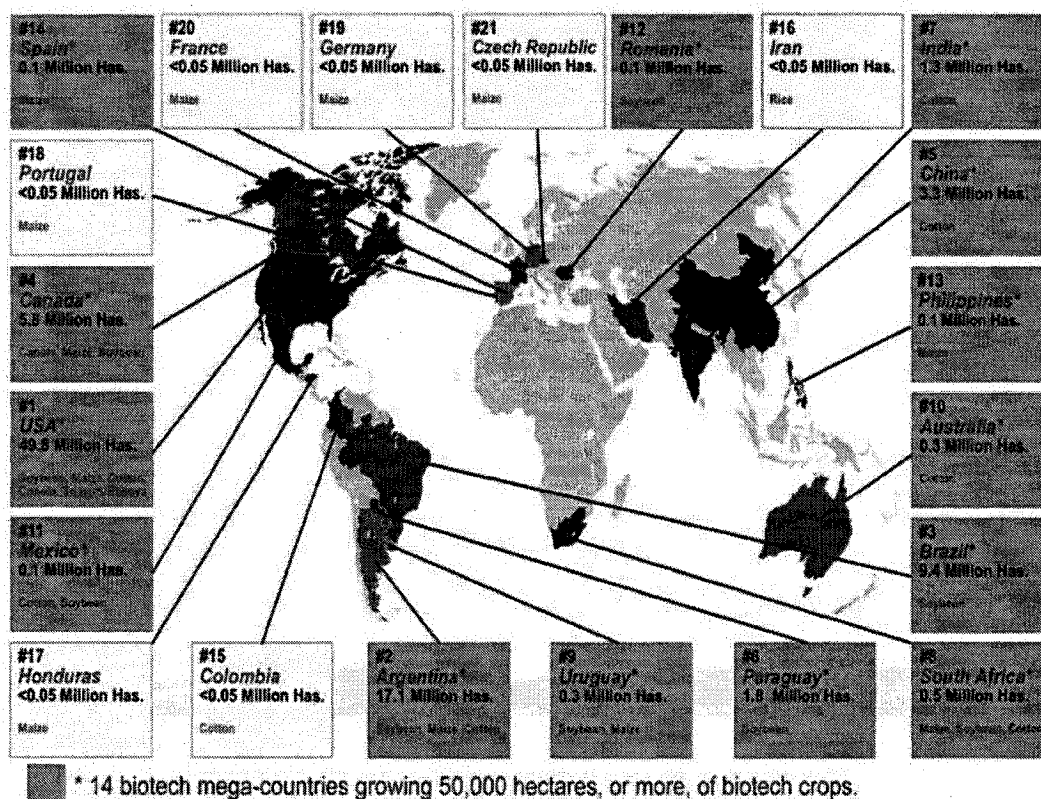
<sup>171</sup> ISAAA, Global Status of Commercialized Biotech/GM Crops in 2005, *supra* note 157.

<sup>172</sup> *Ibid.*

<sup>173</sup> *Ibid.* at 5. Soybeans and cotton are the most widely produced transgenic crops in Mexico.

<sup>174</sup> *Ibid.*

## 21 Biotech Crop Countries and Mega-Countries\*, 2005

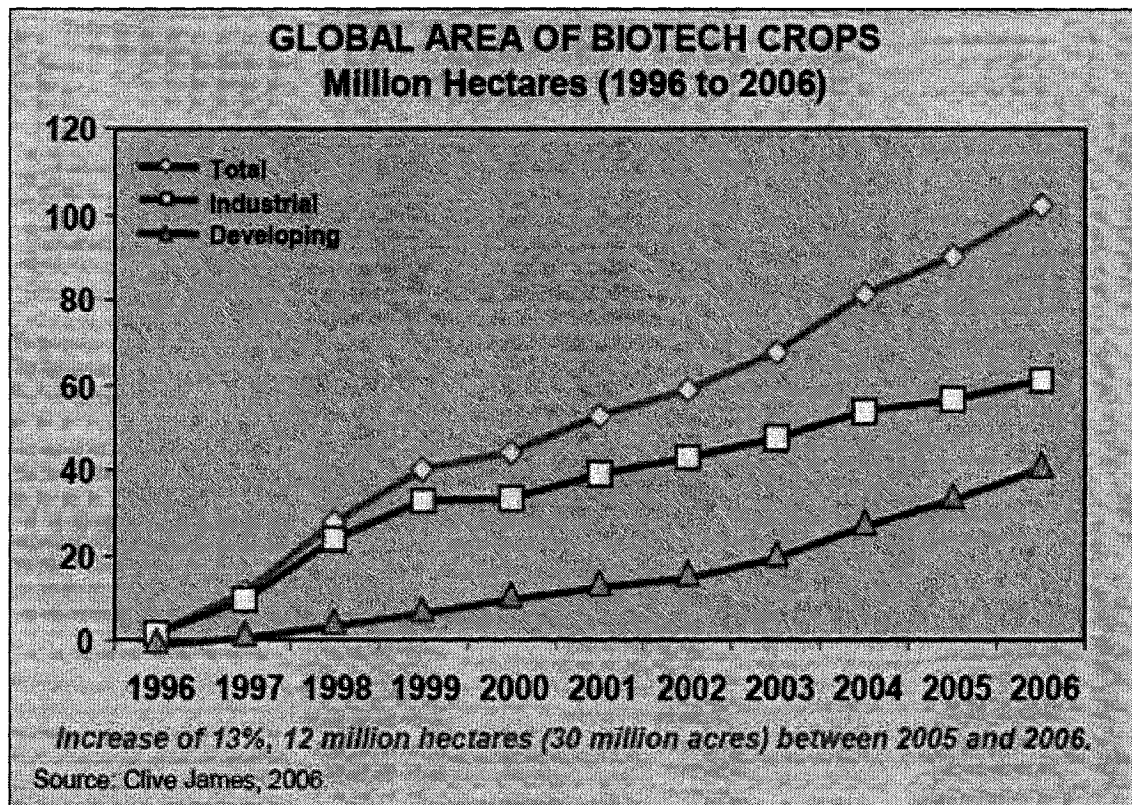


Source: Clive James, 2005

**Figure 2. Biotech Crop Countries and Mega Countries**

\* Chart by James Clive Chairman and Founder of the International Service for the Acquisition of Agri-Biotech Applications, (2005). Online: <[http://www.isaaa.org/kc/CBTNews/press\\_release/images/briefs34/figures/hectares/mega%20countries\\_hectares.jpg](http://www.isaaa.org/kc/CBTNews/press_release/images/briefs34/figures/hectares/mega%20countries_hectares.jpg)>. (accessed January, 11, 2007).

As noted earlier, genetic manipulation has been performed by farmers for centuries. Important developments in this area, however, emerged with simultaneous advances in genetic manipulation. Biotechnology techniques can manipulate LMOs to insert potentially any characteristics of organic products.



**Figure 3. Global Area of Biotech Crops**

\* Chart by James Clive Chairman and Founder of the International Service for the Acquisition of Agri-Biotech Applications, Global Area of Biotech Crops Million Hectares (1996-2006). Online: <<http://www.isaaa.org/Resources/Publications/briefs/35/executivesummary/default.html>>. (accessed January, 11, 2007).

As the biotechnology industry gains ground at the international level, so too does the need for adequate regulation, particularly in developing countries such as Mexico where technological advances are far behind those of developed countries and where 1% of the total agricultural production is of transgenic origin.<sup>175</sup> Adequate regulation and a long-term balancing of the benefits and risks of LMOs are urgently needed. To do this requires balancing policy interests that ultimately hinge on whether to further economic

<sup>175</sup> *Ibid*

development or environmental/biodiversity preservation in the effort to determine appropriate courses of action. The next section examines these competing policy issues.

#### **4. Competing Policy Interests**

In spite of the increased international trade in transgenic crops in virtually all countries, there is still fierce opposition to this technology. Currently, the debate over the safety of LMOs permeates the international arena. Advocates and opponents of this technology are trapped in endless arguments over the benefits and risks of these organisms not only on human health but also on the environment.<sup>176</sup> Until science delivers an outcome over the safety of these organisms, these conflicts are likely to continue.

At the international level, States that are parties to the CBD and the Cartagena Protocol attempt to play down risks posed by LMOs as they try to ensure their safe transport across borders. The Convention and the Protocol, typical multilateral environmental agreements, make use of environmental principles to minimize the threats posed by these organisms. The international trade regime allows States to ban these organisms based on firm scientific evidence of their negative effects on human health and the environment.<sup>177</sup> The Cartagena Protocol, on the other hand, allows States under certain circumstances such as uncertainty, lack of scientific evidence over the safety of

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<sup>176</sup> Babinard Julie, "The Stakeholders and the Struggle for Public Opinion, Regulatory Control and Market Development" in Nelson, Gerald, *supra* note 146 at 82-83.

<sup>177</sup> Dresden, Cynthia, "Biotechnology in the Balance of International Trade: Scientific Uncertainty and Legal Response," (2003), 12 Currents Int'l Trade L.J. 44. at 46-48. (LEXIS).

LMOs and potential effects resulting from environmental impact and risk assessments, to prevent these organisms from entering their territories.<sup>178</sup>

At the regional level in North America, genetic manipulation issues are part of the agenda of the parties. As mentioned earlier, under the NAFTA Forum, issues regarding the effects of LMOs on biodiversity and their social and economic impacts on Mexican agriculture were analyzed through the CEC.<sup>179</sup> In the CEC's Maize Report, the Commission analyzed the use of LMOs in Mexico and their environmental impacts.<sup>180</sup>

Mexico, a party to the CBD and the Cartagena Protocol,<sup>181</sup> WTO<sup>182</sup> and NAFTA,<sup>183</sup> develops six-year Strategic Plans in accordance with Article 26 of the Mexican Constitution.<sup>184</sup> These Plans are aimed at achieving economic development and also environmental preservation. In addition to the Strategies, Mexico has put in place specialized legislation to minimize the threats posed by LMOs. As well, Mexican environmental policy is gradually addressing biosafety and the risks posed by these organisms. This is exemplified in the enactment in 2005 of the Biosafety Law on GMOs which strives to ensure biosafety and to preserve biological resources from biotechnology threats.<sup>185</sup>

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<sup>178</sup> Applegate, John S. "The Prometheus Principle: Using the Precautionary Principle to Harmonize the Regulation of Genetically Modified Organisms", (2001) 9 Ind. J. Global Legal Stud. 207, at 243. (Lexis). See also Cartagena Protocol, *supra* note 2 art. 10 (6).

<sup>179</sup> See Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6.

<sup>180</sup> *Ibid.*

<sup>181</sup> Mexico ratified the CBD on March 11, 1993, and the Cartagena Protocol on September 11, 2003. The Convention on Biological Diversity Around the World, Mexico's Profile, online: < <http://www.biodiv.org/world/map.asp?ctr=mx>>. (accessed January, 12, 2007).

<sup>182</sup> Mexico has been a member of the WTO since 1995. Mexico and the WTO, Member Information, online: < [http://www.wto.org/English/thewto\\_e/countries\\_e/mexico\\_e.htm](http://www.wto.org/English/thewto_e/countries_e/mexico_e.htm)>. (accessed January, 12, 2007).

<sup>183</sup> Mexico became a member of NAFTA on January 1<sup>st</sup>, 1994. See NAFTA, *supra* note 5.

<sup>184</sup> Constitution of the Mexican United States of 1917, online: <<http://constitucion.presidencia.gob.mx/index.php?idseccion=210>>. at 26. (accessed January, 12, 2007).

<sup>185</sup> Biosafety Law on GMOs, *supra* note 9.

To appreciate the tension that contextualizes the competing policy issues regarding LMOs that must be made globally, regionally and nationally, we first consider the benefits and dangers posed to biodiversity by LMOs.

#### 4.1 Potential Benefits of LMOs

The potential benefits from agricultural biotechnology are numerous. Genetic manipulation holds the potential to increase the production of grains all over the world.<sup>186</sup> GM plants have the potential to alleviate some of the world's most dire problems such as hunger, undernourishment and disease control. LMO advocates affirm that genetic modification can greatly contribute to enhancing the benefits of agriculture and the quality of life for human beings.<sup>187</sup> Supporters believe that "biotechnology can address environmental degradation and poverty in the developing world by providing improved agricultural productivity and greater nutritional security."<sup>188</sup>

Drought has been a problem throughout history. In the 1970s, for example, droughts affected agricultural production throughout the world.<sup>189</sup> GM plants can be specifically engineered to produce under the most adverse environmental and climatic situations.<sup>190</sup> They can be engineered to mature faster and to develop a more extensive systems of roots adapting better to dry conditions.<sup>191</sup> Also, plants can be designed to increase production utilizing less space. This is seen, for example, in the Philippines

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<sup>186</sup> Avery, Dennis T., "Genetically Modified Organisms Can Help Save the Planet" in Nelson Gerald, *supra* note 146 at 206-215.

<sup>187</sup> Agbioworld, Scientists in Support of Agricultural Biotechnology, online: < [http://www. Agbio world.org/declaration/petition/petition.php](http://www.Agbio world.org/declaration/petition/petition.php)>. This Declaration was signed by 3200 scientists. (accessed January, 12, 2007).

<sup>188</sup> *Ibid.*

<sup>189</sup> Rubenstein, Irwin & Gengenbach, Burle, (et al), *Genetic Improvement of Crops: Emerging Techniques*, (Minneapolis: University of Minnesota Press, 1980) at 4-5.

<sup>190</sup> *Ibid.*

<sup>191</sup> *Ibid.*



where GM rice caused production to increase two metric tons per hectare from 1970 to 1980.<sup>192</sup>

GM plants benefit the environment by reducing dramatically the use of conventional pesticides and herbicides. Scientists who favor GM plants affirm that these plants can reduce dependence on conventional pesticides and herbicides.<sup>193</sup> The reduction of plant pesticides can also contribute to the preservation of biological resources in the long run by preserving beneficial non target insects. Before GM plants were introduced into the market, 80 million pounds of pesticides and herbicides were being employed by farmers.<sup>194</sup> In Arizona, for example, by relying on GM varieties, the use of conventional pesticides to harvest cotton in 2000 was reduced from 400,000 pounds to only 2,000 pounds.<sup>195</sup> Also, the benefits of GM pest-resistant plants can be seen in China where this technology increased yield in plants and reduced the mortality rate of those handling pesticides.<sup>196</sup>

Recently, researchers at the University of Georgia engineered trees that can eliminate mercury from soil.<sup>197</sup> Additionally, LMOs could perhaps be manipulated to eliminate toxic substances from contaminated areas. In the case of Mexico, biotechnology has the potential to contribute to agriculture. Drought-resistant LMOs, for example, could be employed in the semi-desert northern regions of Mexico to increase production.

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<sup>192</sup> Nelson, Gerald, *supra* note 146 at 272-273.

<sup>193</sup> *Ibid.*

<sup>194</sup> Nestle, Marion, *Safe Food. Bacteria Biotechnology and Bioterrorism*, (Berkeley, Los Angeles & London: University of California Press, 2003) at 180-181.

<sup>195</sup> *Ibid.* See also Pimentel, David, "Overview of the Use of Genetically Modified Organisms and Pesticides in Agriculture", (2001) 9 Ind. J. Global Legal Stud. 51. at 51-60.

<sup>196</sup> Frompovicz, Holly B., "A Growing Controversy: Genetic Biotechnology in Agriculture", (2006) 17 Vill. Envtl. L.J. 265. at 270-271.

<sup>197</sup> Falk, Michael C., (et al) "Food Biotechnology: Benefits and Concerns" (2002), 132 (6) The Journal of Nutrition 1384. at 1386.

Furthermore, health benefits can be associated with LMOs. Engineered crops can reduce exposure to pesticides and chemical residues. They can be manipulated to contain vitamins and nutrients that would help prevent malnutrition in developing countries.<sup>198</sup> The production of these enriched grains has the potential to fight malnutrition and disease in developing countries. Rice varieties enriched with vitamin A, for example, can be employed in regions where populations are afflicted by deficiencies in this vitamin.<sup>199</sup> In addition to vitamin A, several other substances can be added to modified crops such as iron and vitamin E to contribute to the improvement of human health in developing countries.<sup>200</sup>

Another potential benefit of genetic engineering and LMO is the terminator technology. This technology has the ability to sterilize a GM plant once it has produced fruit for the first time.<sup>201</sup> It prevents plants from producing their second generation.<sup>202</sup> While this technology has the potential to minimize LMO threats by preventing GM plants from cross pollinating or reproducing.<sup>203</sup> It should be acknowledged that the terminator technology is for some, a powerful tool that will destroy indigenous traditions

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<sup>198</sup> Yan Li & Kerr Philip S., *supra* note 26 at 135.

<sup>199</sup> *Ibid.*

<sup>200</sup> *Ibid.*

<sup>201</sup> For more on patents and plant resources see Mgbeoji, Ikechi, "Patents and Plants Resources-Related Knowledge: Towards a Regime of Communal Patens for Plant Resources-Related Knowledge" in *Environmental Law in Developing Countries*, (2001) 43 IUCN Environmental Policy Paper at 81-116; For more on the terminator technology and its implications see Ohlgart, Samantha M., "The Terminator Gene: Intellectual Property Rights Vs. The Farmers' Common Law Right To Save Seed", (2002) 7 Drake J. Agric. L.J. 473., See also, Oczek, Jeremy P., "In the Aftermath of the "Terminator" Technology Controversy: Intellectual Property Protections for Genetically Engineered Seeds and the Right to Save and Replant Seed", (2000) 41 B.C.L. Rev. 627.

<sup>202</sup> Fresh K's Terminator Technology, information page, online: < [http://www.usask.ca/agriculture/plantsci/classes/plsc416/projects\\_2003/kiall/information.html](http://www.usask.ca/agriculture/plantsci/classes/plsc416/projects_2003/kiall/information.html)>. (accessed January, 12, 2007).

<sup>203</sup> Cummins, J., (et al), *The Killing Fields: Terminator Crops at Large*, I-SIS Report, (2001), in Fresh K's Terminator. *ibid.*

such as 'saving seeds for future seasons' and will create dependence on transnational corporations' transgenic products.<sup>204</sup>

#### 4.2 Potential Risks of LMOs

In spite of the potential good LMOs may hold for humans or for the preservation of biological diversity, there are some risks related to the use of this technology.

Allergenicity seems to represent the most legitimate claim against LMOs.<sup>205</sup> There are claims that GM plants can be harmful to humans if they are manipulated with genetic material of a fruit or product known for causing those effects such as nuts and peanuts.<sup>206</sup>

In 1996, an engineered soybean with the protein of nuts from Brazil was found to cause allergic reactions in humans.<sup>207</sup> Since genetic manipulation employs diverse components from a variety of products, people can develop allergic reactions to a greater number of products.<sup>208</sup>

Another health concern for human beings is that GM plants may cause resistance to antibiotics if ingested.<sup>209</sup> GM plants can be manipulated with antibiotic-resistant genes called 'markers'. This will indicate whether or not the modified plants have attained the desirable characteristics for which they were manipulated.<sup>210</sup> These markers, while helpful in indicating success in genetic manipulation, are believed to cause resistance to

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<sup>204</sup> *Ibid.*

<sup>205</sup> GEO-PIE Project "Issues Related to Genetic Engineering", *supra* note 24.

<sup>206</sup> *Ibid.*

<sup>207</sup> Teitel, Martin (et al), *Genetically Engineered Food*, (Rochester, Vermont: Park Street Press, 2001) at 36-37.

<sup>208</sup> *Ibid.*

<sup>209</sup> Geo-PIE Project, *supra* note 24.

<sup>210</sup> *Ibid.*

antibiotics.<sup>211</sup> Among the most widely used antibiotic resistant markers is the '*mp<sub>t</sub>II*' gene which, as argued by some, confers resistance to the antibiotics neomycin and kanamycin.<sup>212</sup> This marker has been widely used in the process of modification of ten plants including the delayed ripening tomato, herbicide tolerant and insect protected corn and varieties of cotton.<sup>213</sup>

Another antibiotic resistant marker employed to modify mainly maize plants is the '*bla*' which, according to some, provides resistance to ampicillin. In response to the claims of antibiotic resistance in modified plants, some respond that it is not probable to transfer antibiotic resistant genes to microbes or populations of insects in the place where modified plants are grown. Others claim that the 'old' antibiotic kanamycin is not widely used and that new antibiotics are more widely used in human therapy.<sup>214</sup>

In addition to the health claims related to GM plants, negative environmental impacts are attributed to engineered plants. GM plants have the potential to transfer their traits to other plants.<sup>215</sup> LMOs could transmit novel genes to unintended species and disrupt genetic diversity. These organisms as well have the potential to transfer their unique traits to weeds making them almost impossible to be controlled.<sup>216</sup>

In view of the pros and cons, a careful consideration and balancing of the competing policy interests pertaining to the use of LMOs is paramount. This is so not only at the international and regional levels, but also nationally in Mexico. This country

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<sup>211</sup> *Ibid.*, For more on antibiotic resistance, see Teitel Martin, *supra* note 207 at 39-40. See also Fincham, J.R. & Ravetz, J.R., *Genetically Engineered Organisms: Benefits and Risks*, (Toronto: University of Toronto Press, 1991).

<sup>212</sup> European Federation of Biotechnology (EFEB), Antibiotic Resistance Markers in Genetically Modified Crops, Briefing Paper 10, (2001), online: < [http://www.efb-central.org/images/uploads/AntibioticRM\\_English.pdf](http://www.efb-central.org/images/uploads/AntibioticRM_English.pdf)>. at 2. (accessed January, 12, 2007).

<sup>213</sup> *Ibid.*

<sup>214</sup> *Ibid* at 3.

<sup>215</sup> Teitel Martin, *supra* note 207 at 60-65.

<sup>216</sup> *Ibid.*

is one of the richest in biological diversity in the world, home to many species and plants. The challenge for Mexico is then to embrace a policy that balances the risk and benefits of LMOs such that environmental protection and economic development are not forestalled. We now turn to the policy challenges at all three levels.

#### **4.3 The International Level**

Several factors come into play in the debate over the use of LMOs. These include the failure of science to drive environmental policy; an increase in the value of the biotech market; and, the difficulties in regulating LMOs in the international trade and environmental regimes.

First, the role of science in the LMO debate should, ideally, be to shed light on the controversy over the effects of LMOs on human health and the environment. However, the field of biodiversity being extremely complicated,<sup>217</sup> and the topic of LMOs being so far-reaching, it is clear that science cannot be looked to for all of the answers.<sup>218</sup> Scientists possess no definite knowledge about the way ecosystems interact and the role particular species play. Though they have been accurate in some of their predictions, they have not always been proven correct,<sup>219</sup> especially with regard to marine biodiversity. For example, long based on science, the North Sea fisheries system established a system of quotas for the exploitation of certain species.<sup>220</sup> Unfortunately, the fallibility of science

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<sup>217</sup> Wilson, E.O., *Biodiversity*, (Washington, D.C: National Academy Press, 1988) at 265.

<sup>218</sup> L.L. Wolfenbarger & R.R. Phifer, "Ecological Risks and Benefits of Genetically Engineered Plants", (2000) *Science* 290 at 2088.

<sup>219</sup> Kaiser, Matthias, "The Precautionary Principle and its Implications for Science," (1997), 2 *Foundations of Science* 201. at 202.

<sup>220</sup> *Ibid.* 202-203.

is exemplified only too clearly in this instance, as many species in this particular system were threatened with extinction as a result of excessive reliance on scientific theory.<sup>221</sup>

Also, regarding scientific uncertainty, Tim O’Riordan says that the ignorance that surrounds biodiversity makes these resources vulnerable.<sup>222</sup> Under these circumstances, science is not able to provide answers or to guide policymakers. Therefore, environmental policy is open to being driven by uncertainty, politics and economic interests.

Second, the biotech market has dramatically grown with higher demands to feed the world with the wide variety of solutions available to agriculture. The biotech market in 2006 was worth 6.15 billion USD, which represents about 20 percent of the total agricultural trade in the world.<sup>223</sup> The profitability of this market will continue to increase, according to experts. Biotech corporations, equipped with abundant economic resources, will strive not only to drive environmental policy but also to create dependency in developing countries with tools such as terminator technology. Developing countries, on the other hand, will strive to benefit from the transfer of genetic resources located in their territories to these corporations.<sup>224</sup>

Third, the foregoing leads to the issue of legal regulation of the industry. LMO regulation falls both under the international trade and environmental regimes. LMOs are regulated under the CBD and the Cartagena Protocol. Under these Agreements, countries are committed to preserve their biological resources and to ensure the safe introduction of

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<sup>221</sup> *Ibid.*

<sup>222</sup> O’Riordan, Tim & Stoll –Kleenmann, Susanne (eds)., *Biodiversity, Sustainability and Human Communities, Protecting Beyond the Protected*, (Cambridge: Cambridge University Press 2000) at 3.

<sup>223</sup> ISAAA, The Global Value of the Biotech Crop Market, *supra* note 155.

<sup>224</sup> Haley, Stein, “Intellectual Property and Genetically Modified Seeds: The United States, Trade, and the Developing World,” (2005) 3 Nw. J. Tech. & Intell. Prop. 160. at 168-169.

LMOs.<sup>225</sup> The Protocol, for example, allows States to ban LMOs from entering their markets in cases where risk assessment foresees environmental harm, in light of the precautionary principle or socio-economic considerations.<sup>226</sup> The inclusion of this principle has also ignited controversy as it accentuates the frictions between the environmental and trade regimes.<sup>227</sup> For some, this principle is necessary to protect the environment by ensuring the safety of new technologies. For others, the principle is a powerful tool that can be used indiscriminately to restrict trade.

Under the trade regime, LMOs are regulated in Article XX of the General Agreement on Tariffs and Trade (GATT) of 1947,<sup>228</sup> the Subsidiary Agreement on Sanitary and Phytosanitary (SPS) Measures (the SPS Agreement),<sup>229</sup> and the Agreement on Technical Barriers to Trade (TBT).<sup>230</sup> These Agreements encourage States to base their levels of protection on international standards. Under this regime, States are allowed to set higher standards if they can scientifically prove they are necessary to protect human, animal or plant life or health.<sup>231</sup>

<sup>225</sup> For more on the conflict between the environmental and trade regimes, see Winham Gilbert R., "International regime conflict in Trade and Environment: the Biosafety Protocol and the WTO", (2003) 2 World Trade Review, online: <[http://centreforforeignpolicystudies.dal.ca/pdf/bio\\_prot.pdf](http://centreforforeignpolicystudies.dal.ca/pdf/bio_prot.pdf)>. at 33-34. (accessed January, 12, 2007).

<sup>226</sup> Applegate, John S. *supra* note 178 at 256.

<sup>227</sup> Sabrina Shaw, & Schwartz, Risa, "The Cartagena Protocol and the WTO: Reflections on the Precautionary Principle." (2000) 10 Swiss Review of International and European Law 536. at 537.

<sup>228</sup> General Agreement on Tariffs and Trade (GATT), Oct.30, 1947, 61 Stat. A-11 T.I.A.S. 1700 U.N.T.S. 194, as modified by Marrakech Agreement of the World Trade Organization, Annex 1A, Legal Instruments of the Uruguay Round vol.1, 33 I.L.M. 1154 (1994).

<sup>229</sup> Agreement on the Application of Sanitary and Phytosanitary Measures (SPS)", (15 April, 1994), & "WTO Agreement, Annex 1A, 69," online: <[http://www.wto.org/english/docs\\_e/legal\\_e/15-sps.pdf](http://www.wto.org/english/docs_e/legal_e/15-sps.pdf)>. (accessed January, 12, 2007).

<sup>230</sup> Agreement on Technical Barriers to Trade (TBT), Apr. 15, 1994, GATT Doc. MTN/FA II-A1A-6, online: < [http://www.wto.org/english/docs\\_e/legal\\_e/final\\_e.htm](http://www.wto.org/english/docs_e/legal_e/final_e.htm)>. (accessed January, 12, 2007).

<sup>231</sup> See exceptions in GATT Article XX (b) to protect human, animal or plant life or health, SPS Agreement Article 3.3 regarding increased standards of protection, Agreement on TBT art. 2.2 regarding the protection of human health or safety, animal or plant life or health or the environment.

An illustration of the clash between these regimes and policy conflicts is the, previously mentioned, 2003 request for the establishment of a Dispute Settlement Body of the WTO by Argentina, Canada and the United States<sup>232</sup> in a complaint against a moratorium issued by the European Communities (EC) against the import of GM products from these countries.<sup>233</sup> The WTO Panel produced a decision on 29 September 2006 regarding the *EC Moratorium on Biotechnology Products* in which it found the EC had violated trade provisions contained in the SPS Agreement and that it had no scientific evidence to substantiate such ban.<sup>234</sup> The Panel's decision has international repercussions and it has the potential to shape not only environmental policy but also the implementation of the CBD and the Cartagena Protocol.<sup>235</sup>

#### 4.4 The Regional Level

At the regional level, conflicts over the use of LMOs and their impact on biological diversity have been tangentially addressed in the NAFTA forum. The complaint by Mexican NGOs over the introduction of transgenic maize in Mexican crops was filed under Article 13 of the North American Agreement on Environmental Cooperation (NAAEC),<sup>236</sup> which authorizes the CEC's Secretariat to investigate and prepare reports on environmental issues within its overall program.<sup>237</sup>

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<sup>232</sup> Grant, Isaac, & Kerr, William A., "Genetically Modified Organisms at the World Trade Organization: A Harvest of Trouble," (2003) 37 J. World Trade 1083. at 1083-1084.

<sup>233</sup> Bridgers, Mystery "Genetically Modified Organisms and the Precautionary Principle: How the GMO Dispute Before the World Trade Organization Could Decide the Fate of International GMO Regulation", (2004) 22 Temp. Env'tl. L. & Tech. J. 171. at 181-182. (Lexis).

<sup>234</sup> WTO Dispute Settlement Panel, *supra* note 27 at 1029-1031.

<sup>235</sup> *Ibid.*

<sup>236</sup> North American Agreement on Environmental Cooperation (NAAEC), Sept. 14, 1993, Can.-Mex.-U.S., 32 I.L.M. 1480 (entered into force Jan. 1, 1994).

<sup>237</sup> *Ibid.* see art. 13.



The complaint before the CEC involved possible contamination of traditional maize with transgenic sequences in 2001<sup>238</sup> and the contamination of 13% of maize varieties in 11 Mexican indigenous communities.<sup>239</sup> Transgenic maize was also found in storage facilities of the Mexican government's Food Distribution Agency (DICONSA).<sup>240</sup> The transgenic maize was introduced in imports from the United States and planted by indigenous farmers.<sup>241</sup>

In 2004, the CEC produced a report that analyzed the impacts of the cultivation of transgenic maize varieties on land areas and on indigenous varieties of maize, such as the teosinte.<sup>242</sup> This native variety of maize, according to the CEC's advisory group, is paramount in maize manipulation and is the key to the genetic diversity of maize.<sup>243</sup> The CEC's Maize Report analyzed the following issues: 1) Gene flow and transgenic maize; 2) the impact of LMOs on biodiversity and on health; and, 3) sociocultural impacts of LMOs in Mexico.<sup>244</sup>

Regarding gene flow, the advisory group acknowledged that 25 to 30 percent of the transgenic maize introduced to Mexico from the United States was of transgenic origin.<sup>245</sup> Furthermore, the advisory group acknowledged the importance of traditional agricultural practices, such as plant improvement through pollination.<sup>246</sup> The CEC's Maize Report pointed out that further research was needed to fully assess the degree of

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<sup>238</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 8-10.

<sup>239</sup> *Ibid.* at 32-34.

<sup>240</sup> *Ibid.*

<sup>241</sup> *Ibid.*

<sup>242</sup> *Ibid.* at 8-10.

<sup>243</sup> *Ibid.* at 6-8.

<sup>244</sup> *Ibid.* at 8-9.

<sup>245</sup> *Ibid.* at 16.

<sup>246</sup> *Ibid.* at 15.

transgenic sequences in Mexican maize and it recommended that a monitoring strategy be implemented to guarantee the preservation of the genetic diversity of maize.<sup>247</sup>

As to the impacts on biodiversity and health, the Report stated that no negative effects were found<sup>248</sup> and that further studies were necessary to determine the effects of transgenic maize varieties on non-target insects. Additionally, the advisory group also warned of the risks of the production of pharmaceuticals from plants. The Report acknowledged the role indigenous farmers play in the preservation of maize<sup>249</sup> and recommended that a systematic program to monitor transgenic products be implemented and that the Mexican government should strive to preserve indigenous varieties of maize.<sup>250</sup>

Regarding sociocultural matters, the Report acknowledged that Mexico was not self-sufficient in maize production, that this product was an essential component in Mexican diet, and that it represented cultural and spiritual values for Mexicans. Additionally, it stated that traditional practices such as saving seeds for future seasons were essential to traditional farmers not only in the preservation of maize but also in the improvement of this grain.<sup>251</sup> For these reasons, the advisory group recommended that transgenic maize imports from the United States be labelled as such,<sup>252</sup> and that farmers be educated over the handling of transgenic maize. The Report recommended public participation in making decisions on these matters, particularly participation by parties involved in maize production.<sup>253</sup>

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<sup>247</sup> *Ibid.* at 17.

<sup>248</sup> *Ibid.* at 19.

<sup>249</sup> *Ibid.* at 18.

<sup>250</sup> *Ibid.* at 28.

<sup>251</sup> *Ibid.* at 22.

<sup>252</sup> *Ibid.* at 31.

<sup>253</sup> *Ibid.*

#### 4.5 The National Level

Throughout recent history, Mexico has struggled to elaborate policies that encompass both economic development and environmental protection. More recently, legislation, environmental policy and institutions have been gradually modernized to address the challenges in the preservation of biological diversity. In this context, Mexico seems to be striving to preserve its natural resources and to create effective policies to guide the effort.

All modern development strategies have emanated from the executive branch of Mexico's government since 1995. Environmental strategies have also been formulated by the executive to guide implementation of its environmental commitments in national plans to protect specific resources from being depleted. The Organization for Economic Cooperation and Development (OECD), in a 2005 assessment of Mexico's economy, acknowledged that Mexico's indicators partially improved in 2001.<sup>254</sup> The OCED also recognized that there are still many challenges that Mexico faces, such as developing an effective economic model and adequately protecting the significant biological resources located in its territory.<sup>255</sup>

Mexican legislation and institutions are being updated to keep pace with developments in biotechnology. As noted earlier, in 2005, for example, a Biosafety Law on GMOs<sup>256</sup> was enacted to ensure biosafety and to minimize threats posed by LMOs.<sup>257</sup>

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<sup>254</sup> OECD, Economic Survey of Mexico, (2005), online :< [http://www.oecd.org/document/8/0,23\\_40,en\\_33873108\\_33873610\\_35307080\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/8/0,23_40,en_33873108_33873610_35307080_1_1_1_1,00.html)>. at 18. (accessed January, 12, 2007).

<sup>255</sup> *Ibid.*

<sup>256</sup> See Biosafety Law on GMOs, *supra* note 9.

<sup>257</sup> *Ibid.*

This law regulates all stages in the development of modified organisms that are likely to be introduced into the environment, those to be consumed, and with regard to experimentation with these organisms.

At the institutional level, the Inter-Secretarial Commission on Biosafety and Genetically Modified Organisms (CIBIOGEM or the Inter-Secretarial Commission on GMOs), a federal agency was created to deal with threats posed by 'GMOs' due to the increase of their production in Mexico. All these developments, nevertheless, carry with them challenges that hinge on balancing the various interests that would be affected by how the plans are carried out and legislation implemented by government institutions. We examine these issues in the following subsections.

#### **4.6 The Socioeconomic Context**

Mexico's climatic and geographic situation plays an important role in the great number of resources that exists in this country. According to the Mexican Secretariat of the Environment and Natural Resources (SEMARNAT or Secretariat of the Environment), 10 percent of the known species on earth live in this country.<sup>258</sup>

Due to this great variety, Mexico is considered 'mega-diverse' in biological resources, along with Colombia, Peru, Brazil, China, Congo and India.<sup>259</sup> Mexico's richness is not only limited to biological resources, but also extends to cultural diversity.

Mexico's population reached an estimated 105.3 million people at the end of 2005, presenting a growth rate from the previous year of 1.44 percent.<sup>260</sup> The population is diverse: according to the National Commission for the Development of the Indigenous

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<sup>258</sup> Secretariat of the Environment and Natural Resources (SEMARNAT), *supra* note 4 at 134 -135.

<sup>259</sup> *Ibid.*

<sup>260</sup> *Ibid.*

People, 12.7 million Mexicans are of indigenous origin and speak approximately 85 different dialects.<sup>261</sup> Indigenous groups have a unique culture, and most of them depend on traditional agriculture for their survival.

In spite of the partial improvements in Mexico's economy, poverty is still far from being eradicated. According to the OECD, one of six Mexicans lives in extreme poverty. The distribution of income in Mexico is one of the most uneven among the OECD countries.<sup>262</sup> Rural and indigenous communities are the most vulnerable groups.<sup>263</sup>

Overall, the steady population growth in Mexico and the uneven income distribution levels obscure efforts to protect biodiversity. This country is trapped between the need to develop and to provide for its citizens, and the obligation to preserve its biological resources and the diverse traditions of indigenous groups. The challenge for Mexico is then to elaborate a balanced environmental policy that encompasses these elements.

#### 4.7 Policy Issues

Mexico's environmental policy is embedded in national development plans and environmental strategies. National Strategies are formulated by the executive for a period of six years while environmental strategies can be created to support the National Strategies or to attack environmental problems at any given time.

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<sup>261</sup> Comisión Nacional para el Desarrollo de los Pueblos Indígenas, online: < [http://cdi.gob.mx/index.php?id\\_seccion=90](http://cdi.gob.mx/index.php?id_seccion=90)>. (accessed January, 12, 2007). See also INEGI "The Indigenous Population of Mexico," (2000), online: <[http://www.inegi.gob.mx/prod\\_serv/contenidos/espanol/bvinegi/productos/censos/poblacion/poblacion\\_indigena/pob\\_ind\\_mex.pdf](http://www.inegi.gob.mx/prod_serv/contenidos/espanol/bvinegi/productos/censos/poblacion/poblacion_indigena/pob_ind_mex.pdf)>. (accessed January, 12, 2007).

<sup>262</sup> OECD, Economic Survey of Mexico, *supra* note 254 at 33-35.

<sup>263</sup> World Bank, Indigenous Peoples, Poverty and Human Development in Latin America, 1994-2004, online: < <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/LACEXT/MEXICOEXTN/0,,contentMDK:20505838~menuPK:50003484~pagePK:141137~piPK:141127~theSitePK:338397,00.html>>. (accessed January, 12, 2007).

Currently, National Strategies have been evolving to include greater regard for the environment. The National Development Strategy of 1995, for example, based on sustainable development, notionally reconciled development and environmental protection interests.<sup>264</sup> An environmental plan that emerged parallel to this 1995 Strategy aimed to halt damage to ecosystems and natural resources through a sustainable development approach. Together, these strategies constitute a landmark for environmental protection in Mexico. Additionally, in 2000, a National Biodiversity Strategy was launched to comply with Mexico's international environmental commitments and to identify areas for improvement in this field.<sup>265</sup>

A longer term vision in environmental protection was established in the 2001-2006 Environmental Strategy.<sup>266</sup> This plan focused on including environmental concerns in decision making, protecting biological resources and preserving genetic material of species.<sup>267</sup> More regard for the environment was also clear in the Environmental Plan of 2001 which emphasized the protection of biological resources.

#### **4.8 Legislative and Institutional Issues**

The effectiveness of Mexican legislation and institutions was questioned in the CEC's Maize Report. Legislation and institutions have since been striving to deal with the threats posed by biotechnology.

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<sup>264</sup> National Development Strategy 1995-2000, online: < <http://uninet.mty.itesm.mx/legis-demo/progs/pnd.htm> >. (accessed January, 12, 2007).

<sup>265</sup> National Biodiversity Commission, National Biodiversity Strategy, (2000), online: < [http://www.conabio.gob.mx/conocimiento/estrategia\\_nacional/doctos/ENB.pdf](http://www.conabio.gob.mx/conocimiento/estrategia_nacional/doctos/ENB.pdf) >. (accessed January, 12, 2007).

<sup>266</sup> National Environmental Plan of 1995-2000, online: < [http://zedilloworld.presidencia.gob.mx/PAGES/library/od\\_environmental.html](http://zedilloworld.presidencia.gob.mx/PAGES/library/od_environmental.html) >. (accessed January, 12, 2007).

<sup>267</sup> National Development Strategy 2001-2006, online: < <http://pnd.presidencia.gob.mx/index.php?idseccion=6> >. (accessed January, 12, 2007).

Mexican environmental legislation is rooted in Article 27 of the Mexican Constitution. This Article establishes the regime for utilizing land and marine resources.<sup>268</sup> According to this Article, ownership of natural resources belongs to the Mexican State and can be transmitted to private persons by means of private property.<sup>269</sup>

General environmental legislation is contained in the General Law of Ecological Equilibrium.<sup>270</sup> This law is the backbone of Mexican environmental legislation. It coordinates environmental institutions and sets the basis for biosafety regulation.

Biodiversity legislation is contained in the 2005 Biosafety Law on GMOs.<sup>271</sup> This law regulates the production, experimentation and introduction of LMOs into the environment. Furthermore, it follows a precautionary approach and requires an assessment of risks before activities can be allowed.

Parallel to federal legislation are Mexican Official Norms (NOMs), which are obligatory standards, established by federal Secretariats on certain activities. The Norm, NOM 059-1994, for example, contains a list of endangered species that are subject to special protection.<sup>272</sup> Regarding LMOs, the phytosanitary norm 1995 NOM-056-FITO regulates introduction of LMOs into the environment for experimental purposes. In general, NOMs provide specific regulation and standards essential for the implementation of Mexican legislation.<sup>273</sup>

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<sup>268</sup> Constitution of the Mexican United States of 1917, *supra* note 184 see Article 27.

<sup>269</sup> *Ibid.*

<sup>270</sup> General Law of Ecological Equilibrium, *supra* note 8.

<sup>271</sup> Biosafety Law on GMOs, *supra* note 9.

<sup>272</sup> NOM 059-ECOL-1994, online: < <http://www.ine.gob.mx/ueajei/publicaciones/gacetas/227/especies.html>>. (accessed January, 12, 2007).

<sup>273</sup> SAGARPA, NOM-056-FITO-1995, online:< [http://www.cibiogem.gob.mx/normatividad/normatividad\\_SAGARPA/NOM-056-FITO-1995.html](http://www.cibiogem.gob.mx/normatividad/normatividad_SAGARPA/NOM-056-FITO-1995.html)>. (accessed January, 12, 2007).

Mexican institutions that play a role in the protection of the environment are the Secretariat of the Environment and the Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (the Secretariat of Agriculture or SAGARPA). These institutions regulate the utilization of natural resources which, obviously, infringes upon various areas of biological diversity. They have the authority to create obligatory national standards in their respective areas of control.

These two Secretariats employ a permit mechanism to regulate the release of LMOs into the environment. Three institutions serve as consultative organs for releases of LMOs, the Inter-Secretarial Commission on GMOs, the National Biodiversity Commission and the National Institute of Ecology. The Inter-Secretarial Commission on GMOs is composed of representatives of all the federal secretariats that deal with environmental protection. This institution provides opinions about the risks posed by LMOs and strives to coordinate institutional efforts to regulate the introduction, use and transportation of such organisms. The National Biodiversity Commission and the National Institute of Ecology, on the other hand, are specialized bodies on biodiversity preservation that also provide opinions on the potential effects of introducing LMOs into the environment.

The spectrum of environmental protection activities in Mexico is based on presidential goals, and the priorities outlined at the time policies and plans are launched. In theory, Mexico has the framework to preserve its biological resources. In practice, however, it is yet to be seen if this country has the necessary resources to enforce its environmental legislation and to implement its environmental commitments under the CBD and the Cartagena Protocol. The study of Mexico's implementation of these MEAs



may perhaps help transitional economies in overcoming challenges in the implementation of these environmental agreements.

## **5. Conclusion**

This Chapter has looked at biological diversity and the fundamental role it plays in human survival. It points out that variedness of biological resources is of paramount importance in the survival and adaptation of species to climatic and environmental changes. The more diverse species are the most chances they have to survive on earth. The concept of biodiversity, as it was argued in this Chapter, is tightly linked to the maintenance of the earth's ecological equilibrium. The increase of the extinction rate in species in recent years seems to be an accurate indicator of the depletion of biological resources. Overexploitation of any of the three levels of biological diversity negatively impacts the preservation of these resources. Overall, biodiversity preservation is essential not only for subsistence and survival of human beings on earth but also for the survival of species and their habitats.

It was also pointed out that overpopulation demands large amount of resources to meet the needs of a growing world. Until this complicated issue is addressed by governments, overpopulation is likely to negatively impact the availability of biological resources on earth. In addition, invasive species were pointed out as an important factor in the depletion of biological diversity. These species when accidentally transported to an environment in which they are aliens, they are capable of becoming invasive and deplete not only biological resources but also to diminish the diversity of species in their new environment.

It was argued that biotechnology holds the potential to alleviate some of the world's most dire problems, such as food insecurity through the development of modified organisms. LMOs can potentially increase crop production and eradicate malnutrition, especially in developing countries. Despite the great developments of biotechnology and the wide increase of LMOs in agriculture, so far, the 'promise' of these organisms is yet to be fully manifested, particularly in light of the food requirements of the world's growing population. A clear tendency, however, is seen regarding the increase in the terminator technology and farmers' dependence on biotechnology products.

Several factors were found to impact LMO regulation and the protection biodiversity is afforded by governments. At the international level, it was argued that the great deal of scientific uncertainty in the field of biodiversity is likely to drive LMO regulation along with commercial interests in the biotechnology sector and agreements in the international trade regime. Regionally, high LMO production and trade in North America were pointed out as important factors that may influence Mexico's regulation of LMOs.

Although there is no scientific evidence regarding the long term effects of LMOs on biological diversity, it has been argued that they should be extensively regulated and monitored. This regulation seems fundamental in Mexico, since this country boasts one of the richest territories in biological diversity and since it is a center of origin of some of the world's species. In other words, like all States, Mexico needs to balance the risks of utilizing these organisms against poverty, the need to develop, and respect for the skills and needs of its citizens who depend on traditional agriculture for their livelihoods.

Overall, the challenges that arise for Mexico with regard to the preservation of biological diversity require thoughtful study of the requirements of the Biodiversity Convention and the Cartagena Protocol and the influence of international trade agreements that impact the transboundary movements of LMOs. This study should also include a study of Mexico's implementation mechanisms including environmental policy, institutional capacity and legislation that it has in place by means of which to carry out those international obligations contained in these environmental agreements. These issues are considered in detail in the following Chapters.

## CHAPTER III

### BIODIVERSITY AND INTERNATIONAL LAW

#### 1. Overview

Although efforts pertaining to the protection of the environment can be traced back as far as 3100 BC in Mesopotamia, known today as Iraq, most initiatives concerned with environmental protection have emerged since the 1970s.<sup>274</sup> These international efforts, expressed in international agreements, principles, customary rules and soft law, have consistently attempted to address pressing environmental problems.<sup>275</sup>

International agreements are the primary means for developing binding environmental commitments at the global level; however, they do not necessarily contain straightforward obligations.<sup>276</sup> As discussed in Chapter II Section 4.3, the 1992 CBD constitutes a framework agreement for the preservation of the world's biological resources. It provides commitments to be addressed by State parties at the national level or in subsequent Protocols. Key provisions of the Convention deal with the use of genetic resources and strategies for the preservation of biological resources. Pursuant to the CBD, the Cartagena Protocol on Biosafety of the Convention of Biological Diversity,<sup>277</sup> based on environmental principles and exchange information mechanisms, emerged to be

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<sup>274</sup> Nanda, Ved P., *International Environmental Law & Policy for the 21<sup>st</sup> Century*, (Ardsey, NY: Transnational Publishers, Inc., 2003) at 5.

<sup>275</sup> *Ibid.* at 5-9.

<sup>276</sup> Birnie, Patricia W. & Boyle, Alan E., *International Law and the Environment* (Oxford: Clarendon Press, 1992) at 14.

<sup>277</sup> It is important to note that the Cartagena Protocol on Biosafety to the Convention on Biological Diversity was adopted by the Conference of the Parties to the CBD on 29 January 2000. After 103 signatures, the Protocol entered into force on 11 September 2003.

employed to minimize threats posed by LMOs to biodiversity preservation. Similar to the Cartagena Protocol's regulation of transboundary movement of LMOs, the WTO SPS Agreement, the TBT Agreement and GATT exceptions in Article XX strive to guarantee free trade of LMOs across borders. These Agreements allow States to enact their own levels of protection inspired by international standards and scientific evidence.

In addition to international agreements, customary international law can potentially contribute to the preservation of the environment. Prior to the 20<sup>th</sup> century, international custom played an important role in shaping international obligations.<sup>278</sup> However, some argue that custom is not the ideal means by which to develop international standards of environmental protection. First, the process of demonstrating State practice is lengthy and may not provide expeditious solutions to pressing environmental problems.<sup>279</sup> Second, with the exception of the law of the sea, few environmental practices have been accepted as norms.<sup>280</sup>

International law principles were formulated in the 1972 Stockholm Declaration to offer guidance in addressing the world's environmental problems. Many of these principles aimed at preserving biological resources, such as the precautionary principle and Environmental Impact Assessment (EIA), were later crafted in the 1992 Rio Declaration at the United Nations Conference on Environment and Development (Rio Declaration).<sup>281</sup> Principle 15 of this Declaration regarding the precautionary principle states:

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<sup>278</sup> Nanda, Ved P., *supra* note 274 at 10.

<sup>279</sup> *Ibid.*

<sup>280</sup> *Ibid.*

<sup>281</sup> United Nations Conference on Environment and Development: Rio Declaration on Environment and Development (Rio Declaration), Rio de Janeiro, June 14, 1992, (1992) 31 *ILM* 874.

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.<sup>282</sup>

The precautionary principle is widely included in international agreements ranging from fisheries to biodiversity protection.<sup>283</sup> This principle is advocated by the Cartagena Protocol to guide States in the introduction and transfer of LMOs. It relies on anticipatory action in the absence of firm scientific evidence.<sup>284</sup> The principle marks a new era in environmental law and policy;<sup>285</sup> rather than reacting to environmental problems, it takes a proactive approach by scrutinizing the safety of activities related to biological diversity in light of scientific uncertainty.

Principle 17 of the Rio Declaration regarding EIA provides that this environmental principle “shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.”<sup>286</sup> In the case of biotechnology, EIA is aimed to guide States in assessing the safety of introducing LMOs into the environment. The assessment gathers information on a proposed project; then, it considers alternatives and mitigating factors before taking a decision. It also allows the public to participate in the decision-making process.<sup>287</sup>

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<sup>282</sup> *Ibid.* Principle 15.

<sup>283</sup> Freestone, David & Hey, Ellen, *The Precautionary Principle and International Law :The Challenge of Implementation*. (The Hague; Boston: Kluwer Law International, 1996) at 3.

<sup>284</sup> Fullem, Gregory D. “The Precautionary Principle: Environmental Protection in the Face of Scientific Uncertainty”, (1995) 31 *Willamette L. Rev.* 497 at 497-498. (HeinOnline).

<sup>285</sup> VanderZwaag, David, “The Precautionary Principle in Environmental Law and Policy: Elusive Rhetoric and First Embraces”, (1999) 8 *J. Env'tl. L. & Prac.* 355. at 357.

<sup>286</sup> Rio Declaration, *supra* note 281, Principle 17.

<sup>287</sup> Gilpin, Alan, *Environmental Impact Assessment: Cutting Edge for the Twenty First Century*, (Honk Kong: Cambridge, 1995) at 4-5.

Soft law has also become a contemporary source of international environmental law and has been developing since the Stockholm Conference of 1970.<sup>288</sup> Soft law is contained in resolutions and recommendations of international organizations, as well as in final acts agreed upon at the conclusion of international conferences.<sup>289</sup> Soft law can carry enormous weight over time and it is both time and cost effective as well as flexible.<sup>290</sup> An example of the influence of soft law in the international arena is the acceptance of environmental principles that were contained in the Rio Declaration, such as the precautionary principle, into international treaties.

The evolution of international law has had an impact on certain areas, like the regulation of the seas and regarding biodiversity preservation. However, overall, international agreements, environmental principles and soft law still struggle to provide the grounds for the preservation of the world's biological resources. In view of the foregoing, the objective of this Chapter is to analyze international law and the preservation of biological resources as a basis for the detailed study in Chapters V and VI of Mexico's implementation of the Biodiversity Convention and the Cartagena Protocol. The rest of the Chapter is organized into four parts. Part 2 deals with the Biodiversity Convention, and Part 3 analyzes the Cartagena Protocol on Biosafety and international trade agreements.

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<sup>288</sup> Dupuy, Pierre-Marie, "Soft Law and the International Law of the Environment", (1990)12 Mich. J. Int'l L. 420. at 422. (Hein Online).

<sup>289</sup> *Ibid.* at 428. For Ved Nanda, the 1972 Stockholm Conference, the 1983 World Commission on Environment and Development (WCED), and the 1992 Rio Declaration are three of the most influential sources of soft law. See Nanda, Ved P., *supra* note 274 at 14.

<sup>290</sup> *Ibid.*

## 2. The 1992 United Nations Convention on Biological Diversity

The CBD provides a regulatory framework for the conservation of biological resources at the international level. It has the distinction of being the first multilateral instrument that considers the potential dangers posed by LMOs to biodiversity preservation. For some, it is a different type of agreement in that it departs from standard treaty obligations<sup>291</sup> by outlining objectives instead of obligations.<sup>292</sup> It also recognizes that most genetic resources are located in developing countries and asserts the rights of those States over those resources within their territories.<sup>293</sup>

The CBD endorses, as well, environmental principles such as the precautionary principle and EIA as important tools to protect biodiversity. At the same time, it has been criticized for being vague and for failing to provide implementation guidelines for State parties, thus making impossible its practical observation.<sup>294</sup> The objectives of the CBD can be summarized as follows: The preservation of biological diversity; the sustainable use of its components; and, the fair and equitable sharing of genetic resources.<sup>295</sup>

Biological diversity is defined as the “variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part.”<sup>296</sup> Additionally, the Convention places responsibility on States to ensure that their activities from the exploitation of the

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<sup>291</sup> Kimball, Lee A., “Is a United Nations Convention the Most Appropriate Means To Pursue the Goal of Biological Diversity?” (1995), 28 Vand.J. Transnat’l L. 763 at 764 (Lexis).

<sup>292</sup> *Ibid* at 765.

<sup>293</sup> *Ibid*; CBD, *supra* note 1, art. 4.

<sup>294</sup> Wold, Chris, “The Futility, Utility, and Future of the Biodiversity Convention,” (1998) 9 Colo. J. Int’l Envtl. L. & Pol’y 1 at 15 (Lexis).

<sup>295</sup> CBD, *supra* note 1 art. 1.

<sup>296</sup> *Ibid*. art. 2.



resources located within their territories do not impose damage beyond the limits of their national jurisdiction.<sup>297</sup>

States play a fundamental role in the success of implementing the Convention. They are entrusted with fundamental roles that range from implementing preservation strategies to organizing data regarding biological resources. According to the Convention, “States shall, in accordance with their particular conditions and capabilities: develop national strategies, plans or programs for the conservation and sustainable use of biological diversity or to adapt for this purpose existing strategies.”<sup>298</sup>

The Conference of the Parties (COP), a body entrusted to oversee the implementation of the Convention, has provided guidelines to State parties with regard to the elaboration of national policies and regulations. The COP encourages States to take those guidelines into account as part of their efforts to implement their national strategies and action plans.<sup>299</sup> These guidelines include those established by the UNEP and the IUCN under the publication “National Biodiversity Planning” document aimed to guide parties in national planning and reporting regarding this activity.<sup>300</sup>

States also have an obligation to identify components of biological diversity, and to maintain and organize this information.<sup>301</sup> Article 7 on identification and monitoring has been the object of considerations in the CBD. COP 2, for example, produced decision II/8, which encourages States to identify the status and trends of the components of

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<sup>297</sup> *Ibid.* art. 3.

<sup>298</sup> *Ibid.* art. 6.

<sup>299</sup> Convention on Biological Diversity, National Biodiversity Strategies and Action Plans, Consideration of Article 6 by the Conference of the Parties, online: < <http://www.biodiv.org/reports/nbsap.aspx> >. (accessed January, 12, 2007).

<sup>300</sup> *Ibid.*

<sup>301</sup> *Ibid.* art. 7. For more on the decisions of the COP see Mackenzie, Ruth (eds), *Handbook of the Convention on Biological Diversity*, (London & Sterling, VA: Earthscan Publications, 2001).

biological diversity. Decision III/10 of the COP 3 also encourages States to take an integrative approach in protecting their biological resources.<sup>302</sup>

The CBD attempts to preserve biological resources in their natural surroundings and habitats (*in-situ*) and outside of their natural habitat (*ex-situ*). *In-situ* conservation strategies encompass the establishment of protected areas, the preservation of ecosystems, and the rehabilitation of contaminated areas.<sup>303</sup> In addition, the Convention encourages States to regulate and manage the risks regarding the use and control of LMOs,<sup>304</sup> and to incorporate in their policies, respect for traditional knowledge and traditional practices.<sup>305</sup> Article 8 (j) of the CBD, regarding the obligation of States to preserve biodiversity *in situ* provides that Parties shall, as far as possible:

Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.<sup>306</sup>

States are encouraged to employ *ex-situ* measures to preserve biological resources including the establishment of facilities for the conservation and research of plants, animal and micro-organisms. Such facilities, according to the Convention, should preferably be located in the same country as the resources that are to be preserved.<sup>307</sup>

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<sup>302</sup> *Ibid.*

<sup>303</sup> *Ibid.* art. 8.

<sup>304</sup> *Ibid.* art. 8 (g).

<sup>305</sup> *Ibid.* art. 8 (j).

<sup>306</sup> *Ibid.*

<sup>307</sup> *Ibid.* art. 9.

Protective measures in the CBD are reflected in the requirement to perform an EIA.<sup>308</sup> Furthermore, it persuades States to require impact assessments. Regarding EIA, the CBD provides that States shall:

Introduce appropriate procedures requiring environmental impact assessment of its proposed projects that are likely to have significant adverse effects on biological diversity with a view to avoiding or minimizing such effects and, where appropriate, allow for public participation in such procedures.<sup>309</sup>

Also, regarding access to genetic resources, it recognizes the rights of States to regulate it by means of national legislations. The CBD also encourages States to facilitate the transfer of genetic resources through a prior informed consent mechanism and to enjoy the benefits of such transfer.<sup>310</sup>

Despite the international recognition that the Convention has achieved with its widespread ratification,<sup>311</sup> there are several provisions that water down its effectiveness. There is first the overbroad scope of the Convention; second, lack of regulation regarding access to genetic resources; third, ambiguity related to prior informed consent; and fourth, protected areas and indigenous practices. These issues will be discussed in turn.

## **2.1. The Broad Focus of the CBD**

The goals of the CBD are stated in Article 1:

The objectives of this Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic

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<sup>308</sup> *Ibid.* art 14.

<sup>309</sup> *Ibid.* art. 14 (a).

<sup>310</sup> *Ibid.* art.15.

<sup>311</sup> To June 2007, the CBD has 190 parties. Secretariat of the Biodiversity Convention, Parties to the Convention on Biological Diversity / Cartagena Protocol on Biosafety, online: <<http://www.biodiv.org/world/parties.asp>>. (accessed January, 12, 2007).

resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.<sup>312</sup>

As seen from this Article, the CBD aims to accomplish mainly two goals: the preservation of biological diversity and the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of such resources.<sup>313</sup> Virtually all areas of biodiversity fall under these objectives, including protection of terrestrial and marine species, forests and habitats.<sup>314</sup>

To some the various issues that arise from the ambitious scope of the Convention create an unmanageable agenda for collectively addressing the preservation and sustainable use of biological diversity.<sup>315</sup> The CBD also addresses issues that have been brought to the table by previous environmental agreements. Such is the case of environmental agreements that aim to preserve aspects of biological diversity such as flora, fauna and habitats, namely, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES),<sup>316</sup> the Convention on the Conservation of European Wildlife and Natural Habitats of 1979 (Berne Convention),<sup>317</sup> and the Convention on the Protection of Migratory Species of Wild Animals of 1979 (Bonn Convention).<sup>318</sup>

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<sup>312</sup> CBD, *supra* note 1 art. 1.

<sup>313</sup> *Ibid.*

<sup>314</sup> Wold, Chris, *supra* note 294 at 2.

<sup>315</sup> *Ibid.* at 5.

<sup>316</sup> Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), *opened for signature* Mar. 3, 1973, 27 U.S.T 1087, 993 U.N.T.S 243.

<sup>317</sup> Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention), UKTS 56 (1982). For more a more detailed discussion on this Convention see Bowman Michael & Redgwell Catherine (eds), *supra* note 16 at 74-77.

<sup>318</sup> Convention of Migratory Species of Wild Animals (Bonn Convention), (1980) 19 ILM 15. For more a more detailed discussion on this Convention see Bowman Michael & Redgwell Catherine (eds), *ibid* note 11 at 73-77.

Similar to the CBD, CITES affords protection to some of the world's biological resources of such as fauna. This Agreement focuses on protecting threatened species by means of banning their commerce and regulating their movement across borders.<sup>319</sup> The Berne Convention, in addition to protecting species, also aims to protect the habitats where the species live.<sup>320</sup> The Berne Convention places the responsibility on States to protect species included in the Agreement's red lists.<sup>321</sup> The Bonn Convention aims to protect wild flora and fauna and their natural habitats, especially those containing vulnerable species.<sup>322</sup>

In addition to international agreements on species, there are international initiatives sponsored by the United Nations Food and Agriculture Organization (FAO) on several issues covered under the CBD.<sup>323</sup> For example, the FAOs' Leipzig Declaration on Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture of 1996 (Leipzig Declaration), aims to preserve plant genetic resources and advocates the fair and equitable sharing of the benefits arising from the utilization of these resources.<sup>324</sup> It also aims to sustain "existing *ex situ* collections and *in situ* habitats of plant genetic resources" making them available for food security purposes.<sup>325</sup>

The Leipzig Declaration also aims to support "plant breeding programmes, including initiatives to adapt and enhance genetic materials for further development by

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<sup>319</sup> CITES, *supra* note 316 see arts. III, IV, and V, online: < <http://www.cites.org/eng/disc/text.shtml> >. (accessed January, 12, 2007).

<sup>320</sup> Berne Convention, *supra* note 317 see art. 313.

<sup>321</sup> Red lists of species in danger of extinction are contained in the Agreement's four annexes, online: < <http://conventions.coe.int/treaty/en/Treaties/Html/104.htm> >. (accessed January, 12, 2007).

<sup>322</sup> Bonn Convention, *supra* note 318.

<sup>323</sup> Chris, Wold, *supra* note 294 at 13-14.

<sup>324</sup> Leipzig Declaration on Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture, Leipzig, Germany, 17-23 June 1996, online: < <http://www.fao.org/ag/AGP/AGPS/GpaEN/Leipzig.htm> >. (accessed January, 12, 2007).

<sup>325</sup> *Ibid.* at 8.

plant breeders.”<sup>326</sup> This international effort covers issues considered in CBD’s Article 15 on access to genetic resources, Article 16 on transfer and access to technology, and Article 19 on the handling of biotechnology and the distribution of its benefits.<sup>327</sup>

The ambiguous language of the CBD also hinders the application of its important provisions. Phrases such as “parties shall, as far as possible and as appropriate”<sup>328</sup> and “parties in accordance with their capabilities and particular conditions,”<sup>329</sup> weaken the force of this Agreement in terms of the implementation of its obligations.

Some academics argue that the ‘over breadth’ of the Convention could become an advantage as it would allow for the coordination of existing agreements that aim to protect specific areas of biodiversity.<sup>330</sup> This possibility, is beginning to crystallize since the CBD Secretariat has participated in several meetings with the executive secretaries of CITES and the Bonn Convention to discuss collaboration among these treaties. A closer collaboration among these treaties is expected to take place in the near future potentially benefiting the implementation of the CBD.<sup>331</sup>

## 2.2 Access to Genetic Resources and Benefit Sharing

Genetic resources are defined in the CBD as “material of plant, animal, microbial, or other origin that contains units of heredity.”<sup>332</sup> These resources, according to the Convention, must be of actual or potential value.<sup>333</sup> Genetic material covered under this

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<sup>326</sup> *Ibid.*

<sup>327</sup> Wold, Chris, *supra* note 294 at 13-14.

<sup>328</sup> CBD, *supra* note 1 art. 5.

<sup>329</sup> *Ibid.* art.6.

<sup>330</sup> Wold, Chris, *supra* note 294 at 22.

<sup>331</sup> CBD, Report on Activities of the Secretariat on the Implementation of the Work Programme of the Convention and its Protocol, (2006), UNEP/CBD/COP/Bur/2006/6, online: < <http://www.biodiv.org/doc/secretariat/activities/activities-2006-report-en.pdf> > at 7. (accessed January, 12, 2007).

<sup>332</sup> CBD, *supra* note 1 art. 2.

<sup>333</sup> *Ibid.*

Agreement could include seeds, cuttings, individual organisms or sperm.<sup>334</sup> The CBD, in Article 15, strives to balance the vast genetic resources of developing countries against the enormous economic resources of developed countries by regulating access to genetic resources.<sup>335</sup>

The CBD also encourages developed countries to compensate developing countries for the utilization of their resources.<sup>336</sup> It has been suggested that by recognizing the absolute right of States over the genetic resources located within their national jurisdiction, the CBD departs from the 'common heritage' approach.<sup>337</sup> The CBD provides, with respect to access to genetic resources, that States shall not impose restrictions that run counter to the sustainable use and conservation of biological resources.<sup>338</sup>

Issues related to the sharing of benefits from the exploitation of genetic resources were considered at the Conference of the Parties (COP) that took place in Curitiba, Brazil from the 20<sup>th</sup> to the 31<sup>st</sup> of March, 2006.<sup>339</sup> The COP's objectives were to facilitate and regulate access to genetic resources according to the objectives of the CBD, to ensure the equitable sharing of monetary and non-monetary benefits from the use of genetic resources and those associated with traditional knowledge, and to establish a mechanism to assert the origin of genetic resources by means of a certificate of origin.<sup>340</sup>

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<sup>334</sup> Glowka, Lyle, *supra* note 3 at 21-22.

<sup>335</sup> Blais, Francois, "The Fair and Equitable Sharing of Benefits from the Exploitation of Genetic Resources: A Difficult Transition from Principles to Reality" at 145 in Le Prestre, Philippe G., (ed), *Governing Global Biodiversity* (Burlington, VT: Ashgate 2002).

<sup>336</sup> CBD, *supra* note 1 art. 15.

<sup>337</sup> Downes, David R., "New Diplomacy for the Biodiversity Trade: Biodiversity, Biotechnology, and Intellectual Property in the Convention of Biological Diversity", (1993) 4 *Touro J. Transnat'l L.* 1. at 9.

<sup>338</sup> CBD, *supra* note 1 see art. 15 (2).

<sup>339</sup> COP 8, March 2006, decision VIII/4, online: < <http://www.biodiv.org/decisions/default.aspx?m=COP-08&id=11016&lg=0> >. (accessed January, 12, 2007).

<sup>340</sup> *Ibid.*

The COP stressed the importance of national legislation or agreements among parties to regulate the transfer of genetic resources. It also stressed the need to base such transfers on the Prior Informed Consent established in Article 15 of the CBD and to take into account the Bonn Guidelines on Access to Genetic Resources provided by the CBD's Conference of the Parties.<sup>341</sup> With respect to the benefits arising from traditional knowledge, national authorities of the provider country, according to the COP, should provide such agreements with the active involvement of the concerned indigenous communities.

Although the COP's guidelines and recommendations regarding the fair sharing of benefits resulting from the transfer of genetic resources shed some light on this issue, the interested parties have not been able to reach a formal consensus on the matter. As has been pointed out by some, this issue raises important questions, such as the definition of fair compensation, the resources to be shared and who should be the beneficiaries of these resources.<sup>342</sup>

The economic factor also plays an important role in these issues. States may feel tempted to overexploit their genetic resources to obtain monetary compensation. Indigenous communities may encounter difficulties not only in seeking compensation for traditional knowledge or techniques in exploiting those resources, but also for the preservation of such traditional knowledge. It is important to note that other venues have been explored to preserve indigenous traditions, culture and the environment in the

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<sup>341</sup> Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization, online: < <http://www.biodiv.org/doc/publications/cbd-bonn-gdls-en.pdf> >. art. 1-3. (accessed January, 12, 2007).

*Ibid.*

<sup>342</sup> Blais, Francois, *supra* note 335 at 150-151. The Conference of the Parties of the Biodiversity Convention developed a series of mechanisms known as the Bonn Guidelines to assure access to genetic resources and the equitable sharing of their benefits. These voluntary guidelines were created to aid States in crafting a policy on access and benefit-sharing. See Bonn Guidelines *supra* note 341.



human rights field, particularly under the International Covenant on Civil and Political Rights (ICCPR)<sup>343</sup> and the Inter-American Commission of Human Rights of the Organization of American States.<sup>344</sup> The potential contributions of this field to the preservation of the environment to this day remain to be seen.

The following section explores the potential of the Prior Informed Consent (PIC) in addressing some of the aforementioned problems related to access to genetic resources and its effectiveness as a foundation for empowering stakeholders in States decisions to transferring genetic resources.

## 2.3 Prior Informed Consent

Governing the transfer of genetic resources is a central part of the CBD. Article 15 establishes a Prior Informed Consent (PIC) procedure as the basis for granting access to other contracting parties to such resources.<sup>345</sup> For some, the idea envisaged in the PIC is rooted in the 17<sup>th</sup> century and is related to democracy and the consent of the governed.<sup>346</sup> This idea, for others, is simply a procedural requirement of international

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<sup>343</sup> International Covenant on Civil and Political Rights, (1996) 999 U.N.T.S. 171, in force in 1976. In *Kitok v. Sweden*, a complaint was launched before the United Nations Human Rights Committee regarding Ivan Kitok's unfairly deprivation of the right to herd reindeer. In this case, the Committee viewed that issues regarding traditional practices could fall under the ICCPR. Under article 27, persons belonging to minority groups "shall not be denied the right, in community with the other members of their group, to enjoy their own culture, to profess and practice their own religion, or to use their own language". See also *Kitok v. Sweden*, No. 197/185, *Kitok v. Sweden*, Dec. of July 27, 1998, UN Doc. A/43/40.

<sup>344</sup> The Inuit Circumpolar Conference (ICC) of Alaska, representing more than 150,000 Inuit filed a complaint before the Inter-American Commission on Human Rights of the Organization of American States regarding the potential effects of United States' inability to take effective actions to prevent climate change. The ICC argued that climate change is dramatically affecting the rights of indigenous peoples, the right to enjoy property with undue interference, the right to life, etc. See Vermont Journal of Environmental Law, An International Commission, Inuit Want to See Change in U.S. Policy on Global Warming, (March, 2, 2007), online: <<http://vjel.org/news/NEWS100058.html>>. (accessed January, 12, 2007).

<sup>345</sup> CBD, *supra* note 1 art. 15.

<sup>346</sup> Wolf, Amanda, "The Emergence and Implementation of the Advance Informed Agreement," in Le Prestre, Philippe G., *supra* note 335 at 129.

environmental law to allow States to enjoy the benefits of genetic resources.<sup>347</sup> Regarding access to genetic resources and the PIC, the Convention states: "Access to genetic resources shall be subjected to prior informed consent of the contracting Party providing such resources, unless otherwise determined by that Party."<sup>348</sup>

The transferring party plays a significant role in the development of a PIC procedure. This party has the responsibility to develop national guidelines and to exchange information on it. It also has discretion to decide whether it will employ the procedures when transferring such resources.<sup>349</sup>

Although the Convention places the burden on States to elaborate PIC mechanisms, guidelines have been developed through the Conference of the Parties to assist States in this matter. The COP, through decision VI/24, adopted the Bonn Guidelines established for the regulation of access to generic resources. These guidelines outline specific requirements for the implementation of the PIC procedures. Its objectives are to contribute to the preservation of biological diversity and to provide parties and stakeholders with a transparent framework to facilitate access to such resources.<sup>350</sup>

Guideline 16 (d), for example, encourages States to seek informed consent relevant to the transfer of genetic resources, to respect the customs, values and traditions of indigenous peoples and to ensure that those resources are used in accordance with the purposes for which they were acquired.<sup>351</sup> Additionally, the Guidelines encourage States to document the PIC procedures.<sup>352</sup>

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<sup>347</sup> Okowa, Phoebe N., "Procedural Obligations in International Environmental Agreements," (1996) 67 *British Yearbook of International Law* 275, in Le Prestre, *Ibid.*

<sup>348</sup> CBD, *supra* note 1 art. 15 (5)

<sup>349</sup> Glowka, Lyle, *supra* note 3 at 80-81.

<sup>350</sup> Bonn Guidelines, *supra* note 341 at I.

<sup>351</sup> *Ibid.* See Guideline 16 (d).

<sup>352</sup> *Ibid.*

Furthermore, the Bonn Guidelines encourage States to base the PIC on legal certainty, transparency and cost effectiveness.<sup>353</sup> The procedures also have to include timing deadlines and mechanisms for consulting relevant stakeholders.<sup>354</sup>

Although the Bonn Guidelines have the potential to aid States in implementing the PIC procedure, they are far from being implemented since they are general and lack any coordination mechanism for such purposes. This situation can dramatically affect not only how States preserve their biological resources, but also how they transfer valuable genetic material. A more active role is required from the COP to monitor the implementation of the guidelines and to ensure that States develop national legislation to operationalize the PIC.

In view of the uncertainties arising from the loose obligations imposed by the CBD and the operationalization of the PIC procedure regarding access to genetic resources, a party's creation and management of protected areas seems a firmer basis for protecting biodiversity under the CBD. The next sub-section considers this issue.

## **2.4 Protected Areas and Indigenous Groups**

A system of protected areas is advocated in the CBD for the preservation of biological resources.<sup>355</sup> It encompasses not only *in situ* protection of biological resources from LMOs and invasive species, but it also links this to the preservation of traditional knowledge and its utilization in preserving biodiversity. Article 8 of the CBD provides that States shall:

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<sup>353</sup> *Ibid.* See Guideline 26.

<sup>354</sup> *Ibid.* See Guideline 27.

<sup>355</sup> CBD, *supra* note 1 art. 8

Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity; Develop, where necessary, guidelines for the selection, establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity.<sup>356</sup>

A strong system of protected areas has the potential to preserve not only biodiversity but also indigenous traditions and traditional knowledge. In spite of this potential, the effectiveness of this strategy has been questioned by the COP of the CBD on the basis of inadequate mapping and lack of resources to manage such areas.<sup>357</sup> In terms of this issue, the World Database of Protected Areas (WDPA) 12% of the world's territory operates under a system of protected areas.<sup>358</sup> These areas have been traditionally known as national parks, natural reserves or heritage sites.<sup>359</sup> Protected areas are defined in the CBD as geographically delineated zones, which are designated or regulated and managed to achieve specific objectives,<sup>360</sup> such as the protection and rehabilitation of biological diversity and ecosystems as provided under Article 8 of the CBD.<sup>361</sup>

COP 8 of the Convention has also considered, in Decision VIII/24, protected areas as an important tool in preserving the world's biological resources.<sup>362</sup> This Decision recognizes that despite the potentials of preserving species in protected areas, practice has shown that such areas do not necessarily encompass the world's ecosystems, nor do they

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<sup>356</sup> *Ibid.* art. 8 (a).

<sup>357</sup> COP decision VIII/24, online:< <http://www.biodiv.org/decisions/default.aspx?m=COP-08&id=11038&lg=0>>. (accessed January, 12, 2007).

<sup>358</sup> Brooks Thomas M. (et al) "Coverage Provided by the Global Protected-Area System: Is it Enough?", (2004) 54 *Bioscience* 12 at 1081.

<sup>359</sup> Glowka, Lyle, *supra* note 3 at 39.

<sup>360</sup> CBD, *supra* note 1 art. 2

<sup>361</sup> *Ibid.* art. 8

<sup>362</sup> COP decision VIII/24, *supra* note 357.

adequately protect critical habitats and endangered species.<sup>363</sup> Consequently, international and national efforts should be aimed at improving management in such areas.

In addition, the Decision proposed curbing the exploitation of resources in existing protected areas and involving indigenous communities in their management and monitoring.<sup>364</sup> As can be seen from this Decision, traditional knowledge and indigenous communities are linked to the operation of the system of protected areas advocated in the CBD. Traditional knowledge, if integrated into such a system, has the potential to contribute to the preservation of biodiversity since traditional communities have, for generations maintained such resources.

In addition to the inadequate mapping of protected areas globally, as acknowledged at the COP 8,<sup>365</sup> lack of enforcement and monitoring have been identified as potential hurdles in the effective implementation of this management system.<sup>366</sup> The system of protected areas, as seen from the COP Decision requires substantial resources to overcome these obstacles in order for them to be an effective biodiversity preservation mechanism. Unless States allocate the necessary funds for this purpose, protected areas are not likely to afford good protection to the world's biological resources. If effectively managed, however, protected areas could usefully incorporate measures to specifically deal with the dangers of LMOs as proposed in the CBD.<sup>367</sup> For example, LMO-free zones could be created in areas where native species originate. The creation of these areas

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<sup>363</sup> *Ibid.*

<sup>364</sup> *Ibid.*

<sup>365</sup> *Ibid.*

<sup>366</sup> Chape, S., (et al), "Measuring the extent and effectiveness of protected areas as an indicator for meeting global biodiversity targets", (2005) 360 Phil. Trans. R. Soc. B. 443. at 450-453. See also "Global Gap Analysis: towards a representative network of protected areas" 5 Advances in Applied Biodiversity Sciences, online: <<http://portals.conservation.org/downloads/storedfile/Document/0x7f0a45b122b828489b23bb76013344c6.pdf>>. (accessed January, 12, 2007).

<sup>367</sup> CBD, *supra* note 1 art. 8 (g).

would not only prevent LMOs from spreading, but would also preserve native plants and indigenous traditions such as saving seeds for future seasons. In the case of Mexico, regions in the south, such as Oaxaca and Puebla where native species of maize exist and where most indigenous communities live, could benefit from the establishment of such zones.

Regarding traditional practices of indigenous communities, the Convention provides that States party shall, as far as possible and as appropriate:

Subject to national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.<sup>368</sup>

According to this provision, States have a commitment to preserve and maintain traditional practices and culture. Indigenous practices may represent the equivalent of scientific method and may provide answers to questions concerning ecosystem and species conservation.<sup>369</sup> Furthermore, States are encouraged to protect biological resources in accordance with traditional knowledge.<sup>370</sup>

The use of GM maize in communities, where ancient traditions are practiced and survival depends on maize cultivation, raises important considerations, such as how States will implement the CBD provisions regarding the preservation of indigenous traditions and how they will integrate traditional knowledge into the sustainable utilization of biological resources. A public participation mechanism should be

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<sup>368</sup> CBD, *supra* note 1 see art. 8 (j)

<sup>369</sup> Potvin, Catherine, (et al), "The Role of Indigenous People in Conservation Actions: A Case Study of Cultural Differences and Conservation Priorities", at 58, in Le Prestre, Philippe G., *supra* note 335.

<sup>370</sup> CBD, *supra* note 1 see art. 10 (c).

implemented to incorporate traditional knowledge to the preservation of biological diversity. Such knowledge, if incorporated into the management of protected areas, can contribute to the preservation of biodiversity and to the management of such areas.

Overall, several flaws exist globally, regarding the *in situ* preservation of biological resources in protected areas. Inadequate mapping, lack of financial resources and monitoring hinder the potential effectiveness of this system. These problems may prevent developing countries from effectively preserving their biological resources and from implementing the provisions of the CBD related to *in situ* preservation through the protected areas strategy. A system of LMO-free zones created under the regime of protected areas has the potential not only to address the threats posed by LMOs but also to preserve traditional knowledge employed in traditional agriculture. A strong public mechanism is required to implement the CBD provisions regarding the incorporation of traditional knowledge into the running of protected areas.

While the protected areas potential is yet to be tapped for effective control of LMO introduction into the environment, it is useful to examine what extent an environmental impact assessment process may help under the CBD. The discussion turns to this next.

## **2.5 Environmental Impact Assessment**

The origins of EIA can be traced back to 1969 in the United States National Environmental Policy Act (NEPA).<sup>371</sup> EIA is required to assess the environmental impacts of major federal activities that could affect the quality of the environment.<sup>372</sup> After it was implemented in the United States, this tool received widespread attention

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<sup>371</sup> Gilpin, Alan, *supra* note 287 at 2-3.

<sup>372</sup> *Ibid.*

internationally and is now employed in many countries.<sup>373</sup> EIA is a project-based decision-making tool aimed at providing a clear view of possible impacts of a project on the environment, human health and economy.<sup>374</sup> EIA considers such factors in determining how best to undertake a project or what the best alternative for doing so may be.<sup>375</sup>

The utilization of an EIA process helps to identify likely harm to biological diversity and how to prevent it by providing the decision maker with grounds to reject projects that will negatively impact the environment. The stages in an EIA process include identifying the impacts of a proposed project on biological diversity.<sup>376</sup> This stage can particularly be problematic, since a broad range of considerations have to be taken into account, such as the effects of LMOs on similar organic species and on insects and habitats in the region where these organisms will be introduced.<sup>377</sup>

Assessments on biodiversity also are extremely difficult since they carry, most of the time, residual or major uncertainties as a result of their complexity and lack of reliable scientific evidence in this field.<sup>378</sup> Economics and technological considerations also come into play in an EIA process. It has been argued that some States may lack the monetary resources or technology to adequately perform such assessment or to scrutinize those that are performed by a proponent.<sup>379</sup>

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<sup>373</sup> *Ibid.*

<sup>374</sup> Ahmad, Yusuf J., *Guidelines to Environmental Impact Assessment in Developing Countries*, (London: Hodder and Stoughton, 1985) at 2.

<sup>375</sup> Gilpin, Alan, *supra* note 287 at 2-3.

<sup>376</sup> *Ibid* at 11.

<sup>377</sup> *Ibid.*

<sup>378</sup> Hart, Stuart & Gordon, Enk, (et al), *Improving Impact Assessment: Increasing the Relevance and Utilization of Scientific and Technical Information*, (Boulder: Westview Press, 1984), at 144.

<sup>379</sup> Wathern, Peter, *Environmental Impact Assessment: Theory and Practice*, (London; New York: Routledge, 1992) at 25. In general it can be assumed that the direct costs of the project may not represent a



Apart from consideration of the impacts, the EIA process also includes the development of alternatives for the proposed project.<sup>380</sup> A conclusion reached at this point can be that another location is more suitable for the project or that employing different technologies could reduce negative impacts on the environment. The process also requires reporting the likely impacts of the project when it is in operation, and accommodation of public views as to undertaking it.<sup>381</sup> The integration of public input into the EIA process presents potential problems, specifically as to economic costs and time delays.<sup>382</sup> This hurdle is perhaps magnified in the case of issues involving the introduction of LMOs in view of the controversies surrounding this activity.<sup>383</sup>

Decision making and monitoring represent the last stages of EIA. Potential problems have already been identified at the point of engaging these two stages.<sup>384</sup> Though it is thought that a more active role on the part of the decision maker in early stages of the EIA would probably generate better choices, some assert that there is no guarantee that the result of the EIA would necessarily impact the decision-making process.<sup>385</sup>

The CBD recognizes the potential role EIA could play in preserving biological diversity. As such it encourages States to minimize adverse impacts on biological diversity by utilizing the procedure. On this matter, the CBD provides that parties shall as far as possible and as appropriate:

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burden for developed countries. In the case of Australia, for example, the direct costs of the projects represented in 1990 1 percent, in Taiwan around 1.5 percent. See Gilpin, Alan, *supra* note 287 at 25-26.

<sup>380</sup> *Ibid.* at 19.

<sup>381</sup> Wathern, Peter, *supra* note 379 at 17-19.

<sup>382</sup> *Ibid.* at 25.

<sup>383</sup> Other obstacles in implementing EIA have been identified as lack of background or historical records of the project, and lack of awareness of biodiversity values. *Ibid.*

<sup>384</sup> Ahmad, Yusuf J., *supra* note 374 at 17-18.

<sup>385</sup> Wathern, Peter, *supra* note 379 at 17-19.

Introduce appropriate procedures requiring Environmental Impact Assessment of its proposed projects that are likely to have significant adverse effects on biological diversity with a view to avoiding or minimizing such effects and, where appropriate, allow for public participation in such procedures.<sup>386</sup>

Due to the potential difficulties that are inherent in this procedure and in light of the lack of guidance provided in Article 14 of the CBD, the COP of the CBD has developed a series of guidelines aimed at guiding States in incorporating EIA into the decision-making process.<sup>387</sup>

The COP5 of the CBD in Decision V/18 invited States to employ the EIA procedure to address loss of biological diversity in conjunction with socioeconomic and human health concerns. It encouraged them to consider biological diversity in early stages of the drafting process of legislation and regulations on biodiversity preservation.<sup>388</sup> Also it urged States to integrate different sectors of society in all stages of the EIA process.<sup>389</sup>

The COP5 also recognized the potential limitations of a project-based EIA and invited States to utilize a Strategic Environmental Assessment (SEA) for enacting policy and national programs.<sup>390</sup> The term SEA was first introduced in a draft report to the Commission of the European Communities. This planning tool has been advocated by the COP also. It has been defined as a systematic and comprehensive process of identifying and assessing the environmental consequences of proposed programmes, plans and

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<sup>386</sup> CBD, *supra* note 1 see art. 14.

<sup>387</sup> CBD, Conference of the Parties 8 (COP8), Decision VIII/ 28. (2006), online: < <http://www.biodiv.org/decisions/default.aspx?m=COP-08&id=11042&lg=0>>. (accessed January, 12, 2007).

<sup>388</sup> CBD, COP5, Decision V/28 on Impact Assessment and Liability and Redress, online:< <http://www.biodiv.org/decisions/default.asp?m=cop-05&d=18>> at 1. (accessed January, 12, 2007).

<sup>389</sup> *Ibid.*

<sup>390</sup> *Ibid.*

policies<sup>391</sup> whose results must be incorporated and taken into account in the early stages of environmental decision making.<sup>392</sup>

The SEA's aim is to guarantee continuity in environmental policy and coordination between projects and national guidelines.<sup>393</sup> In developing countries, for example, it has the potential to provide a more integrated and balanced decision making and to integrate sustainability into policies and plans.<sup>394</sup> In countries like Mexico a SEA would, ideally, aid decision makers in producing strongly coordinated national policies to address the preservation of biological resources and to address the potential threat of LMOs to biodiversity preservation. SEA could potentially facilitate coordination among institutions and legislation on biodiversity preservation and, thus aid in the implementation of the CBD and the Cartagena Protocol in the country.

Decision VIII/28 of COP 8 of the CBD extensively defines EIA and SEA along with the stages and procedures that are required for both. It emphasizes that decision on undertaking projects should ensure that biodiversity preservation considerations should be integrated in the EIA and SEA procedures and that "it is desirable that the proponent and the decision-making body are two different entities."<sup>395</sup> Regarding the balancing of EIA results, Decision VIII/ 28 states that the precautionary approach should be taken into account in cases of scientific uncertainty and that "as scientific certainty improves, decisions can be modified accordingly."<sup>396</sup> Regarding SEA, the COP provides that this

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<sup>391</sup> *Ibid.* See Voluntary Guidelines on Biodiversity Inclusive Impact Assessment. at 23.

<sup>392</sup> Treweek, Joanna, "Incorporating Biodiversity with National Environmental Assessment Processes, (Biodiversity Planning Support Programme," online: < <http://www.unep.org/bpsp/eia%20guide.pdf>>. at 56. (accessed January, 12, 2007).

<sup>393</sup> Dalal-Clayton, Barry & Sadler, Barry, *Strategic Environmental Assessment*, (UK: Earthscan, 2005) at 20-23.

<sup>394</sup> *Ibid.*

<sup>395</sup> CBD, COP8, *supra* note 387, Decision VIII/28 at 23.

<sup>396</sup> *Ibid.*

procedure should be taken into account in the early stages of policy and national program formulation and that a concern for biodiversity preservation should be incorporated.<sup>397</sup> It calls on States to allow the participation of stakeholders and to include their input into both EIA and SEA.<sup>398</sup>

Altogether, EIA and SEA are fundamental tools for implementing the obligations set out in the CBD, particularly regarding the assessment of activities that can potentially harm biological diversity. The rationale behind an impact assessment is to identify projects that are potentially harmful to biodiversity. The aim of the CBD COP 8 Decision VIII/28 is to provide States with guidance and tools on how to create biodiversity-friendly policies and national programs by means of SEA.

Unfortunately, the various COPs of the CBD failed to establish procedures to weigh EIA and SEA. This can be illustrated in the area of 'decision making' in which the COP 6 guideline VI/8 only recognizes that decisions are inherently political and that rejected projects can be resubmitted for reconsideration. Also, the various COPs did not provide guidelines on how to employ the precautionary principle in cases of uncertainty. Lastly, existing COP guidelines do not show States how to effectively utilize public participation and how to weigh public input. Consequently, States are left on their own as to how to use EIA and SEA.

In any case, under the CBD, States are required to employ an EIA and SEA for projects and policies that may impact negatively on biological diversity.<sup>399</sup> Their obligation to preserve natural resources also embodies a commitment to preserve centers of origin of species or plants for their vital role in the preservation of biological resources

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<sup>397</sup> *Ibid.*

<sup>398</sup> *Ibid.*

<sup>399</sup> *Ibid.* art. 14.

globally. Measures to protect native species and plants are to be put in place by parties to the Convention, and for these to be nationally coordinated with their policies on protecting their biological resources.<sup>400</sup> Such policies must contain biosafety legislation and create mechanisms by which to coordinate the activities of secretariats and government agencies with authority over biological resources preservation.

The CBD also demands the establishment of biodiversity reserves and protected areas for the protection of biodiversity along with the creation of zones for the preservation of traditional plants. These zoning systems ideally would include mechanisms to alert actors to products that are for feed or consumption if these should be introduced in remote communities. Indigenous communities would benefit from these measures,<sup>401</sup> and be helped by legislation that advocates respect for indigenous practices and traditional knowledge.<sup>402</sup>

Taken together the obligations to employ EIA and SEA in observing the CBD would for a developing country like Mexico require changes to existing institutions in terms of structure and powers. This means the need to devote substantial financial technical and management resources to make the changes. These concerns, as noted in the introduction to this Chapter, are addressed in Chapters V and VI. For now, the discussion turns to the Cartagena Protocol on Biosafety to lay out its obligations and how they too deepen CBD implementation challenges for Mexico.

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<sup>400</sup> *Ibid.* see art. 6.

<sup>401</sup> *Ibid.* art. 8.

<sup>402</sup> *Ibid.* art. 8(j).

### 3. The Cartagena Protocol on Biosafety

The Cartagena Protocol is the response to the call by the parties to the CBD to address biosafety concerns, specifically the safe transfer and handling of LMOs.<sup>403</sup> After much debate, the Conference of the Parties produced the Jakarta Mandate in November of 1995, under which a working group to negotiate the Cartagena Protocol was established.<sup>404</sup> The first negotiation meetings of the Protocol, which began in 1996, were crucial in determining the priorities and interests of States and in identifying conflicting positions on the issue of LMOs.<sup>405</sup> After lengthy debates, a compromise was reached. The Cartagena Protocol on Biosafety<sup>406</sup> was finally adopted by the Conference of the Parties in January 2000. The Protocol's objective is:

To contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movements.<sup>407</sup>

LMOs regulated in the Protocol are those to be introduced into the environment such as GM plants.<sup>408</sup> Pharmaceutical products,<sup>409</sup> and transgenic Food, Feed and Processing Products (LMO-FFPs) are excluded from the main scope of the Protocol and are regulated under a less onerous exchange of information regime under the Biosafety

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<sup>403</sup> *Ibid.* 1 see art. 19 (3). To February 2007, the Cartagena Protocol has 139 parties.

<sup>404</sup> Gupta, Aarti, "Governing Trade in Genetically Modified Organisms," (2000) 42 Environment 4. at 24.

<sup>405</sup> *Ibid.*

<sup>406</sup> Cartagena Protocol, *supra* note 2.

<sup>407</sup> *Ibid.* art. 1.

<sup>408</sup> *Ibid.*

<sup>409</sup> *Ibid.* see art. 5. LMO-FFPs are regulated in this protocol under a less strict documentation procedure contained in Article 11.

Clearing House Mechanism (BCH) of the CBD.<sup>410</sup> The same exception applies to the use of LMOs that are not for commercial purposes. The Protocol employs a Compliance Committee to oversee the implementation of the Protocol. It also makes use of an Advance Information Agreement (AIA) procedure, risk assessment and the precautionary principle as tools to regulate LMO trade and their transboundary movement.<sup>411</sup>

It is important to note that initiatives are being considered by the CBD Secretariat to aid in the implementation of the Cartagena Protocol. These include: capacity building to aid States in developing regulatory biosafety frameworks to implement the Protocol as provided in Article 22 of the Protocol<sup>412</sup> and the development of a liability and redress regime for damages resulting from the transboundary movements of LMOs.<sup>413</sup>

In spite of the aforementioned initiatives and developments in the Cartagena Protocol, there are several issues that hinder its effective implementation. First, the regulation of LMO trade overlaps with the international trade regime under the governance of the WTO. As such, disputes that arise within the Protocol framework and impinge upon obligations under trade treaties may result in complications assimilable to

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<sup>410</sup> *Ibid.* see art 7(2). Under this Article, safety procedures (AIA) will not apply to LMO-FFPs because they are not to be introduced in the environment.

<sup>411</sup> Cartagena Protocol, *supra* note 2 arts. 1,7,15.

<sup>412</sup> Capacity Building, Cartagena Protocol, COP Decisions Decision BS-III/3, Curitiba, March, 2006; Decision BS-III/4, Curitiba, March, 2006; Decision BS-II/3, Montreal, Canada, 2005; Decision BS-I/5, Kuala Lumpur, Malaysia, 2004, online: <<http://www.biodiv.org/biosafety/articles.shtml?lg=0&a=cpb-22>>. (accessed January, 12, 2007). Article 22 of the Cartagena Protocol provides: The Parties shall cooperate in the development and/or strengthening of human resources and institutional capacities in biosafety, including biotechnology to the extent that it is required for biosafety, for the purpose of the effective implementation of this Protocol, in developing country Parties, in particular the least developed and small island developing States among them, and in Parties with economies in transition, including through existing global, regional, sub-regional and national institutions and organizations and, as appropriate, through facilitating private sector involvement.”

<sup>413</sup> Liability and Redress, Cartagena Protocol, online: <<http://www.biodiv.org/biosafety/issues/liability.shtml>>. (accessed January, 12, 2007).

the proverbial Pandora's Box set of problems.<sup>414</sup> Second, although commodities are not regulated under the Protocol, they have the potential to impact biological diversity if they are introduced into the environment. Third, the requirement of risk assessment by the Protocol may constitute a burden for those States that do not have the technical and economic resources to implement them. Lastly, the precautionary principle may encourage States to indiscriminately ban imports of LMOs.

In view of the foregoing, and with focus on biodiversity conservation, the analysis of the Protocol that follows looks at AIA procedure, the treatment of commodities, risk assessment and the role of the precautionary principle in ensuring that the objectives of the Protocol may be achieved. It also looks at the Protocol's Compliance Committee and its potential for aiding States in the implementation of the Protocol. This discussion sets the stage for considering the Protocol's place within the regulatory regime of international trading and the prospect that the relationship may hold for promoting or stifling biodiversity conservation.

### **3.1 The Advance Information Agreement**

The AIA is the backbone of the Cartagena Protocol. It provides States with guidelines and procedures as how to make decisions on the transfer of LMOs. The idea behind this procedure is that States have a right to know what is being introduced in their territories and that information should be provided in time to enable them to prepare for any potential harm that the transfer may involve. In the worst-case scenario, States have a right to prohibit a product from entering their borders based on the information available

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<sup>414</sup> For Gilbert Winham, regimes are 'vehicles of cooperation but they can also compete such as is the case of the trade and environmental regimes. Winham, Gilbert, *supra* note 225 at 33.



under the AIA.<sup>415</sup> This procedure applies only to LMO introduction into the environment. LMO-FFPs or transgenic commodities are regulated under less stringent procedures under the Biosafety Clearing-House or an information database employed by States to exchange information regarding LMOs and LMO-FFPs.

AIA procedures are embodied in Articles 8, 9 and 10 of the Cartagena Protocol. Article 7 states that the “advance informed agreement procedure shall apply prior to the first intentional transboundary movement of living modified organisms for intentional introduction into the environment of the Party of import.”<sup>416</sup> Furthermore, Article 8 provides that:

The Party of export shall notify, or require the exporter to ensure notification to, in writing, the competent national authority of the Party of import prior to the intentional transboundary movement of a living modified organism that falls within the scope of Article 7.<sup>417</sup>

According to these procedures, the exporting party must communicate a written request to the importer prior to the transfer of LMOs intended to be introduced into the environment.<sup>418</sup> This request should include sufficient information regarding the organisms in question.<sup>419</sup> A request to export LMOs, for example must contain scientific information of the LMOs in question,<sup>420</sup> the intended dates of the transboundary

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<sup>415</sup> The Cartagena Protocol, *supra* note 2 art. 10.3 ( c). In this article, a party can decide to prohibit imports in light to the information provided in the AIA procedure or in light of ‘new’ scientific evidence as stated in art. 12 of the Protocol.

<sup>416</sup> *Ibid.* art. 7.

<sup>417</sup> *Ibid.* art. 8.

<sup>418</sup> *Ibid.* art. 8-10.

<sup>419</sup> *Ibid.* Annex I.

<sup>420</sup> *Ibid*

movement,<sup>421</sup> areas of origin of the organisms and information on the areas where they are likely to proliferate.<sup>422</sup>

The Cartagena Protocol provides that the importing State is obliged to acknowledge receipt of information on those matters from the exporting party within ninety days of receiving it.<sup>423</sup> Also the importing party, in the acknowledgment, must also indicate whether the transfer of LMOs will proceed according to its domestic regulatory framework<sup>424</sup> which according to the Cartagena Protocol, must make rules that are consistent with the provisions of the Protocol.<sup>425</sup>

Article 10 of the Cartagena Protocol establishes the decision-making procedures States must follow for the transfer of LMOs.<sup>426</sup> It also provides that the importing Party must communicate its decision to the Party that intends to transfer LMOs within two hundred and seventy days of the date of receipt of the notification. The decisions that importing Parties must communicate may:

- (a) Approve the import, with or without conditions, including how the decision will apply to subsequent imports of the same living modified organism;
- (b) Prohibit the import;
- (c) Request additional relevant information in accordance with its domestic regulatory framework or Annex I; in calculating the time within which the Party of import is to respond, the number of days it has to wait for additional relevant information shall not be taken into account; or
- (d) Inform the notifier that the notification period required is extended by a defined period of time on account of the time taken up in a request for additional relevant information.<sup>427</sup>

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<sup>421</sup> *Ibid*

<sup>422</sup> *Ibid*

<sup>423</sup> *Ibid.* art. 9 (1).

<sup>424</sup> *Ibid.* art. 9 (c).

<sup>425</sup> *Ibid.* 9 (3).

<sup>426</sup> *Ibid* art. 10.

<sup>427</sup> *Ibid.* art. 10.

The Cartagena Protocol encourages Parties to base their decisions to allow the introduction of LMOs into their territories on risk assessment results, and that such decisions, along with the risk assessment procedures, must be forwarded to the BCH information mechanism.<sup>428</sup>

The BCH is designed to aid States in the implementation of the Cartagena Protocol and in providing updated information regarding LMOs.<sup>429</sup> It is also aimed at assisting decision makers around the world, civil society and the biotechnology industry with decisions involving LMOs.<sup>430</sup> Article 20 of the Protocol provides that the purpose behind the BCH is “to facilitate the exchange of scientific, technical, environmental and legal information on, and experience with, living modified organisms.”<sup>431</sup> This information resource is to assist parties in the implementation of the Protocol.<sup>432</sup>

The BCH contains information on States’ laws, regulations and guidelines employed for the implementation of the Protocol and information related to the AIA.<sup>433</sup> It also contains information on risk assessments or environmental reviews of LMOs, including scientific information of these organisms.<sup>434</sup> The BCH database also contains States’ decisions regarding the import and introduction of LMOs into the environment.<sup>435</sup>

Altogether, the AIA is an essential component of the Cartagena Protocol. It assists Parties in the safe import of LMOs. Once the procedure matures it is likely to guide

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<sup>428</sup> *Ibid.*

<sup>429</sup> United Nations Environment Programme (UNEP), UNEP-GEF Biosafety Projects, Building Capacity for Effective Participation in the Biosafety Clearing-House (BCH) of the Cartagena Protocol on Biosafety (2005), online: <<http://www.unep.ch/biosafety/BCH/files/UNEP-GEF%20BCH%20Project%20EN%20FINAL%20www.pdf>>. at 7. (accessed January, 12, 2007).

<sup>430</sup> *Ibid.*

<sup>431</sup> Cartagena Protocol, *supra* note 2 art. 20.

<sup>432</sup> *Ibid.*

<sup>433</sup> *Ibid.*

<sup>434</sup> *Ibid.*

<sup>435</sup> *Ibid.*

States in the import of LMOs and to ensure and monitor their introduction into the environment. Also by making information relevant to the AIA available in the BCH, States can see what products other States accept and what products are banned from that market. Transgenic commodities or LMO-FFPs, although not scrutinized under the AIA, are regulated under less stringent procedures in the BCH by which States are required to provide information regarding their decision to either import or ban them from their territories.

An analysis of the regulation of LMO commodities follows to assess the Protocol's potential effectiveness in preserving biodiversity.

### **3.2 Commodities in the Context of LMOs**

LMO-FFP commodities are defined in the Cartagena Protocol as "Living Modified Organisms intended for direct use as Food, Feed and Processing."<sup>436</sup> These are exempt from the Advance Information Agreement procedure and are subject to the less onerous procedures under the BCH.<sup>437</sup>

According to the Protocol, Parties exporting LMO-FFPs shall notify others through the BCH within fifteen days of making that decision.<sup>438</sup> They shall also input into the BCH scientific information regarding the LMO-FFPs, suggested methods for the safe handling and transport of these organisms, the location of areas of origin and suggested contingency procedures.<sup>439</sup> Importing parties can decide according to the information in the BCH whether to import LMO-FFPs.<sup>440</sup> States with transitional economies and without

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<sup>436</sup> *Ibid.* art. 7.

<sup>437</sup> *Ibid.* art. 11.

<sup>438</sup> *Ibid.* art. 11 (1).

<sup>439</sup> *Ibid.* Annex I.

<sup>440</sup> *Ibid.* art. 11 (4).

a regulatory framework addressing such introduction may request through the BCH a risk assessment to be undertaken in order to consider the import of LMO-FFPs.<sup>441</sup>

This mechanism utilizes a database that enables States to exchange scientific, technical environmental and legal information on LMOs.<sup>442</sup> It also enables them to make documented decisions about imports, not only regarding shipments of LMO-FFPs but also of LMOs in general. At the time the Protocol entered into force, parties agreed to inform transferring parties that shipments of transgenic commodities “may contain LMOs” as a minimum information requirement.<sup>443</sup>

The inclusion of LMO-FFPs in the Advance Informed Agreement, at the time of the negotiation of the Cartagena Protocol, was thought to require enormous resources on the part of States to monitor imports and to establish documentation procedures.<sup>444</sup> Furthermore, the Cartagena Protocol may no longer adequately reflect the dangers posed by modified organisms. In 1996, in the midst of negotiations of the Cartagena Protocol, there was only one approved type of transgenic soybean. Before the conclusion of the Protocol, in the year 2000, there were more than 50 different types of transgenic crops that were grown commercially.<sup>445</sup> This Protocol may, therefore, not adequately address the real threats posed by LMO-FFPs.

In light of the increase of LMO-FFPs in the market excluding them from the AIA procedure may have adverse impacts on biological diversity because they have the potential to make their way into the environment. In addition, LMO-FFPs can be stored

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<sup>441</sup> *Ibid.* art. 11 (6) (a).

<sup>442</sup> *Ibid.* art. 20.

<sup>443</sup> *Ibid.* art. 18 (2) (a).

<sup>444</sup> Schnier, David J., “Genetically Modified Organisms and the Cartagena Protocol,” (2001) 12 *Fordham Envtl. Law J.* 377. at 408

<sup>445</sup> Pythoud, Francois, “Commodities,” in Bail, Christoph, (eds.) *The Cartagena Protocol on Biosafety, Reconciling Trade in Biotechnology with Environmental Development?*, (London: EarthScan, 2002) at 321.

and planted by farmers in developing countries, such as what happened in the CEC's Maize Case where farmers who lack the resources to buy seeds stored and planted these commodities.<sup>446</sup> The exclusion of LMO-FFPs from the AIA represents a bigger burden for developing countries since this eventually forces them to put financial and technical resources into educating indigenous groups and to establish monitoring mechanisms to prevent these products from entering the environment.

### 3.3 Risk Assessment

Risk assessment is a tool employed for assessing the risk of harm to the environment and human health. It also weighs the acceptability of the considered risks.<sup>447</sup> Risk assessment was traditionally employed to determine the risk of chemical substances.<sup>448</sup> This procedure, however, has broadened its application to several environmental areas, including the risks posed by LMOs as employed in the Cartagena Protocol.<sup>449</sup>

The objective of employing risk assessment in the Protocol, as explained in Annex III, is to: "identify and evaluate the potential adverse effects of living modified organisms on the conservation and sustainable use of biological diversity in the likely potential receiving environment, taking also into account risks to human health."<sup>450</sup> This procedure is thus employed to aid States in deciding on the potential risks of LMOs by providing information accordingly.<sup>451</sup> Furthermore the Cartagena Protocol provides that

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<sup>446</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 15-16. The Transgenic Maize Case will be discussed in detail in Chapter III.

<sup>447</sup> Wathern, Peter, *supra* note 379 at 20-22.

<sup>448</sup> *Ibid.*

<sup>449</sup> Cartagena Protocol, *supra* note 2 See art. 15.

<sup>450</sup> *Ibid.* See Annex III.

<sup>451</sup> *Ibid.*

risk assessment is to be carried out in a “scientifically sound manner and in accordance with the guidelines and requirements provided in Annex III.”<sup>452</sup>

Risk assessment is considered one of the most important components of the Protocol for the protection not only of biological diversity, but also of the environment in general. This is because it provides States with the legal justification to stop LMOs from being imported and introduced into their environment. On this matter, Article 10 of the Cartagena Protocol provides that decisions taken by the Party of import regarding imports of LMOs should be based in the risk assessment results.<sup>453</sup> In addition, this procedure is important for developing countries or States with economies in transition since it aids them in deciding whether to import of LMO-FFPs.<sup>454</sup>

The Cartagena Protocol implies the use of risk assessment to decide on whether to import LMOs. It also implies that the precautionary principle can also be resorted to in making a decision. Thus Article 10 (6) provides:

Lack of scientific certainty due to insufficient relevant scientific information and knowledge regarding the extent of the potential adverse effects of a living modified organism on the conservation and sustainable use of biological diversity in the Party of import, taking also into account risks to human health, shall not prevent that Party from taking a decision, as appropriate, with regard to the import of the living modified organism in question as referred to in paragraph 3 above, in order to avoid or minimize such potential adverse effects.<sup>455</sup>

But this does not indicate how to balance the uncertainty regarding the potential effects of LMOs on the environment.<sup>456</sup> For example, although Annex III outlines the

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<sup>452</sup> *Ibid.* See Annex III.

<sup>453</sup> *Ibid.* art. 10.

<sup>454</sup> *Ibid.*

<sup>455</sup> *Ibid.* art. 10 (6).

<sup>456</sup> According to the United Nations Environment Program, almost two million species that exist have been discovered and there is greater speculation among scientists on the number of species that have not been discovered yet. See B. Groombridge and M. Jenkins, *Global Biodiversity Earth's Living Resources in the 21<sup>st</sup> century*, (Cambridge: World Conservation Press, 2000) at 15.

methodologies and procedures for conducting risk assessment, it does not guide States on how to incorporate the precautionary principle into the risk assessment procedure.<sup>457</sup>

Altogether, risk assessment is a central part in the implementation of the Cartagena Protocol, this procedure aids States in identifying the risks posed by LMOs and it guides States in decisions to import those products under Article 10. In spite of the importance of risk assessment, several problems emerge particularly when it is performed between two economies in transition that do not possess the technology and the required resources to perform such assessments. In such case biodiversity protection would be subject to whether they have financial resources and technology to invest in doing the required risk assessments before importing LMOs.<sup>458</sup> An assessment of risk under these circumstances would probably result in inadequate protection of biological diversity. Risk assessment could be rendered substantially less difficult if the results of such assessments were scrutinized or performed by an independent body established under the Convention, and if technical and financial assistance was provided to developing countries to build their technical and scientific capacities to perform such assessments.

The largely loose process of regulating LMOs as commercial commodities and the likelihood that importing States, most of which are developing States that lack the capacity to undertake risk assessment to assist their import decisions, would seem to make observation of the precautionary principle under the Protocol another safety mechanism for biodiversity protection. While the principle holds such a potential, again its actual usefulness requires scientific and technical competence. We look at this issue next.

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<sup>457</sup> Cartagena Protocol, *supra* note 2 art. 15.

<sup>458</sup> Section (3) of Article 15 of the Protocol, provides that the party of import can also require that the costs of risks assessment be borne by the exporter.



### 3.4 The Precautionary Principle

#### *Background*

The 1984 Bremen Ministerial Declaration of the International Conference on the Protection of the North Sea borrowed the use of the precautionary principle from German law.<sup>459</sup> At that time, States fully relied on science and so, in the absence of scientific evidence, it was thought that they had no basis for controlling emissions and harmful substances.<sup>460</sup> Article 7 of the Bremen Declaration contains the first mention of the precautionary principle at the international level; the purpose of the Bremen Conference was to protect the North Sea from the most dangerous substances even before a causal link could be established by clear scientific evidence.<sup>461</sup> Later, the principle gained worldwide recognition in the 1992 Rio Declaration.<sup>462</sup> Principle 15 of the Rio Declaration states:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.<sup>463</sup>

In addition to the Ministerial Declaration and the UNCED, this principle has been defined in various ways in multilateral agreements,<sup>464</sup> some of which contain more stringent and others weaker versions of the principle. An illustration of a strong version

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<sup>459</sup> Sadeleer, Nicolas de., *Environmental Law Principles From Political Slogans to Legal Rules*, (Oxford: Oxford University Press, 2002). at 93.

<sup>460</sup> Cooney, Rosie, *The Precautionary Principle in Biodiversity Conservation and Natural Resource Management* (IUCN Policy and Global Change Series No. 2., 2004) at 6.

<sup>461</sup> *Ibid.* at 7 -8.

<sup>462</sup> Freestone, David & Hey, Ellen, *supra* note 283 at 3.

<sup>463</sup> Rio Declaration, *supra* note 281.

<sup>464</sup> Freestone, David & Hey, Ellen, *supra* note 283 at 4.

of this principle is the implementation of 'reverse listings' for ocean dumping,<sup>465</sup> while the United Nations Framework Convention for Climate Change (UNFCCC)<sup>466</sup> represents an example of a weak version of this principle since it constraints the application of the principle by cost-effective factors.<sup>467</sup>

The precautionary principle emerges as a rejection of the Assimilative Capacity Model (ACM).<sup>468</sup> This model determines the capacity of ecological systems to withstand a particular activity.<sup>469</sup> The ACM fully relies on science and assumes that it can restore environmental equilibrium and health.<sup>470</sup> The precautionary principle marks a new era in environmental law and policy.<sup>471</sup> Rather than reacting to environmental problems, it seeks to protect human health and the environment by anticipating harm.

It is important to note that there has been considerable debate over the relationship of this principle to science. This principle, as argued by some, does not negate the need for science.<sup>472</sup> It requires scientific knowledge for the protection of the environment.<sup>473</sup> However, it challenges scientists to search for answers in light of new technologies and their effects on the environment.<sup>474</sup> The degree to which this principle

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<sup>465</sup> VanderZwaag, *supra* note 285 at 357-358.

<sup>466</sup> United Nations Conference on Environment and Development: Framework Convention on Climate Change, May 9, 1992, 31 I.L.M. 849.

<sup>467</sup> VanderZwaag, David, *supra* note 285 at 362-363.

<sup>468</sup> Puttagunta, Saradhi P., "The Precautionary Principle in the Regulation of Genetically Modified Organisms," (2000) 9 Health Law Review 10. at 12.

<sup>469</sup> *Ibid.* See also Shipworth, D. & Keneley, R., "Fitness Landscapes and the Precautionary Principle: The Geometry of Environmental Risk," (1999), 24 *Envir. Manag.* 121. at 122-124.

<sup>470</sup> McIntyre, O., & Mosedale, T., "The Precautionary Principle as a Norm of Customary International Law", (1997) 9 *J. Envtl. L.* 221 at 224.

<sup>471</sup> VanderZwaag, David, *supra* note 285 at 357-358.

<sup>472</sup> Mee, Laurance David, "Scientific Methods and the Precautionary Principle" in Freestone, David & Hey, Ellen, *supra* note 283 at 109.

<sup>473</sup> *Ibid.*

<sup>474</sup> *Ibid.*

clashes with science depends on its formulation.<sup>475</sup> Stringent versions require that the proponent of an activity shows that activity to be safe and that it will not impact the environment in an adverse manner.<sup>476</sup> It can be affirmed, however, that all activities involve some kind of risk, some greater than others.<sup>477</sup>

Less stringent versions of the precautionary principle depart from zero risk, but are conditioned by economic factors. In other words, an activity will be restricted only if the measure is not cost-effective. To an extent, some of the more stringent versions can be criticized for demanding too high a degree of reliance on science. This may be problematic since there is substantial uncertainty about the long-term effects of LMOs on biodiversity.

### **3.4.1 The Precautionary Principle and the Cartagena Protocol**

To some, the inclusion of the precautionary principle in the Protocol represents its strongest enunciation.<sup>478</sup> The precautionary principle is reflected in the PIC, the AIA and the risk assessment procedures. As noted earlier, Art. 10 (6) of the Protocol<sup>479</sup> formulates the Protocol's version of the principle. In practice, it appears that the Protocol allows State parties to apply the principle to imports of LMO-FFPs in cases of uncertainty.<sup>480</sup> Specifically, it helps them in their assessment of the risk that may be engaged in such imports.<sup>481</sup>

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<sup>475</sup> Foster, Kenneth R., (et al) "Science and the Precautionary Principle," (2000), 288 Science 979. at 979-981.

<sup>476</sup> *Ibid.* at 979-981.

<sup>477</sup> Sunstein, Cass R., "Beyond the Precautionary Principle", (2003) 151U.Pa. L. Rev. 1050. at 1016.

<sup>478</sup> Schinier, David J., "Genetically Modified Organisms & the Cartagena Protocol", (2001) 12 Fordham Envtl. Law J. 377. at 411.

<sup>479</sup> Cartagena Protocol, *supra* note 2 art. 10 (6).

<sup>480</sup> *Ibid.* art. 11(8).

<sup>481</sup> *Ibid.*

In spite of the numerous formulations of the principle and the lack of uniformity in its application,<sup>482</sup> three consistent elements can be distinguished in its provisions under the Protocol. First, there is a threat of harm; second, a lack of scientific certainty or evidence; and third, necessity or duty to act. Although there is no consensus on the degree of harm that is needed to trigger precaution,<sup>483</sup> some enunciations state that the damage must be serious or irreversible; this requirement is used on its formulation in the Rio Declaration.<sup>484</sup>

The Cartagena Protocol, however, requires 'potential' damage and 'adverse effects' to act as catalysts for resort to precaution.<sup>485</sup> Uncertainty of evidence refers to situations where knowledge is incomplete, or scientific information is simply not available at the time the activity is being considered.<sup>486</sup>

The precautionary principle has been criticized for lacking guidelines for its application at the international level.<sup>487</sup> Although there is no consensus as to which measures to apply to certain activities,<sup>488</sup> precautionary regulations of LMOs may require policy makers to act by reversing the burden of proof, requiring the activity's proponent to demonstrate that these organisms will not have an adverse effect on human health or the environment. Eventually, in the strongest application of this principle, LMOs might be prohibited from entering the market.<sup>489</sup> Other indirect measures have been suggested to support the application of this principle, and they include super funds or monetary

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<sup>482</sup> Hickey, James E. Jr., & Walker, Vern R., "Refining the Precautionary Principle in International Environmental Law", (1995) 14 Va. Env'tl. L. J. 423. at 424-425.

<sup>483</sup> VanderZwaag, David, *supra* note 285 at 359.

<sup>484</sup> Rio Declaration, *supra* note 281.

<sup>485</sup> Cartagena Protocol, *supra* note 2 art. 11.

<sup>486</sup> McIntyre, O., & Mosedale, T, *supra* note 470.

<sup>487</sup> Sunstein, Cass R., *supra* note 477 at 1011-1013.

<sup>488</sup> *Ibid.* at 1003-1005.

<sup>489</sup> *Ibid.* at 1019-1021.

deposits made prior to the activity, EIA<sup>490</sup> and the development of a liability regime, such as that proposed in Article 27 of the Cartagena Protocol.<sup>491</sup>

The inclusion of the principle in the Protocol represents a shift in the burden of proof in the case of LMO trade since exporter States are required to demonstrate in the assessment of risks that LMOs will not pose a threat to biological diversity. Although the exercise of precaution with regard to LMOs has the potential to aid States and to help protect biodiversity, there are still unresolved issues regarding its use under the Protocol. One of the most important of these is the lack of guidelines for its application and its possible arbitrary application by States in a manner that may increase friction with their obligations under other regimes such as global free trade.

Altogether, it would seem that for developing States such as Mexico, the presence of the precautionary principle becomes a double-edged sword in their effort to preserve biodiversity. While they are apparently entitled to err on the side of caution to ensure biodiversity under this principle, by so doing, they also risk trade disputes as it will be discussed in the next section, most likely with the developed exporters of LMOs. At best, the Protocol heightens tension between the obligation to preserve biodiversity and the need to ensure free trade. Mexico, which needs both in order to realize its economic potential as a nation, must therefore balance the demands of the short-term benefits of trade with the long-term necessity of ensuring environmental protection.

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<sup>490</sup> Vanderzwaag, David L., Fuller, Susanna D., Myers, Ransom A., "Canada and the Precautionary Principle/Approach in Ocean and Coastal Management: Wading and Wandering in Tricky Currents", (2002/2003) 34 Ottawa L. Rev. 117. at 119 -120. (Heinonline).

<sup>491</sup> The Cartagena Protocol has proposed the creation of a liability regime in art. 27, where it states that parties shall "adopt a process with respect to the appropriate elaboration of international rules and procedures in the field of liability and redress for damage resulting from transboundary movements of living modified organisms" See the Cartagena Protocol in *supra* note 2.

### 3.5 The Cartagena Protocol's Compliance Committee

Internal compliance mechanisms seem to be an indispensable element of MEAs.<sup>492</sup> The widespread use of these mechanisms, for some, demonstrates a departure from the bilateral relationship in international law between the injured and non-complying States, and embraces a new collective approach in which States party to an environmental agreement and non-complying States participate. Among academics, the existence of compliance mechanisms has sparked considerable debate regarding the ability of these mechanisms to influence conduct and to bring compliance to the provisions of an agreement.<sup>493</sup> Some argue that the inclusion of these non-compliance mechanisms into an environmental agreement imply that the agreement's provisions are flexible and subject to negotiation and that this flexibility cheapens international law.<sup>494</sup> Others argue that these mechanisms are necessary to achieve compliance and, while they may soften international rules, they aid to achieve the goals of the international agreement. It is argued as well that these mechanisms are an effort to build consensus.<sup>495</sup> In spite of this debate, it can not be denied that these mechanisms bring flexibility and implementation hope to the rigid and, sometimes, titanic endeavor of implementing environmental agreements and that they identify implementation problems related to lack of resources and capacity building deficiencies.<sup>496</sup>

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<sup>492</sup> Gunther Handl, "Compliance Control Mechanisms and International Environmental Obligations" (1997) 5 Tul. J. Int'l & Comp. L. 29 at 32.

<sup>493</sup> Klabbbers, Jan, *Compliance Procedures*, in Bodansky, Daniel, Brunnee, Jutta and Hey, Ellen (et al), *The Oxford Handbook of International Environmental Law*, (New York: Oxford University Press, 2007) at 1003.

<sup>494</sup> *Ibid.* at 1007-1009. See also Ronald, Mitchell B., *Compliance Theory: Effectiveness, and Behavior Change in International Environmental Law*, in *Ibid.* at 910-911.

<sup>495</sup> Gunther Handl, *supra* note 492 at 37.

<sup>496</sup> Klabbbers, Jan, *supra* note 493 at 1003.

UNEP has developed a Manual 'Compliance with and Enforcement of Multilateral Environmental Agreements' (UNEP's Manual on Compliance)<sup>497</sup> to guide States in creating compliance mechanisms. It provides that compliance bodies may be created in environmental agreements to review and assess instances of non-compliance and to provide or facilitate capacity assistance to Parties having difficulties.<sup>498</sup> UNEP's Manual on Compliance also provides that "non-compliance is frequently the result of incapacity rather than intentional disregard for an agreement's rules; and in these circumstances, assistance arguably is more appropriate than penalization" and that compliance mechanisms must distinguish between violations arising from a lack of capacity to comply and those related to intentional non-compliance.<sup>499</sup>

Similar to other environmental agreements, the Cartagena Protocol employs a Compliance Committee to aid parties in the fulfillment of their obligations in this Agreement.<sup>500</sup> The Committee was created by decision BS-I/7 of the Conference of the Parties serving as the meeting of the Parties to the Protocol (COP-MOP).<sup>501</sup> It aims to identify non compliance issues from State Reports and information that countries make

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<sup>497</sup> United Nations Environment Programme, Division of environmental Law and Conventions, Manual on Compliance with Enforcement of Multilateral Environmental Agreements, guideline 14 (d), online:< <http://www.unep.org/dec/onlineManual/Compliance/NegotiatingMEAs/ComplianceMechanisms/tabid/429/Default.aspx>>. (accessed January, 12, 2007).

<sup>498</sup> *Ibid.*

<sup>499</sup> *Ibid.*

<sup>500</sup> Compliance Committee, Cartagena Protocol, online:<<http://www.biodiv.org/biosafety/issues/compliance.shtml>>. (accessed January, 12, 2007). The Cartagena Protocol's "Compliance Committee" is composed of 15 members nominated by Parties and elected by the COP. The Compliance Committee, aiming to promote compliance can take the following measures: (a) providing advice or assistance to the Party concerned; (b) making recommendations to the COP on the provision of financial and technical assistance, technology transfer, training and other capacity building measures. Furthermore, the Compliance Committee, decide a) to provide financial and technical assistance to a party, or to issue a caution to the concerned Party regarding its non compliance.

<sup>501</sup> Convention on Biological Diversity, Compliance Committee under the Cartagena Protocol on Biosafety, UNEP/CBD/BS/CC/3/3, Kuala Lumpur, 5-7 March 2007, online:< <http://www.biodiv.org/doc/meetings/bs/bccc-01/official/bccc-01-04-en.pdf>>. (accessed May, 28, 2007).

available to the Secretariat through the Biosafety Clearing House Mechanism.<sup>502</sup> It is integrated by representatives of 15 States party to the Protocol which are elected, based on geographical representation, by the Protocol's Conference of the Parties.

The Compliance Committee was created in accordance with Article 34 of the Protocol which, on compliance matters, provides that the Conference of the Parties serving as the meeting of the parties to the Protocol "shall consider and approve cooperative procedures and institutional mechanisms to promote compliance with the provisions of this Protocol and to address cases of non-compliance."<sup>503</sup> This Article also provides that the objective of the compliance mechanisms in the Protocol shall include provisions to offer advice or assistance, where appropriate and that they shall be separate from the dispute settlement procedures and mechanisms established in Article 27 of the CBD.<sup>504</sup>

Compliance submission issues can be submitted to the CBD's Secretariat by any State. Measures employed the Committee in addressing compliance claims include a recommendation to the Conference of the Parties to provide financial and technical assistance, capacity building and technology transfer. In addition the Committee can assist States to elaborate plans of action to address compliance issues,<sup>505</sup> as well as to issue a caution, and to publish non compliance issues in the Biosafety Clearing House Mechanisms.<sup>506</sup>

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<sup>502</sup> *Ibid.*

<sup>503</sup> Cartagena Protocol, *supra* note 2 at 34.

<sup>504</sup> *Ibid.*

<sup>505</sup> Cartagena Protocol, Issues of Compliance, the Compliance Committee, online: < <http://www.biodiv.org/biosafety/issues/compliance.shtml> >. (accessed May, 28, 2007).

<sup>506</sup> *Ibid.*



In the third meeting of the Compliance Committee in Kuala Lumpur, Malaysia in March 2007,<sup>507</sup> several issues were raised with respect to compliance mechanisms in the Cartagena Protocol, particularly with respect to the measures that the Committee could employ in cases of non-compliance by party members. It was agreed in this meeting that persistent non-compliance and lack of efforts to comply by a State party should be taken into account in assessing a party's compliance with the Protocol.<sup>508</sup>

Altogether, the Cartagena Protocol's Compliance Committee has enormous potential to contribute internationally to the implementation of the Cartagena Protocol. This recently created Committee needs to comprise effective mechanisms to strengthen the implementation of the Cartagena Protocol. The Committee, for example, in search for issues of non-compliance, can go beyond State Reports and take into account reports from international organizations for such matters. Also, compliance with the Protocol could be dramatically improved if the Committee would establish a mechanism of public complaints in which international organizations, indigenous groups and in general citizens of States party to the Protocol could bring issues of potential violations to the Protocol before the Compliance Committee.

#### **4. The Cartagena Protocol and Trade Agreements**

The relationship of the Cartagena Protocol to international trade agreements is perhaps the most controversial element in the regulation of LMOs, particularly where the Protocol and the WTO Agreements converge in the regulation of LMO trade. The Protocol permits State parties to ban imports based on a risk assessment and in cases of

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<sup>507</sup> Convention on Biological Diversity, Compliance Committee under the Cartagena Protocol on Biosafety, *supra* note 500.

<sup>508</sup> *Ibid.*

scientific uncertainty according to the precautionary principle. Measures allowed by the Protocol have the potential to clash with those advocated by the WTO. On the other hand, the international trade regime affords protection to natural resources based on a stringent risk assessment and international standards. These two approaches appear to be incompatible.<sup>509</sup>

The WTO emerged on April 15, 1994, predicated on the General Agreement on Tariffs and Trade of 1947.<sup>510</sup> The establishment of the WTO also introduced resolutions regarding the environment. In its preamble, the WTO Agreement states:

Expanding the production of and trade in goods and services, while allowing for the optimal use of the world's resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment and to enhance the means for doing so in a manner consistent with their respective needs and concerns at different levels of economic development.<sup>511</sup>

In 1995, the Committee on Trade and the Environment was created to promote sustainable development and to identify a relationship between trade and environment.<sup>512</sup>

This Committee was created at the behest of the WTO at the end of the Uruguay Round.<sup>513</sup> WTO decisions since then have addressed trade issues that substantially relate to the environment.<sup>514</sup>

With respect to the relationship with other agreements, the Cartagena Protocol states in its preamble:

[Recognizes] that trade and environment agreements should be mutually supportive with a view to achieving sustainable development, [and emphasizes]

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<sup>509</sup> Winham, *supra* note 225 at 2-3.

<sup>510</sup> Macmillan, Fiona, *WTO and the Environment*, (London: Sweet & Maxwell, 2001) at 7.

<sup>511</sup> See preamble of Marrakech Agreement of the World Trade Organization, Annex 1A, Legal Instruments of the Uruguay Round vol.1, 33 I.L.M. 1154(1994).

<sup>512</sup> Macmillan, *supra* note 510 at 12.

<sup>513</sup> *Ibid.* at 12-13.

<sup>514</sup> *Ibid.* at 12-16. Among the cases the WTO has addressed are: the Tuna-Dolphin cases, The Automobiles case, The Reformulated Gasoline and the Sea Turtle Case.

that [the] Protocol shall not be interpreted as implying a change in the rights and obligations of a Party under any existing international agreements.<sup>515</sup>

The savings clause embedded in the preamble of the Protocol acknowledges that conflicts should not arise between the environmental and trade agreements, and that the Protocol does not intend to change obligations contained in other international agreements.<sup>516</sup> This clause perhaps reflects the unique precautionary regulation in the Protocol with respect to LMO trade as opposed to different standards set by the General Agreement on Tariffs and Trade,<sup>517</sup> the SPS Agreement,<sup>518</sup> the Agreement on Technical Barriers to Trade,<sup>519</sup> and NAFTA.<sup>520</sup> Even so, the Protocol states that it:

..Is not intended to subordinate this Protocol to other international agreements.<sup>521</sup>

The foregoing contradictory dispositions in the preamble of the Cartagena Protocol regarding its relationship with other international agreements that similarly regulate the movement of LMOs create problems with agreements in the trade area. For some, this contradiction is minimized by their being in the preamble rather than in the operative part of the Protocol.<sup>522</sup> Others argue that a savings clause “only indicates whether a party’s rights and obligations under earlier agreements continue or whether those rights and obligations apply only if compatible with the provisions of the later

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<sup>515</sup> Cartagena Protocol, *supra* note 2, see preamble.

<sup>516</sup> Winham, *supra* note 225 at 2.

<sup>517</sup> GATT, *supra* note 228.

<sup>518</sup> SPS Agreement, *supra* note 229.

<sup>519</sup> TBT Agreement, *supra* note 230.

<sup>520</sup> NAFTA, *supra* note 5.

<sup>521</sup> Cartagena Protocol, *supra* note 2, see Preamble.

<sup>522</sup> Laidlaw, Anais K., “Is it Better to be Safe than Sorry? The Cartagena Protocol versus the World Trade Organization”, (2005) 36 *Vict. U. Wellington L. Rev.* 427. at 444.

agreements.”<sup>523</sup> This implies that the Protocol both acknowledges the continuing validity of the WTO regime for its parties while seeking to carve space for its objectives to be realized.

As it is however, the impasse creates and obscures relationship between the Protocol and the WTO Agreements and complicates matters for a State like Mexico in terms of its obligations under both regimes. Unless integration is achieved between these regimes, such as is proposed in the WTO 4th Ministerial Declaration of November of 2001 (Doha Declaration),<sup>524</sup> Mexico will be tempted to comply primarily with the well structured international trade regime, thereby putting at risk its biological resources in the name of economic development.

A more detailed analysis of the Cartagena Protocol’s relationship and agreements in the international trade regime follows particularly with relation to the exceptions in GATT’s Article XX, the SPS and the TBT Agreements.

#### **4.1 The Cartagena Protocol and GATT Exceptions in Article XX**

GATT was inspired by a post World War II idea to more effectively organize the international community,<sup>525</sup> and came into force provisionally at the beginning of 1948.<sup>526</sup> Although GATT’s objectives are the gradual elimination of trade barriers, Article XX allows States to impose barriers in certain cases. The SPS Agreement<sup>527</sup> and

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<sup>523</sup> Safrin, Sabrina, “The Relationship with other Agreements: Much Ado with a Savings Clause,” in Bail, Christoph, *The Cartagena Protocol on Biosafety, Reconciling Trade in Biotechnology with Environmental Development?* *supra* note 445.

<sup>524</sup> World Trade Organization, 4<sup>th</sup> Ministerial Declaration, (9 to 14 of November of 2001), online: < [http://www.wto.org/English/thewto\\_e/minist\\_e/min01\\_e/mindecl\\_e.pdf](http://www.wto.org/English/thewto_e/minist_e/min01_e/mindecl_e.pdf) >. at 6-8. (accessed January, 12, 2007).

<sup>525</sup> Terence, Stewart P., (ed), *The World Trade Organization: Multilateral Trade Framework for the 21<sup>st</sup> Century and U.S. Implementing Legislation*, (Washington, DC: American Bar Association, 1996) at 5.

<sup>526</sup> *Ibid.* at 6.

<sup>527</sup> SPS Agreement, *supra* note 229.

the TBT<sup>528</sup> Agreements set out specific rules for determining the conditions of such barriers.

GATT imposes several obligations upon member States.<sup>529</sup> Three of the most relevant are the 'Most-Favoured- Nation Treatment' (MFNT), the 'National Treatment' Principle (NTP) and the prohibition from imposing quantitative restrictions on trade.<sup>530</sup> Substantial litigation has been brought before the WTO panels regarding infringement of these provisions.<sup>531</sup> In addition, GATT contains exceptions in Article XX allowing States to impose bans aimed to protect: a) human health and plant life, and b) the conservation of natural resources. The aforementioned rules and exceptions essential to GATT's regime are analyzed subsequently.

The MFNT principle is contained in Article I, according to which "any advantage, favor, privilege or immunity granted by any contracting party to any product originating in or destined for any other country shall be accorded immediately and unconditionally to the like product originating in or destined for the territories of all other contracting parties."<sup>532</sup>

The National Treatment Principle is contained in Article III, according to which

The products of the territory of any contracting party imported into the territory of any other contracting party shall be accorded treatment no less favorable than accorded to like products of national origin in respect of all laws, regulation and requirement affecting their internal sale.<sup>533</sup>

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<sup>528</sup> TBT Agreement, *supra* note 230.

<sup>529</sup> Macmillan, *supra* note 510 at 69.

<sup>530</sup> *Ibid.* at 69-70.

<sup>531</sup> *Ibid.* at 69-82.

<sup>532</sup> GATT, *supra* note 228 Article I (1).

<sup>533</sup> *Ibid.* art. III

Furthermore, Article XI forbids States to impose quantitative restrictions on exports and imports.<sup>534</sup> If they act contrary to this disposition, the measure in question would be deemed technically a 'zero quota' or a restriction and constitute a *prima facie* violation of GATT.<sup>535</sup> It also contains exceptions to the prohibition of quantitative restriction, such as when States aim to "prevent or relieve critical shortages of foodstuffs",<sup>536</sup> when these restrictions are necessary to "the application of standards or regulations for the classification, grading or marketing of commodities in international trade", etc.<sup>537</sup>

According to the GATT interpretation to this Article, the exceptions in Article XI can potentially lead to conflicts between the trade and environmental regimes, particularly with respect to the regulation of trade in threatened species under CITES<sup>538</sup> and transboundary movement of hazardous waste under the Basel Convention.<sup>539</sup> The provisions of GATT Article XI, however, have never been challenged under these MEAs.<sup>540</sup>

The definition of products under GATT also has the potential to ignite conflicts in the regulation of LMOs. Precautionary regulation under the Cartagena Protocol may be

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<sup>534</sup> *Ibid.* art. XI.

<sup>535</sup> Crawford, Christine, "Conflicts Between the Convention on International Trade in Endangered Species and the GATT in Light of Actions to Halt the Rhinoceros and Tiger Trade", (1995) *Geo. Intl. Env'tl. L. Rev.* 555, at 572; see also Cameron, Shawn Morton, Discussion Paper: "The use of Trade Sanctions in Multilateral Environmental Agreements and the Interaction with GATT: Flipper Meets Gattzilla," (1996), online: <<http://www.web.ca/~smorton/wto-meas.html>>. (accessed January, 12, 2007).

<sup>536</sup> GATT *supra* note 228 see art. XI (a).

<sup>537</sup> *Ibid.* see art XI (b).

<sup>538</sup> United Nations Environment Programme, *Environment and Trade a Handbook*, (Canada: International Institute for Sustainable Development, 2005) at 36-37.

<sup>539</sup> Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, 28 I.L.M. 657, 1673 U.N.T.S. 57, online: <<http://www.basel.int/text/con-e.pdf>>. (accessed January, 12, 2007).

<sup>540</sup> Crawford, Christine, *supra* note 535 at 570-572.

problematic particularly in light of the definition of a 'like product' and the ostensible product regulation the WTO has employed for products.<sup>541</sup>

Article 2.6 of the Agreement on the implementation of GATT Article VI on Antidumping and Countervailing Measures reads as follows:

Throughout this Agreement the term 'like product' (*produit similaire*) shall be interpreted to mean a product which is identical, i.e. alike in all respects to the product under consideration, or in the absence of such a product, another product which, although not alike in all respects, has characteristics closely resembling those of the product under consideration.<sup>542</sup>

This definition could be crucial in regulating LMOs since these organisms could be technically considered similar to organic products in the GATT Agreement because, in spite of genetic manipulation, their composition will remain almost identical or identical to organic products. An examination of relevant litigation suggests also that GATT looks at the end product, rather than the process of production.<sup>543</sup> If the WTO Panels decide to take this approach to regulate LMOs, it will be largely impossible to sustain bans on LMOs based on the precautionary principle since LMOs are almost identical to their organic counterparts.

This interpretation was reiterated in a case before the WTO between Canada and the EC where the appellate body stated again the relevant considerations:<sup>544</sup> a) States have freedom to choose the level of protection; b) scientific evidence must serve as the

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<sup>541</sup> Macmillan, *supra* note 510 at 22-26.

<sup>542</sup> Agreement on Implementation of Article VI of the GATT 1994, online: <[http://www.wto.org/english/docs\\_e/legal\\_e/19-adp.pdf](http://www.wto.org/english/docs_e/legal_e/19-adp.pdf)>. (accessed January, 12, 2007).

<sup>543</sup> Gehring, Markus & Cordonier-Segger, Marie-Claire, "Precaution in World Trade Law: The Precautionary Principle and its Implications for the World Trade Organization", Center for International Sustainable Development Law (CISDL) Research Paper (2003), online: <[http://www.cisdl.org/pdf/brief\\_precaution\\_trade.pdf](http://www.cisdl.org/pdf/brief_precaution_trade.pdf)>. (accessed January, 12, 2007).

<sup>544</sup> European Communities Measures Affecting Asbestos and Asbestos Containing Products WT/DS135/AB/R 12 March, 2001. online: <<http://docs.wto.org/DDFDocuments/t/WT/DS/135ABR.doc>>. (accessed January, 12, 2007).

basis for protective measures or the 'level of protection'; and, c) the definition of likeness includes physical properties, end of use, and consumer habits.<sup>545</sup>

Despite rules and principles in GATT, there are exceptions that States can apply under special, specific circumstances. These are contained in Article XX.<sup>546</sup> States can apply these when "necessary to protect human, animal or plant life or health."<sup>547</sup> A similar clause is contained in part (g), which refers to measures "related to the conservation of exhaustible natural resources."<sup>548</sup>

An illustration of the application of GATT's Article XX exceptions was the decision of the WTO panels in the "Shrimp-Turtle Case."<sup>549</sup> The decision in the Shrimp-Turtle Case involved Section 609 of the US Endangered Species Act.<sup>550</sup> This Act aimed to protect turtles by requiring the US to certify that imported shrimp were caught with "turtle excluder devices."<sup>551</sup> In 1997, India, Malaysia, Pakistan and Thailand brought a joint complaint against the US shrimp ban before the WTO dispute settlement bodies.

The WTO Appellate Body in April 1998<sup>552</sup> ruled against the shrimp embargo, arguing that it represented the kind of unilateral measure that "could jeopardize the multilateral trading system" and that it was not covered by GATT's Article XX.<sup>553</sup> It also suggested that States, prior to imposing such bans, should engage in dialogue with the

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<sup>545</sup> *Ibid.*

<sup>546</sup> GATT *supra* note 228 see art. XX.

<sup>547</sup> *Ibid.* See part (b).

<sup>548</sup> *Ibid.* See part (g).

<sup>549</sup> WTO Appellate Report on U.S. Prohibition of Shrimp and Shrimp Products, (Oct. 12, 1998) 38 I.L.M. 118.

<sup>550</sup> 1989 Endangered Species Act, Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, Section 609.

<sup>551</sup> WTO Shrimp-Turtle Dispute, International Centre for Trade and Sustainable Development (ICTSD), online: < [http://www.ictsd.org/html/shrimp\\_turtle.htm](http://www.ictsd.org/html/shrimp_turtle.htm) >. (accessed January, 12, 2007).

<sup>552</sup> Report of the Appellate Body, United States-Import Prohibition of Certain Shrimp and Shrimp Products, WT/DS58/AB/R (1998).

<sup>553</sup> *Ibid.*



other States regarding their policies on environmental products.<sup>554</sup> It also found that the United States' Environmental Act had unjustifiably discriminated against certain States by imposing a ban on their products.<sup>555</sup> Meanwhile the US provided some countries with technical and financial assistance and longer transition periods for their fishermen to start using turtle-excluder devices but did not give the same advantages to the four Asian countries (India, Malaysia, Pakistan and Thailand).

Overall, potential conflicts can arise from the relationship between the Cartagena Protocol and GATT's provisions, particularly from the application of the National Treatment Principle in the transfer of LMOs. For instance, following GATT's provisions, States can grant foreign products national treatment exempting them from the documentation requirements for LMOs established in the Advance Informed Agreement of the Cartagena Protocol.<sup>556</sup>

In addition, LMO bans based on the genetic composition of LMOs are not likely to withstand scrutiny from the WTO panels since these organisms have similar characteristics to organic products and since GATT looks at the result instead of the process. Also, Article XX does not seem to provide solid grounds for the imposition of bans based on the preservation of natural resources unless scientific evidence could demonstrate that some LMOs are harmful to biological diversity and could potentially deplete environmental resources and unless non-discriminatory measures are employed to achieve such a purpose.

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<sup>554</sup> *Ibid.* 45-46.

<sup>555</sup> Chang, Howard F., "Toward a Greener GATT: Environmental Trade Measures and the Shrimp-Turtle Case", (2000) 74 S. Cal. L. Rev 31 at 39-41. For more on the GATT's exceptions in Article XX see Deere, Alana T., "Balancing Free Trade and the Environment: A Proposed Interpretation of GATT Article XX's Preamble", (1998) 10 Int'l. Legal Persp.1; Gaines, Sanford, "The WTO's Reading of the GATT Article XX Chapeau: A Disguised Restriction on Environmental Measures", (2001) 22 U. Pa. J. Int'l Econ. L. 739.

<sup>556</sup> Cartagena Protocol, *supra* note 2 art.7.

Seeing that the main GATT provisions do not encourage the degree of caution regarding trading LMOs, we next consider whether the SPS and TBT agreements offer some leeway.

#### 4.1.2 The SPS Agreement

The SPS Agreement was adopted in 1993 by WTO parties to help reduce the incidence of non-tariff trade barriers imposed to protect, ostensibly, human, animal or plant life.<sup>557</sup> The WTO describes the focus of the SPS Agreement as being: “To maintain the sovereign right it deems appropriate, but to ensure that these sovereign rights are not misused for protectionist purposes and do not result in unnecessary barriers to international trade.”<sup>558</sup>

Unlike the Cartagena Protocol, the SPS Agreement does not provide States with acceptable sanitary standards or procedures to establish them,<sup>559</sup> instead, it guides governments in establishing SPS rules.<sup>560</sup> These guidelines are aimed at helping WTO members to harmonize standards and to assess the appropriate level of SPS protection based on an assessment of risks.

Regarding harmonization, paragraph 6 of the preamble of the SPS Agreement referring to the levels of protection, mentions that States can determine “the appropriate level of protection of human, animal or plant life or health.”<sup>561</sup> Furthermore, Article 3

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<sup>557</sup> Grosko, Brett, “Genetic Engineering and International Law: Conflict or Harmony? An Analysis of the Biosafety Protocol, GATT, and the WTO Sanitary and Phytosanitary Agreement”, (2001) 20 Va. Env'tl. L.J. 295 at 308.

<sup>558</sup> WTO, “Understanding the WTO Agreement on Sanitary and Phytosanitary (SPS) Measures,” online: <<http://www.wto.org/wto/goods/spsund.htm>>. (accessed January, 12, 2007).

<sup>559</sup> Terence, Stewart P., & David S. Johanson “The SPS Agreement of the World Trade Organization and the International Trade of Dairy Products”, (1999) 54 Food & Drug L.J. 55 at 56.

<sup>560</sup> *Ibid.* at 56-57.

<sup>561</sup> SPS Agreement, *supra* note 229 see preamble (1) 6.

recommends that they base their SPS measures on international standards, guidelines or recommendations, whenever they exist. Regarding the level of protection, this Article provides that “members may introduce or maintain sanitary or phytosanitary measures which result in a higher level of protection than would be achieved on measures based on the international standards.”<sup>562</sup>

Additionally, Article 5 encourages States to base their sanitary standards of risks on scientific evidence and mentions that States can adopt higher standards provisionally “in cases where relevant scientific evidence is insufficient.”<sup>563</sup> The SPS Agreement promotes transparency among States regarding the SPS level of protection they establish.<sup>564</sup> Such SPS measures have to be published and implemented by a national institution of the State.<sup>565</sup>

It is important to note that this Agreement provides for an efficient control of the approval and inspection procedures for approving the use of additives and for establishing tolerances for contaminants in food, beverages or feedstuffs, aiming to make such procedures consistent with the Agreement.<sup>566</sup> It provides guidance to States in enacting transparent procedures. On this matter, Annex C 1 (a) of this Agreement provides”

Members shall ensure, with respect to any procedure to check and ensure the fulfillment of sanitary or phytosanitary measures, that: (a) such procedures are undertaken and completed without undue delay and in no less favorable manner for imported products than for like domestic products.<sup>567</sup>

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<sup>562</sup> *Ibid.* art. 3.3

<sup>563</sup> *Ibid.* art. 5.7

<sup>564</sup> *Ibid.* art. 7.

<sup>565</sup> *Ibid.* Annex B on Transparency on Sanitary and Phytosanitary Regulations.

<sup>566</sup> *Ibid.* art.8.

<sup>567</sup> *Ibid.* Annex C 1 (a).

The first case to put to the test SPS measures was the *Beef Hormones* Dispute,<sup>568</sup> based on an embargo imposed by the EC against U.S. beef treated with artificial growth-enhancing hormones.<sup>569</sup> The EC implemented a ban on beef treated with growth hormones by means of a Council Directive 96/22.<sup>570</sup> The ban covered artificial and natural hormones and although it was not supported by scientific evidence it reflected the public perceptions of the European public on the consumption of this beef.<sup>571</sup> The ban ended with a complaint before the WTO's Dispute Resolution Bodies in 1996 by the United States.

Regarding the embargo, the Appellate Body confirmed the findings of the Panel that the EC had violated the SPS Agreement in the absence of appropriate risk assessment<sup>572</sup> and consideration of international standards of protection, referring to those of the Codex Alimentarius Commission's (CODEX) food standards.<sup>573</sup>

Regarding harmonization measures, the Appellate Body affirmed the interpretation of Article 3 by the Panel's as meaning that if States do not base measures on international standards,<sup>574</sup> they have to scientifically prove the higher standard. In this

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<sup>568</sup> EC Measures Concerning Meat & Meat Products, Panel Reports: Case WT/DS26/R/USA, August 18, 1997 & WT/DS48/R/CAN, August 18, 1997; Appellate Body Report: WT/DS26/AB/R & WT/DS48/AB/R, January 16, 1998.

<sup>569</sup> *Ibid.*

<sup>570</sup> Council Directive No. 96/22, 1996 O.J. (L 125) 3-9, online: <[http://europa.eu.int/smartapi/cgi/sga\\_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=31996L0022&model=guichett](http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=31996L0022&model=guichett)>. (accessed January, 12, 2007).

<sup>571</sup> Neugebauer, Regine, "Fine-Tuning WTO Jurisprudence and the SPS Agreement: Lessons from the Beef Hormones Case", (2003) 31 Law & Pol'y Int'l Business 1255. at 1256-1257.

<sup>572</sup> Bridgers, Mystery, *supra* note 233 at 189 (Lexis).

<sup>573</sup> *Ibid.* The Codex Alimentarius Commission was created under the auspices of the Food and Agriculture Organization and the World Health Organization in 1963. It strives to preserve human health by establishing and coordinating food standards of international governmental and non governmental organizations. The Standards developed by this Commission deal with requirements regarding foods, their production process or the operation of government regulatory systems for food safety. For more information see "Codex Alimentarius Commission" online: <<http://www.codexalimentarius.net/web/index.en.jsp>>. (accessed January, 12, 2007).

<sup>574</sup> Neugebauer, Regine, *supra* note 571 at 1262-1265.

case the EC's ban was a higher level of protection than that of the CODEX. Regarding Article 5 on the assessment of risks, the Appellate Body also affirmed the Panel's interpretation of this Article as meaning that health measures must be based on risk assessment and that there should be a rational relationship between them.<sup>575</sup>

The hormone case gives us an idea as to the standard that needs to be met to sustain stricter measures than those contained in the CODEX. In this case, the EC did not look at the international standards set by CODEX for selecting the SPS protection level. According to Article 3.3 of the SPS Agreement, the EC had a right to increase the level of protection only when the 'higher protection' was based on a risk assessment. By virtue of Article 5.7, the EC could have chosen higher standards temporarily until it acquired scientific evidence to support its SPS measures.

With respect to the precautionary approach contained in the Cartagena Protocol, both the WTO Panel and the appellate body refused to consider its evolution into a principle of international law.<sup>576</sup> However, they recognized that it was the focus of debate "among academics, law practitioners, regulators and judges."<sup>577</sup> The appellate body, found, however, that the precautionary principle was 'reflected' in the SPS Agreement in Article 5.7 allowing States in cases where relevant scientific evidence is insufficient to:

Provisionally adopt sanitary or phytosanitary measures on the basis of available pertinent information, including that from the relevant international organizations as well as from sanitary or phytosanitary measures applied by other Members. In such circumstances, Members shall seek to obtain the additional information necessary for a more objective assessment of risk and review the sanitary or phytosanitary measure accordingly within a reasonable period of time.<sup>578</sup>

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<sup>575</sup> *Ibid.* at 1256-1257.

<sup>576</sup> Macmillan, *supra* note 510 at 153-154.

<sup>577</sup> *Ibid.* at 153-154.

<sup>578</sup> SPS Agreement, *supra* note 229 art. 5.7

The Panel also stated that the precautionary principle did not override the specific rules in that Agreement.<sup>579</sup> Based on the WTO's application of the SPS Agreement in the *hormones* case, there may be potential clash with the Cartagena Protocol, particularly if countries apply stricter standards of protection or bans on LMOs based on the precautionary principle. In this scenario, such precautionary barriers will not likely be upheld by the WTO unless they are established on a temporary basis to gain time to gather scientific evidence. The Cartagena Protocol, on the other hand, fully complies with the SPS Agreement if it is based merely on a scientifically-sound risk assessment.

Recently, a controversial EC's ban on transgenic products from June 1999 to August 2003 involving the United States, Canada and Argentina resulted in the constitution of a WTO Panel. The request for consultation alleged that the ban was contrary to Article 11 of the SPS Agreement,<sup>580</sup> Article 14 of the TBT Agreement,<sup>581</sup> and GATT Article XII.<sup>582</sup> The ban imposed by the EC, allegedly included the following:

- a) The suspension of applications for, or granting of, approval of biotech products,
- b) The failure by the EC to consider for approval applications for various biotech products.
- c) National marketing and import bans maintained by member States including Austria, France, Germany, Greece, Italy and Luxemburg.<sup>583</sup>

Regarding the restrictions imposed by the EC, the WTO Panel stated that the EC's approval procedures for biotechnology products fell under Article 8 of the SPS

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<sup>579</sup> World Trade Organization, Summary on the Precautionary Principle," online: < [http://www.wto.org/english/tratop\\_e/sps\\_e/sps\\_agreement\\_cbt\\_e/c8s2p1\\_e.htm](http://www.wto.org/english/tratop_e/sps_e/sps_agreement_cbt_e/c8s2p1_e.htm)>. (accessed January, 12, 2007).

<sup>580</sup> SPS Agreement, *supra* note 229 art. 11.

<sup>581</sup> TBT Agreement, *supra* note 230 art. 14.

<sup>582</sup> WTO Dispute Settlement Panel, *supra* note 27 at 53.

<sup>583</sup> European Communities, Measures Affecting the Approval of Biotech Products, Request for Consultations, (May 20, 2003), online:<<http://docsonline.wto.org:80/DDFDocuments/t/G/TBT/D28.doc>>. (accessed January, 12, 2007).

Agreement.<sup>584</sup> It also noted that EC Directive 2001/18<sup>585</sup> and Directive 90/220<sup>586</sup> on the release of GMOs into the environment and Regulation 258/97<sup>587</sup> on novel foods and their ingredients were not directly SPS measures but that they affected individual approval procedures causing undue delays and raising inconsistencies with SPS Article 8 and Annex C 1(a) regarding transparency of SPS measures.<sup>588</sup>

The Panel also concluded that the EC had acted inconsistently with its obligations under the SPS Agreement Article 8 and Annex C (1) (a) regarding the obligation of member States to “ensure the fulfillment of sanitary or phytosanitary measures”<sup>589</sup> and that such procedures are undertaken and completed without undue delay and in no less favorable manner for imported products than for like domestic products.”<sup>590</sup> As noted in the Panel decision, in the EC’s Moratorium, there was lack of transparency and consistency in the procedures to approve imports of biotech products, and although the EC could employ risk assessments, it decided not to conduct them and employed a *de facto* moratorium ignoring the procedures available under the SPS Article 5.7 to impose a temporary moratorium until scientific evidence is available to sustain a permanent ban.<sup>591</sup>

Overall, the *Hormones Case* and the *EC Moratorium on Biotechnology Products* illustrate the application of SPS measures. The *Hormones Case* establishes the importance of scientific evidence in imposing stricter standards than those established at the international level. States are obliged under this Agreement to provide scientific

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<sup>584</sup> WTO Dispute Settlement Panel, *supra* note 27 at 1029.

<sup>585</sup> European Community, Directive 2001/18/EC, O.J. 17.4.2001 L106/1.

<sup>586</sup> European Community, Directive 90/220/EEC, O.J. 8.5.1990 L117/15, preamble, as amended by Directive 94/15/EC, O.J. 22.4.1994 L103, and Directive 97/35/EC, O.J. 27.6.1997 L169.

<sup>587</sup> European Communities Regulation No. 258/97, O.J. 14.2.1997 L043/1.

<sup>588</sup> WTO Dispute Settlement Panel, *supra* note 27 at 1031.

<sup>589</sup> SPS Agreement, *supra* note 229 Annex C (1) (a).

<sup>590</sup> *Ibid.*

<sup>591</sup> *Ibid.*

evidence showing that CODEX measures, for example, did not provide substantial protection to human and animal health and plant life.

The WTO Panel decision regarding the EC's moratorium on biotechnology products implies that countries must elaborate public SPS measures with strong processes of authorization. It also stresses the importance of impact assessment and the important role scientific evidence plays to eliminate disguised barriers to trade.<sup>592</sup>

Strict scientific requirements seen from the implementation of the SPS Agreement may impose a burden on developing States like Mexico, which lack the technical and monetary means to pursue scientific evidence to support its decision and to monitor the introduction of these organisms into the environment. In the case of LMOs, this burden is even greater since conclusive studies regarding the effects of these organisms on biodiversity and human health will likely take time. In sum, States under the SPS Agreement are only entitled to imposing temporary bans under Article 5.7 for a reasonable time until scientific evidence becomes available.

An analysis of the TBT Agreement seems pertinent at this point to assess the feasibility of imposing technical regulations to preserve biodiversity and to assess the standards required for that purpose. An analysis of the TBT Agreement follows.

#### **4.1.3 The TBT Agreement**

The TBT Agreement was created to eliminate unfair technical regulations that may constitute or pose trade obstacles to foreign products.<sup>593</sup> This Agreement, however,

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<sup>592</sup> WTO Dispute Settlement Panel, *supra* note 27 at 1031-1033.

<sup>593</sup> Macmillan, *supra* note 510 at 153-154.



recognizes that State parties have the right to establish their own levels of protection<sup>594</sup> and to enact measures to ensure that those levels are met.<sup>595</sup>

The exceptions laid out in the TBT Agreement are a mixture of measures provided in GATT Article XX and SPS measures. Legitimate objectives that can authorize States to impose TBT are outlined in Article 2.2 and include: (1) 'national security requirements', (2) 'prevention of deceptive practices', and (3) 'protection of human health or safety, animal or plant life or health or the environment'.<sup>596</sup>

The TBT Agreement, although similar to the SPS Agreement, administers a very different test to determine when a measure constitutes a trade barrier.<sup>597</sup> While the SPS Agreement requires an assessment of risk, the TBT Agreement relies on a non-discrimination test.<sup>598</sup> It also encourages States to demonstrate that technical barriers are not more restrictive than necessary to achieve such objectives.<sup>599</sup>

An innovation in this Agreement is the inclusion of the term 'environment protection' as justification for imposing TBT measures by States.<sup>600</sup> In the application of these measures, States have to be cognizant that these restrictions shall not be more "trade-restrictive than necessary to achieve a legitimate objective."<sup>601</sup> At first sight, the Agreement on TBT measures seems more environmentally oriented than those of Article

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<sup>594</sup> "Legal Texts: the WTO Agreement," online: <[http://www.wto.org/english/docs\\_e/legal\\_e/ursum\\_e.htm#d\\_Agreement](http://www.wto.org/english/docs_e/legal_e/ursum_e.htm#d_Agreement)>. (accessed January, 12, 2007).

<sup>595</sup> *Ibid.*

<sup>596</sup> TBT Agreement, *supra* note 230 art. 2.2.

<sup>597</sup> Macmillan, *supra* note 510 at 162.

<sup>598</sup> *Ibid.* at 163.

<sup>599</sup> *Ibid.* 163-164.

<sup>600</sup> *Ibid.* 163-165

<sup>601</sup> *Ibid.*

XX of GATT,<sup>602</sup> because of the provision referring to protection of the environment contained in Article 2.2.

As suggested by Fiona Macmillan,<sup>603</sup> LMO litigation may also find its way into a TBT Agreement dispute, since Article 1.3 of this Agreement encompasses ‘industrial and agricultural products’ and since labeling schemes have already been implemented by some States to “prevent deceptive practices.”<sup>604</sup> TBT measures to prevent ‘deceptive practices’ in the organic market, such as labeling, can probably be upheld as long as they are not ‘more trade restrictive than necessary’ and as long as States apply the ‘Most-Favoured-Nation Treatment’ and ‘National Product Treatment’ principles.

Although the Agreement on TBT is not environmentally oriented like the Cartagena Protocol, some of its exceptions may afford some level of protection. Article 2.2,<sup>605</sup> for example, allows States to impose TBT measures to protect legitimate objectives such as “national security, prevention of deceptive practices, protection of human health or safety, animal or plant life or health, or the environment.” It also states that “in assessing such risks, relevant elements of consideration are, *inter alia*: available scientific and technical information, processing technology or intended end-uses of products”.<sup>606</sup>

The TBT Agreement and the Cartagena Protocol are related in that both regulate agricultural products. Possible conflicts arise from the imposition of moratoriums and precautionary measures as established in the Protocol. It also allows States to impose technical barriers to trade in the protection of human health or safety, animal or plant life

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<sup>602</sup> *Ibid.* at 166-167.

<sup>603</sup> *Ibid.* 181.

<sup>604</sup> *Ibid.* 182.

<sup>605</sup> TBT Agreement, *supra* note 230 art. 2.

<sup>606</sup> *Ibid.* art. 2.2.

or health or the environment.<sup>607</sup> Once States have imposed a TBT requirement, they are compelled to scientifically demonstrate that the prohibition is not more restrictive than necessary to achieve its objectives.

The provision contained in the TBT Agreement may leave States unable to stringent scientific standards to justify moratoriums on agricultural products imports. Additionally, measures instituted in accordance with the Cartagena Protocol may constitute technical barriers to trade such as the AIA procedures. Stringent standards required in trade Agreements can impinge upon developing countries conducting the necessary studies that would enable them to make the right decisions in each situation.

## **5. Conclusion**

This Chapter has looked at developments in international law in the field of biological diversity and the role this discipline plays in its protection. It looked at the development of international environmental law principles, such as the precautionary principle and environmental impact assessment. It also looked at the CBD, the Cartagena Protocol, and international trade agreements. It pointed out that environmental law principles included in the Rio Declarations, such as the precautionary principle and environmental impact assessment, have made their way into environmental agreements. These principles have the potential to guide States in regulating and controlling the transboundary movement of LMOs and in the preservation of biological diversity. Unfortunately, in the absence of uniform rules for their application, States may apply them indiscriminately and thus create conflicts with obligations set out in international trade agreements. Many of these clashes are perhaps caused by the level of scientific

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<sup>607</sup> *Ibid.* art. 2.2.

uncertainty surrounding what level of protection from LMOs would benefit biodiversity preservation and the lack of scientific evidence regarding the long-term effects of LMOs. This complex uncertainty affects how States balance economic development and environmental protection.

Beyond the foregoing, it was established that though the CBD has the potential to be applied successfully to preserve the world's natural resources, its comprehensiveness waters down its obligations and complicates its implementation. Specifically for instance, its requirements for *in situ* conservation of resources is impeded by lack of sufficient demarcation of the world's protected areas. Again, its provisions recognize, but do not give clear-cut provisions as how, as part of biodiversity preservation, to protect indigenous traditions and traditional agriculture from the uncontrolled spread of LMOs. Finally, the discussion points out that the financial, technical and institutional resources needed to carry out CBD obligations pose great challenges to States like Mexico that do not command good reserves of these resources.

The discussion of the Cartagena Protocol on Biosafety points out the potential conflicts its regulation of LMO trade, in pursue of its objective to ensure biosafety, creates in its clash with the stringent requirements of international trade agreements such as the SPS and TBT Agreements. As a specific situation, the Protocol's provisions allowing for risk assessment and the precautionary principle in situations of uncertainty regarding whether to import LMOs, clash with the international trade regime in that precautionary regulation will likely be found to represent a trade barrier by WTO dispute resolution panels. This situation, as argued, is not helped by the fact that the Cartagena Protocol excludes LMO-FFPs from its main scope. This endangers the preservation of

biological diversity since these commodities can be introduced into the environment by indigenous farmers who follow ancient traditions of saving seeds for future seasons because they cannot afford to buy seeds every season. Indeed even the Protocol's BCH information procedure employed prior to the export of these commodities does not ensure that States will not abuse the export procedures.

In this Chapter it was also argued that enforcement of the Protocol can be improved at the international level. It was pointed out that a recently created Compliance Committee emerged to aid States and to oversee compliance with the Cartagena Protocol. The Committee, although is still being consolidated, has potential to contribute to the implementation of the Protocol among State parties. To achieve its objective, the Protocol's Compliance Committee needs to consider the work of international organizations and non-governmental organizations to monitor compliance with the provisions of the Protocol. The Committee, as well, needs to create a public complaint procedure to allow indigenous groups, NGOs and those that play a role in the preservation of biodiversity to bring issues on compliance with the Protocol before this Committee.

In this Chapter, GATT exceptions in Article XX, the SPS and TBT agreements were also analyzed. It was pointed out that although these Agreements are concerned with free trade, they allow States to impose restrictive measures to preserve human and animal health and natural resources in cases where scientific evidence is available. In cases with great scientific uncertainty such in the field of biodiversity and the potential effects of LMOs on those resources, however, the international trade regime is not likely to afford long-term protection to natural resources or to human and animal health. In such

case, States are allowed to impose temporary measures until they can acquire scientific evidence to substantiate their bans on trade.

Altogether, the Chapter shows that through a combined operation of relevant international environmental agreements and environmental protection relevant rules of the trade regime, biological diversity preservation is still only symbolically and minimally assured. For countries, like Mexico, this poses major challenges in that while they seek economic development, the international legal regime does not encourage them to protect the natural resource base on which such development can be sustained. Indeed, not even at the North American level, under NAFTA and its environmental side agreement is this secured. Chapter IV looks in more detail at the regional dimension of biodiversity preservation and regional trade and the challenges that arise for Mexico.

## CHAPTER IV

### THE ENVIRONMENTAL REGIME OF THE NORTH AMERICAN FREE TRADE AGREEMENT AND THE CEC's MAIZE REPORT

#### 1. Overview

Since its creation, NAFTA has been considered one of the “greenest” trade agreements for its environmental provisions and for the creation of an environmental side agreement that promotes environmental cooperation and law enforcement among the parties, namely, NAAEC.<sup>608</sup> NAFTA’s environmental agreement provides for the creation of the Commission for Environmental Cooperation (CEC) to reconcile trade and the environment in this region and to ‘green’ the North American Free Trade Agreement.<sup>609</sup>

Similar to the WTO Agreement on SPS measures, NAFTA contains Sanitary and Phytosanitary (SPS) provisions (NAFTA SPS provisions) allowing States to choose their sanitary level for the protection of human, animal or plant life or health, and encourages them to base such measures on international standards and on scientific evidence.<sup>610</sup> NAFTA’s provisions, like those described in Chapter III Section 4 regarding WTO Agreements, have the potential to conflict with the Cartagena Protocol’s regulation of transboundary movement of LMO trade. Issues regarding genetic modification and the preservation of biodiversity have been addressed under the NAFTA forum by means of

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<sup>608</sup> North American Agreement on Environmental Cooperation (NAAEC), *supra* note 236.

<sup>609</sup> *Ibid.* art. 8.

<sup>610</sup> NAFTA, *supra* note 5 art. 712.

NAFTA's environmental institution, the Commission for Environmental Cooperation (CEC).

The CEC addressed a complaint regarding the introduction of transgenic maize from the United States into Mexican landraces. The maize was intended for human consumption but was planted by farmers who follow ancient traditions such as saving seeds for future seasons.<sup>611</sup> It produced a report based on Article 13 of the NAAEC, which allows the Secretariat to address environmental matters related to the cooperative functions of the Agreement. The CEC's Maize Report recognized Mexico's richness in biological resources, but noted that this country was unable to monitor the introduction of transgenic maize and that it was unable to enforce a moratorium on transgenic maize imports.

The study of NAFTA in the context of LMOs is of paramount importance because it establishes, *inter alia*, phytosanitary rules in North America that impact the transit and movement of these organisms and, like WTO trade Agreements, it covers issues on trade in LMOs that are also dealt with in the Cartagena Protocol. The rest of the Chapter is therefore, focused on the NAFTA regime and its contribution to the potential of biodiversity preservation through its environmental provisions, particularly with respect to instituting SPS measures by State parties.

Section 2, next, discusses the relevant provisions. Following that, Section 3 discusses the regime of environmental protection created by NAAEC and the central role of the CEC in ensuring its observance. It is argued that the CEC could play a more substantial role in preserving Mexico's biological diversity. For Mexico, the impact of the functioning of the CEC is, thus far, most remarkably demonstrated in the CEC's

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<sup>611</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 21.



Maize Report. Section 4 analyses the Report in terms of its findings on the potential effects of the unmonitored and unregulated introduction of transgenic maize into Mexican agriculture. It also sums up the Reports' main recommendations, the reactions of the NAFTA parties to it, and above all, its exposure of policy, institutional and regulatory weaknesses in Mexico's structure of environment and resources preservation.

In the concluding Section 5, it is argued that free trade promotion obligations under the WTO and NAFTA have, as illustrated by the CEC's Maize Report, made observation of environmental protection obligations a balancing act. In the result, both the requirements of the CBD and the Cartagena Protocol discussed in Chapter III Sections 2 and 3, and the potential effectiveness of the NAAEC, could hardly ensure serious biodiversity preservation efforts in Mexico for their own sakes.

## **2. The North American Free Trade Agreement**

This Agreement was created in accordance with the international trade regime established in Article XXIV of the General Agreement on Tariffs and Trade.<sup>612</sup> NAFTA, in relation to the GATT, represents a regional agreement in North America to further international trade.<sup>613</sup> It is a comprehensive Agreement that reduces gradually tariffs among the parties. It regulates market access, rules of origin, energy, agriculture, investments, intellectual property, labor and the environment.<sup>614</sup>

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<sup>612</sup> GATT Agreement, *supra* note 228 art. XXIV (5). Regarding regional agreements, this Article provides "Accordingly, the provisions of this Agreement shall not prevent, as between the territories of contracting parties, the formation of a customs union or of a free-trade area or the adoption of an interim Agreement necessary for the formation of a customs union or of a free-trade area."

<sup>613</sup> NAFTA's Article 101 provides that this Agreement was created in consistency with Article XXIV of the General Agreement on Tariffs and Trade. NAFTA, *supra* note 5 art. 101.

<sup>614</sup> Winham, Gilbert & Grant, Heather, "NAFTA: An Overview" in Barry, Donald, Dickerson, Mark, Gaisford, James, (eds), *Towards a North American Community? Canada, the United States, and Mexico*, (Boulder: Westview Press, 1995) at 15. See also Izquirdo, Jordan, "Progress by Mexico in Selected Areas

NAFTA is, for some, the most environmentally conscious trade Agreement in force because several of its provisions refer to the environment.<sup>615</sup> In the preamble of this Agreement, the three North American parties, Canada, the United States and Mexico, stated their environmental objectives:

To promote sustainable development... to strengthen the development and enforcement of environmental laws and regulations.<sup>616</sup>

In addition, NAFTA's Article 904 on Standards-Related Measures, refers to the environment and to the protection of human health. This Article on the rights and obligations of the Parties provides that:

Each Party may, in accordance with this Agreement, adopt, maintain or apply any standards-related measure, including any such measure relating to safety, the protection of human, animal or plant life or health, the environment or consumers, and any measure to ensure its enforcement or implementation.<sup>617</sup>

The aforementioned provision refers to measures other than SPS measures as a way to deal with the preservation of human health and the environment.<sup>618</sup> NAFTA specifically refers to its relationship with MEAs. On this matter, Article 104 states that provisions of the Convention on International Trade in Endangered Species of Wild Fauna and Flora,<sup>619</sup> the Montreal Protocol on Substances that Deplete the Ozone Layer of 1987<sup>620</sup> and the Basel Convention on the Control of Transboundary Movements of

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and the North American Free Trade Agreement" (1998), 31 Transportation Law Institute at 331-332. (Lexis).

<sup>615</sup> Hufbauer, Gary C., (et al), *NAFTA and the Environment: Seven Years Later*, (Washington, DC: Institute for International Economics, 2000) at 5.

<sup>616</sup> NAFTA, *supra* note 5 see preamble.

<sup>617</sup> *Ibid.* art. 904. See Ludwiszewski, Raymon & Seley, Peter, "Green Language in the NAFTA: Reconciling Free Trade and Environmental Protection" in Bello, Judith, Holmer, Alan, Norton, Joseph, (eds) *The North American Free Trade Agreement: A New Frontier in International Trade and Investment in the Americas*, (Washington: American Bar Association, 1994) at 375-377.

<sup>618</sup> *Ibid.*

<sup>619</sup> CITES, *supra* note 319.

<sup>620</sup> Montreal Protocol on Substances That Deplete the Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1541 (1987).

Hazardous Wastes and Their Disposal of 1989<sup>621</sup> will prevail over those of NAFTA in cases of disagreements “to the extent of the inconsistency, provided that where a Party has a choice among equally effective and reasonably available means of complying with such obligations.”<sup>622</sup>

NAFTA contains provisions related to SPS measures which are based on the WTO SPS Agreement<sup>623</sup> and encompass the following principles: parties are forbidden from discriminating and from imposing disguised barriers to trade.<sup>624</sup> NAFTA’s measures in Chapter 7 allow a State party to choose its level of protection when implementing phytosanitary measures. Article 712 on the matter provides that:

Each Party may, in accordance with this Section, adopt, maintain or apply any sanitary or phytosanitary measure necessary for the protection of human, animal or plant life or health in its territory, including a measure more stringent than an international standard, guideline or recommendation.<sup>625</sup>

According to NAFTA, State parties must base their protection standards on scientific principles and on risk assessment.<sup>626</sup> The assessment of risks adopted in NAFTA must be based on methodologies and techniques set by North American or international standardizing institutions,<sup>627</sup> on relevant scientific evidence and inspection, sampling and testing methods.<sup>628</sup> In addition to satisfying the risk assessment

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<sup>621</sup> Basel Convention, *supra* note 539.

<sup>622</sup> NAFTA, *supra* note 5 art. 104.

<sup>623</sup> Meilke, Karl, “An Appraisal of the SPS Provisions of the North American Free Trade Agreement” (2001) U.S. Agency for International Development, online: <[http://www.satradehub.org/CXA\\_html/docs/reports/ An%20appraisal%20of%20the%20SPS%20provisions%20on%20the%20NAFTA.pdf](http://www.satradehub.org/CXA_html/docs/reports/An%20appraisal%20of%20the%20SPS%20provisions%20on%20the%20NAFTA.pdf)>. at 7. (accessed January, 12, 2007).

<sup>624</sup> *Ibid.* at 7-8.

<sup>625</sup> NAFTA, *supra* note 5 art. 712.

<sup>626</sup> *Ibid.*

<sup>627</sup> Four regional and international standards are recognized by NAFTA: the Codex Alimentarius Commission, the International Office of Epizootics, the International Plant Protection Convention, and the North American Plant Protection Organization.

<sup>628</sup> NAFTA, *supra* note 5 art. 715.

requirements when adopting a SPS measure, State parties are obliged to establish such levels of protection only as necessary to achieve their goals and keeping in mind economic and technical factors and minimizing, as far as possible, negative effects on trade.<sup>629</sup>

Non-discrimination is also an essential component of the establishment of SPS measures. States are required to provide equal treatment between their goods and goods from another State party, or between goods of another Party and like goods of any other State, where identical or similar conditions prevail.<sup>630</sup> Similar to the WTO's SPS Agreement, NAFTA allows States in cases of lack of scientific evidence, to impose provisional measures for a 'reasonable period of time', thus allowing them to obtain scientific evidence regarding the SPS measure.<sup>631</sup>

NAFTA also created a Sanitary and Phytosanitary Commission composed of the representatives of the three countries.<sup>632</sup> This Commission consults parties with regard to SPS measures and has the authority to constitute *ad hoc* committees and groups of experts to address any concerns of NAFTA members. Under the procedural rules of the Phytosanitary Commission, a State party alleging violations of this section by another party or parties has the burden of establishing the inconsistency.<sup>633</sup>

Overall, clashes over LMO regulation can potentially take place before the NAFTA forum. This trade Agreement, similar to the WTO's SPS Agreement, encourages States to base their level of protection on international standards and on scientifically-based risk assessments. However, due to the small membership and to the geographical

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<sup>629</sup> *Ibid.* art. 712.

<sup>630</sup> *Ibid.* art. 712 (4).

<sup>631</sup> *Ibid.* 715 (4).

<sup>632</sup> *Ibid.* art. 722.

<sup>633</sup> *Ibid.* arts. 722-723.

location of the parties, NAFTA provides more room for interaction and technical cooperation among its members.

In sum, NAFTA seems to provide support and guidance for parties regarding the establishment of SPS measures. The application of the Cartagena Protocol in North America, if it is based on strict scientific standards, is likely to be deemed compatible with NAFTA's provisions as long as such measures are based on a scientific risk assessment and on non-discriminatory measures.

Mexico, a party to NAFTA and to the Cartagena Protocol faces enormous pressure to balance its obligations under these Agreements, especially in light of the powerful economic and commercial influence of two of the world's biggest LMO producers, the United States and Canada. This regional relationship is likely to influence not only Mexico's policy but also the country's legislative and institutional structures. One example of such regional influence is the North American Biotechnology Initiative (NABI) among the three NAFTA countries which will be the focus of the following section.

## **2.1 The North American Biotechnology Initiative**

The North American Biotechnology Initiative is an example of the implementation of NAFTA SPS provisions and of the influence of the Cartagena Protocol with non-parties. This initiative was undertaken at the same time as the CEC's Advisory group began the analysis of the effects of transgenic maize in Mexico. NABI comprises

Mexico, Canada<sup>634</sup> and the United States as members. It aims to provide uniform documentation requirements for the export and import of LMOs for Food Feed, or Processing (FFPs).<sup>635</sup> This Agreement, signed in October of 2003, harmonizes SPS measures in North America since it is noted that the United States and Canada are not party to the Cartagena Protocol.<sup>636</sup>

The Documentation Agreement is based on Article 24 of the Cartagena Protocol which, regarding the transfer of LMOs, provides that:

Transboundary movements of living modified organisms between Parties and non-Parties shall be consistent with the objective of this Protocol. The Parties may enter into bilateral, regional and multilateral agreements and arrangements with non-Parties regarding such transboundary movements. The Parties shall encourage non-Parties to adhere to this Protocol and to contribute appropriate information to the Biosafety Clearing-House on living modified organisms released in, or moved into or out of, areas within their national jurisdictions.<sup>637</sup>

The objective of the Documentation Agreement under NABI on LMO-FFPs is to provide the parties with notification that the export “may contain” LMO-FFPs. These notification requirements will be employed with exports that contain more than 5 percent of the commodities that are of transgenic origin.

The implementation of NABI, ideally has the potential to aid Mexico in implementing the Cartagena Protocol by alerting this country to the potential presence of

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<sup>634</sup> Canada signed the Cartagena Protocol on April, 19, 2001. See Cartagena Protocol on Biosafety (Montreal, 29 January 2000), Status of Ratification and Entry Into Force, online: < <http://www.biodiv.org/biosafety/signinglist.aspx?sts=rtf&ord=dt> >. (accessed January, 12, 2007).

<sup>635</sup> Documentation Requirements for Living Modified Organisms for Food or Feed, or for Processing (LMO/FFP's), (October, 2003), online:< [http://www.agr.gc.ca/itpd-dpci/english/topics/bsp\\_trilateral.htm](http://www.agr.gc.ca/itpd-dpci/english/topics/bsp_trilateral.htm)>. (accessed January, 12, 2007). See also Workshop on Technical Cooperation and Information Exchange on Safety in Agricultural Biotechnology, North American Initiative Biodiversity Initiative, (China, December 2003), online:<<http://www.inspection.gc.ca/english/sci/biotech/capac/pdf/rdeab7.pdf>>. at 11-12. (accessed January, 12, 2007).

<sup>636</sup> Documentation Requirements for Living Modified Organisms for Food or Feed, or for Processing (LMO/FFP's), *Ibid.*

<sup>637</sup> Cartagena Protocol, *supra* note 2 art. 24.

LMO-FFPs. The effectiveness of the initiative, however, similar to the CBD and to the Cartagena Protocol, will depend on Mexico's will to allocate the required financial resources and to create the structure needed at the point of entry to classify the large amounts of maize imports it receives from the United States. A study of the 2004 CEC's Transgenic Maize Report in Section 4 will allow us to see the recommendations produced and the prospects for biodiversity preservation that those recommendations offer if they are followed. It will also give us a sense of progress of NABI since its creation in 2003. The institutional context for that Report is the function of the CEC working under NAAEC. To this the discussion now turns.

### **3. The NAAEC and the Commission for Environmental Cooperation**

The NAAEC was created under political pressure due to the contamination that the manufacturing program of U.S companies had visibly caused along the Mexican border.<sup>638</sup> The NAAEC, then, was created as a side Agreement to green NAFTA and to balance trade interests with environmental protection in North America.<sup>639</sup>

NAAEC's objectives are outlined in Article 1, which among others, provides for increasing cooperation among the parties to protect the environment including wild flora and fauna.<sup>640</sup> It also aims to strengthen cooperation for the development and improvement of environmental laws, regulations, procedures, policies and practices and

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<sup>638</sup> Weiss, Aimee L., "An Analysis of the North American Agreement on Environmental Cooperation" (1998) 5 ILSA J. Int'l & Comp. L. 185. at 195.

<sup>639</sup> *Ibid.* at 195-196.

<sup>640</sup> NAAEC, *supra* note 236 art. 1.

to promote transparency and public participation in the development of environmental laws, regulations and policies.<sup>641</sup>

NAAEC sets out series of principles for achieving its objectives. It acknowledges that parties have freedom to choose levels of protection and to develop their environmental policies, but encourages them to “ensure that their laws and regulations provide for high levels of environmental protection and that they shall strive to continue to improve those laws and regulations.”<sup>642</sup> It asks parties to enforce their environmental laws by:

Appointing and training inspectors; monitoring compliance and investigating suspected violations, including through on-site inspections; seeking assurances of voluntary compliance and compliance agreements; promoting environmental audits; using licenses, permits or authorizations.<sup>643</sup>

One of the major achievements of the NAAEC is the establishment of the Commission for Environmental Cooperation.<sup>644</sup> The CEC is a Ministerial Commission similar to a free trade Commission.<sup>645</sup> This institution is controlled by a Council made up of representatives of Mexico, Canada and the United States. The Council serves as a forum for the discussion of matters related to the environment within the scope of the NAAEC. It oversees the CEC’s Secretariat and addresses the differences among the three countries regarding the interpretation of this Agreement.<sup>646</sup>

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<sup>641</sup> *Ibid.*

<sup>642</sup> *Ibid.* art. 3.

<sup>643</sup> *Ibid.* art. 5.

<sup>644</sup> Bolinger, Christopher N., “Assessing the CEC on its record to date,” (1997) 28 Law and Pol’y in Int’l. Bus. 1107. at 1107-1108. (Proquest).

<sup>645</sup> Johnson, Pierre Marc, & Beaulieu, Andre, *The Environment and NAFTA: Understanding and Implementing the New Continental Law* (Peterborough, Ontario: Island Press, 1996) at 131.

<sup>646</sup> NAAEC, *supra* note 236 art. 10.



The role of the CEC in protecting the environment and particularly in North America, according to the NAAEC, can be performed in two ways. One is the promotion of environmental protection by means of public reports under Article 13,<sup>647</sup> which focuses on activities within NAFTA's jurisdiction. An example of this is the CEC's Maize Report,<sup>648</sup> developed by the Secretariat due to public concerns of transgenic sequences in Mexico's native maize.

The other procedure is to promote national compliance with domestic environmental laws of NAFTA parties by means of a public complaint procedure outlined in Article 14 of NAAEC.<sup>649</sup> The complaint procedure of the CEC was crafted to allow North American non-governmental organizations (NGOs) and citizens to file public complaints regarding the effective application of a party's environmental law.<sup>650</sup> NAAEC Article 14 (1) establishes that complaints must meet two important considerations: that the complaint is aimed at promoting enforcement and, that the complaint provides sufficient information to substantiate the claimant's assertions.<sup>651</sup>

In addition to these requirements, the CEC considers several aspects of requesting a response from the Party, such as if national private remedies have been exhausted, if harm has been brought to the complainant, and if such complaint may further the objectives set forth in NAAEC such as: to foster the preservation and improvement of the environment; to promote sustainable development; to increase cooperation; to support the environmental goals and objectives of the NAFTA and to strengthen cooperation on the development and improvement of environmental laws, regulations, procedures, policies

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<sup>647</sup> *Ibid.* art. 13.

<sup>648</sup> See Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6.

<sup>649</sup> NAAEC, *supra* note 236 arts. 14-15.

<sup>650</sup> *Ibid.*

<sup>651</sup> *Ibid.* art. 14 (1).

and practices.<sup>652</sup> Successful complaints brought before the CEC may culminate in factual records that outline the background of the problem, the actions of the Party and the facts relevant to the complaint.<sup>653</sup> The factual record can be made public by a two-thirds vote of the Council's members.<sup>654</sup>

The CEC's public complaint procedure in the case of LMOs presents several problems. The harm requirement of Article 14(2)<sup>655</sup> to request a response from the party that allegedly did not enforce its environmental law is not likely to be met since scientific evidence is not yet conclusive on the effects of LMOs on human health and on the environment. Acquiring such information can potentially represent a burden for individuals, particularly in Mexico, due to the socioeconomic conditions in this country. Consequently, the supporting documentation requirements required in Article 14 (1) are not likely to be met. Lastly, even if a complaint is accepted, it could take years for a decision to be reached since the CEC's Council lacks time constraints or procedural timelines, particularly in regard to revising and analyzing legal drafts related to a complaint.<sup>656</sup>

Although the CEC has tangentially addressed issues posed by LMOs, it is, in fact, simply a political organization that reflects the will of the three countries. It was created to further NAFTA's objectives. This Environmental Commission lacks autonomy since recommendations and environmental initiatives must be approved by the Council.<sup>657</sup> In this context, it would be fair to say that the CEC has limited capacity to deal with the

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<sup>652</sup> *Ibid.* art. 1.

<sup>653</sup> Commission for Environmental Cooperation, *Bringing Facts to the Light*, (2002) at 1-2.

<sup>654</sup> *Ibid.*

<sup>655</sup> NAAEC, *supra* note 236 art. 14 (2).

<sup>656</sup> *Ibid.* art. 14 (1).

<sup>657</sup> *Ibid.* art. 10.

threats posed by LMOs and to preserve biodiversity in North America. Even so, that limited capacity, especially in terms of reporting on environmental concerns, can be utilized to good effect. The CEC's Maize Report demonstrates this, and we look at that next.

#### **4. The CEC's Maize Report**

##### *The Context*

In September 2001, Mexican government officials first reported contamination of traditional maize by transgenic sequences.<sup>658</sup> In 2002, the Mexican government confirmed contamination of 13% of maize varieties in 11 indigenous communities.<sup>659</sup> Transgenic maize was also found in storage facilities of DICONSA.<sup>660</sup> A petition was filed in April, 2002 with the CEC by various indigenous communities in the Mexican State of Oaxaca and several NGOs from the NAFTA parties.<sup>661</sup> This petition included concerns over the introduction and planting of transgenic maize in that country and requested an evaluation of the possible environmental impacts of transgenic maize; an analysis of the gene flow in the native communities where maize was planted, and the degree and source of contamination and recommendations to address such harm.<sup>662</sup>

Due to the inherent difficulty in proving claims regarding impacts on biodiversity by LMOs, indigenous groups and NGOs were unable to bring the grievance under the public complaint procedures of Article 14 of the NAAEC.<sup>663</sup> They did, however, succeed

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<sup>658</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 32.

<sup>659</sup> *Ibid.*

<sup>660</sup> *Ibid.*

<sup>661</sup> *Ibid* at 33.

<sup>662</sup> *Ibid.* See page 34.

<sup>663</sup> The requirements under NAAEC Article 14 under the complaint procedure are the following: (a) Written complaint in a language designated by that Party in a notification to the Secretariat; (b) identify the person or organization making the submission; (c) provide sufficient information to allow the Secretariat to

in influencing public opinion and ultimately in getting the CEC's Secretariat to pursue a report under NAAEC Article 13. The Report was intended to include, *inter alia*, two program areas within the CEC, namely, Environment, Economy and Trade.<sup>664</sup>

The Secretariat took into account in developing this Report, the issue of "insufficient knowledge on the impact of emerging technologies, such as the use of transgenic material, and that this issue was one of North America's most important concerns to biodiversity."<sup>665</sup> The Secretariat gathered an advisory group composed of scientists and biodiversity experts to consider the issue for purposes of the Report.<sup>666</sup>

#### 4.1 The Scope of the CEC's Maize Report

Under Article 13 of the NAAEC, the CEC Report was to analyze the potential impacts of the cultivation of transgenic maize on Mexico's native varieties and the potential alteration in their genetic composition.<sup>667</sup> The advisory group commissioned to conduct the Report strove to analyze the risks and benefits to "interested and affected parties in and to maize biodiversity in Mexico."<sup>668</sup>

To achieve this goal, the Report focused on examining the potential problems related to direct and indirect gene flow from transgenic varieties of maize and on the

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review the submission, including any documentary evidence on which the submission may be based; (d) aimed at promoting enforcement rather than at harassing industry; (e) indicating that the matter has been communicated in writing to the relevant authorities of the Party and indicates the Party's response, if any; and (f) filed by a person or organization residing or established in the territory of a Party. NAAEC, *supra* note 236 art. 14.

<sup>664</sup> Memorandum of the Secretariat to the CEC Council, June 14, 2002, online: < <http://www.cec.org/files/PDF/memo-maize2e.pdf> >. (accessed January, 12, 2007).

<sup>665</sup> *Ibid.*

<sup>666</sup> Advisory group, online : < <http://www.cec.org/news/details/index.cfm?varlan=english&ID=2502> >. (accessed January, 12, 2007).

<sup>667</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 8.

<sup>668</sup> *Ibid.*

conservation of maize biodiversity near its center of origin.<sup>669</sup> Several discussion papers were developed, chapters were submitted to the peer review process, symposiums were organized and public participation took place. The findings of the Report were meant to aid the CEC Secretariat in its analysis to enable it provide recommendations to the three NAFTA parties.<sup>670</sup>

The following section deals with an analysis of the CEC's Maize Report. It describes issues dealt with in the Report such as gene flow; the effects of transgenic maize on biodiversity and human health; socioeconomic impacts; Mexico's policy on transgenic maize and recommendations by the CEC's advisory group.

#### **4.2 Gene Flow**

The Advisory group pointed out that extreme poverty, large dependence on agriculture and significant indigenous communities in Mexico were important factors that needed to be taken into account in assessing not only 'gene flow' but also in general the effects of transgenic maize in that country.<sup>671</sup> Regarding gene flow, the advisory group acknowledged that this constitutes a vital factor in the *in situ* conservation of maize. It pointed out that farmers often trade seeds and allow cross-pollination between different strains of maize and that despite the improvement of maize through gene flow, farmers have always been able to select and perpetuate the diverse varieties of landraces and cultivars in Mexico.<sup>672</sup>

The advisory group noted that the transgenic maize planted by farmers entered Mexico via imports from the United States. It also mentioned that 25 percent of the

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<sup>669</sup> *Ibid.* at 8-9.

<sup>670</sup> *Ibid.*

<sup>671</sup> *Ibid.* at 15.

<sup>672</sup> *Ibid.*

imported maize from the United States is of transgenic origin.<sup>673</sup> It pointed out that the transgenic maize in question was distributed by DICONSA and that it is a well known fact that many small scale farmers plant transgenic maize distributed from that governmental Agency.<sup>674</sup> It also acknowledged that *ex situ* and *in situ* conservation strategies were necessary to maintain and preserve the rich genetic diversity found in Mexican landraces.<sup>675</sup>

#### 4.3 Transgenic Maize, Biodiversity and Human Health

The advisory group noted that local and indigenous farmers play a fundamental role in the preservation of maize biodiversity<sup>676</sup> and that Mexican landraces are the product of a dynamic process, a result in which nature and human selection are substantial factors. Furthermore, on the effects of transgenic maize on biodiversity, the advisory group noted that “neither negative nor positive effects of transgenic maize on the plants and animals occurring with them in the maize fields have been reported” and that additional scientific tests needed to be done to assess the effects of transgenic maize on Mexican maize varieties.<sup>677</sup>

The advisory group affirmed that due to the biological characteristics of traditional varieties of maize, transgenic or not, they are very unlikely to spread into neighboring communities. The Advisory group noted that the effect of transgenic maize on non-target insects in maize fields is still unknown.<sup>678</sup>

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<sup>673</sup> *Ibid.* at 16.

<sup>674</sup> *Ibid.*

<sup>675</sup> *Ibid.*

<sup>676</sup> *Ibid.*

<sup>677</sup> *Ibid.* at 19.

<sup>678</sup> *Ibid.* at 19.

Regarding the effects of transgenic maize on human health, the advisory group noted that there was not sufficient evidence that transgenic crops were either beneficial or harmful to human beings but that the high consumption of maize in Mexico needed to be taken into account in future introductions of new varieties of transgenic maize.<sup>679</sup>

#### 4.4 Transgenic Maize and Socioeconomic Impacts

The advisory group acknowledged that there are about 59 races of maize in Mexico<sup>680</sup> and that this grain has significant, symbolic and cultural and spiritual values for Mexicans.<sup>681</sup> It also pointed out that Maize is associated with a deity and that parts of the maize plant such as the kernel, ear or leaves were captured in murals or integrated in sculptures of Mexican indigenous groups.<sup>682</sup>

The advisory group also noted that in the southern Mexican State of Oaxaca, some farmers considered the presence of transgenes in maize as an unacceptable risk for their farming activities and to the cultural, symbolic and spiritual value of maize.<sup>683</sup> In other rural areas of the country, the introduction of transgenic maize is also considered a “contamination.”<sup>684</sup>

In addition, the group acknowledged that Mexico was not self-sufficient in maize production and that the maize industry was regulated under a very complicated scheme including millers, importers, transporters, tortilla production, etc. It noted that traditional

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<sup>679</sup> *Ibid.* at 21.

<sup>680</sup> Turrent Antonio & Serratos Antonio, *Maize and Biodiversity: The Effects of Transgenic Maize in Mexico*, “Context and Background on Maize and its Wild Relatives in Mexico,” (2004), Secretariat of the Commission for Environmental Cooperation. at 29.

<sup>681</sup> *Ibid.*

<sup>682</sup> *Ibid.* at 5-6.

<sup>683</sup> *Maize and Biodiversity: The Effects of Transgenic Maize in Mexico*, *supra* note 6 at 21.

<sup>684</sup> *Ibid.* at 21.

and indigenous farming accounted for two-thirds of maize production in the country.<sup>685</sup> It stressed that Mexican farmers, as part of their cultural identities and community traditions, exchange seeds for future planting, experiment with maize landraces, and that indigenous groups had *in situ* conservation systems to preserve some traditional varieties of maize.<sup>686</sup>

The advisory group noted too that herbicide tolerance and insect resistance varieties of modified maize had not demonstrated, *per se*, to be beneficial to Mexican farmers more than traditional varieties of maize.<sup>687</sup> It stressed that transgenic maize was introduced into Mexico from the United States and that there had been no formal process of consultation with the interested stakeholders. It recognized that there was a general sentiment of distrust of government officials and there was miscommunication about the benefits and risks of such maize in Oaxaca.<sup>688</sup>

#### **4.5 Mexico's Policy on Transgenic Maize**

At the time transgenic maize was introduced, it was obvious that Mexican policy on the issue was deficient or non-existent. In any case, financial and institutional resources were lacking to properly monitor the introduction of this maize into Mexico. On these matters, the advisory group acknowledged that Mexico lacked monitoring mechanisms to ensure the protection of Mexican maize. It also mentioned that the introduced and planted transgenic maize did not undergo appropriate risk assessment for

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<sup>685</sup> *Ibid.*

<sup>686</sup> *Ibid.*

<sup>687</sup> *Ibid.*

<sup>688</sup> *Ibid.*



environmental, social, health and economic risks.<sup>689</sup> In addition, it was affirmed by the advisory group that:

The official Mexican government positions regarding transgenic maize and the roles and responsibilities of specific government departments to regulate transgenic maize are either unknown or not understood by the public.<sup>690</sup>

Overall, the advisory group acknowledged that Mexico lacked the capacity to undertake scientific research, regulatory assessment and policy enforcement on the issue.<sup>691</sup>

#### **4.6 Recommendations**

Based on its key findings and considering background papers and public input, the advisory group made recommendations to the three NAFTA parties on gene flow, the preservation of biodiversity, health and sociocultural matters. Regarding gene flow, it recommended that Mexico should minimize the import of transgenic maize by strengthening the maize moratorium imposed on commercial planting of transgenic maize or by milling the transgenic maize at the point of entry.<sup>692</sup>

The advisory group recommended that effective programs for *in situ* and *ex situ* preservation of maize were needed in the country and that traditional forms of gene flow, derived from traditional farming, should be protected since they promote the foundation of food security and genetic diversity in Mexico's landraces.<sup>693</sup> It concluded that further

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<sup>689</sup> *Ibid.* at 25.

<sup>690</sup> *Ibid.*

<sup>691</sup> *Ibid.*

<sup>692</sup> *Ibid.* at 27-28.

<sup>693</sup> *Ibid.*

research was needed to determine the effects of transgenic maize in Mexico's native landraces and varieties of maize.<sup>694</sup>

Regarding biodiversity, the advisory group recommended that capacity building be supported in Mexico to allow this country to conduct scientific studies of maize cultivation and maize improvement.<sup>695</sup> It recommended that the genetic structure of maize should be monitored on a permanent basis due to the importance of this grain in the country. It noted that maize cultivation should include a consideration of the potential risks and benefits of this activity on small scale farmers and that they should be involved in the development of new agricultural practices from the very beginning of the process.<sup>696</sup>

Regarding human health, the advisory group recommended that further studies be performed, particularly on the high human intake of transgenic maize commodities in Mexico and that the production of maize that is not compatible with human consumption be prohibited from being planted or imported.<sup>697</sup> Regarding sociocultural matters, the advisory group noted that to lessen the risks associated with transgenic maize imports from the United States, maize should be labeled as "may contain GMOs."<sup>698</sup> It also suggested that imported transgenic maize be directed to mills for processing to avoid further risks.<sup>699</sup>

The advisory group recommended that harmonization is necessary in addressing biosafety risks and that this objective could be achieved under the North American

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<sup>694</sup> *Ibid.*

<sup>695</sup> *Ibid.*

<sup>696</sup> *Ibid.*

<sup>697</sup> *Ibid.* at 30.

<sup>698</sup> *Ibid.* at 31.

<sup>699</sup> *Ibid.*

Biotechnology Initiative (NABI). It asked that this initiative be implemented and that exchange of information among the three NAFTA countries is necessary so that no products are released without the knowledge of the three governments.<sup>700</sup> It also recommended that the Mexican government should initiate a consultation process with farmers regarding the risks and benefits of transgenic maize. It urged the Mexican government to create programs to educate farmers regarding the dangers of planting transgenic commodities. In addition, it encouraged the three NAFTA parties to create an information exchange mechanism to coordinate GMO regulation efforts in the three countries and to communicate decisions among the three countries.<sup>701</sup>

Additionally, the Report highlighted the convergence of trade and environmental protection: on the hand, Mexico's obligations to preserve its vast biological resources, and on the other, its need to abide by NAFTA obligations. The Report demonstrated the lack of consensus and how political the topic of LMO regulation is in North America. This factor came out clearly in the angry response of the three NAFTA parties when the Report recommended that Mexico should reconsider transgenic maize imports from the United States.<sup>702</sup>

On the subject of the CEC's Maize Report, the government of Canada stated that there were discrepancies between the key scientific findings and some recommendations on the issue of gene flow.<sup>703</sup> It argued that the gene flow recommendations implied that all traits derived from transgenes presented the same risks, and that this otherwise lumps

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<sup>700</sup> *Ibid.*

<sup>701</sup> *Ibid.*

<sup>702</sup> *Ibid.* at 41,46, 47.

<sup>703</sup> *Ibid.*

it with the effect of the gene flow that occurs between other non-transgenic varieties.<sup>704</sup> It accusatorily pointed out that “without the inputs that have informed the development of these recommendations, it was difficult to reconcile this apparent discrepancy.”<sup>705</sup>

The United States of America, on the same matter, noted: “We are deeply disappointed that the CEC Secretariat has produced a report under NAAEC Article 13 that ignores key science about biotechnology and fails to focus on efforts that will preserve maize genetic diversity, the stated goal of the report.”<sup>706</sup> In its view, an improvement on the implementation of Article 13 of the NAAEC was needed.<sup>707</sup>

Lastly, Mexico criticized the Report and suggested that several judgments were included in it regarding Mexican culture and Mexican politics: “In the regions of maize landrace cultivation, there is recent cultural memory and political history among the indigenous peoples of perceived inequity and injustice at the hands of Mexicans of Spanish origin, Americans, and powerful elites.”<sup>708</sup>

Notwithstanding the disapproving views of the three governments, the CEC’s Maize Report is of paramount importance. It acknowledges the importance maize has for Mexican culture and the necessity of preserving maize biodiversity in that country. It also evidenced the deficiencies in Mexico’s policy, legislation and environmental institutions, not only in the preservation of such an important grain of maize, but also in the preservation of biodiversity in general. This is shown throughout the report in comments on institutional deficiencies and observations about the lack of coordination between

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<sup>704</sup> *Ibid.*

<sup>705</sup> *Ibid.*

<sup>706</sup> *Ibid.*

<sup>707</sup> *Ibid.*

<sup>708</sup> *Ibid.*

DICONSA and other relevant institutions that have related authority in the area of concern in issue.

The Report shows that transgenic maize imports did not undergo risk assessment and public consultations did not take place regarding the potential effects of transgenic maize on traditional farmers and agriculture. Also, farmers who follow the tradition of saving seeds for future seasons and who regularly plant maize from that distribution agency were not warned or educated on the potential effects of planting transgenic commodities.

In the Report, it was also shown that the absence of biosafety legislation was sought to be compensated with a moratorium on planting transgenic maize, but such a measure, unfortunately, could not be enforced. The failure to enforce the moratorium demonstrated Mexico's lack of monitoring mechanisms, financial resources, and a comprehensive policy on handling transgenic maize in the country. These issues raise important questions regarding the capacity of this country to preserve its biological resources in keeping with its obligations under the Cartagena Protocol and the CBD.

## **5. Conclusion**

The preceding discussion demonstrates that under the NAFTA regime, environmental protection is an important component of trade. The creation of the NAAEC with its implementation under the CEC institutionalizes it. In practice, however, we saw that there is a careful balance between encouraging free trade and observing science-based SPS standards set up by each State against international yardsticks to protect biological resources, among others. Discussion of the CBD and the Cartagena

Protocol in Chapter III Sections 2 and 3 shows that ultimately, efforts by Mexico to observe biodiversity preservation obligations under the international agreements must be hemmed in trade considerations under NAFTA, as under the WTO regime.

Together then, Chapters III and IV demonstrate that efforts to preserve biodiversity are still in their infancy due to the tension between trade promotion and environmental protection obligations. This clash at the international and regional levels hinders the application of the CBD and the Cartagena Protocol, and non-political implementation of the NAAEC. In sum, States are trapped in a dilemma between preserving their biological resources and achieving economic development through abiding by international trade agreements.<sup>709</sup> Such is the case of Mexico, and the CEC's Maize Report discussed in this Chapter illustrates the dilemma. For Mexico this case evidences deficiencies in its legislation, institutions and environmental policy formulation and enforcement. The CEC's Maize Report depicts Mexico as unable to enforce a moratorium that could afford some protection to its rich biological diversity in general and to native maize plants in particular. More generally, the Case reflects the struggle of economies in transition to balance the potential benefits of LMOs in agriculture, economic development and environmental protection.

Overall, the challenges that arise in international law for the implementation of the CBD and the Cartagena Protocol in Mexico require thoughtful study of its environmental laws, federal regulations and national implementation mechanisms,

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<sup>709</sup> Indeed, it must be observed that environmental regime effectiveness is measurable by various criteria. Essentially, such a regime must show a fair correlation between national environmental conduct and the practical demands of environmental treaty obligations. The discussion in this, and the preceding chapter show that as regards Mexican biodiversity preservation, the socioeconomic and political context in which to secure it as a matter of international legal obligation makes an effective Mexican regime a remote possibility. For a detailed study on factors that may make for effective environmental regimes, see Young, Oran R., (ed) "The Effectiveness of International Environmental Regimes: Causal Connections and behavioural Mechanisms," (Cambridge, Massachusetts, Institute of Technology, 1999).

including environmental policy, institutional capacity and legislation. This study is conducted in the following two Chapters.

## CHAPTER V

### GMOs IN MEXICAN AGRICULTURE: THE EVOLUTION AND CALIBRE OF THE LEGAL AND INSTITUTIONAL REGIMES

#### 1. Overview

Mexico's environmental legislation is rooted in the Constitution of the Mexican United States of 1917.<sup>710</sup> Article 4 provides for the right of all persons to an adequate environment for their development.<sup>711</sup> Although general, this suggests a concern for the environment and for human health. In addition, Article 27 of the Constitution regulates the ownership of lands and waters in Mexico. It also details the obligation of the Mexican government "to preserve and to restore the ecological equilibrium of the land."<sup>712</sup> Article 73 empowers Congress to delimit the competences and attributes of the States and municipalities regarding environmental protection.<sup>713</sup>

At the federal level, several laws aim to preserve biological resources and to regulate LMOs. One such law is the General Law of Ecological Equilibrium,<sup>714</sup> which establishes the basis for environmental protection in Mexico. This law distributes authority among States and the federation, and attempts to coordinate the federal agencies that are responsible for protecting the environment.<sup>715</sup>

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<sup>710</sup> Constitution of the Mexican United States of 1917, *supra* note 184.

<sup>711</sup> *Ibid.* at 4.

<sup>712</sup> *Ibid.* at 27.

<sup>713</sup> *Ibid.* at 73. For a comprehensive explanation of Mexican Law, see Zamora, Stephen, *supra* note 11.

<sup>714</sup> General Law of Ecological Equilibrium, *supra* note 8.

<sup>715</sup> *Ibid.* at. 4-14.



The General Law of Ecological Equilibrium also contains provisions with respect to EIA to be undertaken prior to the disposal of hazardous waste, and prior to the import, export, and introduction of genetic material into the environment.<sup>716</sup> Additionally, the General Law of Ecological Equilibrium's subordinate legislation, the Regulatory Law on Impact Assessment,<sup>717</sup> sets out federal guidelines and standards according to which to evaluate and perform impact assessments of activities that could negatively alter ecological equilibrium.<sup>718</sup>

Also at the federal level, the Law of Plant Health<sup>719</sup> regulates the use of transgenic material and its introduction into the environment. It does this by requiring a phytosanitary certificate requirement previous to their commercialization. Also, the Law on the Production, Certification and Commerce of Seeds<sup>720</sup> imposes a permit requirement procedure regarding activities involving experimentation with transgenic crops and their introduction into the environment.<sup>721</sup>

Biotechnology and 'LMOs' are regulated by means of the recent Biosafety Law on GMOs.<sup>722</sup> This law makes use of the broad term, GMOs, to regulate both Living Modified Organisms and GMOs.<sup>723</sup> It regulates the introduction of LMOs into the

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<sup>716</sup> The General Law of Ecological Equilibrium refers to LMOs as "genetic material" or "living organisms resulting from biotechnology." *Ibid.* at 3 section (V).

<sup>717</sup> Federal Regulation of the Ecological Equilibrium Law on Impact Assessment (Ley Reglamentaria de la Ley General del Equilibrio Ecológico y la Protección al Ambiente en materia de Evaluación de Impacto Ambiental). DOF 30-05-2000. This law regulates the Impact Assessment figure contained in the Ecological Equilibrium Law setting up a national framework of environmental protection.

<sup>718</sup> *Ibid.* at 5.

<sup>719</sup> Law of Plant Health (Ley de Sanidad Vegetal), DOF 05-01-1994, online: <<http://www.diputados.gob.mx/LeyesBiblio/pdf/117.pdf>>. (accessed January, 12, 2007).

<sup>720</sup> Law on the Production, Certification and Commerce of Seeds (LPCCS), DOF 15-07-1991, online: <<http://www.sagpa.gob.mx/mnformativo/pdf/leyes/L001.pdf#search=%22Ley%20de%20produccion%20y%20comercializacion%20de%20semillas%22>>. (accessed January, 12, 2007).

<sup>721</sup> *Ibid.* at 1-3.

<sup>722</sup> Biosafety law on GMOs. *supra* note 9 arts. 86-87.

<sup>723</sup> *Ibid.* art. 2.

environment by means of a permit procedure.<sup>724</sup> It also contemplates zones free of GMOs to protect native plants and for certification purposes where this is required for the production of organic products.<sup>725</sup> Public participation is also contemplated in this law as a democratic tool for making decisions.<sup>726</sup>

Parallel to this federal legislation are NOMs or national obligatory standards created by the National Commission of Standardization and the federal secretariats on issues within their competence.<sup>727</sup> One such NOMs is the 1995 NOM-056-FITO.<sup>728</sup> This norm establishes phytosanitary requirements for transportation, import and experimental trials of organisms manipulated genetically in the country.<sup>729</sup> As well, the Mexican Federal States have legislative competence to enact environmental protection laws within their respective areas of competence and in accordance with the Mexican Constitution.<sup>730</sup>

Specialized governmental secretariats are empowered to implement environmental legislation to preserve the environment from the threat of LMOs and to regulate these organisms. These are the Secretariat of the Environment and the Secretariat

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<sup>724</sup> The Secretariat of the Environment or the Secretariat of Agriculture or the Secretariat of Health may authorize the introduction of LMOs in their respective areas.

<sup>725</sup> Biosafety Law on GMOs. *supra* note 9 arts. 86-87. The Biosafety Law on GMOs employs these terms indistinctively although they are different for some. The term LMOs refers organisms that have been modified by the use of biotechnology techniques and to those that are capable of replicating. Genetically Modified Organisms (GMOs), on the other hand, are not defined in the CBD or the Cartagena Protocol and portray dormant organisms that have been genetically modified by the use of biotechnology. The term GMOs in this Chapter may be used to refer to LMOs when employed in Mexican legislation. See IUCN Environmental Law Centre, *An Explanatory Guide to the Cartagena Protocol on Biosafety*, *supra* note 3 at 45.

<sup>726</sup> *Ibid.* art. 2 section XIV.

<sup>727</sup> NOMs are mandatory standards to be enforced by one or more of the Mexican Secretariats, the characteristics and requirements that products must meet for their safety and procedures that must be followed to protect people and the environment from harm. An example of a Mexican Official Norm is the NOM-056-FITO-1995 developed by the Secretariat of Agriculture and Rural Development in which guidelines are established for the control and protection of the environment. According to this norm, the proponent is obliged to request a phytosanitary permission to introduce LMOs in the environment for research purposes. The proponent must include in the petition characteristics of the organisms, place of introduction, route of transportation, etc.

<sup>728</sup> NOM-056-FITO-1995, *supra* note 273.

<sup>729</sup> *Ibid.*

<sup>730</sup> General Law of Ecological Equilibrium, *supra* note 8, art. 8.

of Agriculture. These Secretariats are responsible for applying most of Mexico's environmental laws related to biodiversity and the introduction of LMOs into the environment.<sup>731</sup> They also have authority to grant permits that enable the introduction of such organisms into the environment.

Other institutions also play important roles in this matter. These are the National Institute of Ecology; the National Biodiversity Commission; the Inter-Secretarial Commission of GMOs; and, the Federal Attorney for Environmental Protection (PROFEPA or the Federal Attorney for Environmental Protection).

The National Institute of Ecology and the National Biodiversity Commission regulate limited aspects of LMOs. The National Institute of Ecology,<sup>732</sup> for example, promotes scientific research and identifies vulnerable areas that need to be protected. The National Commission of Biodiversity, similarly, promotes research on issues that can potentially impact biological diversity and to create national programs and policies for the preservation of biological diversity.<sup>733</sup> The Inter-Secretarial Commission on GMOs was created specifically to coordinate the efforts of the secretariats of agriculture, health and the environment to regulate LMOs.<sup>734</sup> This Commission, led by the Mexican President, has the power to propose the establishment of Mexican official norms or federal standards regarding the introduction, manipulation and experimentation with

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<sup>731</sup> Biosafety Law on GMOs. *supra* note 9 at 10. See also art. 12.

<sup>732</sup> National Institute of Ecology, Mission and Aim of the National Institute of Ecology, online: < [http://www.ine.gob.mx/english/what\\_is\\_ine.html](http://www.ine.gob.mx/english/what_is_ine.html) >. (accessed January, 12, 2007).

<sup>733</sup> National Commission on Biodiversity, Profile, online: < <http://www.conabio.gob.mx/institucion/conabioingles/doctos/perfil.html> >. (accessed January, 12, 2007). See also National Commission on Biodiversity, Internal Regulations, online: < [http://www.conabio.gob.mx/institucion/conabioingles/doctos/reglamento\\_interno.pdf](http://www.conabio.gob.mx/institucion/conabioingles/doctos/reglamento_interno.pdf) >. (accessed January, 12, 2007).

<sup>734</sup> The Inter-Secretarial Commission on GMOs was created in 2002, at the same time the CEC considered elaborating the Report on the introduction of transgenic maize in Mexico.

LMOs. These norms are essential to ensure implementation of the Biosafety Law on GMOs.

The Federal Attorney for Environmental Protection is an institution that enforces Mexican environmental law. It is an independent administrative organ of the Secretariat of the Environment.<sup>735</sup> It utilizes a public complaint system at the federal level to enforce Mexico's environmental law.

The preceding descriptive cataloguing is meant to indicate that an analysis of Mexican legislation and environmental institutions that play various roles in the conservation of biological diversity is the focus of this Chapter. The discussion contextualizes the legislative and institutional framework within the obligation to preserve biological resources from the threat of LMOs and to assess the degree of compliance that the legislation and institutions could be said to generate in keeping with the obligations Mexico has under the CBD and the Cartagena Protocol.

The rest of the Chapter is organized into three sections. Section 2 undertakes the discussion in relation to Mexico's environmental legislation, and Section 3 does the same with focus on Mexico's environmental institutions. Section 4 provides a conclusion that draws together the weaknesses and shortfalls of both the legal and institutional regimes in light of the purpose of biodiversity preservation which they are otherwise designated to ensure.

## **2. Mexican Legislation**

Mexico's environmental legislation has been evolving since the beginning of the 1970s. Early legislation was specifically created to deal with environmental problems and

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<sup>735</sup> General Law of Ecological Equilibrium, *supra* note 8, at 188.

the effects of environmental degradation on human health. This was the case of the Law to Prevent and Control Environmental Pollution of 1971.<sup>736</sup> It is also important to note that at that time, several legislative reforms took place that gradually empowered the government to take appropriate action against environmental pollution.<sup>737</sup> One such measure was the creation of the 1982 Federal Law to Preserve the Environment, which exhibited an enhanced commitment to preserve the environment in contrast to previous legislation.<sup>738</sup>

Constitutional reforms in 1987 granted the Mexican Congress authority to legislate on environmental matters.<sup>739</sup> Consequently, in 1988, the General Law of Ecological Equilibrium and Environmental Protection was created.<sup>740</sup> It offered a more comprehensive approach to environmental preservation. Unlike previous legislation, this Law went beyond preserving the environment in its consideration of the importance of biological resources.<sup>741</sup>

Continuous legal reforms and specialized legislation continue to shape Mexico's environmental law regime. One such reform is the 2005 Biosafety Law on GMOs,<sup>742</sup> which constitutes the most advanced legislation that addresses the threat of LMOs to biological resources. A description and analysis of these laws follows.

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<sup>736</sup> *Ibid.*

<sup>737</sup> Vargas, Jose M., "The Development of Mexico's Environmental Legislation" Mexican National Institute of Ecology, online: < <http://www.ine.gob.mx/ueajei/publicaciones/libros/395/vargas.html>>. (accessed January, 12, 2007).

<sup>738</sup> *Ibid.*

<sup>739</sup> Quintana, Jesus, *Derecho Ambiental Mexicano: Lineamientos Generales*, (Mexican Environmental Law : General Guidelines), (Mexico City: Porrua, 2002) at 44.

<sup>740</sup> General Law of Ecological Equilibrium, *supra* note 8

<sup>741</sup> Quintana, Jesus, *supra* note 739.

<sup>742</sup> Biosafety Law on GMOs, *supra* note 9.

## 2.1 The Mexican Constitution

The Mexican Constitution contains general provisions that show regard for the environment and natural resources. Two such provisions are found in Articles 27 and 73.<sup>743</sup> These Articles lay the environmental framework upon which Mexico's environmental legislation is built.<sup>744</sup> Article 27 regarding natural resources states:

The Nation shall at all times have the right to impose on private property such limitations as the public interest may demand, as well as the right to regulate the utilization of natural resources which are susceptible of appropriation, in order to conserve them and to ensure a more equitable distribution of public wealth...and to prevent the destruction of natural resources.<sup>745</sup>

This provision is the result of extensive reforms that occurred in 1987 that enhanced the authority of the federal government in the task of preserving the environment.<sup>746</sup> Article 27 emphasizes the right of the State to regulate the utilization of natural resources and imposes on it the specific obligation to preserve them.<sup>747</sup> On the basis of this provision, the Mexican government can extensively regulate activities that potentially impact the environment by means of specialized federal laws, national standards or norms regarding the utilization of natural resources.

Article 73 also contains several provisions that impact the regulation of natural resources. In general, it states that the Mexican Congress has:

The power to make laws that establish agreement of the Federal Government and of the governments of the States and municipalities, in the areas of their

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<sup>743</sup> Constitution of the Mexican United States of 1917, *supra* note 184 arts. 27, 73.

<sup>744</sup> Law and Environmental Policy in North America, Commission for Environmental Cooperation, (1998), online: < [http://www.cec.org/files/pdf/LAWPOLICY/vol-2s\\_ES.pdf](http://www.cec.org/files/pdf/LAWPOLICY/vol-2s_ES.pdf)>. at 160. (accessed January, 12, 2007).

<sup>745</sup> Constitution of the Mexican United States of 1917, *supra* note 184, art 27.

<sup>746</sup> Micheli, Jordy, "Política ambiental en México y su dimensión regional", (2002) XIV Region y Sociedad 23 at 137-139.

<sup>747</sup> Constitution of the Mexican United States of 1917, *supra* note 184 at 227.

respective jurisdictions, in matters of protection of the environment and preservation and restoration of ecological balance.<sup>748</sup>

This provision goes beyond regulating the use of natural resources. It empowers Congress to delineate competences regarding environmental protection, not only at the federal, but also at the State and municipal levels. The enhanced authority vested in Congress to delineate environmental responsibilities at the constitutional level and the inclusion of Mexico's commitment to preserve the environment in the Constitution has the potential not only to unify and strengthen environmental preservation in Mexico but also to coordinate legislation and institutions for this purpose across the various levels of government.

In addition to Articles 27 and 73, there are general provisions in the Constitution regarding the environment. These are contained in Articles 4 and 25.<sup>749</sup> Article 4 states that all "individuals have a right to an adequate natural environment for their development and welfare."<sup>750</sup> This provision considers the environment as an important factor in the development of individuals and acknowledges the potential effects of a deteriorated environment on human beings. It also shows, at least on paper, concern for the preservation of the environment.<sup>751</sup> Article 25 is concerned with regulating economic activities across the country.<sup>752</sup> This Article states that resources utilized in production

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<sup>748</sup> *Ibid.* at 73 section XIX(G).

<sup>749</sup> *Ibid.* at 4, 25.

<sup>750</sup> *Ibid.* at 4.

<sup>751</sup> In 2000 a legislative initiative by Mexico's Green Party attempted to reform Article 4 of the Mexican Constitution of 1917 to enforce polluters to compensate for environmental harm. Legislative Initiative, Green Party (7 November 2000), online: < [http://www.diputados.gob.mx/sia/coord/pdf/refconst\\_lvi/ivos\\_doc/009.doc](http://www.diputados.gob.mx/sia/coord/pdf/refconst_lvi/ivos_doc/009.doc)>. (accessed January, 12, 2007).

<sup>752</sup> *Ibid.* at art. 25

and “natural resources shall be preserved”,<sup>753</sup> implying that economic activities should take into account resources and environment preservation.<sup>754</sup>

General provisions such as Articles 4 and 25 tangentially address environmental protection and resources preservation. But they are not implemented by federal legislation, nor can they be directly invoked in court.<sup>755</sup> Consequently, only Articles 27 and 73 can be relied upon to pursue the goal of preserving the environment. Although biological diversity is not specifically mentioned in the Constitution, the relevant Articles discussed imply that biological diversity preservation is considered by those Articles as necessary for the welfare and development of Mexico and its citizens.<sup>756</sup>

We now turn to an analysis of Mexico’s federal laws and national environmental standards in terms of how far their provisions could preserve Mexico’s biological resources and regulate the introduction and spread of LMOs.

## **2.2 General Law of Ecological Equilibrium and Environmental Protection**

The General Law of Ecological Equilibrium<sup>757</sup> is the backbone of Mexico’s environmental law. It is the result of constitutional reforms introduced in 1987 to modernize its predecessor, the Federal Law of Environmental Protection of 1982.<sup>758</sup> The General Law of Ecological Equilibrium’s objectives with respect to biodiversity preservation are as stated in Article 1:

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<sup>753</sup> *Ibid.*

<sup>754</sup> *Ibid.*

<sup>755</sup> Carmona, Maria, *Derechos Relacionados con el Medio Ambiente*, (Rights related to the environment), Nacional University of Mexico, (2000), online:< <http://www.bibliojuridica.org/libros/1/66/tc.pdf>>. at 10-12. (accessed January, 12, 2007).

<sup>756</sup> Constitution of the Mexican United States of 1917, *supra* note 184 at 4.

<sup>757</sup> General Law of Ecological Equilibrium, *supra* note 8.

<sup>758</sup> Quintana, Jesus, *supra* note 739 at 54.



- II. To define environmental policy and guarantee its implementation
- III. The preservation, restoration and the betterment of the environment
- IV. The preservation and protection of biological diversity and the creation and management of a system of protected areas to “preserve biological diversity and to establish a system of protected areas”.<sup>759</sup>

The General Law of Ecological Equilibrium offers the opportunity for a comprehensive approach to dealing with Mexico’s environmental problems. This is because it is a framework upon which specialized federal laws and regulations must be based.<sup>760</sup> It sets the basis for regulating various areas of environment-impacting activity, such as nuclear energy, protected areas, biodiversity, atmospheric contamination and hazardous waste.<sup>761</sup>

The General Law of Ecological Equilibrium follows a sustainable development approach to the preservation of the environment.<sup>762</sup> It reiterates the constitutional commitment to guarantee the right of individuals to an adequate environment and it defines Mexico’s environmental policy and instruments for its implementation.<sup>763</sup> Furthermore, this law provides coordination mechanisms for national and State environmental institutions and legislation.<sup>764</sup> It also makes provisions to facilitate the formulation and execution of actions to preserve biological diversity and the utilization of ‘genetic material’ countrywide.<sup>765</sup>

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<sup>759</sup> General Law of Ecological Equilibrium, *supra* note 8 art. 1.

<sup>760</sup> *Ibid.*

<sup>761</sup> Gonzalez, George R., “Overview of Environmental Laws of Mexico”, (2000) 9 Currents Int’l Trade L.J. 49. at 50.

<sup>762</sup> *Ibid* at 56.

<sup>763</sup> General Law of Ecological Equilibrium, *supra* note 8 art. 1

<sup>764</sup> *Ibid.*

<sup>765</sup> *Ibid.* art. 2 (III).

The General Law of Ecological Equilibrium considers the preservation of biodiversity and the utilization of genetic material a public matter.<sup>766</sup> It considers ‘genetic material’ as similar to Living Modified Organisms. It defines genetic material as “all material of vegetal, animal or microbial origin or of other type that contains functional units of heredity.”<sup>767</sup> In addition, it defines biological resources as being composed of genetic resources, organisms, populations of biotic components, and ecosystems.<sup>768</sup> The General Law of Ecological Equilibrium’s definition, although different from the one employed in the CBD, encompasses several components also covered under the Convention.<sup>769</sup>

Overall, the General Law of Ecological Equilibrium has been considered a law that provides for an integrated approach to dealing with Mexico’s environmental problems. Three outstanding elements comprise this law: environmental and risk assessment requirements; the establishment of protected and restoration zones; and, enforcement mechanisms to achieve its objectives. These elements are discussed next.

### **2.2.1 Environmental Impact and Risk Assessments**

Environmental impact assessment was consolidated in Mexico with the creation of the Secretariat of the Environment in 1994. This environmental institution proposed extensive reforms to the General Law of Ecological Equilibrium in 1996, aiming to improve the EIA procedure.<sup>770</sup> As a result, the EIA provisions establish clearly what activities require this assessment. The provision also allows for public participation in the

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<sup>766</sup> *Ibid.* art. 2.

<sup>767</sup> *Ibid.* at 3 (XXII).

<sup>768</sup> *Ibid.* art.3(XXI- XXVII).

<sup>769</sup> CBD, *supra* note 1 art. 2.

<sup>770</sup> Environmental Impact Assessment: Achievements and Challenges for Sustainable Development 1995-2000, National Institute of Ecology, General Directorate of Law and Environmental Impact Assessment, at 50-53.

process.<sup>771</sup> Furthermore, the Federal Regulation on EIA was enacted in September 2000 to aid in the implementation of the General Law of Ecological Equilibrium's provisions on EIA.<sup>772</sup>

Apart from EIA, the General Law of Ecological Equilibrium also provides for the use of risk assessment in the effort to preserve biological resources. These two procedures are employed together when activities are likely to dramatically alter ecological equilibrium.<sup>773</sup> The activities that require an impact and risk assessment include those involving transgenic material, such as the introduction of LMOs into the environment.<sup>774</sup> It is important to note that neither the General Law of Ecological Equilibrium nor its federal Regulation provide for the use of Strategic Environmental Assessment in environmental policies.<sup>775</sup>

The General Law of Ecological Equilibrium provides that the following activities require an environmental impact assessment: hydraulic and projects in the oil industry; mining; treatment of hazardous waste or radioactive material; activities in wild forests; changes in the use of land and industrial parks; activities involving coastal ecosystems; activities in protected areas, and activities that can impact marine ecosystems.<sup>776</sup>

In respect to activities covered under national standards and regulations, such as discharges or emissions, or when such activities are performed in authorized industrial

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<sup>771</sup> *Ibid.* at 53-54.

<sup>772</sup> *Ibid.*

<sup>773</sup> General Law of Ecological Equilibrium, *supra* note 8 art. 28.

<sup>774</sup> Environmental Impact Assessment: Achievements and Challenges for Sustainable Development 1995-2000, *supra* note 770 at 82.

<sup>775</sup> Although Strategic Environmental Assessment is not expressly mentioned in the Federal Regulation of the General Law of Ecological Equilibrium on Environmental Impact Assessment, the Organization for Economic Co-operation and Development (OECD) points out that efforts in the tourism sector have been taking place since 2006 to employ this important planning tool. See Organization for Economic Co-operation and Development, *Applying Strategic Environmental Assessment: Good Practice Guidance for Development Co-operation*, Guideline and Reference Series, 2006, online: < <http://www.oecd.org/dataoecd/4/21/37353858.pdf> >. (accessed January, 12, 2007).

<sup>776</sup> General Law of Ecological Equilibrium, *supra* note 8 art. 28.

parks, the General Law of Ecological Equilibrium only requires a preventive report.<sup>777</sup> Preventive reports include the name of the project, a particular application provided by the Secretariat of the Environment and reference to the Mexican Official Norms applicable to the activity. Based upon this report, SEMARNAT, can also decide within twenty days of receiving such a report to request an impact assessment if it considers that the activity will bring harm to the environment.<sup>778</sup>

The EIA procedure is initiated by a proponent's request before the Secretariat of the Environment. The request must contain: first, an environmental impact statement (EIS), which contains detailed information on the project or activity that may alter or impact the environment such as construction of gas plants, oil plants, etc. The EIS must include information on activities that will be performed and the development plans of the project. Second, a legal analysis of the project's compliance with national legislation and regulations must be provided.<sup>779</sup> Third, the economic development path of the project and its potential environmental impact on the local and regional area must be set out. Fourth, identification, description and evaluation of the direct and indirect environmental impacts of the proposed activity in terms of mitigating and preventive measures must be provided.<sup>780</sup> Fifth, evaluation of alternative locations, and sixth, an analysis of the methodology employed in the impact assessment must be detailed in the EIS.<sup>781</sup>

Other than the EIA requirements, proponents must also include a risk assessment of the proposed activity where potential harm to the environment is envisaged such as respecting projects or activities involving genetic material and LMOs. A risk assessment

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<sup>777</sup> *Ibid.* art. 31.

<sup>778</sup> *Ibid.*

<sup>779</sup> *Ibid.*

<sup>780</sup> *Ibid.*

<sup>781</sup> *Ibid.*

must be based on the technical information on the environment and on the activity contained in the impact statement. The risk assessment report must contain: first, a detailed analysis of the environmental risks of the project; second, possible scenarios and preventive measures related to the risks of the proposed project; third, a delimitation of buffer protection zones in the surrounding areas; and, fourth, security measures to protect from environmental harm.<sup>782</sup>

Once the Secretariat of the Environment receives an application from the proponent, it will evaluate the impact and risk assessment documents within sixty days, after which it will decide if it will allow the activity to proceed.<sup>783</sup> The Secretariat of the Environment also will conduct the necessary tests or will request additional information if required for the approval of the project.<sup>784</sup> It is important to note that the General Law of Ecological Equilibrium makes use of general forms for the presentation of EIAs on the activities covered under Article 28. It also employs NOMs to regulate the oil, electric and communications industry with regard to their potential impact on the environment. The NOMs prescribe the technical requirements to be met regarding the matters to be considered in the assessment of the aforementioned activities.<sup>785</sup>

We now turn to requirements regarding protected areas and restoration zones.

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<sup>782</sup> General Law of Ecological Equilibrium's Federal Regulation on Environmental Impact Assessment, DOF- 30- 05- 2000, art. 18, online : < [http://www.diputados.gob.mx/LeyesBiblio/regley/Reg\\_LGEEPA\\_MEIA.DOC](http://www.diputados.gob.mx/LeyesBiblio/regley/Reg_LGEEPA_MEIA.DOC)>. (accessed January, 12, 2007).

<sup>783</sup> General Law of Ecological Equilibrium, *supra* note 8 art. 35.

<sup>784</sup> *Ibid.* arts. 34-35.

<sup>785</sup> *Ibid.* at 152-153. NOM-113-ECOL-1998, establishes specifications for the planning, operation of electric plants that are to be located in urban areas; NOM-120-ECOL-1997, establishes specifications aimed to preserve the environment on mining activities; NOM-114-ECOL-1998, establishes guidelines to be considered for transmission of electricity in urban areas; NOM-115-ECOL-1998, establishes specifications regarding soil exploitation in the oil industry; NOM-116-ECOL-1998, provides guidance for the preservation of Agrícola zones and livestock; NOM-117-ECOL-1998, establishes guidelines for the transport of oil derivatives; NOM-130-ECOL-1998, provides specifications regarding the operation, planning and design of telecommunication activities and the use of fiber optic cables.

### 2.2.2 Protected Areas and Restoration Zones

Besides the EIA and risk assessment procedures, the General Law of Ecological Equilibrium also makes provision for preserving Mexico's biological diversity by means of a sophisticated system of protected areas, including their management regimes.<sup>786</sup> The system of protected areas in Mexico comprises biosphere reserves, national parks, natural monuments, areas of protected natural resources, areas for the preservation of fauna and flora, natural sanctuaries, park and State reserves and areas for the preservation of ecological zones.<sup>787</sup>

Under this law, the system of protected areas such areas are meant to preserve representative elements of the different climatic and geographic areas of the country,<sup>788</sup> to preserve endangered species, and to ensure the sustainable utilization of biological diversity in the country.<sup>789</sup>

Another measure contemplated in the General Law of Ecological Equilibrium for the preservation of biological resources is the restoration of deteriorated zones.

According to this law, in cases of extreme loss of biodiversity, the Secretariat of the Environment can propose to the executive the creation of restoration zones in places that face degradation problems.<sup>790</sup> The law also provides for biodiversity preservation through the protection of flora and fauna achieved by preserving the ecological processes of biological resources and endangered species.<sup>791</sup>

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<sup>786</sup> General Law of Ecological Equilibrium, *supra* note 8 art. 44.

<sup>787</sup> *Ibid.*

<sup>788</sup> *Ibid.*

<sup>789</sup> *Ibid.* art. 45.

<sup>790</sup> *Ibid.* art. 78.

<sup>791</sup> *Ibid.*

The General Law of Ecological Equilibrium mandates the elimination of illegal traffic in species, and the development of research on flora and fauna genetic materials to acquire knowledge of the potential scientific, environmental and economic value of such materials.<sup>792</sup> The General Law of Ecological Equilibrium also regulates the importation, propagation and exportation of flora, fauna and genetic material by means of a permission mechanism administered by this Secretariat.<sup>793</sup>

Under the General Law of Ecological Equilibrium, environmental impact and risk assessment, and the usefulness of protected areas and restorations zones depend on how well this observation is enforced. So we next look at the potential of the enforcement procedures put in place by this law.

### **2.2.3 Enforcement**

The Secretariat of the Environment enforces the General Law of Ecological Equilibrium's provisions in three ways: first, by means of audits and monitoring inspections; second, by imposing administrative sanctions;<sup>794</sup> and, third, by means of public participation during the EIA procedure and by means of the public complaint procedure administered by the Federal Attorney for Environmental Protection.<sup>795</sup>

Monitoring and compliance is ensured by means of inspector visits and audits conducted by the Secretariat of the Environment.<sup>796</sup> Inspectors verify compliance with the commitments or conditions included in authorized impact assessments. Also, by means of audits, compliance with emissions established in official norms is assessed. Pecuniary

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<sup>792</sup> *Ibid.* art. 79.

<sup>793</sup> *Ibid.* art. 82.

<sup>794</sup> *Ibid.* art. 160-166.

<sup>795</sup> *Ibid.* art. 189

<sup>796</sup> *Ibid.* art. 160, 171.

sanctions are imposed on those responsible for altering ecological equilibrium or causing environmental deterioration.<sup>797</sup> Administrative sanctions include fines as high as 15,000 USD,<sup>798</sup> license revocation and administrative arrest for thirty-six hours.<sup>799</sup>

After risk and impact assessment procedures are presented to the Secretariat of the Environment and they fulfill the legal and formal requirements, a public consultation procedure can be requested by any citizen. This procedure is controlled by the Secretariat of the Environment and it is aimed to incorporate public views and suggestions into carrying out the proposed project. The idea behind public participation in the EIA is that average citizens can provide insight to the Secretariat of the Environment because of their familiarity with the project and surrounding areas.<sup>800</sup>

Another tool employed to oversee the implementation of the General Law of Ecological Equilibrium and, in general, Mexican environmental law, is the public complaint procedure.<sup>801</sup> This procedure accomplishes three objectives; first, it helps the Secretariat of the Environment to implement the General Law of Ecological Equilibrium's requirements regarding environmental protection; second, the complaint procedure provides an inexpensive means to ensure compliance with Mexican environmental law; and, third, the procedure empowers society to play a wider role in the preservation of this Mexico's resources and, consequently, will contribute to create a culture of respect for the environment.<sup>802</sup>

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<sup>797</sup> *Ibid.* art. 171 sections I- III.

<sup>798</sup> *Ibid.*

<sup>799</sup> *Ibid.*

<sup>800</sup> *Ibid.* art. 28-31.

<sup>801</sup> *Ibid.* art. 189-203.

<sup>802</sup> *Ibid.*



Overall, the General Law of Ecological Equilibrium offers an integrated approach to integrating Mexican environmental protection measures. It provides a broad framework upon which federal laws and regulations could be based. The EIA procedure prescribed by the General Law of Ecological Equilibrium has the potential to help preserve biological diversity from harmful individual projects. But the procedure lacks guidelines for its uniform application and it fails to include Strategic Environmental Assessment for federal policies or plans.

Mexican Official Norms, although available in the implementation of the General Law on Environmental Equilibrium, are only concerned with activities in the oil, electric and communications industries and their impact on the environment. NOMs are necessary to establish guidelines for evaluating EIA. As well, the potential effectiveness of audits and inspector visits to enforce environmental law remains low unless financial resources are made available to carry them out. So far, such resources have barely been adequately provided.

Although the General Law of Ecological Equilibrium does not specifically regulate LMOs, it has the potential to address the risks posed by these organisms in the absence of biosafety legislation in Mexico. It could also compliment biosafety legislation when such legislation has unclear provisions. LMOs, for example, could be regulated under activities that may alter ecological equilibrium. Risk and impact assessments are likely to identify some of the risks posed by these organisms. The General Law of Ecological Equilibrium makes all of these possible.

Additionally, the citizen complaint process established in the General Law of Ecological Equilibrium is an innovative mechanism to aid the Secretariat of the

Environment to enforce environmental legislation. It is likely to contribute to the preservation of biodiversity in cases where pollution and harm to the environment are easily identified by the general population. In the case of LMOs, however, the complaint procedure may not be very helpful, since complicated technical analysis and scientific expertise is required to differentiate these organisms from their organic counterparts. Such specialized knowledge and skills are generally out of the reach of a common citizen. Another federal law relevant to the regulation of LMOs is the Law on Plant Health. We look at this next.

### **2.3 Law on Plant Health**

The Law on Plant Health (LPH)<sup>803</sup> aims to prevent, control and to eradicate plagues and diseases in forests, agricultural and wild plants.<sup>804</sup> Plants constitute an essential part of biodiversity in Mexico; their protection by means of this law contributes to the larger objective of preserving biological diversity, particularly from threats posed by LMOs.

The law approaches plant protection by setting out general phytosanitary requirements and formulating national standards on this matter. Also, the LPH establishes requirements on the importation, mobilization and introduction of genetically modified plants into the environment. The law acknowledges the potential threats of biotechnology and states that LMOs have the potential to replicate their traits in other organisms and to produce unexpected results.<sup>805</sup>

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<sup>803</sup> Law on Plant Health, D.O.F. 05-01-1994, online: < <http://www.diputados.gob.mx/LeyesBiblio/pdf/117.pdf> >. (accessed January, 12, 2007).

<sup>804</sup> *Ibid.* at 5.

<sup>805</sup> *Ibid.*

The LPH, administered by the Secretariat of Agriculture, utilizes a national phytosanitary standard NOM-056-FITO-1995<sup>806</sup> to regulate the national mobilization, import, and introduction of LMOs into the environment. Four essential aspects of the LPH can be distinguished: 1) National Phytosanitary Council; 2) Phytosanitary regulation; 3) The phytosanitary standard NOM-056-1995; and, 4) Enforcement measures. These elements are described in turn.

### **2.3.1 National Phytosanitary Council**

The National Phytosanitary Council (NAPC) comprises groups of experts on science and agronomy from academia, the government and different sectors of Mexican society.<sup>807</sup> It is assigned the task of providing expert advice on matters covered under the LPH. The Council also organizes national campaigns to eliminate plagues, and it participates actively in training agriculture producers on how to provide adequate diagnostics to ensure the health of plants.<sup>808</sup>

Although the Council lacks normative authority, it can propose norms to the Secretariat of Agriculture regarding plant protection and the elimination of plagues. If such proposals are accepted by this Secretariat, they can become national phytosanitary standards. The work of the Council is necessary for implementing the LPH and in preserving biological diversity from devastation by plagues and the unintended effects of LMOs.

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<sup>806</sup> Phytosanitary Norm NOM-056-FITO-1995, *supra* note 273.

<sup>807</sup> Law on Plant Health, *supra* note 803 arts. 16-18.

<sup>808</sup> *Ibid.*

### 2.3.2 Phytosanitary Regulation

The LPH depends on NOMs for its application. Such standards are established by the Secretariat of Agriculture and considered obligatory in Mexico. The law establishes a phytosanitary certificate requirement mechanism and quarantine measures as tools to ensure plant health within Mexican territory. Due to the importance of NOMs as national standards, LPH requires that they must be strictly based on science and on cost-effective risk assessments. Also the standards must emulate international guidelines.<sup>809</sup>

Specifically, the LPH states that official norms must contain guidelines through which to diagnose and identify plagues in plants.<sup>810</sup> They must also establish the phytosanitary requirements plants must meet for their import, transport and introduction into the environment. In addition to regulating their conformation to NOMs, the LPH makes use of a phytosanitary certificate requirement to ensure compliance with the Secretariat of Agriculture's sanitary regulations. This certificate requirement regulates the import, mobilization and introduction of LMOs into the environment.<sup>811</sup>

The LPH contemplates sanitary measures, such as national campaigns to locate possible sites of infestation. These campaigns also aim to identify plagues and to elaborate cost-effective studies as to their potential damage on plants.<sup>812</sup> Quarantines may also be employed by the Secretariat of Agriculture as a means to control infestation and to preserve plant health.<sup>813</sup>

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<sup>809</sup> *Ibid.* art. 20.

<sup>810</sup> *Ibid.* art. 19.

<sup>811</sup> *Ibid.*

<sup>812</sup> *Ibid.* arts. 31-37.

<sup>813</sup> *Ibid.* arts. 36.

The LPH is, in practice, supported for purposes of implementation by the Phytosanitary Standard NOM-056-1995. This norm is discussed next, following the official definition of a norm and an explanation of the process of enacting them.

### **2.3.3 The Phytosanitary Standard NOM-056-1995**

By way of a definition, Mexican Official Norms are, under the Federal Law of Metrology and Standardization, described as:

Obligatory technical regulations enacted by the competent Secretariats establishing rules, specifications, attributes, characteristics of a product or process, activity, service or labeling.<sup>814</sup>

The Federal Law of Metrology and Standardization is implemented by the Secretariat of Economy (SE), which employs the National Commission of Standardization to create NOMs. The Commission hosts several consultative committees on different topics including the environment. On matters related to the environment it is the National Consultative Commission of Standardization and the Environment and Natural Resources (COMARNAT) which considers the creation of the appropriate norms. Like other National Commissions, COMARNAT includes in its membership representatives of the public, experts and personnel of the pertinent Secretariats.<sup>815</sup>

Generally, competent Secretariats propose the creation of Mexican Official Norms to their respective National Consultative Commission. Any such proposal, upon its discussion, comes before the Secretariat of Economy for its enactment. Proposals that may have economic or substantial impact on a sector of society must include an economic analysis of the projects they may authorize, alternatives to such projects, and a

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<sup>814</sup> Federal Law of Metrology and Standardization, DOF-01-JUL-1992 (reformed DOF-28-07-2006), online: < <http://www.diputados.gob.mx/LeyesBiblio/doc/130.doc> >. art.3 (XI). (accessed January, 12, 2007).

<sup>815</sup> *Ibid.* arts. 43-44.

comparative study of relevant and applicable international norms.<sup>816</sup> As pointed by some, the process of enactment of NOMs could take up to 230 days.<sup>817</sup> It is important to note that issues have been raised by academics regarding the effectiveness of this Norms and their constitutionality in the Mexican legal system.<sup>818</sup>

It is under the complicated procedure described above that the Mexican Official Norm NOM-056-1995 emerges. This national standard establishes obligatory guidelines regarding the introduction of experimental LMOs into the environment and also their import into the country. This norm also requires a phytosanitary certificate for the introduction of these organisms into the environment.<sup>819</sup> Experimental introduction of LMOs into the environment is overseen by the Secretariat of Agriculture's National Committee on Agricultural Biosafety and the Directorate General of Plant Health, which are empowered by the LPH to grant phytosanitary certificates for introducing LMOs into the environment.<sup>820</sup>

An application for a phytosanitary certificate must contain technical information on the genetic composition and properties of the LMOs intended to be introduced into the environment. If the phytosanitary certificate is granted by these two institutions, the decision must be communicated to the State governments where trials will take place.<sup>821</sup> A similar authorization is required to transport LMOs across the territories of the Mexican States.<sup>822</sup>

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<sup>816</sup> *Ibid.* art. 45.

<sup>817</sup> Huerta, Carla, "Mexican Official Norms in the Mexican Legal System" (Las Normas Oficiales Mexicanas en el Ordenamiento Jurídico Mexicano), (1988) 92 Boletín Mexicano de Derecho Comparado 1 at 1-3.

<sup>818</sup> *Ibid.*

<sup>819</sup> SAGARPA, Phytosanitary Norm NOM-056-FITO-1995, *supra* note 273 art. 3.

<sup>820</sup> *Ibid.*

<sup>821</sup> *Ibid.*

<sup>822</sup> *Ibid.*

Import of LMOs or transgenic material is also regulated in this official norm by a phytosanitary requirement mechanism.<sup>823</sup> This certificate may be granted by the Directorate for Phyto- and Zoosanitary Inspection (DGIF). It is important to note that to obtain this certificate required for experimentation with LMOs, it is required to also obtain an international phytosanitary certificate from the country where the LMOs originated.<sup>824</sup>

#### 2.3.4 Enforcement Measures

On site inspector visits, a public complaint process and administrative sanctions are employed to achieve compliance with the obligations in the LPH.<sup>825</sup> The Secretariat of Agriculture must conduct on site visits to places where vegetal material is stored and produced.<sup>826</sup> Also, it must provide incentives by means of a National Prize of Plant Sanity awarded to outstanding efforts in contributing to the prevention, control and eradication of plagues.<sup>827</sup>

The Secretariat of Agriculture utilizes a public complaints procedure to enforce the provisions of the LPH.<sup>828</sup> This procedure allows individuals in any region countrywide to denounce acts and omissions that endanger plant health. Finally, the LPH employs administrative sanctions against those who do not obtain a phytosanitary certificate or those who disregard the conditions established in such certificates. The fines established in the LPH can reach up to 7,000 USD.<sup>829</sup>

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<sup>823</sup> *Ibid.*

<sup>824</sup> *Ibid.*

<sup>825</sup> Law on Plant Health, *supra* note 803, at 54-58.

<sup>826</sup> *Ibid.* at 54-60.

<sup>827</sup> *Ibid.* at 61.

<sup>828</sup> *Ibid.* at 63-64.

<sup>829</sup> *Ibid.* at 66.

Altogether, the LPH is meant to play an important role in preserving biological diversity in Mexico by preventing, controlling and eradicating plant diseases and plagues and LMOs in their experimental introduction. Furthermore, the NAPC is meant to contribute expert advice to the Secretariat of Agriculture to enhance its prospects. The phytosanitary norm NOM-056-FITO-1995 is aimed at curtailing the introduction of LMOs into the environment and their import by means of a certificate requirement. Such a requirement, if fully implemented, has the potential to control possible threats posed by LMOs.

Despite the potential contributions of this law to biosafety in Mexico, its role in regulating LMOs is limited in scope, particularly in that it focuses on LMO experimental trials, excluding commercial crops and transgenic commodities that could be introduced into the environment and thus affect plant health. It also gives little attention to LMOs that are past the experimentation stage, limiting the spectrum of application of this law. Also, the implementation of this law is deficient to the extent that it heavily depends on inspector visits to ensure compliance with its provisions. The problem here is that given Mexico's economic situation, trained personnel are few for such inspections. Besides, their inspections tasks are not regularly or adequately funded. In this scenario, the LPH actually affords limited protection to Mexico's biological diversity.

#### **2.4 Law on the Production, Certification and Commerce of Seeds**

The Law on the Production, Certification and Commerce of Seeds (LPCCS)<sup>830</sup> was enacted in 1991 under the National Development Plan of 1989-1994.<sup>831</sup> At that time,

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<sup>830</sup> Law on the Production, Certification and Commerce of Seeds (LPCCS), *supra* note 720.

<sup>831</sup> Mexican Senate, Legislative Initiative of the Production, Certification and Commerce of Seeds, Agriculture and Hydraulic Commission, July 1<sup>st</sup> of 1991 at 3.



Mexico was undergoing a severe economic crisis, and increase in agricultural production was a national priority to guarantee alimentary self sufficiency.<sup>832</sup> The Mexican government advocated the use of 'improved seeds' to achieve an increase in food production. Such seeds were the result of genetic engineering.<sup>833</sup> This law underwent substantial reform in 1996 to allow experimentation and research on transgenic material to obtain new varieties of plants to overcome droughts, soil infertility and salinity.<sup>834</sup>

The LPCCS is enforced by the Secretariat of Agriculture and regulates government research for the production of improved seeds and the certification of such seeds.<sup>835</sup> The Secretariat of Agriculture is empowered to delineate guidelines regarding the use and handling of transgenic material.<sup>836</sup> The major focus of the LPCCS is to regulate experimentation with transgenic seeds.<sup>837</sup> This is discussed next.

#### **2.4.1 Experimentation with Transgenic Seeds**

The LPCCS requires a permit for conducting experimentation with high risk transgenic material.<sup>838</sup> The Secretariat of Agriculture establishes guidelines to assess the risks posed by transgenic materials by means of scientific tests.<sup>839</sup> Also, the LPCCS establishes a review procedure on decisions to consider certain transgenic material as high risk and on those decisions of the Secretariat of Agriculture that affect individuals.<sup>840</sup> This review must be performed by the Secretariat of Agriculture's Legal

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<sup>832</sup> *Ibid.*

<sup>833</sup> *Ibid.* at 4.

<sup>834</sup> *Ibid.*

<sup>835</sup> *Ibid.*

<sup>836</sup> Law on the Production, Certification and Commerce of Seeds (LPCCS), *supra* note 720 arts. 1-2.

<sup>837</sup> *Ibid.*

<sup>838</sup> *Ibid.*

<sup>839</sup> *Ibid.*

<sup>840</sup> *Ibid.* arts. 34-38.

Director within 15 days of his or her receiving the complaint file.<sup>841</sup> Transgenic material and seeds not considered high risk by the Secretariat of Agriculture are allowed to be planted and introduced into the environment experimentally.<sup>842</sup> No monitoring mechanisms are provided under this law or its federal regulation on transgenic seeds and material that are 'low risk'.

Another means of ensuring biosafety in Mexico is the certification of seeds before they are commercialized and introduced into the environment. Certification is performed by the Secretariat of Agriculture in accordance with its technical guidelines. Only seeds that have been approved and certified by the Secretariat of Agriculture are allowed to be introduced into the environment and commercialized.<sup>843</sup> In addition to approval, seeds have to be labeled with information regarding their characteristics, the chemical disinfection treatment they underwent when appropriate and the percentage of content of material from other varieties.<sup>844</sup>

The LPCCS centers around a National Consultative Committee on Plant Varieties which is comprised of representatives of the sectors involved in the commercialization of seeds. This Committee verifies information regarding the properties of seeds and serves as a dispute resolution organ in relation to conflicts involving seeds.<sup>845</sup> The LPCCS also imposes pecuniary sanctions on those who commercialize or plant seeds that have not met the law's standards or on those who certify seeds in contravention of the law's dispositions.<sup>846</sup>

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<sup>841</sup> *Ibid.*

<sup>842</sup> *Ibid.* arts. 1-2.

<sup>843</sup> *Ibid.* arts. 8-11.

<sup>844</sup> *Ibid.*

<sup>845</sup> *Ibid.* art. 13.

<sup>846</sup> *Ibid.* arts. 15-20.

Overall, the LPCCS emerged in a time of economic crisis. It resembles, more than a law to preserve the environment, an economic instrument to allow experimentation with transgenic material. It opened the door for the utilization of biotechnology in Mexico without the supporting biosafety regulation required for such a purpose. Similar to the Law on Plant Health, it offers a limited approach to LMO regulation.

The LPCCS does not include coordination mechanisms among environmental institutions and ignores important issues such as a concern for Mexico's native plants and the areas where they exist. As an economic growth instrument, it requires an enormous financial support to monitor the certification of seeds and to ensure compliance with its provisions. Also, the LPCCS lacks the support of environmental institutions and biosafety legislation not yet created in Mexico at the time of its emergence.

## **2.5 The 2005 Biosafety Law on GMOs**

As discussed in sections 2.2-2.4 above, Mexico's legislation only addressed how to counter the potential threats of LMOs arising from experimentation with transgenic seeds. In spite of the presence of those pieces of legislation, the control of LMOs has remained a problem, as evidenced in the CEC's Maize Case.<sup>847</sup> The Mexican Congress also noted that the breadth of the provisions in the various laws did not offer "certainty" to the national and foreign investments in the biotechnology sector.

Prior to the enactment of the Biosafety Law on GMOs, in 2002, the Mexican Congress constituted Legislative Committees of Science and Technology and Environment, Natural Resources and Fisheries (Legislative Committee) who conducted comprehensive studies on how to balance Mexico's richness in biological resources

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<sup>847</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6.

against its international obligations to promote free trade. These commissions strove to unify biosafety dispositions scattered in Mexican legislation, keeping in mind the potential contribution of LMOs to meet such pressing challenges as hunger, and general economic underdevelopment, and to benefit the Mexican economy.<sup>848</sup> They acknowledged that there was a close relationship between biotechnology and biosafety and that biotechnology offers innumerable benefits to agriculture and human health, to plant and animal health, and to the improvement of contaminated soil through bioremediation.<sup>849</sup> They also noted that biotechnology could provide a venue for Mexico to achieve economic development.<sup>850</sup>

Furthermore, Congress considered the legislative initiatives by Mexico's political parties, namely, the Green Ecological Party of Mexico (Green Party), the National Action Party (PAN) and the Institutional Revolutionary Party (PRI).<sup>851</sup> The Green Party's initiative advocated monitoring the introduction of LMOs into the environment and the creation of Mexican Official Norms to regulate the confined use of LMOs.<sup>852</sup>

PAN's initiative proposed a strong risk assessment requirement to obtain permits for the introduction of LMOs into the environment and that the proponent of the introduction of LMOs could elaborate contingent measures in emergency situations involving LMOs.<sup>853</sup> The PRI also proposed several measures to consider the preservation of human and animal health and that LMOs were not introduced in protected areas.<sup>854</sup>

Following the report of the Legislative Committee and taking into account various parts

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<sup>848</sup> Mexican Senate, Legislative Initiative of the Biosafety Law on GMOs, Legislative Commissions of Science and Technology and Environment, Natural Resources and Fisheries, November 12, 2002, at 1-2..

<sup>849</sup> *Ibid.* at 4.

<sup>850</sup> *Ibid.*

<sup>851</sup> *Ibid.* at 11.

<sup>852</sup> *Ibid.*

<sup>853</sup> *Ibid.*

<sup>854</sup> *Ibid.*

of each of the political parties' proposed initiatives, a 'unified' legislative proposal was considered by the Mexican Congress in 2003,<sup>855</sup> from which the 2005 Biosafety Law on GMOs emerged.<sup>856</sup>

The enactment of the 2005 Biosafety Law on GMOs was propelled by Mexico's ratification of the Cartagena Protocol in April 2002.<sup>857</sup> This law is seen as the ideal tool to address Mexico's lack of a legislative and institutional biosafety framework appropriate to meet the obligations imposed by the Cartagena Protocol. The law attempts to unite biosafety dispositions in various legislation such as those in the General Law of Ecological Equilibrium, Law on Plant Health and the Law on the Production, Certification and Commerce of Seeds. Furthermore, this law strives to strengthen Mexico's environmental institutions, such as the Inter-Secretarial Commission on GMOs and the National Biodiversity Commission and to coordinate their efforts in biosafety regulation.<sup>858</sup> The Biosafety Law affords Mexico a basis for implementing the CBD and the Cartagena Protocol.<sup>859</sup>

The following elements of the Biosafety Law on GMOs are discussed next: its objectives; the distribution of competences; procedure to release LMOs into the environment; impact and risk assessment; and, enforcement.

### 2.5.1 Objectives

The Biosafety Law on GMOs establishes the foundation of biosafety regulation in Mexico and the institutional structure needed for this purpose. This law is implemented

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<sup>855</sup> The 2003 legislative proposal to enact a Biosafety Law on GMOs is almost identical to the actual 2005 Biosafety Law on GMOs. See Annex.

<sup>856</sup> *Ibid.* at 1-2.

<sup>857</sup> *Ibid.*

<sup>858</sup> *Ibid.* See Annex.

<sup>859</sup> *Ibid.*

by the Secretariat of Agriculture and the Secretariat of the Environment.<sup>860</sup> The objective of the Biosafety Law on GMOs is to regulate the production, introduction and commercialization of 'GMOs'.<sup>861</sup> Such a regulatory approach comprehensively regulates the confined use, experimental introduction, imports and exports of these organisms.<sup>862</sup> Furthermore, the law seeks to prevent, avoid and minimize the potential adverse effects of GMOs, not only on biological diversity but also on human health and in the environment in general. In addition, it seeks to protect animal and plant health.<sup>863</sup>

The Biosafety Law on GMOs serves as a framework for the implementation of the Cartagena Protocol. It strives to define Mexico's policy on LMOs and coordinates the interactions of Mexico's environmental institutions, the federation and the Mexican States.<sup>864</sup> It also seeks to set out the administration and permit procedures for the introduction of LMOs into the environment.<sup>865</sup>

Also, with respect to the areas in which LMOs could be released, the Biosafety Law on GMOs would "determine on a case by case basis the establishment of areas in which activities with these organisms will be restricted including those in which Mexican plants originate." It also affords a special protection regime to those areas in which native varieties of maize originate.<sup>866</sup> Furthermore, it establishes the basis for the creation of Mexican Official Norms regarding biosafety.<sup>867</sup> The Biosafety Law also seeks to unify

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<sup>860</sup> *Ibid.* art. 2 (3).

<sup>861</sup> The Biosafety Law on GMOs uses the terms LMO and GMOs as synonyms. See Biosafety Law on GMOs art. 3 (XXI).

<sup>862</sup> Biosafety Law on GMOs, *supra* note 9 art. 1.

<sup>863</sup> *Ibid.* art. 2.

<sup>864</sup> *Ibid.*

<sup>865</sup> *Ibid.*

<sup>866</sup> *Ibid.*

<sup>867</sup> *Ibid.*

and coordinate 'scattered' biosafety legislation and to rely on the precautionary approach in cases of scientific uncertainty.<sup>868</sup>

The objectives set out in this legislation are quite ambitious, it covers the control and regulation of all activities in the country that relate to various aspects of biosafety and biotechnology. In practice, it sets out broader objectives than the ones employed by the Cartagena Protocol since it addresses issues related to labeling, pharmaceuticals and consumption of transgenic commodities.<sup>869</sup> One example of the overbreadth of this law is the use of the terminology 'Genetically Modified Organisms' in an effort to encompass LMO/GMOs under the same concept.<sup>870</sup> Also, it includes titanic commitments, such as generating Mexican Official Norms or national obligatory standards, to delineate the competence of environmental institutions, and establishing zones free of LMOs.<sup>871</sup>

The comprehensiveness of the Biosafety Law on GMOs may prevent it from being fully implemented. In the alternative, any effort at implementation would be a difficult endeavor. It would require huge financial resources to be done. Its broadness also holds the potential to create conflicts regarding the competence of environmental institutions under its purview. Besides, the federal regulations needed to support its implementation need an astute legislature to undertake while the scientific and technical resources needed to ensure the carrying out of its obligations would be difficult for Mexico to assemble. In spite of these challenges, the terms of the Biosafety Law must be appreciated. Its analysis that follows looks at the competence it confers on environmental institutions, the procedures to be observed regarding introducing LMOs into the

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<sup>868</sup> *Ibid.* art. 9 (IV).

<sup>869</sup> *Ibid.* arts. 4-8.

<sup>870</sup> The Biosafety Law on GMOs, defines Genetically Modified Organisms as Living Organisms that possess novel genetic combination resulting from biotechnology. *Ibid.*, art. 3 XXI.

<sup>871</sup> *Ibid.* arts. 2 (XI), 90.

environment, and its treatment of commodities, impact and risk assessment and restricted zones.

### 2.5.2 Competence of Environmental Institutions

Two institutions play fundamental roles in ensuring biosafety and in regulating the introduction of LMOs into the Mexican environment. These are the Secretariat of Agriculture and the Secretariat of the Environment. The Biosafety Law on GMOs assigns a shared responsibility and creates checks and balances between these two institutions.<sup>872</sup> The Secretariat of Agriculture, for instance, would authorize the introduction of LMOs into the environment after taking into account a resolution passed by the Secretariat of the Environment regarding the safety of such organisms and their potential to impact biological diversity.<sup>873</sup> Likewise, the Secretariat of the Environment is competent to authorize LMOs in forests and for bioremediation purposes, but it must take into account a resolution of the Secretariat of Agriculture on the safety of these organisms.<sup>874</sup> This shared authorization procedure is meant to guarantee transparency and impartiality in decisions over the introduction of these organisms into the environment.

The Secretariat of Agriculture formulates national policy on LMOs in agriculture and is in charge of monitoring their introduction into the environment. Additionally, this Secretariat is empowered by the biosafety law to suspend or revoke permits to introduce such organisms into the environment.<sup>875</sup> Similarly, on matters of LMOs in forests and on bioremediation, the Secretariat of the Environment is also competent to establish a national biosafety policy and to evaluate on a case-by-case basis the risks associated with

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<sup>872</sup> *Ibid.* art 10-13.

<sup>873</sup> *Ibid.* art. 15.

<sup>874</sup> *Ibid.* art. 14.

<sup>875</sup> *Ibid.* art. 38.



LMOs in forests and for bioremediation purposes.<sup>876</sup> The two Secretariats are responsible for monitoring LMOs within their areas of competence and to apply the required measures to restore biological diversity countrywide.<sup>877</sup> In cases of accidental introduction of LMOs, the Biosafety Law on GMOs provides coordination mechanisms among all the federal Secretariats so that in their respective areas, they can enact the necessary measures to address contingency situations nationwide.<sup>878</sup>

An innovative institution created under the Biosafety Law on GMOs is the Inter-Secretarial Commission on GMOs.<sup>879</sup> This institution is comprised of a representative appointed by the executive and by one representative of each of the following institutions: the Secretariat of the Environment, Agriculture, Economy (SE), and the National Council of Science and Technology (CONACYT).<sup>880</sup> Under the law, this institution functions as a consultative organ on matters related to scientific and technical aspects of biotechnology and biosafety.<sup>881</sup> In addition, the Inter-Secretarial Commission on GMOs coordinates efforts among Mexican institutions in matters related to LMOs.<sup>882</sup>

As noted the distribution of competence under the Biosafety Law of GMOs strives to guarantee transparency and impartiality in decisions to introduce LMOs into the environment. By placing the responsibility on the Secretariat of the Environment and the Secretariat of Agriculture to ensure this balance, the law embraces its potential to benefit biological diversity because scientists and experts from the two institutions are thereby obliged to carefully consider the risks of LMOs and agree on what must be done in each

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<sup>876</sup> *Ibid.* art. 11.

<sup>877</sup> *Ibid.*

<sup>878</sup> *Ibid.* art. 17.

<sup>879</sup> *Ibid.* arts. 19-24.

<sup>880</sup> *Ibid.*

<sup>881</sup> *Ibid.* art. 20.

<sup>882</sup> *Ibid.* arts. 19-24.

case. The law also ensures that efforts at the national level to secure biodiversity can be coordinated by the Inter-Secretarial Commission on GMOs.

While this system, has a great potential, it can also create conflict and other difficulties among the governmental institutions involved in decision making regarding the introduction of LMOs into the environment. For example, if federal regulations and Mexican Official Norms do not delineate in detail the competence of the institutions involved, potential conflicts can arise affecting decision making and thus biodiversity.

The following sub-section looks at the procedure for analyzing the introduction of LMOs and following subsections look at the specific roles institutions play in the authorization procedure.

### **2.5.3 Permit Procedure to Authorize LMO Introduction into the Environment**

The Biosafety Law on GMOs distinguishes three types of authorization by which to introduce LMOs into the environment: experimental; pilot and, commercial.<sup>883</sup> The procedure regarding all three authorizations is similar. Authorization from the Secretariat of Agriculture or the Secretariat of the Environment is initiated by a request by a proponent that is immediately recorded in the National Registry of Biosafety and GMOs of the Inter-Secretariat Commission on GMOs.<sup>884</sup> Such a request must include the characteristics of the LMO to be released into the environment based on guidelines and specifications contained in NOMs.<sup>885</sup> In addition, the request must include information regarding the location where such releases will take place.<sup>886</sup>

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<sup>883</sup> *Ibid.* art. 32.

<sup>884</sup> *Ibid.* art. 109.

<sup>885</sup> *Ibid.* art. 50 (V).

<sup>886</sup> *Ibid.*

The Biosafety Law on GMOs establishes also that LMOs that are not allowed to be released in their country of origin will not be allowed in Mexico.<sup>887</sup> It also provides that all requests to introduce LMOs into the environment must be accompanied by impact and risk assessment studies conducted by the proponent addressing the potential impact of these organisms on biological diversity and on plant and animal health.<sup>888</sup> The request should also include monitoring mechanisms and contingency measures to preserve biodiversity from the unintended release of these organisms.<sup>889</sup> A decision taken by the Secretariat of the Environment or the Secretariat of Agriculture is based on an analysis of the scientific studies conducted by the proponent and additional scientific considerations of the potential effects of the proposed LMOs on the environment.<sup>890</sup>

Being a framework, the Biosafety Law relies on NOMs to establish specific biosafety regulations. At the stage of introducing LMOs into the environment, NOMs become particularly important. These NOMs, according to the Biosafety Law, must establish:

- 1) The requirements for authorizing general releases of LMOs.<sup>891</sup>
- 2) The information required to identify LMOs to be introduced into the environment.<sup>892</sup>
- 3) Information that must be taken into account for LMO releases related to the risks of these organisms.<sup>893</sup>
- 4) The information that pilot LMO release will contain.<sup>894</sup>
- 5) The requirements for commercial release of LMOs.<sup>895</sup>

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<sup>887</sup> *Ibid.* art. 40.

<sup>888</sup> *Ibid.* art. 32- 41.

<sup>889</sup> *Ibid.*

<sup>890</sup> *Ibid.*

<sup>891</sup> *Ibid.* art. 34.

<sup>892</sup> *Ibid.* art. 42 (I).

<sup>893</sup> *Ibid.* art. 42 (VII).

<sup>894</sup> *Ibid.* art. 50 (V).

<sup>895</sup> *Ibid.* art. 55 (VII).

As a final stage in the authorization process, the Biosafety Law calls for the incorporation of public opinion and recommendations into the authorization to release LMOs into the environment.<sup>896</sup> The public participation procedure must take place 20 business days following the submission of the request to introduce LMOs into the environment.<sup>897</sup> The law provides that accepted public opinion must be technically and scientifically based.<sup>898</sup> At the end of the process, in such a procedure, the Secretariat of the Environment and the Secretariat of Agriculture produce an authorization technical document. LMOs that can be introduced in their country of origin undergo the above procedures to assess the possibility of their being introduced in Mexico. The Law gives Mexican Official Norms a central role in authorizing LMO imports and their release into the environment.

As it was discussed before in Section 2.3.3 of this Chapter, the process of elaborating Mexican Official Norms could be lengthy due to the various institutions that participate in their creation and to the potential economic impact they can cause on sectors of the population. With respect of the Biosafety Law on GMOs, it must be pointed out, that at present, NOMs or any federal regulations to aid in biosafety regulation and the implementation and support of the Biosafety Law have not yet been developed. As it is, the Biosafety Law stands on its own with general guidelines to regulate a growing activity that constitutes more than 1 per cent of Mexican crop production.<sup>899</sup>

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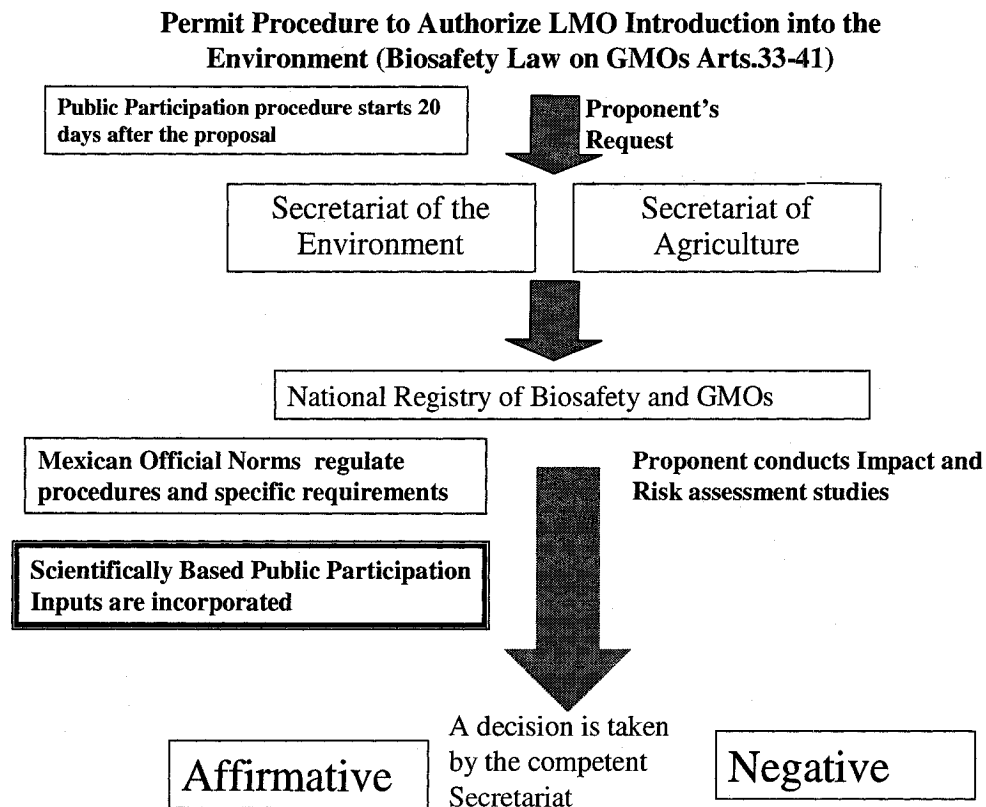
<sup>896</sup> *Ibid.* art.33.

<sup>897</sup> *Ibid.*

<sup>898</sup> *Ibid.*

<sup>899</sup> ISAAA, Global Status of Commercialized Biotech/GM Crops in 2005, *supra* note 157.

In addition to the lack of NOMs, the public participation process also limits the individuals who can participate by requiring that opinions must be technically and scientifically based.<sup>900</sup> This means that the views of traditional farmers and plant breeders who have played a role in the preservation of biological diversity for generations, but are not scientifically and/or technically knowledgeable, are excluded.



**Figure 4 Permit Procedure for the Introduction of LMOs in Mexico**

#### **2.5.4 LMOs for Food, Feed and Processing**

The Biosafety Law on GMOs, unlike the Cartagena Protocol, extensively regulates LMO-FFPs and includes them under its main scope because of the potential

<sup>900</sup> Biosafety law on GMOs, *supra* note 9 art. 3 (XXI).

they have to harm human health. The Mexican Secretariat of Health (SSA) plays a central role in regulating LMO-FFPs. It regulates commodities for human consumption, including grains, those for processing of aliments for human consumption, those that impact public health and those for bioremediation purposes.<sup>901</sup> In those cases, the Secretariat of Health requires a permit from the proponent.

The permit procedure is ignited by a proponent's request which will include a risk assessment and scientific information over the products and the potential effects on humans for consuming them.<sup>902</sup> The assessment required to commercialize and distribute LMOs-FFPs follows the general requirements for agricultural products in the Biosafety Law on GMOs.<sup>903</sup> The Biosafety Law on GMOs also provides that further requirements to authorize LMO-FFPs will be contained in Mexican Official Norms.<sup>904</sup> The Secretariat of Health, in deciding over the authorization of these commodities can also request technical opinions from the Secretariat of the Environment or the Secretariat of Agriculture.

Altogether, the Biosafety Law on GMOs goes beyond the Cartagena Protocol by regulating LMOs-FFPs and their potential impacts on human health. This law empowers the Secretariat of Health to authorize the import and the consumption of LMO-FFPs in Mexico. The procedure to authorize LMO-FFPs is limited in that it focuses exclusively on their effects on human health. A more comprehensive approach could be taken by the Biosafety Law by addressing, in the risk assessment aspect, the potential effects of these commodities on the environment if they are introduced. Following the CEC's Maize

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<sup>901</sup> Biosafety Law on GMOs, *supra* note 9 art. 91. Bioremediation is defined by the National Safety Council as "The use of living organisms to clean up oil spills or remove other pollutants from soil, water, and wastewater, use of organisms such as non-harmful insects to remove agricultural pests or counteract diseases of trees, plants, and garden soil." See National Safety Council, Environmental Health Center Glossary, online:< <http://www.nsc.org/ehc/glossary.htm#b>>. (accessed January, 12, 2007).

<sup>902</sup> Biosafety law on GMOs, *Ibid* art. 92.

<sup>903</sup> *Ibid.* arts. 60-63.

<sup>904</sup> *Ibid.*

Report, however, the Secretariat of Agriculture and the Secretariat of the Environment launched national campaigns to warn and educate traditional farmers over the potential dangers of introducing these organisms into the environment. Several questions remain unanswered regarding the capabilities of these two environmental agencies to reach indigenous farmers in remote areas and the availability of resources for such national campaigns.

### **2.5.5 The Precautionary Principle**

The precautionary principle was enunciated in Article 8 of the Biosafety Law on GMOs as an obligation of the Mexican government to:

Protect the environment and biological diversity, by applying the precautionary approach according to its capabilities, taking into account commitments established in international treaties and agreement of which the Mexican United States is a member. When there is danger of substantial or irreversible harm, lack of absolute scientific certainty shall not be used as justification to postpone the application of cost effective measures to prevent environmental and biodiversity degradation. Such measures shall be applied according to the provisions and administrative procedures established in this law.<sup>905</sup>

This principle is also mentioned at the stage of risk assessment. The Biosafety Law on GMOs provides that the Secretariats of Health, Agriculture and the Environment must follow the precautionary approach for the protection of biodiversity and human health. On this matter, Article 63 states:

In case of danger of substantial and irreversible harm, uncertainty from the level of risks that GMOs can cause to biological diversity or to human health should not be used as justification for the competent Secretariat to postpone effective measures that prevent negative effects on biological diversity or human health.<sup>906</sup>

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<sup>905</sup> *Ibid.* art. 8.

<sup>906</sup> *Ibid.* art. 63.

Although this Law does not define how this principle should be applied, it provides that the precautionary principle should be applied taking into account precautionary measures and Mexico's obligations contained in international trade agreements. Article 63, regarding the precautionary principle provides:

In adopting such measures, the relevant secretariat shall take into account existing scientific evidence to be employed as criteria to establish such measures; administrative procedures in this law and trade legislation contained in international treaties and agreement of which Mexico is part.<sup>907</sup>

Further precautionary provisions in this law are embedded in the establishment of protected areas, zones free of LMOs and areas of origin.<sup>908</sup>

The Biosafety Law casts the application of this principle in light of Mexico's 'international commitments.' If the principle is applied in accordance with the commitments in the Biodiversity Convention or the Cartagena Protocol, to which Mexico is a party, the interpretation of this principle and its application will be more environmentally oriented. The interpretation will anticipate harm and take into account uncertainty so as to trigger precaution. On the other hand, if Mexico interprets precaution in light of the commitments under international trade agreements, this principle will primarily be scientifically based and will fully rely on risk assessments and scientific evidence, if available. This 'trade' interpretation will perhaps not provide comprehensive protection, because science is not fully developed, Mexico lacks the technology and infrastructure to monitor an activity once it is permitted, and because Mexico is one of the richest territories in biodiversity and is the original home of many plants.

The inclusion of the precautionary principle in the Biosafety Law on GMOs is, therefore, only a 'good intention' or a 'promise.' Although the first enunciation of the

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<sup>907</sup> *Ibid.*

<sup>908</sup> *Ibid.* arts. 86-87.



principle in Mexican legislation is normatively weak, it could also be the beginning of an effective balance between the demands of capitalism and environmental awareness in that country.<sup>909</sup>

### 2.5.6 Impact and Risk Assessment

The Biosafety Law's EIA and risk assessment procedures are safeguards to ensure biosafety in activities involving the release of LMOs.<sup>910</sup> The studies are conducted by the proponent of an activity, on a case-by-case basis, and must be based on science, expert opinions and the precautionary approach.<sup>911</sup> It is important to note that similar to the General Law of Ecological Equilibrium, the Biosafety Law on GMOs does not contain provisions for the use of Strategic Environmental Assessments in LMO policies or regulations.

Impact and risk assessment procedures in the Biosafety Law follow a threefold process: the initial stage of identification of the LMO and its characteristics; the identification of the possible impacts on biological diversity; and, the evaluation of such risks along with the probability of their occurrence.<sup>912</sup> A recommendation follows these procedures as to whether the risks associated with this activity are acceptable and manageable.<sup>913</sup>

Although this Law does not establish further procedures for the evaluation of such assessments performed by the proponent, the Secretariat of the Environment and the Secretariat of Agriculture routinely request technical opinions from the National

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<sup>909</sup> *Ibid.*

<sup>910</sup> *Ibid.* arts. 42- 60.

<sup>911</sup> *Ibid.*

<sup>912</sup> *Ibid.*

<sup>913</sup> *Ibid.*

Biodiversity Commission and the National Institute of Ecology. The technical opinions produced by these two institutions are non-binding and they are further evaluated by the two Secretariats before a decision is taken.<sup>914</sup> In respect of the EIA, the Biosafety Law on GMOs provides that the characteristics and requirements regarding the evaluation of this assessment will be established in NOMs.<sup>915</sup> To date, NOMs have not been developed, either under the Biosafety Law on GMO or the General Law of Ecological Equilibrium.

In cases of uncertainty or lack of scientific evidence over the potential effects of LMOs on biodiversity or animal and plant health, this Law provides that Mexican authorities can request additional information from the proponent based on the findings in the impact and risk assessments.<sup>916</sup> Authorities can also adopt additional monitoring measures to scrutinize the potential interaction of those LMOs with organic species in the location of the releases.<sup>917</sup> In cases where substantial or irreversible harm may occur as a result of the release of the LMOs into the environment, the law states that “nothing will preclude the competent Secretariats from taking the necessary measures to prevent substantial or irreversible harm to biodiversity, taking into account the available scientific evidence and Mexico’s international trade obligations.”<sup>918</sup> But it provides that the procedures and guidelines required to perform impact and risk assessment studies would be set out in national standards or official norms.<sup>919</sup>

The procedures, which are to be scrutinized by the Secretariat of the Environment or the Secretariat of Agriculture, acknowledge the difficulties in assessing the risks of the

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<sup>914</sup> National Institute of Ecology, Internal Regulations, (2003), online: < <http://www.inc.gob.mx/ueajei/rules32.html#art110> > arts.110-112. (accessed January, 12, 2007).

<sup>915</sup> Biosafety Law on GMOs, *supra* note 9 art. 65.

<sup>916</sup> *Ibid.* art. 63.

<sup>917</sup> *Ibid.*

<sup>918</sup> *Ibid.*

<sup>919</sup> *Ibid.*

organisms in situations of uncertainty or lack of scientific evidence. Though it mentions the precautionary approach, the law does not provide guidelines for its application to balance uncertainty. Thus, it limits the ability of the decision maker to apply the principle, for instance, as it may impact Mexico's international trade obligations. In addition, the Law lacks guidelines regarding the characteristics and requirements for EIA. Such requirements have not been developed in NOMs. Consequently, the lack of guidelines hampers the adequacy of this important assessment procedure and can be subject to abuse by the Secretariats in light of financial interests that may be stirred by applications to introduce LMOs through trade.

#### **2.5.7 Restrictions on Introducing LMOs**

The Biosafety Law on GMOs employs a threefold mechanism to restrict the spread of LMOs. First, it restricts the introduction of LMOs in the 'areas of origin,'<sup>920</sup> in natural protected areas<sup>921</sup> and in zones where organic products are produced.<sup>922</sup> These restrictions will be analyzed accordingly.

The regime of 'areas of origin' is established and designated by the Secretariat of the Environment and the Secretariat of Agriculture. In so doing, they must take into account areas where the organic counterparts of the proposed LMOs originated.<sup>923</sup> Areas of origin are those that host species and genetic diversity native to Mexico. The introduction of LMOs is forbidden in such areas due to their importance in preserving ecosystems, habitats and, in turn, biological diversity.<sup>924</sup>

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<sup>920</sup> *Ibid.* art. 86-88.

<sup>921</sup> *Ibid.* art. 89.

<sup>922</sup> *Ibid.* art. 90.

<sup>923</sup> *Ibid.*

<sup>924</sup> *Ibid.* art. 86.

Introduction of LMOs is also restricted in national protected areas. Though they are allowed as part of bioremediation efforts to cleanse and restore polluted areas or to fight pests and disease,<sup>925</sup> they are banned from the core zones or designated areas within a protected area where ecosystems are preserved.<sup>926</sup>

The introduction of LMOs is also restricted for organic certification purposes in zones free of LMOs. These zones are established to preserve agricultural organic production in communities across the country.<sup>927</sup> This system of zones will be established in those regions where, according to scientific studies, LMOs and their organic counterparts cannot coexist in the same area.<sup>928</sup> Space establishment in such zones falls within the competence of the Secretariat of Agriculture, which may request technical opinions from the Inter-Secretarial Commission on GMOs and the National Biodiversity Commission.

The Secretariat of Agriculture must also take into account dispositions established in NOMs regarding the production of organic products.<sup>929</sup> To establish a zone free of LMOs, a community request, approved by the municipality and State government must be made. Following such a request, the Secretariat of Agriculture will conduct the scientific and technical test required by the Biosafety Law on GMOs to determine if it will design such a zone free of LMOs.<sup>930</sup>

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<sup>925</sup> *Ibid.* art. 89.

<sup>926</sup> Regulation of the General Law of Ecological Equilibrium on National Protected Areas, DOF-30-11-2000, online: < <http://www.conanp.gob.mx/anp/legal/ANP.pdf>>. See arts. 48-49. (accessed January, 12, 2007). In this law, core zones comprise zones of protection, zones of restricted use, zones of traditional use, zones of sustainable use of natural resources, restoration zones, etc. *Ibid.*

<sup>927</sup> Biosafety Law on GMOs, *supra* note 9 art. 90.

<sup>928</sup> *Ibid.*

<sup>929</sup> *Ibid.*

<sup>930</sup> *Ibid.*

Although the threefold system of restrictions on the introduction of LMOs into these areas has the potential to preserve biological diversity and native species, it presents a series of pitfalls. The system of areas of origin, for example, lacks mechanisms in place to force Mexico's environmental institutions to designate them. There is also no indication that such areas have been delineated or that they exist in Mexico. Similarly, national protected areas may provide limited protection to biological diversity since the introduction of LMOs is only banned in the core zones established within these areas.

Zones free of LMOs may also provide protection to biological diversity and to traditional agriculture since valuable resources may be encompassed in them. The procedure to designate these areas, however, is complicated and politicized since it involves a unanimous decision by the relevant State, municipalities and communities involved. Also, the proponent of these zones may find it difficult to demonstrate the incompatibility of modified plants with their organic counterparts.

#### **2.5.8 Enforcement Measures in the 2005 Biosafety Law on GMOs**

The Biosafety Law on GMOs comprises information, monitoring and enforcement mechanisms to achieve its goals. This law implements a National System of Information on Biosafety that aims to organize, update and distribute biosafety information throughout the country.<sup>931</sup> This information system is implemented by the Inter-Secretarial Commission on GMOs, which is also responsible for producing annual reports on the state of national biosafety in Mexico.<sup>932</sup>

The Inter-Secretarial Commission on GMOs is responsible for coordinating efforts with the Secretariat and it is the national authority responsible for liaison with the

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<sup>931</sup> *Ibid.* art. 108.

<sup>932</sup> *Ibid.*

Secretariat of the CBD and the BCH under the Cartagena Protocol.<sup>933</sup> In addition to the information system, the law creates a National Biosafety Registry of GMOs comprising all the information related to the introduction and experimentation with GMOs and LMOs countrywide.<sup>934</sup>

The Secretariat of Agriculture and the Secretariat of the Environment oversee the enforcement of this law by means of inspection and financial fines.<sup>935</sup> These institutions are also responsible for establishing contingency measures in the case of adverse effects of LMOs on the environment, human health, and animal and plant health.<sup>936</sup> In the event of such adverse circumstances, the Secretariats are obliged to revoke authorizations for the release of LMOs and, ultimately in the case of substantial harm resulting from the introduction of such organisms, to destroy them or to return them to their country of origin.<sup>937</sup>

The law also provides for monetary sanctions to be imposed on those who in the absence of the proper authorization introduce LMOs into the environment, who falsify information regarding the effects of these organisms on the environment or who infringe upon the requirements of the law. The competent Secretariat is authorized to impose a fine of up to 60,000 USD for breach of the law.<sup>938</sup>

The implementation and enforcement of the Biosafety Law on GMOs is left to the institutions that may authorize the introduction of LMOs into the environment, namely, the Secretariat of Agriculture and the Secretariat of the Environment. The Biosafety Law

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<sup>933</sup> *Ibid.* See also art. 19 of the Cartagena Protocol on Competent National Authorities and National Focal Points, Cartagena Protocol, *supra* note 2.

<sup>934</sup> Biosafety Law on GMOs, *supra* note 9 art.109.

<sup>935</sup> *Ibid.* art. 115.

<sup>936</sup> *Ibid.*

<sup>937</sup> *Ibid.*

<sup>938</sup> *Ibid.*

does not allocate a fixed budget for its implementation. These two institutions absorb the costs as they enforce the law through inspections. Inspectors are not only responsible for implementing biosafety regulations nationwide; they also oversee the implementation of general environmental legislation countrywide. The Biosafety Law's potential effectiveness is left, then, to the uncertain availability of inspectors and financial resources.

Altogether, the enactment of the Biosafety Law on GMOs represents an important achievement in Mexico. It is a synthesis of the various proposals of Mexico's political parties. As seen from its legislative history, there was a struggle in the Mexican Congress to preserve biodiversity and to create a law that would propel national economic development, particularly by employing biotechnology in the exploitation of genetic resources.

The enactment of this law puts Mexico in a position to regulate activities involving releases of LMOs into the environment and experimentation with these organisms in the country. It also serves as a framework legislation upon which the application of dispersed biosafety regulations must be based. It aims to contribute to the implementation of the Cartagena Protocol by creating the structure upon which the Protocol could be implemented. The Biosafety Law on GMOs, however, has a broader scope than the Protocol by directly regulating LMO-FFPs. But the Law lacks the supporting NOMs and regulations required to ensure biosafety and to accomplish its ambitious objectives. Without these regulations and national standards, this law is largely toothless and difficult to implement for the large amount of resources needed and the many institutions it engages in the exercise.

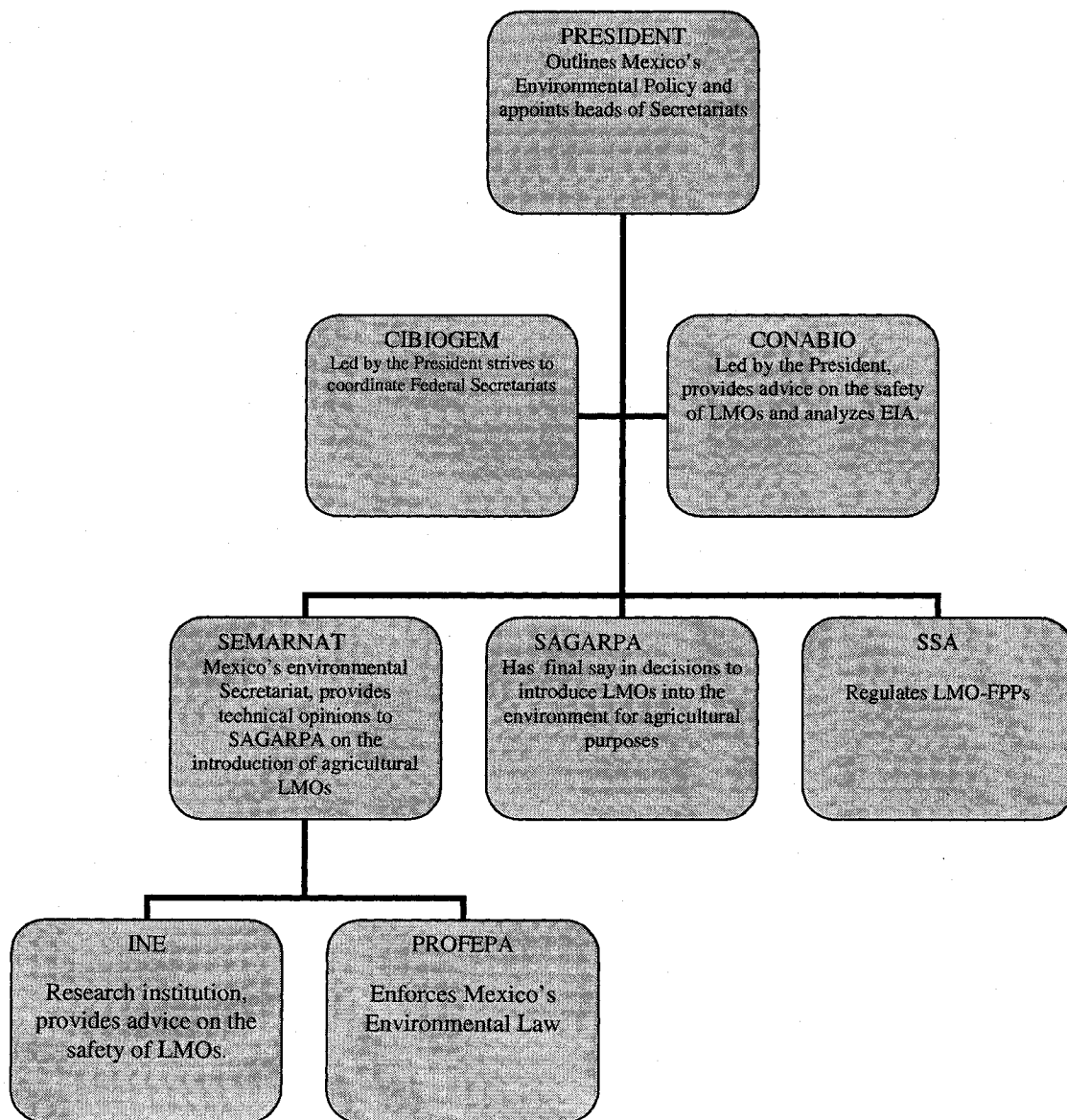
As well, guidelines are needed for the designation of the system of areas of origin. This regime, although it has the potential to preserve native plants, is far from being enforced because they do not exist by designation. A more active role is required from the Secretariat of the Environment and the Secretariat of Agriculture to conduct the necessary studies and identifying those areas. Lack of financial resources and specialized inspectors devoted to biosafety also represent hurdles that need to be overcome to ensure biosafety and to implement the obligations established in the Cartagena Protocol through the Biosafety Law on GMOs.

We now turn to the institutional regime for environmental Law implementation and enforcement in Mexico.

### **3. Mexico's Institutional Framework**

Institutions are essential in the implementation of Mexico's international obligations and in the administration of Mexico's environmental policy. Institutions provide the structure upon which laws can be implemented. As discussed before, Mexico's biosafety legislation suffers from various deficiencies in the absence of regulations and national standards; consequently, strong governmental institutions are required in this country to implement Mexico's biosafety legislation. An analysis of Mexico's governmental institutions follows.





**Figure 5. Mexico's Institutional Regime on Environmental Law Implementation**

\* The following acronyms are used in the chart: the Secretariat of Agriculture (SAGARPA), the Secretariat of the Environment (SEMARNAT); the Inter Secretarial Commission on GMOs (CIBIOGEM); the National Institute of Ecology (INE); The Federal Attorney for Environmental Protection (PROFEPA), and National Commission for the Knowledge and Use of Biodiversity (CONABIO).

### 3.1 Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food

The Secretariat of Agriculture's participation in the preservation of Mexico's environment is outlined in the Mexican Organic Law of the Federal Public Administration. Federal legislation also assigns a participatory role to this institution in the fields of agriculture, livestock, fisheries and biosafety.<sup>939</sup> The Secretariat of Agriculture's functions directly impact the preservation of biological diversity because of its active role in regulating the introduction of LMOs into the environment and for establishing the country's national policy on LMOs. This institution could also propose the creation of NOMs to regulate biosafety. The role of this Secretariat in the field of biosafety and regulation of LMOs is the focus of this section. We discuss its structure, mandate and role in the regulation of LMOs.

This Secretariat has a versatile organic structure comprised of three Undersecretariats. The Undersecretariat of Agriculture<sup>940</sup> fosters the development of this activity countrywide, and the incorporation of new technologies in agriculture. The Undersecretariat of Rural Development<sup>941</sup> promotes growth in rural areas through

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<sup>939</sup> SAGARPA is responsible for the implementation of the following federal legislation: Law on the Production, Certification and Commerce of Seeds (LPCCS), *supra* note 720; Fisheries Law, DOF-2506-1992, online: <<http://www.diputados.gob.mx/LeyesBiblio/pdf/58.pdf>>; Law of National Waters, DOF-01-12-1992, online: <<http://www.diputados.gob.mx/LeyesBiblio/pdf/16.pdf>>; Law on Animal Health, DOF 18-06-1993, online: <<http://www.diputados.gob.mx/LeyesBiblio/pdf/116.pdf>>. Law on Plant Health, *supra* note 804, Law on Varieties of Vegetal, DOF 25-10-1996, online: <<http://www.diputados.gob.mx/LeyesBiblio/pdf/120.pdf>>; Law on Rural Sustainable Development, DOF 07-12-2001, online: <<http://www.diputados.gob.mx/LeyesBiblio/pdf/235.pdf>>. (accessed January, 12, 2007).

<sup>940</sup> SAGARPA, Undersecretariat of Agriculture, online: <<http://www.sagarpa.gob.mx/subagri/pages/hacer.htm>>. (accessed January, 13, 2007).

<sup>941</sup> SAGARPA, Undersecretariat of Rural Development, online: <<http://www.sagarpa.gob.mx/sdr/acercad.htm>>. (accessed January, 13, 2007).

regional and national programs. The Undersecretariat of Agro-business<sup>942</sup> also advances investment in agriculture and fisheries.

In addition, the Secretariat of Agriculture comprises subsidiary institutions in diverse fields such as fisheries, agriculture, inspection of seeds, food, etc. It is important to note that one of the Secretariat of Agriculture's subsidiary institutions, the National Service for Sanity, Inoculation and Agro-alimentary Quality (NSS), oversees biosafety throughout the country. The NSS oversees this field through its internal organ, the Directorate of Plant Health (DPH), which deals with matters related to LMOs in agriculture.<sup>943</sup> It is in this office that matters related to agriculture and LMOs are addressed in Mexico.

The Directorate of Plant Health oversees the prevention, control and eradication of pests and ensures that plants and their products meet phytosanitary requirements nationwide.<sup>944</sup> Furthermore, this institution guarantees that imports and national transportation of plants across the country do not threaten agriculture and human health.<sup>945</sup> In addition, the DPH oversees the application of laws and official norms countrywide on matters related to plant health. It also fosters research, technological assistance and training in this area.<sup>946</sup> The DPH received an average of 20 million USD a

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<sup>942</sup> SAGARPA, Undersecretariat of Agro-business, online: < <http://www.sagarpa.gob.mx/sfa/objetivos.html> >. (accessed January, 13, 2007).

<sup>943</sup> SAGARPA's internal regulation, Direction of Plant Health, online: < <http://web2.senasica.sagarpa.gob.mx/xportal/sen/ceorg/Doc1173/ManualOrganizacionSenasica3.pdf> >. at 58. (accessed January, 13, 2007).

<sup>944</sup> SAGARPA, General Directorate of Plant Health, online: < [http://senasicaw.senasica.sagarpa.gob.mx/portal/html/sanidad\\_vegetal/actividades/actividades.html](http://senasicaw.senasica.sagarpa.gob.mx/portal/html/sanidad_vegetal/actividades/actividades.html) >. (accessed January, 13, 2007).

<sup>945</sup> *Ibid.*

<sup>946</sup> *Ibid.*

year from 2003-2006 to regulate LMOs and to ensure biosafety throughout the country.<sup>947</sup>

The mandate assigned to the Secretariat of Agriculture is broad. It is responsible not only for regulating LMOs, but also for rural development, job creation and promoting investment in the country's rural areas.<sup>948</sup> It is also responsible for monitoring the application of the Plant Health and Animal Health Laws and for the creation of NOMs in these areas.<sup>949</sup> In addition, the Secretariat of Agriculture is responsible for fostering and regulating the fisheries sector, including the regulation and maintenance of ports.<sup>950</sup>

The Secretariat of Agriculture's procedure for regulating LMOs follows a threefold approach. As assigned by the Law of Certification and Commerce of Seeds, this institution regulates LMOs by certifying seeds and ensuring their safe introduction into the environment.<sup>951</sup> Furthermore, following the norm NOM-056-FITO-1995, it requires a phytosanitary certificate in activities that employ genetically modified materials that have the potential to harm biological diversity.<sup>952</sup>

This Secretariat, as provided by the Biosafety Law on GMOs, regulates commercial LMOs employed for agricultural uses and related to livestock.<sup>953</sup> The Secretariat of Agriculture authorizes the introduction of LMOs for agricultural purposes following a technical consideration produced by the Secretariat of the Environment. It also participates in the formulation of national biosafety policy and in monitoring and

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<sup>947</sup> The following amounts were estimated in USD, 20,000,000 in 2003; 32,000,000 in 2004; 7,000,000 in 2005, and 24,000,000 in 2006. See, SAGARPA, Transparency obligations of the ISS, online: < <http://www.senasica.sagarpa.gob.mx/transparencia>>. (accessed January, 13, 2007).

<sup>948</sup> Organic Law of the Public Federal Administration, DOF-29-06-1976, online: < <http://www.diputados.gob.mx/LeyesBiblio/pdf/153.pdf>>. art. 35. (accessed January, 13, 2007).

<sup>949</sup> *Ibid.*

<sup>950</sup> *Ibid.*

<sup>951</sup> Law on the Production, Certification and Commerce of Seeds (LPCCS), *supra* note 720.

<sup>952</sup> SAGARPA, Phytosanitary Norm NOM-056-FITO-1995, *supra* note 273 art. 3.

<sup>953</sup> Biosafety law on GMOs, *supra* note 9 art. 12.

overseeing its implementation.<sup>954</sup> In addition to these responsibilities, the Secretariat of Agriculture performs technical studies regarding the safety of LMOs in forests and for bioremediation purposes and it provides the Secretariat of the Environment with a binding technical opinion.<sup>955</sup>

Altogether, the Secretariat of Agriculture has a broad mandate under Mexican environmental law. Not only is it this Secretariat responsible for promoting economic growth and investment in rural areas of the country, but also for regulating and authorizing the introduction of agricultural LMOs. It oversees the introduction of LMOs through the Directorate for Plant Health (DPH), in addition to biosafety, the eradication of pests and plagues, and the enforcement of national phytosanitary requirements.

It can be seen from the DPH's mandate that although it is responsible for biosafety, when LMOs become plagues or when they threaten agriculture, it plays a remedial role with respect to risks related to LMOs lacking strong prevention and monitoring mechanisms. Consequently, ensuring biosafety in the country is a difficult task. Furthermore, the Secretariat of Agriculture does not seem to have sufficient financial support from the government, and this affects the level of attention it could give to biological resources and LMO monitoring and regulation. Ultimately, for these reasons, it cannot give its full potential to ensuring biosafety in Mexico and to implementing international agreements, such as the CBD and the Cartagena Protocol.

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<sup>954</sup> *Ibid.* art. 13.

<sup>955</sup> *Ibid.* art. 15.

### 3.2 Secretariat of the Environment and Natural Resources

The Secretariat of the Environment and Natural Resources emerged in February 2000 after institutional reforms eliminated fisheries from its jurisdiction.<sup>956</sup> The Secretariat of the Environment comprises three Undersecretariats that oversee matters related to environmental policy, environmental regulation and environmental management and preservation.<sup>957</sup> The Undersecretariat of Planning and Environmental Policy designs the Secretariat of the Environment's national policy and includes it in National Development Plans. It also serves as a bridge between the international community on matters related to the preservation of biodiversity.<sup>958</sup> The Undersecretariat of Environmental Regulation proposes environmental legislation to improve regulation countrywide. It also proposes the creation of Mexican Official Norms.<sup>959</sup>

The Undersecretariat of Environmental Management and Preservation establishes the procedures and guidelines to grant authorizations for activities within the competence of the Secretariat of the Environment.<sup>960</sup> This Undersecretariat also proposes studies and programs to remediate contaminated zones countrywide.<sup>961</sup> Further, it hosts the General Directorate of Environmental and Impact Assessments (DGIRA), which evaluates environmental assessment of activities that can potentially harm the environment.<sup>962</sup> It

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<sup>956</sup> SEMARNAT, ¿Quiénes Somos?, online: <<http://www.semarnat.gob.mx/queessearnat/Pages/quienessomos.aspx>>. (accessed January, 13, 2007).

<sup>957</sup> *Ibid.*

<sup>958</sup> SEMARNAT, Internal Regulations, online: <[http://www.semarnat.gob.mx/queessearnat/Documents/facultades/CAPITULO%20TERCERO\\_21012003.pdf](http://www.semarnat.gob.mx/queessearnat/Documents/facultades/CAPITULO%20TERCERO_21012003.pdf)>. at 7. (accessed January, 13, 2007).

<sup>959</sup> *Ibid.* art. 8.

<sup>960</sup> *Ibid.*

<sup>961</sup> *Ibid.* art. 9.

<sup>962</sup> *Ibid.* art. 80.

also provides technical determinations regarding the introduction of LMOs into the environment in the field of agriculture.<sup>963</sup>

The Secretariat of the Environment includes other subsidiary organs, such as the National Commission of Water, the National Commission of Natural Protected Areas, the National Institute of Ecology and the Federal Attorney for Environmental Protection. Two of these institutions play a role in regulating LMOs and enforcing environmental legislation: the National Institute of Ecology, a specialized body, which provides the Secretariat of the Environment with technical opinions and matters related to the environment; and the Federal Attorney for Environmental Protection, which enforces Mexico's environmental legislation.

The Secretariat of the Environment regulates a broad range of environmental activities nationwide, ranging from biodiversity to air quality. It also strives to foster the preservation of ecosystems and natural resources and to achieve their sustainable use and, in the long run, sustainable development.<sup>964</sup> In addition, it formulates and directs policy on natural resources within its areas of competence,<sup>965</sup> and creates national standards regarding the preservation and restoration of the quality of the environment and on the sustainable use of natural resources.<sup>966</sup>

The Secretariat of the Environment also oversees the enforcement of Mexico's environmental law related to natural resources and relevant Mexican Official Norms on the subject and makes proposals to the executive for the designation of protected areas.<sup>967</sup> In addition, it evaluates and makes determinations on the impact and risk assessment of

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<sup>963</sup> *Ibid.* art. 27.

<sup>964</sup> Organic Law of the Public Federal Administration, *supra* note 948, art. 32 Bis. Section (I).

<sup>965</sup> *Ibid.* See section (II).

<sup>966</sup> *Ibid.* See section (IV).

<sup>967</sup> *Ibid.* See section (VI).

activities that can potentially harm the environment.<sup>968</sup> Furthermore, it plays an active role in coordinating universities and research centers to form professional groups in fields related to the environment.<sup>969</sup>

Regarding LMOs and biosafety, this institution directly regulates the introduction of LMOs in forests and for bioremediation purposes. It also produces a technical binding report to the Secretariat of Agriculture on the viability and safety of LMO release into the environment. This report is produced by the Directorate of Environmental Impact and Risk Assessment (DGIRA), which in addition to evaluating the impact and risk assessments provided by the proponent, conducts additional studies to determine the risks and potential effects of introducing LMOs into the environment. DGIRA not only specializes in LMOs, but also covers a wide range of activities, one of which is biosafety.

DGIRA monitors impact and risk assessment studies and their influence on biodiversity. It also requests technical opinions from the National Institute of Ecology and the National Biodiversity Commission.<sup>970</sup> It is important to note that the budget allocated by the Mexican government to the Secretariat of the Environment in 2005 (1,180,217.01 USD) decreased 25 percent for 2006 ( 914,588.94 USD).<sup>971</sup> Environmental protection constituted roughly six percent of Mexico's budget in 2006.<sup>972</sup>

Altogether, the Secretariat of the Environment is the backbone of Mexico's environmental institutions. Its role is also of great importance in regulating LMOs and ensuring biosafety under its mandate to create Mexico's environmental programs and

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<sup>968</sup> *Ibid.* See section (XI).

<sup>969</sup> *Ibid.* See section (XXI).

<sup>970</sup> *Ibid.* art. 80 (XII).

<sup>971</sup> Amount estimated in USD. Mexican Centre of Studies on Public Finances, 2005-2006 National Expenditures, online: <<http://www.cefp.gob.mx/intr/documentos/pdf/cefp0592005.pdf>>. at 7. (accessed January, 13, 2007).

<sup>972</sup> *Ibid.*



identify its environmental preservation priorities. Also, it analyses environmental and impact assessments relating to the introduction of LMOs in agriculture. Its technical opinion on this is of binding character and essential for the introduction of LMOs into the environment. The Secretariat of the Environment also contributes to the implementation of the Biosafety Law on GMOs by proposing the creation of supporting NOMs.

In spite of the aforementioned potential, several difficulties hinder the role of this Secretariat. First, its organizational structure is crowded and encompasses too many institutions with broad mandates such as the National Commission of Water (CNA), the National Commission of Protected Areas (CONANP), the National Institute of Ecology and the Federal Attorney for Environmental Protection. This broad range of institutions may create conflicts of interest or lack of independence since they all ultimately answer to the head of this Secretariat. Second, as seen from the assigned budget, this Secretariat lacks the financial and personnel resources to enforce Mexico's environmental laws and to monitor the introduction of LMOs into the environment. These issues were brought to light in the CEC's Maize Report where it was evidenced that Mexico was not able to monitor or to arrest the introduction of the maize into the environment.<sup>973</sup>

Third, a more active role of this Secretariat is required to make a difference in LMO regulation. For example, NOMs to implement the Biosafety Law on GMOs have not been created. The absence of these NOMs shows lack of political will to implement the framework legislation and a lack of coordination among the relevant Mexican institutions. Fourth, a delimitation of the areas of origin of Mexico's plants has not been done, although this is under the mandate of this Secretariat. Such areas are important to

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<sup>973</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 25. The Maize Report stated that Mexico had "no mechanisms for systematic monitoring of transgenes in Mexico."

prevent LMOs from being introduced in critical areas that host Mexico's native species. For the aforementioned reasons, the Secretariat of the Environment, as it is now, is not likely to provide the required institutional competence necessary to ensure effective implementation of not only the Biosafety Law on GMOs, but also Mexico's international commitments under the CBD and the Cartagena Protocol.

### **3.2.2 National Institute of Ecology**

The National Institute of Ecology was created in 2001 under the Secretariat of the Environment to promote and coordinate research on environmental issues. Additionally, it provides data and technical input for environmental and natural resources management.<sup>974</sup> The National Institute of Ecology comprises four directorates: the Directorate of Ecological Land-use Planning and Ecosystem Conservation, the Directorate of Research on Politics and Environmental Economics, the Directorate of Research on Urban, Regional, and Global Pollution, and the Directorate of the National Environmental Research and Training Centre.<sup>975</sup>

The Directorate of Research on Politics and Environmental Economics conducts research on the economic value of ecosystems and environmental services and promotes research projects to design new economic instruments of environmental policy.<sup>976</sup> The Directorate of Research on Urban, Regional, and Global Pollution conducts research to define pollution trends at the national level and participates in the creation,

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<sup>974</sup> National Institute of Ecology, What is the National Institute of Ecology?, online:< [http://www.ine.gob.mx/english/what\\_is\\_ine.html](http://www.ine.gob.mx/english/what_is_ine.html)>. (accessed January, 13, 2007).

<sup>975</sup> SEMARNAT, Internal Regulations, *supra* note 958 arts. 110-117.

<sup>976</sup> *Ibid.* art. 114.

implementation and evaluation of studies over air quality in urban zones.<sup>977</sup> The Directorate of the National Environmental Research and Training Centre follows an experimental approach to technologies that can contribute to the attention of environmental problems, and strives to build specialized capacity needed to study the environmental problems that afflict Mexico.<sup>978</sup>

The Directorate of Ecological Land-use Planning and Ecosystem Conservation, as an organ of the National Institute of Ecology, contributes the most to the preservation of biodiversity and biosafety in Mexico. It conducts studies and research to support Mexico's environmental law, and coordinates and promotes monitoring of wildlife species and biological communities at risk.<sup>979</sup> Also, it analyzes requests to collect specimens for scientific research and those to be used in biotechnology and access to genetic resources, and for the handling, release and transit of LMOs and GMOs. In addition, it oversees all issues related to biotechnology and biosafety.<sup>980</sup>

The National Institute of Ecology's role in ensuring biosafety is of paramount importance. This institution aids the Secretariat of the Environment in overseeing and monitoring the introduction of LMOs into the environment. Also, it provides DGIRA with non-binding technical and scientific advice on impact and risk assessments regarding the safety of LMO release countrywide.<sup>981</sup> Several accomplishments can be attributed to the National Institute of Ecology. It produced specific methods of analyzing and identifying GMOs in vegetal tissue and on varieties of maize.<sup>982</sup> Furthermore, in

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<sup>977</sup> *Ibid.* art. 113.

<sup>978</sup> *Ibid.* art. 115.

<sup>979</sup> *Ibid.* art. 113.

<sup>980</sup> *Ibid.*

<sup>981</sup> *Ibid.* art. 80 (XIII).

<sup>982</sup> 2001-2005 Report, National Institute of Ecology (INE), online:< [http://www.ine.gob.mx/transparencia/download/rend\\_ctas\\_etapa1.pdf](http://www.ine.gob.mx/transparencia/download/rend_ctas_etapa1.pdf)>. at 37. (accessed January, 13, 2007).

2005, it published a comparative analysis, exploring molecular techniques, to detect GMOs.<sup>983</sup> It also participated in training personnel to identify GMOs countrywide.<sup>984</sup> In addition, the National Institute of Ecology is actively involved in creating databases and support software for the analysis of risks in the release of LMOs into the environment.<sup>985</sup> This tool has been employed since 2004 to allow officials to input all risk assessments of LMOs in a database to ensure consistency in the preservation of biological diversity.<sup>986</sup>

Overall, the potential of INE to help in the preservation of biodiversity in Mexico is obvious. But like other institutions in Mexico's environmental sector, it has financial and regulatory constraints that largely make it a consultation agency of the Secretariat of the Environment and of other governmental agencies such as the Secretariat of Agriculture and of Health.<sup>987</sup> The expertise of this institution and the specialized research it conducts are essential to identifying the potential effects of LMOs before their introduction into the environment. But due to its dependence on the Secretariat of the Environment and to its lack of authority to produce binding technical opinions, the National Institute of Ecology will continue to be a consultative organ without impacting or contributing substantially to the preservation of biodiversity in Mexico.

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<sup>983</sup> *Ibid.* at 43.

<sup>984</sup> *Ibid.* at 47.

<sup>985</sup> *Ibid.* at 125.

<sup>986</sup> *Ibid.*

<sup>987</sup> Article 110, on the mandate of the National Institute of Ecology, states that it will provide technical and scientific support to the administrative units of the Secretariat of the Environment and that it will foster and coordinate scientific research among Mexico's federal agencies. The participation of this Institution regarding LMOs regulation is to provide opinions on the authorizations to release LMOs based on scientific evidence and on existing biosafety regulations and in coordination with the National Institute of Biodiversity. See National Institute of Ecology, Internal Regulations, (2003), online: < <http://www.ine.gob.mx/ueajei/download/risemarnat21ene03.pdf>>. art. 110. (accessed January, 13, 2007).

### 3.2.1 Federal Attorney for Environmental Protection

The Federal Attorney for Environmental Protection is a subsidiary institution of the Secretariat of the Environment that oversees the enforcement of Mexican environmental law and the preservation of natural resources. This institution investigates complaints over the ineffective application of environmental law and ensures public participation.<sup>988</sup> It enforces environmental legislation by making recommendations to federal authorities over the violation of environmental provisions countrywide.<sup>989</sup> The Federal Attorney for Environmental Protection is comprised of departments that specialize in natural resources, environmental audits, industrial inspection and legal services.<sup>990</sup>

The Department of Environmental Audits proposes environmental inspections throughout the country.<sup>991</sup> The Department of Industrial Inspection comprises a Directorate of Inspection of Sources of Contamination and oversees atmospheric and soil contamination, hazardous waste and risk assessments.<sup>992</sup> On these matters, this Directorate oversees the enforcement of environmental legislation, environmental programs, prevention and eradication of contaminating sources.<sup>993</sup>

The Department of Natural Resources tracks the enforcement of environmental legislation through the Directorates of Marine and Coastal Resources, Wildlife, Forests and Impact Assessment.<sup>994</sup> The Legal Department oversees the enforcement of

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<sup>988</sup> SEMARNAT, Internal Regulations, *supra* note 958 art. 118.

<sup>989</sup> *Ibid.*

<sup>990</sup> PROFEPA, Regulations, online: <<http://www.profepa.gob.mx/PROFEPA/PortaldeTransparencia/FacultadesdelasUnidadesAdministrativas/SubprocuraduriaDeInspeccionIndustrial.htm>>. (accessed January, 13, 2007).

<sup>991</sup> *Ibid.* arts. 120-124.

<sup>992</sup> *Ibid.* art. 126.

<sup>993</sup> *Ibid.*

<sup>994</sup> *Ibid.* arts. 127-131.

environmental legislation through a General Directorate on Environmental Complaints and Public Participation. This Directorate implements a public complaint mechanism regulated by the General Law of Ecological Equilibrium countrywide.<sup>995</sup>

The Federal Attorney for Environmental Protection's most substantial participation in regulating LMOs and enforcing biosafety legislation in Mexico is through the public complaint procedure and by way of inspections by its personnel.<sup>996</sup> A complaint procedure is triggered by a complaint via fax, telephone or in person at any of the Secretariat of Agriculture's branches.<sup>997</sup> Although the complaint mechanism was not specifically crafted to address matters related to LMOs and biotechnology, it can be utilized to report any activity that causes disequilibrium or harm to the environment including the introduction of transgenic material into the environment.<sup>998</sup>

### **3.4 National Commission for the Knowledge and Use of Biodiversity**

This 1992 Commission is the first specialized institution regarding biodiversity created in Mexico with the aim to safeguard its diversity of biological resources and to exploit such resources' economic potential.<sup>999</sup> In addition, the National Biodiversity Commission's specialized structure is essential for the implementation of Mexico's international obligations and for the regulation of LMOs.<sup>1000</sup>

The National Biodiversity Commission was created by a Presidential Decree with the objective of:

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<sup>995</sup> General Law of Ecological Equilibrium, *supra* note 8 art. 189.

<sup>996</sup> *Ibid.*

<sup>997</sup> *Ibid.*

<sup>998</sup> *Ibid.* at 192-194. In 2006, this institution was allocated 13,994,488.39 USD to accomplish its mandate. See Mexican Centre of Studies on Public Finances, 2005-2006 National Expenditures, *supra* note 971 at 7-10.

<sup>999</sup> CONABIO, Creation Agreement, online:< [http://www.conabio.gob.mx/institucion/conabio\\_ingles/doctos/acuerdo.html#AGREEMENT](http://www.conabio.gob.mx/institucion/conabio_ingles/doctos/acuerdo.html#AGREEMENT)>. (accessed January, 13, 2007). See preamble.

<sup>1000</sup> *Ibid.*

Coordinating the actions and studies related to the knowledge and preservation of biological species, as well as to promoting and developing scientific research activities for the exploration, study, protection, and use of biological resources tending toward the conservation of the nation's resources and generating criteria for its defensible handling.<sup>1001</sup>

This Commission strives to accomplish its goals by means of four strategies: first, to constitute a National Biodiversity Information Network (SNIB) to generate, gather and share knowledge throughout the various sectors of society;<sup>1002</sup> second, to provide guidance and follow-up on international matters and commitments related to biodiversity; third, to support and foster actions oriented to the conservation, restoration and sustainable use of biodiversity;<sup>1003</sup> and, fourth, to update and coordinate national and international networks on biodiversity.<sup>1004</sup>

The National Biodiversity Commission is comprised of the heads of the following secretariats: Foreign Relations (SRE); Treasury and Public Credit (SHCP); Energy (SENER); Economy (SE), Agriculture; Public Education (SEP); Health (SSA); Tourism (SECTUR); and Social Development (SEDESOL).<sup>1005</sup> The Commission is headed by the Mexican President who serves as its president. Also it has other officials: a Technical Secretariat;<sup>1006</sup> a National Coordinator; an Executive Secretariat; a Technical Group on

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<sup>1001</sup> CONABIO, Creation Agreement, DOF-03-16-1992, online: < [http://www.conabio.gob.mx/institucion/conabio\\_ingles/doctos/acuerdo.html](http://www.conabio.gob.mx/institucion/conabio_ingles/doctos/acuerdo.html)>. at 1 (accessed January, 13, 2007).

<sup>1002</sup> CONABIO, Strategic Objectives, online:< [http://www.conabio.gob.mx/institucion/conabio\\_espanol/doctos/objetivos.html](http://www.conabio.gob.mx/institucion/conabio_espanol/doctos/objetivos.html)>. (accessed January, 13, 2007).

<sup>1003</sup> *Ibid.*

<sup>1004</sup> *Ibid.*

<sup>1005</sup> CONABIO, Organization Structure, online: < [http://www.conabio.gob.mx/institucion/conabio\\_ingles/doctos/estructura.html](http://www.conabio.gob.mx/institucion/conabio_ingles/doctos/estructura.html)>. (accessed January, 13, 2007). See also CONABIO, Internal Regulation, online:< [http://www.conabio.gob.mx/institucion/conabio\\_ingles/doctos/reglamento\\_interno.pdf](http://www.conabio.gob.mx/institucion/conabio_ingles/doctos/reglamento_interno.pdf)>. (accessed January, 13, 2007).

<sup>1006</sup> The Executive has great influence in the organic structure of this institution since he appoints the National Secretariats and he sits as president of such institution. In addition, the Technical Secretariat and the National Coordinator are appointed the Executive.

Analysis and Priorities; a Technical Group on Evaluation of Projects; and an Administrative and Operational Unit.<sup>1007</sup>

Regarding biosafety and LMOs, this institution participates actively in analyzing environmental and risk assessment studies regarding the release of LMOs into the environment upon request from the Secretariat of the Environment and the Secretariat of Agriculture. Although its technical and scientific opinions are non-binding, they serve as the basis for approval or denial of the release applications.<sup>1008</sup>

Since its creation, the Commission has built an enormous infrastructure that now aids in the implementation of Mexico's biosafety laws and international obligations. For example, it created the Mexican Network on Biodiversity (REMIB), the National Program for the Preservation of Biodiversity and the System for Handling Information "BIOTICA."<sup>1009</sup> Also, it has provided more than 750 opinions regarding requests to release diverse crop LMOs into the environment.<sup>1010</sup>

Overall, the National Biodiversity Commission plays an active role in the preservation of biological resources. This Commission created the technical tools for analyzing and monitoring issues on biological resources. But like the National Institute of Ecology, the National Biodiversity Commission lacks the independence necessary to produce its technical opinions, since it is led and funded by the executive and the

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<sup>1007</sup> CONABIO, Internal Regulation, *Ibid.*

<sup>1008</sup> *Ibid.*

<sup>1009</sup> CONABIO, Achievements, online:< [http://www.conabio.gob.mx/institucion/conabio\\_espanol/doctos/logros.html](http://www.conabio.gob.mx/institucion/conabio_espanol/doctos/logros.html) >. (accessed January, 13, 2007).

<sup>1010</sup> CONABIO, 1992-2004 REPORT, online:< [http://www.conabio.gob.mx/institucion/conabio\\_espanol/doctos/informe\\_doce\\_anios.pdf](http://www.conabio.gob.mx/institucion/conabio_espanol/doctos/informe_doce_anios.pdf) >. at 28. (accessed January, 13, 2007).



Secretariats.<sup>1011</sup> It also has no independent legal authority to initiate appropriate activities. As such it can only serve as a specialized consultation body.

### 3.5 Inter-Secretarial Commission on GMOs

The Inter-Secretarial Commission on GMOs emerged in 1999 by a Presidential Decree replacing the former National Commission of Biosafety in Agriculture of 1989.

<sup>1012</sup> It was created due to concerns about the increasing use of LMOs and biotechnology in Mexico in light of the richness of the country's biological resources.<sup>1013</sup>

The Inter-Secretarial Commission on GMOs is made up of the heads of the Secretariats of Agriculture, Environment, Health (SSA), Revenue (SHCP), Energy (SE), Education (SEP) and the National Council of Technology (CONACYT).<sup>1014</sup> Thus it strives to coordinate the activities of all environmental institutions on all matters related to biosafety and production, import, exports, consumption and transportation of LMOs. It has authority to propose to the executive the national policy on LMOs, and it proposes to the Secretariat of Agriculture and the Secretariat of the Environment inspector visits to ensure that proponents comply with biosafety requirements outlined in Mexico's legislation.<sup>1015</sup>

Led by the Mexican President, this Commission has subcommittees on legal, environmental and agricultural matters and a National Biosafety Committee comprised of

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<sup>1011</sup> In 2005, CONABIO was assigned 30,667,659.31 USD by the Executive and international sources. See CONABIO, Financial information, online:< [http://www.conabio.gob.mx/institucion/conabio\\_espanol/doctos/edos\\_fin.html](http://www.conabio.gob.mx/institucion/conabio_espanol/doctos/edos_fin.html) >. at 5. (accessed January, 13, 2007).

<sup>1012</sup> Inter-Secretarial Commission on GMOs, about the CIBIOGEM, online:<[http://www.cibiogem.gob.mx/publicaciones/Que\\_es\\_CIBIOGEM.pdf](http://www.cibiogem.gob.mx/publicaciones/Que_es_CIBIOGEM.pdf)>. at 7. (accessed January, 13, 2007).

<sup>1013</sup> *Ibid.*

<sup>1014</sup> *Ibid.*

<sup>1015</sup> Inter-Secretarial Commission on GMOs, creation Agreement, *Ibid.* at 2.

biosafety experts nationwide.<sup>1016</sup> It serves as the liaison to the Secretariat of the CBD regarding the Biosafety Clearing House Mechanism.<sup>1017</sup> The National Biodiversity Commission participates in its meetings on this score.<sup>1018</sup>

Regarding the introduction of LMOs, the Subcommittee on Agriculture is the branch of the Inter-Secretarial Commission on GMOs that is actively involved in biosafety and LMO matters. This subcommittee coordinates institutional efforts, particularly between the Secretariat of the Environment and the Secretariat of Agriculture regarding the release of LMOs into the environment. Also, the Inter-Secretarial Commission on GMOs' National Biosafety Committee serves as a consultative body on technical and scientific issues surrounding the release of these organisms into the environment.

Altogether the Inter-Secretarial Commission on GMOs has the potential to coordinate environmental institutions in Mexico. It can also propose standards regarding the implementation of biosafety norms. In practice, however, this institution has not been able to impact LMO regulation due to the absence of normative and institutional authority at the federal level to feed its existence. Although it is comprised of the heads of the Secretariats, it lacks the legal weight that the Secretariats enjoy.

#### 4. Conclusion

Mexican legislation previous to the Biosafety Law on GMOs contained diffuse provisions on biosafety. The General Law of Ecological Equilibrium and Environmental Protection, for example, provided a general framework for regulating LMOs under

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<sup>1016</sup> Inter-Secretarial Commission on GMOs, Organic Structure, *Ibid.* at 30.

<sup>1017</sup> *Ibid.*

<sup>1018</sup> *Ibid.*

activities that are likely to alter the ecological equilibrium.<sup>1019</sup> This Law, however, lacked the specialized legislative and institutional structure to effectively address threats posed by LMOs. Similarly, the LPH offered a remedial approach to LMOs by addressing the threats posed by these organisms when they became plagues or pests.<sup>1020</sup> Preventive approaches and monitoring tools were lacking in this law.

The 1995 NOM FITO-056,<sup>1021</sup> although it could preserve biological diversity, required numerous personnel to carry out inspections and to run seed certification centers. These were not available when this NOM was enacted, as shown later in the CEC's Maize Report.<sup>1022</sup> Similarly, the Law on Certification and Commerce of Seeds was an economic development tool employed to allow LMO experimentation in Mexico. As observed from the aforementioned biosafety provisions, there was a lack of legislative coordination in the regulation of LMOs. Also, the relevant disaggregated provisions could not extend the necessary protection to Mexico's biological resources.

The 2005 Biosafety Law on GMOs came in to unite and coordinate prior biosafety regulation in Mexico. It offers a more comprehensive approach by regulating experimentation, pilot programs and commercialization of LMOs. But again the potential of this Law to engender effective biodiversity preservation is undermined by the lack of NOMs and regulations necessary for its implementation. In the absence of those, the Biosafety Law on GMOs remains a general framework that is difficult to implement, and therefore, does not afford substantial protection to biodiversity. It also does not further

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<sup>1019</sup> General Law of Ecological Equilibrium, *supra* note 8 art.31.

<sup>1020</sup> Law of Plant Health, *supra* note 719 art. 5.

<sup>1021</sup> NOM-056-FITO-1995, *supra* note 273.

<sup>1022</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6.

the objectives of the CBD and the Cartagena Protocol in Mexico's effort to observe these international treaties.

Regarding environmental principles, the Biosafety Law on GMOs lacks guidelines and specific regulation to integrate environmental impact assessment into decision making regarding the introduction of LMOs into the environment. It also fails to provide tools for balancing scientific uncertainty against trade interests, even though it endorses, for the first time in Mexican legislation, observation of the precautionary principle.

The enunciation of the precautionary principle in the Biosafety Law on GMOs is, however, weak. This is because it is subordinate in its application to trade agreements and to cost effective measures. The implementation of the principle also requires extensive rules and national guidelines that must be observed by environmental institutions. As it is, the principle expresses a good intention whose practical impact is rather remote at the moment.

Regarding Mexico's environmental institutions, they are modern and specialized. However their powers and authority reflect the ambiguities inherent in current Mexican environmental legislation. The institutional framework seems overcrowded and not coordinated. This can be observed, for example, in the structure of the Secretariat of the Environment and the various institutions under its structure such as the National Commission of Water, the National Commission of Protected Areas, the National Institute of Ecology and the Federal Attorney for Environmental Protection.

Also there seems to exist duplication of efforts among the institutions. This is exemplified by the National Biodiversity Commission and the National Institute of

Ecology. These two specialized institutions perform similar tasks as technical scientific bodies. Another example in this vein are the Secretariat of the Environment and the Secretariat of Agriculture. Under the Biosafety Law on GMOs these two institutions are required to designate areas of origin to restrict the introduction of LMOs. So far, since this Law emerged, no designations have been observed regarding these areas, probably also because no regulations have been enacted to demand that this be done. Finally, it was pointed out that the Mexican environmental institutions lack the necessary funding, and that the Mexican government lacks the political will to provide them with the necessary resources to accomplish their mandates. Under these circumstances, these institutions do not and cannot effectively work for the observation of Mexico's obligations under the legal and institutional regimes for environmental and biodiversity preservation in Mexico, prospects for good performance are rather low.

## CHAPTER VI

### MEXICAN ENVIRONMENTAL POLICY

#### 1. Overview

Mexico's environmental policy is embedded in six-year framework strategies that contain economic and environmental goals. These framework strategies have their foundation in the Mexican Constitution and federal law. Regarding the responsibilities of the Federation, Article 26 of the Constitution provides that the Mexican State "will organize a system of democratic planning for the economic, social and political development of the Nation."<sup>1023</sup> Also at the Federal level, the General Law of Ecological Equilibrium provides that the preparation and management of Mexico's environmental policy must be created by the federal government,<sup>1024</sup> and that such policy must be included in National Development Strategies.<sup>1025</sup>

In addition to National Development Strategies, Mexico's environmental policy is outlined in plans of action formulated by the Federal Secretariats. These institutions create specific plans to help the federation reach its national goals. The plans of the Secretariats may serve as national guidelines to be applied throughout the country.

Mexico's environmental policy has been forged by economic and political factors since the 1970s. During that time, the population in Mexico City reached seven million

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<sup>1023</sup> Constitution of the Mexican United States of 1917, *supra* note 184.

<sup>1024</sup> General Law of Ecological Equilibrium, *supra* note 8 art. 5.

<sup>1025</sup> *Ibid.* art. 17.

inhabitants and air pollution problems began to cause problems, particularly during winter.<sup>1026</sup> Heated protests and public mobilization contributed to the politicization of environmental protection in this country, particularly in the most affected areas.<sup>1027</sup> Mexico's environmental policies and laws were forged in this context to ameliorate environmental harm that had been inflicted by economic activities. One such law is the Federal Law to Prevent and Control Environmental Pollution of 1971.<sup>1028</sup> External factors, also, put pressure on Mexico to update its environmental policy, particularly with regard to oil spills and transboundary pollution from 1976 to 1979.<sup>1029</sup> Also in 1978, with the aim to halt the effects of air pollution in Mexico City, Mexico launched an ambitious plan to improve industrial emissions. A few years later this attempt would fail due to the lack of resources and the necessary infrastructure to implement the plan.<sup>1030</sup>

During the 1980s, a severe generalized economic crisis struck Mexico.<sup>1031</sup> Miguel de la Madrid's government attempted to deal with the economic crisis and to remediate Mexico's pressing environmental problems.<sup>1032</sup> The effort was expressed through the National Development Plan of 1983-1988 which, for the first time, linked 'ecological factors' to economic development. At least on paper, this plan provided some strategies for the preservation and enjoyment of natural resources.<sup>1033</sup>

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<sup>1026</sup> Mumme, Stephen P., (et al), " Political Development and Environmental Policy in Mexico" (1988) 23 LARR 1 at 11.

<sup>1027</sup> *Ibid.* at 10-12.

<sup>1028</sup> Guevara, Alejandro, "Política Ambiental en México: Génesis Desarrollo y Perspectivas ", (2005) 821 ICE at 167-168.

<sup>1029</sup> Mumme, Stephen, *supra* note 1026 at 15-16.

<sup>1030</sup> *Ibid.* at 16.

<sup>1031</sup> Schulz, Donald E., "Mexico in Crisis", (1995) Strategic Studies Institute, U.S. Army War College at 4-5. online: < [http://www.dtic.mil/doctrine/jel/research\\_pubs/crisis.pdf](http://www.dtic.mil/doctrine/jel/research_pubs/crisis.pdf)>. (accessed January, 13, 2007). According to this author, inflation roared to over one hundred per cent, and the GNP dropped from U.S. 3,170 (1981) to U.S. 1,860 (1988).

<sup>1032</sup> Micheli, Jordy, *supra* note 746 note 117-120.

<sup>1033</sup> *Ibid.*

Environmental policy at that time already suggested that there was a relationship between development and environmental depletion. In this period, also, a reform that would serve as the basis for modern environmental policy started developing. Series of legal reforms took place, including the Constitutional amendment of articles 27 and 23 to include the obligation of the State to preserve and restore the environment and to grant Congress authority to legislate over environmental matters with respect to the obligations of the Mexican federal States, thus enhancing the role of the State in the protection of the environment.<sup>1034</sup>

During the 1990s, Mexico's environmental policy started to show signs of regard not only for the environment, but also for the preservation of biological resources. The National Development Strategy of 1995<sup>1035</sup> was a landmark in Mexico's environmental policy because, for the first time, such a national program incorporated environmental considerations into economic development planning. Two individual Plans were developed by the Secretariat of the Environment and National Resources to aid in reaching the goals set forth in the National Development Strategy of 1995. These were the National Environmental Plan of 1995<sup>1036</sup> and the National Biodiversity Strategy of 2000.<sup>1037</sup> These Strategies, although predominantly concerned with economic development, set the foundation for more integrated national approaches to all aspects of development activities. Also at this time, the Mexican government began authorizing the experimental planting of GM crops.

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<sup>1034</sup> *Ibid.* at 139.

<sup>1035</sup> National Development Strategy 1995-2000, *supra* note 264.

<sup>1036</sup> *Ibid.*

<sup>1037</sup> National Biodiversity Strategy of 2000, *supra* note 265.



In 2001, a new Development Strategy<sup>1038</sup> was formulated, along with an ambitious environmental program enacted by the Secretariat of the Environment along with specific environmental plans. This Strategy attempts to deal with environmental problems in a coordinated manner including, for the first time, regard for biological resources and the threat posed by LMOs. Additionally, in 2005, a Biosafety Law on GMOs<sup>1039</sup> was created aiming to preserve Mexico's biological resources from the possible threats of Genetically Modified Organisms (GMOs) and LMOs.

An analysis of Mexico's environmental policy on biodiversity and LMOs is essential to assess whether it reflects the commitments and environmental principles contained in the CBD and the Cartagena Protocol, and whether it provides a sufficient framework that would aid in its implementation. The rest of the Chapter examines the Policies in detail, to show the progression and continuity of environmental policy and Mexico's commitment to implement these Agreements.

The rest of the Chapter is divided into 5 sections. Section 2 deals with early developments in Mexico's environmental policy; section 3 deals with Mexico's policy from 1995 – 2000; section 4 covers Mexico's policy from 2001-2006; and, section 5 provides an assessment of Mexico's environmental policy.

## **2. Mexico's Planning System**

As discussed in Chapter III Section 2.5, the CBD's Conference of the Parties encourages States to employ SEA as planning tools to elaborate their policies and

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<sup>1038</sup>National Development Strategy 2001-2006, *supra* note 267.

<sup>1039</sup> Biosafety Law on GMOs, *supra* note 9.

national plans.<sup>1040</sup> Ideally, this tool would guide States in elaborating strong and consistent policies where public participation and concern for biodiversity are present from the early stages of the SEA process.<sup>1041</sup> Ideally, Mexico, a party to the CBD, will employ this planning tool in creating its national plans and policies.

A study of Mexico's planning system and the factors that influence its development is paramount at this point, not only to see if it provides the infrastructure to implement its environmental law and to coordinate its environmental institutions, but also to assess if it reflects international commitments in the CBD and the Cartagena Protocol. An analysis of Mexico's planning system follows.

As discussed before, Mexico's planning system is rooted in Article 26 of the Mexican Constitution of 1917.<sup>1042</sup> It describes a National Democratic Planning System in which the different sectors of society can integrate 'aspirations and concerns' with national plans.<sup>1043</sup> The Constitution also grants authority to the President to coordinate public participation and to integrate it in a national plan. It also provides that the Mexican Congress can authorize such national plans.<sup>1044</sup>

The Presidential figure, as noted above, plays an important role in this country's strategic planning. As some academics noted, this has been the most powerful institution in Mexico's politics rooted in constitutional provisions and in traditions of the Mexican political system.<sup>1045</sup> This influence, although it has been diminishing since the 2000

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<sup>1040</sup> CBD, Conference of the Parties 8 (COP8), *supra* note 387 at 1.

<sup>1041</sup> *Ibid.*

<sup>1042</sup> Constitution of the Mexican United States of 1917, *supra* note 184 art. 26.

<sup>1043</sup> *Ibid.*

<sup>1044</sup> *Ibid.*

<sup>1045</sup> Zamora, Stephen, *supra* note 11 at 142. See also Ugalde, Luis Carlos, "The Transformation of the Presidentialism 1929-2000" (2000) 25 Fletcher F. World Aff. 115. at 116.

elections, is still present, at least on environmental issues.<sup>1046</sup> The President, for example, approves by decree the creation of national protected areas<sup>1047</sup> and proposes to the Mexican Congress the national budget every year including the allocation of resources to environmental institutions.<sup>1048</sup> He or she appoints the heads of Secretariats and he leads the institutions that play a strategic role in preserving biodiversity and regulating LMOs, namely, the Inter-Secretarial Commission on GMOs and the National Biodiversity Commission.<sup>1049</sup>

Furthermore, the President plays a central role in the planning system in this country, as provided in the Federal Planning Law of 1983.<sup>1050</sup> This Law provides that Mexico's priorities, strategies, allocation of financial resources and coordination mechanisms will comprise national strategies.<sup>1051</sup> Furthermore, it establishes the mechanisms to create Mexico's plans. According to the Federal Planning Law, the executive is to elaborate a National Development Strategy within six months of coming into power and that the Strategy will not exceed the six-year Presidential period.<sup>1052</sup> The Planning Law also provides that exceptionally, a National Development Plan could contain considerations and projects for a longer term.<sup>1053</sup> Furthermore, it points out that Secretariats will create individual plans to support the implementation of the National Development Strategy.<sup>1054</sup>

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<sup>1046</sup> *Ibid.* at 121.

<sup>1047</sup> General Law of Ecological Equilibrium, *supra* note 8 art. 57-58.

<sup>1048</sup> Constitution of the Mexican United States of 1917, *supra* note 184 art. 89 (I).

<sup>1049</sup> *Ibid.*

<sup>1050</sup> Federal Planning Law, *supra* note 10 art. 3.

<sup>1051</sup> *Ibid.*

<sup>1052</sup> *Ibid.*

<sup>1053</sup> *Ibid* art.21.

<sup>1054</sup> *Ibid*

The aforementioned Constitutional and Federal provisions were put to the test in the creation of the 2001-2006 National Development Plan. In December of 2000, after the former President was in power, an extensive consultation process began from January to April of 2001.<sup>1055</sup> It is important to note that public participation gathered throughout the country and integrated with this National Development Plan was comprised of 153,000 proposals received by mail, 117 040 via internet, and 36 850 in forums.<sup>1056</sup> In May 2006, this Plan was published in the Mexican Gazette (*Diario Oficial de la Federacion*) by Presidential Decree.

Overall, Mexico exhibits a structured democratic planning system rooted not only in the Constitution but also in federal legislation. This system is meant to integrate input from the different sectors of society into National Development Plans. It does not seem to reflect the implementation of Strategic Environmental Assessment as advocated under the CBD. For example, it does not seem to encourage the creation of strongly coordinated national policies and the coordination of institutions and legislation on biodiversity preservation.

Furthermore, several pitfalls were found in Mexico's Planning System. First, the President plays a dominant role in this planning system and there is no transparency regarding how he or she coordinates and integrates inputs into Development Plans. Second, the Law of Planning dramatically curtails the ability of the country to establish long term goals. It is clear from this law that National Development Plans are six-year Presidential priorities and that a President can not impose his or her will after a Presidential mandate.

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<sup>1055</sup> National Development Strategy 2001-2006, *supra* note 267 at 13.

<sup>1056</sup> *Ibid.* at 15.

Third, it is also seen that the Mexico's planning system limits the integration of public input since it only gives a short period of time for this purpose. This also reduces the possibility of Mexican society inputting opinions and concerns into such National Plans. In the 2001-2006 National Development Plan, for example, the President coordinated public participation only from December to April. Also, a lack of public participation was seen considering the total of Mexico's population in 2000 was 97, 483, 412.<sup>1057</sup> Fourth, a strong Presidential figure is seen in Mexico. This figure's influence while according to academics has been decreasing, still is influential on environmental matters. This figure is likely to influence Mexico's policy, legislation and institutions.

As it is now, Mexico's planning system is not likely to construct long-term, consistent environmental policies. A further analysis is required to assess if Mexico's policy provides the required support to implement environmental legislation, to coordinate institutions and to implement the CBD and the Cartagena Protocol.

### **3. Early Developments in Mexico's Environmental Policy**

During the 1970s, the Mexican government heavily emphasized economic development over environmental protection. In a speech before the General Assembly of the United Nations (UN) in 1971, Mexican President Luis Echeverria stated:

“Industrialization is the only alternative for third world countries: Industrialization has frequently produced pollution but we should never adopt measures to stop development or to prevent poor countries from being industrialized.”<sup>1058</sup>

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<sup>1057</sup> Statistics Mexico (INEGI), Mexico's Population, online: < <http://www.inegi.gob.mx/est/contenidos/espanol/rutinas/ept.asp?t=mpob00&c=5262> >. (accessed January, 13, 2007).

<sup>1058</sup> Simonian Lane, “Medio Ambiente y Políticas Publicas en México (1980-1993)” (1998) 56 *Gaceta Ecológica* at 18.

At that time, environmental policy was only focused on solving pressing problems such as air and water pollution.<sup>1059</sup> There was no coordinated attack through national environmental initiatives to protect the environment as a whole. Logically, environmental legislation at that time reflected Mexico's current environmental policy in the context of the economic development priorities of the federal government. This is clearly seen in the 1971 Federal Law to Prevent and Control Environmental Pollution.<sup>1060</sup>

The progressive dimension to this Law was that it introduced for the first time concern for the impact of environmental pollution on human health.<sup>1061</sup> This legislation's objective was to preserve human health and the 'ecological systems of the nation'.<sup>1062</sup> In fact, the 1971 Law was implemented by the Secretariat of Health and to some degree, other Secretariats, including those of Commerce and Agriculture. On a practical level, the broad scope of this law and the institutional interaction for its application made it difficult to implement.<sup>1063</sup>

Article 5 of the 1971 law mandated the creation of national parks, industrial areas, and education and awareness on pollution.<sup>1064</sup> Article 14 defined contamination "as the presence of any pollutant in the environment that causes damage or disturbs human health, plants, or animals, or the quality of air, water, soil or natural resources belonging to private individuals or to the federal government."<sup>1065</sup> Consequently, environmental

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<sup>1059</sup> *Ibid.* at 19 -20.

<sup>1060</sup> *Ibid.*

<sup>1061</sup> *Ibid.* at 19.

<sup>1062</sup> Federal Law to Prevent and Control Environmental Pollution, DOF, No. 20, March 23, 1971.

<sup>1063</sup> Organization of American States, Inter American Commission of Human Rights, Constitutional Norms and judicial decisions related to the American Declaration, online: < [http://www.cidh.org/annualrep/71sp/parte1.htm#\\_ftnref18](http://www.cidh.org/annualrep/71sp/parte1.htm#_ftnref18)>. (accessed January, 13, 2007).

<sup>1064</sup> Cabrera Lucio, "Demographic and Legal Aspects of Pollution in Mexico" in Carrillo Prieto and Necedal Raul (eds.), *Legal Protection of the Environment in Developing Countries*, (Mexico City: Instituto de Investigaciones Juridicas, (UNAM, 1976) at 306.

<sup>1065</sup> *Ibid.*

protection at that time, as reflected in this law, was merely remedial and heavily emphasized a concern for human health. Environmental protection was considered important only when environmental degradation could negatively impinge upon human health.<sup>1066</sup>

Increasing environmental problems led to the creation of the 'Undersecretariat for the Improvement of the Environment' in 1972. This institution, under the jurisdiction of the Secretariat of Health,<sup>1067</sup> attempted to train environmental specialists, to create a database of information on the State of Mexico's environment and to represent Mexico in international forums.

Simultaneous with the developments in Mexico's environmental policy, international factors also put pressure on the country to create a more comprehensive environmental policy. These pressure sources include the Stockholm Declaration, the Conference on Trade in Endangered Species in 1972,<sup>1068</sup> and the Constitution of a Mexico-US border consultative mechanism to deal with water and air pollution and with oil spills.<sup>1069</sup> In light of these, a Presidential Decree<sup>1070</sup> included for the first time regard for whales and marine species<sup>1071</sup> by designating marine reserves along the coast of Baja California, Mexico.<sup>1072</sup>

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<sup>1066</sup> Mumme Stephen P., *supra* note 1026 art. 14.

<sup>1067</sup> Micheli, Jordy, *supra* note 746 at 167-168.

<sup>1068</sup> Chavez Mario A., "Legal Protection of the Environment in Mexico" in Carrillo Prieto and Nosedal Raul (eds.) *supra* note 1068 at 296-297.

<sup>1069</sup> Mumme Stephen P., *supra* note 1026 at 15. Bilateral efforts were consolidated due to an oil spill in a Mexican well located in the State of Campeche, in the Gulf of Mexico.

<sup>1070</sup> *Ibid.*

<sup>1071</sup> Some of the marine species subject to hunting vetoes were marine turtles, crocodiles and alligators, sea elephants, and seals.

<sup>1072</sup> Chavez Mario A., *supra* note 1068 at 297. Mexico's Presidential Decree was part of an international initiative that started on whale hunting in 1949.

In spite of international pressure to include the environment in the Presidential agenda, in 1974, a National Deforestation Program was launched encouraging farmers to plant 'every corner of Mexico's land'. This National Campaign is known for depleting more than 60 percent of Mexican forests.<sup>1073</sup>

Overall, slow progress toward environmental protection occurred in the 1970s. Lack of coordination of institutions and legislation is characteristic of this time. For some, the struggles and problems found in Mexican policy are the result of a powerful Presidential influence and one-political-party dominance.<sup>1074</sup>

Mexico's environmental policy during the 1980s dramatically departed from previous efforts in that it included an environmental agenda as part of the National Development Plan. Additionally, legislative and institutional reforms were introduced during this decade. In 1982, the Undersecretariat for the Improvement of the Environment was dissolved and a new environmental institution emerged, the Secretariat of Urban Development and the Environment. This institution, which included an Undersecretariat of the Environment, participated actively in the formulation of the National Development Plan of 1983-1988 and in the development of Mexico's environmental policy during that time.<sup>1075</sup>

Along with the institutional developments, several legislative reforms were introduced. A new environmental law was enacted in 1982, the Federal Law for the Preservation of the Environment.<sup>1076</sup> Article 27 of the Mexican Constitution was also

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<sup>1073</sup> Delgadillo Javier, *Los Terrenos de la Politica Ambiental en Mexico*, (Mexico City: Porrúa, 2001) at 300.

<sup>1074</sup> Simonian Lane, *supra* note 1058 at 26. For more on the Presidentialism in Mexico see. Ugalde Luis, *supra* note 1045.

<sup>1075</sup> Guevara Alejandro, *supra* note 1028 at 167-168.

<sup>1076</sup> *Ibid.*



reformed to include the restoration of ecological equilibrium as an obligation of the federal government.<sup>1077</sup> Later, in 1988, the General Law of Ecological Equilibrium<sup>1078</sup> was enacted to replace the 1982 Environmental Law.<sup>1079</sup>

In 1990, a National Program for the Protection of the Environment was created by Presidential Decree<sup>1080</sup> and its application was mandatory throughout the country.<sup>1081</sup> This program constituted the first modern attempt to create a comprehensive institutional program. It focused on protecting the genetic diversity of species, particularly those in danger of extinction. The program aimed to utilize those resources in a sustainable manner and to restore deteriorated land and marine ecosystems.<sup>1082</sup>

Altogether, Mexico's environmental policy, in its early development, was the result of harsh economic crises and social struggle. Thus, the policy reflects attempts to balance development and environmental protection. Environmental policy from the 1970s was highly politicized and influenced by the Presidential figure. Environmental problems were used in political campaigns as means to increase popularity during presidential elections. Also, policy at this time offered only a remedial approach to environmental problems.

Environmental policy in the 1980s and early 1990s displays an evolution, such as the use of modern institutions and legislation to implement the commitments outlined in National Plans. Although a pattern of progress is found in early policy, there is also a

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<sup>1077</sup> *Ibid.* at 139.

<sup>1078</sup> *Ibid.*

<sup>1079</sup> Micheli, Jordy, *supra* note 746 at 140.

<sup>1080</sup> Carmona Maria "Criterios normativos para el ordenamiento ecológico" (1993) 78 Boletín Mexicano de Derecho Comparado 1, online: <<http://www.juridicas.unam.mx/publica/rev/boletin/cont/78/art/art2.htm>>. (accessed January, 13, 2007).

<sup>1081</sup> *Ibid.*

<sup>1082</sup> *Ibid.*

pattern of change during every six-year Presidential mandate, which also means a lack of continuity in the evolution of environmental institutions and legislation.

#### **4. Mexico's Environmental Policy from 1995-2000**

When the 1995 National Development Strategy<sup>1083</sup> was formulated, Mexico was facing pressing environmental problems, such as air pollution in metropolitan areas, uncontrolled hazardous waste dumping across the country, increasing deforestation, contamination of water reserves and the overexploitation of several species.<sup>1084</sup> This Strategy emerged as a policy instrument issued by the Executive to counter these pressing environmental problems and to address serious economic challenges.<sup>1085</sup>

The 1995 Strategy was directed at promoting sustainable economic development with the aim of preserving natural resources. These were viewed as having great economic potential to generate income and to help fight poverty.<sup>1086</sup> In practice, the Strategy sought to provide the legal and institutional means by which to achieve sustainable development.<sup>1087</sup>

Five general objectives formed the basis of the 1995 National Development Strategy: to strengthen national sovereignty; to consolidate the legal system; to strengthen democracy; to achieve social justice; and, to foster economic development.<sup>1088</sup> To achieve these goals this Strategy attempted to integrate environmental policies in development projects.<sup>1089</sup>

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<sup>1083</sup> National Development Strategy of 1995-2000, *supra* note 261.

<sup>1084</sup> *Ibid.* See section 5.8 on environmental policy for a sustainable development.

<sup>1085</sup> *Ibid.* see section 5.8.

<sup>1086</sup> *Ibid.*

<sup>1087</sup> *Ibid.*

<sup>1088</sup> *Ibid.* see introduction.

<sup>1089</sup> *Ibid.*

Mexico devoted substantial resources to implement the National Strategy. The Federal government and the Secretariat of the Environment formulated and strove to accomplish four specific priority actions: first, to improve the environment of the most contaminated cities and to ameliorate harm arising from the inadequate handling of hazardous material; second, to improve the quality of hydrological reserves; third, to restore critical areas to the preservation of biodiversity; and fourth, to consolidate environmental legislation and its enforcement, particularly with regard to hazardous waste.<sup>1090</sup>

Due to previous economic crises, financial resources to implement this Plan were limited. The Mexican government allocated to the Secretariat of the Environment and Natural Resources, during the term of this Strategy, the equivalent of 900 million USD a year,<sup>1091</sup> not only to implement such Strategy but for this institution's total budget. The budget allocated in 2000 to the Secretariat of the Environment represented only 1.7 per cent of the budget of the federal administration.<sup>1092</sup>

Also, during that time, Mexico's environmental policy on LMOs took a liberal approach in 1998 when, according to the Inter-Secretarial Commission on GMOs, from 1998-2001, about 201 applications of experimental LMO crops were approved to be

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<sup>1090</sup> *Ibid.*

<sup>1091</sup> Revenue Mexico, Federal Budget 1995-2000, online: [http://www.shcp.sse.gob.mx/contenidos/presupuesto\\_egresos/temas/pef/1995a2000/pef19952000.pdf](http://www.shcp.sse.gob.mx/contenidos/presupuesto_egresos/temas/pef/1995a2000/pef19952000.pdf). at 171. (accessed January, 13, 2007). The Federal Budget allocated to the Environmental Secretariat from 1995-200 was as follows: 1995, 1847.1 millions of Mexican pesos (about 186,316,047.95 USD; in 1996, 2,934 millions of MP (295,988,147.86 USD); 1999, 9254 millions of Mexican pesos (933,694,851.76 USD); and, in 2000 14269.5 millions of Mexican pesos (1,439,894,105.65 USD).

<sup>1092</sup> Center for the Study of Public Finances, online: <<http://www.cefp.gob.mx/modpef99-05/pdf/pef2000.pdf>>. (accessed January, 13, 2007).

introduced in the country.<sup>1093</sup> These trials covered an area of approximately 214,311.172 hectares.<sup>1094</sup> Experimental GM crops included, among others, 18 varieties of Maize.<sup>1095</sup>

In addition to the Development Strategy, the federal government incorporated two institutional programs to implement specific environmental objectives under the National Development Strategy. These environmental initiatives were contained in the National Environmental Strategy of 1995,<sup>1096</sup> and the National Biodiversity Strategy of 2000.<sup>1097</sup>

#### **4.1 The National Environmental Plan of 1995**

The 1995 Environmental Plan was created by the Secretariat of the Environment. This Secretariat elaborated a diagnostic on Mexico's natural and biological resources that concluded that, due to geographic and climatic factors, Mexico had great richness in species, plants, animals and ecosystems. The Secretariat of the Environment, also, considered that part of the 'vast' biological diversity located in Mexico was native to the country.<sup>1098</sup>

Following the diagnostic, this federal Secretariat outlined the objectives of the Environmental Plan:

To halt the trends that damage the environment, the ecosystems and natural resources, and to lay the foundations for a process of ecological restoration and

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<sup>1093</sup> Inter-secretarial Commission on Biosafety and Genetically Modified Organisms, Transgenic Products in Mexico 1998-2003, online: < [http://www.cibiogem.gob.mx/bases\\_datos/productos\\_transgenicos.html](http://www.cibiogem.gob.mx/bases_datos/productos_transgenicos.html) >. (accessed January, 13, 2007). Although the Inter-Secretarial Commission on GMOs report states that the LMO trials began in 1998, information contained in the report suggests that experimental LMO trials in this country were authorized as early as 1992. See also Secretariat of Agriculture and Fisheries (SAGARPA), Authorized LMO trials 1998- 2005,online: <[http:// web2. senasica.sagarpa.gob.mx/xportal/inocd/trser/ Doc2060/ensayos\\_OGM\\_1988\\_2005.pdf](http://web2.senasica.sagarpa.gob.mx/xportal/inocd/trser/Doc2060/ensayos_OGM_1988_2005.pdf)>. (accessed January, 13, 2007).

<sup>1094</sup> *Ibid.*

<sup>1095</sup> *Ibid.*

<sup>1096</sup> National Environmental Plan of 1995-2000, *supra* note 266 see section IV on goals.

<sup>1097</sup> National Biodiversity Strategy of 2000, *supra* note 265.

<sup>1098</sup> National Environmental Plan of 1995-2000, *supra* note 266 at 31- 35.

recovery that will allow the promotion of social and economic development of Mexico, through sustainability criteria.<sup>1099</sup>

The Secretariat of the Environment formulated policy instruments and strategic projects to accomplish those objectives.<sup>1100</sup> Four strategic actions were chosen: the formation of protected areas; the requirement of environmental impact and risk assessment; the establishment of NOMs or national standards; and, education and research.<sup>1101</sup>

A system of protected areas was conceived by this Plan as a critical 'instrument' for the *in situ* preservation of biological diversity and to attain sustainable development.<sup>1102</sup> In the case of Mexico, this plan advocated an enhanced regime of protected areas to preserve the large number of biological resources located in the country. The Secretariat of the Environment sought to include in protected areas key marine and terrestrial elements to preserve genetic resources and biological diversity.<sup>1103</sup>

EIA was devised as one of the most crucial tools in decision making at the time the Plan was elaborated. This tool was meant to generate environmental information, including the cost-effective implications of particular projects.<sup>1104</sup> Several goals were established with respect to improving the process, including clear guidelines for its application and mechanisms to integrate public participation into the assessment.<sup>1105</sup> Although this fundamental tool was advocated in this 1995 Development Plan, Mexico

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<sup>1099</sup> *Ibid.*

<sup>1100</sup> *Ibid.*

<sup>1101</sup> *Ibid.*

<sup>1102</sup> *Ibid.* at 145.

<sup>1103</sup> *Ibid.* at 156.

<sup>1104</sup> *Ibid.* at 136.

<sup>1105</sup> *Ibid.*

did not have guidelines in place to conduct the EIA; these guidelines were elaborated after the creation of Mexico's General Law of Ecological Equilibrium of 1998.<sup>1106</sup>

Parallel to the emphasis on improving impact assessment procedures, the complementary risk process was integrated to minimize the effects of industrial development on the environment. This procedure was directed to assessing possible harm from hazardous and chemical substances. Under the Plan, evaluation of risk was linked to prevention programs.<sup>1107</sup>

Another important tool in the Environmental Plan was the creation of NOMs or National Standards. NOMs are mandatory standards to be enforced by one or more of the Mexican Secretariats. These standards contain the characteristics and requirements that products must meet for their safety. Also, NOMs contain the procedures that must be followed to protect people and the environment from harm.<sup>1108</sup>

Creating NOMs was an important achievement of this Plan. These Standards allowed the Secretariat of the Environment to integrate economic and social objectives at the national level and to achieve a certain level of environmental protection throughout the country. Before the Plan was put into practice, 81 pre-existing NOMs dealt only with industrial pollution.<sup>1109</sup> NOMs were created also in other areas such as to regulate the introduction of genetic material into the environment as established in the Phytosanitary Norm Phyto-056-1995.<sup>1110</sup>

#### **4.2 The National Biodiversity Strategy**

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<sup>1106</sup> General Law of Ecological Equilibrium, *supra* note 8.

<sup>1107</sup> *Ibid.* at 137.

<sup>1108</sup> See Phytosanitary Norm 056-1995, *supra* note 273.

<sup>1109</sup> *Ibid.*

<sup>1110</sup> *Ibid.*

Along with the National Development Strategy and the National Environmental Plan, a National Biodiversity Strategy was also formulated to help Mexico implement the 1995 National Development Plan and the obligations contained in the CBD.<sup>1111</sup> The National Biodiversity Commission centered its efforts on three objectives: conserving biological resources; generating information and improving scientific research; and, diversifying the use of biological resources.<sup>1112</sup>

The National Biodiversity Commission advocated several measures to preserve biological diversity, among which *in situ* preservation and rehabilitation of ecosystems were the most important. *In situ* conservation, as proposed in this initiative, has the potential not only to preserve biological resources but also to integrate isolated ecosystems and to foster public participation in rural communities that play a role in the protection of such resources.<sup>1113</sup>

Challenges in preserving biological resources, however, were acknowledged by the National Biodiversity Commission. This National Commission pointed out that most of Mexico's biological resources escaped the protection offered by environmental law because the resources were located in remote areas of the country.<sup>1114</sup>

Regarding biosafety, the Biodiversity Initiative called for efforts to prevent the introduction of 'GMOs' into the environment and to prevent these organisms from being consumed by human beings without the proper assessment of their potential risks.<sup>1115</sup> To ensure biosafety and preservation of biodiversity, the Strategy advocated the following measures: to formulate a national program of Biosafety that would include the

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<sup>1111</sup> Biodiversity Strategy of 2000, *supra* note 265 at 31-37.

<sup>1112</sup> *Ibid.* at 31.

<sup>1113</sup> *Ibid.* at 33.

<sup>1114</sup> *Ibid.* at 32.

<sup>1115</sup> *Ibid.*

consideration of the effects of 'LMOs' on agriculture and food security and to increase scientific research and studies on the potential effects of LMOs on biodiversity and human health.<sup>1116</sup>

Additionally, the Initiative aimed to create: a National Biodiversity Information Database; to enact specific legislation to regulate LMOs; and, to create awareness through national campaigns of the cultural and economic value of biodiversity, emphasizing native species, such as maize. Lastly, this institution aimed to establish an inventory of land and marine-based invasive species that have been introduced in Mexico. It attempted to launch an eradication campaign of those species that negatively impinge upon biological resources.<sup>1117</sup>

In addition to the measures advocated by the National Biodiversity Commission, the Biodiversity Strategy estimated that biological resources in Mexico are more likely to be preserved if they are adequately valued by Mexican society, not only intrinsically but also in social, cultural and economic terms.<sup>1118</sup> According to the National Biodiversity Commission, Mexican society underestimates the value and uses of biodiversity. An adequate perception of such resources, according to the National Biodiversity Commission, could be dramatically improved by launching educational campaigns on biological resources and their important roles in society. The National Biodiversity Commission also promoted multidisciplinary studies on the different types of ecosystems, traditional ecological knowledge, and economic studies on the value of such resources so as to encourage their sustainable use.<sup>1119</sup>

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<sup>1116</sup> *Ibid.*

<sup>1117</sup> *Ibid.* at 31-36.

<sup>1118</sup> *Ibid.* at 38.

<sup>1119</sup> *Ibid.* at 41.



An innovative feature in the National Development Plan of 1995 was the commitment to produce reports at the end of each year that assessed the implementation of such national Strategy. The reports were made public and available over the internet.

According to the reports, several contributions were made to improve environmental protection in Mexico since the implementation of these National Strategies. The system of protected areas, for example, considerably increased in comparison with previous years. At the end of 1999 there were 117 protected areas throughout the country that were supported by government funding.<sup>1120</sup> 'Biological resources' were also preserved from depletion by means of a System of Sustainable Preservation Zones (SUMA). These were concerned with preserving wildlife species.<sup>1121</sup>

Also during this time, a system of public environmental complaints was consolidated. This complaints system is administered by the Federal Attorney for Environmental Protection, and in 1999, 3,280 complaints were investigated.<sup>1122</sup> In addition, the system of risk assessment and EIA were strengthened and improved by providing specific guidelines for their application in 1998.<sup>1123</sup>

Although the 1995 National Development Strategy marks the beginning of a new era in modern environmental policy in Mexico, it mirrors a struggle to balance economic development with environmental protection. Mexico's environmental policy in this Development Strategy is no more than a short-term goal to ameliorate environmental damage. In other words, the environmental component of the 1995 Development Strategy

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<sup>1120</sup> Presidency of Mexico, Execution Report of the National Development Strategy of 1995-2000, online: <[http://zedillo.presidencia.gob.mx/pages/f\\_archivo\\_gral.html](http://zedillo.presidencia.gob.mx/pages/f_archivo_gral.html)>. at 312-316. (accessed January, 13, 2007).

<sup>1121</sup> *Ibid.*, see also SEMARNAT, Conservation Units for Wildlife, online: <<http://www.semarnat.gob.mx/vs/suma.shtml>>. (accessed January, 13, 2007).

<sup>1122</sup> *Ibid.* at 319.

<sup>1123</sup> *Ibid.* at 320.

represents an isolated effort to promote sustainable development. As outlined environmental resources are protected as long as they are important for the national economy. In this way, environmental protection and preservation are not truly integrated with economic development planning and implementation.

The National Environmental Plan, formulated to support the National Development Strategy and to comply with the goals of the CBD, although setting the basis for a national environmental database and scientific research, falls short of achieving the objectives of the CBD. This is because it pursues a remedial approach to natural resource restoration after damage, rather than natural resource preservation against foreseeable damage. The Environmental Plan is also limited in scope since it can only regulate the areas covered under the National Development Plan. A more active role of the federal Secretariats is required in integrating the environmental priorities in such Development Plan.

The Biodiversity Strategy has the specific merit of considering for the first time the potential effects of 'LMOs' on agriculture and human health. This Strategy, however, fails to set out mechanisms by which to initiate programs of action to improve the conservation of biological resources in an effective way. As well, Mexico's policy on LMOs at this time reflects lack of consistency and coordination among national institutions. This country while advocating biosafety and concern for biodiversity, authorized massive cultivation of LMOs without the proper scientific and technical infrastructure required for this purpose. As stated in the Inter-Secretarial Commission on GMOs Report, 42 approved requests prior to 2001 did not indicate the area of

experimentation with these crops.<sup>1124</sup> It is important to note that it is not clear in the Report how were these organisms evaluated and monitored in absence of biosafety legislation in this country.

Altogether, the 1995 National Development Strategy does not make for coordination among its various institutional plans to facilitate a holistic approach to economic development activities. In particular, the increase of protected areas and the focus on *in situ* preservation alone stand no chance to protect the environment without substantial financial commitments from the Mexican government. The National Environmental Plan, then, stands on its own, rather than being a part of the socioeconomic development matrix. Consequently, not much was achieved under the 1995-2000 term. It is evident in situations like this that the lack of coordination among Mexican institutions and the lack of consistency in Mexico's environmental policy during this period.

## **5. Mexico's Environmental Policy from 2001-2006**

Mexico's environmental policy during this period is outlined mainly in the National Development Strategy of 2001-2006. In this Strategy, the policy is based on long-term goals and a more holistic approach to environmental protection. Preservation of genetic resources and biodiversity are, at least on paper, directly integrated with economic development and decision making. A culture of respect for the environment and environmental education are endorsed by the federal government. Consequently,

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<sup>1124</sup> Inter-Secretarial Commission on GMOs, *supra* note 1093.

specialized institutions are created to address Biosafety threats. One such institution is the Inter-Secretarial Commission on GMOs.<sup>1125</sup>

The 2001-2006 National Development Strategy is the first effort estimated by a President to be accomplished over a period of twenty-five years.<sup>1126</sup> Previous national plans considered their goals and programs for Presidential periods of six years. This Development Strategy establishes the 2001 National Environmental Program and the Strategic Program to Preserve Ecosystems and Biodiversity of 2002 in order to implement its environmental goals.<sup>1127</sup>

In the 2001 Development Strategy, the Executive acknowledges the challenges in preserving the environment due to the rapid increase in Mexico's population. In this regard, it states that "it is necessary to consider our country, not as an endless and unexplored bounty horn but also as a resource that we can deplete without benefiting from it for the growth and welfare of its inhabitants."<sup>1128</sup> This statement illustrates well the challenge that the federal government faces in its effort to decrease poverty levels and to utilize the country's natural resources in a sustainable manner.<sup>1129</sup>

The National Strategy centers around three fundamental objectives: social and human development; sustainable growth; and, order and respect. Environmental policy is contained under social and human development in which the federal government

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<sup>1125</sup> National Development Strategy 2001-2006, *supra* note 267 at 24. In spite of previous strategies and environmental plans, according to this 2001 Strategy, in Mexico some environmental degradation was caused by population growth. Studies in 2000 showed that each year 600 000 hectares of forest are lost, 50 per cent of the hydrologic reserves in the country are over exploited, tropical forests were reduced by thirty per cent in the last twenty years. Lastly, the Strategy states that 15 species of plants and 32 species of vertebrates became extinct in Mexico.

<sup>1126</sup> *Ibid.*

<sup>1127</sup> *Ibid.*

<sup>1128</sup> *Ibid.*

<sup>1129</sup> *Ibid.*

advocates the use of education, and “development in harmony with nature.”<sup>1130</sup> The Strategy also recognizes the important role biological resources play in providing ‘goods and ecological services’ and that they are crucial in Mexico’s development<sup>1131</sup> both for now and for future generations.<sup>1132</sup>

Environmental policy in this Strategy focuses on the preservation of natural resources, urban planning and the sustainable use of natural resources. The inclusion of environmental considerations in decision making, particularly in economic, social and political matters, is advocated.<sup>1133</sup>

The Strategy provides for several measures through which to preserve Mexico’s biological resources and to restore its natural equilibrium. The first line of attack proposed is the harmonization of urban and population growth, since these two factors play an important role in Mexico’s environmental crisis in metropolitan cities.<sup>1134</sup> Also proposed is the need to include a long term perspective in environmental planning and to consider the environment in economic and social projects. These measures, according to the federal government, would allow this country to consolidate an effective environmental policy.<sup>1135</sup>

The preservation of ecosystems is also considered a fundamental step toward preserving Mexico’s biological diversity. To achieve such a goal, the Mexican government committed resources and efforts to support scientific and specialized research to promote understanding of how ecosystems and ecological processes work.<sup>1136</sup>

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<sup>1130</sup> *Ibid.* at 91.

<sup>1131</sup> *Ibid.*

<sup>1132</sup> *Ibid.* at 92.

<sup>1133</sup> *Ibid.*

<sup>1134</sup> *Ibid.*

<sup>1135</sup> *Ibid.*

<sup>1136</sup> *Ibid.* 92-93.

Preserving genetic material is also considered a fundamental measure in this direction. Therefore, Mexico committed resources to increase the number of protected areas and to create a system of management regimes to provide alternative sources of income for communities located near protected areas.<sup>1137</sup>

With regard to biosafety and LMOs, Mexico has continued authorizing the introduction of LMOs into the environment since 2001. In 2005, Mexico enacted the 'Biosafety Law on GMOs' in which it regulates the procedures and requirements to introduce and handle LMOs. In addition, Mexico incorporated in this Law two environmental principles that could guide it in preserving its biological resources, the precautionary principle and EIA. With regard to these principles, as discussed in Chapter V Sections 2.5.5 and 2.5.6, Mexico, *per se*, does not provide guidelines for their implementation. They are, therefore, just a mere intention in this Biosafety Law.

### **5.1 National Environmental Program 2001-2006**

As a part of the effort to achieve the objectives of the National Development Strategy, the federal government, in conjunction with the Mexican Secretariat of the Environment, elaborated a National Environmental Program. This offers a more complete sustainable development approach than previous national efforts. The plan outlines Mexico's environmental policy and attempts to deal with environmental problems in an integrated manner.

According to the National Environmental Plan, six pillars constitute the foundations of modern environmental policy in Mexico: the integral and coordinated management of natural resources; a commitment by all government sectors to achieve sustainable

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<sup>1137</sup> *Ibid.*

development; modern environmental management to stop the depletion of natural resources so that they can be used in a sustainable manner; social participation in the creation of environmental policies and programs; and, enforcing environmental legislation without exceptions.<sup>1138</sup>

Thus, in the context of the 2001 National Development Strategy, the Environmental Plan is based on four specific objectives: 1) reverting and halting pollution of life and natural supporting systems; namely, water, air and soil; 2) halting the loss of natural resources; 3) preserving ecosystems and biodiversity; and 4) promoting sustainable development.

The Plan also aims to ensure the integral management of resources such as water, air and soil. It emphasizes enforcing environmental legislation, rehabilitating rivers, lakes and all national water reserves.<sup>1139</sup> A major objective of the Plan is that by acting of these relevant measures it sets out, resources will be preserved for sustainable use by future generations. This is why it seeks to foster informed and responsible public participation by all social groups, and for their opinions to be integrated in programs for the preservation of natural resources and the environment.<sup>1140</sup>

### **5.1.2 Strategic Program to Preserve Ecosystems and Biodiversity of 2002**

Unlike previous efforts, the National Environmental Plan embodies strategic coordinated plans for its multiple environmental objectives, one of which is the Strategic

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<sup>1138</sup> SEMARNAT, National Environmental Plan 2001-2006. online: < <http://www.semarnat.gob.mx/programas/documentos/archivo/pnmarn.pdf> > at 71-72. (accessed January, 13, 2007).

<sup>1139</sup> *Ibid.* at 74-75.

<sup>1140</sup> *Ibid.*

Program to Preserve Ecosystems and Biodiversity of 2002.<sup>1141</sup> Mexico's Environmental Secretariat is responsible for the creation and implementation of such a plan. The plan centers its efforts on protecting and handling biological resources, promoting its value in Mexican culture and managing their use.<sup>1142</sup>

The aim of the Biodiversity Strategy is the preservation of biodiversity and ecosystems through *in situ* conservation, mainly in protected areas. Under it, efforts are being made to increase the number of protected areas in Mexico. According to this Strategy, in 2000, only 8.5 per cent of Mexico's territory was under a system of protected areas.<sup>1143</sup> Consequently, the Secretariat of the Environment committed a budget for the 2002-2006 to increase the number of natural protected areas, to reduce deforestation and to increase scientific research.<sup>1144</sup> Furthermore, the Program itself committed a budget of 3.3 million Mexican pesos (around 350,000 USD) to preserve biosafety and genetic resources, and 99.7 million Mexican pesos (around 10 million USD) to rehabilitate species and habitats and to restore priority conservation areas.<sup>1145</sup>

The Plan advocates the establishment of a national biodiversity database to hold information from Mexican and international databanks, which ultimately can contribute to the sustainable use of this country's biological resources.<sup>1146</sup> Preserving genetic diversity, as well, plays an important role in such a Strategy; the Secretariat of the Environment aims to preserve genetic diversity, ecosystems and their inherent ecological

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<sup>1141</sup> SEMARNAT, Strategic Program to Preserve Ecosystems and Biodiversity of 2002, online:<

<sup>1142</sup> *Ibid.* at 2.

<sup>1143</sup> *Ibid.*

<sup>1144</sup> *Ibid.* at 10.

<sup>1145</sup> *Ibid.* at 18-19.

<sup>1146</sup> *Ibid.* at 5-6.



processes. In addition to these measures, the National Biodiversity Commission is helping Mexico's federal States to develop and implement their own biodiversity strategies to preserve biological resources in a coordinated fashion across this country.<sup>1147</sup>

Compliance reports have been produced regarding the implementation of the National Development Strategy of 2001, along with its institutional plans. The reports reflect the priorities of the Mexican government in implementing its environmental policy. Important goals were achieved, according to the compliance reports produced by the Executive. During the term where the 2001 Development Strategy was in place, the number of protected areas increased to 127 zones that afforded protection to several endangered animal and plant species.<sup>1148</sup> During that term, also, there was an increase in impact and risk assessment studies performed in this country in relation to those of previous years.<sup>1149</sup>

2002 marked a milestone in achieving regional sustainable development. Several programs were created in this field to stimulate Mexico's economy, among which the Northern Border Program is the most important.<sup>1150</sup> In 2003, also, several national environmental standards were created to preserve natural resources, and, particularly forest ecosystems.<sup>1151</sup> Also during that time, the management of hazardous waste improved considerably, reaching a growth rate of 56.42 per cent compared to previous

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<sup>1147</sup> *Ibid.* at 84.

<sup>1148</sup> *Ibid.* at 366.

<sup>1149</sup> *Ibid.*

<sup>1150</sup> 2002 Implementation Report of the National Development Strategy of 2001, online: <<http://pnd.presidencia.gob.mx/index.php?idseccion=49>>. at 474-476. (accessed January, 13, 2007).

<sup>1151</sup> 2003 Implementation Report of the National Development Strategy of 2001, online: <<http://pnd.presidencia.gob.mx/index.php?idseccion=51>>. at 225-226. (accessed January, 13, 2007).

years.<sup>1152</sup> Additionally, specific rules were developed to improve the impact assessment process.<sup>1153</sup>

Furthermore, several inspection campaigns took place in this year to improve environmental enforcement in the fields of forests, animal and plant species, fisheries and marine resources. Lastly, during this period a citizen complaint process was implemented as a procedure to contribute to transparency and the betterment of Mexico's environment.<sup>1154</sup> Moreover, in 2004, the number of protected areas increased to 154, covering almost 10 percent of Mexico's territory.<sup>1155</sup>

Despite the optimistic Executive reports and the progress achieved by the 2001 National Development Plan, the Secretariat of the Environment acknowledged that biological diversity and natural resources in general have not been safe from depletion. From 2000-2003, several terrestrial ecosystems were affected as a result of the expansion of the highway systems.<sup>1156</sup> Also, according to this environmental agency, 2,583 Mexican species are at risk, particularly 939 plant species, 123 mammals and 108 bird species. Moreover, the number of invasive species grew at an accelerated rate. In 2005, 780 invasive species were documented, 647 of which were plants. Additionally, 2.5 million hectares were deforested and water species were being disrupted by the construction of 212 dams across the country.<sup>1157</sup>

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<sup>1152</sup> *Ibid.* at 228.

<sup>1153</sup> *Ibid.*

<sup>1154</sup> *Ibid.* at 223.

<sup>1155</sup> SEMARNAT, Mexico's Environment 2005: an Overview, online: < <http://portal.semarnat.gob.mx/semarnat/portal/!ut/p/kcxml/Zc-9CoNAEATgR5r7y5GUdppwcBbKeY1clSJETRESHz-IbhZ0q-UbWGYR0SBO6TP06T3MU3oiINpWtNL0NVpXfUFzoOwkTm7kFIInfxVuSutikvpNIfd0v6RtbTlawebLyb0ZQC8mmuJnL57FDxU8ogWDxgMdrGjCdZHZDxp1R5Q!/delta/base64xml/L3dJdyEvd0ZNQUFzQUMvNEIvRS82XzBfMTQ0> >. (accessed January, 13, 2007).

<sup>1156</sup> *Ibid.*

<sup>1157</sup> *Ibid.*

Also the 2001-2005 Report on the implementation of the CBD (the 2001-2005 Biodiversity Report)<sup>1158</sup> elaborated by the National Biodiversity Commission and the Secretariat of the Environment evidence that there still much work to do in preserving biological resources in this country. In the Report, Mexico acknowledges that lack of financial resources and personnel at the border and ports prevent this country from implementing an effective program regarding invasive species. In addition, the Report indicates that this country lacks appropriate biodiversity indicators to monitor the protection of such resources.<sup>1159</sup>

Altogether, the 2001-2006 Development Strategy constitutes a landmark in this country's environmental policy. The Strategy employs specialized institutions and legislation to preserve biological resources in this country. Unlike previous efforts, this Strategy has consolidated a solid environmental policy, at least on paper, and the necessary tools to preserve the environment, such as the case of the Biosafety Law on GMOs that directly regulates the introduction and handling of LMOs. Mexico's policy during this period, however, still fails to allocate the necessary financial resources to effectively implement such national endeavor.

## **6. Assessment**

Mexico's environmental policy from 1970-1994 was shaped by economic crises and external influences. Such influences made Mexico include dispositions to preserve a number of endangered species. During that period, the country was exclusively

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<sup>1158</sup> National Biodiversity Commission, Third National Report on the Implementation of the Biodiversity Convention 2001-2005, online: <[http://www.conabio.gob.mx/institucion/cooperacion\\_internacional/doctos/3InfNacCDBMEXICO\\_FINAL.pdf](http://www.conabio.gob.mx/institucion/cooperacion_internacional/doctos/3InfNacCDBMEXICO_FINAL.pdf)>. (accessed January, 13, 2007).

<sup>1159</sup> *Ibid* at 94.

concerned with achieving economic development and alleviating social problems such as uneven population growth in metropolitan cities. 'Environmental' institutions were created on a short term basis and there was no coordination whatsoever among them. Legislation also was difficult to implement due to the various institutions that participated in its implementation. Consequently, environmental policy lacked a preventive approach and strove to remediate the effects of air quality in urban areas and environmental problems. Environmental protection, also, was considered a priority as long as it could have detrimental effects on human health. As a result of Mexico's acute social problems during this period, no progress was achieved regarding the preservation of biological resources.

Mexico's policy from 1995-2001 shows signs of progression toward the preservation of natural resources. The environmental policy during this period clearly departs from previous years in that specialized environmental institutions start to emerge. Also, this country attempted to integrate such policy at the national level by means of specific plans. This can be illustrated by looking at the National Development Strategies of 1995, the National Environmental Plan, and the National Biodiversity Strategy.

Mexico's environmental policy at that time focused on preserving biological resources under a system of protected areas. This measure seems problematic when such areas require a vast number of financial resources, including personnel, monitoring technology and mapping. As can be seen from the 2001-2005 Implementation Report of

the CBD,<sup>1160</sup> Mexico lacks such resources and long term monitoring programs to preserve its biological resources.<sup>1161</sup>

In sum, Mexico's policy during that period offered no protection to biological resources due to the lack of specialized legislation setting out the procedures and requirements that guarantee biosafety. Also, with regard to LMOs, Mexico's policy exhibits a lack of coordination among its institutions; this can be illustrated with the CEC's Maize Report and also with the fact that Mexico allowed the introduction of LMOs without the proper legislation or resources to monitor and assess the safety of these organisms.<sup>1162</sup>

Mexico's environmental policy from 2001-2006 apparently offers an integrated approach to environmental problems for the first time; such an approach is reflected in the 2001 Development Strategy, which is responsible for creating awareness of the value of all resources relevant to economic development. A landmark achievement at this time includes the enactment of the 2005 Biosafety Law on GMOs as a positive step to preserve Mexico's biological resources from biotechnology threats. This law requires risk and impact assessment procedures for the introduction of these organisms into the environment.<sup>1163</sup>

The environmental policy in this period focuses on increasing the number of protected areas and *in situ* conservation as the primary strategy to preserve biological resources. It is not clear how these measures alone could preserve biological resources

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<sup>1160</sup> *Ibid.*

<sup>1161</sup> *Ibid.* at 94. During 2001-2006 Mexico allocated about 1.7 per cent of the national budget to the Secretariat of the Environment and Natural Resources.

<sup>1162</sup> Inter-Secretarial Commission on GMOs, *supra* note 1093.

<sup>1163</sup> Biosafety Law on GMOs, *supra* note 9.

from LMO threats, particularly when the country lacks the monitoring technology and enforcement mechanisms to prevent such organisms from entering such areas.

Also, lack of coordination and long-term goals is seen in Mexico's environmental Policy. This problem perhaps is caused by a deficient planning system. As discussed before, the Federal Planning Law dramatically limits Development Plans to the Presidential period in which they are formulated. Until this law is reformed these weaknesses will hinder the effectiveness of this country's environmental policy.

Altogether, Mexico's environmental policy has evolved since 1970. The existence of environmental institutions has trended upward in number as has the creation of specialized legislation. Mexico now has a framework of institutions, legislation and strategies that would ideally aid in implementing the CBD and the Cartagena Protocol. However, in spite of this progress several problems remain. The country lacks the political will to allocate sufficient financial resources for the protection of biological resources. While specialized programs support Mexico's environmental policy, these are far from being implemented, due to lack of funding. Such is the case of the 2002 Strategic Program to Preserve Ecosystems and Biodiversity.<sup>1164</sup> From the CEC's Maize Report, it is evident that Mexico lacks the enforcement mechanisms necessary to implement its environmental policy. This can also be seen today in the difficulties inherent in implementing the Biosafety Law on GMOs.

Lack of institutional coordination and long-term goals can be seen partially due to politics, the six-year pattern of Presidential influence and the absence of strategic planning. Lack of consistence in environmental policy illustrates the fact that Mexico does not employ Strategic Environmental Assessment as provided in the CBD.

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<sup>1164</sup> Strategic Program to Preserve Ecosystems and Biodiversity of 2002, *supra* note 1141.

Consequently, Mexico's environmental policy does not afford effective protection for this country's biological resources from the threats of LMOs, nor does it create the necessary structure for implementing Mexico's commitments contained under the CBD and in the Cartagena Protocol.

## CHAPTER VII

### ANALYSIS AND CRITIQUE

#### 1. Overview

As discussed in Chapter IV section 4, in April 2002, the CEC received a request from 21 indigenous groups and 3 Mexican non-governmental organizations (NGOs) regarding the claim that sequences of transgenic maize were found in landraces in the Mexican State of Oaxaca.<sup>1165</sup> Issues regarding the introduction of transgenic maize in Mexico were explored in a special Report under NAAEC Article 13, which accords citizens the right to bring complaints regarding any NAFTA environmental issues that fall within the scope of the CEC.<sup>1166</sup>

The polemic that the CEC Secretariat's Report ignited reflects several issues that have enormous implications not only for Mexico, but also for developing countries that possess vast biological resources and lack the financial, monitoring and technical resources to preserve them and to implement the CBD and the Cartagena Protocol. At the international level, the Report questions the effectiveness of implementation mechanisms in the CBD and the Cartagena Protocol and the hurdles that developing countries face in implementing the commitments delineated in these environmental agreements.<sup>1167</sup> It also reflects the clash between the environmental and international trade regimes. This is the

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<sup>1165</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 6.

<sup>1166</sup> *Ibid.* at 6-9.

<sup>1167</sup> *Ibid.* at 24-25.



case of Mexico, a party to these environmental conventions, to the WTO<sup>1168</sup> and to NAFTA.<sup>1169</sup> At the regional level, the Report magnified regional tensions as a result of the recommendations made by the CEC's Advisory group as shown in Canada, United States and Mexico's comments on the CEC's Maize Report.<sup>1170</sup> It highlighted the CEC's inability to take action to ensure substantial mechanisms to aid Mexico implement its environmental law, as provided in NAAEC, and to preserve its biodiversity from the potential threats of LMOs.<sup>1171</sup> It also reflected Mexico's lack of capacity to monitor imports and to enforce the moratorium put in place to restrict the introduction of transgenic maize for human consumption. At the national level, the Report made evident the lack of coordination among Mexican environmental institutions, the lack of specialized legislation at that time, and of enforcement measures directed at preserving biological resources. In turn, this questions the ability of Mexico to implement its obligations under the CBD and the Cartagena Protocol.<sup>1172</sup>

As discussed in the preceding chapters, the CEC's Maize Report and its implications for biodiversity preservation in Mexico has focused the discussion and

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<sup>1168</sup> GATT, *supra* note 228.

<sup>1169</sup> NAFTA, *supra* note 5.

<sup>1170</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 41, 46, 47. ( letters from the NAFTA countries criticizing the Maize Report were incorporated to the main body of the CEC's Maize Report).

<sup>1171</sup> The North American Agreement on Environmental Cooperation (NAAEC) through the Commission for Environmental Cooperation seeks to implement its objectives which among others are to: a) foster the protection and improvement of the environment in the territories of the Parties for the well-being of present and future generations; (b) promote sustainable development based on cooperation and mutually supportive environmental and economic policies; (c) increase cooperation between the Parties to better conserve, protect, and enhance the environment, including wild flora and fauna; (d) support the environmental goals and objectives of the NAFTA; (e) avoid creating trade distortions or new trade barriers; (f) strengthen cooperation on the development and improvement of environmental laws, regulations, procedures, policies and practices; (g) enhance compliance with, and enforcement of, environmental laws and regulations; (h) promote transparency and public participation in the development of environmental laws, regulations and policies; (i) promote economically efficient and effective environmental measures; and (j) promote pollution prevention policies and practices. NAAEC, *supra* note 236 at 1.

<sup>1172</sup> *Ibid.* at 25.

analysis of Mexico's obligations under the CBD and the Cartagena Protocol. The need to implement those obligations led, in turn, to an explication of relevant Mexican laws and the potential of environmental institutions to carry out their actual implementation. As previously mentioned in Chapter V Section 2.5.8 and Chapter VI Section 6, the absence of financial resources, the lack of consistent environmental policy and the absence of NOMs and federal regulations under the Biosafety Law of GMOs mean that prospects of implementation of MEAs are not promising in Mexico.

It is against this background that this analysis and critique are undertaken. This overview points to the need to critically assess a number of issues that are germane to biological diversity preservation in Mexico. Those issues are all represented in the shortcomings of policy, legislation and institutional coordination that the CEC's Maize Report exposed. For a transitional economy like Mexico, they encapsulate its struggle to implement its commitments under the CBD and the Cartagena Protocol. These problems call into question the magnitude of the burden that these MEAs impose on States and the effectiveness of their implementation mechanisms. In addition, issues of absence of policy, law and institutional capacity were exposed by the CEC's Maize Report.<sup>1173</sup> These have implications for the Mexican environment and for biodiversity preservation at the international, regional and national levels. They are considered in sequence in terms of those various levels throughout the rest of this Chapter.

## **2. Issues at the International Level**

The CEC's Maize Report depicts Mexico, a transitional economy, as struggling to preserve its biological resources pursuant to its international obligations, under the CBD

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<sup>1173</sup> *Ibid.* at 24-25.

and the Cartagena Protocol, in the face of challenges to fulfill obligations set out in international trade agreements that are impacted by the environmental treaty obligations.<sup>1174</sup> The Report evidenced that Mexico imported the maize in question from the United States and that 25 percent of it was transgenic.<sup>1175</sup> It also revealed that Mexico was not self sufficient in maize production and that it required maize imports to satisfy the high demand for maize, the basic staple of the Mexican diet.<sup>1176</sup>

Under the CBD, Mexico is obligated to preserve its biodiversity by means of *in situ* and *ex situ* conservation strategies.<sup>1177</sup> This obligation, in the case of native plants such as maize, implies that Mexico has a duty to enact a comprehensive policy on the use of LMOs, biosafety, and a system of protected areas in the regions where native plants and species are located, including areas free of LMOs.<sup>1178</sup>

The CEC's Maize Report shows that although Mexico had adopted measures to preserve biodiversity, such as setting aside protected areas, and imposing a moratorium on the cultivation of transgenic maize, it did not have any measures in place to address threats posed by LMOs.<sup>1179</sup> As a result, not only was transgenic maize introduced but was also distributed throughout the southern Mexican States by DICONSA.

The Mexican government did not have measures in place to classify maize at the entry point, nor did it have biosafety regulations in place, or the capacity to enforce them.<sup>1180</sup> Also, the distribution of mixed maize highlighted lack of coordination among the Secretariat of Agriculture, the Secretariat of the Environment, and DICONSA. It is

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<sup>1174</sup> *Ibid.* at 6.

<sup>1175</sup> *Ibid.*

<sup>1176</sup> *Ibid.* at 20.

<sup>1177</sup> CBD, *supra* note 1 art. 8.

<sup>1178</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 16-18. See also CBD, *ibid.* art. 8(j).

<sup>1179</sup> *Ibid.* at 16, 27.

<sup>1180</sup> *Ibid.* at 25.

also obvious that indigenous communities were neither warned nor educated about the potential dangers of LMO-FFPs.<sup>1181</sup>

The moratorium on the experimental cultivation of transgenic maize, imposed by the Mexican government, was lifted in June 2003. The idea behind the moratorium was to allow the government to enact biosafety regulation including the requirements to allow the experimental introduction of LMOs into the environment. On the maize moratorium, the CEC's advisory group stated:

The policy of a moratorium on commercial transgenic maize planting is undermined by the unapproved cultivation of imported maize and does not accomplish its aim if imports of unlabelled, unsegregated, and fertile GM maize from the United States are allowed.<sup>1182</sup>

Also, on this matter, the Mexican government argued that the moratorium had been lifted and that efforts were being made by the Secretariat of the Environment to elaborate guidelines to ensure the safe experimental cultivation of LMOs.<sup>1183</sup> It is important to note that biosafety regulation addressing the experimental release and cultivation of LMOs was not enacted until March 18, 2005 under Mexico's Biosafety Law on GMOs. As evident from the CEC's Maize Report, the moratorium initiated in Mexico was, in fact, not enforced because of two fundamental problems: Mexico's lack of economic resources to honor its international obligations under the CBD, and its legislative and institutional inability to comply with them.

Financial resources are needed for the implementation of the CBD. The availability of these resources in developing countries affects the level of protection that can be given to protecting biodiversity. Mexico's lack of financial resources can be

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<sup>1181</sup> *Ibid.*

<sup>1182</sup> *Ibid.*

<sup>1183</sup> *Ibid.* at 46.

illustrated in its 2001-2005 Implementation Report on the CBD.<sup>1184</sup> The National Biodiversity Commission acknowledged that economic factors limit Mexico's ability to preserve such resources. On this matter, the Commission stated:

Mexico is a big country with enormous biodiversity in species and ecosystems but with limited financial resources. International cooperation and access to international funds have always been essential to preserve these resources.<sup>1185</sup>

Lack of the economic resources needed to create the institutional mechanisms to preserve biological diversity is a common problem in developing countries. The CBD obviously acknowledges this reality by allowing each party to fulfill its obligations according to ... "its particular conditions and capabilities."<sup>1186</sup> Such ambiguous wording may encourage States not to strive to their maximum capability to implement their obligations. This is evidenced in the National Biodiversity Commission's declaration that Mexico's efforts to preserve its resources are limited by its stretched economic resources, and that Mexico depends on international sources to fund its resources preservation efforts.<sup>1187</sup> It must be pointed out international funds are in limited supply. The Global Environment Facility (GEF) that funds CBD projects, for example, from 1991 to 2004,

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<sup>1184</sup> National Biodiversity Commission, Third National Report on the Implementation of the Biodiversity Convention 2001-2005 *supra* note 1158.

<sup>1185</sup> *Ibid.* at 13.

<sup>1186</sup> See CBD Article 6, for example, "Each Contracting Party shall, in accordance with its particular conditions and capabilities: a) Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes which shall reflect, inter alia, the measures set out in this Convention relevant to the Contracting Party concerned; and (b) Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies." See also Article 7 "Each Contracting Party shall, as far as possible and as appropriate, in particular for the purposes of Articles 8 to 10: (a) Identify components of biological diversity important for its conservation and sustainable use having regard to the indicative list of categories set down in Annex I." CBD, *supra* note 1.

<sup>1187</sup> National Biodiversity Commission, Third National Report on the Implementation of the Biodiversity Convention 2001-2005, *supra* note 1158 at 13.

made available an average of 153 million USD a year for biodiversity related projects<sup>1188</sup> and from 2005 to 2007 made available 540 million USD to fund 129 biodiversity projects worldwide.<sup>1189</sup> Thus, Mexico, for instance, would not necessarily be given all it needs to fund biodiversity preservation activities.<sup>1190</sup>

The overbroad scope of the CBD contributes to the financial burden that its implementation imposes. The CBD encompasses preservation of terrestrial and marine species, forests, habitats, ecosystems, and genetic diversity. Almost everything related to environment and resources management and conservation falls within the scope of this Convention. This duplicates obligations imposed by specific wild life and conservation agreements, such as CITES,<sup>1191</sup> with which the CBD's implementation must clearly be coordinated, not only internationally but also at a national level, by each State party including Mexico. The financial burden all this involves, apart from scientific and technical resources needed for the undertaking, makes the burden even heavier. Coordination among biodiversity and relevant Conventions would not only encourage a more holistic approach to biodiversity preservation, but would also alleviate the financial burden involved in implementing the CBD alone.<sup>1192</sup>

The CEC's Maize Report identifies some issues on biodiversity preservation in the context of the Cartagena Protocol. It illustrates the fact that Mexico was unable to

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<sup>1188</sup> Global Environmental Facility (GEF), Biodiversity Projects, online: < [http://www.gefweb.org/projects/Focal\\_Areas/bio/bio.html](http://www.gefweb.org/projects/Focal_Areas/bio/bio.html) >. (accessed January, 13, 2007).

<sup>1189</sup> *Ibid.* See also GEF, Focal Area: Biodiversity, Period 2005-2007, online: < <http://gefonline.org/projectList.cfm> >. (accessed January, 13, 2007).

<sup>1190</sup> In 2004-2005 Mexico was awarded 1 million USD from the Global Environmental Facility to improve the implementation of its biosafety policies. Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 25.

<sup>1191</sup> CITES, *supra* note 316 arts. I, III, XIV.

<sup>1192</sup> As mentioned in Chapter II, coordination efforts among the CBD and biodiversity agreements is beginning to develop. CBD, Report on Activities of the Secretariat on the Implementation of the Work Programme of the Convention and its Protocol, *supra* note 331 at 7.

implement the Protocol by preventing LMOs from being introduced in Mexican maize landraces. It also questions the effectiveness of the implementation mechanisms in the Protocol and the CBD Secretariat's ability to aid States in its implementation and in minimizing LMO threats.

Regarding implementation mechanisms, Article 33 of the Cartagena Protocol provides:

Each Party shall monitor the implementation of its obligations under this Protocol, and shall, at intervals to be determined by the Conference of the Parties serving as the meeting of the Parties to this Protocol, report to the Conference of the Parties serving as the meeting of the Parties to this Protocol on measures that it has taken to implement the Protocol.<sup>1193</sup>

As shown from Article 33, implementation of the Protocol relies on national level self monitoring by States party to ensure compliance. This approach seems problematic because the Protocol does not provide for specialized external bodies to monitor compliance with the Protocol. Ideally, the CBD Secretariat would employ strong compliance mechanisms based on monitoring and capacity building to aid Mexico and other States party to implement the Protocol. For example, financial and capacity building aid, when available, could be provided to make up for potential institutional and legislative deficiencies that they could encounter at the national level such as those Mexico encountered in preventing LMOs from being introduced and planted in the country.

As discussed in Chapter III Section 3.5, recent developments in the Protocol have materialized in the creation of a Compliance Committee in the Cartagena Protocol.<sup>1194</sup> The creation of a compliance body in the Cartagena Protocol has the potential to aid

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<sup>1193</sup> Cartagena Protocol, *supra* note 2 art. 33.

<sup>1194</sup> Compliance Committee, Cartagena Protocol, *supra* note 500.

States in the implementation of the Agreement. The Cartagena Protocol's Compliance Committee aims to bring to the Conference of the Parties issues of non-compliance with the provisions of the Cartagena Protocol among State parties. Although this initiative has the potential to aid in the implementation of the Protocol, several issues remain unresolved, first, the accuracy of State reports and information provided by them in the Biosafety Clearing House Mechanisms; second, the calibre of the measures that will be employed by the Committee to ensure compliance with the protocol; and, third how far will the Committee go to enforce the Protocol.

The creation of the Protocol's Compliance Committee is supported by compliance and enforcement guidelines elaborated by the United Nations Environmental Programme.<sup>1195</sup> These Guidelines shed light on the issue of compliance in MEAs. Guideline 14, for example, provides that non-compliance is frequently the result of incapacity rather than intentional disregard for agreements' rules in MEAs; and that in these circumstances, assistance is more appropriate than penalization. It also provides that non-compliance mechanisms should employ non-coercive means to bring parties into compliance and to prevent them from getting into non-compliance in the first place.<sup>1196</sup>

This Dissertation argues that the Protocol's Compliance Committee could improve national level compliance and monitoring by establishing a public complaint procedure in which NGOs, indigenous groups and citizens in general, could bring potential violations to the Cartagena Protocol before the Compliance Committee. The complaint procedure, along with information generated by international organizations, NGOs, and the work of scholars on issues related to the Protocol, will also contribute to

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<sup>1195</sup> United Nations Environment Programme, Division of Environmental Law and Conventions, Manual on Compliance with Enforcement of Multilateral Environmental Agreements, *supra* note 497.

<sup>1196</sup> *Ibid.*



the monitoring of the national implementation of the commitments in the Protocol. Information generated from these sources is likely to be transparent, free from political influence and can be useful to monitor the implementation of the Protocol. Among these we find OECD's environmental performance reviews, agricultural policy reports, and economic performance reviews;<sup>1197</sup> and environmental policy papers; UNEP's Global Environment Outlook series which contain updated information regarding the status of biological resources in several countries including Mexico,<sup>1198</sup> and the comparative work of the North American Consortium of Legal Education (NACLE) on important issues relevant to the implementation of the Protocol such as the environment and trade.<sup>1199</sup> It is important to note that at the international level, the North Atlantic Salmon Conservation Organization (NASCO), an international organization, recently allowed participation of NGOs in its meetings and implementation committees to improve compliance with the agreements of this Organization.<sup>1200</sup>

Other issues arise from the implementation of the Cartagena Protocol, these relate to LMO-FFPs, the application of environmental law principles and their relation to this Protocol and to agreements on international trade. Although the Protocol excludes LMO-

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<sup>1197</sup> Organization for Economic Co-operation and Development, Environmental Indicators and Outlook, online: < [http://www.oecd.org/topic/0,2686,en\\_2649\\_34283\\_1\\_1\\_1\\_1\\_37425,00.html](http://www.oecd.org/topic/0,2686,en_2649_34283_1_1_1_1_37425,00.html) >. (accessed January, 13, 2007).

<sup>1198</sup> UNEP's Global Environment Outlook series provide an overview of the global environment in different regions of the world and its study includes biodiversity and the environment in general. See UNEP, GEO: Global Environment Outlook, Overview, (2006), online: < [http://www.unep.org/geo/yearbook/yb2007/PDF/5\\_Overview72dpi.pdf](http://www.unep.org/geo/yearbook/yb2007/PDF/5_Overview72dpi.pdf) >. (accessed January, 13, 2007).

<sup>1199</sup> The North American Consortium of Legal Education (NACLE) is an organization devoted to the study and analysis of North American issues. It fosters comprehensive comparative analysis of issues in North America. In 2007, for example, several issues were addressed in the NACLE forum including commercial arbitration, pollution, biodiversity and water conflicts. For more on this comparative work see, NACLE, 2007 Paper Winners, online : < <http://www.nacle.org/content.asp?secnum=9&pid=60> >. (accessed January, 13, 2007).

<sup>1200</sup> North Atlantic Salmon Conservation Organization (NASCO), 23<sup>rd</sup> Annual Meeting, Saariselka, Finland (June 8, 2006), online: <[http://www.salmon-trout.org/files/pdf/STA\\_ET\\_Committee/Item%207.2%20NASCO%20summary%20report%20June%202006.pdf](http://www.salmon-trout.org/files/pdf/STA_ET_Committee/Item%207.2%20NASCO%20summary%20report%20June%202006.pdf)>. (accessed January, 13, 2007).

FFPs from the Advance Information Agreement procedure for the transfer of LMOs, it encourages States to obtain information on the LMO-FFPs regarding their composition, characteristics and information, on “centers of origin and centers of genetic diversity, and description of the habitats where the organisms may persist or proliferate”.<sup>1201</sup>

It is also evident from the Report that Mexico’s traditional farmers, indigenous communities and those stakeholders involved in the preservation of biological diversity were not aware of the distribution of LMO-FFPs by DICONSA, Mexico’s Food Distribution Agency.<sup>1202</sup> As pointed out by the CEC’s advisory group, the imported transgenic maize did not undergo risk assessment as provided under the Cartagena Protocol.<sup>1203</sup> As well, a moratorium imposed by Mexico did not provide protection against LMO-FFPs.<sup>1204</sup>

The dangers posed by LMO-FFPs are magnified in the case of countries like Mexico, where traditional agriculture depends largely on traditional agricultural practices, such as saving seeds. An interpretation of the Cartagena Protocol’s provisions for Mexico would require this country to educate indigenous farmers on the potential benefits and risks of LMOs and transgenic commodities and to allow public input from these indigenous groups that actively participate in the preservation of biodiversity. A coordinated effort between the Secretariat of the Environment and the Secretariat of Agriculture would be necessary to help achieve this objective.

As discussed in Chapter III Sections 3.3 and 3.4, environmental principles in the CBD and the Cartagena Protocol, such as the precautionary principle and EIA, are to

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<sup>1201</sup> Cartagena Protocol, *supra* note 2 Annex II.

<sup>1202</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 27.

<sup>1203</sup> Cartagena Protocol, *supra* note 2 art.15.

<sup>1204</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 31.

guide States particularly in cases of scientific uncertainty or when activities are likely to impact the environment. Regarding the precautionary principle, at the time of the CEC's Maize Report, Mexico had not officially endorsed it,<sup>1205</sup> but there were provisions in Mexico's legislation and policy, such as the reversal of the burden of proof in the General Law of Ecological Equilibrium<sup>1206</sup> and the moratorium on transgenic maize, which are germane to observing the principle. But as previously mentioned, the Mexican government was not guided by the precautionary principle in its maize import process, and could not enforce its moratorium with regard to transgenic maize imports.

In the absence of implementation guidelines and by virtue of the economic power and influence of the biotechnology industry and that of the international trade regime under the WTO, the precautionary principle has failed to be influential in biodiversity preservation. The WTO Panel decision on the *EC Moratorium on Biotechnology Products*, for example, reaffirms that precautionary regulation, to withstand scrutiny from the WTO, needs to be based on scientific evidence, on an assessment of risks, non-discrimination measures and in transparent authorization processes.<sup>1207</sup> Based on this decision, States can not observe this principle in the absence of scientific support for specific assertions of its applicability. The central dilemma is that scientific uncertainty, ironically employed by the precautionary principle, is now used by the WTO regime to advance trade interests over environmental preservation.

In Mexico, although this principle is endorsed in the Biosafety Law on GMOs, the lack of guidelines and regulations prevents it from being implemented. Mexican officials also lack the power and discretion to apply it. In an interview conducted with officials in

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<sup>1205</sup> *Ibid.* at 12.

<sup>1206</sup> General Law of Ecological Equilibrium, *supra* note 8 section art. 28 section XIII on EIA.

<sup>1207</sup> WTO Dispute Settlement Panel, *supra* note 27.

the Office of the Federal Attorney for Environmental Protection, it was acknowledged that the potential of this principle is stifled by the absence of implementation guidelines. Since these have not been developed, the principle remains merely an indication of good intention in the Biosafety Law on GMOs.<sup>1208</sup>

The application of the precautionary principle in Mexico can be achieved by developing guidelines for its uniform application throughout the country. These can be introduced in federal regulation under the Biosafety Law on GMOs. To be effective, the guidelines must be based on SEA and be endorsed by the two institutions that joint to authorize requests regarding the introduction of LMOs into the environment. These institutions are the Secretariats of Agriculture and Environment.

The application of the precautionary principle in such regulations could be triggered under two situations, namely, LMO trade, and the introduction of LMOs in areas of origin of plants. Due to the strong influence of the international trade regime as demonstrated in Chapters III Section 4, and in agreement with the WTO's Appellate Panel decision on the *EC's Moratorium on Biotechnology Products*,<sup>1209</sup> the precautionary principle in trade takes a strictly scientific approach, relying on international guidelines like those of CODEX, and on results of science based risk assessments.<sup>1210</sup>

In cases where potential harm may result to its biodiversity, Mexico could impose provisional moratoriums as allowed under the international trade regime until it acquires scientific evidence to support its decision.<sup>1211</sup> The application of a scientifically-based

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<sup>1208</sup> Interview with officials in the Federal Attorney for Environmental Protection, Mexico City, November 2006.

<sup>1209</sup> WTO Dispute Settlement Panel, *supra* note 27.

<sup>1210</sup> *Ibid.*

<sup>1211</sup> The WTO's SPS Agreement allows States to impose measures provisionally until evidence is acquired. NAFTA's SPS Agreement allows States to impose them on the same grounds.

precautionary principle in Mexico will eliminate conflicts with the trade regime and will encourage Mexico to acquire scientific resources necessary to enable it to identify potential biosafety threats.

The application of the precautionary principle could, on the other hand, be stricter in areas of origin and in places where indigenous groups depend on traditional agriculture for their survival. In this case, the burden of proof must shift onto the proponent to show that the introduction of LMOs will not interfere with the survival of organic plants and with the preservation of Mexico's biological diversity. In this case, the invocation of the principle must include public participation from the earliest stages and must encompass strategic planning.

EIA plays a fundamental role in the CBD and sets the basis for the risk assessment study in the Cartagena Protocol.<sup>1212</sup> Its observance helps to identify and avoid potential harm to biodiversity. It also sets the foundations for conducting an assessment of risks required in the Cartagena Protocol for LMO-FFPs and for the introduction of LMOs into the environment.<sup>1213</sup> Potential problems hinder the application of EIA. First, scientific and technical tools essential to conduct this assessment may not be available in developing countries.

Second, despite the requirements in the CBD and the Cartagena Protocol for States to develop guidelines to implement EIA, States may decide not to incorporate it into decision making due to lack of monitoring mechanisms in these Agreements. Third, the CBD and the Protocol do not provide guidance on how to balance uncertainty, particularly in cases involving LMOs. This deficiency may allow other States to

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<sup>1212</sup> CBD, *supra* note 1 art. 14 (a).

<sup>1213</sup> Cartagena Protocol, *supra* note 2 see Annexes II and III.

characterize EIA as a trade barrier, or manipulate its observation to allow potentially harmful projects. Lastly, although public participation is required by an EIA, the CBD and the Protocol lack guidelines on how to integrate such input into decision making. This problem was evidenced in the CEC's Maize Report, where, as noted by the CEC's advisory group, the introduced maize did not undergo an EIA and public participation was not sought by the Mexican government.<sup>1214</sup>

Altogether, in light of obligations under the CBD and the Cartagena Protocol for biodiversity preservation, Mexico, like most developing countries, continues to require external help in all aspects of implementation activity required by these instruments. However, the international environmental regime of the CBD and the Cartagena Protocol, unfortunately, is not likely to make much difference in Mexico's implementation of these Agreements.

The CBD Secretariat, to be effective in the implementation of the CBD and the Cartagena Protocol, needs to play a stronger role in the monitoring, capacity building and implementation mechanisms of the Protocol. The first step required from the CBD Secretariat to improve compliance to the Protocol's provisions is to strengthen the Compliance Committee by creating a citizen complaint mechanism, expanding its monitoring capacity and considering the work of international organizations, NGOs and academics as potential monitoring sources. Information from these sources is likely to widen the vision of the Committee and to aid it in identifying and preventing non-compliance issues with the Protocol. Beyond this, another issue is whether regional regimes offer practical help to Mexico in preserving biodiversity and in complying with the global agreements.

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<sup>1214</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 24-28.

### 3. Regional Level

North America is one of the world's largest producers of agricultural LMOs.<sup>1215</sup> The United States is the world's biggest producer, followed by Canada in fourth place, and Mexico in eleventh place.<sup>1216</sup> Consequently, LMO trade constitutes big business in this region. As it was previously mentioned in Chapter IV Section 4 under the analysis of the CEC's Maize Report, Mexico heavily depends on imports of maize from the United States to supplement its own grain production.<sup>1217</sup> It is important to note that maize imports from the United States are about 25 to 30 percent of transgenic origin.<sup>1218</sup>

Three important factors in the regional context are worthwhile analyzing in view of their potential contribution to Mexico's implementation of the CBD and the Cartagena Protocol, namely, NAFTA's SPS provisions, the CEC's Secretariat Reports and the citizen complaint procedure under Articles 13 and 14 of NAAEC. These are analyzed next.

#### 3.1 NAFTA's SPS Provisions

Regional rules on trade regulation and the imposition of sanitary measures are set out under NAFTA's SPS provisions.<sup>1219</sup> These Provisions, as discussed earlier in Chapter IV Section 2, allow North American States to select their level of protection based on scientific evidence, assessment of risks and in non-discriminatory measures.<sup>1220</sup> In cases of scientific uncertainty, similar to the WTO SPS Agreement, NAFTA's SPS provisions

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<sup>1215</sup> ISAAA, *Global Status of Commercialized Biotech/GM Crops in 2005*, *supra* note 157.

<sup>1216</sup> *Ibid.*

<sup>1217</sup> *Maize and Biodiversity: The Effects of Transgenic Maize in Mexico*, *supra* note 6 at 21-22.

<sup>1218</sup> *Ibid.* at 16.

<sup>1219</sup> NAFTA, *supra* note 5 arts. 712-723.

<sup>1220</sup> Regine Neugebauer, "Fine-tuning WTO Jurisprudence and the SPS Agreement: Lessons from the *Beef Hormones Case*", *supra* note 571; See also WTO Dispute Settlement Panel, *supra* note 27.

allow States to implement temporary moratoriums for a reasonable period of time until such scientific evidence is acquired.<sup>1221</sup>

Mexico's chances of restricting LMO trade are not good, whether they are based on the WTO or on NAFTA's SPS provisions. In other words, the protection that Mexico could give to its biodiversity is conditioned upon scientific evidence demonstrating adverse effects of LMOs on traditional plants and centers of origin of such plants. In the absence of such evidence at the moment, Mexico is left with few means by which to preserve its biological diversity. One such resort is a temporary moratorium that can be put in place within a 'reasonable time' until scientific evidence is available.<sup>1222</sup>

Mexico could take advantage of the temporary moratoriums in NAFTA's SPS provisions to preserve its native species and centers of origin of biodiversity.<sup>1223</sup> As shown in the CEC's Maize Report, Mexico had a moratorium in place as a protective measure to stop the introduction of transgenic maize into the country.<sup>1224</sup> But this did not prevent transgenic maize from entering the country. Indeed in spite of the dietary and cultural importance of maize, Mexico could not extend sufficient protection to this plant under the regional regime.<sup>1225</sup>

### 3.2 CEC's Secretariat Reports

As argued in Chapter IV Section 4, the CEC constitutes an important institution that strives to reconcile trade and environmental protection by aiding States in the

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<sup>1221</sup> NAFTA, *supra* note 5 at 715.

<sup>1222</sup> NAFTA's SPS provisions allow parties to employ temporary moratoriums, See *ibid.* Also Article 5.7 of the WTO SPS Agreement allows States to impose temporary moratoriums. See also WTO SPS Agreement, *supra* note 229 art. 5.7.

<sup>1223</sup> *Ibid.*

<sup>1224</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 25.

<sup>1225</sup> *Ibid.*



enforcement of their environmental laws and regulations. It strives to achieve the objectives set out in the NAAEC by elaborating Secretariat Reports on issues within the scope of the CEC. Secretariat Reports are elaborated under Article 13 of the NAAEC, the CEC's Maize Report is one example of those. The Report, although it contained non-binding recommendations elaborated by the CEC's advisory group, managed to bring widespread attention and international pressure to Mexico's struggle in preserving its biodiversity and implementing the CBD and the Cartagena Protocol. International attention, according to some government officials, expedited the enactment of Mexico's Biosafety Law on GMOs.<sup>1226</sup>

Altogether, Secretariat Reports under NAAEC's Article 13, after all, even in a limited manner, may contribute to the enforcement of Mexico's environmental law by bringing public embarrassment and international pressure to the lack of enforcement of this country's environmental law. This attention, if employed by citizens, indigenous groups and non governmental organizations, has the potential to at least open debate to enforcement issues and in some cases to influence governments or corporations. An example of this is the recent withdrawal of Chevron Texaco from a project to build a gas processing plant on the biodiversity rich Coronado Islands in the northern Mexican State of Baja California.<sup>1227</sup>

Although, the controversial project on the Coronado Islands was authorized by the Mexican government, Chevron Texaco decided to withdraw from the project due to public pressure and to the CEC's decision to pursue a factual record on the Mexican government's authorization process, the impact and risk assessment authorization

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<sup>1226</sup> Interview with officials in the Federal Attorney for Environmental Protection, *supra* note 1208.

<sup>1227</sup> Commission for Environmental Cooperation, Citizen Submission for Enforcement Matters, Coronado Islands, SEM 05-002. (filed 3/05/2005, terminated 3/07/2007).

procedures and the potential impacts of the project on protected species on the Mexican Islands.<sup>1228</sup>

### 3.3 CEC's Citizen Complaint Procedure

The other procedure employed by the CEC to bring compliance to States' environmental laws is the citizen complaint mechanism under Article 14 of NAAEC.<sup>1229</sup> This procedure, as outlined in Chapter IV Section 3, has been employed in various cases including air pollution, hazardous waste, protection of forests, etc. In such cases, complainants may find it easy to access the complaint procedure since the lack of enforcement of environmental laws can materialize in the deterioration of air quality, the accumulation of waste or the construction of potentially harmful projects. Complaints involving LMOs and biodiversity may be difficult to demonstrate under the CEC public complaint mechanism. On this matter, Article 14 of NAAEC provides that "complaints on the lack of enforcement of a country's environmental laws should provide sufficient information to allow the Secretariat to review the submission, including any documentary evidence on which the submission may be based."<sup>1230</sup> This provision imposes a substantial burden to citizens in cases involving LMOs. It requires technical and scientific expertise to distinguish these organisms from their organic counterparts and to produce documentary evidence.<sup>1231</sup> An example of these was the inability of Mexico's indigenous groups and non governmental organizations to bring LMO issues in the CEC's Maize Report under the citizen complaint procedure of NAAEC's Article 14.

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<sup>1228</sup> *Ibid.*

<sup>1229</sup> NAAEC, *supra* note 236 art. 14.

<sup>1230</sup> *Ibid.* art. 14 (c).

<sup>1231</sup> *Ibid.*

Altogether, similar to the international level, the regional level does not afford sufficient mechanisms for the enforcement of Mexico's biosafety provisions and the implementation of the CBD and the Cartagena Protocol. The CEC proved unable to aid Mexico in the implementation of its environmental law. The only potential contributions in this regime are the temporary moratoriums that can be imposed under NAFTA's SPS provisions and the publicity and international attention the CEC can bring upon an enforcement issue in this region. Furthermore, the CEC's Maize Report resonates in the effectiveness of Mexico's environmental policies, legislation and institutional capacity to protect biodiversity.

#### **4. National Level**

In Chapter V Mexican legislation and institutions were analyzed along with issues that hinder the implementation of Mexico's commitments under the CBD and the Cartagena Protocol. Several issues were identified in respect to Mexico's legislative framework, particularly in relation to the Biosafety Law on GMOs. This Law was enacted in 2005 to implement Mexico's international commitments; however, it suffers from pitfalls that impinge upon its implementation. Among these are: the relationship of the law to other federal legislation; the lack of NOMs and federal regulation for its implementation; and the restrictions imposed on public participation under the Law. Similarly, in the institutional area, duplication of institutional efforts, Presidential influence and lack of an integrated environmental policy on LMOs were also identified. These issues are analytically revisited subsequently.

As discussed in Chapter V, the relationship of the Biosafety Law on GMOs to other federal laws is controversial. This Law, aiming to preserve biological diversity and

to ensure biosafety, must be supplemented by the Federal Law on Administrative Procedure.<sup>1232</sup> On this matter, it provides that:

In the absence of an express provision in this Law, the Law of Federal Administrative procedure will supplement the Biosafety Law on GMOs.<sup>1233</sup>

The Law of Administrative Procedure can aid in the procedures regarding permit mechanisms and their administration. However, it lacks any environmental content whatsoever. It is unfortunate that a law with no environmental content supplements the Biosafety Law on GMOs. This dramatically limits the potential of the Biosafety Law, as it isolates it from Mexico's environmental law regime. One law that has the potential to complement the Biosafety Law on GMOs is the General Law of Ecological Equilibrium, particularly with regard to its provisions on the formation of protected areas and EIA.<sup>1234</sup> Beyond this, there is the need for federal regulation and NOMs to be passed to ensure its implementation and enforcement. When these are in place, then Mexico would be in a position to implement its obligations under the CBD and the Cartagena Protocol.

It must be pointed out that international conventions and treaties signed and ratified by Mexico, such as the CBD and the Cartagena Protocol, are considered the law of the land.<sup>1235</sup> These agreements, however, are not self-executing and require federal legislation to implement them nationwide.<sup>1236</sup> As well, federal regulations are needed to aid in the implementation of federal law. They establish specific obligations and guidelines, not only for the general population but also for authorities. They also contain administrative measures required to enforce the law. Federal law and its respective

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<sup>1232</sup> Federal Law on Administrative Procedure, DOF-04-04-1994, online:< <http://www.diputados.gob.mx/LeyesBiblio/pdf/112.pdf>>. (accessed January, 13, 2007).

<sup>1233</sup> Biosafety Law on GMOs, *supra* note 8 art. 8.

<sup>1234</sup> General Law of Ecological Equilibrium *supra* note 8 arts. 28-35.

<sup>1235</sup> Constitution of the Mexican United States of 1917, *supra* note 184 art.33 on international treaties.

<sup>1236</sup> Ortiz, Loretta, *Derecho Internacional Publico (Public International Law)*, (Mexico, Oxford, 2002). at 8-11.

regulation can make use of specific standards, rules, guidelines, characteristics of a product, process or activity that may be required for their implementation. These particular procedures that are essential in implementing federal law are established in NOMs.<sup>1237</sup>

As noted earlier, NOMs are proposed by the federal Secretariats, in their respective areas of competence, to the Secretariat of Economy to facilitate implementing federal law across the country. They aid in enforcing legislation by ensuring that specific procedures and requirements are met. Lack of NOMs renders legislation overly broad and incapable of being implemented. Such is the case with the Biosafety Law on GMOs.

The implementation of the Biosafety Law on GMOs enacted to implement Mexico's commitments under the CBD and the Cartagena Protocol is not supported by federal regulations and NOMs. This law lacks standards on the requirements for authorizing general releases of LMOs,<sup>1238</sup> the information required to identify LMOs;<sup>1239</sup> the information that the pilot program of releases of LMOs should contain;<sup>1240</sup> and guidelines on the elaboration of EIA and risk assessments.<sup>1241</sup> The Biosafety Law also states that the aforementioned regulations will be established in NOMs, but they have not been developed in any NOMs yet.

In an interview with Mexican environmental officials in the Secretariat of the Environment and the National Biodiversity Commission, it was learned that in practice, it takes years to reach consensus at the federal level for the enactment of NOMs and that this is the problem faced by the Biosafety Law in terms of supporting its implementation

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<sup>1237</sup> General Law of Ecological Equilibrium, *supra* note 8 art. 36

<sup>1238</sup> Biosafety Law on GMOs, *supra* note 9 art. 34.

<sup>1239</sup> *Ibid.* art.42(I)

<sup>1240</sup> *Ibid.* art. 42(VII)

<sup>1241</sup> *Ibid.* art. 65.

with the necessary official norms.<sup>1242</sup> Also as described in Chapter V Section 2.33, under the Mexican Official Norm MON-FTO-056-1992, the Secretariat of Economy oversees the creation of NOMs and ensures that they do not cause negative economic impacts on the various social sectors in Mexico. This Secretariat, however, is mainly focused on economic considerations for the creation of NOMs. This focus would not allow for the creation of the best regulatory standards to preserve biodiversity and to regulate LMOs. Clearly, as seen from the lengthy process to enact NOMs to implement the Biosafety Law on GMOs, the Secretariat of Economy is not the proper institution for the creation of biosafety and environmental standards.

A more independent and expeditious procedure for creating NOMs is urgently required. The procedure must engage the competent Secretariats to play central roles in the elaboration of the standards. In the case of biodiversity the Secretariats of the Environment and Agriculture could propose the creation of NOMs directly to the Mexican Congress to avoid the lengthy administrative procedures currently followed by the Secretariat of Economy and as a way to obtain the financial resources required for their implementation. In the event of the continuous disagreement on the enactment of biosafety NOMs and the potential economic burden they could impose on some sectors of society, some of the biosafety standards and requirements can perhaps be incorporated into federal regulation or the competent Secretariat's internal regulations to aid in the implementation of the Biosafety Law on GMOs.

The hurdles in the creation of NOMs reflect lack of coordination among Mexican institutions and legislation on environmental matters. NOMs are required for the

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<sup>1242</sup> Interview conducted with environmental officials from SEMARNAT and CONABIO, Mexico City, November 12, 2006.

preservation of biodiversity and to support the implementation of the Biosafety Law on GMOs. Until these NOMs are developed, the Biosafety Law remains toothless to regulate LMOs as part of ensuring biosafety.

As discussed earlier, EIA is essential in the preservation of biodiversity. In Mexico, this procedure is employed along with risk assessment to aid the Secretariat of Agriculture and the Secretariat of the Environment in deciding whether to allow the introduction of LMOs into the environment.<sup>1243</sup> The observation of such a procedure, according to the CBD<sup>1244</sup> and the Cartagena Protocol,<sup>1245</sup> should take into account and integrate public input.<sup>1246</sup>

The integration of public input into a project's EIA is of vital importance, for it allows the decision maker to identify potential adverse impacts of the project prior to its authorization. It also broadens the government's perspective on the potential effects of projects on the environment. In addition, EIA can incorporate traditional knowledge into project implementation to benefit biological diversity. On this matter, the Biodiversity Law on GMOs states, regarding public input, that "citizens including State governments, in the areas where LMOs will be released, could provide technically and scientifically based opinions on such releases."<sup>1247</sup> The requirement of technical and scientific knowledge dramatically limits public participation and thus hinders the implementation of the process advocated in the CBD and the Cartagena Protocol. Furthermore, this law

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<sup>1243</sup> Biosafety Law on GMOs, *supra* note 9 arts. 10-13.

<sup>1244</sup> CBD, *supra* note 1 art. 14.

<sup>1245</sup> Cartagena Protocol *supra* note 2 art.23 (2).

<sup>1246</sup> CBD *supra* note 1 art. 14; Cartagena Protocol, *ibid.* See also CBD, Conference of the Parties 8 (COP8), Decision VIII 28. *supra* note 383.

<sup>1247</sup> Biosafety Law on GMOs, *supra* note 9 art. 33.

lacks guidelines not only on how to integrate public participation into the EIA procedure but also regarding the requirements and evaluation of EIA and risk assessment.<sup>1248</sup>

EIA procedure has had a history of limitations and problems in Mexico. According to the Secretariat of the Environment, for example, from 1988-1994, 848 projects did not obtain an environmental assessment prior to their beginning.<sup>1249</sup> So it is today, as indigenous communities and those stakeholders who possess traditional and other knowledge that has potential to benefit biodiversity, are excluded from providing their opinions and valuable knowledge because they are not scientifically based.

Moreover, there is a general lack of protection for native plants and species, such as maize, a situation which ignited the maize controversy considered in the CEC's Maize Report. The advisory group concluded that Mexico did not afford any protection to these species and plants.<sup>1250</sup> As discussed earlier, the CBD imposes an obligation on States to devise programs to preserve biodiversity *in situ* and *ex situ*.<sup>1251</sup> The 2005 Biosafety Law on GMOs addresses some of these issues by contemplating the creation of areas of origin for the preservation of native species and plants. It also restricts the introduction of LMOs in these areas.<sup>1252</sup>

The provision restricting the introduction of LMOs in areas of origin has the potential to help preserve Mexico's native species and the areas where they originate. Regarding these areas, the Biosafety Law on GMOs provides that they will be designated by the Secretariat of Agriculture and the Secretariat of the Environment. But the law

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<sup>1248</sup> *Ibid.* art. 65.

<sup>1249</sup> Environmental Impact Assessment: Achievements and Challenges for Sustainable Development 1995-2000, *supra* note 770 at 30-32.

<sup>1250</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 25.

<sup>1251</sup> CBD, *supra* note 1 arts. 8-9.

<sup>1252</sup> Biodiversity Law on GMOs, *supra* note 9 arts. 86- 90.



leaves several questions unanswered, such as the procedures regarding the designation of those areas and rules regarding interaction between these two federal Secretariats on carrying out this exercise. In the absence of further regulation or national standards, this provision has already engendered conflict.<sup>1253</sup> This can be illustrated by the discrepancies between the Secretariat of Agriculture and the Secretariat of the Environment over the designation of areas of origin of maize in the Mexican State of Sinaloa.<sup>1254</sup>

Recently, a Secretariat of the Environment's official, in a newspaper interview, stated that a complete national study to identify areas of origin, not only of maize, but of other species and plants, has to be performed.<sup>1255</sup> Until these areas are established in Mexico, provisions limiting the introduction of LMOs can not be implemented and *in situ* preservation would not be feasible in this country.

Mexico's environmental institutions were also analyzed in Chapter V Section 3 to determine if they provide the necessary structure for the implementation of the Biosafety Law on GMOs and for observing Mexico's international obligations under the CBD and the Cartagena Protocol. The analysis shows that the institutional structure is rife with problems such as duplication of institutional effort and a strong Presidential influence.

As established in the National Biodiversity Commission's Report to the CBD, Mexico lacks the financial resources to preserve its biological diversity and the political will to support biodiversity preservation with the necessary funds.<sup>1256</sup> Potential duplication of functions is observed in two institutions, the National Institute of Ecology

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<sup>1253</sup> Discrepancies over the designations of areas of origin, LA JORNADA, 23 November, 2006, online:<<http://www.jornada.unam.mx/2006/11/23/index.php?section=sociedad&article=050n2soc>>. (accessed January, 13, 2007).

<sup>1254</sup> *Ibid.*

<sup>1255</sup> *Ibid.*

<sup>1256</sup> National Biodiversity Commission, Third National Report on the Implementation of the Biodiversity Convention 2001-2005, *supra* note 1159 at 13.

and the National Biodiversity Commission. The National Institute of Ecology is a Secretariat of the Environment's institution devoted to conducting research on various environmental issues that fall under the sphere of biodiversity such as air quality, pollution, ecosystems preservation, wild species and LMOs.<sup>1257</sup> Similarly, the National Biodiversity Commission provides technical guidance to the federal Secretariats on issues related to biodiversity and to the safety of LMO introduction into the environment.

Integration of the National Biodiversity Commission and the National Institute of Ecology presents several advantages. For example, technical opinions produced are likely to be given more weight; second, eliminating duplication of efforts, more resources would be available for the preservation of biodiversity; and third, the merging of these two institutions would increase personnel resources and likely improve preservation and monitoring efforts.

Institutional duplication of efforts creates jurisdictional conflicts and hinders the implementation of the Biosafety Law on GMOs and the preservation of biodiversity. Optimization of resources and the streamlining of personnel devoted to the preservation of biological resources are likely to improve Mexico's institutional environmental framework and provide the grounds for implementing not only the Biosafety Law on GMOs but also international commitments under the CBD and the Cartagena Protocol.

As discussed in Chapter V, another issue pertaining to the lack of coordination among environmental institutions is the strong extent of Presidential influence. The President is central in building the framework of environmental institutions in Mexico.

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<sup>1257</sup> 2001-2005 Report, National Institute of Ecology *supra* note 982.

The Mexican President, by means of decrees, has the authority to create institutions<sup>1258</sup> such as the National Biodiversity Commission and the Inter-Secretarial Commission on GMOs. The President appoints heads of the federal Secretariats such as those of the Secretariat of the Environment and the Secretariat of Agriculture.<sup>1259</sup> The President is also responsible for establishing Mexico's economic priorities and national policies in six-year National Development Plans (NDP).<sup>1260</sup> These Plans contain Mexico's environmental policy for the Presidential period. The President also actively participates in creating protected areas<sup>1261</sup> and in the allocation of the federal budget to various sectors including environmental institutions.<sup>1262</sup> The President also heads the institutions that play a strategic role in preserving biodiversity and regulating LMOs, namely, the Inter-Secretarial Commission on GMOs and the National Biodiversity Commission.

As can be seen, Mexico's President impacts environmental institutions, environmental policy, protected areas, etc. At the national level, it is observed that this figure has played a role in institutional duplication by creating institutions such as the National Biodiversity Commission that serve similar purposes to the Secretariat of the Environment's National Institute of Ecology. This influence is also seen in the creation of the Inter-Secretarial Commission on GMOs, a dormant institution headed by the President that has not been able to coordinate environmental institutions for the preservation of biodiversity.

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<sup>1258</sup> Constitution of the Mexican United States of 1917, *supra* note 184 art. 89 (I); see also Organic Law of the Federal Public Administration, *supra* note 948 arts. 9, 21, 28, 31, 33, 34, 35, 37, 38, 39, 43.

<sup>1259</sup> Constitution of the Mexican United States of 1917, *ibid.* art. 89 (II).

<sup>1260</sup> *Ibid.* art. 26.

<sup>1261</sup> General Law of Ecological Equilibrium, *supra* note 8 art. 57-58.

<sup>1262</sup> Constitution of the Mexican United States of 1917, *supra* note 184 art. 89 (I).

Because of the nature of Mexican politics, long-term change and continuity is difficult to achieve, given that every six years, a new President is elected resulting in new plans, priorities and policies.<sup>1263</sup> Under these circumstances, political changes seriously affect the permanency of a high number of environmental officials within institutions and loss of institutional memory occurs every six years. In December 2006, for example, the changes are notorious regarding Mexico's environmental enforcement agency, the Federal Attorney for Environmental Protection. On the verge of Presidential change, a new Attorney for Environmental Protection was substituted in June 2005, as were the Vice Director of Environmental Audits, and the Administrative Coordinator of the office of Environmental Audits. In addition, several vacancies still remain, such as the Legal Vice Director, the Vice Director of Public Participation and Environmental Complaint; the Director of Regulation Support, the Director of Institutional Strategies, the Vice Director of Planning, and the Director of Industrial Inspection.<sup>1264</sup>

Six-year term politics tied to Presidential changes plays a role in ensuring the lack of continuity evident in Mexico's environmental policies. In this context, it is difficult for environmental institutions to be consistent in developing and enforcing Mexico's environmental laws. As noted by Stephen Zamora, "the power of the President office comes in part from the power of appointment and control over a vast federal bureaucracy."<sup>1265</sup> The President is allowed by law to remove middle and senior

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<sup>1263</sup> See Zamora Stephen, *supra* note 11 at 40-43.

<sup>1264</sup> PROFEPA, Personnel Directory, online: < <http://www.profepa.gob.mx/Profepa/Directorio.htm?Valor=Directorio>>. (accessed January, 13, 2007).

<sup>1265</sup> Zamora, Stephen, *supra* note 11 at 142.

government officials. It is important to note that low ranking government employees such as secretaries are affiliated to unions and can not be removed easily from their jobs. Independent, solid environmental institutions are required in Mexico with permanent personnel, at least, at the medium and lower levels of technical specialists to ensure institutional continuity.

In addition to the role that the influence from the President's office plays in environmental institutions, the influence is also seen at the policy level. Mexico's environmental policy was analyzed in Chapter VI. It was argued that Mexico's modern environmental policy started being developed since 2001. Since then, a pattern of progress has been seen in this area with the creation of specialized institutions and legislation. On this matter, the CBD's COP calls upon States to employ SEA to elaborate national programs and policies.<sup>1266</sup>

SEA, as discussed in Chapter V Section 2.5.6, is not present in Mexico's environmental legislation and it is not reflected in the Federal Planning Law. This strategic tool is of paramount importance in that it enables countries to elaborate consistent, coordinated and comprehensive policies and national programs. It also aids in incorporating public participation and concern for biodiversity from the beginning of the elaboration process of the policies and programs. The implementation of SEA, in Mexico, can potentially guarantee long-term policies and coordination among environmental institutions.

Although development has been seen in Mexico's policies from 2001-2006, this does not guarantee long-term policy consistency. Overall, while deficiencies in Mexico's

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<sup>1266</sup> CBD, Conference of the Parties 8 (COP8), *supra* note 387 at 1.

environmental policy can be blamed on lack of financial resources to create the necessary infrastructure, the federal planning system may be the center of this problem, resulting not only in inefficient policies, but also conflicts in legislation and lack of coordination among institutions. Mexico's policy also does not reflect the SEA advocated in the CBD to guide the creation of environmental policies and national plans. As it is now, Mexico's environmental policy is based on six-year goals that lack the necessary framework to facilitate the implementation of national environmental legislation and Mexico's commitments under the CBD and the Cartagena Protocol.

Among others, the points of weakness and failure analyzed in the Chapter are confirmed in Mexico's 2005 Report on the Implementation of the Cartagena Protocol.<sup>1267</sup> In this Report, Mexico acknowledges that it can not implement its Biosafety Law on GMOs without the necessary federal regulation and the several Mexican Official Norms required and that it has been unable to produce them.<sup>1268</sup> This is so, the Report says, even though the Biosafety Law on GMOs entered into effect in May 2005. Mexico admits also that biodiversity preservation in that country is a difficult endeavor due to its great biological diversity and to the fact that Mexico is a center of origin of more than 100 genetically diverse species.<sup>1269</sup>

Also with respect to Article 23 of the Cartagena Protocol on the promotion and facilitation of public awareness, education and participation on issues of LMOs and the

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<sup>1267</sup> Mexico's Report on the Implementation of the Cartagena Protocol (2005) online: <  
<http://www.biodiv.org/doc/world/mx/mx-nr-cpbi-es.doc>>. at 5-6. (accessed January, 13, 2007).

<sup>1268</sup> *Ibid.*

<sup>1269</sup> *Ibid.* at 6.

conservation of biological diversity, Mexico acknowledges that its implementation of this provision has been hampered by lack of financial resources.<sup>1270</sup>

## **5. Concluding Observations**

The regime of the CBD and the Cartagena Protocol are clear in their objectives. Their aim is to ensure that parties take steps to protect the amplitude of their biological resources and that they address potential biosafety threats related to the introduction of LMOs into the environment. Because of the general formulation of the obligations in these environmental Agreements prescribe, they do not provide concrete guidelines as to how the principles of precaution, environmental and risks assessment which are to inform implementation conduct, could be practically followed by States in observing biodiversity protection obligations. With particular reference to the introduction and control of LMOs, the requirement under the Cartagena Protocol is to base decisions to accept, delay or reject LMO imports on a risk assessment and, in cases of scientific uncertainty, on the precautionary principle. This requirement at times seems to contradict with the stringent scientific requirements of the international trade regime advocated by the WTO and NAFTA.

The Sanitary and Phytosanitary regimes of the WTO and NAFTA condition Mexico's ability to impose LMO bans on conclusive scientific evidence that these organisms will negatively impact biological diversity. In the absence of such evidence, developing countries like Mexico can only afford temporary protection under this regime until they acquire such evidence. In the regional regime, under the Commission for Environmental Cooperation, publicity and media attention can be resorted to by citizens

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<sup>1270</sup> *Ibid.* at 26-27.

and non governmental organizations to afford some protection to biological diversity. The citizen complaint procedure of this Commission is not likely to afford substantial protection since common citizens are not likely to possess scientific knowledge to identify LMOs or biosafety threats. This Commission, *per se*, does not afford substantial resources to Mexico for the preservation of biological diversity and the implementation of the CBD and the Cartagena Protocol.

Thus both the global and regional regimes of biodiversity preservation binding upon Mexico leave this country to seek a careful balance between environment and biological resources protection and preservation of economic development through trade and investment promotion. Clearly, responsible national policy, appropriate legislative regime, and competent relevant administrative, and management resources are needed to secure balance in this issue. The dissertation has demonstrated that despite its supported implementation of the CBD Mexico is still lacking in all these areas. As such its potential to effectively implement the demand of the CBD and Cartagena Protocol is remote. This is because of the absence or inadequacy of national resources and capacity to apply to achieve this purpose and the lack of specific guidelines to implement Mexico's Biosafety Law on GMOs.



## CHAPTER VIII

### CONCLUSION

#### 1. Conclusion

The emergence in the 1980s of the term “biodiversity” serves to better describe the natural environment with its resources.<sup>1271</sup> Despite the philosophical arguments regarding the intrinsic value of biodiversity, these resources can obviously be appreciated for their role in our survival.<sup>1272</sup> As well, science can manipulate genetic material from organisms, plants, etc., to create improved varieties that can help alleviate the world’s lack of resources.<sup>1273</sup>

Biotechnology has great potential to improve production, to eradicate pests, create drought-resistant seeds, and eliminate the use of pesticides.<sup>1274</sup> This technology can also be used to produce vaccines and for bioremediation, the utilization of LMOs, although it has some associated risks. They can produce allergic reactions in humans if the organisms manipulated have such properties; for example, peanuts.<sup>1275</sup> Also, if not monitored, they can replicate in their organic counterparts. In spite of the promises of LMOs and biotechnology, science does not have all the answers as to the safety of these

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<sup>1271</sup> Gaston J. Kevin & Spicer, John, *supra* note 68 at 3-5.

<sup>1272</sup> *Ibid.* at 98-99.

<sup>1273</sup> Bosselmann Klaus, The International Legal Regime Concerning Biotechnology and Biodiversity, *supra* note 153 at 116.

<sup>1274</sup> ISAAA, Global Status of Commercialized Biotech/GM Crops in 2005, *supra* note 157.

<sup>1275</sup> GEO-PIE Project “Issues Related to Genetic Engineering, *supra* note 24.

organisms or their long-term effects on biological diversity.<sup>1276</sup> Consequently, the regulation of these organisms is controversial.

At the national level, Mexico, a transitional economy, has struggled to regulate LMOs and to implement its international obligations under the CBD and the Cartagena Protocol. The preservation of biological diversity in Mexico is of great importance since it is a mega-diverse country hosting a great number of the world's species and plants.<sup>1277</sup> The challenge is for Mexico to balance the economic benefits that biotechnology and LMOs can offer against their potential harmful effects on biological resources in the face of the need to implement environmental agreements and to further international trade. The study of Mexico's struggle in implementing these Agreements may potentially serve transitional economies as illustration of the challenges when seeking to ensure the preservation of their biological diversity and the implementation of their international obligations under the CBD and the Cartagena Protocol, and under international trade agreements.

As discussed in Chapter III, the CBD provides mechanisms for the preservation of biological diversity. This agreement, however, suffers from overbreadth, such that its implementation potentially overlaps and duplicates efforts under other international agreements on specific areas of biological resources preservation. The language of the CBD also is vague and States can easily avoid implementing it for lack of monetary resources or specialized legislation and institutions.<sup>1278</sup> This probability holds especially for transitional economies like Mexico.

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<sup>1276</sup> *Ibid.*

<sup>1277</sup> Secretariat of the Environment and Natural Resources, *supra* note 3 at 134 -135.

<sup>1278</sup> Chris Wold, *supra* note 294 at 2.

The CBD's overbreadth also magnifies other issues, such as lack of guidelines for accessing genetic resources, requiring States to enter into agreements and to enact national legislation for this purpose. In absence of national legislation and the consensus over the application of the Bonn Guidelines,<sup>1279</sup> States are left with no mechanisms by which to preserve their genetic resources from overexploitation. A more aggressive approach by the CBD Secretariat is needed to reach a consensus among States over the implementation of the Bonn Guidelines and more straightforward obligations.

The Cartagena Protocol also seeks to preserve biodiversity from the threats posed by LMOs. It relies on the Compliance Committee to achieve such a goal and to enforce the provisions in the Protocol. Unfortunately, as noted in Chapter III Section 3.5, the Committee monitoring mechanisms require strengthening to improve compliance with the Protocol and to aid States in overcoming their shortcomings at the national level. This task perhaps can be achieved by taking into account external and independent sources of information on States' performance on issues related to the Protocol such as that generated by international organizations and scholars.

In addition to challenges in the implementation of the Cartagena Protocol, the exclusion of LMO-FFPs from the main focus of the Protocol has proven to be harmful to biodiversity preservation. LMO-FFPs have the potential to be invasive and to reproduce in the environment. In the case of Mexico, LMO-FFPs endanger biological diversity since Mexican farmers practice an ancient tradition of saving seeds for future seasons, as shown in the CEC's Maize Report.<sup>1280</sup>

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<sup>1279</sup> Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization, *supra* note 341.

<sup>1280</sup> David J. Schnier, Genetically Modified Organisms and the Cartagena Protocol, *supra* note 444 at 408.

To address challenges posed by LMO-FFPs in countries rich in biological resources like Mexico requires great financial investment, which represents a major burden. Apart from training personnel, and establishing monitoring institutions with the required technology, Mexico requires economic resources to educate indigenous communities regarding the potential danger that these organisms pose to native plants and species.

The environmental and risk assessment procedures established in the CBD and the Cartagena Protocol to authorize the introduction of LMOs into the environment are essential safeguards, but they do not provide States with guidelines to balance uncertainty in cases where scientific evidence is not available. The lack of guidelines may affect the manner in which States implement this requirement, and this may cause friction with their obligations under trade agreements as exemplified in the WTO Appellate body decision over the EC's GMO moratorium.<sup>1281</sup> This is also the case of Mexico where lack of guidelines to perform these assessments is lacking, therefore limiting their potential to preserve biodiversity.

The precautionary principle aims to guide States in the application of the Cartagena Protocol. While this principle has the potential to help preserve biological resources in a mega-diverse country like Mexico, its implementation is not straightforward. In Mexico, the principle is embedded in the Biosafety Law on GMOs but its enunciation is weak and its application is subject to science and to Mexico's trade obligations. Indeed, Mexico lacks guidelines for the application of this principle and thus

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<sup>1281</sup> WTO Dispute Settlement Panel, *supra* note 27.

its inclusion in the Biosafety Law on GMOs represents only a good intention.<sup>1282</sup> It requires guidelines or institutional rules from the Secretariat of the Environment and the Secretariat of Agriculture on the application of the principle to bring it to life in Mexico. The application of this principle could be strict in cases of areas of origin of biodiversity and in cases involving indigenous groups and their agricultural practices.

In addition, as discussed in Chapters III and IV, the international trade regime of the WTO and NAFTA, while it allows States to impose protective measures for the preservation of human, animal or plant life or health, requires scientific evidence. Such a requirement may prove effective in cases where scientific evidence is available. This is not the case, unfortunately, in connection with biodiversity and LMOs where conclusive scientific evidence is lacking. This uncertainty is problematic since it limits the level of protection States afford to their biological diversity due to their inability to produce scientific evidence as required by the international trade regime. Conflicts between the environmental and trade regime are likely to continue until scientific evidence becomes available regarding the potential impacts of LMOs on biological diversity.

The role of Mexican legislation and institutions in the implementation of the CBD obligations and the rules of the Cartagena Protocol were discussed in Chapter V. The point emerged that biosafety regulation prior to 2005 offered limited protection to

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<sup>1282</sup> Biosafety Law on GMOs, *supra* note 9 at 133. It is important to note that recently, guidelines for the application of the precautionary principle have been developed by IUCN. The Guidelines are intended to provide assistance in the application of the Precautionary Principle to the conservation of biodiversity and natural resource management. The areas focus of the guidelines include forestry, fisheries, protected areas, invasive alien species, and wildlife conservation, management, use and trade. According to IUCN, the primary target audience of the Guidelines is policymakers, legislators and practitioners, but they also aim to create a culture of precaution in all sectors relevant to biodiversity conservation and natural resource management. IUCN, IUCN Council, Guidelines for Applying the Precautionary Principle to Biodiversity Conservation and Natural Resource Management, May 14-16, 2007, online: < [http://www.iucn.org/themes/law/pdffdocuments/LN250507\\_PPGuidelines.pdf](http://www.iucn.org/themes/law/pdffdocuments/LN250507_PPGuidelines.pdf) >. (accessed June, 2, 2007).

experimental seeds, and to the sanitary standards of plants. In essence, the regime of that era did not afford protection to biological diversity in Mexico on their terms, and there were hardly adequate mechanisms to enforce them.

Unfortunately, the Biosafety Law on GMOs also has serious deficiencies. This law requires an EIA and risk assessment to be performed by a proponent and to be analyzed by the Secretariat of Agriculture or the Secretariat of the Environment. This procedure does not provide guidelines to evaluate uncertainties, and does not make for a transparent authorization process, especially since public input is acceptable only if those opinions are based in scientific evidence.<sup>1283</sup>

The Biosafety Law on GMOs, although it provides for the delimitation of areas center of origin to restrict the introduction of LMOs and to preserve Mexico's native species,<sup>1284</sup> lacks mechanisms and regulations for their creation. Until such areas are created, LMOs can potentially hinder the preservation of Mexico's native species. Moreover, as argued in Chapters V and VI, enforcement of the Biosafety Law heavily depends on inspections by personnel from the Secretariat of Agriculture and the Secretariat of the Environment. This procedure is not effective in the absence of personnel and financial resources.

Probably the greatest weakness of the Biosafety Law on GMOs is the absence of detailed official regulations to implement it. This law requires for its implementation technical requirements and regulations to set out standards to be met prior to the release of LMOs into the environment.<sup>1285</sup> The implications of this can be demonstrated if we consider the hypothetical introduction of LMOs in Mexico under current biosafety

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<sup>1283</sup> *Ibid.*

<sup>1284</sup> *Ibid.* art. 90.

<sup>1285</sup> *Ibid.* arts. 34,42,50.

regulations. As mentioned earlier in Chapter V Section 2.5.3, the Biosafety Law on GMOs requires a proponent to perform environmental and risk assessments on LMOs that are to be introduced into the environment. It also requires the Secretariat of Agriculture to scrutinize such assessments and to request a binding opinion from the Secretariat of the Environment regarding the proponent's request. The National Institute of Ecology and the National Biodiversity Commission are, as well, obliged under this Law to provide technical assistance to the Secretariats of Agriculture and the Environment in their decisions.

In this hypothetical introduction of LMOs in Mexico, due to the absence of NOMs establishing the technical requirements and characteristics of EIA and risk assessments, the proponent will likely meet the Biosafety Law on GMOs' requirements of EIA and risk assessments. Also, in light of the regulatory deficiencies in the Biosafety Law on GMOs, and the absence of NOMs to provide the technical requirements for authorizing a) general releases of LMOs;<sup>1286</sup> b) the information required to identify LMOs to be introduced into the environment;<sup>1287</sup> c) information that must be taken into account for LMO releases related to the risks of these organisms;<sup>1288</sup> d) the information that pilot LMO release will contain,<sup>1289</sup> and e) the requirements for commercial release of LMOs,<sup>1290</sup> the Secretariats of Agriculture and the Environment are likely to authorize the introduction of LMOs in Mexico.

Additionally, lack of regulation to establish zones free of LMOs and to demarcate areas of origin of biodiversity will allow the proposed LMOs to be introduced virtually in

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<sup>1286</sup> *Ibid.* art. 34.

<sup>1287</sup> *Ibid.* art. 42 (I).

<sup>1288</sup> *Ibid.* art. 42 (VII).

<sup>1289</sup> *Ibid.* art. 50 (V).

<sup>1290</sup> *Ibid.* art. 55 (VII).

any region in the country, including zones where maize and other native species originate. Lack of financial resources, monitoring personnel and enforcement agents will contribute to the failure of this Law to afford protection to Mexico's biodiversity in the event of LMO introductions.

Altogether, the lack of regulations that afflict the Biosafety Law on GMOs makes this legislation practically 'empty', only constituting a general unenforceable biosafety guideline. Consequently, this legislation can not effectively ensure biosafety in Mexico and to serve as a vehicle for the implementation of the CBD and the Cartagena Protocol.

It was argued also in Chapter VI that improved environmental institutions would aid Mexico in preserving its biodiversity and in enforcing supporting legislation. But as shown, in the institutional sector, a lack of environmental policy continuity after each Presidential term was observed along with a pattern of strong Presidential influence under Mexico's legal regime. The President appoints the heads of the Secretariats and decides the priorities of the nation on environmental matters in the National Development Plans. The executive is also the head of the specialized institutions that can, potentially, contribute effectively to the preservation of biological resources and to the implementation of obligations under the CBD and the Cartagena Protocol. A strategic planning system based on SEA perhaps could balance such strong influence by creating long-term environmental goals and thus making environmental policy less dependent on politics.

Furthermore, the National Biodiversity Commission and the National Institute of Ecology perform similar duties; they are interlinked and exhibit a strong Presidential influence. Also, their role in regulating LMOs is merely to provide non-binding opinions



to the Secretariat of the Environment and the Secretariat of Agriculture. At least the merging of these two institutions would rationalize expenditure and leave some money to be devoted to practical biodiversity preservation activities.

The enforcement of Mexico's legislation is deficient as well. The Federal Attorney for Environmental Protection, which is a part of the administrative structure of the Secretariat of the Environment, is overwhelmed with enforcing environmental law in every area, including air quality, hazardous waste, biodiversity conservation, etc. As well, the public complaint procedure that may trigger an enforcement investigation, employed by this enforcement Agency, is not very helpful because its ultimate result is only to remediate environmental harm. What is needed, therefore, is a monitoring mechanism that encompasses a more preventive approach, particularly for addressing the potential risks posed by LMOs to the integrity of Mexico's biodiversity and a more independent and well resourced enforcement agency.

Mexico's environmental policy was discussed in Chapter VI to assess how successfully it reflects its obligations under the CBD and the Cartagena Protocol. It was argued that Strategic Environmental Assessment, although it had the potential to aid Mexico in creating strong and coordinated policies, was not contained in Mexico's environmental legislation and was not employed by the Mexican government to enact its environmental policies. For example, prior to 1995, Mexico's environmental policy and implementation strategies were concerned with economic development and regulation of the exploitation of natural resources.<sup>1291</sup> They were also concerned with alleviating problems related to human health and, to this end, the Secretariat of Health was empowered to apply environmental legislation. But because of the preeminent focus on

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<sup>1291</sup> Guevara Alejandro, *supra* note 1028 at 167-168.

economic development, the institutional reform that began in the 1980s could solve the problematic of lack of coordination to make the institutional structure more able to administer environmental responsibilities and to enforce environmental legislation.<sup>1292</sup>

Though environmental policy from 1995-2000 showed some progress toward effective environmental protection administration; evidenced, for example, in the formulation of a Biodiversity Strategy and the creation of specialized law on biosafety; paradoxically, during this time, Mexico authorized a massive experimental release of LMOs without legislative, institutional and monitoring tools to oversee their impacts on biological diversity. This activity clearly paid little regard to Mexico's obligations under the CBD.

A more comprehensive environmental policy emerged from 2001-2006. It utilizes specialized institutions and legislation to regulate LMOs. Specific regulations on environmental risk assessment were established to regulate the introduction of these organisms into the environment.<sup>1293</sup> Even so, the basic problems of long duration have not been tackled. These include failure to fund programs essential to preserve biological diversity, such as the Strategic Program to Preserve Ecosystems of 2002.<sup>1294</sup>

Mechanisms to enforce environmental policy and law remain inadequate as exemplified in the CEC's Maize Report where LMO-FPPs were introduced into the country in spite of a moratorium.<sup>1295</sup> Presidential influence remains an important factor in the administration of Mexico's environmental policy, particularly in creating institutions and formulating and implementing policy through National Development Plans. These

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<sup>1292</sup> Micheli, Jordy, *supra* note 746 at 138.

<sup>1293</sup> Biosafety Law on GMOs, *supra* note 9.

<sup>1294</sup> Strategic Program to Preserve Ecosystems and Biodiversity of 2002, *supra* note 1141.

<sup>1295</sup> Maize and Biodiversity: The Effects of Transgenic Maize in Mexico, *supra* note 6 at 32-34.

plans are formulated every six years by a different President, and to date they have prioritized economic development. Along with this, environmental policy also changes every six years. Not only is the lack of continuity detrimental to the preservation of biodiversity, but also the prospect of biodiversity preservation activity depends on how much each president may have regard for it.

Altogether, from the analysis of Mexico's legislation, institutions and environmental policy, it can be said that this country is not particularly dedicated to its obligations under the CBD and the Cartagena Protocol. The presence of specialized legislation to preserve biodiversity must be complemented by the political will to expend the resources needed to implement it. Beyond the legislation, the enactment of official norms and specific implementing regulations are needed to give more practical content to the framework laws.

Overall, it can be concluded that in Mexico, international obligations to secure biological diversity have been accepted under the CBD and Cartagena Protocol. As well, framework laws exist to implement them. These laws are, however, practically empty, because they are not filled in by the official norms and federal regulations necessary to empower their enforcement. Finally, the varieties of interrelated institutions created to administer environmental laws not only duplicate each other in membership and functions. They are also ultimately subjected to the power and policy of each succeeding president who always defines anew the direction of environmental policy and implementation.

In the context of this situation, this Dissertation proposes international, legislative and institutional reforms to improve the implementation of the CBD and the Cartagena

Protocol in Mexico and potentially in developing countries with similar situations. These will be outlined next.

## **2. Recommendations**

This Dissertation recommends reforms aimed at aiding in the implementation of the CBD and the Cartagena Protocol at the international level, such as strengthening the work of the Protocol's Compliance Committee. At the national level, legislative and institutional reforms are proposed to improve the preservation of biological resources in Mexico via domestic implementation of the CBD and the Cartagena Protocol. In the legislative area, reforms to the Federal Planning Law are proposed, along with the creation of supporting regulation for the Biosafety Law on GMOs. In the institutional area, it is proposed to streamline Mexico's environmental institutions so as to avoid duplication of efforts and unnecessary spending, to preserve institutional memory and enable them to develop long-term strategies for environmental protection. Also a well resourced and independent office of the Federal Attorney for Environmental Protection is proposed to improve the enforcement of Mexico's environmental law. These proposals are elaborated next.

### **2.1 International Reforms**

As previously mentioned in Chapter IV, the CEC's Maize Report demonstrated that the compliance mechanisms in the international environmental regime did not afford substantial help to Mexico in implementing the Cartagena Protocol. The implementation mechanism employed by the CBD's Secretariat heavily relied on States capacity to

monitor their own performance in the implementation of the Cartagena Protocol.<sup>1296</sup> This mechanism, as argued in Chapter VII, was limited in scope and it did not prove to be an effective resource for Mexico.

Several efforts are being undertaken by the CBD Secretariat to aid States party in the implementation of the Cartagena Protocol, amongst the most important of which is the recent creation of a Protocol's Compliance Committee.<sup>1297</sup> The Committee's objective is to monitor and scrutinize the performance of countries in the implementation of the Protocol based on country reports and the information available in the Biosafety Clearing House Mechanism.<sup>1298</sup> As previously discussed in Chapter III, the Committee is in the process of elaborating rules under which it measure States' compliance and it will determine what actions can be taken against those States that do not comply with the provisions in the Protocol.

This Dissertation argues that, to improve the implementation of the Cartagena Protocol, the Compliance Committee must improve its compliance and monitoring mechanisms. This could be achieved by incorporating a complaint mechanism similar than the one employed by the CEC in which NGOs, indigenous groups and citizens in general could bring to the attention of the Protocol's Compliance Committee issues on the implementation of the Cartagena Protocol. The Compliance Committee, as well, could benefit by taking into account the work of academics NGOs, international organizations and academics. The information generated from these sources will likely be more free from political interference than the information generated by States themselves, and it will provide the Compliance Committee with a clearer picture of a State's

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<sup>1296</sup> Cartagena Protocol, *supra* note 2 art. 33.

<sup>1297</sup> Compliance Committee, Cartagena Protocol, *supra* note 500.

<sup>1298</sup> *Ibid.*

limitations and challenges in implementing the Protocol. Information that could be taken into account includes reports and studies on States' environmental performance, enforcement of environmental laws, trade and environment, economic performance, and enforcement complaints submitted before international organizations. Ideally, this information will nourish and expand the work of the Compliance Committee and its analysis of country reports. As mentioned in Chapter VII, examples of the institutions which work could be taken into account by the Committee are: UNEP; Organization for Economic Co-operation and Development (OECD), and the North American Consortium of Legal Education (NACLE).

## **2.2 National Level: Mexico's Legislative Reforms**

Several legislative reforms must take place in Mexico to preserve the rich biological resources in this country and to improve the implementation of the CBD and the Cartagena Protocol. First, Federal Planning Law must be reformed to allow long-term environmental planning. As discussed in Chapters V and VII, this Law only allows planning strategies to be developed for six-year periods. As well, those strategies, developed under the National Development Strategies, can only encompass programs consistent with executive objective during each six year Presidential period. Consequently, Article 3 of the Planning Law must be reformed to require that environmental plans and strategies be conceived for longer terms based on considerations that prioritize environmental and resources preservation albeit in the context of national economic development.

On this score, the recommended reform of the Planning Law must make provisions for taking into account the guidelines recommended by the Conference of the

Parties of the CBD regarding Strategic Environmental Assessment.<sup>1299</sup> According to such guidelines, biodiversity preservation objectives should be incorporated in the early stages of economic development planning. The strategic planning that such reform would facilitate, has the potential to improve Mexico's environmental policy and to aid in the implementation of the CBD and the Cartagena Protocol.

Second, federal regulation and NOMs should be urgently created to support the implementation of the Biosafety Law on GMOs. For this purpose, it is necessary that a new procedure for creating such national standards must be put in place. In this procedure, the Secretariats of the Environment and Agriculture must take the central and lead roles in developing and proposing official norms for legislative passage. The Secretariat of Economy should be excluded from the process altogether, even though its views on the economic and social consequences of environmental protection obligations that the norms demand must be given due consideration in the implementation process.

Together with the overarching federal regulation, it is proposed that NOMs must be targeted to fill the gaps in the 2005 Biosafety Law on GMOs in specific areas to facilitate its implementation. As discussed in Chapter V, these gaps include the need to establish the requirements for authorizing general releases of LMOs;<sup>1300</sup> the need to set out the information required for identifying LMOs to be introduced into the environment;<sup>1301</sup> the need to clarify information and guidelines on the risks posed by LMOs;<sup>1302</sup> the need to establish the information that pilot LMO release must contain;<sup>1303</sup>

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<sup>1299</sup> CBD, COP8, *supra* note 387, Decision VIII/28 at 23.

<sup>1300</sup> Biosafety Law on GMOs, *supra* note 9 art. 34.

<sup>1301</sup> *Ibid.* art. 42 (I).

<sup>1302</sup> *Ibid.* art. 42 (VII).

<sup>1303</sup> *Ibid.* art. 50 (V).

and, to set out the requirements that must be met for commercial release of LMOs.<sup>1304</sup>

Until these regulations are established in Mexican Official Norms, the Biosafety Law on GMOs cannot be fully implemented, and this would hamper the implementation of the CBD and the Cartagena Protocol.

Third, so far in Mexico, the delimitation of areas of origin has not been established without conflict. The establishment of these areas is necessary for the preservation of biodiversity and to regulate the introduction of LMOs. Federal regulation in support of the Biosafety Law on GMOs must include procedures and mechanisms for delineating such areas. The regulation must set out the competences of the Secretariats of the Environment and Agriculture under the process. These competences must be complementary so that conflicts could be avoided or minimized. Until the areas of origin are determined, provisions for their delineation in the Law will remain toothless, and undermine protection for Mexico's biological resources.

Fourth, guidelines for the implementation of the precautionary principle are required, particularly in protected areas and in communities where indigenous groups largely depend on traditional agriculture for survival. As discussed in Chapter VII, a strict application of this principle is required to protect indigenous agriculture against the adverse effects of LMOs, particularly genetically modified maize. The Secretariats of the Environment and Agriculture must utilize their power to propose official norms as here recommended, to develop guidelines for the observation of the principle in biodiversity preservation in Mexico.

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<sup>1304</sup> *Ibid.* art. 55 (VII).



### **2.3 National Level: Institutional Reforms**

As discussed throughout the dissertation, the implementation of the CBD and the Cartagena Protocol impose major financial burdens on developing States. This burden is increased where the implementation process is mired in effort duplication. Mexico's environmental institutions, as discussed in Chapter V, such as the National Institute of Ecology and the National Biodiversity Commission, perform similar tasks under Mexico's regime of environmental protection.

As discussed in Chapter V, the spectre of numerous institutions that, under the overall control of the Presidency, participate in environmental policy formulation, law proposal and policy and law implementation, not only sap financial and personnel resources. They also slow down the functioning of the institutional machinery. While the generality of the institutional structure needs to be rationalized by combining institutions that do the same or similar tasks so as to free up personnel for other important tasks, the most immediate structural reform must involve the National Institute of Ecology and the National Biodiversity Commission. The simple proposal is to combine these two because of the similarity of their responsibilities, namely, research in support of environmental regulation and offer opinions in regard to the introduction of LMOs.

Another measure that could possibly improve the enforcement of Mexico's environmental law is the elimination of the institutional burden that the office of the Federal Attorney for Environmental Protection constitutes upon the Secretariat of the Environment. It is prudent that while the Secretariat of the Environment focuses on the legislative and administrative concerns under its portfolio, the Federal Attorney is freed to pursue environmental law enforcement to support the Secretariat.

Finally, as seen from Chapters V and VI, though becoming less powerful in the federal administration, the Presidency in Mexico still plays a central role in the environmental area. This is encapsulated in the Presidential term phenomenon, which ensures that environmental institutions are deserted and new personnel are awarded the positions under each new President. As pointed out, this development regularly affects the office of the Federal Attorney for Environmental Protection. It is necessary that the appointment of personnel to environmental institutions be separated from the Presidential political process. Permanent personnel are required, at least in the lower levels of environmental institutions, to guarantee continuity and preservation of institutional memory.

Altogether, it must be emphasized that for purposes of getting the CBD and the Cartagena Protocol implementation off the ground in Mexico, the simple reforms set out above are indispensable. They are recommended out of sensitivity to the fact that, at least thus far, the funds required for them and the personnel necessary to ensure they get done, could be afforded by Mexico. The hope is that once the basic steps are taken, they lay the groundwork for the deepening of the reform process. In this way, not only biodiversity preservation under the CBD and the Cartagena Protocol would become increasingly practical realities in Mexico. More generally, environmental protection would become more practiced as part of sustainable development across the country from Presidency to Presidency.

## APPENDIX

### ENGLISH TRANSLATION OF MEXICO'S 2003 LEGISLATIVE PROPOSAL OF THE BIOSAFETY LAW ON GENETICALLY MODIFIED ORGANISMS<sup>1305</sup>

#### GENETICALLY ENGINEERED ORGANISMS BIOSAFETY STATUTE

##### TITLE FIRST

##### General Disposals

##### CHAPTER I

##### Object and Purpose

ARTICLE 1st – The Statute herein becomes a public order and social interest statutory instrument having as main object confined utilization activities regulation, experimental release, pilot program release, commercial release, marketing, imports and exports in connection with genetically engineered organisms with the purpose to prevent, avoid or reduce possible hazards that might be posed by such activities to either human health or environment as well as to biological diversity or animal, vegetal or aquiculture health.

ARTICLE 2nd – In order to comply with its main object, the purpose of this statutory instrument is as follows:

- I. Ensure a proper and efficient protection level to human health, environment and biological diversity as well as to animal, vegetal and aquiculture ecosystems health with regard to the adverse effects which might be caused by activities performed using genetically engineered organisms;
- II. Define both principles and national policy with regard to GEOs (Genetically Engineered Organisms) biosafety matters as well as the application instruments;
- III. Establish jurisdiction of the different bodies detaching from the Federal Civil Service for GEO's biosafety matters;
- IV. Establish the principles to enter into coordination agreements by and between Federal Government, through Ministries having jurisdiction and federal entities governments for the best compliance with the object of the Statute herein;

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<sup>1305</sup> English Translation of the 2003 Legislative Proposal of Mexico's Biosafety Law on Genetically Modified Organisms, Inter-Secretarial Commission of Genetically Modified Organisms, The House of Congressmen Parliamentary Gazette, No. 101, 2003. This 2003 Legislative Proposal was submitted to the Mexican Congress and it is almost identical to the 2005 Biosafety Law on GMOs.

V. Establish the principles for Genetically Engineered Organisms Biosafety Inter-secretarial Committee functioning through which the different integrating Ministries shall coordinately collaborate, within their specific jurisdiction scope, with regard to genetically engineered organisms' biosafety;

VI. Establish both administrative procedures and criteria for the due evaluation and monitoring of the possible hazards, which may arise out of the activities performed with genetically engineered organisms, to human health, environment, biological diversity, animal, vegetal or aquiculture ecosystems health;

VII. Establish permission granting levels for the due achievement of experimental release, pilot program release and trading release activities in connection with genetically engineered organisms, including imports of such organisms to properly develop the aforementioned activities;

VIII. Establish a notification plan for the due development of genetically engineered organisms' confined utilization activities as per the specific cases referred hereof;

IX. Establish authorization levels issued by the Health Ministry with regard to genetically engineered organisms as described herein;

X. Create and develop the National Information System on Biosafety as well as the Biosafety National Registry in connection with Genetically Engineered Organisms;

XI. Set forth the basis for the due establishment, case by case, of geographical areas in which activities using certain specific genetically engineered organisms is retrained;

XII. Set forth the basis on the contents to be included under the Mexican Official Standards in Biosafety matters;

XIII. Establish biosafety- ensuring control measures as well as the corresponding sanctions and fairs in case of failure or breaching to this Statutory Instrument disposals, its regulations and the Mexican Official Standards which may detached thereof;

XIV. Establish mechanisms for involving public participation in biosafety matters in connection with this Statutory Instrument, including information accessibility, private, social and productive sectors participation through the CIBIOGEM's Composite Advisory Council as well as public consultation on OGM's released to the environment applications, and

XV. Establish biosafety and biotechnology scientific and technological research promotion means.

ARTICLE 3rd – For the specific purpose of this Statute, the following is understood as:

I. Accident: Stands for the genetically engineered organisms' involuntary release during their utilization process which may, based on technical criteria, represent possible hazards to human health or either to the environment or biological diversity.

II. Activities: Refers to confined utilization, experimental release, release during pilot programs, commercial release, marketing, imports and exports in connection with genetically engineered organisms in accordance with this Statute.

III. Approval: Stands for the administrative action through which the Health Ministry, within its jurisdiction scope in compliance with this Statute, either approves or authorizes genetically engineered organisms as expressly described hereof with import or marketing purposes as well as utilization aimed to either to public health or bio remediation.

IV. Bio Remediation: Refers to the process in which genetically engineered microorganisms are used for contaminants degrading or disintegration affecting natural resources and/or elements with the purpose to turn them into simpler and less harmful or even harmless components to the environment.

V. Biosafety: Stands for evaluation, monitoring, control and prevention actions and measures that shall be assumed when performing activities involving genetically engineered organisms with the sole purpose to prevent, avoid or even reduce possible hazards posed by such activities against human health, the environment or biological diversity, including innocuousness of those organisms aimed for human use or consumption.

VI. Modern Biotechnology: Is understood as the application of nucleic acid in vitro techniques, including recombining deoxyribonucleic acid (DNA and RNA) as well as nucleic acid direct injection into cells or organelles or cells merge taken beyond taxonomic family and surpassing reproduction, physiological or recombination natural barriers, other than those traditional reproduction and selection techniques, applied to give birth to genetically engineered organisms as described under the Mexican Official Standards detaching from this Statute.

VII. Case by Case: Refers to genetically engineered organisms individual assessment sustained through the available techniques and scientific evidence, by considering among other aspects, by way of illustration and not by way of limitation; the receiving organism, releasing area as well as the characteristics of such genetic modification and the existing background in connection with activities performance using any organism and finally the benefits versus alternative technological options in order to be able to fight the specific issue.

VIII. Source Areas and Genetic Diversity: Refers to all those geographical areas within National territory in which certain species have been domesticated for the first time characterized for lodging wild populations relative to such specific species, different

breeds or varieties thereof which also may constitute a genetic reserve under Articles 86th and 87th terms of the Statute hereof.

IX. Marketing: Refers to the fact of launching into the market, either for distribution or consumption, genetically engineered organisms as products or commodities not intended to be released into the environment and irrespective from profitability activities and legal titles under which this might be carried out.

X. CIBIOGEM: Stands for Genetically Engineered Organisms Biosafety Inter-Secretarial Committee.

XI. CONACyT: Stands for The Science and Technology National Council.

XII. Biological Diversity: Refers to live organisms' variability from any source, included, among others, terrestrial and sea ecosystems as well as other aquatic ecosystems and ecological complexes thereof. Diversity of each and every species is also considered both among species and ecosystems.

XIII. Innocuousness: Refers to sanitary evaluation carried out to genetically engineered organisms aimed for human consumption or use or either for foodstuffs processing aimed to human consumption which main purpose is to prevent damage or hazards posed to population health.

XIV. Release: Refers to the introduction into the environment of genetically engineered organism or combination of organisms without having taken contention or restraint measures such as physical, chemical or biological barriers or a combination thereof to prevent contact whether with the population or the environment.

XV. Commercial Release: Refers to the intended and permitted introduction into the environment of a genetically engineered organisms or a combination of such without having taken restraint or contention measures such as physical, chemical or biological barriers or a combination thereof to limit contact either with population or the environment; carried out with commercial, production, bio-remediation industrial or any other purposes other than experimental or pilot program release as per the terms and conditions expressly stated under the corresponding permission granted.

XVI. Experimental Release: Refers to the introduction, whether intended or permitted, of genetically engineered organism or a combination thereof without having adopted restraint or contention measures such as physical barriers or a combination thereof using chemical or biological restraints with the purpose to limit contact with either population or the environment with experimental purposes as per the terms and conditions expressly stated under the corresponding permission granted.

XVII. Pilot Program Release: Refers to the introduction, whether intended or permitted, of genetically engineered organism or a combination thereof having adopted or not restraint or contention measures such as physical barriers or a combination thereof using

chemical or biological restraints with the purpose to limit contact with either population or the environment; by representing the stage prior to commercial release of such organism provided this is carried out within permitted areas and in compliance with the terms and conditions stated under the corresponding permission granted.

XVIII. Environment: Refers to the biotic, abiotic or men- induced elements entirety making possible human being and other live organisms existence and development interacting within a given time and space outside genetically engineered organisms' experimental facilities or confined utilization scope.

XIX. Organism: Stands for any live biological entity able to reproduce, transfer or replicate genetic material. Included in this category are sterile organisms, microorganisms, virus and viral elements whether cellular or not. For the purpose of this Statute, human beings shall not be considered as organisms.

XX. Genetically Engineered Organism: Refers to any live organism, except for human beings, who has acquired a novel genetic combination generated through the specific use of modern biotechnology techniques as defined in this Statute provided techniques set forth either under this law or under the Mexican Official Standards detaching thereof may be used.

XXI. GEO or GEOs: Stands for genetically engineered organism or organisms.

XXII. Step by step: Refers to such methodological focusing through which all GEOs pretended to be commercially released shall be previously submitted to satisfactory tests in compliance with the applicable risk studies, evaluation of risks and reports of results during experimental release and pilot program release activities in connection with such organisms as set forth in this Statute.

XXIII. Permission: Stands for the administrative action issued either by the SEMARNAT or the SAGARPA Ministries, within the scope of their corresponding jurisdiction according to this Statute, necessary to perform GEOs' experimental release, pilot program release, commercial release and import activities under the terms and conditions set forth herein and which may be derived from the Mexican Official Standards thereof.

XXIV. Products containing genetically engineered organisms: Refers to those elements containing in their composition any or some genetically engineered organisms and intended for commercialization.

XXV. Byproducts: Refers to those elements in which genetically engineered organisms may have been used as raw materials during their production process, including their extracts, provided no live genetically engineered organisms may be contained for commercialization or marketing purposes and for such reason they are not able to either transfer or replicate their genetic material.

XXVI. Registry: Stands for the Genetically Engineered Organisms Biosafety National Registry.

XXVII. Residues: Refers to those materials generated during genetically engineered organisms confined utilization which may be disposed into the environment by including the genetically engineered organisms themselves.

XXVIII. Ministries: Within this context shall mean the Agriculture, Livestock, Rural Development, Fishing and Nourishment Ministry; the Environmental and Natural Resources Ministry and the Health Ministry with regard to their corresponding jurisdiction scopes as stated under this Statute.

XXIX. SAGARPA: Stands for the Agriculture, Livestock, Rural Development, Fishing and Nourishment Ministry.

XXX. SEMARNAT: Stands for the Environment and Natural Resources Ministry.

XXXI. SHCP: Stands for the Treasury and Public Credit Ministry.

XXXII. SSA: Stands for the Health Ministry.

XXXIII. Confined Utilization: Refers to those activities through which an organism's genetic material may be modified or through which such organism, already modified, might be cultivated, stored, used, processed, transported, marketed, destroyed or eliminated provided physical barriers or a combination thereof using chemical or biological elements may be used during activities performance, with the purpose to effectively restrain contact with either population or environment. For the purpose of this Statutory Instrument the installations area or confined utilization scope is not considered as part of the environment.

XXXIV. Authorized Zones: Refers to those geographical areas or regions, which may be determined case by case for permission granting, in which genetically engineered organisms, that had been analyzed, may be released into the environment.

XXXV. Restricted Zones: Refers to those geographical areas which may be determined and delimited, according to permission granted or through Mexican official standards jointly and severally issued by the Environmental and Natural Resources; and Agriculture, Livestock, Rural Development, Fishing and Nourishment Ministries whose scope may restrain genetically engineered organisms activities performance.

ARTICLE 4th – All GEOs biosafety either obtained or produced through the application of modern biotechnology techniques as referred herein, which may be used for agricultural, cattle, aquiculture, forestry, industrial, bio- remediation and any other purposes shall fall within the scope of this Statute, provided the exceptions stated thereof may be taken into account.

ARTICLE 5th – Also, approval of GEOs pretended for human use or consumption or aimed to foodstuffs processing for human consumption in order to accomplish both marketing and imports for marketing purposes falls within the scope of this Statute.



Likewise, as part of this GEOs approval statutory instrument, other than the foregoing, those aimed to public health or bio- remediation are also considered.

ARTICLE 6th – The following is excluded from the scope of this Statute:

I. GEOs Confined utilization activities, experimental release, pilot program release and commercial release, marketing, imports and exports; when genetic engineering of such organisms may be attained through traditional mutagenesis or cellular fusion techniques, including vegetal cells protoplasts, in which resulting organisms may be produced also through traditional multiplication or in vivo or in vitro cultivation methods; provided these techniques do not assume genetically engineered organisms utilization as receiving or parental organisms;

II. Utilization of in vitro fertilization techniques, conjugation, transduction, transformation or any other natural process as well as polypoid introduction; provided neither recombining deoxyribonucleic acid (DNA) nor genetically engineered organisms may be used;

III. Medicines and medications both production and process with GEOs created based on confined processes which regulation falls within the Health Care General Statute scope;

IV. Byproducts sanitary control as well as confined productive processes in which approved GEOs, according to this Statute, may be involved for either human or animal consumption or use, which are thus subject to the Health Care General Statute disposals and the applicable regulations thereof with regard to products and processes;

V. Human genome, human truncan cells cultivation, human germinal cells modification and hospitals biosafety, which regulation may fall within the Health General Statute and the International Treaties scope where the Mexican United States may be involved;

VI. Biological resources collection and utilization, which regulation may fall within the Ecological Balance and Environmental Protection General Statute, Wild Life General Statute and the International Treaties scope where the Mexican United States may be involved; and

VII. Intellectual property of biotechnological processes and products, under the Industrial Property Statute, Vegetal Varieties Federal Law and International Treaties jurisdiction in which the Mexican United States may be an integral party.

ARTICLE 7th – The activities, organisms and products subject to the scope of this Statutory Instrument shall not require, with regard to biosafety and innocuousness matters; permissions, approvals, notifications and, in general, requirements, formalities and restrictions other than those set forth herein.

From the paragraph hereinabove the following is excluded:

I. Those measures which, under general healthiness matters, may be adopted according to the Health Care Ministry jurisdiction as set forth by Health Care General Statute and its

regulations thereof, except for formalities and approvals issuance regulated by this Statute;

II. Those measures which, under animal, vegetal and aquatic healthiness matters, may be adopted according to the Agriculture, Livestock, Rural Development, Fishing and Nourishment Ministry jurisdiction, under the terms set forth by the Animal Sanity Federal Statute, the Vegetal Sanity Federal Statute, the Fishing Statute, the Sustainable Rural Development and other applicable disposals as the case may be, and

III. Those measures which, under environmental matters, may be adopted from time to time according to the Environment and Natural Resources Ministry jurisdiction under the terms set forth by the Ecological Balance and Environmental Protection General Statute, the Wild Life General Statute, the Sustainable Forestry Development General Statute and other applicable laws thereof, except for those in connection with:

A) Environmental impact evaluation and risks study as regulated under Section V, Chapter IV, Title First and Chapter V, Title Forth detaching from Ecological Balance and Environmental Protection General Statute, and

B) Permission granting formalities and issuance and other control and monitoring instruments regulated by this Statute.

ARTICLE 8th – Due to the lack of express availability as described in this statutory instrument, procedures set forth under the Administration Procedure Federal Statute shall govern.

## CHAPTER II

### Biosafety Principles

ARTICLE 9th – For both formulation and conduction of biosafety policy, regulation issuance and the Mexican Official Standards detached from this Statute, the following principles shall be observed:

I. The Mexican country possesses one of the broadest biodiversities of the world and within its territory there are some areas standing for the source and genetic diversity of species and varieties that must be protected, used, empowered, and utilized in a sustainable way since they represent molecules and genes- rich valuable reservoir for the country's sustainable development;

II. Federal Government is liable to guarantee the right of every individual to live within a suitable environment for nourishment, health, development and welfare proper attainment;

III. The purpose of GEOs biosafety is to ensure a proper level of protection with regard to confined utilization scope, experimental release, pilot program release, commercial release, marketing, exports and imports of such organisms resulting from modern biotechnology which might have adverse effects on biological diversity, environmental

preservation and sustainable utilization as well as on human health and animal, vegetal and aquatic sanity;

IV. With the purpose to protect both environment and biological diversity, the Mexican State shall exert precautions enough according to its capacities by taking into account previously established commitments entered into under international treaties and agreements where the Mexican United States may participate. When the possibility of serious or irreversible damage may exist, lack of absolute scientific certainty should not be used as a reason to delay adoption of efficient measures directly connected with costs for preventing environmental and biodiversity degradation. Such measures shall be adopted in accordance with the administrative procedures and provisions as set forth hereunder;

V. Human health, environment and biological diversity protection measures demand due control and management of possible hazards arising out of the activities performed using GEOs through a previous evaluation of such hazards and releasing further monitoring;

VI. Scientists' knowledge, opinion and expertise, particularly domestic, constitute a valuable orientation element for regulation and administration of the activities performed using GEOs to be substantiated upon scientifically- grounded studies and reports. Thereupon, scientific research as well as technological development with regard to biosafety and biotechnology matters shall be promoted;

VII. As for GEOs' confined utilization with teaching, scientific, technological, industrial and commercial research purposes; disposals set forth under this Statute shall be observed as well as the regulations and the Mexican Official Standards detaching thereof and the preventive standards and principles established from time to time by the institutions, centers or companies, whether public or private, performing such activities;

VIII. All possible hazards which might arise out of the activities performed using GEOs against human health and biological diversity shall be evaluated on a case- by- case basis. Such evaluation shall be substantiated through the best available scientific and technical evidence and, as the case may be, upon the existing background with regard to activities performance using such organisms;

IX. GEOs releasing into the environment shall be carried out on a "step- by- step" basis and thereupon, each and every GEO intended for commercial release shall be previously subject to satisfactory tests according to the applicable risk studies, risks evaluation and reports of results for experimental release and pilot program release activities of such organisms under the terms set forth hereof;

X. Adverse effects caused by GEOs releasing against biological diversity shall be duly monitored by also taking into account the possible risks posed against human health;

XI. Administrative procedures aimed to permission and approvals granting to perform activities involving GEOs shall be both efficient and transparent. In consideration to

regulations and the Mexican Official Standards detaching from this Statute; commitments previously established in international treaties and agreements in which the Mexican United States may be involved should be observed in such a way that both context and scope thereof be compatible with such treaties and agreements;

XII. Support to technological development and scientific research with regard to genetically engineered organisms that may contribute to national welfare shall be provided;

XIII. As for the particular problems solution analysis, benefits and possible risks arising out of the use of GEOs should be evaluated on a case- by- case basis. Such analysis shall include the risk evaluation with regard to alternative technological options that may fight the specific problematic for which the GEO was designed. Such comparison analysis shall be substantiated upon scientific and technical evidence as well as on use, production and consumption background and may be used as additional element to the risk evaluation study to decide, in a casuistic way, whether to release the subject matter GEO into the environment or not;

XIV. Proper regulations and authority shall be exerted to prevent GEOs' accidental release into the environment derived from residues produced through any kind of processes in which such organisms might have been used;

XV. Application of this Statute, administrative procedures and criteria used for the due evaluation of the risks arising out of the activities regulated by the Statute herein, control instruments and monitoring of such activities, their regulations and the Mexican Official Standards detaching thereof, inspection and surveillance procedures implemented to verify and confirm compliance with this Statute and disposals arising thereof, application of safety and emergency measures and application of sanctions for breaching this Statute's precepts as well as the disposals detaching thereof shall be the way through which the Mexican Government will act, by exerting precaution and prudence, based on technical and scientific evidence; to prevent, reduce or avoid possible risks resulting from the activities performed using GEOs against human health, the environment and biological diversity;

XVI. Livestock, fishing and aquiculture products biosafety is closely related to vegetal, animal and aquatic sanity. Thus, regulating policy on these matters shall enclose environmental, biological diversity, human health, vegetal and animal sanity aspects;

XVII. The Mexican Government shall cooperate with regard to information and research exchange on socio- economical effects caused by the GEOs, specially at indigenous and local communities, and

XVIII. Experimentation using either GEOs or any other organisms for biological weapons manufacturing and/or utilization purposes is expressly prohibited within National Territory.

### CHAPTER III

#### Jurisdiction With Regard to Biosafety Matters

ARTICLE 10th – The following are competent authorities in biosafety matters:

I. SEMARNAT;

II. SAGARPA, and

III. SSA. The SHCP shall be vested on power enough, according to this Statute, to regulate GEOs and GEOs- bearing products related imports.

ARTICLE 11th – The SEMARNAT shall be vested on power enough and shall be liable to regulate the following with regard to activities performed using any kind of GEOs, except when such GEOs may be the SAGARPA's liability:

I. Contribute in both formulation and application of biosafety general policy;

II. Analyze and evaluate, on a case- by- case basis, all possible risks activities performed using GEOs may pose against environment and biological diversity based upon risk studies and reports of results that may be submitted and prepared on request, in compliance with this Statute;

III. Permission granting and issuance for GEOs releasing into the environment activities as well as the establishment and follow up of binding measures and conditions for such activities in accordance to disposals set forth under this Statutory Instrument, including GEOs release with bio- remediation purposes;

IV. Monitoring of the effects that might be caused by an GEO releasing, whether permitted or accidental, to the environment and biological diversity in accordance with this Statute disposals and the Mexican Official Standards detaching thereof;

V. Participate in both elaboration and issuance of the listings as described herein;

VI. Permission suspension when scientific and technical information available may infer that permitted activity is posing greater hazards than those previously foreseen and which may negatively impact environment, biological diversity, human health or animal, vegetal and aquatic sanity. These two assumptions, upon the SAGARPA's or the SSA's express request and according to their jurisdiction with regard to this Statute, shall be supported on technical and scientific elements;

VII. Arrange and put into effect the corresponding safety or emergency application measures based on scientific and technical elements as well as on the precaution focusing, under the terms of the Statute herein;

VIII. Inspect and supervise fulfillment of the Statute herein, its regulations and the Mexican Official Standards detaching thereby;

IX. Apply administrative sanctions or penalties to those individuals who may breach this Statute precepts, regulations thereon and the Mexican Official Standards therefrom, unprejudiced, as the case may be, of the penalties which may correspond when infringements or omissions with regard to this statutory instrument may constitute a felony and civil and environmental liability which may arise out of, and

X. Others as set forth under Statute hereto.

ARTICLE 12th – It shall be the SAGARPA's sole liability to exert powers vested on by this Statute in the following cases where activities involving GEOs may arise:

I. Vegetables considered as agricultural species, including but not limited to, seeds and any other organism or product which might be considered within the Vegetal Sanity Federal Statute application scope except for those wild and forestry species regulated by the Wild Life general Statute and the Sustainable Forestry Development General Statute, accordingly as well as those included under any protection program as per Mexican Official Standards detaching from such laws or statutes;

II. Animals considered as cattle species as well as those considered within the Animal Sanity Federal Statute application scope, except for those species regulated under the Wild Life General Statute and those under any Mexican Official Standard protection program detaching from the statutes therefrom;

III. Phyto- zoo- sanitary and animal and vegetal nutrition raw materials;

IV. Fishing or aquatic species, except for those under any protection program drawn by the Mexican Official Standards;

V. GEOs used for immunization with the purpose to protect and prevent animals disease spreading, and

VI. Other organisms and products as determined under this Statute regulation.

ARTICLE 13th – As for the cases established on paragraph hereinabove, compliance with the following attributions shall be the SAGARPA's sole liability:

I. Participation in biosafety general policy formulation and application;

II. Analyze and evaluate, on a case- by- case basis, all possible risks which may result from GEOs activities performance against animal, vegetal and aquatic sanity as well as to the environment and biological diversity based on both risks studies and reports of results which may be prepared and submitted on request under the terms of this Statute;

III. Permission granting and issuance for GEOs activities performance as well as to establish and follow up conditions and measures such activities shall be subject to in compliance with this statutory instrument disposals;

IV. Monitoring of the effects that might be caused by an GEO releasing, whether permitted or accidental, to the environment and biological diversity in accordance with this Statute disposals and the Mexican Official Standards detaching thereof;

V. Participate in both elaboration and issuance of the listings as described herein;

VI. Permission suspension when scientific and technical information available may infer that permitted activity is posing greater hazards than those previously foreseen and which may negatively impact animal, vegetal and aquatic, environment, biological diversity or human health. These two assumptions, upon the SEMARNAT's or the SSA's express request and according to their jurisdiction with regard to this Statute, shall be supported on technical and scientific elements;

VII. Arrange and put into effect the corresponding safety or emergency application measures based on scientific and technical elements as well as on the precaution focusing, under the terms of the Statute herein;

VIII. Inspect and supervise fulfillment of the Statute herein, its regulations and the Mexican Official Standards detaching thereby;

IX. Apply administrative sanctions or penalties to those individuals who may breach this Statute precepts, regulations thereon and the Mexican Official Standards therefrom, unprejudiced, as the case may be, of the penalties which may correspond when infringements or omissions with regard to this statutory instrument may constitute a felony and civil liability which may arise out of, and

X. Others as set forth under Statute hereto.

ARTICLE 14th – As for those cases in which the SEMARNAT is responsible for the arrangement, acquaintance and resolution of a permission request, with regard to wild and forestry species, this ministry shall submit the corresponding file before the SAGARPA for this body to issue the corresponding judgment.

ARTICLE 15th – As for those cases falling within the SAGARPA's jurisdiction, the SEMARNAT shall be liable for:

I. Issue the corresponding biosafety opinion, prior to SAGARPA's resolution, with regard to the analysis and risk evaluation carried out based on the study prepared and submitted upon request by the involved parties in connection with the possible risks that GEOs activity, whichever type, may cause to the environment and biological diversity when dealing with permission requests aimed to the experimental release of such organisms or based upon reports of results and information attached by the involved parties to their permission requests with regard to pilot program release or commercial release;

II. Request the SAGARPA permission effect suspension, expressly issued by such Ministry, when relying on scientific and technical information inferring that allowed

release activities pose risks greater to those previously foreseen which may negatively affect both the environment and biological diversity, and

III. Proper discharge of its duties as stated under fractions I, II, IV, V, VII and VIII detaching from Article 11 hereinbefore.

Biosafety opinion report referred on Fraction I herein shall be bonding prior to permission granting according to SAGARPA's jurisdiction and shall be issued under the terms set forth under Article 66th detaching from this Statute.

ARTICLE 16th – It shall be the SSA liability the discharge of the following duties in connection with GEOs:

I. Actively participate in biosafety general policy formulation and application;

II. Evaluate, on a case- by- case basis, all the studies prepared and submitted by the involved parties with regard to innocuousness and possible risks posed by the GEOs subject to approval under the terms set forth on Title Fifth of this Statute;

III. Grant and issue all GEOs approvals as referred on paragraph hereinabove;

IV. Participate in both elaboration and issuance of the listings as described herein;

V. Arrange and put into effect the corresponding safety or emergency application measures based on scientific and technical elements as well as on the precaution focusing, under the terms of the Statute herein;

VI. Request the SEMARNAT or the SAGARPA, as the case may be, supported on scientific and technical elements; permission granted force suspension with regard to GEOs release into the environment when information available may infer that the activity permitted by such Ministries may pose risks greater than those foreseen thus affecting human health;

VII. Inspect and supervise compliance with this Statute, its regulations and the Mexican Official Standards therefrom;

VIII. Impose administrative sanctions or penalties to those individuals who may breach this Statute precepts, regulations thereon and the Mexican Official Standards therefrom, unprejudiced, as the case may be, of the penalties which may correspond when infringements or omissions with regard to this statutory instrument may constitute a felony and civil liability which may arise out of, and

IX. Others as set forth under Statute hereto.

The SSA shall be liable to perform all the GEOs, their products or byproducts sanitary and epidemiologic surveillance actions in compliance with the Health General Statute and its statutory disposals.



ARTICLE 17th – In case of GEOs accidental release, the Ministries shall coordinate efforts in order to, within the scope of their respective jurisdictions according to this Statute, impose and enforce the necessary measures to prevent a negative impact against biological diversity, human health or animal, vegetal and aquatic sanity, as the case may be.

ARTICLE 18th – It shall be SHCP's liability to exercise the following duties with regard to GEOs imports and products containing such organisms:

I. Verify, at the national territory entry customs offices, that GEOs being imported and aimed either for release into the environment or the end purposes stated under Article 91st hereunder, have the corresponding permission and/or approval, as the case may be, as per the terms of this Statutory Instrument;

II. Verify that all documentation attached to the GEOs being imported into the country specify the identification requirements set forth under the Mexican Official Standards detaching from this Statute;

III. Participate, jointly and severally with the other Ministries, in the Mexican Official Standards issuance relative to storage or placement of GEOs, or products containing such organisms, at the very customs reservoirs within National Territory;

IV. Immediately notify the SEMARNAT, the SAGARPA and/or SSA about the infringements commission likelihood to this Statute precepts with regard to GEOs import matters, and

V. Restrain GEOs and products containing such organisms' entry into the country in those cases in which such organisms and products do not rely on a proper permission and/or approval, as the case may be, for their import according to this Statute. The SHCP shall exercise the aforementioned duties, unprejudiced of those conferred by customs law, applicable to commodities imports.

#### CHAPTER IV

##### Coordination and Participation Matters

ARTICLE 19th – CIBIOGEM is an Inter- Secretarial Committee whose main purpose is to formulate and coordinate Federal Civil Service policies relative to GEOs biosafety, and shall have all duties as described by statutory disposals thereby and in accordance with the following principles:

I. CIBIOGEM shall be integrated by the Agriculture, Livestock, Rural Development, Fishing and Nourishment Ministry; Environment and Natural Resources Ministry; Health Care Ministry; Public Education Ministry; Treasury and Public Credit Ministry and the Economics Ministry holders as well as by the CONACyT General Director;

II. CIBIOGEM shall be constituted by a Chairmanship which shall be rotational among the Agriculture, Livestock, Rural Development, Fishing and Nourishment Ministry; Environment and Natural Resources Ministry; Health Care Ministry holders and whose exercise, functions and period of appointment shall be determined under the corresponding statutory disposals. Also, a Vice Chairmanship shall exist and holder to this shall be the CONACyT General Director who, in the absence of the Chairman, shall chair all sessions, cooperate with both the Committee and the Executive Secretariat in the exercise of their functions and shall perform activities conveyed by the CIBIOGEM itself under the terms set forth by statutory disposals detaching hereby;

III. CIBIOGEM may invite other entities and bodies to participate, with right to vote, in the agreements and decisions made in connection with the specific object as well as the Advisory Council members;

IV. CIBIOGEM shall rely on an Executive Secretariat who shall be appointed by the President of the Republic upon proposal submitted by the CONACyT General Director and approved by the CIBIOGEM itself. Shall be vested on powers as set forth under statutory disposals detaching from this statutory instrument and, shall be liable to enforce and follow up the Committee's agreements as well as other duties as conveyed from time to time;

V. CIBIOGEM's Executive Secretariat shall rely on organizational structure, previously approved by the CIBIOGEM, and shall be considered as an administrative unit depending on the CONACyT in compliance with this semi- state Constitutional Law, and

VI. CIBIOGEM shall also rely on a Technical Committee integrated by competent coordinators, general directors, or their equivalent, on the subject matter who may be appointed, form time to time, by the entities and bodies' holders being CIBIOGEM's integral part. Such Committee may propose the creation of specialized Sub- committees for specific issues and shall be vested on powers as determined under the statutory disposals detaching from this Statute.

ARTICLE 20th – The CIBIOGEM's Scientific Advisory Council is hereby created and shall act as the CIBIOGEM's mandatory consultation organization with regard to technical and scientific aspects on GEOs modern biotechnology and biosafety. It shall be integrated by a team of experts in the different disciplines coming from centers, research institutions, widely known corporations or scientific academies which shall exercise personally exercise all their duties, irrespective from the institution, corporation or company they are part of or rendering their services to. Such team of experts shall expressly state under a commitment letter, at the time of registration as Scientific Advisory Council members; that such activity does not involve a conflict of interests. Scientific Advisory Council members' eligibility shall be carried out through public citation jointly issued by the CONACyT and the Scientific and Technological Advisory Forum as foreseen under Science and Technology Statute. Among the Advisory Council duties; research, analysis and methodologies and technical reports protocol formulation which might be reimbursed shall be foreseen. Advisory Council specific duties as well as

progressive and regular interval members' renewal mechanisms shall be duly set forth under statutory disposals detached herein.

ARTICLE 21st – The CIBIOGEM's Composite Advisory Council is hereby constituted and shall act as the CIBIOGEM's ancillary organization for consultation and opinion. It shall be integrated by private, social and productive sectors' associations, chambers or companies' representatives. Its underlying object shall be acquaintance and opinions issuance with regard to social and economical aspects as well as other relevant to statutory and development policies as well as with regard to those standardization priorities and formalities and procedures enhancement in GEOs biosafety matters. The Composite Advisory Council specific duties as well as the mechanisms to be applied on members' eligibility shall be stated by the CIBIOGEM.

ARTICLE 22nd – CIBIOGEM shall be liable to issue all its operation rules in which participation mechanisms shall be established for the members and representatives of the different academic, scientific, technological, social and productive sectors, featuring a well-known reputation and experience on the subjects directly related to the subject matter activities herein, to actively participate through opinions, studies and consultations with regard to biosafety, biosafety and biotechnology research and development policies knowledge and evolution as well as to receive and hear opinions, studies, and consultation on such matters.

ARTICLE 23rd – CONACyT's budget shall rely on the necessary resources for the due development of CIBIOGEM's activities, the Executive Secretariat and the Advisory Council in accordance with the budget approved by CIBIOGEM. Such resources shall be administered and enforced by the CIBIOGEM's Executive Secretary.

ARTICLE 24th – The Ministries may establish scientific- technical committees for support in the due resolution of permissions and approvals requests files as well as on notification matters. Statutory disposals hereof shall determine such committees' organization and operation basis.

## CHAPTER V

### Coordination with Federal Entities

ARTICLE 25th – The Federation, through the Ministries' jurisdiction scope and under the terms of the applicable disposals, prior notification to CIBIOGEM, may enter into coordination agreements by and between federal entities governments, with the purpose to:

I. Establish concurrent collaboration with regard to risks or hazards monitoring which may be caused by the GEOs releasing into the environment activities, whether experimental or pilot program, which might be stated, from time to time, under such agreements, and

II. In its case, with regard to actions aimed to compliance surveillance of the disposals hereof.

ARTICLE 26th – Those coordination agreements entered into by and between the Federation and the federal entities governments for the purposes referred on article hereinabove, shall be adhered to both the applicable disposals and the following principles:

I. Accurately define matters and activities constituting the subject matter agreement object;

II. The purpose of such agreements shall be congruent to biosafety policy;

III. All goods and resources provided by the parties shall be accurately described by clarifying specific destination and ways of management. For such purpose, the Federation shall contribute to the strengthening of institutional and financial capacities;

IV. Means, procedures and necessary resources provided by competent Ministries shall be determined with the purpose the federal entity governments may be capable to carry out the subject matter activities and actions as stated under the aforementioned agreements;

V. Agreement force as well as termination conditions and controversy settlement and, in its case, prorogation terms shall be duly specified;

VI. The organization or organizations in charge to carry out actions resulting from coordination agreements shall be defined;

VII. Actions to promote and jointly participate in biosafety and biotechnology scientific and technological research shall be determined;

VIII. Detailed reports submittal liability with regard to coordination agreements' subject matter object compliance shall be established;

IX. Shall contain all other statutes which, from time to time, may be deemed as necessary by the parties for the due fulfillment of the aforementioned agreement. Agreements as referred herein shall be published under the Federal Official Diary and also by the corresponding local government's official forecasting instrument.

ARTICLE 27th – Federal entity governments shall have permanent access to the information entered in the Genetically Engineered Organisms Biosafety National registry. Likewise, CIBIOGEM, through its Executive Secretariat; shall notify federal entity governments about the GEOs commercial release into the environment permissions intended to be carried out at their locations with the purpose to acquaint them about such situation and for they to issue their opinions according to the terms of the Statute hereof. Notification shall be issued within a term which shall not exceed twenty days following to the corresponding permission request has been received by the CIBIOGEM for insertion into the registry.

## CHAPTER VI

### With Regard to Technological and Scientific Research Development On Biosafety and Biotechnology Matters

ARTICLE 28th – The Federal Executive shall be liable to develop, support and strengthen all scientific and technological information with regard to biosafety and biotechnological matters through the policies and statutory instruments set forth herein and under the Science and Technology Statute.

ARTICLE 29th – In order to achieve scientific and technological research development with regard to biosafety and biotechnology matters, a program aimed to biosafety and biotechnology development shall be established and shall be considered as a program whose formulation shall be the CONACyT sole liability based on proposals submitted by the different Ministries and other entities and regulation bodies directly depending on the Federal Civil Service either supporting or performing scientific research and technological development. In such process, opinions and proposals submitted by the scientific, academic and technological communities as well as the productive sector, previously summoned by the Scientific and Technological Advisory Forum and the CIBIOGEM shall be taken into account.

The aforementioned program shall be integral part of a Science and Technology Special Program as set forth by the Science and Technology Statute.

ARTICLE 30th – The biosafety and biotechnology development program shall at least contain diagnosis, policies, strategies and general and sector actions with regard to:

I. Scientific research;

II. Innovation and technological development;

III. High- level technologists, researchers and professionals training;

IV. Scientific and technological knowledge forecasting;

V. National and international cooperation;

VI. Biosafety culture strengthening, and

VII. Regional development and decentralization.

ARTICLE 31st – The CONACyT shall create a Biosafety and Biotechnology Technological and Scientific Research Support and Development Fund according to Science and Technology Statute to which all tax resources provided by the entities and regulation bodies for such purpose shall be destined as well as third parties resources and incomes arising out of rights as determined by taxation disposals or derived from actions in the due fulfillment of this Statute.

**TITLE SECOND**  
**Pertaining to Permissions**

**CHAPTER I**  
**Common Disposals**

**ARTICLE 32nd** – The following activities shall require permission:

I. Experimental release into the environment, including imports in connection thereof, of one or more GEOs;

II. GEOs' pilot program release into the environment, including imports in connection thereof;

III. GEOs' commercial release into the environment, including imports in connection thereof.

**ARTICLE 33rd** – Once the corresponding Ministries are delivered with the permission request for GEOs release into the environment, provided all requirements and information as requested herein are attached, shall be handed over to the Registry to perform the corresponding entry and advertising. Once achieved the foregoing, the Ministry in charge of granting GEOs releasing permissions into the environment, shall make such request available to the public for consultation. Non- disclosure provisions as foreseen herein shall be considered. Such Ministry may use the means deemed as suitable with the purpose to make available to the public the corresponding permission request. Any person, including the governments of the federal entities in which the corresponding release is pretended to be carried out, may issue their opinion duly substantiated both technically and scientifically, within a term no longer than twenty business days counted as of the date in which the corresponding request may be available to the public as per the terms of the Article hereto.

Opinions issued in compliance with disposals stated on paragraph hereinabove shall be considered by the corresponding Ministries for the due establishment of additional biosafety measures, in case the corresponding GEOs releasing into the environment permission issuance may proceed according to the terms hereof.

**ARTICLE 34th** – The corresponding Ministry shall issue a duly grounded and motivated resolution, once both the information and documentation handed over by the interested party, with regard to reports or opinions which might be issued by the responsible Ministries in compliance with this Statute and, if applicable, the GEOs approval issued by the SSA under the terms of this statutory instrument. To issue a resolution, the corresponding Ministry shall:

I. Issue the corresponding permission granting for performing release into the environment activities, as the case may be, by establishing additional monitoring, control, prevention and safety measures to those proposed by the interested party at the time of permission request, or

II. Permission shall be denied in the following cases:

- A) When application request do not comply either with this Statute or the Mexican Official Standards as requirements for permission granting;
- B) When the information furnished by the interested party, including that information relative to the possible hazards which might be caused by the GEOs, is false, incomplete or insufficient, or
- C) When the corresponding Ministry may conclude that all hazards and risks posed by the GEOs shall negatively impact human health and biological diversity or animal, vegetal or aquatic sanity by causing serious or irreversible damages.

ARTICLE 35th – Time periods established by this Statute with regard to permission granting resolutions pertaining to GEOs release into the environment activities, whether experimental or pilot program, shall be prorogued in the specific case the interested party do not rely on the SSA approval according to this statutory instrument terms, provided such approval may be a requirement for the due issuance of the corresponding permission.

ARTICLE 36th – GEOs experimental, pilot program or commercial release into the environment shall enforce import permissions pertaining to such organisms to be experimentally, pilot program or commercially released, as the case may be, under the terms and conditions as established from time to time in the corresponding permissions. The foregoing, unprejudiced of whichever GEOs' imports, shall be subject to the phytosanitary or aquiculture regulation established in the law which might be correspondent.

Likewise, in the specific case other countries may notify the corresponding Ministry about GEOs exports with the purpose to import such organisms and be released into the environment within the national territory, such Ministry shall issue the corresponding acknowledge receipt provided this requirement may be established in the international treaties and agreements in which the Mexican United States may be a part and irrespective such GEOs and their related release into the environment activities may be subject to the disposals set forth herein.

ARTICLE 37th – Monitoring, prevention, control and safety measures arising out of GEOs utilization possible risks as established by the corresponding Ministry permissions may comprise, among others, the following aspects:

I. GEO Handling;

II. Safety measures to maintain the possible risk within the tolerance limits approved in the evaluation, and

III. Monitoring of the related activity with regard to the possible risks which might be generated by such activities.

ARTICLE 38th – The Ministry in charge of permissions issuance may modify, from time to time, monitoring, control and prevention measures as well as to request the interested party to implement new measures and also suspend or revoke such permission, prior

summon granted to interested parties, whenever scientific or technical information from which it might be inferred that the subject matter activity may pose a risk either greater or minor than those originally foreseen in the corresponding studies. The foregoing shall be established in the permissions issued by the competent Ministries.

ARTICLE 39th – Permission holder shall be liable to observe and comply with all monitoring, control, and safety measures as set forth in the permission as well as disposals stated in this statutory instrument its regulations and the Mexican Official Standards thereby which may be applicable with regard to releasing activities. Failure to fulfill measures and disposals referred herein shall be cause to determine the corresponding liability as well as the application of the corresponding sanctions which may be correspondent according to this Statute.

ARTICLE 40th – Imports of GEOs or products containing such organisms shall be prohibited into national territory in the specific cases in which such organisms may be prohibited in the country of origin or might be classified under the corresponding listings as not allowed for either commercial release or imports with the purpose to carry out such activity.

In case such organisms and products may be prohibited within the country of origin or in a country other than the origin, the corresponding Ministry shall study the reasons of such decision with the purpose to determine if such prohibitions are applicable and therefore, if they should be adopted or not within national territory. The possible existence of other endangering reasons for human health, the environment and biological diversity shall be also considered.

ARTICLE 41st – Activities using GEOs or any other organism whatsoever aimed to manufacturing and/or utilization of biological weapons are expressly prohibited.

## CHAPTER II

### Requirements for Permission Attainment

#### SECTION I

##### Experimental Release into the Environment Permission

ARTICLE 42nd – Permission request to perform GEOs experimental release into the environment, including related imports in connection with such activity, shall be attached to the following information:

I. GEO's characterization which shall consider regulations stated, for each particular case, under the Mexican Official Standards detaching from this Statute;

II. Identification of the area or region where the GEO is pretended to be experimentally released, including total surface specifications where releasing is to be carried out;

III. A study of the possible risks which may be caused by GEOs releasing to the environment and biological diversity. Moreover, in such cases falling within the



SAGARPA's scope, the aforementioned study shall contain all elements relative to the risks the release of such organisms may cause to animal, vegetal or aquatic sanity;

IV. All activity and biosafety monitoring procedures and measures which shall be carried out at the time of releasing the organism and afterwards;

V. In its case, all considerations with regard to the available technological alternatives' risks to fight the problem for which the genetically engineered organism pretended to be released was constructed.

To obtain the experimental release into the environment permission, it shall be required that applicant rely on the GEO approval issued by the SSA in compliance with this Statute, when such organism may be aimed for either public health or bio remediation. The applicant may start formalities to attain such permission before the competent Ministry, nevertheless, such permission shall not be granted until approval by the SSA may be accredited under the corresponding file.

ARTICLE 43rd – Individuals interested on GEOs imports for experimental release into the environment, besides what is established on paragraph hereinabove, shall attach to their request all information and documentation evidencing that the GEO release is permitted according to the country of origin laws, at least in experimental stage. For such purpose approval or official documentation evidencing the aforesaid situation shall be attached therein. In such case, the interested party shall deny the situation and submit consideration elements sustaining the application to be solved by the corresponding Ministry.

ARTICLE 44th – Resolution for GEOs experimental release permission application shall be issued within a maximum term which shall not exceed six months counted as of the following day on which the resolving Ministry has acknowledged receipt of permission application provided information furnished by the interested party is complete.

ARTICLE 45th – If during a GEO experimental release into the environment, following to permission granting, the situations described hereinbelow may arise:

I. Any modification with regard to releasing activities which might increase or decrease possible risks to the environment and biological diversity, or

II. New scientific and technical information on such risks may be available.

In such cases, permission holder shall be liable to:

A. Immediately notify the corresponding Ministry about such situation;

B. Verify monitoring and biosafety measures specified in the documentation furnished, and

C. Adopt the necessary biosafety measures.

ARTICLE 46th – The Experimental release into the environment permission holder shall acquaint the forwarding Ministry, through a written report, about the results obtained from the releasing activity or activities in connection with the possible risks that might be caused to the environment and biological diversity. Characteristics and content of the

report referred in this Article shall be set forth under the Mexican Official Standards detaching from this Statute.

ARTICLE 47th – Permission holder shall be liable to immediately notify the corresponding Ministry any situation which might increase or decrease the possible risks to the environment, biological diversity and/or human health during permitted releasing activities.

ARTICLE 48th – The corresponding Ministry may limit experimental release into the environment permission force by considering file elements.

ARTICLE 49th – GEOs experimental releases into the environment shall be carried out in accordance to the terms and conditions set forth in the permission. In the specific case such permission may include performance of several releases of the same GEO within the same geographical area as established under permission terms, notification of each release performed may be also established under such permission.

## SECTION II

### Pilot Program Release into the Environment Permission

ARTICLE 50th – Permission request to perform GEOs release into the environment in a pilot program, including imports in connection with such activity, shall be attached to the following information:

I. Permission for the GEO experimental release, whichever type;

II. References and considerations on the report of results regarding experimental release carried out in connection with the possible risks that might be caused to the environment and biological diversity, and additionally to animal, vegetal o aquatic sanity in such cases falling within the SAGARPA's scope according to this Statute;

III. Information in connection with:

A) Total GEO quantity to be released;

B) Handling conditions to be applied with the GEO, and

C) Identification of the areas where the GEO is pretended to be released, including specifications of total surface or surfaces where the subject matter release is to be performed.

IV. Monitoring and biosafety measures to be performed during releasing and following to such activity, and

V. The information which, for each specific case, may be determined by the Mexican Official Standards derived from this Statute.

The foregoing with the purpose the corresponding Ministries rely on sufficient information to perform analysis and evaluation of the possible risks that might be caused

to the environment and the biological diversity or animal, vegetal or aquatic sanity as the case may be in compliance with this Statute.

Attainment of the release into the environment pilot program permission shall be mandatory. Also, the applicant shall rely on the GEO approval issued by the SSA in compliance with this Statute when such organism may be intended for human consumption or use. The interested party may begin all the formalities to obtain such permission before the competent Ministry but shall not be granted until approval by the SSA may be evidenced under the corresponding file.

ARTICLE 51st – Persons interested in importing GEOs for releasing into the environment under pilot programs, additional to specifications stated on paragraph hereinabove, shall attach to their requests the information and documentation evidencing that the GEO release is not prohibited according to the country of origin laws, at least in this stage, by attaching for such purpose the official documentation or approval evidencing such situation. Otherwise, the interested party shall deny the situation and submit consideration elements sustaining the application shall be solved by the corresponding Ministry.

ARTICLE 52nd – Resolution of GEOs release into the environment permission on pilot program shall be issued within a maximum term which shall not exceed three months counted as of the following day on which the resolving Ministry acknowledged receipt of permission request provided information furnished by the interested party is complete. Permission force shall be determined considering all file elements.

ARTICLE 53rd - The release into the environment in pilot program permission holder shall acquaint the forwarding Ministry, through a written report, about the results obtained from the releasing activity or activities in connection with the possible risks that might be caused to the environment and biological diversity. Characteristics and content of the report referred in this Article shall be set forth under the Mexican Official Standards detaching from this Statute.

ARTICLE 54th - Permission holder shall be liable to immediately notify the corresponding Ministry any situation which might increase or decrease the possible risks to the environment, biological diversity and/or human health during permitted releasing activities.

### SECTION III

#### Commercial Release into the Environment Permission

ARTICLE 55th – Permission request to perform commercial release into the environment of GEOs, including imports in connection with such activity, shall be attached to the following information:

I. The corresponding experimental and pilot program release permissions with regard to the specific GEO;

II. References and considerations with regard to the reports of results in connection with performed experimental release and pilot program release under the terms referred on paragraph hereinabove;

III. Specific instructions or recommendations for storing, transportation and, as the case may be, handling;

IV. In its case, releasing and marketing conditions;

V. In its case, considerations of the risks with regard to the technological alternatives available to fight the problem for which the GEO intended for release was constructed;

VI. Other information as determined under the Mexican Official Standards detaching from this Statute.

The foregoing with the purpose the corresponding Ministries rely on sufficient information to perform analysis and evaluation of the possible risks that might be caused to the environment and the biological diversity or animal, vegetal or aquatic sanity as the case may be in compliance with this Statute.

ARTICLE 56th - Persons interested in importing GEOs for commercial release purposes, additional to specifications stated on paragraph hereinabove, shall attach to their requests the information and documentation evidencing that the GEO marketing is not prohibited according to the country of origin laws, by attaching for such purpose the official documentation or approval evidencing such situation. Otherwise, the interested party shall deny the situation and submit consideration elements sustaining the application shall be solved by the corresponding Ministry.

ARTICLE 57th - Resolution of a commercial release into the environment permission request shall be issued within a maximum term which shall not exceed fourth months counted as of the following day on which the resolving Ministry acknowledged receipt of permission request provided information furnished by the interested party is complete.

ARTICLE 58th – Activities and imports following to commercial release permission granting shall be carried out subject to the terms and conditions set forth thereby with no need of subsequent permissions. It shall be understood that subsequent imports shall be carried under the same terms and conditions as established in the corresponding commercial release permission, provided this is the same GEO and same releasing area. The foregoing disregarding such activities may be subject to monitoring or inspection and surveillance actions under the terms stated herein.

ARTICLE 59th – Commercial release into the environment permission for a GEO involves organism marketing approval, whichever type, as well as the products containing such organism; under the terms of this Statute.

### CHAPTER III

#### Risk Study and Evaluation

ARTICLE 60th – Risk evaluation refers to the process through which all possible risks or effects caused by GEOs experimental release to the environment and biological diversity as well as to animal, vegetal and aquatic sanity are analyzed, on a case- by- case basis, based on scientifically and technically grounded studies provided by the interested parties.

Possible risks to human health shall be subject to a risk study in order to attain the GEO approval under the terms of the Statute herein.

ARTICLE 61st – In order to be able to carry out risks study and evaluation, the following guidelines shall be observed:

I. Shall be clearly performed on a case- by- case basis and based on both scientific principles and precautions focusing, under the terms hereunder, by taking into account the experts advise;

II. Shall be carried out in the relevant specialty fields;

III. The lack of knowledge or scientific consensus shall not necessarily be construed as an indication of a certain level of risk, absence of risk or acceptable risk existence;

IV. As minimum base, the possible risks which shall be imposed as a result of non-genetically engineered host organisms release or otherwise parental organisms shall be considered when released within the same environment;

V. Receiving organism, genetic modification, including genetic construction, insertion method and the environment in which such GEO is pretended to be released shall be considered, and

VI. Nature and detail level of the information contained may vary from one case to another depending on the GEO as well as foreseen usage and probable receiving environment.

ARTICLE 62nd – Basic stages to be followed throughout risk study and evaluation are:

I. Identification of new characteristics directly associated with the GEO which might pose risks upon biological diversity;

II. Evaluation on the fact these risks are really occurring by taking into account GEO's exposure levels and type;

III. Evaluation of the possible consequences if such risks would really occur;

IV. Estimation of the possible global risk represented by the GEO based on the evaluation of the likelihood those possible risks and identified consequences really occur, and

V. Recommendation whether possible risks are acceptable or manageable or not, including strategies plan for possible risks handling.

ARTICLE 63rd – Whenever uncertainty with regard to the possible risks the GEOs may cause to biological diversity exists, the corresponding Ministries shall request, within the administrative procedure applicable for the GEOs' release into the environment activity permission; additional information either with regard to specific questions in connection with risks study or the adoption of proper strategies for risks handling and/or GEO monitoring within the receiving environment.

In case of severe or irreversible damage, uncertainty with regard to possible risks level the GEOs might cause to either biological diversity or human health, shall not be used as a reason to prevent the corresponding Ministry to continue adopting efficient measures in order to prevent a negative impact against biological diversity or human health. In adopting such measures, the corresponding Ministry shall take the existing scientific evidence into account and use it as foundation or criteria to establish the measure or measures; the administrative procedures set forth herein and the commercial statutory instrument contained under the international treaties and agreements in which the Mexican United States may be integrating party.

ARTICLE 64th – Additional to the possible risks study, the interested party may submit other studies and considerations in which GEO contribution to remediate environmental, social, and productive or any other problems may be analyzed as well as socio-economical considerations that may exist towards GEOs release into the environment and a risk evaluation about the alternative technological options to fight the specific problem for which the GEO was created or designed. These analyses shall be substantiated on scientific and technical evidence as well as on usage, production and consumption background and might be considered by the competent Ministries as additional elements to decide over whichever GEO experimental release into the environment and subsequent commercial and pilot program releases into the environment accordingly.

ARTICLE 65th – Characteristics and requirements with regard to the possible risks evaluation studies shall be determined in the Mexican Official Standards in connection with this Statute.

#### CHAPTER IV Pertaining to Reports

ARTICLE 66th – Reports falling under the SEMARNAT's liability shall only be required for GEOs experimental release, pilot program release and commercial release which may be within the SAGARPA's scope. Such reports shall be issued within a term no longer than sixty day as of the date the SEMARNAT acknowledges receipt of the administrative file handed over by SAGARPA. Such time period involves both the corresponding report issuance and delivery to the SAGARPA. In turn, the SAGARPA shall issue the corresponding GEOs release into the environment permission provided report issued by SEMARNAT may be favorable.

## CHAPTER V

### Pertaining to Negative Resolutions Reconsideration

ARTICLE 67th – Individuals to whom the corresponding Ministry denied the requested permission may appeal for the subject matter resolution reconsideration to such Ministry, whenever the following may be considered:

I. A change in the prevailing circumstances, that may influence possible risks study results upon which resolution was based, has occurred, or

II. New scientific or technical information may be available from which it might be inferred that the possible identified risks are not those originally foreseen.

Competent Ministry may issue a resolution within the two following months. In case of default, reconsideration appeal shall be dismissed.

ARTICLE 68th – Reconsideration referred on Article hereinabove, shall not, in any way; constitute recourse of remediation or defense and may be promoted by the interested parties irrespective from objection or rebuttal means, as established under this Statute, may be enforced against the resolution directly affecting their jurisdictions.

## CHAPTER VI

### Pertaining to Permissions Revision

ARTICLE 69th – The corresponding Ministry, any time and based on new technical or scientific information with regard to the possible risks the GEOs pose against public health or the environment and biological diversity, may review permissions granted and, as the case maybe, either revoke or suspend their effects according to the procedures established by the statutory disposals detaching hereby when the following may be considered as a reason:

I. A change in the prevailing circumstances, that may influence possible risks study results upon which permission was based, has aroused, or

II. Additional scientific or technical information which may modify any conditions, limitations or requirements in connection with such permission may be available.

## CHAPTER VII

### Confidentiality

ARTICLE 70th – Interested individuals may clearly identify in their permission requests such information that may be considered as confidential according to industrial property or copyrights system. The corresponding Ministry shall be subject to provisions set forth in the subject matter Laws and shall refrain from register and facilitate to third parties the information and data protected by such Laws.

ARTICLE 71st – The following shall not be considered as confidential:

- I. GEOs general description;
  - II. Identification of the interested party or responsible for the activity;
  - III. Purpose, location or locations of the activity
  - IV. Biosafety, monitoring, control and emergency measures and systems, and
  - V. The studies with regard to the possible risks to human health or the environment and biological diversity.
- The information referred on sections hereinbefore shall be for the SEMARNAT's or SAGARPA's exclusive use, according to their jurisdiction scope in compliance with this Statute, once the corresponding permissions may be issued under the terms set forth in this statutory instrument. The foregoing shall also apply to GEOs approval information issued by the SSA in accordance with this Statute.

#### CHAPTER VIII

##### Exports pertaining to GEOs to be Released into Other Countries Environment

ARTICLE 72nd – Persons interested in exporting GEOs to be released into other countries' environment shall notify per se, as determined under statutory disposals detaching hereof; their intention to export such organisms before the competent authorities of the country in which such release is pretended to be carried out. Such notification shall only be issued in case the international treaties and agreements in which the Mexican United States is involved may request so in order to perform export to the subject matter country. Information attached to the aforementioned notification by the applicant shall be accurate, reliable and adhered to what such international treaties and agreements may establish from time to time.

#### TITLE THIRD

##### Pertaining to Confined Utilization and Notices

#### CHAPTER I

##### Confined Utilization

ARTICLE 73rd – GEOs confined utilization may be aimed to teaching, scientific or technical research, industrial or commercial purposes.

ARTICLE 74th – Any person performing confined utilization activities subject to notice submittal requirement according to the terms hereby, shall also comply with the following:

- I. Availability of a registry log for confined utilization activities performed which shall be delivered upon request to the corresponding Ministries;
- II. Apply such confining measures which enforceability may be adapted to the most advanced and streamlined scientific and technical knowledge pertaining to risks



management and treatment, final disposal and residues elimination generated by the GEOs during a given activity, and

III. In case of confined utilization with teaching or scientific and technological purposes, a biosafety internal committee should be created and the principles of the scientific research good practices as well as biosafety rules defined by the biosafety internal committee shall be applied. Such internal committee shall be in charge of the safety and good practices within the facilities as well as to ensure handling safety of the GEOs used in the aforesaid activity.

The Mexican Official Standards derived hereby shall establish:

- A) Requirements and general characteristics which should be contained in the registry log referred herein for each activity type;
- B) Requirements and characteristics relative to confinement, treatment, final disposal, destruction and elimination of GEOs residues;
- C) Handling conditions which shall be required in the different confined utilization ways of such organisms, and
- D) Emergency actions in case of GEOs accidental release.

ARTICLE 75th – GEOs, or products containing such organisms, storage or bonding as well as transportation of such organisms and products throughout national territory shall be subject to the corresponding Mexican Official Standards which may be jointly issued by the competent Ministries with the SHCP collaboration.

ARTICLE 76th - GEOs, or products containing such organisms, transportation and transit of such organisms and products throughout national territory, when final destination may be a country other than Mexico shall be ruled by the Mexican Official Standards which may be jointly issued by the competent Ministries with the Communications and Transportation Ministry collaboration.

## CHAPTER II

### Pertaining to Notifications

ARTICLE 77th – Notification stands for the report which shall be submitted in official formats by the individuals referred herein before either the SEMARNAT or the SAGARPA, as the case may be, in compliance with this statutory instrument and with regard to GEOs confined utilization in such cases as referred in this Chapter.

ARTICLE 78th – Notifications shall be submitted before the SEMARNAT or the SAGARPA, according to the powers vested on such Ministries under this Statute, in the official formats issued for such purpose. Formats content shall be determined by such Ministries prior approval by the Regulation Enhancement Federal Committee. Documentation and information which shall be submitted by the interested party shall be determined in such formats. The aforementioned formats shall be published in the Federal Official Diary.

ARTICLE 79th – The following shall require a notification submittal:

I. GEOs handled, created and produced with teaching and scientific and technological research purposes;

II. Biosafety internal committees integration, including the name of the responsible individuals for such committees;

III. Use of laboratories or specific teaching or scientific and technological research facilities for the first time in which GEOs may be handled, created or produced;

IV. Production of GEOs used in industrial processes, and

V. Use of specific facilities for the first time, as referred on paragraph hereinabove, where GEOs are produced.

ARTICLE 80th – Also, GEOs imports for confined utilization with industrial or commercial purposes shall require a notification submittal in the specific cases the following assumptions may arise:

I. Whereas the subject matter GEOs, not requiring permission, may be exclusively used for confined utilization and therefore may not be imported for release into the environment, and

II. Whereas the subject matter GEOs not requiring approval are not intended for human consumption or use or either for public health purposes.

ARTICLE 81st – Individuals liable to submit a notification before the corresponding Ministry shall be:

I. In the specific cases referred on fractions I, II and III detaching from Article 79th hereinbefore, the person in charge or responsible for the institution, center or company Biosafety Internal Committee where teaching and scientific and technological activities with regard to GEO creation and production may be carried out;

II. In the specific cases referred on fractions IV and V detaching from Article 79th hereinbefore, the legal representative of the company where the subject matter GEOs may be produced.

ARTICLE 82nd – Confined utilization or imports intended for such activity are hereby exempted of notification submittal provided the subject matter GEO may be excluded from such requirement under the listings issued by the Ministries in compliance with the Statute herein.

ARTICLE 83rd – GEOs confined utilization and imports of such organisms for the intended activity may be carried out as of the time the biosafety internal committee or the importer, as the case may be, submit the corresponding notification before the Ministry accordingly.

ARTICLE 84th – Once notification is submitted, the corresponding Ministry may determine, in its case and based upon scientific and technical support, the following:

I. In consideration of the genetically engineered organisms and the possible handling risks, such activity must be suspended;  
II. In its case, it may be resolved that confined utilization requires both adoption and implementation of biosafety measures and requirements additional to those previously stated by the interested party on the notification. The foregoing measures shall be determined by such Ministry and shall be observed and complied by the interested party in order to continue with the subject matter activity, or

III. Ban on either confined utilization or import of the genetically engineered organism, as the case may be, for such activity.

An objection may be raised with regard to such resolution through the revision recourse as established in this statutory instrument.

ARTICLE 85th – Individuals whose confined utilization activity may be subject to the notification submittal requirement shall be liable to observe and comply with all other disposals contained in this statutory instrument as well as the Mexican Official Standards detaching thereby, as applicable.

#### TITLE FOURTH

##### Restricted Zones

#### CHAPTER I

##### Sources and Genetic Diversity

ARTICLE 86th – Species originated in the Mexican United States as well as its genetic diversity and the geographical areas where they are located shall be jointly determined by the SEMARNAT and the SAGARPA based on the available information either on files or data bases, including such information provided by the Statistics, Geography and Computer Science National Institute, the Forestry, Agriculture and Livestock Research National Institute, the Ecology National Institute, the National Committee for Knowledge and Use of Biodiversity, and the National Forestry Committee. The information furnished by the interested parties shall also be taken into consideration when requesting the corresponding permissions or at the time of notifications submittal in accordance with the terms of the Statute herein as well as the international treaties and agreements in connection with the subject matter. Both the SEMARNAT and the SAGARPA shall adopt the necessary measures aimed to protect such geographical areas.

ARTICLE 87th – In order to determine source location and genetic diversity, the following criteria shall be taken into account:

I. That these may be considered as genetic diversity source sites and shall be understood as the regions actually sheltering GEOs' wild relatives populations, including different

breeds or varieties of the same species which thereupon constitute a genetic reserve of such material, and

II. In case of cultivations, the geographical regions where the organism was domesticated for the first time provided the aforementioned regions are genetic diversity source sites.

ARTICLE 88th – GEOs release shall be restricted within source and genetic diversity sites sheltering animal and vegetal species, except for the following cases:

I. When the subject matter GEO may be different to the native species provided its intended release does not cause a negative impact to human health or biological diversity;

II. When the subject matter GEO belongs to the same native species, provided it may be demonstrated that genes exchange cannot be performed or, in the specific case genes exchange may occur, no negative impact shall be caused to human health or biological diversity, or

III. Other cases established by the regulations and Mexican Official Standards detaching from this Statute.

## CHAPTER II

Pertaining to the Activities Carried Out Using GEOs within Protected Natural Areas

ARTICLE 89th – Confined utilization and release into the environment activities using GEOs is hereby restricted within the following federal jurisdiction natural protected areas, created in compliance with the subject matter disposals:

I. Biosphere Reserves;

II. National Parks;

III. Natural Monuments;

IV. Areas for Natural Resources Protection;

V. Areas for Wild Flora and Fauna Protection, and

VI. Sanctuaries.

Prior a case- by- case risks evaluation, the activities described in the following cases may be carried out in the aforementioned zones:

A) In the presence of pests or pollutants that may endanger animal, vegetal or aquatic species existence and when GEOs may be created to specifically avoid or fight such situation, provided the necessary scientific and technical elements supporting the environmental benefit pretended to be attained may be available and that such activities may be allowed by the SEMARNAT under the terms of this Statute;

B) In such special and foreseeable cases with regard to specific products aimed to survival, direct consumption and satisfaction of the basic needs of people and communities within these protected natural areas according to the Mexican Official

Standards and permissions which, as the case may be, may be issued in compliance with this Statute, and

C) In other cases as set forth under the regulations and Mexican Official Standards detaching herein.

ARTICLE 90th – In the statements or assertions through which protected natural areas described on Article hereinabove may be established, as well as in the corresponding handling programs; guidelines, conditions, modalities and limitations to which GEOs confined utilization and release into the environment activities shall be subject, according to the cases mentioned on previous article, shall be included in accordance with the Mexican Official Standards detaching from the Statute herein and the corresponding releasing permissions.

Likewise, in case any source site or genetic diversity source site may be located within any of the protected natural areas referred on previous Article, the assertions and programs described in this article shall be amended in compliance with the terms and conditions of the subject matter law and compliant with determinations referred on Article 86th hereinbefore.

## TITLE FIFTH

Pertaining to Human Health Care in connection with GEOs

### CHAPTER I

Pertaining to GEOs Approval

ARTICLE 91st – GEOs subject to approval are:

I. Those intended for human use or consumption, including grains;

II. Those intended for foodstuff processing for human consumption;

III. Those intended for public health purposes, and

IV. Those intended for bio remediation.

For the purposes of this Statute, GEOs considered for human consumption are also those for animal consumption which might be directly consumed by human beings.

ARTICLE 92nd – A GEO approval request shall be attached to the following documentation:

I. Study of the possible risks which human consumption or use of the aforementioned GEOs may represent for human health. This study shall include scientific and technical information relative to organisms innocuousness, and

II. Other requirements as determined by the Mexican Official Standards derived from this Statute.

Guidelines, criteria, characteristics and requirements of the studies with regard to the possible risks GEOs may pose on human health, shall be therefore set forth by the SSA under the Mexican Official Standards which may be issued compliant with this Statute.

ARTICLE 93rd – In case of GEOs imports approval requests intended for the purposes referred on Article [91st] hereinbefore, besides statements established on article hereinabove, the interested party shall attach both information and documentation evidencing the subject matter GEO is approved compliant with the country of origin laws. Failing that, the interested party shall evidence such situation is not proceeding and therefore shall furnish elements of consideration substantiating the fact the SSA may resolve the aforementioned approval request.

ARTICLE 94th – Once the SSA acknowledges receipt of an approval request, provided such request complies with the information and requirements set forth herein, shall hand it over to the Registry for insertion and advertising accordingly.

ARTICLE 95th – Approvals shall be issued in a term no longer than six months as of the date the SSA acknowledges receipt of the subject matter approval request by the interested party, provided information furnished is complete.

ARTICLE 96th – The SSA shall issue resolution once information and documentation furnished thereof have been analyzed. In the subject matter resolution, the Ministry may, prior substantiation and motivation of facts:

I. Issue approval, or

II. Deny approval in the following cases:

A) Whenever request is not compliant with regulations or Mexican Official Standards set forth hereby as requirements for approval granting;

B) Whenever information furnished by the interested party may be false, incomplete or insufficient, or

C) Whenever the SSA may conclude that risks posed by such organisms shall negatively impact human health causing severe or irreversible damages.

Resolutions issued by the SSA shall be based upon duly substantiated technical and scientific information with regard to the possible risks that might be generated by the GEOs as well as impact against human health by such organisms.

ARTICLE 97th – GEOs approved by the SSA may be freely marketed and imported for commercialization, as well as products containing such organisms and their related byproducts. The foregoing with no prejudice that such approved organisms, products containing them and their related byproducts are subject to the general sanitary control system set forth under the Health Care General Statute, the regulations thereof and, if applicable, phytozoosanitary requirements that may be correspondent.

ARTICLE 98th – Disposals in connection with Title Second hereinbefore shall be applicable to the approval administrative procedure with regard to Negative Resolutions Reconsideration, Permissions Revision and Confidentiality.

## CHAPTER II

### Additional Disposals

ARTICLE 99th – GEOs and products containing such organisms canning procedure either for human use or consumption shall be regulated by the Mexican Official Standards which may be issued, from time to time, by the SSA jointly with the Economics Ministry compliant with the Health Care General Statute, the regulations thereof and the Metrology and Standardization Federal Law.

ARTICLE 100th – Development, production, marketing and, in general processes involving GEOs with therapeutic purposes, additional to the terms set forth herein, shall be subject to the Health Care General Statute disposals and other statutory instruments applicable to medicines and medications.

#### TITLE SIXTH

##### GEOs Labeling and Identification

ARTICLE 101st – Labeling of GEOs, products containing such organisms and byproducts intended for human use or consumption shall be subject to the Mexican Official Standards issued, from time to time, by the SSA jointly with the Economics Ministry in compliance with the Health Care General Statute and the statutory disposals thereof.

In the Mexican Official Standards issuance, the following criteria and general guidelines shall be observed:

I. Labeling of GEOs, products containing such organisms and byproducts shall be subject to the general labeling system established for human use or consumption products as set forth in the applicable disposals;

II. In those cases in which the GEO shows significant changes in its nutritional composition or nutrimental properties or may pose a health risk with regard to its conventional counterpart; such products characteristics shall be stated on the label as a mandatory requirement, and

III. In such cases in which the Mexican Official Standards may establish labeling liability in accordance with disposals set forth in this article, the information contained on the labels, compliant with such standards, shall be feasible, objective, clear, understandable and useful for the consumer and shall also be substantiated on scientific and technical information.

Compliance evaluation with such Mexican Official Standards shall be jointly carried out by the SSA and the Economics Ministry, within the scope of their corresponding jurisdiction, as well by the appointed and authorized individuals in accordance with the Metrology and Standardization Federal Law disposals.

ARTICLE 102nd – Information requirements that shall be contained in the imported GEOs attached documentation, according to this Statute, shall be set forth under the Mexican Official Standards detaching from this statutory instrument by considering the intended purpose of such organisms and disposals established under the international treaties and agreements in which the Mexican United States may be involved. The

Mexican Official Standards, as referred herein, shall be jointly issued by the SAGARPA, the SSA and the Economics Ministry. In the specific case GEOs imports may be intended for releasing such organisms into the environment; the Mexican Official Standards referred herein shall therefore be issued by the aforementioned Ministries and the SEMARNAT.

## TITLE SEVENTH

### Pertaining to GEOs Listing

ARTICLE 103rd – GEOs listing which, compliant with this Statute, may be issued and published shall be the following:

I. GEOs list granted permission for either commercial release or imports for such specific activity;

II. GEOs list rejected permission for either commercial release or imports for such specific activity;

III. GEOs list approved by the SSA

IV. GEOs list not requiring notification submittal, and

V. GEOs list not requiring the SSA approval.

GEOs listing referred in this article shall be regularly issued and published by the competent Ministries, as established on the statutory disposals detaching from this Statute and according to this Title. The intended purpose is to acquaint the interested parties and the public in general about the results from the resolutions issued with regard to permissions and approvals request.

ARTICLE 104th – The GEOs listing, as referred on items I and II of article hereinabove, shall be prepared based on the results obtained from the evaluation, case- by- case; and jointly issued by the SEMARNAT, SSA and SAGARPA and shall be published for acquaintance and forecasting on the Federal Official Diary.

The end purpose of the listings referred herein shall be:

I. Duly indicate judicial situation of such GEOs, and

II. Determine those cases in which the GEOs approved for either commercial release or import intended for such specific activity may be freely imported or released within the permitted geographical areas according to the case- by- case analysis.

In the aforementioned list, the corresponding Ministries may state those cases in which imports, use, handling and release of such organisms may be carried out without limitations, as well as those cases in which specific conditions may be accomplished.

ARTICLE 105th – Approved GEOs listing shall be prepared and issued by the SSA considering the results obtained from the case- by- case evaluation with regard to the possible risks such organisms may pose to human health and shall be published for acquaintance and information in the Federal Official Diary. The end purpose shall be to



duly indicate the judicial situation of such GEOs and determine the cases in which approved GEOs, according to this Statute, may be freely marketed and imported.

ARTICLE 106th – Listing of GEOs not requiring notification shall be jointly issued by the aforementioned Ministries and shall be published for acquaintance and information in the Federal Official Diary. The end purpose shall thereupon be to resolve, on a case- by- case basis; the GEOs which, under confined utilization activities, may be subject to notification submittal are therefore exempted from such requirement in virtue of the low or inexistent risk posed against biological diversity.

ARTICLE 107th – Listing of GEOs not requiring authorization shall be issued by the SSA and shall be published for acquaintance and information in the Federal Official Diary. The end purpose of this listing shall be to resolve those cases in which the GEOs, intended for human use or consumption, may be exempt of such requirement since they do not pose a risk to population's health.

ARTICLE 108th – In the GEOs' listings referred on items I and III of Article 103rd hereinbefore, those GEOs which might be exempt from import permission for commercial release and/or sanitary approval for imports with marketing purposes, may be included in such cases in which international organizations declare through the international treaties or agreements where the Mexican United States may be involved; that the subject matter GEO does not pose risks or adverse effects to biological diversity and/or human health and therefore such requirements are not mandatory for imports into national territory.

ARTICLE 109th – Formulation, issuance and amendment of GEOs informative listings not requiring notifications submittal or approval shall be subject to statutory disposals detaching hereby by taking into account the following guidelines:

Shall be formulated in consideration to:

- I. Nature of the genetically engineered organism;
- II. Existence of sexually compatible species to the genetically engineered organism in the country or region of interest;
- III. The genetically engineered organism sexual reproduction type and sexually compatible native species;
- IV. Nature of receiving or parental organism;
- V. Vector and genetic material insertion characteristics used in the operation;
- VI. Genetically engineered organisms ability and propagation means;
- VII. Existence of parental wild species in some area or region within national territory which might be a source site;

### VIII. Handling scale or volume, and

IX. The possible effects or risks the different activities using such organisms may cause to the environment, biological diversity and human health or animal, vegetal or aquatic sanity.

ARTICLE 110th – Any individual interested in performing activities using GEOs subject to notification submittal requirement, may request the corresponding Ministry exemption of such requirement through the listings. For such purpose, the interested party shall furnish all information and documentation evidencing requested exemption on such listings. The same shall be applicable for GEOs approval exemption.

## TITLE EIGHTH

### Pertaining to Biosafety Information

## CHAPTER I

### Pertaining to Biosafety Information National System

ARTICLE 111th – CIBIOGEM, through its Executive Secretary, shall develop the Biosafety Information National System having as main purpose organize, update and broadcast information with regard to biosafety matters. In such system, CIBIOGEM shall be liable to integrate, among other aspects, the information corresponding to the Registry. CIBIOGEM shall gather relevant reports and documents which may be derived from scientific, academic and technical work activities or any other in connection with biosafety, including GEOs innocuousness; carried out by individuals or corporations, whether domestic or foreign, and such material shall be delivered and organized by the Biosafety Information National System. Besides, shall be liable to prepare and publish, on an annual basis; a detailed report with regard to the existing situation within the country as for biotechnology and biosafety matters is concerned according to this Statute. Moreover, CIBIOGEM shall be liable to perform all socio economical studies and considerations resulting from GEOs' effects released into the environment, especially those related to biological diversity value for local and indigenous communities. Likewise, CIBIOGEM's Executive Secretariat shall act as Core National Center before the Cartagena Protocol Secretariat with regard to the Biological Diversity Agreement on Biotechnology Safety, being responsible to act as a link before such Secretariat and comply with the disposals set forth under Article 19th of the aforementioned International Treaty. CIBIOGEM's Executive Secretariat shall also be liable to provide the Information Exchange Center on Biotechnology Safety, established in the aforesaid protocol; with any information regarding:

I. The existing national statutes, regulations and guidelines for Protocol application as well as information and documentation which may be required, in terms of this Statute, for the administrative procedure with regard to GEOs import permissions intended for experimental release, pilot program or commercial release;

II. Bilateral, regional and multilateral treaties and agreements;

III. Summaries relative to GEOs risk evaluations as well as information pertaining to GEOs' byproducts;

IV. Definite resolutions regarding GEOs imports or release into the environment activities; as well as resolutions amendment resulting from revisions performed compliant with this Statute;

V. GEOs socio- economical effects, especially in local and indigenous communities, and

VI. Compliance reports with liabilities established by the Protocol, including those relative to the application of GEOs import procedure to be experimentally released into the environment, in pilot program or commercially.

Competent Ministries may directly provide the Information Exchange Center on Biotechnology Safety with the information referred on the aforementioned fractions by simultaneously acquainting CIBIOGEM's Executive Secretariat.

## CHAPTER II

### Pertaining to GEOs Biosafety National Registry

ARTICLE 112th – The Registry, which shall be under the CIBIOGEM's Executive Secretariat direction, shall be of public domain having as main object subscription of information relative to GEOs activities and the organisms themselves as well. Operation and what may be considered as subscription shall be determined, from time to time, by the statutory disposals detaching hereby. The SEMARNAT, SAGARPA and SSA shall contribute to the Registry organization and operation.

## TITLE NINTH

### Pertaining to the Mexican Official Standards in Biosafety Matters

ARTICLE 113th – In order to ensure biosafety in GEOs activities, the Ministries, either jointly or through the participation of other Federal Civil Service agencies; shall issue Mexican Official Standards whose main object shall be the establishment of guidelines, criteria, technical specifications and procedures according to the disposals of this Statute.

ARTICLE 114th – In the formulation of Mexican Official Standards in Biosafety matters, provisions compliance with the particular characteristics of each activity or productive procedure using GEOs shall be considered.

ARTICLE 115th – Application of the Mexican Official Standards in Biosafety matters as well as inspection and surveillance activities shall be the competent Ministries sole liability under the terms hereby. Compliance with such standards may be evaluated by certification organizations, verification units and test laboratories previously approved by such Ministries in accordance with the statutory disposals detaching from this statutory instrument and with the Metrology and Standardization Federal Law.

## TITLE TENTH

### Inspection and Surveillance and Safety or Emergency Measures

#### CHAPTER I

##### Inspection and Surveillance

ARTICLE 116th – In order to verify and confirm enforcement of this Statute, the regulations thereof and the Mexican Official Standards detaching thereby; the competent Ministries may perform through duly authorized personnel, inspection and surveillance actions which may be deemed as necessary, through Administrative Units duly authorized for such purpose compliant with this Statute.

ARTICLE 117th – As for requirements and formalities which shall be observed with regard to inspection and surveillance visits performance; additional to this chapter, disposals contained under Chapter Eleventh, Title Third from the Administrative Procedure Federal Law shall be applicable.

#### CHAPTER II

##### Safety or Emergency Measures

ARTICLE 118th – The Ministries, within their jurisdiction scope compliant with this Statute, shall order some or several measures as established hereby in case during GEOs activities performance the following may arise:

I. Risks not originally foresaw which may damage or cause adverse and significant effects to human health or biological diversity or animal, vegetal or aquatic sanity may arise;

II. Damages or adverse and significant effects may be caused to human health or biological diversity or animal, vegetal or aquatic sanity, or

III. Not approved and/or permitted GEOs may be accidentally released into the environment.

In such cases, measures to adopt may be as follows:

A) Temporary, partial or total closure of the sites and/or facilities where GEOs may be handled or stored or where activities performed may give birth to the entailments causing application of such measure;

B) Precaution measures to secure GEOs as well as goods, vehicles, utensils and instruments directly related to or in connection with either the action or omission causing measure application;

C) Temporary, total or partial suspension of the activity motivating application of such measure;

D) Repatriation of the subject matter GEO back to its country of origin;

E) Adoption of the necessary actions and measures to prevent entailments motivating application of such measure continue;

F) Destruction of the subject matter GEO, at the interested party cost, and for such purpose, the following shall be observed:

- a) Shall be applicable in the specific case risks or damages may be severe or irreparable and the motivating risks or damages may only be avoided, mitigated, or alleviated through the application of this measure;
- b) In order to determine the measure application, the competent Ministry shall be liable to issue a report, technically and scientifically substantiated, justifying the reason for the intended GEOs destruction. The interested party shall be acquainted about such situation giving him the opportunity to appeal and, as the case may be, to submit all the available evidence, and
- c) While the competent Ministry issues the corresponding resolution, may order, prior agreement, precaution securing of GEOs. This may be carried out by the Ministry through the interested party.

Likewise, the competent Ministry imposing those measures referred in the article herein may promote, among other competent Ministries, the enforcement of any or several measures set forth under other statutory instruments.

ARTICLE 119th – Whenever competent Ministries may order any of the measures foreseen on article hereinbefore, shall be liable to acquaint the interested party about the actions that must be taken into effect in order to correct those irregularities motivating application of such measures, as well as the time frames to perform such actions with the purpose to withdraw all imposed measures once such actions are duly accomplished. If the interested party may refuse to carry out those actions aimed to correct the irregularities motivating application of such measure or measures, the imposing Ministry shall proceed to immediately charge the reluctant or unwilling person for the total amount.

In case the interested party may apply the corresponding safety or emergency measures or, as the case may be, correct previously incurred irregularities, before the competent Ministry may impose any of the sanctions established in this Statute, this Ministry shall consider such situation in extenuation of the incurred infringements.

ARTICLE 120th – In case of accidental releases of GEOs occurring within national territory and which may have significant adverse effects on the biological diversity or human health in other country, the competent Ministry shall notify such situation to the corresponding authority in the country that may be affected by such release. The aforementioned notification shall include:

- I. Information with regard to estimated quantities as well as characteristics and/or important facts about the GEO;
- II. Information with regard to the related circumstances and the estimated date accidental release occurred as well as the GEO intended use within national territory;
- III. The available information with regard to the possible adverse effects for both biological diversity and human health;

IV. The available information with regard to the possible regulatory measures, assistance and control of the risk, and

V. A contact point in order to obtain additional information.

Unprejudiced of the foregoing, the Ministries, within the scope of their jurisdiction in compliance with this Statute, shall perform the actions and apply the necessary measures to reduce to a minimum any risk or adverse effect that might be caused by the accidentally released GEOs. Such actions and measures shall be directed by the Ministries to the person causing the accidental release of the subject matter GEO into the environment and such person shall be liable to immediately comply with such directions. Failure to fulfill the foregoing shall cause the aforementioned Ministries to proceed in accordance with disposals set forth on second paragraph of article hereinabove.

ARTICLE 121st – Additional to this chapter, disposals contained on Unique Chapter, Title Fifth from the Administrative Procedure Federal law shall be applicable except for those disposals stated on article hereinabove.

## TITLE ELEVENTH

### Infringements, Sanctions and Responsibilities

#### CHAPTER I

##### Pertaining to Infringements

ARTICLE 122nd – The person fully aware of the GEO nature is incurring in administrative infringements with regard to disposals hereby when:

I. Performing activities using GEOs without the corresponding permissions and approvals;

II. Performing activities using GEOs breaching the terms and conditions duly stated on the corresponding permissions and approvals;

III. Performing confined utilization activities using GEOs not submitting the corresponding notifications compliant with the terms set forth in this Statute;

IV. Performing activities using GEOs either subject or exempt from notification submittal non-complying with other disposals established in this Statute, the regulations thereof and the Mexican Official Standards derived therefrom which may be applicable to the particular activity or which may be common to all activities with regard to biosafety matters;

V. Submitting before the competent Ministries false information and/or documentation, as referred herein, including such documentation relative to the possible risks the activities carried out using GEOs might cause to human health or biological diversity;

VI. Failing to comply with sanitary, monitoring, control and prevention measures as described by the interested parties in the information and documentation furnished with

the purpose to obtain the corresponding permissions and approvals as well as those established by the Ministries in the permissions and approvals;

VII. Failing to comply with control and response measures in case of emergency as described by the interested parties in the possible risk studies which the activities performed using GEOs may cause to human health or biological diversity or animal, vegetal or aquatic sanity;

VIII. Failing to comply with the liability to notify or acquaint the Ministries according to the assumptions established in this Statute;

IX. Failing to comply with the liability to adopt and implement additional biosafety requirements and measures previously determined by the Ministries in those cases in which confined utilization is subject to notification;

X. Failing to comply with the liability to review, implement or adopt new sanitary, monitoring, control and prevention measures in such cases as determined by competent Ministries compliant with disposals herein;

XI. Performing activities using GEOs or any other organisms for biological weapons manufacturing and/or utilization purposes;

XII. Performing GEOs' release activities at the source sites and genetic diversity sites in situations different than those specified in this Statute;

XIII. Performing activities using GEOs within the protected natural areas described in this Statute under situations different than those specified herein;

XIV. Failing to comply with the requirement to acquaint the SEMARNAT or the SAGARPA, according to the jurisdiction scope compliant with this Statute, and through the corresponding report, about the results obtained from experimental releases or pilot program releases relying on the corresponding permission;

XV. Importing GEOs not permitted in the country of origin or which might be classified as prohibited either for commercial release or imports for such activity in the listings referred in this Statute, whenever the corresponding Ministries have not positively determined that such banning are not applicable within national territory;

XVI. Submitting unsigned notifications before the corresponding Ministries not compliant with this Statute;

XVII. Not having and/or not providing to the corresponding Ministry the registry log with regard to the confined utilization activities that may be carried out, compliant to the terms set forth hereby and in the Mexican Official Standards derived thereof;

XVIII. Not willing to suspend the confined utilization activity in such cases in which the corresponding Ministries, once notification is submitted by the interested party; may

determine the aforementioned situation and, as the case may be, that the subject matter activity requires additional biosafety measures for achievement.

XIX. Performing confined utilization activities not applying confinement, treatment, final disposal and residues elimination measures to the GEOs generated during activity accomplishment;

XX. Non- compliance with disposals relative to GEOs' generation, treatment, confinement, final disposal, destruction or residues elimination as established in the Mexican Official Standards derived from this statutory instrument;

XXI. Not integrating biosafety internal committees according to the cases, forms and terms established under statutory disposals derived hereof;

XXII. Failing to perform safety or emergency actions or measures established by the competent Ministries as per the specific cases and terms set forth herein;

XXIII. Failing to comply with disposals herein and the Mexican Official Standards derived thereof and relative to products labeling practices containing GEOs and byproducts of such organisms;

XXIV. Failing to comply with disposals hereby and the Mexican Official Standards detaching therefrom in connection with GEOs' identification;

XXV. Performing confined utilization activities using GEOs other than those stated under the notifications submitted as per the terms of this Statute;

XXVI. Performing activities using GEOs other than those permitted or with different purposes to those permitted or approved, and

XXVII. Intentionally release GEOs into the environment without relying on the releasing permissions and, as the case may be, on the corresponding approvals as per the terms of this Statute.

## CHAPTER II

### Pertaining to Sanctions

ARTICLE 123rd – Infringements to the precepts hereby, the regulations thereof and the Mexican Official Standards detaching thereof, as described on article hereinabove, shall receive one or more of the following described administrative sanctions applied by competent Ministries:

I. From five hundred to five thousand days faint based on the general minimum salary in force for the Federal District to whomever may infringe disposals set forth under fractions IV, V, VIII, XIV, XVI, XVII and XXI detaching from Article 122nd herein, and

II. From fifteen thousand and one to thirty thousand days faint based on the general minimum salary in force for the Federal District to whomever may infringe disposals



foreseen under fractions I, II, III, VI, VII, IX, X, XI, XII, XIII, XV, XVIII, XIX, XX, XXII, XXIII, XXIV, XXV, XXVI and XXVII detaching from Article 122nd of this statutory instrument.

In case of repeating the offense, the corresponding faint amount shall be duplicated. For the purposes of the fraction herein, as repeating an offense shall be considered the breeching person incurring more than once in conducts implying infringements to the same precept, within a two- year term counted as of the date on which the competent Ministry may determine, through definite resolution, the commission to be applied to the first infringement provided the aforementioned has not been perverted.

III. Temporary or definite, partial or total closure of the facilities at which infringements have been committed, provided:

- A) Infringements committed pose possible risks or cause adverse effects to human health, biological diversity or animal, vegetal and aquatic sanity;
- B) The offender fails to comply with installments and conditions imposed by competent Ministries in connection with safety or emergency measures, or
- C) This may be a repeated disobedience with regard to the compliance of any safety or emergency measures imposed by the competent Ministries.

IV. Forfeit of instruments, printings, obtained organisms or products directly related with committed infringements;

V. Suspension or abrogation of the corresponding permissions and approvals;

VI. Administrative arrest for up to thirty six hours;

VII. Prohibition of experimental release, pilot program release or marketing of GEOs or the products containing such organisms.

ARTICLE 124th – Sanctions referred on article hereinabove shall be applied and unprejudiced, as the case may be, of the corresponding penalties when such actions or omissions constituting the infringements referred herein shall also constitute a felony, unprejudiced of the civil or environmental liability which may result therefrom; and for such purpose disposals set forth under Article 203rd detaching form Ecological Balance and Environmental Protection General Law shall be applicable.

ARTICLE 125th – Additional to this Chapter and with regard to administrative liabilities; disposals set forth under Unique Chapter, Title Fourth from the Administrative Procedure Federal Law shall be applicable except for Article 70th-A of such statutory instrument.

## TITLE TWELFTH

### Recourse of Revision

ARTICLE 126th – Definite resolutions described under administrative procedures in connection with the application of this Statute, the regulations thereof and the standards

detaching therefore, may be appealed through recourse of revision within the fifteen days following to notification submittal or before the competent jurisdictional instances. Revision recourse shall be filed directly before the forwarding Ministry of such appealed resolution, which as the case may be, shall convey admission and granting or denial of recurring action suspension by turning such recourse to its superior in hierarchy within the same Ministry for definite resolution attainment.

ARTICLE 127th – As for other formalities in connection with recourse of revision substantiation referred on article hereinabove, disposals stated under Title Sixth from the Administrative Procedure Federal Law shall be applicable.

#### TEMPORARY ARTICLES

FIRST. The Statute herein shall enter into force on the thirty days following publication on the Federal Official Diary.

SECOND. Competent Ministries shall issue and publish in the Federal Official Diary the notification formats referred in this statutory instrument within the twenty days following approval granted by the Regulatory Formalities Enhancement Federal Committee.

THIRD. Once issued and published the aforementioned formats as referred on temporary article hereinabove, the interested parties, in compliance with this Statute may be liable to submit notifications, shall submit such formats within a term no longer than ninety days counted as of publication of the aforementioned formats in the Federal Official Diary.

FOURTH. Holders of approvals granted prior issuance of this Statute shall not be affected in virtue of this statutory instrument enforcement with regard to the rights and liabilities referred therein.

FIFTH. Approval requests started prior issuance of this Statute, resolution pending, shall be resolved compliant with judicial and administrative disposals in force at the time such requests were submitted.

SIXTH. The SHCP shall perform all necessary actions to convey all necessary resources which may help the CIBIOGEM's Executive Secretariat and Scientific Advisory Council in the due accomplishment of their duties, and shall approve all positions necessary for the CIBIOGEM's Executive Secretariat due operation.

Actions derived from compliance with this Statute and other disposals detaching therefrom shall be taken into account according to budget availability approved for such purpose on the Federal Civil Service agencies and entities behalf integrating the CIBIOGEM.

The Presidential Agreement through which the CIBIOGEM was created shall be in force with regard to such matters not conflicting with this Statute and until the corresponding statutory disposals with regard to this statutory instrument may be issued.

SEVENTH. Statutory disposals relative to Chapter IV, Title First of the Statute herein, as well as those applicable detaching from Chapters I and II, Title Eighth of the statutory

instrument herein; shall be issued within a term no longer than six months counted as of enforcement date of this statutory instrument. CIBIOGEM shall issue its operation regulations within sixty days following enforcement of statutory regulations referred herein.

EIGHTH. Bidding for integration of the Advisory Council shall be issued within thirty days following enforcement of this Statute, and shall be composed within the three months following bidding publication.

NINTH. CONACYT shall be liable to perform the necessary actions to modify the terms of the trust already established for resources management pertaining to the Inter-Secretarial Committee created through Presidential Agreement published on the Federal Official Diary on November 5th, 1999; in order to comply with this Statute with the purpose to subsequently operate in the future as a Fund for Scientific and Technological Support Development on Biosafety and Biotechnology matters as set forth in this statutory instrument.

TENTH. The biosafety and biotechnology development program referred on Article 29th hereinbefore shall be formulated and issued within a term which shall not exceed one year counted as of enforcement of this statutory instrument.

ELEVENTH. The draft Bills with regard to the Mexican Official Standards referred on Article 50th fraction V, 55th fraction VII, 74th, 101st and 102nd herein, shall be submitted before the corresponding National Standardization Advisory Committees and integrated to the National Standardization Program within a term which shall not exceed six months counted as of enforcement of this statutory instrument in compliance with and for the purposes set forth under the Metrology and Standardization Federal Law. Draft Bills pertaining to other Mexican Official Standards referred in this Statute, shall be submitted within a one- year term counted as of enforcement of this statutory instrument for the purposes referred on paragraph hereinabove.

While the Mexican Official Standards referred on Articles 50th fraction V and 55th fraction VII of this Statute may be issued, both the SEMARNAT and the SAGARPA, within their corresponding jurisdiction scope; may determine the information deemed as necessary with the due participation which may be correspondent to the Regulatory Formalities Enhancement Federal Law within a term that shall not exceed one year counted as of enforcement date of this statutory instrument with the purpose to issue the corresponding permissions.

TWELFTH. All legal disposals opposing to this Statute are hereby abolished.

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