The role of information of the Marine Stewardship Council certification process in developing countries: A case study of two MSC fisheries certified in Mexico

by

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ABSTRACT

Scientific information faces many basic challenges in developing countries that affect its use and influence. Fisheries assessments are an important management tool to assist in the decisions of managers and policy and decision-makers; however, shortcomings with scientific information can hinder the role of assessments in developing countries. The Marine Stewardship Council (MSC) certification program, through its fisheries assessment methodology, gathers information about the impact of fisheries on ecosystems, the status of the fish stocks, and the status of fishery management. The purpose of this research was to develop an understanding of the role of the information of the MSC certification process in order to provide recommendations to developing countries about how to enhance the production of scientific information for fisheries management practices using the MSC's framework. To determine the relation between the information of the MSC certification process and fisheries in developing countries, the research focused on two MSC-certified fisheries in Mexico: The Baja California and the Sian Ka'an and Banco Chinchorro Biosphere Reserve lobster fishery. This study was conducted by a literature review, citation analysis, and semi-structured survey question-naires send to relevant individuals. The results show that the reports produced during the certification process are substantial assessments of the state of particular fisheries. Use of the reports may be limited, however, and may be more conceptual than instrumental in fisheries management. Barriers to the use of the information in developing countries may be overcome by adopting the recommendations arising from this study. The MSC certification program is beneficial not only for socio-economic developments in developing countries but also for the information that is generated in the certification process which can inform fisheries management and increase the research capacity of developing countries.

Keywords: Marine Stewardship Council, developing countries, information use, fisheries information, fisheries certification, Mexican fisheries.

GLOSSARY

For purposes of this research, several terms were defined and used within the context of the Marine Stewardship Council (MSC) program and certification process. The list was compiled using as reference the vocabulary section of the MSC Certification Requirements v.1.3 (2013).

Assessment: a process that connects knowledge and action regarding a problem. Review and analysis of information derived from research for the purpose of informing the decision-making process. It may not require new research and involves assembling, organizing, summarizing, interpreting and reconciling existing knowledge and communicating it to the policy-maker or other actors concerned by the problem. Assessment is used to refer to the initial certification and re-certifications of fisheries.

Assessment tree: refers to the hierarchy of principles, components, performance indicators, and scoring guideposts that are used as the basis for the assessment of the fishery for conformity with the MSC principles and criteria.

Assessment team: two or more assessors conducting a fishery assessment, supported by technical experts (i.e., fisheries experts). *Synonym*: certification team.

Audit: used to refer to the surveillance of a fishery and it is a systematic, independent, and documented process for obtaining and evaluating the evidence to determine the extent to which the criteria are fulfilled.

Certification: procedure by which a third party gives written or equivalent assurance that a product, process, or service conforms to specified requirements (i.e., the MSC standard).

Certification company: body that performs the assessment or certification process, and grants a certificate of compliance with the MSC principles and criteria. A CAB which is accredited by ASI to undertake certification audits of applicants for the MSC certification scheme, issue MSC certificates, and conduct the surveillance within the scope set by Accredited System International. *Synonyms*: conformity assessment bodies, certification body, certifier.

Chain of Custody: procedures implemented by a fishery and subsequent entities handling fish and fish products to ensure that products from a certified fishery are not mixed with products from any other fishery and remain fully traceable during processing, storage, distribution, and sale.

Criteria: a sub-division and the operational tool of the MSC principle.

Fisheries certification methodology: the rules and procedures to be followed by a certification company when assessing and certifying fisheries against the MSC principles and criteria.

MSC Principles and Criteria: refers to the organization standards for sustainable fishing, which are the core of the fisheries certification program.

MSC standard: refers to the organization principles and criteria and all requirements as amended and re-issued from time to time in relation to the certification of fisheries.

Stakeholder: individual or a group affected or interested in the outcome of a decision; includes a large number of persons, e.g., politicians, scientists, citizens, producers, and fishers.

LIST OF ABBREVIATIONS

ASFA: Aquatic Science and Fisheries Abstracts
ASI: Accreditation Services International
BC: Baja California
CAB: Conformity Assessment Body
COBI: Community and Biodiversity
CONAPESCA: National Commission of Fisheries and Aquaculture
CRIPs: Mexico Regional Centers
EIUI: Environmental Information: Use and Influence
eNGO: Environmental non-governmental organization
FAO: Food and Agriculture Organization of the United Nations
FEDECOOP: Regional Federation of Fishing Cooperatives
INAPESCA: National Fisheries Institute
MSC: Marine Stewardship Council
NGO: Non-governmental organization
SAGARPA: Ministry of Agriculture, Livestock, Rural Development, Fishery and Aquaculture
SK-BC: Sian Ka'an and Banco Chinchorro
WWF: Worldwide Fund for Nature

1. Introduction

The world's supply of seafood comes from two main sources: capture fisheries, and aquaculture. With a sustained growth in production and distribution over the last five decades, these two sources supplied the world with an estimated total volume of 154 million tonnes of seafood in 2011 (Food and Agriculture Organization of the United Nations (FAO), 2012).

The problems faced by global marine fisheries have led to the fish stock decline and severe impacts on the ecosystems, and have been widely discussed in the literature. Briefly, these problems revolve around two main issues: overfishing fostered by weak management infrastructure, and harmful and wasteful fisheries practices on the marine ecosystem. Although, some authors report a reduction in the exploitation rates and sustainable management of some stocks (Branch, Jensen, Ricard, Ye & Hilborn, 2011), a high number of overexploited stocks still require better management (Worm et al., 2009).

In light of these issues, private standards and their related certification schemes were created, as market-based tools, to encourage responsible fisheries, and procurement practices of consumers and retailers (Washington & Ababouch, 2011). According to Wessells and collaborators (2001), the fisheries assessment and certification schemes recognize desirable standards in fisheries practices, while the ecolabels convey information to consumers and retailers about the environmental impact of products. In this field, the Marine Stewardship Council (MSC), with its blue ecolabel and fishery assessment methodology, has been a key player in the market of seafood ecolabelling and certification, and provides the most respected fisheries assessment guidelines in the scientific community (Peacey, 2001).

Although comments about the impact of the MSC program in the global fisheries are mixed, Potts and Haward (2007) indicate the important role of the MSC as a non-governmental organization in fisheries management. Furthermore, this role has been described in recent publications showing the interactions of the MSC certification with different stakeholders at national and regional levels, in Canada (Foley, 2012), Australia, United Kingdom, and Canada (Gale & Haward, 2011), and South Africa (Ponte, 2008a; 2012).

In spite of its influence at national and regional levels, today the MSC has had little impact on the world's capture fisheries, having only certified about ten percent of the global reported catch, with 205 fisheries certified, as of June 2013 (Christian et al., 2013; MSC, n.d.a). With regard to the MSC certification in developing countries, the numbers are even lower with only eight percent of the total fisheries certified by the program (Agnew & Olorontuyi, 2012).

Fisheries Management Problem

Fisheries from developing countries harvest almost half of the world's seafood products (FAO, 2010). Currently, Latin America is a major player in the international fish trade, with the top producing countries being Peru, Chile, Mexico, and Argentina (Perez-Ramirez & Lluch-Cota, 2010). In order for the MSC program to influence the problematic trends in world fisheries, developing countries must be considered. However, the implementation of the MSC certification in these countries is constrained due to inherent characteristics of these fisheries, such as: (a) the typical multi-species and multiple small-scale fisheries, (b) data deficiency and lack of science-based information on existing stocks, (c) open access management systems, and (d) weak management structures (Washington & Ababouch, 2011).

The priorities in developing nations differ from developed countries in regard to sustainability, largely because the domestic markets of developing countries are more price-oriented than based on the sustainability of products. However, developing nations' suppliers are also seeking to meet the market standards of their international customers (Perez-Ramirez, Phillips, Lluch-Belda & Lluch-Cota, 2012). These international markets are comprised of countries demanding certified products and with stringent food safety requirements, such as the European Union and the U.S. Therefore, although it is challenging for developing countries to implement the MSC certification, the potential benefits of taking this approach are high; for example, international recognition and acceptability, improved ecological image, and the potential availability of new markets and/or consolidations of previous markets (Perez-Ramirez, Phillips, Lluch-Belda & Lluch-Cota, 2012).

For developing countries, the implementation of the MSC process provides potential management benefits since the ecological sustainability indicators applied are based on the practical application and interpretation of the ecosystem-based and precautionary approaches for fisheries management (Potts, 2006). Consequently, although the MSC certification is often considered a marketing tool, it could also provide significant insights to guide local and national fisheries and marine policies. As the MSC certification process itself is a driver that forces the production of scientific information, it has the potential to enhance the social, governance, and environmental outcomes for developing countries (Gulbrandsen, 2009).

Data and information are important components in every assessment framework, particularly in the analysis of sustainability indicators in fisheries management (Potts, 2006). This information, according to Potts (2006), is part of the input system of the model which constructs the indicators and develops appropriate requirements for policy improvement. Fisheries assessments are a pillar for modern management and assist the decisions of managers and policy makers. The fisheries assessment methodology of the MSC certification scheme is based on indicators to assess the fishery performance on a case-by-case basis.

A lack of scientific data is not only an inherent characteristic of small-scale fisheries in developing countries, but also a barrier for the implementation of fisheries assessment methodologies, in particular, the MSC framework for fisheries assessment. Therefore, the lack of appropriate information for the assessment of a fishery has consequences for the decision-making processes and policy development in developing countries.

Thesis Statement and Research Questions

Based on the premises that the MSC's standards and criteria reward ecological friendly practices and well-managed fisheries, and that the certification methodology is carried out through an internationally recognized fishery assessment framework, the thesis statement for this graduate project is: The information of the MSC certification process has the potential to influence the fisheries management practices in developing countries.

The purpose of this research is to develop an understanding of the information framework that is part of the fisheries assessment methodology of the MSC certification scheme and the use of the MSC reports, in order to provide recommendations to developing countries about how to enhance the production of scientific information for fisheries management practices using the MSC's framework.

It is important to mention that the research goal is to understand the role of the information of the MSC certification process rather than the efficiency of the certification itself. Subsequently, the study focuses on the use of the outputs in the MSC certification process**,** i.e., final certification and surveillance reports**,** instead of the drivers behind the inputs of the process.

In order to determine the relation between the information of the MSC certification process and fisheries in developing countries, this research focused on two MSC-certified fisheries in Mexico: the Baja California and the Sian Ka'an and Banco Chinchorro Biosphere Reserve lobster fishery. Three main questions guide this study:

1. What is the information framework of the MSC certification process?
2. What is the life-cycle of the reports produced for the MSC certification?
3. What is the use of the reports in developing countries' fisheries, in particular in Mexico?

The first three sections in this report set the context of the study: Section 2 presents an overview of the MSC organization, the standard, and the certification process; Section 3 describes the characteristics of information and fisheries information in developing nations; and Section 4 provides a description about fisheries management in Mexico and the case studies. Then, the latter part of the report presents the methodologies (Section 5), results (Section 6), discussion (Section 7), and the conclusion and recommendations (Section 8 & 9).

2. Marine Stewardship Council and the Certification Process

The problems affecting fisheries management worldwide are numerous; however, the development of certification and ecolabelling systems provide an alternative to current management systems from governments and/or the fishery industry (Willmann, Cochrane & Emerson, 2008). Frustration with the traditional approaches to public policy reforms and advocacy for lasting and measurable improvement in the marine environment led to the development of market-based programs to harness the procurement power of consumers and retailers. In this context, the Marine Stewardship Council (MSC) was developed in an attempt to change the current excessive demand for unsustainable products towards a sustainable seafood system that would reduce the fishing pressure on worldwide stocks.

The MSC program was the result of a business-environment partnership created in 1995 between Unilever and the Worldwide Fund for Nature (today World Wildlife Fund, WWF). The motivation for Unilever—the world's largest frozen fish buyer, processor, and retailer at the time—was to ensure the sustainability of its raw business material for the success of its operation. The WWF, the world's largest non-profit organization for conservation, expected a new approach would ensure effective management of the oceans (Willmann et al., 2008). Even though, the motivations of the two organizations were different, their common goal was to reverse the trend of unsustainable fishing by promoting market-based incentives and harnessing consumer power to favor well-managed and sustainable fisheries (May, Leadbitter, Sutton & Weber, 2003).

The MSC certification and ecolabel initiative was launched in 1997; however, immediately after the program began, the organization desired the program to gain international acceptance, credibility, and independence from the business and conservationist model of its founders (Howes, 2008). This was accomplished through the establishment of an international executive body, named the Board of Trustees, and its own funding mechanism (Gulbrandsen, 2009; Ponte, 2012). Since 1999, the MSC has operated independently from its founders. It is registered as a charity in the United Kingdom, has a non-profit status in the United States and Australia, and maintains four offices around the world (Howes, 2008).

Funds for this corporate organization are obtained from two sources: private donors, including the David and Lucile Packard Foundation, and the license fees of MSC-certified products carrying the MSC-logo (Christian et al., 2013; Gale & Haward, 2004). These license fees are managed through the organization's trading arm, the Marine Stewardship Council International, which grants the logo license after the MSC-certified product is awarded the chain of custody certification.

There are three key roles within the MSC certification program: (1) setting of standards, (2) accreditation of fisheries and chain of custody assessment, and (3) setting the logo licensing fees (Peacey, 2001). The accreditation of certification companies, which assess fisheries clients against the MSC standard, is independent from the governance structure (Hough & Knapman, 2010). This process is carried out by a third-party certification company, approved by the Accreditation Services International (ASI) organization. ASI, a German-based company, is responsible for the MSC accreditation program and audits the conformity assessment bodies' competency to assess and certify the fishery clients.

After establishing its first governance structure, the MSC undertook a critical review of its processes and functions in 2000 with the objective to increase the transparency and accountability of the organization (Potts & Haward, 2007). The review was undertaken to address stakeholders' concerns about transparency in the decision-making process, and was carried out by an external panel in consultation with several stakeholders (Gale & Haward, 2004). The process resulted in the multi-stakeholder approach by which the organization operates today and a strength of the program (Gale & Haward, 2004; MSC, 2001; Ponte 2012).

As a multi stakeholder organization, the MSC has three governance bodies: the Board of Trustees, the Technical Advisory Board, and the Stakeholder Council, as well as a number of committees and working groups to address specific topics or regional issues (MSC, n.d.b). The Technical Advisory Board and the Stakeholder Council serve in an advisory role to the Board of Trustees, and are composed of a variety of representatives from industry, the scientific community, and environmental groups from different parts of the world (Howes, 2008; MSC, n.d.a).

The Board of Trustees, the executive body, is the final decision-making authority within MSC's governance structure (Gale & Haward, 2004). It is neither elected nor accountable to the delegated bodies and is composed of an executive, the chairman of the Technical Advisory Board, and the Stakeholder Council (MSC, n.d.b; Ponte, 2012). The Technical Advisory Board is composed of fisheries scientists and experts in chain of custody, certification, and fish processing, and advises the executive body on specific topics related to the setting and review of the standards, logo licenses and chain of custody certification (Gale & Haward, 2004). Finally, the Stakeholder Council represents the specific interests of the broad stakeholders, as it is the participatory forum and public representative in the MSC's governance (Gale & Haward, 2004). The Council is divided into two categories: the public interest, and the commercial and socio-economic sector (Ponte, 2012). The first includes representatives from academia, policy makers, and environmentalist groups, while the latter consists of business and industry associations (Ponte, 2012).

Developing countries are represented in the public interest group; however, until 2010, these nations had a separate category composed of four members (Ponte, 2012). Developing world expertise is also included within the Technical Advisory Board, and has been part of the MSC Board of Trustees (MSC, 2007).

2.1. Principles and Criteria

The MSC certification and ecolabelling program is based on a set of principles and criteria that represent the core of this initiative, and encourages consistency through the fishery and chain of custody assessment process. The principles and criteria are the standards on which the organization's promotion and rewards for sustainable fishing practices are based.

The development of the standard began in 1996, and continued through an 18-month period of global consultation among stakeholders and fisheries experts (Howes, 2008; May et al., 2003). The final product of these consultations was the MSC standards for wild capture fisheries, which drew upon two important international fisheries instruments, the UN Agreement of Highly Migratory Species and Straddling Stocks, and the Food and

Agriculture Organization of the United Nations' (FAO) Code of Conduct for Responsible Fisheries.

The MSC standard is also consistent with the FAO's guidelines for seafood certification and ecolabelling. However, these guidelines came years after the MSC's standard was developed. According to Willmann et al. (2008), the launch of the MSC program was the driver for the discussions within FAO's contracting parties to address this subject; even though other ecolabel programs existed before the MSC. In 2005, the "Guidelines for the Ecolabelling of Fish and Fish Products from Marine Capture Fisheries" were adopted among the contracting parties. This voluntary and legally non-binding international instrument established minimum standards and requirements in the seafood ecolabel process, as well as substantive terminology within the field (FAO, 2009a). That same year, the MSC adopted the FAO's guidelines in its certification scheme by separating standard-setting from the accreditations functions in its governance structure (Gulbrandsen, 2009).

The MSC's principles define an overarching basis for the standard (MSC, n.d.c). These three principles are:

(1) Status of the target fish stock: "*The fishing activity must be at a level which is sustainable for the fish population. Any certified fishery must operate so that fishing can continue indefinitely and is not overexploiting the resources*" (MSC, 2013, p. viii).
(2) Fisheries impact on the ecosystem: "*Fishing operations should be managed to maintain the structure, productivity, function and diversity of the ecosystem on which the fishery depends*" (MSC, 2013, p. viii).
(3) Fisheries management performance: "*The fishery must meet all local, national and international laws and must have a management system in place to respond to changing circumstances and maintain sustainability*" (MSC, 2013, p. viii).

Fisheries voluntarily apply to be assessed against these principles by an independent third-party certification company. A MSC compliant fishery or "fishery client" is defined as an individual, organization, or group of organizations that has some influence over the management of the fishery (MSC, 2010, May 1). This client also needs to have the mechanisms to implement the recommendations or conditions raised by the certification company (MSC, 2010). According to this definition, the MSC program is open to all fisheries, independent of their size, type, or location, and they can range from fishing and

processing organizations to a government management authority or any other stakeholder. However, Foley (2012) makes the distinction that the number of clients does not necessarily imply different fisheries, as different clients can harvest the same fish stocks; therefore, the MSC certifies the fishery client's stock rather than the fish stock.

The client is also responsible for paying the certification company for the assessment process. This certification is valid for five years and is subject to annual surveillance audits. The annual audits serve to monitor compliance with the standard and, when conditions are raised, whether the client is addressing them. With regard to developing countries, the associated cost to each client is one of the limitations of the MSC program in these nations.

According to Peacey (2001), the cost of the MSC certification can be separated into four stages: (1) the pre-assessment, (2) the fishery assessment and surveillance audits, (3) the chain of custody assessment, and (4) the logo license fees. The cost of the first two depends on the size and complexity of a fishery, and is covered by the client (Howes, 2008). The other two stages are paid by companies wanting to use the MSC logo, e.g., retailers and restaurants (Peacey, 2001).

2.1.1. Certification Process

Under the MSC program, there are two certification processes: the fishery certification and the chain of custody certification. The first, named the "MSC Environmental Standard for Sustainable Fishing" is based on the Principles and Criteria and is intended to certify fisheries. The second process, the "MSC Chain of Custody Standard for Seafood Traceability" involves an audit of the certified fisheries' products that carry the MSC label. The two are separate processes but relate to the certification standard (Foley, 2012). Due to an interest in determining the implications of the certification process in developing countries, this study focused on the MSC fisheries certification process rather than the chain of custody certification.

Once a fishery client decides to voluntarily apply for MSC certification, it appoints an independent certification body or conformity assessment body (CAB) to conduct a pre-assessment of the fishery. This pre-assessment is confidential among the parties and provides a brief evaluation about the likelihood the client could meet the MSC standards,

defines the unit of certification and potential problems in the fishery, and sets the estimated cost of a full assessment of the fishery (Chaffee, Phillips & Ward, 2003).

After the pre-assessment process is completed, a confidential report is issued. Then, the fishery client decides whether to move forward with the full fishery assessment or to take the time to implement the observations and conditions raised during the pre-assessment, for example, changes to gear type, bycatch policies, and/or environmental risk assessment (Howes, 2008).

In moving forward with a full assessment, certification bodies follow the MSC's Fisheries Certification Methodology guidelines. The seven stages in this process are (see Figure 1):

1. **Fisheries announcement and selection of the assessment team**. In this stage the fisheries officially identify themselves as clients and the formation of the assessment team begins. The certification company assembles the CAB, which is confirmed through open stakeholder consultation (MSC, 2013). The CAB is composed of an auditor leader and two or three fisheries experts. The CAB expertise is in disciplines parallel to the principles, i.e., stock assessment modeling, marine ecosystems, and fisheries management (Chaffee et al., 2003).

   The client and unit of certification have been previously defined in the pre-assessment stage; however, in this stage the CAB has to clearly identify both, as well as the client group, other eligible fisheries, and a certificate sharing mechanism (MSC, 2010). When it applies, the latter defines the conditions under which other fisheries may gain access to the certification (Foley, 2012).

2. **Building the assessment tree.** Under each of the MSC principles are several criteria that provide general guidelines of operational basis. For example, Principle 1 and 2 have three criteria each, while Principle 3 is divided into two categories (operation and management system) with a total of twenty-three criteria (Howes, 2008). These principles and criteria are then used by the CAB to evaluate each fishery client seeking MSC certification. The principles and criteria are at the top of the assessment tree's hierarchy and are the only section predetermined by the MSC. The performance indicators and scoring thresholds are developed by the CAB and are open to public and stakeholder review and

comments. This flexibility with the rest of the assessment tree ensures that the process can be adapted to assess different types of fisheries with specific local conditions (Bush, Toonen, Oosterveer, & Mol, 2013; May, Leadbitter, Sutton, & Weber, 2003). Each criterion has an operational interpretation developed as performance indicators and measured by the scoring guideposts. In the scoring guidepost, the CAB articulates statements that the fishery should have in order to receive the least (60), the minimum acceptable (80), or the maximum (100) score.

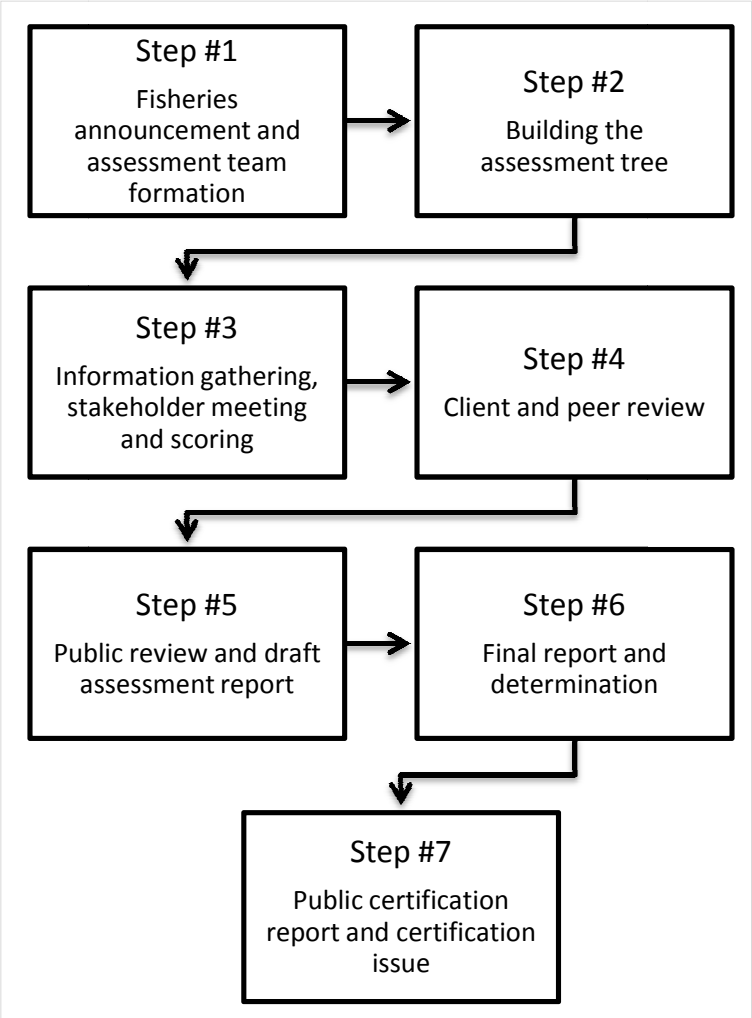


Figure 1. Marine Stewardship Council Certification Process

3. **Information gathering, stakeholder meetings and scoring.** This phase includes information gathering from peer reviewed and grey literature, as well

as site visits and stakeholder meetings (see section 6.1.1). Some of the fishery stakeholders used in this phase were identified in the pre-assessment process; however, the MSC encourages the participation of other relevant stakeholders through its web page (MSC, 2013). This information forms the basis for the preliminary scores of the fisheries against the MSC standard. Once completed, the CAB produces a working document for the next stage of the fisheries assessment.

4. **Client and peer review.** This phase provides an opportunity for the client to provide comments on the working document. Then this report is sent to peer-review for final amendments before being published as a public draft version (Chaffee et al., 2003). These reviewers are peers of the fisheries expert team and have a thorough understanding of the MSC principles and criteria (MSC, 2013).

5. **Public review of the draft assessment report.** Clients' and peer-reviewers' comments are addressed by the CAB and the public draft report is published on the MSC website. In this stage, the general public is invited to comment on the draft report and the fisheries scores.

6. **Final report and determination.** General public inquiries are addressed by the CAB and a final report is produced. The MSC has developed guidelines for consistency in the certification final reports. In general, the report will contain information about the fishery, the assessment criteria, scores and stakeholder consultations, as well as the final decision as to whether the certification is granted. Objections may be filed against the fisheries certification based on the information present in this final report, which is not the equivalent of a final certificate determination (Chaffee et al., 2003).

   The certification can be awarded with or without conditions for ongoing certification. It is the responsibility of the client to develop an action plan that the CAB approves, in order to meet those conditions.

The assessment team's decision to grant the certification is reviewed by an independent panel within the certification company using the final report. Then the final report is given to the MSC.

7. **Public certification report and certificate issue:** The decision to grant the certification is made public and the MSC certification is issued by the certification company.

Annual surveillance audits are monitoring measures required by the MSC to maintain the certification and assurance of the fishery compliance with the MSC standard. The elements reviewed during these audits are: (1) compliance with conditions of certification, (2) inspections of randomly selected areas to assess compliance, (3) changes in the management structure and scientific base information, and (4) changes in personnel and regulations (Chaffee et al., 2003).

3. The Role of Information in Fisheries Management

3.1. Characteristics of Useful Information

Information, in its most general sense, is the assemblage of data, facts, or ideas from multiple sources applied to perform tasks, make decisions, or improve other information sources. This assemblage can take the form of a research or an evidence-based document, either peer-reviewed or grey literature (which also may be peer-reviewed). Use is defined depending on the context and value system of the actors where the information is used (Nutley, Walter & Davis, 2007). The value system is the inherent perception and judgment of the actors (i.e., decision-makers and stakeholders) who define the problem and solution(s). Use of information reflects the priority and power of the actors (Cash et al., 2002; Nutley et al., 2007). Therefore, information and its use is shaped and defined by linkages to the actors' values and the context in which the actors work (Nutley et al., 2007).

Information produced by scientists becomes important for application and use by managers and policy makers; however, the context defines the reasons for use and influence of this scientific information (Soomai, 2009). Wells (2003) has pointed out that the influence of an assessment starts from the rationale of the knowledge creation rather than the final report resulting from it. In this context and value system, useful information not only refers to the content present in the report, but also to the effectiveness of the production process (McNie, 2007). Some reports may have more influence and use than others, which is dependent on the informational environment that the report enters, as well as the format in which the information is presented (Soomai, 2009).

This section provides baseline information about the characteristics of useful information, the types of research uses, and the continuum of research use, as well as what entails useful information in fisheries management. Finally, this section concludes with discussion of fisheries information in developing countries and barriers to the use of such information in the Marine Stewardship Council (MSC) certification program in developing countries.

In addition to the points mentioned above, for information to be useful to an intended audience, it must also display the attributes of being salient, credible, and legitimate

(Mitchell, Clark, Cash & Dickson, 2006). Furthermore, useful information is a balance among these attributes, which are closely interlinked, as too much emphasis on one characteristic can negatively affect the others (Cash et al., 2003).

Salience alludes to the relevance of an environmental assessment for informing the options of a decision-maker or the stakeholders affected by a decision-makers' choice (Cash et al., 2002). In turn, salient information takes into account the scale, the regulatory and legal system, the political landscape, the presentation and communication of information, and the policy and decision-making process (McNie, 2007).

Credibility is an attribute ascribed by a decision-maker or stakeholder who concludes that the information meets scientific adequacy (Cash et al., 2002). Credible information must be perceived by a user as having high quality, validity, accuracy, and judgment based on the scientific process, as well as participants and organizations involved in the production of the assessment (Cash et al., 2002; McNie, 2007).

Legitimacy refers to an actor's perception that the process is unbiased and accounts for the values of multiple stakeholders (Cash et al., 2002). Legitimate information has the characteristic of being transparent and the relationship between an information producer and user is respectful and trustworthy (McNie, 2007).

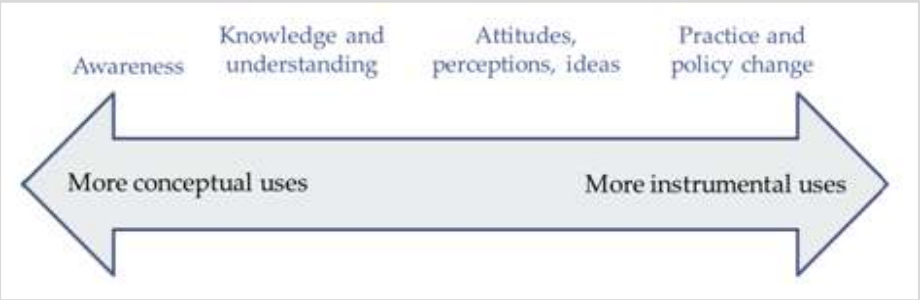


Figure 2. Continuum of Research Use*

* Extracted from Nutley et al., 2007

Use of research can be separated into the types of use and the stages of the research use process. Nutley and collaborators (2007) proposed a framework that merges and complements both aspects. In this framework, the type of research use describes what the use may imply, while the stages note when the use occurs (see Figure 2). The types of research use are placed on a spectrum from conceptual to instrumental. Instrumental use

refers to the direct impact of research in decisions, while conceptual use represents the complex and indirect impacts of research on actors (Nutley et al., 2007). The spectrum of the research use ranges from awareness, knowledge, and understanding of research to changes in attitudes, perception, ideas, practice, and policy (Nutley et al., 2007).

In this study of the information of the Marine Stewardship Council certification, scientific information refers to any research used to inform decision-makers' and stakeholders' choices about the sustainability of a fishery. The domain of fisheries management primarily includes three groups of stakeholders: fisheries policy-makers and managers, fisheries scientists, and fishers (Cash et al., 2002).

3.2. Fisheries information in developing countries

Fisheries scientific information is multidisciplinary and broad in scope, and is characterized by a breadth of knowledge, historical depth, various scales, and a mix of sources, which in turn adds to the complexity of the information requirements for decision-making and policy (FAO, 2009b). In addition, the way fisheries are managed and the participatory mechanisms rooted in the policy and regulatory systems present implications for information providers, users, and decision-makers (FAO, 2009b). All of these characteristics add particular context and related value systems to the use of scientific information, in this case study, the information produced in the two Mexican MSC certification processes.

Scientific information faces many basic challenges in developing countries that affect its influence and use; for example, whether information is used or not can be affected by the competition between economic development and environmental conservation (Soomai, 2009). In fact, one of the barriers to the adoption of the MSC program in developing countries is related to the data and information deficiency of small-scale fisheries (Perez-Ramirez, Phillips, Lluch-Belda & Lluch-Cota, 2012). In particular, small-scale fisheries in developing countries may not have the technical information, surveillance capabilities, or infrastructure in comparison to industrial fisheries with which to prove their compliance with the MSC standards, and thus fail to achieve certification (Perez-Ramirez, Phillips, Lluch-Belda & Lluch-Cota, 2012). To overcome this obstacle, the MSC has created the "MSC Developing World Fisheries Program" that seeks to

develop guidelines for the assessment of fisheries in these countries, using local and traditional information, knowledge, and management systems, as well as a risk-based framework to qualitatively assess the fisheries (Ponte, 2008b).

Agnew and Olorontuyi (2012) mentioned that MSC's approach has increased awareness of the MSC process, certification, and products in developing countries. In addition, this approach has encouraged the development of partnerships between the private sector and NGOs with small-scale fisheries to assist with the certification costs. Since this approach was implemented, the number of fisheries certified in developing countries and those in assessment stages (pre- and full assessment) has risen. Finally, as of February 2012, there were nine certified fisheries in developing countries and 13 in full fishery assessment (Agnew & Olorontuyi, 2012). However, comparing this percentage to the total number (205) of MSC-certified fisheries in the world, small-scale fisheries in developing countries are still underrepresented.

4. Fisheries Management in Mexico

The Mexican fisheries are divided into four regions: Gulf of California, Central Pacific, Gulf of Mexico and the Caribbean Sea (Coayla & Rivera, 2008). Eighty percent of the total national volume is concentrated on the Pacific coast and 18% on the Gulf of Mexico and the Caribbean coast; however, the fishing areas in the latter generate more jobs and have higher catch value species (Carta Nacional Pesquera, 2012; Fernandez et al., 2011). Small-scale fisheries (encompassing 97% of all Mexican fisheries) range in gear types and boats, dependent on the target species, and are concentrated in the Caribbean and Gulf of Mexico region (FAO, 2003).

The fisheries management institutions are: the National Commission of Fisheries and Aquaculture (CONAPESCA), the National Fisheries Institute (INAPESCA), and the Regional Federation of Fishing Cooperatives (FEDECOOP). The first two function under the Ministry of Agriculture, Livestock, Rural Development, Fishery and Aquaculture (SAGARPA), while the third is an organization of fishing societies. INAPESCA is responsible for providing scientific advice to SAGARPA, based on the information produced in the different regional centers (CRIPs) around the country (Phillips, Bourillon & Ramade, 2008).

Fisheries management is regulated through three pieces of legislation: the Mexican Federal Fisheries Law, the Mexican Official Standards, and the National Fisheries Chart. The first provides guidelines for fisheries regulations, the second establishes the input controls (e.g., fleet size, vessel capacity, fishing effort, and fishing area per boat), and the third defines the levels of fishing efforts (Perez-Ramirez, Ponce-Diaz & Lluch-Cota, 2012).

Two lobster fisheries are the focus of this study: the red rock lobster of Baja California and the spiny lobster of Sian Ka'an and Banco Chinchorro (see Appendix A). In general, according to Vega (2003), the lobster fishery has a significant role in the national and regional fisheries industry, in terms of monetary value and employment. With regard to wild-capture fishery value, the lobster is the third most productive species and two-thirds of the national extraction volumes are in the Pacific area (Vega, 2003). The remainder of this section provides a brief background about the fishery, as well as the MSC certification process.

4.1. Baja California Red Rock Lobster Fishery

The red rock lobster or red lobster (*Panulirus interruptus*) is fished commercially and recreationally in the U.S. and only commercially in Mexico (Phillips et al., 2008). The Gulf of California region is divided into three sub-regions: Baja California (west coast), Gulf of California (Baja California east and mainland), and South-Central Pacific (Vega, 2003).

Twenty six fishing cooperatives exploit the species in the Baja California peninsula, of which nine cooperatives, located in the central area, harvest around 80% of the total catch of the resource (Perez-Ramirez et al., 2012) (see Appendix A.1). These nine cooperatives are part of the FEDECOOP- Baja California, which is the client for the MSC certification process as representative of the cooperatives. FEDECOOP-Baja California includes about 1,200 fishers distributed in ten villages along the coast of the fishing area (Perez-Ramirez, Ponce-Diaz & Lluch-Cota, 2012). These fishers use outboard motor fishing skiffs, and lobsters are caught with simple baited wire traps with fish and mollusks as bait (Phillips et al., 2008).

There is no separate formal management plan for the Baja California lobster fishery, as it is included in the national management plan. However, this fishery is managed through three main mechanisms: (1) limited access rights, membership, and strictly delineated fishing areas, (2) co-management among fishers in the cooperative, INAPESCA technicians and CONAPESCA, and (3) regulatory measures to protect recruitment (Perez-Ramirez, Ponce-Diaz & Lluch-Cota, 2012; Phillips et al., 2008).

Total catches across the area are relatively stable, and have been monitored for long periods of time in Mexico and the USA. In particular, data on catches and the number of traps have been available since 1929 for Mexico (Phillips et al., 2008). Around 90% of the catch is exported live to Asian markets, while the remaining percentage is sold domestically, mainly to the tourist sector (Perez-Ramirez, Ponce-Diaz & Lluch-Cota, 2012).

In 2004, Baja California became the first small-scale fishery from a developing country to receive MSC certification. This fishery was selected after a survey consultation of all the fisheries in northwest Mexico by the Community and Biodiversity (COBI)

organization (Phillips et al., 2008). The purpose of the survey was to promote small-scale fisheries in Mexico as a strategy to provide incentives for the best managed fishery.

There were three main purposes for the FEDECOOP to pursue certification: (a) maintain global competitiveness and explore new markets, (b) negotiate for governmental support, and lobby to maintain high levels of management, and (c) achieve international recognition of their stewardship (Phillips et al., 2008). Although, the MSC certification did not result in commercial benefits, it increased the support from governmental authorities (Perez-Ramirez & Lluch-Cota, 2010). In turn, this support resulted in the deployment of electricity among all coastal communities, the modernization of processing plants and fishing equipment, and the construction of new holding facilities (Phillips et al., 2008).

Since its first certification, the Baja California fishery has undergone four annual surveillances, achieved re-certification in 2011, and is currently under the second re-certification surveillance.

4.2. Sian Ka'an and Banco Chinchorro Spiny Lobster Fishery

The spiny lobster (*Panulirus argus*) is distributed in the Western Atlantic Ocean, the Gulf of Mexico, and the Caribbean Sea (MRAG, 2012). Sian Ka'an Biosphere Reserve and Banco Chinchorro Biosphere Reserve are located in the Mexican Caribbean region, specifically in the coast of Quintana Roo, Yucatan peninsula (see Appendix A.2). Sian Ka'an is a combination of ecosystems that includes forest, mangroves, coastal dunes, and coral reefs, while Banco Chinchorro is an atoll reef in the Mesoamerican barrier reef system located 30 km from the closest coastal community (Rodriguez, 2010).

Three fishing cooperatives operate in each biosphere reserve, and together they form the FEDECOOP-Quintana Roo, which was the client in the MSC certification process (MRAG, 2012). This fishery is managed under the same legislation as the Baja California lobster fishery, except for differences in the closure season, female protection, minimal legal size of catches, and fishing effort (Perez-Ramirez & Lluch-Cota, 2010).

There are three traditional fishing zones in the area: north, central, and south, which have differences in the gear and practices employed in their respective fisheries. Sian Ka'an, in the north zone, is characterized by the "casita cubana" or Cuban house method,

which is an artificial concrete infrastructure that provides shadows to the lobster (Rodriguez, 2010). The lobsters are harvested later through diving and collected with a hand-net, referred to as a "jamo" (MRAG, 2012). Banco Chinchorro fishers, in the south zone, use the free-diving method to manually harvest the lobster (MRAG, 2012).

The lack of scientific information about the biological unit of the Mexican spiny lobster, and uncertainties in the stock recruitment caused considerable delays in the assessment process of this fishery which was initiated in January 2009 (MRAG, 2012). As a consequence, the assessment team was required to complete multiple site visits and an international expert consultation in Mexico, as well as additional research to overcome these issues. The assessment concluded in July 2012, and a certification was issued with three conditions of certification, as well as a four-year action plan (MRAG, 2012). The first surveillance of the fishery has been delayed, to October rather than July 2013, because the annual audit coincides with the fishing season.

Even though it is too early to measure the impact of the MSC certification in this fishery, the certification process of the spiny lobster in the Sian Ka'an and Banco Chinchorro Biosphere Reserve prompted the development of guidelines for the sustainable harvest of the resource in the Mesoamerican reef (WWF-Mexico, 2006). The Mesoamerican barrier reef system is comprised of various protected areas and parks along the coast of Belize, Mexico, and the Caribbean side of Guatemala and Honduras. Within this area, the spiny lobster is one of the most important natural resources and these four countries contribute to one-fifth of the annual total volume (WWF-Mexico, 2006).

5. Methods

The research for this project was conducted during an internship with the Environmental Information: Use and Influence (EIUI) research group based in the School of Information Management at Dalhousie University. The research group is addressing questions about the use and influence of marine environmental information, specifically grey literature, produced by governmental, intergovernmental and non-governmental organizations (EIUI, 2013). Methodologies used in the EIUI research were applied in this project.

This study utilized two main sources of data to examine the MSC information framework and to determine the use of the Mexican MSC certification reports. In this research, the Mexican MSC certification reports refer to the documents published for the Baja California red rock lobster (*Panulirus interuptus*) (BC) and the Sian Ka'an and Banco Chinchorro spiny lobster (*Panulirus argus*) (SK-BC) fishery certifications. One source was a literature review about information available for the MSC organization and its certification process. The second source was a survey administered to individuals associated with the two fishery certifications. An application for ethics approval, for the survey component of this research, was submitted to the Faculty of Management Ethics Review Board and approved on June 9, 2013 (see Appendix B).

5.1. Literature Review

Relevant publications were identified by completing searches with the phrase "marine stewardship council" in two databases: Web of Science, Aquatic Science and Fisheries Abstracts (ASFA), and via Google Scholar. In the case of Google Scholar, since Google's algorithm can restrict access to hits, it was necessary to conduct searches by a range of years in order to process the number of publications retrieved.

The documents were read and analyzed to develop an understanding of the MSC information framework, the life cycle of the MSC reports, and the application of the MSC certification program in developing countries. Substantial information also came from the MSC webpage (www.msc.org), such as guidelines and policies. The documents included

peer-reviewed literature and grey literature, such as conference papers and technical reports from the MSC organization and NGOs.

5.1.1. Citation Analysis

Citation analysis is the analysis of references cited in scholarly publications which can be considered indicators of the impact of a research publication (Kousha & Thelwall, 2009). Citation analysis was conducted to evaluate the use of the two Mexican MSC certification reports, by assessing how frequently the reports were cited. The citations were obtained from the three sources mentioned above, as well as the Scopus database (www.scopus.com), using as search strings: (1) the exact title of the report–including the final or re-certification reports, (2) the author's name–in this case the conformity assessment team, and (3) the name of the certification company.

5.2. Survey

Potential participants for the survey were divided in three groups: (a) the fishery client, (b) the certification team–including the team leaders, certification company representatives, and the fisheries experts, and (c) Mexican stakeholders–fisheries managers and policy makers. The first two groups were identified through information on the MSC webpage and the fisheries certification reports. The revised reports included the initial certification, annual audits and the re-certification report of the BC fishery, as well as the certification report of the SK-BC fishery. The third group was identified from Mexican authorities' webpages and recommendations received from participants during the study period. These potential participants were selected according to their relationship or involvement in the MSC process and certification reports, as well as their position in the Mexican regional fisheries management institutions or non-governmental organizations. In addition to the survey participants, the author also contacted Mike DeCesare, the communications director of the MSC's Americas office.

The potential participants were surveyed using a series of structured questionnaires, distributed via email by the author. The objective of the questionnaires was to determine the use of the Marine Stewardship Council reports prepared for the two certified fisheries in Mexico, as well as the benefits of the certification and its assistance in fisheries

management. A questionnaire was developed for each of the three groups to determine the use, awareness, and distribution of the reports. The questionnaires for the fishery client and Mexican stakeholders are provided in Appendices D and F, respectively; however, both of these questionnaires were translated into Spanish by the author (see Appendix G). With regard to the certification team, the conformity assessment body and the fisheries experts were surveyed separately using two questionnaires (see Appendix E). In general, the questionnaires asked the respondents about the distribution, acquisition, production, and knowledge of the reports; additionally, a section was included to assess the use of the information produced by the Marine Stewardship Council certification process. In total, the questionnaires were sent to 26 individuals, of whom four were fisheries clients, four were team leaders, six were fisheries experts, and 12 were Mexican stakeholders.

5.2.1. Data Analysis:

Documents from the literature review were analyzed by range of year to develop an understanding of the MSC organization and its certification scheme. Each hit from the citation analysis research was revewed to evaluate the use of the two Mexican MSC certification reports, and assess the frequency by which the reports were cited.

The responses from the questionnaires were used to determine the post-certification life cycle of the reports, as well as their benefits in fisheries management in Mexico. Content analysis is a research technique that “recognizes meanings” in order to make valid inferences from texts (Krippendorff, 2012, p. 27). This methodology was applied to the responses in each questionnaire using the identification techniques of codes or themes noted in Ryan and Bernard (2003). The codes were established manually and applied to qualitative responses, guided by the literature review of the Marine Stewardship Council. Quantitative responses were analysed using Microsoft Excel.

5.3. Limitations of the Study

Mexico has four MSC certified fisheries and one fishery in stage three of assessment. In order, to fully understand the use of the information in the MSC certification reports from Mexico it would be necessary to survey all the MSC certified fisheries. However,

due to the timeframe for this project, the focus of the research was narrowed to two fisheries: the red rock lobster (*Panulirus interuptus*) and the spiny lobster (*Panulirus argus*). The intent of the study was not to be comprehensive; thus, it was not necessary to study all of the certified fisheries in Mexico.

Second, the nature of the sample was a limitation of the study. Since the study was focused only on the BC and the SK-BC fisheries, the population for the fishery client and the certification team category consisted of those individuals involved in the certification process. With regard to the Mexican stakeholders, identifying the appropriate contacts to send the questionnaire could be a limitation. However, as noted above, the objective of the study was to obtain preliminary, rather than comprehensive, understanding of the use of the information in the Mexican MSC certification reports.

Third, the nature of the fishery client proved a challenge to the survey participants. Multiple fishing cooperatives compose the regional federation of fishing cooperatives cited as the client in both reports, of whom nine are part of the Baja California Regional Federation of the Fishing Cooperative Societies and six are part of the Regional Federation of Fishing Cooperatives in Quintana Roo. Although, the MSC website provided a single contact person for the fishery client, it proved difficult to reach the fishermen, processors, and exporters in the fishery client group. However, the fishery client respondents confirmed active involvement during the certification process.

Finally, the lack of MSC personnel in the survey population is a limitation. In the literature review, the MSC organization was described as the standard setting organization and a secondary medium for distribution of reports, rather than an active actor for reports distribution and awareness. The analysis of the participant's responses showed that the MSC fulfills a major role in the distribution of the reports. Therefore, an attempt was made to establish contact with the MSC headquarters in London and the regional office in Americas. However, contact proved difficult to pursue during the data gathering timeframe of this project.

In summary, this research presents the views of specific members in the fishery client organization, only two certification companies, and stakeholders to the MSC process in Mexico.

6. Results

6.1. Literature Review

Certification schemes and ecolabels, defined as private standards, are marketing tools created by governmental and non-governmental organizations to promote sustainable fisheries (Washington & Ababouch, 2011). The private standard of the Marine Stewardship Council (MSC) has been a key player and a world leader in the field. As a consequence, there is an extensive literature about this organization's program.

The literature about the MSC parallels the creation, development, and revision of its standards, as well as the increase in the number of fisheries certified and major retailers' commitments to the sale of sustainable seafood. Initial publications from the second half of the 1990s, refer to the MSC scheme as the new trend in ecolabelling (Sutton, 1999) or, as Thrope and Bennett (2000) explained, a demand-side pressure for sustainable seafood from consumers. Furthermore, Constance and Bonanno (2000) and Ponte (2008a) summarized stakeholders' inquiries about the MSC initiative during this period.

Although in this period the MSC program was being developed and test cases had been conducted, authors like Von Zharen (1998) and Steinberg (1999) already recognized the new role and power of NGOs in the global fisheries management. Moreover, this view was expanded through a comparison between three cases of environmental NGOs and the fishery industry (Gray, Gray & Hague, 1999). In this research, the MSC partnership was classified as a collaborative approach to pressure the industry, in contrast to the confrontation and negotiation model of the other two case studies. Moreover, WWF was seen as an NGO engaged in an informal collaborative approach with the fisheries organization and in a formal approach with the retailer sector (Unilever) to promote changes (Gray et al., 1999).

The fishery industry, governments, conservation groups, and academia had mixed initial reactions to the creation of the MSC by an environmental NGO and a multi-corporate retailer (Willmann et al., 2008). McHale (1997) provided an overview of the initial positions of these groups to the MSC standard. For example, the U.S. government argued that national fisheries policies were already crafted through stakeholder consultations (McHale, 1997) and Nordic countries strongly advocated for an ecolabel

program from the Food and Agriculture Organization or the World Trade Organization (Nielsen, 2000). This latter concern resulted in the development of FAO's certification guidelines. On the other hand, the industry questioned the necessity of an NGO approach to regulate worldwide fisheries, as the industry was in the initial stages of recognizing the green lobby (Gray et al., 1999; McHale, 1997).

From 2000, the body of literature can be divided in three categories: (1) sustainability claims and impact on world fisheries, (2) organizational policies, and (3) social issues and small-scale and data-deficient fisheries in developing countries. Literature in the first category presented mixed arguments about the sustainability of the MSC certified fisheries and the information that the blue ecolabel conveys to the consumers (see Gulbrandsen, 2009; Gutierrez et al., 2012; Jacquet & Pauly, 2007; Ponte, 2008a), as well as whether there is a tangible, scientifically tested, effect of the MSC program in the reduction of the global fish stocks decline (see Agnew et al., 2006; Bush et al., 2013; MRAG, Poseidon & Meridian Prime, 2011; Froese & Proelss, 2012). The second category of literature included publications that questioned the interpretation of the organizational policies and guidelines by the certification body (see Bush et al., 2013; Foley 2012; Jacquetet al., 2010), in addition to critiques of the objection procedure of the MSC scheme (see Christian et al., 2013; Greenpeace, 2009). Finally, the third category of literature is related to the contextualization of the MSC program with the social aspects of the fisheries, for example, in Canada (Foley, 2012), South Africa (Ponte, 2006, 2008a, 2012), Mexico (Perez-Ramirez, Ponce-Diaz & Lluch-Cota, 2012; Phillips et al., 2008), and Argentina (Perez-Ramirez, Lluch-Cota & Lasta, 2012). This category of literature also includes discussion of the MSC accessibility and benefits to small-scale fisheries and the adaptation of the MSC standard to data-deficient and small-scale fisheries in the context of developing countries (Bush et al., 2013; Constance & Bonanno, 2000; Lopuch, 2008; Perez-Ramirez, Phillips, Lluch-Belda & Lluch-Cota, 2012; Ponte, 2008b). In summary, the authors of publications in this last category described the limitations of the MSC program in developing countries and proposed solutions to attract these fisheries to the certification program.

6.1.1. Information Generated in the MSC Certification

Besides the MSC organizational guidelines and policies, only one other publication provided details about the information used at every step of the MSC certification process. Since this publication was released, few amendments have been made to the information requirements. Therefore, the information presented below is compiled from the Fisheries Certification Methodology V.6.1 (MSC, 2010), the MSC Certification Requirements V.1.3 (MSC, 2013), and Chaffee, Phillips and Ward (2003). Based on these sources the information inputs and outputs are presented for the MSC certification process (see Table 1).

As noted in chapter 2, a confidential report is produced during the pre-assessment stage, which informs the client as to whether the fishery complies with the MSC standard. This determination is accomplished through the evaluation of three basic elements: (a) availability of information required about the fishery in order to complete the MSC assessment, (b) client responsibilities, and (c) potential problems in the fishery, e.g., violations of the MSC standard or instances when the quality of the information is not sufficient to prove the sustainability of the fishery. The identification of available information is conducted by the certification company, to investigate if the necessary data and documents to assess the fishery are available, as well as the location of such information. Therefore, this stage is where baseline information is gathered for every full assessment in the MSC certification process.

Based on this preliminary information, the certification company is able to indicate whether the performance indicators are likely to obtain the minimum acceptable (80) or the least (60) score during the full assessment (Martin et al., 2012). Finally, the assessors report to the client whether they fully, cautiously, or do not recommend the fishery to move forward in the certification process.

There is one input and four outputs of information in the first step of the certification process (Table 1). The input is the pre-assessment report that provides all the basic information along with a list of potential stakeholders. The letter of intent for a fishery's certification (Table 1) informs the MSC of the client entering a full assessment process and provides a probable timeline for publications that will be placed on the MSC website. This letter is then expanded to a notification report (Table 1), which is a formal and a

Table 1. Information Inputs and Outputs of the MSC Certification Process

Step		Input	Output
1	Fisheries announcement and assessment team formation	• Pre-assessment report	• Letter of intent for certification sent to MSC • Notification report for MSC • Certification company and MSC announcement • Announcement of the assessment team
2	Building the assessment tree	• Reports from other MSC-certified fisheries • Pre-assessment report	• Draft of performance indicators and scoring guidelines • Final certification guidelines
3	Information gathering, stakeholder meetings, scoring	• Information compiled by fisheries, fisheries managers, and scientists • Information compiled by stakeholders • Information collected at visit site and stakeholder meetings	• Preliminary draft report for client
4	Client, Peer review	• Comments from client on the Preliminary draft report	• Peer review draft report
5	Public review	• Feedback about the peer review draft report	• Public comment draft report
6	Final report, determination	• Public feedback to the public comment draft report	• Final report

confidential document that provides the MSC with information about the general background of the fishery, fishing area, management practices, fisheries export and domestic consumption, unit of certification, neighboring fisheries not subject to certification, and the probable chain of custody certification. Then, the MSC and the

certification company announce on their websites that the fishery is undergoing full assessment. The certification company also sends the announcement to at least two media outlets (MSC, 2010). However, Chaffee and collaborators (2003) report the use of a combination of multiple techniques to inform as many stakeholders as possible, such as faxes, letters, phone calls, e-mail listservs, and direct e-mail. Finally, the certification company assembles the assessment team and makes an open announcement to encourage stakeholder inputs about the team.

In the second phase, building the assessment tree, there is one input and two outputs of information (Table 1). According to Chaffee and collaborators (2003), the MSC encourages the use of the assessment tree included in reports from other fisheries. The literature produced during the MSC program becomes then a guideline document for this stage. This practice is intended to minimize time commitments, and promote the cost-efficiency and effectiveness of the process, while at the same time increasing the likelihood of a consistent interpretation of the MSC principles and criteria within the certification company. The outputs of this stage are draft and final revised performance indicators and scoring guidelines. The draft assessment tree is built with information from the pre-assessment report and a revision of other fisheries' certification reports. This draft is published for stakeholder feedback, which is then discussed to produce the final certification guidelines.

Information inputs in the third stage are divided in three groups: (1) information from fisheries, fisheries managers, and scientists, (2) information from stakeholders, i.e., conservation groups and fishing organizations not part of the client organization, and (3) stakeholder meetings. As information about a fishery can be extensive and the process to gather it time consuming, the assessment team requires the client to present evidence of the fishery compliance with specific performance indicators. There is also an opportunity for stakeholders to present their information about the fishery being assessed, through written or verbal submissions. This second group of information provides the assessment team with an understanding of possible problems and offers an opportunity to prove credibility, as well as providing an opportunity for fisheries surrounding the client to express their concerns about the certification. In the third group, there are two approaches

to obtain information: during the assessor's site visits or during meetings held with stakeholders identified in the pre-assessment or during any previous steps (MSC, 2013).

Based on the information gathered, the assessment team evaluates and scores the fisheries using the analytic hierarchy process as a support tool for decision-making. The performance indicators can be scores obtained through a consensus decision of the assessment team or through the average of scores from individual assessors. However, the MSC encourages the assessment team to openly discuss and reach consensus on the scores to avoid biases and to promote satisfaction about the issues raised during assessment team conversations (Chaffee et al., 2003). If the fishery scores lower than 80 but more than 60, the assessment team specifies auditable and verifiable conditions that would increase the performance indicator score to 80. After this process, a preliminary draft report is produced for the client to review, which includes the rationale behind the scoring, the strengths, weakness, and gaps, as well as the conditions for correcting these deficiencies. In this stage, the consultation process with the client is initiated to develop the action plan required to meet the conditions and is completed before the public consultation about the reports. The information about the action plan is presented in every draft report and final report (MSC, 2010).

Stage four represents the last opportunity for the client to identify misinterpretations of the data or problems in the rationale of the score. Next, the assessment team reviews this feedback and includes it, as appropriate, in the peer review draft report (Table 1). The peer reviewers are appointed by the certification company, and are intended to have similar expertise to those in the conformity assessment body. The peer review comments are addressed by the assessment team and the public comment draft report is produced. Peer review feedback is appended to the final report, with evidence from the assessment team that the reviews were addressed. Stage five is the last step in which individuals can identify themselves as stakeholders of the fishery. This particular point is relevant in order to file an objection to the certification.

Finally, in stage six, feedback from the public is analyzed and the assessment team produces a final report. This report is handed to an independent panel within the certification company, which makes the final decision about the assessment team's determination of the certification. This determination and the final report are passed to the

MSC for stage seven in which a public certification report is published and the certification company issues the certification.

6.1.2. Life-Cycle of the Reports

Each of the certification reports has its own life-cycle and all the reports are produced in English version (Table 2). Draft versions are intended to encourage inputs from clients, peer reviewers, and the public about the assessment team's scoring rationale and the certification condition(s). As such, the preliminary and the peer reviews draft are confidential working documents among the parties and the certification company, while the public comment draft is open for stakeholder consultation.

The preliminary draft report is produced following stages one to three from the MSC process (see Table 1), and the MSC guidelines (Table 2). This report is only distributed to the members of the fishery client organization group, i.e., directors, technicians, managers, and co-client. The report is used to provide feedback about the scores and certification conditions, and to develop an action plan to meet the certification conditions.

The peer review draft report is produced with the comments of the fishery client about the preliminary draft report. This report is distributed to two peer reviewers for evaluation of the assessment team's rationale on the certification guidelines, scores, and the information that supports the assessment team's rationale.

The public comment draft report contains all the information and sources of information for the certification process, and is produced in digital format. This document is posted on the MSC's and certification company's websites for a time period of no less than 30 days, as well as being distributed to relevant stakeholders. This report is used by stakeholders to provide feedback about the fishery assessment, the certification scores, and the condition(s) of certification.

The final report is also produced in digital format. The MSC requires that the peer review comments and all the public inquires, along with the assessment team's comments on how these inputs were addressed be appended to the document. This document is only posted on the MSC and certification company websites, and is not distributed to particular stakeholders. This report becomes part of the MSC's body of literature, and serves as a reference document for certification companies, or as a reference in the production of

other certification documents. The document is the baseline source for the certification and the conditions of certification monitoring, and is also the source for stakeholders to use when filing a formal objection about a certification.

The surveillance reports are produced during each of the years subsequent to the certification. They are produced to assure the certification claims about the sustainability of the fishery are met, and summarize the surveillance visits and changes in the management and the scientific information. These reports are only posted on the certification company and MSC websites, and are used as baseline documents for monitoring the certification and conditions.

A certification is valid for five years, after which the fishery client begins a new assessment process. In the re-certification, the life cycle of the reports produced in the process begins again. However, the final report from the initial certification and the surveillance reports serve as baseline information in the new process.

Table 2. Life-Cycle of Marine Stewardship Council Reports

Report	Production	Distribution	Use
Preliminary draft	• Strategy for the information gathering process determined by the MSC organization's policies • Assessment team's rationale of the scores and certification conditions • MSC determine the format of the document for consistency • English language	• Only to the members of the fishery client organization	• Provides an opportunity for the fishery client to review the scores and certification condition(s) • Used in development of the client's action plan to meet the certification conditions
Peer review draft	• Contains fishery client feedback of the preliminary draft report	• Two peer reviewers • Confidential	• Used by peer reviewers in evaluations of the scoring rationale
Public comment draft	• Peer reviewed • Digital format • English language • Reports all the information produced during the certification process	• Posted on the MSC and certification company websites • Certification company distributes to relevant stakeholders • Open for public review during 30 days	• MSC and the certification company encourage public and stakeholder feedback about the certification assessment
Final	• Report with public and peer review comments • Digital format • English language • Contains letter with the client's action plan to meet the conditions of certification	• Posted on the MSC and certification company websites	• Baseline document for certification monitoring • Reference document for certification companies • To file a formal objection
Surveillance	• Assures certification claims of sustainability • Includes surveillance visits and changes in management and scientific information	• Posted on the MSC and certification company websites	• Baseline document for monitoring of certification and conditions of certification

6.2. MSC Reports of the Case Study Fisheries

6.2.1. Citation Analysis

Citations were obtained from Scopus and Google Scholar, but none from Web of Science and ASFA. The Scopus search resulted in only one hit. The Google Scholar search resulted in nine unique documents for the initial certification of the BC fishery and no citations for the re-certification report, as well as one document that cited the SK-BC certification report (see Appendix C).

In the case of the BC fishery, seven documents referenced the report by the certification company and two by the names of the assessment team. Six citing documents are published in peer-review journals, two citations are found in a thesis, and one is from an edited book. In general, the report was used in the development of a research agenda, in order to fulfill the conditions of certification, for example, in bycatch studies (see Shester & Micheli, 2011) and habitat impact research (Shester, Lluch-Cota & Micheli, 2008). In addition, information within the report was used to describe the background of the fishery and fishery yield (Costello & Kaffine, 2008), as well as the export market of the MSC fishery product (Hess et al., 2009).

In the case of the SK-BC fishery, the report was cited by the certification company, and was used to describe the government stakeholders, fishery practices, and fishery communities of the Sian Ka'an Biosphere Reserve (Pirie, 2013; see Appendix C).

6.2.2. Survey

Eight or thirty-one percent of the potential participants (n=26) responded to the questionnaire. Table 3 provides the number of respondents in each group with the participants' experience in their current roles, and the fishery with which each participant associated.

The responses of the survey participants regarding the fisheries certification reports are summarized in terms of: (1) production, (2) awareness of the information and reports, (3) distribution mechanisms, and (4) assessment of the use.

6.2.2.1. Production of Reports

Besides the known participation of the certification body in the production of the Mexican MSC reports, both members of the fisheries client described their involvement in their respective reports, specifically, as representatives of the client to the certification body (C1) and as a co-client in the certification process in both fisheries (C2). In the case of the Mexican stakeholders, only one participant had a role in the generation of information for the report (F1). This participant also identified his roles during the certification process, including: advising the client, gathering information (step 3 in the process outlined in Table 1), and assessing the report's content on behalf of the client (step 4 in Table 1) (F1).

Table 3. Responses to the Survey Questionnaires by Group and Participants Description

Group				Number of responses
Category		Role	Fishery	
Fishery Client		C1: technical advisor, 21 years	BC	2
		C2*: NGO co-client, 6.5 years	SKBC/BC	
Certification Team	Team leader or certification company representative	B1: certification company representative, 6 years	SKBC	1
	Fisheries Expert	E1: initial certification team, since 2002	BC	2
		E2: peer reviewer initial certification; re-certification team		
Mexican stakeholders		F1: program director, NGO	BC/SKBC	3
		F2: project technical coordinator, 2 years	SKBC	
		F3: Mexican office coordinator, NGO, 6 years	BC/SKBC	
			Total	8

* BC acronym represents the Baja California red rock lobster fishery and SKBC represents the Sian Ka'an and Banco Chinchorro Biosphere Reserve spiny lobster fishery.
** Participant indicated involvement in both fisheries, but is only cited as contact person for the SKBC.

6.2.2.2. Awareness of the Reports

Responses to question two described the awareness of the reports by the participants from the fishery client and the Mexican authorities groups. Both members of the fisheries clients were aware of and read the initial certification report, the surveillance reports, and the re-certification report (CI & C2). Furthermore, members of the fishery client group stated they became aware of the reports via the certification team and from the MSC webpage (C1), and serving as co-client in the certification process (C2).

Both participants from the fishery client group noted that they became aware of the various reports–mentioned above–upon their publication date (CI & C2). Additionally, participants from the Mexican authorities group stated they became aware of the MSC report within a year after its publication. With regard to how they become aware of the reports (see Appendix E, question 2c), two participants indicated receiving copies (F2 & F3), while the third pointed to his roles during the certification process (F1; see Section 6.2.1.1). One Mexican stakeholder noted that his office received information about a report only when the report was published (F1), while the other two described receiving forthcoming draft and final reports (F2 & F3).

Responses to question five about the acquisition of the Mexican reports confirm that the Mexican stakeholder organizations received copies of the reports. Furthermore, one participant noted he received a notice with a link to the MSC webpage and a copy from the certification company (F3), while the other two received only one of these options (F1 & F2). When asked about the format of the received reports, all participants in this group reported preferring the digital versions (F1, F2 & F3).

All the Mexican stakeholder participants agreed they made other personnel aware of the reports, particularly the initial certification report (F1 & F3) and the draft report (F2). Responses about how the participant informed personnel of their agency included the following methods: sending an email alert (F1), sending a message to a supervisor (F2), and sending an email memorandum to several staff members (F3). None of the Mexican stakeholders stated that a collection of the MSC reports was maintained by their agency's library (F1, F2 & F3).

With regard to recommendations for promoting awareness of the MSC reports, the certification company representative claimed that major retailers can affect awareness

within the fishing industry (B1). While the fisheries experts seemed to misunderstand the question (E1) or the objective of the research (E2), they pointed out that awareness occurs through the MSC's website (E1) where copies of the reports are posted. The Mexican stakeholders' responses included a note about the involvement of a local scientist in the development of simple handouts in a native language to inform members of the industry about certification conditions outlined in the report (F1), and another participant (F3) indicated he was satisfied with the current mechanisms used to increase awareness of the MSC reports.

6.2.2.3. Distribution Mechanism

Prior to identifying the distribution mechanism of the Mexican MSC reports, participants indicated that they did not receive any requests for the MSC certification reports. Among all of the participants, only the certification company representative agreed to have a role in the distribution of the reports (B1). This participant indicated that the distribution of the draft and final certification reports were relevant to a variety of stakeholders, such as, scientists, fisheries managers, the fishery industry, and policy makers outside his agency (B1). However, he acknowledged that his organization does not monitor the traffic on its website (B1). This participant also suggested that the publications were distributed to research institutions, government agencies, and NGOs. Participants from the certification company group pointed out that there is no difference in the distribution of different types of reports (B1 & E1), at least not from the office of the certification company representative. Furthermore, participants in the Mexican stakeholder group stated that their agencies did not distribute copies of the reports (F1, F2 & F3). Moreover, members of the certification team also stated they did not keep a record of requests for the MSC reports (B1, E1 & E2).

With regard to recommendations about the distribution of the MSC reports, the fisheries experts suggested that better advertisement of the MSC's website (E1) would help, and expressed satisfaction with the open access to the reports through the MSC website during the certification process (E2). The Mexican stakeholder respondents pointed out that the national management institutions are not involved in the distribution process of the reports, and that the information in the reports only has an informative

character, as the reports are not adopted in national fisheries management (F1). Participant F3 noted that the strength of the MSC process is in public access to the information and stakeholder involvement in the assessment process.

6.2.2.4. Assessment of Use

Participants in the fishery client group agree they used the reports, indicating that using the reports was within the respondent's job (C1). Another respondent stated that use of the reports occurred within the fulfillment of the NGO's conservation objectives (C2). Participant C2 also indicated that the reports helped with the development of WWF's guidelines for MSC certification and that, in the case of the BC certification, the report proved the applicability of certification to developing countries and other small-scale fisheries (C2).

With regard to assessing the use of the information by the fishery client (question 3, Appendix D), the responses confirm that it was part of the participant's job to use the information contained in the MSC reports (C1). Participant C2 indicated that the reports highlighted successes and areas for improvement, as the conditions listed in the reports can be used to improve the fisheries management.

In response to question four (see Appendix E), participants stated that the certification company produces the reports as working documents for clients and stakeholders (B1) in order to provide transparency to the process and for stakeholder consultation (E1). Furthermore, participant E2 indicated that the reports serve as internal documents among certifiers.

With regard to assessing the use of the information by the certification team, (questions 6 and 7 in Appendix E), the participants showed that they are aware of uses of the Mexican MSC reports. Specifically, fisheries experts listed a reference to the reports in a conference keynote address (E1) and citations in peer-reviewed journals, providing examples of these publications (E2). The certification company's representative stated that the SK-BC report contain an alternative tool to assess a stock biomass (B1). Three participants stated they were not aware of evidence of use of the MSC reports.

Two of the Mexican stakeholders stated that the intended use of the MSC reports in their roles in government positions was as a complete reference document with current

information and an account of the state of the fishery (F1 & F3). Another participant from this group drew attention to an increase in the market demand as a result of working with fishery certification holders (F2). Participant F1 stated that the reports were obligatory reference documents, but acknowledged that they are poorly used. In addition, participant F3 referred to how the conditions of certification prompted improvements in the fishery.

With regard to assessing the use of information by Mexican authorities in fisheries management, participant F1 suggested that the itemized conditions for certification served as guidelines; however, he also acknowledged that the integration of these conditions into official fisheries management plans is difficult. Additionally, the respondent elaborated that the official management plans are static, so the report is the only current document that promotes improvements (F1). The other two participants from this group acknowledged not using the reports (F2, F3). All of the participants indicated they were not aware of other stakeholders using the MSC reports. However, participant F1 noted that his organization's website linked to the MSC webpage.

Finally, with regard to recommendations about the use of the MSC reports, the fisheries experts indicated their use in peer reviewed journals (E1), and their importance primarily for the assessment process alone by providing transparency, validation of arguments, and reporting conditions for certification (E2). The respondents from the Mexican authorities group provided a mix of recommendations. Participant F1 stated that conditions in the reports are not included in the national management plans; therefore, the reports are not often used and use is dependent on the clients. Respondent F2 stated that the report per se are not useful, because it is the certification process that has a value, and participant F3 foresees use of the reports as a method to assess progress towards fulfillment of the conditions for certification.

7. Discussion

This study sought to establish a baseline understanding of the information requirements for the MSC certification and the use of the documents produced during the certification process, through the analysis of the information framework and the life-cycle of the MSC reports. The study also intended to evaluate awareness and use of the reports resulting from the MSC certification of two Mexican fisheries, in order to provide recommendations for fisheries management in developing countries. This section presents an analysis of the information generated in the MSC process, the life-cycle of the reports, and the use of the MSC reports in the case study.

Even though the MSC ecolabel and certification scheme have been adopted in the sustainable seafood industry for 14 years, robust linkages between the MSC certification scheme and the environmental impacts in the worldwide fisheries are lacking (Ward, 2008). According to Jacquet and Pauly (2007), ecolabels have been successful in bringing environmental issues to the forefront of the seafood industry and have increased consumer awareness about these issues, but tangible changes in environmental sustainability have been difficult to prove. Agnew et al. (2006) indicated that the connection has been difficult to test, in part because of three factors: most improvements are related to fisheries management (i.e., institutional, research, and operational action gains), numerous factors influence fisheries markets and marine ecosystems, and there is a lack of indicators to track changes in the fishery performance prior to the certification scheme. However, Martin et al. (2012) demonstrated two environmental impacts of the MSC certification process: (1) more significant changes occurred between the pre-assessment stage and full assessment, and (2) that the majority of the certification conditions raised in the ecosystem impact principle were achieved not by reducing the fishery's impact on the ecosystem, but by reducing the scientific uncertainty of fishing. In the evaluation of the changes in the performance indicator's scores between the pre-assessment stage and the full assessment, these authors acknowledge that fisheries with a cautionary recommendation–to proceed into full assessment–had more significant changes in the scores, as they are trying to comply with the standard to be certified. Decrease in the scientific uncertainty of the fishery occurred through the improvement of research and management capabilities (Martin et al., 2012). This perspective is based on

the expectation that as more research is conducted and more information is gathered, the impact of fishing is better understood by fisheries managers. Then, fisheries managers are able to translate the improvements into environmental outcomes and maintain production within the sustainable limits.

The MCS's standard and the certification procedures were the outcome of a series of workshops, and international expert consultations. Additionally, the certification methodology is periodically revised by the Council, to create more explicit performance criteria that directly link to scientifically defined environmental outcomes (Martin et al., 2012). The involvement of international experts in the development of the MSC standard, and the continuous revision of the certification methodologies by the Council, are strengths of the information produced during the MSC's fisheries assessment framework.

7.1. Information Generated in the MSC Certification Process

In general, the MSC certification process gathers information from fisheries previously evaluated under the MSC program and the fishery pre-assessment report, as well as from peer-reviewed and grey literature produced by the fishery client, scientists, government authorities, and interested stakeholders. This information is used to develop the certification guidelines and to score the fishery against the MSC principles and criteria. A final report is produced at the end of the certification process, encompassing all of the literature gathered during the certification process and the assessment team's rationale underlying a decision to grant certification. Therefore, this final report becomes an assemblage of environmental information about a fishery using as a framework the MSC principles and criteria.

The MSC certification is valid for five years and during this period, besides the final certification report, four surveillance reports are produced by the certification company prior to re-certification (see Section 6.1.2). The information assembled during the certification process (i.e., the final report) and the monitoring of the certification (i.e., the surveillance reports) provides the opportunity to produce "state of the fishery" report. Even though, participants acknowledge that the MSC reports contain actual information of the fishery, areas of improvements and serves as "obligatory reference document" (respondent F1, F2 & F3), one participant noted that the reports are poorly used.

Moreover, all participants in the Mexican stakeholder group agreed that their agencies do not maintain a repository of the MSC reports, which indicates that stakeholders in the country may not be taking advantage of the information in the MSC report.

The MSC fishery assessment methodology is widely accepted in the scientific community (Jacquet et al., 2010), and has been applied to specific fisheries case studies, such as mackerel off the coast of Korea (Lee & Zhang, 2007), tuna (Powers & Medley, 2013), and hake (Gonzalez, Narvate & Caille, 2007). Although these fisheries harvest high value commercial species, the MSC fishery assessment methodology and the performance indicators presented in the MSC reports are credible tools that may assist in strengthening the research capabilities of developing countries. This assessment provides developing countries' managers with a tool to evaluate and report on the sustainability status of their fisheries, using as guidelines the internationally recognized framework of the MSC fishery assessment methodology, and provides a means to advance the understanding of the fisheries.

Shortcoming in available scientific data in developing countries is a major barrier for the implementation of sustainability indicators, fisheries management, and policy-making. These limitations imply a lack of infrastructure, research, and monitoring to provide the MSC certifiers with reliable scientific information about the resource (Perez-Ramirez, Ponce-Diaz & Lluch-Cota, 2012). Fisheries in developing countries may benefit from the increase in research capabilities and information production, which Martin et al. (2012) concluded would inform fisheries managers and policy-makers about the fishery's impact on the ecosystem and how they can achieve sustainable limits of harvesting.

The advantage of the information in the MSC reports goes beyond the life-cycle of the reports into the benefits of the certification process itself (Lopuch, 2008). Developing countries benefit from the MSC certification process, as (1) it brings international scientists to study the fishery (i.e., the assessment team), (2) it develops and/or enhances channels for stakeholder participation, (3) identifies areas of improvements through the certification conditions, and (4) the MSC certification process is a driver in the production of scientific information.

Fisheries managers and scientists in developing countries can benefit from the expertise and the methodologies of the assessment team and vice versa. The MSC

certification process promotes collaboration between local scientists and the assessment team in the development of approaches to assess the fishery. The SK-BC certification provides an interesting example of this collaboration. As mentioned in section 4.2, the SK-BC fishery lacked information about the biological unit for the Mexican spiny lobster and the potential impact of the fishing methods on the ecosystem. To overcome this obstacle, the assessment team invited international experts to Mexico and sought opinions of regional marine scientists from the Gulf of the Caribbean Fisheries Institute (MRAG, 2012).This consultation resulted in the use of the bank-by-bank strategy to assess the stock biomass, which participant B1 referred to, and more sources of information to assess the fishery. The bank-by-bank tool is used when information about the whole stock (i.e., the meta-population) is limited or inconsistent. The tool is an alternative option to assess the biomass that produces the maximum sustainable yield (Bmsy) through a bank-by-bank basis. This means the assessment of a fraction (i.e., the bank) of the whole stock, in which a "bank" is defined such as the specie recruited to the bank does not substantially interchange with other banks (see MRAG, 2012). This bank-by-bank approach applied to the SK-BC fishery may influence surrounding fisheries (e.g., Mesoamerican reef's fisheries) to assess their respective populations with this tool, which then would maintain the whole stock at or above the Bmsy (MRAG, 2012). This approach represent the best practices for this specie in the absent of qualitative information on the fishery recruitment, and can assist the stock assessment of other small-scale fisheries in developing countries carried by local scientist and certification companies.

The stakeholder involvement in the MSC fisheries assessment was highlighted by participant F3 as a strength of the MSC certification process. Perez-Ramirez, Lluch-Cota and Lasta (2012) concluded that for stakeholders of the MSC fishery assessment (i.e., fishers, industry, governments, and NGOs) in Argentina, the benefit of the MSC certification process is the encouragement of effective stakeholder participation through access to the information, increased communication channels, and a process for reaching consensus. The benefits of the stakeholder participation in the MSC certification process was also described by Leadbitter and Ward (2007) as an important asset for an integrated approach to fisheries management. Therefore, a benefit of the MSC certification for developing countries is the enhancement of communication channels and the exchange of

information among fisheries stakeholders, managers, and policy-makers, as a result of the certification process.

The conditions of certification, according to participants in this study, represent valuable guidelines for specific areas of improvement in the fisheries practices and management (F1, F3, C1). Additionally, participant F3 stated that the conditions serve as a method to assess the progress of the fishery and that the fulfillment of the conditions is promoting changes in the fishery. The conditions of certification and the pre-assessment process present an opportunity for fisheries in developing countries to identify areas that need improvement and develop action plans to solve these problems. The action plans to meet the conditions are consulted and approved by the assessment team; therefore, fisheries managers and local scientists can take advantage of working with fisheries experts.

Finally, seeking MSC certification itself becomes a driver in the production of scientific information. The information produced during the MSC fisheries assessment impacts the fisheries management and policy-making, as the fisheries obtain socio-economic benefits of the certification process. Such was the case of the certification of the BC fishery, in which the governmental authorities increased their support as a result of the certification.

7.1.1. Characteristics of the Information in the MSC Reports

Although the MSC reports are produced primarily to support the rationale of the assessment team about a certification, the reports satisfy the characteristics of useful information (i.e., being salient, credible, and legitimate) to stakeholders about a particular fishery. The reports contain relevant information about a fishery client's target stock, the impact of the fishery on the ecosystem, the management structure of a fishery based on the MSC indicators of sustainability. According to the survey participants the Mexican MSC reports provide salient information, as they report on the actual knowledge and state of the fisheries (biological and ecological aspects), as well as its management, and mandate necessary improvements developed as certification conditions (participant F1 & F3).

Due to the difference among fisheries, each MSC report is representative of the scale and the management system of the fishery client, which in turn is relevant to similar stakeholders. For example, information in a MSC report about a small-scale lobster fishery is relevant to similar fisheries and their stakeholders, e.g., surrounding fisheries or regional fisheries. Such is the case of the SK-BC fishery as part of the Mesoamerican barrier reef, a regional system of protected areas, and the influence of the process on the development of guidelines for the sustainable harvest of the spiny lobster.

The credibility and legitimacy attributes are obtained through the integrated fisheries assessment process that encourages stakeholder participation in the certification (Leadbitter & Ward, 2007). However, the lack of traceability of tangible environmental impacts on the world fisheries, questions about the sustainability of the fisheries stocks, the poor representation of small-scale fisheries from developing countries, and little improvement once a fishery is certified undermine the message of the organization, as well as these two attributes (Bush et al., 2013; Cressey, 2012). Still, the credibility of the fishery assessment methodology is scientifically recognized, even though the quality and consistency of the information in the MSC reports is questioned by some academic and conservation groups (Greenpeace, 2009; Jacquet et al., 2010). The legitimacy of the information in the MSC reports is described as being unbiased, accountable, participatory, and transparent (Bush et al., 2013); therefore, it fulfills the characteristics of being legitimate for research use (see Section 3.1).

With reference to the continuum of research use framework described by Nutley and collaborators (2007) (see Figure 2), the use of the MSC information in this study suggests a conceptual rather than instrumental use, particularly as the reports have an indirect impact on the awareness, knowledge, and attitudes of the stakeholders and policy-makers about a fishery. The certification team's research produced the scientific information (i.e., the MSC reports) to develop a rationale about the sustainability of the fishery rather than to directly inform policy. Furthermore, participant F1 indicated that even though the conditions of certification provide guidance for fisheries improvement, they are difficult to integrate into official management plans. However, even though the conditions are not directly include into management plans, the information of the MSC certification process

assists fisheries managers and policy-makers with the identification of the areas that required improvement (e.g., knowledge gaps).

Members of the fishery client and the country stakeholders indicated that the certification reports increase the awareness about the sustainability of the fisheries. Awareness of the reports occurred at the date of publication or within a year after publication for participants in both groups. The findings of this study show that the use of the information in the Mexican report was largely at the awareness end of the spectrum in the model (see Figure 2) rather than in the particular practices and policies changes. However, the certification company representative noted that major retailers can have an impact on the awareness of the reports by the fishing industry (participant B1), while a Mexican stakeholder suggested that the development of handouts in the native language of fishers, with involvement of local scientists, would increase awareness of the reports (participant F1).

The language of the reports is defined by the MSC policies. However, the language of the certification reports may pose a barrier for members of the fishery industry to understand and translate into practice the conditions and action plan outlined in the report into practice. In fact, a characteristic of salient information is its relevance to the context in which it is presented (McNie, 2007). Since the certification reports are only produced in English, language may be a barrier in the use of the reports and implementation of the certification conditions in developing countries in which English is not the native language. This characteristic is relevant to the saliency attribute of useful information (see Section 3). The language can also pose a barrier for the fishery industry to work with managers and scientists to implement the conditions and required changes.

7.2. MSC Reports of the Case Study Fisheries

Citation analysis measures the frequency that publications are cited in other documents, which is an indicator of the research use. In this research, the results showed few citations of the reports. The BC final certification report was the most frequently cited. The differences in frequency of citations between the two certification reports are explained by the certification year. The BC report was published in 2004, whereas the

SK-BC report was published in 2012. As the latter is more recent, it is less likely to be cited.

In addition, BC was the first small-scale fishery from a developing country to be certified, which probably prompted more interest in the reports of this certification than the SK-BC fishery (see Appendix C). Also the BC fishery has been certified for longer period of time, and therefore the benefits of the MSC certification for this fishery are better understood. Although, the search in the Google Scholar resulted in six citing documents published in peer reviewed journals, these citations were not found in the Web of Science database, even though these journals are indexed in Web of Science. The fisheries experts indicated the use of reports in scientific peer reviewed literature (participant E1), and the validation of the assessment team's argument through the peer review stage of the report (participant E2). These responses, coupled with the citation results, speak to the credibility attribute of the information in the Mexican MSC reports. In fact, when asked about the impact of the certification process on the fishery client group, participant F2 indicated that the MSC standard is the "best and most credible standard" to demonstrate the fishery sustainability.

The citation analysis also revealed a citation that referred to a pre-assessment report for the Banco Chinchorro lobster fishery, one of the two locations for the SK-BC certification (Phillips & Chaffee, 2000 as in Ramirez-Estevez et al., 2010). In this case, the final report indicates that the SK-BC fishery, considered as a single unit for certification, had not been assessed against the MSC standard prior to the certification (MRAG, 2012). Nontheless, the existence of a Banco Chinchorro pre-assessment report represents an evaluation of the fishery against the MSC standard. However, Phillips and Chaffe's (2000) pre-assessment report was not cited in the final certification report, because Phillips and Chaffe's (2000) report was confidential and produced by a different certification company. This example indicates the importance of the pre-assessment process for small-scale fisheries, as pre-assessments may prompt other surrounding fisheries to be assessed, based on what they have learned from the report. For example, in a case when a certification team recommends a fishery proceed to full assessment with cautionary conditions, the pre-assessed fishery may influence surrounding small-scale fisheries to overcome similar limitations raised in the report. In addition, this group of

fisheries may allocate better resources to overcome limitations and devote the management and research efforts to deal with the areas that require improvement. In the process, there is an assemblage of information from multiple fisheries to inform national or regional fisheries management.

With regard to the distribution of the reports in the Mexican case studies, only the certification company representative indicated a role in the distribution of the draft and final reports (participant B1). This response suggests that the certification company has a role in the distribution of the public comment draft report to relevant stakeholders (i.e., scientists, fisheries managers, policy-makers, fishers) from various agencies (e.g., research institutions, NGOs, and government). This participant also indicated that the reports were distributed to individuals outside the certification company. This latter practice occurred because peer reviewers were located outside the certification company; however, this respondent did not make reference to the determination process by which the final report is sent to an independent body within the organization (see step 6, Section 2.1). This internal review step and, in general, the third-party certification assessment is the focus of some critiques about the MSC certification process. The observations concern the subjective interpretation by assessment teams of the MSC principles and criteria, and the available information about the fishery (see Jacquet et al., 2010; Ward, 2008).

Fisheries experts expressed satisfaction with the open access distribution methodology in the "Track a Fishery" section of the MSC website (F2; M. DeCesare, personal communications, July 2, 2013), and suggested better advertisement of the MSC website to increase awareness of the reports (F1). According to the Mexican stakeholder, the method of distribution varies between a notice with a link to the MSC webpage and a copy of a report sent from the certification company. In addition, M. DeCesare also claimed that the certification reports can be circulated at will, acknowledging that action plans and annual audits are "shared" with governments (personal communications, July 8, 2013). Although participants highlighted the open access of the documents as strength, this distribution mechanism does not guarantee the use or awareness of the reports. Further research is needed to evaluate the effectiveness of the report's distribution. For example, web analytics could be used to track activity on the MSC website to determine

page views, download, etc. In summary, the use of the information from the MSC certification process showed opportunities and barriers for fisheries management in developing countries. The opportunities were identified as the value of the MSC reports as a state of the fishery report with current information about a fishery, increase of research capabilities and information production, and numerous advantages of the certification process itself. The barriers of the use of the information in the MSC reports are the language and technical format of the reports, and the distribution mechanism of the reports.

8. Conclusion

Data and information are essential components for the analysis of sustainability indicators in fisheries management and to assist in the policy-making process. In the conduct of scientific research information of breadth and depth is assembled to advance knowledge. Use of this information in policy and decision making is influenced by management structures and the political context. As one example, the Marine Stewardship Council, an internationally recognized, non-governmental organization (NGO), with its certification and ecolabel program, compiles complex scientific information about fisheries using an indicator-based framework for the assessment of specific fisheries.

Fishery assessment frameworks are important to assist fisheries managers and decision-makers in the collection of information about the biological and environmental status of particular fisheries. However, a lack of available scientific data and weak fisheries management infrastructure in developing countries have been identified as barriers for fisheries assessment methodologies, particularly in the certification process of the Marine Stewardship Council (Perez-Ramirez, Phillips, Lluch-Belda & Luch-Cota, 2012). Therefore, the purpose of this research was to describe the information framework of the certification program and the life-cycle of the MSC reports, which underly the assessment methodology. Clearly articulated understanding of the role of the information in the MSC certification process, could assist developing nations in assembling the information required for certification of particular fisheries and in fisheries management.

In order to increase understanding about the use and awareness of the information in MSC reports in the context of developing countries, this research conducted a case study of two MSC-certified lobster fisheries in Mexico: the Baja California red rock lobster and the Sian Ka'an and Banco Chinchorro Biosphere Reserve spiny lobster. Mexico is the third-largest seafood producing country in Latin America, and the Baja California lobster fishery was the first small-scale fishery in a developing country to be MSC-certified. Baja California lobster fishery is an example of a community-based management approach. In addition, the Sian Ka'an and Banco Chinchorro Biosphere Reserve lobster fishery was the first fishery in the Mesoamerican reef, a marine region, to be MSC certified and its

certification process prompted the development of guidelines for sustainable fishing in the region.

Certification and ecolabels schemes, such as the MSC program, advocate non-traditional approaches to overcome the problems of global capture fisheries. The MSC certification scheme promotes market-based incentives as a means to change consumer behavior from the current demand for unsustainable products to sustainable seafood consumption. The organization's standard was developed through extensive international consultation, and the performance indicators are the operational guidelines of the MSC's fishery assessment methodology. The development of the standard and the transparency in the decision-making process of certification are motivations for stakeholders, fisheries managers, and policy-makers to use the scientific information assembled under the MSC framework. This framework, which is based on the principles and criteria of the organization, are core features of the MSC, and are related to the status of fish stocks, the environmental impact of particular fisheries, and the fisheries management performance.

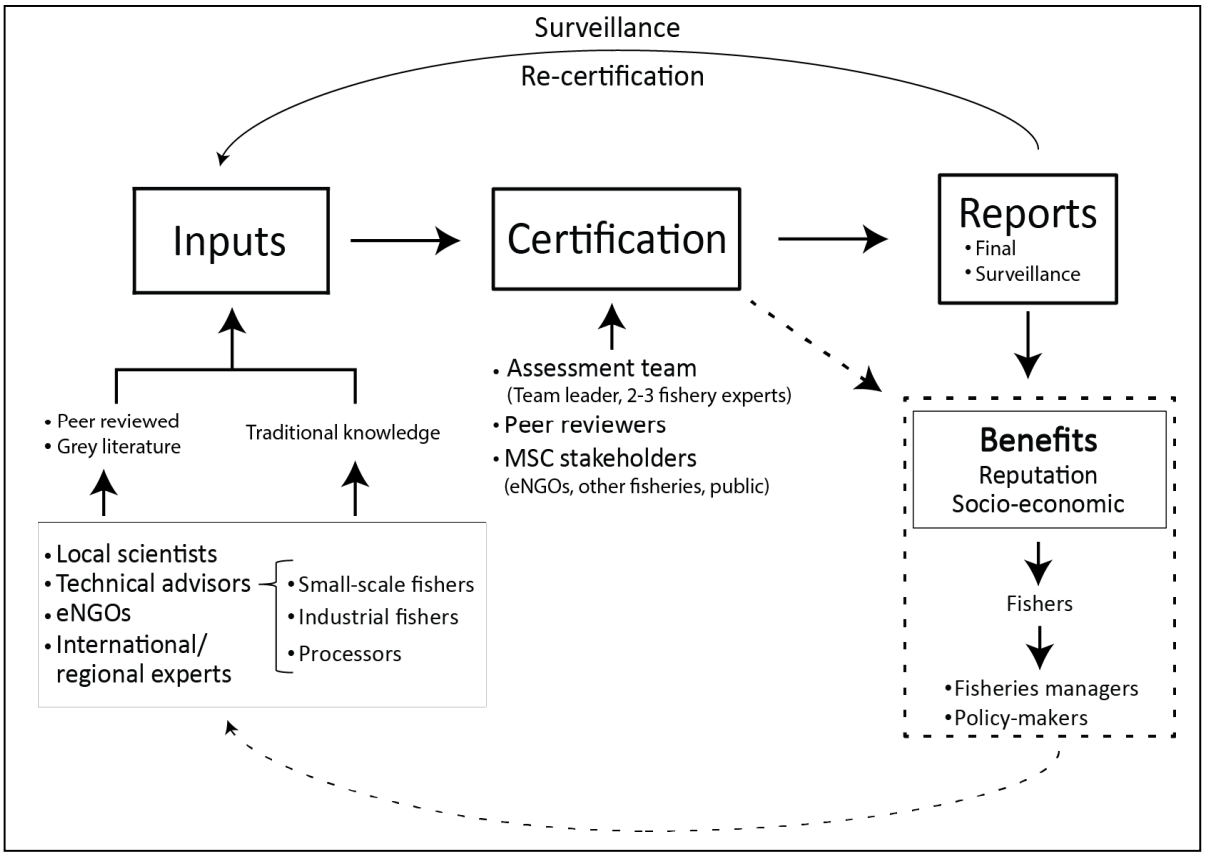
Even though the program has successfully made consumers and retailers aware of the environmental issues of the seafood production, the scheme has not yet demonstrated tangible environmental impacts and has failed to engage most small-scale fisheries from developing countries. However, recent studies revealed that the impact of the certification program has resulted in a reduction of the uncertainty about the fishery impact rather than in an environmental impact per se (Martin et al., 2012). This development has been accomplished through an increase in research and an improvement of management capabilities, which in turn has been translated by managers into on-the-water actions.

The MSC fisheries assessment methodology is recognized by the scientific community and is a credible tool to enhance research capabilities. The reports resulting from the certification process contain salient information, as they include current knowledge and outline the state of particular fisheries, while the credibility and legitimacy attributes of useful information are an outcome of the multi-stakeholder approach inherent of the certification process.

In general, this study has shown that the information inputs of the MSC certification come from peer reviewed and grey literature, and from traditional knowledge (Figure 3). Inclusion of this latter type of information is an attempt by the MSC to overcome the lack

of information in fisheries from developing countries. Two groups contribute to the information inputs of the certification process (Figure 3). The first group is composed of local scientists from government or research agencies, environmental NGOs (eNGOs) in the role of fishery co-client, international and regional experts, and technical advisors within the fishery client's organization. The second group is composed of the small-scale and industrial fishers, and processors, who provide information arising from traditional knowledge during the site visits of the assessment team. The technical advisor represents the client to the certification company, and is responsible to obtaining information from the fishers and producers (Figure 3).

Figure 3. Information Flow of the Marine Stewardship Council Certification Process



* Dashed arrows and dashed box indicate the findings of this study.

The MSC certification process proceeds through seven stages with a series of inputs and outputs of information at each stage (middle box in Figure 3; see also Table 1). The assessment team, a third-party certification company, is responsible for the certification

process (Figure 3). After comments are received from the fisheries client group, a draft report is sent to two peer-reviewers outside the certification company. Throughout the certification process, the MSC and the certification company encourage feedback from stakeholders, which has been described as strength of the certification program (Perez-Ramirez, Phillips, Lluch-Belda & Lluch-Cota, 2012). Stakeholders are individuals who identify themselves as interested parties in the certification process of a fishery. This group is composed of members of eNGOs, other fisheries not under assessment, and the interested public.

The certification process presents benefits to developing countries as it brings together leading scientists to study a fishery, encourages and provides channels for stakeholder participation, the certification condition(s) identify areas to improve the sustainability of a fishery, and the process itself promotes the production of more scientific information that can be used in the management of a fishery.

Three draft reports and a final report are produced during the certification process, and four surveillance reports are produced prior to re-certification (Figure 3). The final report is peer reviewed and contains information about the fishery, the rationale of the assessment team for assigned scores, condition(s) of certification, public feedback, the client's action plan to meet the conditions, and an extensive bibliography of the fishery. As participants in this study noted, this final report serves as a significant reference document for certification companies in the assessment of similar fisheries, or in the production of other certification documents. The final reports can serve as the inputs of other fishery certification processes. The final report is used as baseline information for the subsequent surveillance reports and when the certification expires, these reports are included in the information inputs in the re-certification process (Figure 3).

The life-cycles of the MSC reports suggest a more conceptual use of the information rather than instrumental use in policy-making. Because the reports are produced to document the assessment team's rationale, use is indirect through the increased awareness of policy-makers and stakeholders about the sustainability characteristics of the fishery. The reports are produced in a digital version and in English, and posted in the MSC website as a mechanism for distribution. Reliance on a single language, even though it is widely used internationally, and posting the reports in a single open access repository

without active promotion of the availability of the reports were identified in this study as barriers to the use of the information of the MSC reports in fisheries management in developing countries.

The results of this study showed the use of the two Mexican MSC certification reports as reference documents by Mexican stakeholders. The certification team, specifically, cited the reports in peer reviewed journals, in a conference keynote address, and made reference to alternative assessment methodologies (e.g., the bank-by-bank assessment tool) noted in the reports. In addition, a fishery co-client indicated the use of the reports to develop guidelines to assist small-scale fisheries with the MSC certification process and in an NGO's conservation objectives in the Mesoamerican reef. In total, however, use of the reports seems limited.

According to participants in this study, the most important benefit of the two Mexican MSC reports is the compilation of complete reference documentation about the actual state of the fisheries, and the conditions of certification which serve as guidelines to promote improvements in fishery practices. However, participants from the Mexican stakeholder group acknowledge the poor use of the reports and noted that recommendations in the report are not included in national management plans.

The benefits of the certification and the use of the information in the MSC reports identified in the Mexican fisheries, confirms that the information generated in a MSC certification does have a role in fisheries management in developing countries. The certification process and the information produced with the MSC framework increase the reputation of fisheries and is a driver for socio-economic benefits, such as increased support by governmental authorities within a community. The reputation of a certified fishery also results in advancing the credibility and reputation of governments, when they become actively involved in the sustainability of fisheries within a country's fisheries management systems. These benefits of the certification process, in turn, become drivers for the production of more scientific information that serve as inputs to the certification (Figure 3). This new information can fulfill an important role in improving fisheries management. The MSC organization itself also benefits from each successful certification. The production of more scientific information about fisheries management

speaks to the credibility of the certification program as the presence of the certification scheme becomes more widely applied in developing countries.

9. Recommendations and Further Research

The use and influence of the reports in the Marine Stewardship Council certification process depend on the environment that the reports enter, as well as the presentation and the communication format in which the information is given. Due to the purpose of the reports, they are primarily produced in English only and in a technical format. This combination can pose a barrier to the use of the information in the reports and to knowledge mobilization, and for the fishing industry to implement the conditions. One participant of this study suggested the production of pamphlets or handouts by local scientists in the language of members of the industry, in order to increase the use of the MSC reports.

Recommendation #1: To increase the use of the information in the MSC reports by the fishing industry and government authorities, a summary version should be prepared by local scientists in the native language(s) of the country.

The public comment draft reports, the final reports, and the surveillance reports are posted on the MSC and certification company websites, as the primary mechanism of distribution of the reports. Furthermore, the public draft reports are distributed to interested stakeholders of particular certifications. Other mechanisms for distributing the final and surveillance reports are not explicitly itemized in the MSC policies and guidelines. Simply posting the reports on the two websites does not guarantee that all members of the interested public, government authorities, and individuals associated with other fisheries become aware of the MSC reports. The certification company and the MSC promote awareness of the fishery entering the program, but not awareness and use of the reports and the information they contain.

Recommendation #2: Initiatives should be undertaken to increase awareness of the location of the reports. Increased awareness will contribute to greater use of the information, with the added benefit of improved ecological image of fishers and government authorities in developing countries. For example, this task could be

assumed by the technical advisors and eNGOs within the country once the certification company posts the reports. Notices with a link to the MSC webpage containing the reports could be circulated. In addition, eNGOs and other organizations could embed links in their websites to the MSC webpage containing the reports.

Recommendation #3: Participation of government authorities in the distribution of the documents could be encouraged so as to increase the dissemination of the information in the MSC reports. A representative of the MSC Americas region pointed out that the action plans and the surveillance reports are shared with the governments of countries pursuing certification. Development of a clearer documentation about the mechanisms of participation of government authorities in the production of information of the MSC certification process could elevate their reputation for sustainable fisheries internationally.

Through an examination of the flow of information in the MSC certification process (see Figure 3), this research described the role of the information in the process and identified the value of this information to governments in developing countries.

Recommendation #4: The certification authorities should give greater attention to showcase the advantages of the information in the MSC reports to government authorities to increase the likelihood of instrumental use of the documents by policy-makers. This initiative could result in greater use of the information in fishery management plans when relevant.

According to the Mexican stakeholders and studies conducted in Argentina (Perez-Ramirez, Lluch-Cota & Lasta, 2012), stakeholder involvement in the fisheries assessment process is an important feature of the MSC certification process. Stakeholder participation is important for promoting integrated fisheries management, and is a driver in the production of information about fishery practices.

Recommendation #5: Fisheries managers and policy-makers from developing countries, whether within the MSC fishery assessment framework or not, should

enable mechanisms to encourage stakeholders to participate in the management and decision-making activities of the certification process.

Future research work

Future research about the role of the information in the MSC certification reports could investigate the influence of the reports more thoroughly than was possible in this project. Future study could explore how to the use of information could be moved from conceptual to instrumental use in policy and decision-making. Further research is needed to understand why the information in the MSC reports is not fully exploited by governments or why the conditions of certification are difficult to include in the fisheries management plans, as one participant of this research stated. Developing greater understanding of the mechanisms required to include the conditions of certification in national management plans will assist fisheries managers and policy makers to maximize the use of the information in the MSC reports. Another research stream could apply web analytics to determine the use of particular certification reports or the reports produced in all MSC certifications in general. Moreover, studies of other MSC certified fisheries in developing countries could be conducted for comparison to the findings of this research.

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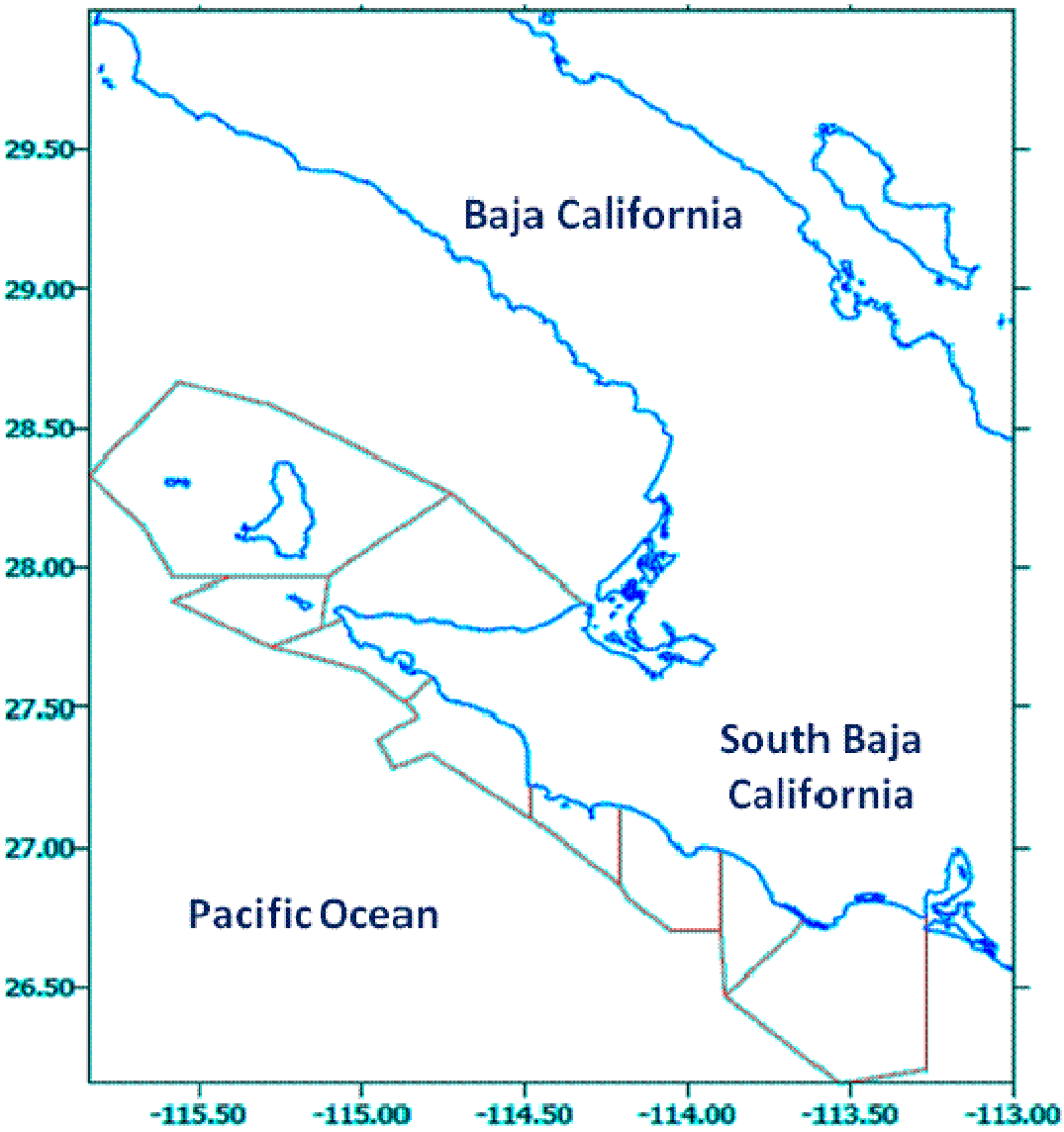
APPENDICES

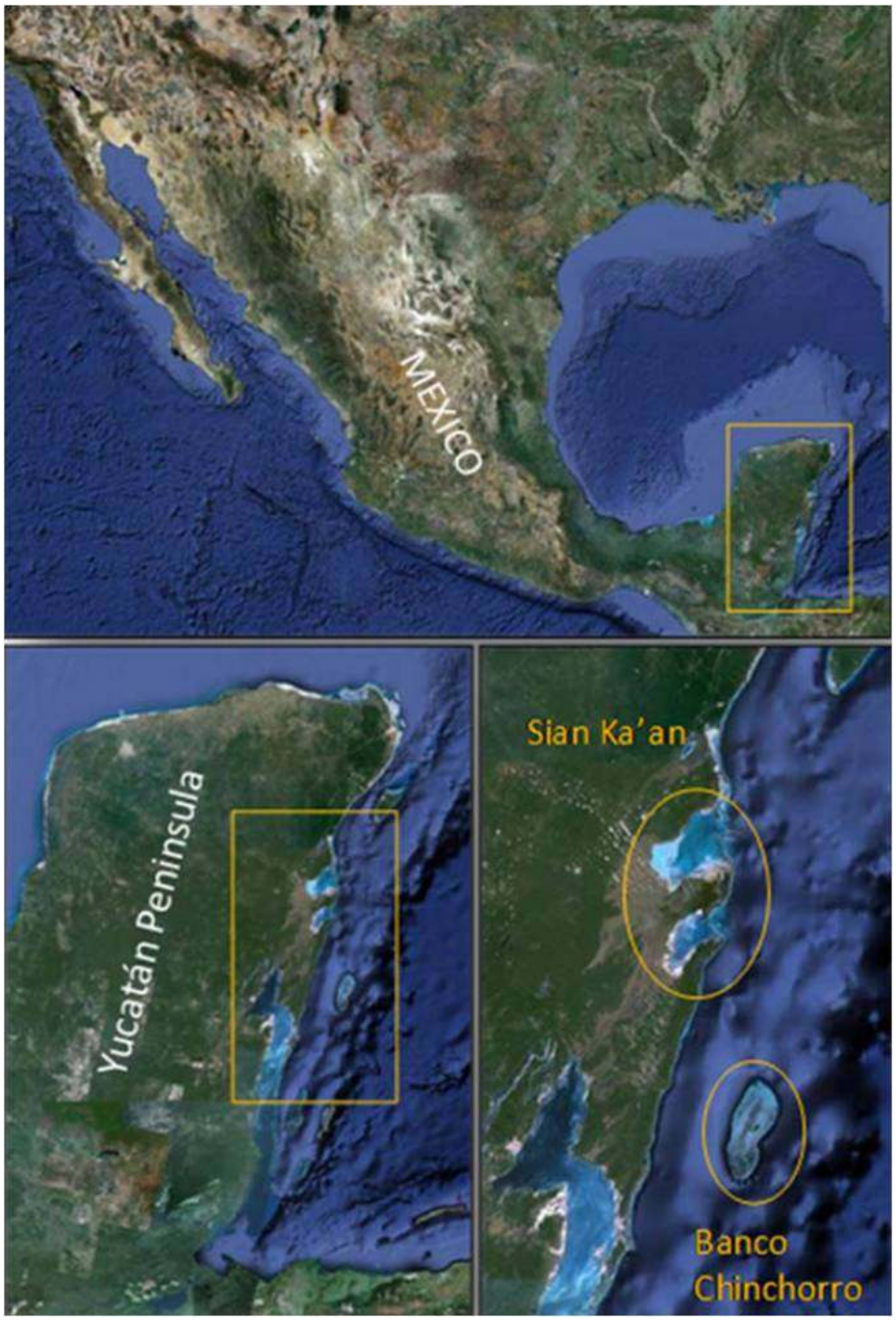
Appendix A. Location of the two Mexican Certified Fisheries

A1. Central Region of the Baja California Peninsula.



*The figure shows the concession area of the ten fishing cooperatives that harvest the Baja California red rock lobster (*Panilurus interuptus*).
**Source Vega 2004

A2. Location of the Sian Ka'an and Banco Chinchorro Biosphere Reserves.



*Source MRAG, 2012

Appendix B. Ethics Approval Letter

DALHOUSIE UNIVERSITY
Inspiring Minds

Office of the Vice-President Academic and Provost

Dr Bertrum MacDonald
School of Information Management
Dalhousie University
Halifax, Nova Scotia B3H 4R2

5th July 2013

Dear Bertrum,

This letter provides my formal approval for Melissa Cano Chacón to pursue her Graduate Project in the MMM program. In my role as the Associate Dean (Research) in the Faculty of Management, I reviewed Melissa's Ethics Review Application for her research project examining "The role of information of the Marine Stewardship Council certification process in developing countries."

As part of my review I provided a few suggested amendments for consideration. Melissa has now submitted her final ethics package for the Faculty's files relating to ethics reviews of individual student projects.

It was a pleasure to read such a thorough ethics application. Please pass on my congratulations to Melissa. Thank you for your very high calibre skills in supervising this student's work. I wish the project every success and am confident that it will provide meaningful and useable results for the Marine Stewardship Council.

Best wishes,

Fiona

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Appendix C. List of Documents that Reference the Mexican Reports

Costello, C. J., & Kaffine, D. (2008). Natural resource use with limited-tenure property rights. *Journal of Environmental Economics and Management*, *55*(1), 20-36.

Deacon, R. T. (2011). Fisheries management by harvester cooperatives. *Review of Environmental Economics and Policy*, *6*(2), 258- 277.

Ezcurra, E., Aburto-Oropeza, O., de los Ángeles Carvajal, M., Cudney-Bueno, R., & Torre, J. (2009). Gulf of California, Mexico. In K. McLeod and H. Leslie (eds.), *Ecosystem-based Management for the Oceans* (pp. 227-252). Washington, D.C: Island Press.

Hess, L., Johnson, P., Karasek, T., Port-Minner, S., Radhakrishnan, U., & Costello, C. (2009). *Pathway to Self-Funding: A case study on the California spiny lobster commercial fishery*. (Unpublished Master dissertation), University of California, Santa Barbara.

Pérez-Ramírez, M., Ponce-Díaz, G., & Lluch-Cota, S. (2012). The role of MSC certification in the empowerment of fishing cooperatives in Mexico: The case of red rock lobster co-managed fishery. *Ocean & Coastal Management*, *63*, 24-29.

Pirie, R. E. (2013). *Exploring marine protected areas: A baseline governance assessment of the Sian Ka'an Biosphere Reserve* (Doctoral dissertation). Dalhousie University, Canada.

Ramírez-Estévez, A. E., Ríos-Lara, G. V., Lozano-Álvarez, E., Briones-Fourzán, P., Aguilar-Cardozo, C., Escobedo, G. F., ... & de Dios Martínez-Aguilar, J. (2010). Estimación de crecimiento, movimientos y prevalencia de PaV1 en juveniles de langosta *Panulirus argus* en la Reserva de la Biósfera Banco Chinchorro (Quintana Roo, México) a partir de datos de marcado-recaptura. *Ciencia Pesquera*, *18*(1), 52.

Shester, G., Lluch-Cota, S., & Micheli, F. (2008). Evaluating the ecological impacts of a small-scale fishery in the context of a certified eco-label. In G. Shester (ed.), *Sustainability in small-scale fisheries: An analysis of ecosystem impacts, fishing behavior, and spatial management using participatory research methods* (pp. 15-52). (Unpublished PhD dissertation). Stanford University, U.S.

Shester, G., & Micheli, F. (2011). Conservation challenges for small-scale fisheries: Bycatch and habitat impacts of traps and gillnets. *Biological Conservation*, *144*(5), 1673-1681.

White, C., & Costello, C. (2011). Matching spatial property rights fisheries with scales of fish dispersal. *Ecological Applications*, *21*(2), 350-362.

Appendix D. Fisheries Client Survey Questionnaire

A. Role with the fishing industry in Baja California/Quintana Roo:

1. a. What is your current role in the fishing industry?
   ____small scale fisher
   ____industrial fisher
   ____processor
   ____exporter
   ____other, please specify_____

   b. What period have you been in this role?

B. Awareness of the use of the Marine Stewardship Council certification reports:

2. a. Are you aware of any of the Marine Stewardship Council certification reports, for the Baja California red rock lobster fishery or the Sian Ka'an and Banco Chinchorro spiny lobster fishery? Yes____No____

   Please, check all the options that apply
   ____initial certification report
   ____surveillance report
   ____re-certification report

   b. If yes, how did you become aware of the reports?

   c. When did you become aware of the reports? Put an X in the options that apply.

	within the last 6 months	within the last year	within the last 2 years	other, please indicate
initial certification report				
surveillance report				
re-certification report				

   d. If you were aware of the reports, did you read them? Yes____No_____

e-*i*. Did you use these reports? Yes____No____

e-*ii*. How did you use these reports? Please explain

C. Knowledge of MSC certification reports:

3. Does the information in the Marine Stewardship Council certification reports help you in your role in the fishing industry? Please explain

4. a. Have you been involved in the creation of any report? Yes____No____

   b. What was your involvement?

5. In your opinion, what are the impacts of the Marine Stewardship Council certification process on your role in the fishing industry?

Appendix E. Certification Team Survey Questionnaire

E1. Conformity Assessment Body Questionnaire

A. Role within the MSC certification process in Baja California/Quintana Roo:

1. Over what period have you been in the role as a member of a conformity assessment body?

B. Distribution of information produced under the MSC certification process in Baja California/Quintana Roo

2. a. Have you received any requests for the Marine Stewardship Council certification reports? Yes_____No_____

   b. If yes, who requested the reports? (Put an X in all that apply)
   ____scientists
   ____fishing industry
   ____fisheries managers
   ____policy makers
   ____other, please explain_____

3. a. Did you have a role in the distribution of the Marine Stewardship Council reports?
   ____Yes

   ____No (Please skip to question 6)

   b. If yes, which Marine Stewardship Council report have you distributed? (Put an X in all that apply)

   ____draft report
   ____certification final report
   ____surveillance report
   ____re-certification draft report
   ____re-certification final report

   c-*i.* To what type of individuals were the Marine Stewardship Council reports distributed (e.g., scientists, fisheries managers, fishery industry, policy makers)?

c-*ii*. Are these individuals inside or outside your agency?
Inside_____ Outside_____

d. Is there a difference in the distribution of different types of reports (e.g., drafts reports, final reports, surveillance reports)? If yes, please explain

e. Were these publications distributed to the following organizations? (Put an X in all that apply)
____libraries
____research institutions
____government agencies
____non-governmental organizations

f-*i.* Is the traffic on your organization's Web site monitored? Yes____No____

f-*ii.* If yes, does your organization analyze the data? Yes____No____

f-*iii.* If yes, how was the analysis used?

C. Assessing the use of information produced by the MSC certification process

4. What is the intended use of the Marine Stewardship Certification reports (i.e., initial certification report, surveillance report, re-certification report) for someone in your role within the certification process?

5. a. Do you or your organization keep a record of requests for the Marine Stewardship Council reports? Yes _____ No_____

   b. If yes, is this information used to provide feedback about the reports? Yes _____ No_____

6. a. Are you aware of any use of a Mexican Marine Stewardship Council certification report? Yes _____ No_____

   b. If yes, how where they used? Please explain.

7. Do you or your organization keep a record of any evidence of the use of the Marine Stewardship Council publications? Yes _____ No_____
8. Finally, do you have recommendations or suggestions about how to enhance the awareness, distribution, and use of the Marine Stewardship Council certification reports?

   Awareness

   Distribution

   Use

E2. Fisheries Experts Questionnaire

A. Role within the MSC certification process in Baja California/Quintana Roo:

1. Over what period have you been in the role of a fisheries assessor?

B. Distribution of information produced under the MSC certification process in Baja California/Quintana Roo

2. a. Have you received any requests for the Marine Stewardship Council certification reports? Yes_____No_____

   b. If yes, who requested the reports? (Put an X in all that apply)
   ____scientists
   ____fishing industry
   ____fisheries managers
   ____policy makers
   ____other, please explain_____

3. a. Did you have a role in the distribution of the Marine Stewardship Council reports?

   ____Yes

   ____No (Please skip to question 4)

   b. If yes, which Marine Stewardship Council report have you distributed? (Put an X in all that apply)

   ____draft report
   ____certification final report
   ____surveillance report
   ____re-certification draft report
   ____re-certification final report

   c-*i.* To what type of individuals were the Marine Stewardship Council reports distributed (e.g., scientists, fisheries managers, fishery industry, policy makers)?

c-*ii*. Are these individuals inside or outside your agency?
Inside_____Outside_____

d. Is there a difference in the distribution of different types of reports (e.g., drafts reports, final reports, surveillance reports)? If yes, please explain

e. Were these publications distributed to the following organizations? (Put an X in all that apply)
____libraries
____research institutions (e.g., government research institutions, universities)
____government agencies
____non-governmental organizations

C. Assessing the use of information produced by the MSC certification process

4. What is the intended use of the Marine Stewardship Certification reports (i.e., initial certification report, surveillance report, re-certification report) for someone in your role within the certification process?

5. a. Do you or your organization keep a record of requests for the Marine Stewardship Council reports? Yes _____ No_____

   b. If yes, is this information used to provide feedback about the reports? Yes _____ No_____

6. a. Are you aware of any use of a Mexican Marine Stewardship Council certification report? Yes _____ No_____

   d. If yes, how were they used? Please explain.

7. Do you or your organization keep a record of any evidence of the use of the Marine Stewardship Council reports? Yes _____ No_____

8. Finally, do you have recommendations or suggestions about how to enhance the awareness, distribution, and use of the Marine Stewardship Council certification reports?

   Awareness

   Distribution

   Use

Appendix F. Mexican Authorities Survey Questionnaire

A. Role with the fisheries administration in Mexico

1. a. What is your current role within your Ministry or Institute?

   b. How long have you been in this role? (Number of years?)

2. a. Are you aware of the Marine Stewardship Council reports?
   Yes___No___(skip to question 3)

   b. When did you become aware of the reports?
   ____within the last 6 months
   ____within the last year
   ____within the last 2 year
   ____other, please specify the period _____

   c. How did you become aware of the Marine Stewardship Council reports?
   ____from a colleague
   ____received a copy
   ____found a copy on Internet
   ____newspaper article or other media account
   ____other, please specify_____

B. Production of information under the Marine Stewardship Council certification process

3. a. Do you have a role in the generation of information for the Marine Stewardship Council reports? Yes____No_____

   b. If yes, please explain

C. Acquisition of the Marine Stewardship Council certification reports

4. Does your office receive information about (A) forthcoming draft reports, (B) forthcoming final reports or (C) information about a report is only obtained when the report is published? (Check all that apply)
   ____A

____B
____C

5. a. Do you or your organization receive copies of the reports? Yes_____ No_____

   b-*i*. If yes, how do you or your organization obtain the reports? (Check all that apply)
   ____notice with a link to the Marine Stewardship Council webpage
   ____receive a copy from the accreditation company

   b-*ii*. In which format did you receive it? print_____ digital _____

   b-*iii*. Is there a preference of format? _____

D. Distribution of information produced from the Marine Stewardship Council certification process

6. In answering this question, please select one report particularly relevant to your agency:
   ____draft report
   ____certification final report
   ____surveillance report
   ____re-certification draft report
   ____re-certification final report

   a. Do you inform personnel in your agency about the report? Yes_____No_____

   b. If yes, how?

7. If your agency has a library, does it maintain a collection of the Marine Stewardship Council reports? Yes_____No_____
8. a. Do you receive requests for the Marine Stewardship Council reports?
   Yes____ No_____

   b. If yes, who requests the reports?
   ____scientists
   ____fishing industry
   ____fisheries managers
   ____policy makers
   ____other, please explain_____

9. a. Does your agency distribute any information or report? Yes_____No_____

   b. What method(s) is used to distribute that information or report? (Check all that apply)

   _____hardcopy
   _____digital copy
   _____notice with a link to the Marine Stewardship Council webpage

   c. Who is the information or report distributed to?
   ____scientists
   ____fishing industry
   ____fisheries managers
   ____policy makers
   ____other, please explain_____

E. Assessing the use of information produced by the Marine Stewardship Council certification process

10. What is the intended use of the Marine Stewardship Council reports for someone in your role as a fisheries manager or policy maker?

11. As a fisheries manager or policy maker, have you been able to use the information from the Marine Stewardship Certification reports in fisheries management and policy development? If yes, please explain

12. a. Are you aware of other fisheries managers or policy makers using the Marine Stewardship Council reports? Yes_____ No_____

    b. If yes, please explain

13. Does your organization's website link to the Marine Stewardship Council webpage? Yes____No_____

14. Finally, do you have recommendations or suggestions about how to enhance the awareness, distribution, and use of the Marine Stewardship Certification reports?

Awareness

Distribution

Use

Appendix G. Spanish Translations of the Questionnaires

F1. Fisheries Client Questionnaire

A. Papel dentro de la industria pesquera en Baja California/Quintana Roo:

1. a. ¿Cuál es su posición actual en la industria pesquera?
   ____pescador artesanal
   ____pescador industrial
   ____procesador
   ____exportador
   ____otro, por favor especificar_____

   b. ¿Cuánto tiempo ha tenido usted su actual posición?

B. Conocimiento sobre uso de los reportes de certificación del Marine Stewardship Council:

2. a. Tiene usted conocimiento sobre algún reporte de certificación del Marine Stewardship Council, específicamente el de la pesquería de la langosta roja de Baja California o de la langosta espinosa de Sian Ka'an and Banco Chinchorro Reserva de Biosfera? Si____No____

   Por favor, marque con una X todas las opciones que aplican
   ____ reporte de certificación inicial
   ____informe de vigilancia
   ____reporte de re-certificación

   b. En caso afirmativo, ¿Como tuvo conocimiento sobre los reportes?

   c. ¿Cuando tuvo conocimiento de los reportes? Coloque una X en las opciones que aplican.

	dentro de los últimos 6 meses	dentro del último año	dentro de los últimos 2 años	otros, por favor indicar
reporte de certificación inicial				
informe de vigilancia				
reporte de re-certificación				

d. ¿Si usted tuvo conocimiento de los reportes, los leyó? Si____No_____

e-*i*. ¿Utilizó los reportes? Si____No____

e-*ii*. ¿Cómo los utilizó? Por favor explicar

C. Conocimiento del proceso de certificación del Marine Stewardship Council:

3. ¿Ayudo a su papel en la industria pesquera la información en los reportes de certificación del Marine Stewardship Council? Por favor explicar.

4. a. ¿Ha estado usted involucrado en la creación de algún reporte? Si____No____

   b. ¿Cuál fue su participación?

5. En su opinión, ¿cuál es el impacto del proceso de certificación del Marine Stewardship Council a su papel en la industria pesquera?

F2. Mexican Authorities Questionnaire

A. Papel dentro de la administración de las pesquerías en México:

1. a. ¿Cuál es su actual papel dentro de su ministerio o instituto?

   b. ¿Cuánto tiempo tiene ejerciendo este cargo? (Número de años)

2. a. ¿Tiene conocimiento de algún reporte del Marine Stewardship Council? Si___No___(ir a la pregunta 3)

   b. ¿Cuándo tuvo conocimiento de los reportes?
   ____dentro de los últimos 6 meses
   ____dentro del último año
   ____dentro de los últimos 2 años
   ____otro, por favor especificar el período_____

   c. ¿Cómo tuvo conocimiento de los reportes del Marine Stewardship Council?
   ____de un colega
   ____recibí una copia
   ____encontré una copia en el Internet
   ____artículo del periódico u otro tipo de medio
   ____otro, por favor especificar_____

B. Producción de la información dentro del proceso de certificación del Marine Stewardship Council:

3. a. ¿Tuvo usted algún papel en la generación de información de los reportes del Marine Stewardship Council? Sí____No_____

   b. De ser cierto, por favor explicar

C. Adquisición de los reportes de certificación del Marine Stewardship Council:

4. ¿Su oficina recibe información acerca de (A) próximos borradores de reportes, (B) próximos reportes finales (C) la información acerca de un reporte es solo obtenida cuando el reporte es publicado? (Poner una X en todas las opciones que aplican)
   ____A
   ____B

____C

5. a. ¿Usted o su organización recibe copias de los reportes? Si_____ No_____

   b-*i*. En caso afirmativo, ¿cómo usted o su organización reciben las copias? (Poner una X en todas las opciones que aplican)
   ____noticia con un link a la página web del Marine Stewardship Council
   ____recibo una copia de la compañía acreditadora

   b-*ii*. ¿En qué formato lo recibe? impreso_____ digital _____

   b-*iii*. ¿Existe alguna preferencia? _____

D. Distribución de la información producida durante el proceso de certificación del Marine Stewardship Council:

6. Para responder a esta pregunta, por favor seleccione un reporte particularmente relevante a su agencia:
   ____borrador de reporte
   ____reporte de certificación inicial
   ____informe de vigilancia
   ____borrador de reporte de re-certificación
   ____reporte final de re-certificación

   b. ¿Informa usted al personal de su agencia acerca del reporte? Si_____No_____

   b. En caso afirmativo,¿Cómo?

7. Si si agencia posee una librería, ¿Mantiene alguna colección de los reportes de Marine Stewardship Council? Si_____No_____
8. a. ¿Recibe usted pedido de los reportes de Marine Stewardship Council? Si____ No_____

   b. En caso de afirmativo, ¿Quién lo solicita?
   ____científicos
   ____industria pesquera
   ____administradores de pesquerías
   ____políticos
   ____otro, por favor explicar_____

9. a. ¿Su agencia distribuye alguna información o reporte? Si_____No_____

   b. ¿Qué método(s) es utilizado para la distribución? (Poner una X en todas las que apliquen)

   _____copia impresa
   _____copia digital
   _____aviso con un link a la página web del Marine Stewardship Council

   c. ¿A quién fue distribuida esta información?
   ____científicos
   ____industria pesquera
   ____administradores de pesquerías
   ____políticos
   ____otros, por favor explicar_____

E. Evaluando el uso de la información producida durante el proceso de certificación del Marine Stewardship Council:

10. ¿Cuál es la utilización prevista para los reporte del Marine Stewardship Council para alguien en su posición como administrador, político o científico en pesquerías?

11. Como administrador, político o científico en pesquerías, ¿ha podido usted utilizar la información presente en los reportes del Marine Stewardship Certification para el manejo de pesquerías, desarrollo de políticas o investigación? En caso de ser afirmativo, por favor explique

12. a. ¿Tiene usted conocimiento del algún otro administrador, político o investigador utilizando los reportes del Marine Stewardship Council? Si_____ No_____

c. En caso de afirmativo, por favor amplíe su respuesta

13. a. ¿La página web de su organización tiene un link que la conecte a la página web del Marine Stewardship Council? Si____No_____

14. Finalmente, ¿tiene usted alguna recomendación acerca de como realzar el conocimiento, distribución y uso de los reportes del Marine Stewardship Council?

Conocimiento

Distribución

Uso