SUSTAINABILITY CERTIFICATION IN
COMMUNITY-BASED FISHERIES

By

Elizabeth H. Fetherston

Date:____________________

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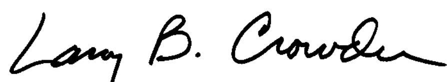
Dr. Scott Eckert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Dr. Larry Crowder, CEM Program Director

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ABSTRACT

Mismanagement of global fisheries resources has an overwhelmingly negative effect on the survival of community-based fisheries. In developing countries, community-based fishing is a socially as well as economically valuable activity providing much needed employment and income in areas where there are few alternatives for either. In order to promote sustainability in these areas, the World Wildlife Fund for Nature (WWF) and the Marine Stewardship Council (MSC) are attempting to apply their sustainable seafood ecolabeling program to community-based fisheries.

The MSC and WWF examined ten community-based fisheries in 2000, including Prainha do Canto Verde, a fishing village in northeastern Brazil. Though the community harvested lobster in a sustainable manner, the larger fishery did not. The national lobster fishery in Brazil covers over 150,000 square kilometers and is characterized by illegal, unsustainable fishing practices and poor enforcement. As a result, the lobster stock remains in serious decline and faces the possibility of collapse. This failing stock health prevented the MSC from considering Prainha do Canto Verde for sustainability certification. Under the MSC, a sustainable product can never come from an unsustainable fishery, despite pockets of good management and environmentally responsible practices.

Currently, the MSC is powerless to promote sustainable practices in community-based fisheries because the criteria relate directly to the sustainability of the product. By certifying small-scale communities that harvest sustainably within an admittedly unsustainable system, economic incentives for other communities to change their behavior could develop, to the benefit of the larger fishery. Recognizing the constraints inherent in the MSC, this project proposes alternative approaches to promoting the welfare of communities and the sustainability of their fisheries.

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INTRODUCTION

Mismanagement of global fisheries resources is having an overwhelming impact on the capacity of community-based fisheries to survive. Although world fish production topped 120 million tons in 1997, the 200 million people around the globe who depend on fishing for their livelihood find themselves squeezed out of this way of life (http://www. world watch.org /press/news/1998/06/18). Globally, a staggering one billion people rely on fish as their primary animal protein source, and despite their local protein needs, developing nations contribute 85% of fish products traded internationally. A globally-estimated 19 million small-scale fishers from these developing nations continue to see increasing ranges of large-scale foreign and domestic vessels encroach on the limited waters available to community-based fisheries (http://www.worldwatch.org/ press/news/1998/06/18).

This situation becomes critical in nations south of the equator, where 95% of the world's fishworkers live. Increasing competition from industrialized fisheries continues to jeopardize the sustainability of these poor and vulnerable sections of society (see Appendix I). Survival of these artisanal fishermen is inextricably linked to sustainability in marine resources, and the intrinsic characteristics of artisanal fisheries –small vessels, low waste, seasonal diversity, local consumption, and fishing within a small distance from shore – tend to make overharvest a near impossibility (http://www.fortalnet.com.br/ ~fishnet/afolder_pcv.htm). Regulations and subsidies that favor industrial fisheries,

however, are creating perverse incentives for governments and communities alike to harvest unsustainably.

Artisanal fishers and poor communities south of the equator depend on fisheries for survival, yet traditional fisheries management measures are failing to protect fish stocks in both developing and industrial nations. According to the Food and Agriculture Organization, 76% of world fish stocks are now fully or over exploited, and a further 20% of world catch comes from stocks for which we lack sufficient information to assess their state of exploitation (FAO, 2005). International failure to protect fish stocks has prompted conservation organizations to examine alternatives to traditional management in order to ensure both fish stocks and fishing communities will continue into the future. One such organization, the Marine Stewardship Council (MSC), developed a strategy for providing a market-based, economic incentive to fisheries that operate in a sustainable manner via an ecolabel certification program.

To date, the MSC has been successful at measuring and assessing fisheries that originate in industrialized countries, use industrialized gear, or have exclusive access to their fishery. In 2000, the MSC selected ten pilot fisheries to test the applicability of its certification methodology on community-based fisheries. The purpose of this study was to investigate the MSC experience of one community-based lobster fishery in Brazil and to evaluate the suitability of the certification process for community-based fisheries. As a fishery product, lobster provides a good candidate to evaluate how cash-based fisheries (in contrast to subsistence fisheries) lend themselves to sustainable fishery certifications. In addition, the single-species nature of the fishery and the high-dollar market value create favorable conditions for certification.

CHAPTER 1: LOBSTER

Two varieties of lobster exist in the crustacean order Decapoda: the "true" lobsters that have two large claws and a rigid, shelled tail, and the spiny/rock lobsters which lack enlarged front claws, and have spiny antennae, a rock-hard shell protected with spines, and a muscular tail adapted for swimming. Every commercially harvested spiny or rock lobster belongs either to the genera *Panulirus* or *Jasus*, and lives in shallow water. The lobster prefixes 'rock', 'spiny', and 'red' lack taxonomic meaning, and are often applied to the same species (http://www.mbayaq.org/cr/cr_seafoodwatch/ sfw_factsheet.aspx?fid=20).

The life history of the spiny lobster is comprised of five distinct developmental stages: egg, larvae, pluerulus, juvenile, and adult. In the greater Caribbean, of which Brazil is considered a part, adults generally begin spawning between 75 and 85 mm carapace length. Egg production is size dependent, and the number released can vary from 159,000 to 1,952,000 per spawn. This occurs most intensely in the spring and summer months, when egg-bearing females migrate to the continental shelf to incubate and spawn (http://www.mbayaq.org/cr/cr_seafoodwatch/sfw_factsheet.aspx?fid=20).

Juvenile and adult spiny lobsters are prized for the rich meat of their tails, and are widely sought for commercial sale in international markets (http://www.mbayaq.org/cr/ cr_ seafoodwatch /sfw_factsheet.aspx?fid=20). Traps are generally considered the best method of capture, because they provide the two things required by the species: food (bait) and shelter (the trap) (Fonteles-Filho, 1992). In addition, fishers actively take lobsters by hook, speargun, Hawaiian sling, compressor diving, and free diving. Other,

less common gears include gill nets and hoop nets. Lobsters exhibit a high handling mortality (24.1%), especially when landed on the deck of a vessel and released (http://www.mbayaq.org/cr/cr_seafoodwatch/sfw_factsheet.aspx?fid=20).

Managers commonly employ two general regulations to manage Caribbean spiny lobster stocks: a mandated minimum carapace size limit in order to protect the breeding stock until maturity, and a temporally limited fishing season in order to a preserve a portion of the harvested stock. These are but a few of the available management tools. Additional methods used in fishery management include: limiting total allowable catch (an absolute tonnage, that when caught, mandates shutting down the fishery for the year); restricting gear (limits destructive or non-size-selective fishing gear); licensing (allows only a set number of fishermen participation in the fishery); closing spatial areas (protects migrating and spawning females); as well as a handful of other, less common techniques (Fonteles-Filho, personal communication).

CHAPTER 2: THE MARINE STEWARDSHIP COUNCIL

The Marine Stewardship Council (MSC) is a non-profit, non-governmental organization that seeks to promote the long-term sustainable use of the world's marine resources. The venture began when the World Wildlife Foundation (WWF) and the global seafood corporation Unilever decided to work toward long-term sustainability in marine fisheries and their ecosystems. The MSC is now an independent entity with an executive board and an advisory panel consisting of scientists, economists, and fisheries experts. The initial mission of the MSC was, "To work for sustainable marine fisheries by promoting responsible, environmentally appropriate, socially beneficial, and economically viable fisheries practices, while maintaining the biodiversity, productivity and ecological processes of the marine environment" (http://www.msc.org /html/content_482.htm).

In 1996, the MSC brought together over 20 experts in fisheries science, economics, social science, biology, and the legal system, as well as other stakeholders in global fisheries to objectively define a sustainable fishery and the guidelines and benchmarks that could determine success (Chaffee, 2001). This collection of experts defined a sustainable fishery as one conducted in such a way that:

- "It can be continued indefinitely at a reasonable level;
- It maintains and seeks to maximize, ecological health and abundance;

- It maintains the diversity, structure and function of the ecosystem on which it depends as well as the quality of its habitat, minimizing the adverse effects that it causes;
- It is managed and operated in a responsible manner, in conformity with local, national and international laws and regulations;
- It maintains present and future economic and social options and benefits;
- It is conducted in a socially and economically fair and responsible manner" (MSC, 2002).

The MSC, with the knowledge of the experts assembled in 1996 and other leading organizations (FAO, Greenpeace, ICES, WWF, etc.), created the Principles and Criteria for Sustainable Fishing (Chaffee, 2001). The Principles and Criteria define sustainable fisheries based on three categories: maintenance of healthy populations of targeted species, integrity of ecosystems, and effective fisheries management based on relevant biological, technological, economic, social, environmental, and commercial aspects (MSC, 2002).

The three Principles for Sustainable Fishing, as defined by the MSC are as follows:

> "Principle 1) A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.
>
> "Principle 2) Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.
>
> "Principle 3) The fishery is subject to an effective management system that respects local, national and international laws and standards and

> incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable” (MSC, 2002).

These Principles have their intent and criteria for fulfillment further articulated in the MSC internal and external literature (http://www.msc.org/html/content_505.htm).

Fisheries that conform to the standards of sustainability – the Principles and Criteria – can then request assessment from the MSC. The MSC contracts this assessment out to a third party certifier, who assembles a team of experts to analyze the fishery based on the three Principles and Criteria, tailoring their analysis to the specific dimensions of the fishery. The system is meant to be flexible enough to evaluate any kind of fishery. The actual benchmarks of success (i.e. specific catch levels or effort restrictions) are designed for the fishery under assessment by the certification team using the Principles and Criteria as a framework (MSC, 2001).

In order to use the product logo of the MSC, a fishery must have all aspects of their fishery certified as sustainable. Table 1 graphically illustrates the chain of custody that takes the fish product from the point of capture – the fishery – to the point of sale – the market – and ensures that no other, unsustainably harvested products have been mixed in. Rigid inspection of the chain of custody is essential to the credibility of the MSC, and guarantees that the product purchased by the consumer is, in fact, from a sustainable source (MSC, 2001).

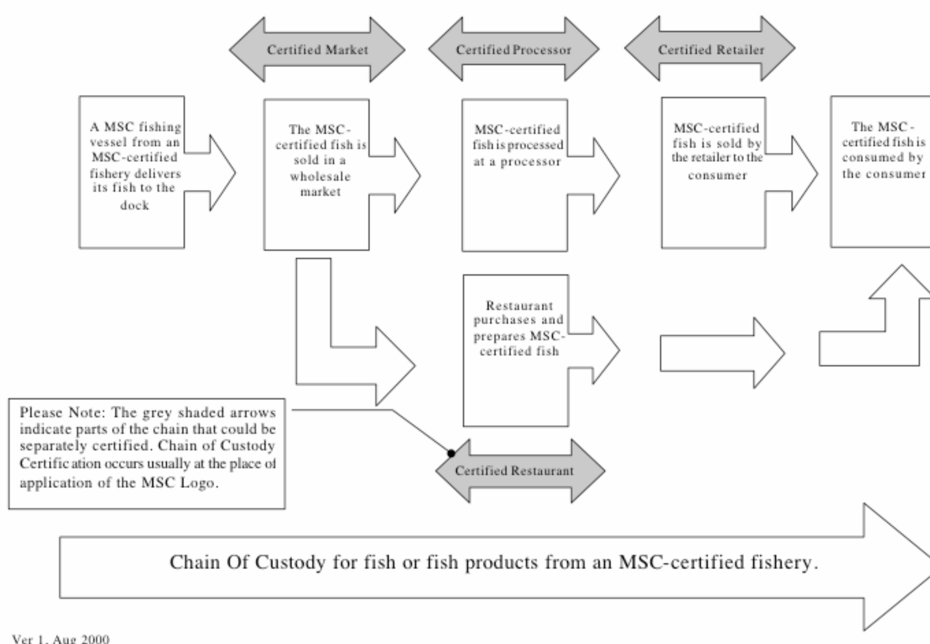

Figure 1. The MSC Chain of Custody for marine fisheries products

Fisheries that meet all assessment criteria can use the MSC logo to promote their product in higher value elite or ‘green’ markets. The MSC hopes to use this process to provide an economic benefit to fisheries operating in a sustainable manner, and to provide an economic incentive for other fisheries to change their unsustainable practices. Ideally, fishers operating within a MSC certified fishery can exact a higher price for their product from socially and environmentally conscious consumers (Charles et al., 2003).

Accessing conscientious consumers through certification of fisheries is still a new concept. The MSC is currently the only international organization that offers a market incentive for sustainably harvested marine fish products. Sustainability certification lasts for five years, at which time the fishery is re-examined to determine continued adherence to the MSC Principles of Sustainable Fishing (SCS, 2000). The Western Australia Rock

Lobster fishery was used as the pilot assessment project in 2000, and became the first fishery certified as sustainable by the MSC. The MSC contracted Scientific Certification Systems of Oakland, California, USA to test the certification methodology and practical application of the Principles and Criteria for Sustainable Fishing (Chaffee and Phillips, 2000(b)).

WESTERN AUSRALIA ROCK LOBSTER FISHERY

A lucrative fishery has existed in Western Australia since the European settlement of the southwestern provinces (see Figure 2). The first fishery regulation of 1897 designated a minimum size limit for lobster that remains virtually the same today. Historically, a fishery of small boats harvested lobster to supply local markets. At the end of World War II in 1945, commercial export to the United States began, and by 1958 eight million kilograms were harvested and sent overseas. The developmental period (1945-1962) saw few new regulations, and growth in number of participants was unlimited. After a peak of 12.9 million kg, annual catch leveled off between seven and eight million kg in the early 1960’s.

Figure 2. Map of Western Australia Rock Lobster Fishery

However, as increasing numbers of participants harvested lobster, fishers saw declines in their catch. The fishing industry lobbied for a limited entry program in 1963. In 1965, they sought strict controls on the number of traps that fishers could deploy. Increasing fishing effort, and new vessel and gear design, however, soon offset the limiting effects of controlling the number of boats and traps. In response, fishery managers implemented seasonal fishery closures, and further defined vessel and gear design, which effectively controlled the threat of overharvest (SCS, 2000).

In addition to limits on trap design and days at sea, regulation in the rock lobster fishery is based on the biological parameters of the species. The major restrictions are:

- Minimum legal size;
- Maximum legal size;
- Prohibition on take of egg-bearing females;

- Five month closed season;
- Limited entry (fixed number of boats and traps); and
- Mandated trap design.

For thirty years, these regulations ensured Australia's most important fishery remained sustainable. It is this sustainability, and the availability of both catch and effort data that led the MSC to chose the Western Australia Rock Lobster Fishery (WARLF) to test their methodology (Chaffee and Phillips, 2000(b)).

An independent certifying body, Scientific Certification Systems (SCS), assembled a team of experts in fisheries management, biology, economics, as well as other people knowledgeable about the fishery. The assembled team met to determine the procedures and requirements for assessment. The WARLF Pilot Study Feasibility Report described the process this way:

> "The first discussion will be to go through the list of potential measurable indicators provided by the MSC, and select the ones that are deemed relevant for the project. Once selected, the indicators will be grouped by categories (i.e. management indicators, stock assessment indicators, habitat impact indicators, etc.) and the team will go through a consensus process of prioritizing and weighting the indicators within categories. Indicators will not be weighted between categories.
>
> "The second discussion will be to work through a consensus process of setting minimum performance levels for each indicator chosen. This is the part of SCS's assessment procedures where the MSC Draft Principles and Criteria are translated into performance measures" (Chaffee and Phillips, 2000(b)).

The team decided what indicators were relevant and what levels of performance indicated success within a category. They then acquired information about the various aspects of the fishery. This included: "The legal framework for fisheries; management systems and processes; compliance and penalty systems; research and information

collection systems; fish and non-fish bycatch and or discards; management plans; and levels of compliance in the fishery" (Chaffee and Phillips, 2000(b)).

Further information on stock assessments required:

- Commercial fishers monthly and daily catch and effort returns;
- Processors' production and returns by size category;
- Lobster growth, mortality and movement data; and
- Models used to generate MSY and optimum fishing levels (Chaffee and Phillips, 2000(b)).

After performing the initial feasibility study, SCS determined the WARLF to be a good candidate for certification: "Good information collection and research programs are in place; there are no subsidies in the fishery; overcapitalization is not an issue; there are no significant socio-economic issues; and industry and other interested parties are involved in all aspects of management" (Chaffee and Phillips, 2000(b)).

The conclusion of the team was that the fishery qualified for MSC certification.

> "The Western Rock Lobster Fishery is considered to be well managed and biologically sound. There is also considerable industry input into management decisions. Along with these factors, the five measurable indicators for fishery certification that have been identified as necessary for compliance with the MSC Principles and Criteria can all be addressed from available data" (Chaffee and Phillips 2000(b)).

The Western Australia Rock Lobster Fishery earned a passing score in Resource Sustainability, Minimizing Ecosystem Impacts, and Management Operations. WARLF became the world's first certified sustainable fishery. The industrial nature of the fishery leant itself well to Western-style data collection, and the measurements of sustainability that were developed for this fishery set the tone for future certification efforts.

Since the successful certification of Western Australia rock lobster, eleven fisheries worldwide have been certified. Ten of those fisheries either originate in industrial nations, or are mechanized, industrial fisheries with excellent data collection and exclusive access to their resource. Only one community-based fishery to date has been certified by the Marine Stewardship Council (www.msc.org/html /content_484.htm).

COMMUNITY-BASED CERTIFICATION

Community-based fisheries are relatively small in scale, and linked to the area surrounding the community. These generally operate with low capital investments, and high labor input, making them socially valuable as well as economically valuable to the area (McGoodwin, 1990). Some sources cite community-based fisheries as being more stable than their mechanized, industrial counterparts because of their smaller scope and traditional fishing methods (http://www.fortalnet.com.br/~ fishnet/afolder_pcv.htm). The productivity of industrial fleets worldwide is increasing as modern fishing technologies improve and spread to exploit new areas. This encroachment creates incentives for communities to maximize short-term economic benefits, and reject practices that encourage long-term sustainability (Anon., 2000).

Scientists, governments, conservationists, and philanthropic foundations expressed concern that the MSC certification program would not be able to measure and assess community-based fisheries, especially those in developing nations and in areas without management based on Western-style scientific information (Schärer, 2001). In response, the MSC and WWF created a Community Fisheries Program in 2000, “recognizing the need to create alternative models for resource extraction that incorporate

the conservation of fishery resources, the security of fishers' livelihoods, and the protection of the marine environment" (Schärer, 2001).

The Community Fisheries Program drafted a proposed methodology for certification of community-based fisheries that would incorporate local ecological knowledge with scientific data, and heavily rely on partnerships with stakeholders to determine the health of a fishery. WWF then engaged in a number of assessment projects to field-test a flexible methodology that allows for variability in fisheries that requires diverse methods of certification. This yielded a methodology that proceeds in four stages: site selection, informational meetings, informal assessment of the status of the fishery, and a formal assessment by an accredited certifier (Schärer, 2001).

Any fishery could ask for assessment by the MSC and start this four step pre-assessment process. The diverse reasons for communities to undergo certification include economic, political, environmental, and community-oriented incentives (see Table 1). Participants in the 2000 Sydney, Australia Community Fisheries Workshop "recognized that non-economic reasons for seeking certification seemed to have particular relevance to data-poor, non-market-oriented fisheries" (Schärer, 2001).

Environmental Incentives	Economic Incentives
Long-term resource availability driven by catch declines	Wider market access
Traditional management processes under threat	Increased leverage in markets
Poor management by government agencies	Increased market security
Threats to established rights to fish	Improves prices
Resource conflicts with other fishers (e.g. larger trawlers)	Improves sharing in local markets
Political Incentives	**Community Incentives**
Kudos for local politicians	Increased community pride
Provision of methods of conflict resolution and bridge building in community/local politics	Building of confidence in resource management
Provision of leverage in government processes	Validation of traditional/local knowledge
Sense of stewardship strength	Reinforcement of traditional systems

Table 1. Incentives for certification in community-based fisheries (adapted from Anon., 2000)

While the Community-Based Fisheries Program examined over a dozen community-based fisheries since 2000, only one – Baja California, Mexico – achieved MSC certification. However, the assessment process itself brought benefits to the other fisheries. Positive repercussions include advancement of knowledge about the fishery, new alliances for conservation, new market opportunities, data sharing, and collaboration with stakeholders and government. In a number of places, like Brazil, the MSC certification process served as a catalyst, engaging people in dialogues about the complexities of resource management, and generating a multi-sector drive for conservation (Schärer, 2001).

During the process of defining and refining the methodology for community-based fisheries, the following obstacles were identified:

- Even if the fishery is sustainable, the format of MSC Principles and Criteria may not allow for the assessment of fisheries relying on significant amounts of traditional ecological knowledge;
- Poor management in other areas may preclude the certification of communities harvesting trans-boundary, highly migratory, or portions of a greater fish stock;
- Communities often lack the significant financial resources needed to finance the assessment process;
- Questions surround the degree to which communities can reap the economic benefits of certification – the chain of custody may not pass the benefits to fishers, green product labels may lack meaning to a community, etc.;
- Political reasons may prevent government agencies from providing biologic or economic data about the fishery to certifiers (Anon., 2000).

Despite these pitfalls, the MSC's community-based certification process gives communities a chance to look critically at their governance and their fishing practices, and to identify shortcomings threatening the sustainability of their resource. The Community Fisheries Program assessment "facilitates a new dialogue between fishing communities and their processors, buyers, and local, regional and national government leaders: certification allows for the development of new partnerships. These partnerships may, in turn, lead to a new way of viewing resources and a more collaborative approach

to a sustainable future. The future of ocean stewardship relies upon innovative and adaptive tools that encourage positive change in fisheries of all scales" (Schärer, 2001).

BAJA CALIFORNIA MEXICO SPINY LOBSTER FISHERY

Spiny lobsters are caught in the Pacific Ocean off the western coast of Mexico's Baja Peninsula, known as the "Pacific Norte Region". The fishermen of this sparsely populated region have formed cooperatives to organize and regulate their own fishing activity. Twenty-six cooperatives fish commercially throughout the range of the red lobster (*Panulirus interruptus*), ten of those twenty-six cooperatives in the Pacifico Norte Region harvest 80% of all the lobster captured in Baja. A federation called FEDECOOP represents nine of the ten highest-grossing lobster fishing cooperatives, and is the organization that requested assessment by the MSC (Chaffee, 2003).

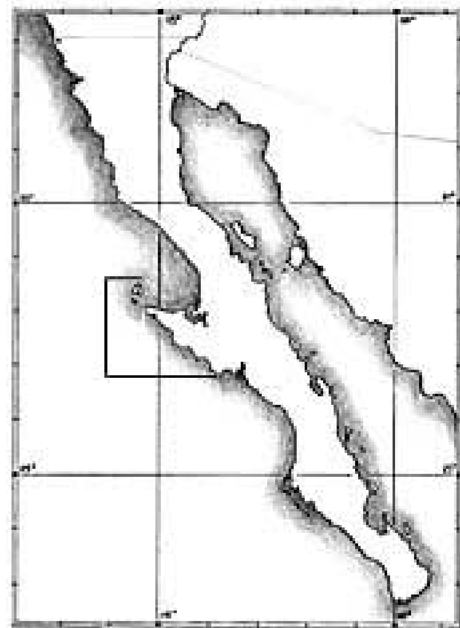

Figure 3. Map of Baja California, Mexico FEDECOOP fishing area

The nine FEDECOOP cooperatives span ten villages in the center of the fishing area (see Figure 3), and include 1,300 fishermen. These fishermen capture lobster with

wire traps set from seven-meter skiffs run with outboard engines. Lobsters caught at sea are transported live to reception centers, where the catch is primarily marketed live, but is also steamed and frozen as a whole, or tail-only product. Live and frozen products are mainly exported to Asia via American ports in San Diego or Los Angeles. Each cooperative employs a biologist to aid in data collection and to offer advice and assistance to the Cooperative, the Federation, and government agencies (Chaffee, 2003).

The National Commission on Aquaculture and Fisheries is responsible for creating management structures for all of Mexico's lobster fisheries. A separate government entity – the Administration of Fisheries – is charged with permitting, compliance, and enforcement. In addition, each state has a forum in which fishing issues can be brought before stakeholders for consideration and comment. That feedback goes to the management-structuring National Commission (Chaffee, 2003).

The national regulations include:

- A closed season;
- Minimum legal size;
- Prohibition on catching egg-bearing females; and
- Gear limitations (no nets or diving allowed) (Chaffee, 2003).

The national framework of fisheries regulation does not address specific fisheries, and thus Baja California has no separate regulations for the red lobster fishery. The National Fisheries Institute uses local research institutions to interpret national policy for the various regions. There are no codified regulations that mandate cooperatives or sustainable practices; instead the government allocates exclusive fishing rights to voluntary cooperatives on a twenty-year time scale. Since the 1930's, groups of species

(finfish, lobster, abalone, etc.) within a defined geographic area have been assigned to a specific organization of fishers. This custom spawned an effective scheme of limited entry that exists today as the 20-year fishing concessions for cooperatives. The concession is a clearly defined exclusive fishing area (see Figure 3) that is rigorously controlled and enforced by the fishermen, essentially eliminating fishing with illegal gear and poaching. Coops limit both the number of fishers and the number of traps in the fishery, and have exclusive access to their resource (Chaffee, 2003).

The Federation of nine cooperatives (FEDECOOP) exerts authority over 1,300 fishers that deploy 13, 900 traps from 230 skiffs. Over the last fifteen years, catch has fluctuated between 1,200 and 2,000 tons, and statistical analysis (done by Vega et al. 2000) revealed that the biomass of red lobster can support the level of annual catch and still sustainably perpetuate the stock (Chaffee, 2003).

In 2000, FEDECOOP requested certification assessment by the MSC. The process of certification took four years, and involved a number of complications. As a smaller part of a larger fishery, the nine cooperatives have no control over governance and management that occurs at a national level that may not encourage sustainable fishing, and no control over the fishing methods of other cooperatives that might detrimentally reduce the stock. Furthermore, data was not available on the effect of gear on the ecosystem, which is required for MSC certification. Finally, there were concerns that the MSC review represented the influence of a foreign certification entity, for which Mexico's only experience was a ten-year embargo on exporting tuna to the U.S. that was not certified as dolphin-safe (Bourillon, 2004).

Despite these problems, the certification team gave Baja California, Mexico's FEDECOOP red lobster fishery passing marks in each of the three principle areas: Resource Sustainability, Minimizing Ecosystem Impacts, and Management Operations. The FEDECOOP red lobster fishery was granted certification in 2004 and now markets sustainably harvested lobster products using the MSC logo (Chaffee, 2003).

Even though Baja California, Mexico is a community-based fishery, it still exhibits the characteristic central to MSC certification. All eleven MSC certifications have been awarded to fisheries that were highly organized, operated in a sustainable manner, used Western-style science-driven management, and had exclusive access to their resource. Although classified as a community-based cooperative, Baja California shares these features that have been essential to certification.

As an international organization, the MSC cannot force governments to institute and enforce regulations that create sustainable fisheries. The market power that the MSC relies on to promote sustainability is limited in most community-based fisheries by the strict credibility demands of the MSC chain of custody. Questions still surround the MSC's power to both measure the sustainability of community-based fisheries, and to change unsustainable fishing practices. An analysis of the failure of the certification process in Brazil provides an opportunity to examine these questions that will define the MSC's future efforts to achieve their mission of sustainable marine fisheries.

CHAPTER 3: PRAINHA DO CANTO VERDE LOBSTER FISHERY

Spiny lobsters have long existed off the coast of Brazil in the substrate rich in calcareous algae, and in the stable temperatures and salinities of the narrow continental shelf. The many fishing villages of the northeast coast historically relied on lobster for consumption and for use as bait in the capture of finfish. The introduction of traps in 1955 by an American businessman began the commercial fishery. Advances in gear and vessel technology allowed lobster harvest and production to multiply quickly in the following decades (Fonteles-Filho, 2000).

As fishers began to recognize the profitability of lobster fishing, lobster stocks in the waters around the fishing harbors of Fortaleza (Ceará State), Recife (Pernambuco State), and Ilheus (Bahia State) became depleted. Fishing gear and vessels evolved from traditional wooden sail crafts and canoes using hoop nets, to larger motorized boats capable of making 50-day trips with traps modeled on Florida's spiny lobster pots. These new vessels began to dominate the fishery in the early 1960's and were capable of laying and retrieving 600 traps in a 24-hour period. The increased capital investment was rewarded by orders of magnitude increases in catch efficiency (Fonteles-Filho, 2000).

The raft fleet re-emerged in the mid 1970's with the introduction of the gill net (which favors deck-space-limited vessels) into the Brazilian lobster fishery. Gill net fishers experience lower operational costs, shorter trips, and high efficiency in the shallow waters of the near-coast – factors which favor the artisanal fleet of wooden sailing crafts and canoes traditionally found in Northeastern Brazil. This new gear type, however, was merely an addition to the trap, not a replacement. Consequently, both the

industrial and artisanal fleets increased to meet the growing demand for their product (Fonteles-Filho, 2000).

More fishing technology was introduced with compressor diving, which is illegal, and extremely dangerous, costing lives and leaving countless fishers paralyzed. This type of diving requires a mechanized commercial vessel, and fishing usually occurs on rock or reef substrates in clear waters. Divers breathe through hoses linked to air compressor devices on their boat and actively seek out lobsters with hooks, gaffs, or nets (Fonteles-Filho, 2000). This allows one vessel with two or more divers to effectively exterminate the lobster in an entire area before moving on to another (Fonteles-Filho, personal communication). The fishing intensity asserted by this collection of gears and vessels culminated in a record high lobster catch of 3,638 metric tons in 1991, valued at US$99.3 million dollars (Fonteles-Filho, 2000).

Brazil's most experienced lobster biologist, Fonteles-Filho (2000), reported that the fishery spanned over 149,380 square kilometers in 1997, from Para state at the mouth of the Amazon River to 20 degrees south of the equator in Espirito Santo state.

Figure 3. Lobster Fishing Area Extending from Belém to Victória on the Central Atlantic Coast of Brazil

The fishery differs over its range in size and intensity based on the distribution of the stock, which is dependent on the geography and biochemistry of the ocean substrate. Depending on these variables, fishing takes place at depths between five and sixty

meters, and effort concentrates unequally on block areas of lobster aggregation. Fishing intensity peaks between April and June, after which a sharp decline in catch is seen in most areas. Numbers of lobster traps decrease with increased distance from shore, owing to the spatial limitations of the numerically superior sail fleet (Fonteles-Filho, 1997). Data on the vessels that constitute the national lobster fishing fleet do not exist, though state-specific data is available in some cases.

Though exact data is sparse, the lobster fishing industry includes thousands of workers who capture, transport, process, and export the valuable product. In Brazil, fishing is seen primarily as a socially valuable enterprise as opposed to an economically valuable one (where the major benefit to the nation comes from employment of many people, not from profit generated), and, as such, frequently escapes government attention. Fonteles-Filho (2000) describes the economic structure of the national lobster fishery as follows:

- Processing plants capable of overseeing the phases of catching, storing, processing and marketing;
- Individual boat-owners, sometimes organized as co-operatives, who supply the industry with lobsters;
- Middlemen, most of the time hired by the processing plants to supply them with small quantities of lobster bought from boat-owners in the artisanal fishery communities;
- Fishermen, employed by the industry, or working as independent operators in the raft fishery.

In the late 1990's, the processing industry shifted to a 'purchase only' role in the chain of custody of lobster, and relinquished control of the production side of the operation. The resulting increase of middlemen who brought lobster from disparate

sources, areas, and gear types to processing plants made origin of product almost impossible to trace (Fonteles-Filho, 2000).

Traceability of product (while crippling to a certification attempt) is overshadowed by other, more fundamental problems as an issue for management. Fonteles-Filho (2000) discusses the economic costs and benefits of the current state of Brazil's lobster fishery:

> "The world-wide interest in this luxury commodity, and resultant high prices, have caused a substantial increase in fishing effort in what is an open-entry fishery characterized by high economic inefficiency. The present catch could be more economically obtained with much smaller inputs of labor and capital investment. In Brazil, this situation has been further aggravated by two aspects: 1 a lack of alternative employment that has stimulated what might be called a 'lobster rush' to capture by whatever means are at hand, namely traps, gill nets, and diving; and 2 a centralized system of lobster production by large boats in long-distance fishing trips. Overall, the benefits of the high prices received for lobster tails have been outweighed by high operational costs in some years, and the economic equilibrium may have even been passed. Nevertheless, the fact that fishing is a high-risk economic activity, generating ancillary industries and employment opportunities, has justified its classification as a socio-economic activity, which is thus entitled to government support such as tax and financial subsidies."

The overwhelming demand for lobster that created the 'race for fish' in Brazil mirrors circumstances found in open-access fisheries around the globe. Government subsidies perpetuate this problem, supporting large, industrial vessels that catch more lobster, generate fewer social benefits, and travel further and further in search of economically viable fishing grounds. The industrial fleet depletes an area traditionally fished by the sail fleet, and then moves on north, south, or east in search of lobster, constantly increasing the fishery's perimeters (Fonteles-Filho, personal communication).

Despite the growing area, few agencies govern the lobster fishery in Brazil. The Brazilian Ministry of the Environment and Renewable Natural Resources (IBAMA) is charged with creating legislation to regulate the lobster fishery, as well as enforcing these mandates. Since 1976, IBAMA has instituted the following laws regarding lobster catch:

- Illegal to land, sell or transport lobsters smaller than 65 mm carapace length;
- Closed season (fixed since 1987) from January 1 to April 30;
- Prohibition on catch of egg-bearing females;
- Prohibition on fishing with bottom gill nets, or commercial diving (IBAMA, 2004).

In accordance with internationally accepted standards, Brazil's regulations are based on biology, and local size and spawning parameters intended to prevent removal of gravid females and pre-spawn juveniles from the population (Fonteles-Filho, 2000).

By the 1990's, it was evident that these regulations did not prevent illegal fishing from impacting the health of the lobster stocks, or the communities that depended on them. In 2002, the newly elected President Luiz Inacio Lula da Silva pledged his support to the fishermen of Brazil's impoverished Northeast (see Appendix II). Lula promised region-specific plans to develop sustainable fishing activities in the short, medium, and long term, ensuring preservation of the nation's vast aquatic resources.

The government created SEAP, the Special Secretariat of Aquaculture and Fishing (SEAP, 2003), to integrate the ministries that govern fishing into a compatible single entity, but retained IBAMA as the enforcement body (SEAP, 2003). SEAP issued Normative Instruction No. 32 in 2003 (see Appendix III), which further codified the existing size and season prohibitions in the spiny lobster fishery (IBAMA, 2004). SEAP

did not examine inter-governmental relationships, redesign legislation, or fulfill its mission to bring sustainability to depleted fisheries. Though Lula was elected on a platform of solidarity with the common worker, conditions for artisanal lobster fishermen were little changed (Schärer, personal communication).

Despite the reorganization that created SEAP, the regulatory structure remains insufficient to handle the management and enforcement of the spiny lobster fishery in Brazil. IBAMA owns and operates only a single vessel to cover the 150,000 square kilometers of the lobster fishery. Stationed in Recife, the boat patrols far south of the majority of fishing activities and is used primarily as a research vessel. In addition, only two enforcement officers police the state of Ceará (Fonteles-Filho, personal communication), where 78% of all exported lobster is harvested and processed (Fonteles-Filho, 2000). Funding for vessels and personnel to enforce the regulations of the lobster fishery never materialized out of President Lula's administration, and the limitations of policies attempting to govern the actions of Northeastern fishermen remain money and personnel (Fonteles-Filho, personal communication).

Solely responsible for the enforcement of the lobster fishery, IBAMA engages in little cooperation with other government agencies. As a consequence of this segregation IBAMA alone is responsible for monitoring and punishing illegal activity. In the 2003 season closed to fishing, IBAMA issued a total of eight citations in the state of Ceará. Ironically, the majority of these were issued on land under the law prohibiting capture and *transport* of undersized lobster in Brazil. Often, middlemen or processors truck illegal catch to ports in the south, where there exists no lobster fishery, and no port authority interested in or capable of checking exported products. Many undersized, and

thus unreported, lobsters not sold to local restaurants are shipped easily out of Brazil from port cities south of Espirito Santo (Ribero-Neto, personal communication). Brazil exports 95% of the reported catch to the international market, with the vast majority (over 99%) shipped to the United States (Anon., 2003(a)).

The high-dollar nature of fishery exports and lack of a credible enforcement threat drive the lobster-fishing sector to harvest contrary to government regulations (Schärer, personal communication). These regulations governing Brazil's lobster fishery continue to be based on 'the best available science.' This oft-used phrase in resource management describes policy guided by rigorous data collection and scientific modeling. While policy and management frequently seek to design regulations based on such science, economic or political realities, such as the ones in Brazil's northeast state of Ceará, mar the integration of science and policy.

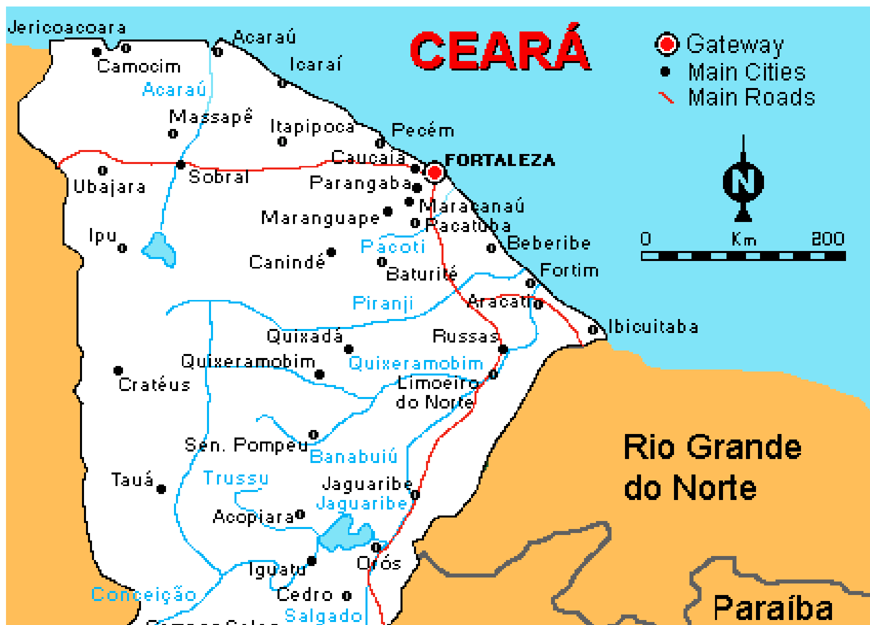

Figure 4. The Brazilian coastline in the state of Ceará runs west to east and spans 573 kilometers. The capital city of Fortaleza, located strategically in the middle, is by far the largest urban area in the state.

To the east and west of Fortaleza, the coastline of Ceará traces out the land-sea interface crucial to survival in northeast Brazil. Fishing villages of various sizes sprang up among the dunes and palm trees along the coast, where they remain much as they were fifty and a hundred years ago (http://www.brazzil.com/p37mar02.htm).

Historically, the state of Ceará was responsible for 100% of the catch with fishermen working primarily from sail powered rafts, called jangadas, or canoes with baited wooden traps. As a consequence, Ceará controlled all of the fishing licenses. When the fishery spread to new areas, new permits were issued and the fleet began to grow uncontrollably. The number of unlicensed vessels in Ceará grew to well over 1,800 and made up 74% of the entire nation's fishing fleet (Schärer and Schärer, 2004).

In the early decades of the commercial lobster fishery in Ceará, effort and catch grew proportionately until 1975 when yield dropped off but effort continued to rise. Scientists used statistical analysis and yield models to estimate the production potential of Brazil's lobster fishery. They determined the Maximum Sustainable Yield (MSY) to be 6,862 metric tons, ideally obtained by 33.8 million trap days (standard Catch per Unit Effort measurement in Brazil). This required a reduction of the fleet by 30.2% (Fonteles-Filho, 2000).

The reduction was never undertaken. There were too many motorboats and not enough lobster, despite the ever-increasing boundary of known lobster distribution. Declining catches could not justify increased investment. The artisanal fleet flourished once again, due to the comparatively small investment in vessel, gear, and personnel. Most of these vessels were associated with small fishing villages, and were, and continue to be, unregulated and unlicensed (Schärer, personal communication).

The fleet that fishes for lobster in Brazil was examined in 2001, the vessels divided into three categories: the sail fleet (sailcrafts, canoes, and others); motorized wood boats from eight to fifteen meters; and motorized steel hull vessels. The 2,000 motorized wooden boats combined to generate 92% of the total lobster fishing effort, and employed 10,231 fishermen. The sail fleet had a comparable 1,700 boats, and though it employed 5,043 fishermen, combined to contribute only 1.5% of the fishing effort. Ceará is responsible for 1,347 of those artisanal sailcrafts, which contribute 1.13% of the total national fishing effort. Over the three vessel types combined, Ceará contributes 25% of the nation's vessels, two thirds of its fishermen, and 64% of the fishing effort (Anon., 2003(b)).

Within the northeastern state of Ceará, Prainha do Canto Verde (PCV), is located 120 km southeast of Fortaleza in the municipality of Beberibe, and is home to 1,200 residents. Settlers arrived in PCV in the 1850s, and lived off the bountiful fish catch that the Atlantic Ocean provided (http://www.fortalnet.com.br/~ fishnet/afolder_pcv.htm). The fishermen take to the sea, and return with fish to eat and trade with the community of farmers found a few kilometers inland. Prainha do Canto Verde is Portuguese for 'Village of the Green Corner', named for the stands of palm trees that surround the freshwater lagoon supporting the growth of staple vegetables like potatoes and carrots. These lagoons are infrequently found in such close proximity to the beach, and the fishermen developed a partnership with the farming community that still exists today (Schärer, personal communication).

The traditional method of harvesting fish from these waters involved a raft first engineered by the Tupinquin Indians, and later modified by the Portuguese colonists who

added a sail and a center bench. These rafts were given the name ‘jangada’ by the Europeans, after a similar construction seen in India, and the fishermen were consequently called ‘jangadeiros’. The rafts are made flat with no keel, and intentionally ride low on the water such that waves crash easily over them and the choppy waters of the southern Atlantic Ocean only minimally affect sailing effort. Two or three fishermen typically work on a single jangada, clinging to rope attached to the ship’s mast, constantly leaning their body weight off the sides to correct for the weight of the bulky pole (http://www.brazzil.com/p37mar02.htm).

As a consequence of full thirteen-hour days at sea, six days a week, fishermen of the northeast have the strong, rugged physique and tough determination that evolve from generations of carving life out of an unpredictable sea. These men are descendents of native tribes and escaped slaves from the European plantations who settled in the remote corners of the anglo empires. As a result, the settlements of Ceará have traditionally enjoyed a large degree of independence from governmental authority. The jangadeiro’s strength, autonomy, and determination are legendary in Brazil, and these men played a large role in the political evolution of the northeast (http://www.brazzil.com/p37 mar02.htm).

In 1884, and again in 1947, jangadeiros of Ceará left Fortaleza in protest of unfair social conditions. Both voyages traveled over 3,000 kilometers to Brazil’s then capital, Rio de Janeiro. The first journey called for the end of slavery (which ended in 1888), and the second brought attention to the working conditions of the fishermen, and the need to include them in national social security. These courageous trips inspired the villagers of PCV in 1993 to launch yet another jangada voyage of protest. The fishermen of PCV had

been dealing with vessels poaching lobster with illegal gear in their waters for years. After armed conflicts at sea took lives on both sides, four PCV jangadeiros and two local women launched the SOS Survival trip, objecting to the systematic lack of government enforcement of fishing regulations. The courage of the men and women involved in the trip caught the attention of a global audience, and the momentum generated locally inspired the formation of the non-governmental organization Instituto Terramar (Schärer, 1996).

Prior to the 1993 journey of the jangadeiros, almost all the families in PCV relied on fishing income for their livelihood. This was supplemented by welfare, and money sent back to the village from children who emigrated to larger cities in the south, or to the dangerous gold mines of the Amazon. By the 1990's the sail fleet had grown large and disorderly, and the decrease in catch necessitated expansion of the fishing area. As jangadas are limited to one and two-day trips, this expansion has put the artisanal fishers at greater risk as they sailed further and endured longer hours at sea (Schärer and Schärer, 2004). The decline in near-shore lobster stocks increased the importance of less-valuable pelagic fish, and it is not known what effect the increased fishing pressure may have (Fonteles-Filho, personal communication).

During the SOS Survival voyage, informational and organizational meetings were held in villages down the northeastern coastline. Despite this effort, traditional methods of fisheries management continue to fail the fishermen of PCV. The northeastern stock of lobster threatens to collapse, and another artisanal way of life teeters in the balance. The cycle of boom and bust resource use in Brazil has seen the same pattern in the extraction of sugar, coffee, rubber, and gold from the land. But foreign settlers introduced the

extraction of these resources, and the resources were removed, eliminated, and forgotten. The lobster fishery supports not only foreign investment, but maintains the livelihood of thousands of costal fishermen and their families (Schärer and Schärer, 2004).

The SOS Survival voyage helped raise awareness in the poor, artisanal fishing villages of northeast Brazil. The problems of increasing industrialized and illegal fishing were not isolated in PCV, but plaguing all of the artisanal and subsistence lobster fishermen. The voyage began a dialogue within and between villages about sustainable and responsible fishing practices that would allow the lobster stocks, and thus the traditional livelihood of the northeast, to continue into the future. PCV took the lead in organizing its fishermen, and set the standard for community organization and sustainable fishing practices. By 1995 most of the fishers in PCV voluntarily complied with the national regulations, and the community imposed further regulation that limited entry, fishing time, and catch (Schärer, personal communication).

Fishers from PCV fished in accord with national regulations that require responsible and sustainable practices, and this commitment attracted the attention of the World Wildlife Foundation and the Marine Stewardship Council. Prainha do Canto Verde was one of ten community-based fisheries across the globe selected in 2000 for assessment using the MSC standards for sustainability.

Prainha do Canto Verde (PCV) requested certification assessment from the MSC in the year 2000. Scientific Certification Systems began the pre-assessment phase in May that existed in two parts. The first entailed collecting general information about the fishery, and the state of the lobster stocks, while the second involved interviewing managers, scientists, and stakeholders to determine policy objectives, regulatory

effectiveness, and the fishery's readiness for full assessment (Chaffee and Phillips, 2000(a)).

The scope of the project was intended to examine management and practices in the geographic area around PCV that is defined by the sailing limits of the traditional fishing vessel – the jangada (other villages and fishers were not examined, except where they interfered with PCV's ability to manage or fish its lobster resource). The pre-assessment document reports that, "[in order] to examine if this community of fishers is managing and fishing a sustainable fishery as defined by the Principles and Criteria of the Marine Stewardship Council (MSC), one must look at three things:

1. The health of the stock being fished by PCV fishers,
2. The ecological/environmental impacts of fishing lobster in the areas fished by PCV fishers, and
3. The robustness of the system in place to manage the lobster fishery fished by the fishers of PCV" (Chaffee and Phillips, 2000(a)).

At the time of PCV's request for pre-assessment, members of the MSC and the community held strong suspicions that the depleted state of the lobster stock would limit the potential for certification. The sustainability of the lobster fishery in PCV is dependent on the heath of the stock as a whole, and it is impossible to separate one single lobster population in Brazil that is not dependent on the entire fishery for recruitment. While PCV has its own management system, the entire fishery is governed by national agencies that do not require the strict compliance that is observed in PCV. While Prainha do Canto Verde's lobster fishing *practices* were under assessment, the *sustainability* of the entire nationwide lobster stock was also in question (Chaffee and Phillips, 2000(a)).

Based on the suspicions that the greater Brazilian lobster stock was in decline, the organization funding the pre-assessment (MSC's parent corporation, the World Wildlife Foundation) requested that the examination be broken into two parts. First, SCS would commence examination of the lobster stock; if it proved healthy, SCS would continue on to the second phase, investigating ecological impacts and management operations (Chaffee and Phillips, 2000(a)).

The first phase involved meetings with fishery scientists, fishery managers, and other representatives of the fishery, which quickly revealed the lobster stocks to be in serious decline. In addition, scientists confirmed that no sub-stock existed in the waters surrounding PCV, and that the MSC assessment had to examine the health of the stock over its entire commercial range. Two major statistics revealed the declining health of the lobster resource: the general downward trend in total landings from 1979 onward, despite increasing area and effort in the fishery, and the drop from a CPUE of 0.936 in 1965 to 0.097 by 1999. Over a thirty-year span, there was an order of magnitude drop in catch per unit effort (Chaffee and Phillips, 2000(a)).

The body of information indicating the unsustainable nature of Brazil's lobster resource led to the termination of the pre-assessment after phase one. The SCS assessment team had this to say about the fishery:

> "One thing appears to be clear, the management of the fishery in Brazil does not appear to be making the necessary effort to change its management practices to stop the decline in the lobster fishery and rebuild the stocks. This appears to be a serious problem that is putting the PCV lobster fishers, other fishers, and the local ecology and fishery at risk through no fault of their own …
>
> "At the local level, the PCV fishing community appears to have excellent local management. The PCV community has a local management council and strict regulations regarding who can fish, what time of day fishing can occur, what can be caught. In addition, the community has placed restrictions on gear, enforces closed seasons,

> and is working hard to patrol their own fishing territory to ensure that overfishing and predatory fishing do not occur. There are severe penalties for those who violate the local fishing regulations from losing permission to fish for given periods of time to having either fishing gear or boats confiscated.
>
> "In terms of meeting the MSC Principles and Criteria for management it is clear that the local PCV community has excellent measures in place to create a sustainable fishery within its local waters. However, it does not appear that the federal management would meet the stringent requirements of the MSC.
>
> "In general, we found that the Prainha do Canto Verde fishing community was doing everything it could to ensure the long-term sustainability of its fishery. The PCV community and fishers should be applauded for their hard work, their diligence, and their continued commitment to making their local fishery as sustainable as they possibly can. Through no fault of its own, the PCV fishery at this time would not meet the MSC requirements as the stock is in serious decline with what appears to be little or no effort being made to reverse the situation… We sincerely hope that any commercial concern purchasing lobster from PCV will recognize that these local fishermen continue to make toward the sustainability of their fishery" (Chaffee and Phillips, 2000(a)).

That the assessment proved lobster fishing in PCV to be unsustainable was not a surprise to anyone involved (Schärer and Schärer, 2004). Prainha do Canto Verde and the Instituito Terramar succeeded once again in bringing their plight to the global arena, and forcing the government to address the grave inconsistencies in their stated policy toward artisanal fishermen (see Appendix II) versus the lack of support for them.

After MSC assessment, the government of Ceará agreed to initiate a co-management system for the lobster fishery, generating funding and support for the enforcement of fishing regulations in the waters of Ceará. As the pilot community, PCV fishers agreed to donate one lobster per week to IBAMA (approximately $30 US) for equipment and personnel to police the fishing grounds used by PCV fishermen (Schärer, 2004). The IBAMA official responsible for this cooperative agreement was soon transferred however, and the potential for cooperation between fishers and government

withered away without support from the Ministry of the Environment. The momentum created from the miraculous 76-day voyage and the MSC pre-assessment seemed spent (Schärer, personal communication).

The jangadeiros of PCV have not given up, and with the aid of Federal University of Ceará scientists, they have begun to map their 50 square km fishing area, and collect both catch and effort data in all target fisheries. These measurers do not stave off the decline in lobster stocks, as poachers with motorized vessels and illegal gear continue to remove tons of lobster from their waters. Fishers of PCV are aware, however, that they contributed to the decline of the lobster stock, and are determined to do their part to recover it (Schärer and Schärer, 2004).

Currently, Instituto Terramar and the fishers of PCV are campaigning once again for a system of cooperative management. This time, they are including the processing industry as well as government agencies, citing increased profitability to all sectors of a sustainable lobster fishery (Schärer, 2004).

CHAPTER 4: CONCLUSIONS

Fishing illegally and unsustainably in Brazil has always been a very lucrative practice. The current system rewards those who choose to fish out of season with illegal gear and unlicensed vessels, and who harvest pre-spawn juveniles or egg-bearing female lobsters. Regulatory enforcement in non-existent. In spite of this, Prainha do Canto Verde (PCV) fishers opt to harvest lobster sustainably. The fishing practices of PCV appear to be just the kind that the Marine Stewardship Council (MSC) seeks to promote. As an organization, the MSC is dedicated to ensuring the world's marine fish supply by promoting practices that are environmentally responsible and socially beneficial (http://www.msc.org/html/content_482.htm), and yet the certification process in Brazil has been ineffective.

Reviewing PCV's experience with the Marine Stewardship Council reveals the problems of a certification program designed for data-rich industrial fisheries when used in community-based fisheries. Since the MSC is powerless to affect government agencies that use disincentives to manage fisheries, they rely instead on providing economic incentives outside the traditional regulatory framework. These incentives are contingent on having distinct fishery products that can be certified as coming from a sustainable source. Because the MSC's definition of sustainable source includes a sustainable stock, certification relies on the sustainability of an entire fishery. Areas like PCV do not have exclusive access to their resource, and can neither impose their fishing practices on other areas, nor distinguish their product from other Brazilian lobster. Thus, despite PCV's

good fishing practices, they are prevented from MSC certification by the actions of other participants in an unsustainable fishery.

The current regulatory framework will never grant Brazil a sustainable lobster fishery. The incentives to fish illegally are too strong, and the enforcement of regulations are too weak to promote sustainable practices along the 150,000 square kilometers of the lobster fishery. Yet one village has chosen to forgo the significant short-term economic benefits of these common illegal practices. If the MSC's mission is to promote sustainable fishing practices, the question becomes: how do you reward this ethic of sustainability so as to encourage other villages to participate?

Certification may yet hold the answer. Fishers, government officials, enforcement officers, scientists, and members of NGO's agreed that if PCV were given some tangible benefit for their efforts at sustainability, fishers from nearby villages would change their behavior to gain access to those rewards (DeLima, Aragao, Ribero-Neto, Fonteles-Filho, Schärer, personal communication). (This anecdotal evidence is supported by work done by Charles et al. (2003) in a more industrialized, French fishery.) The MSC, as it is currently structured, cannot provide those benefits to the fishers because it cannot provide certification to sustainable communities existing within a larger unsustainable fishery.

However, with changes in the way the MSC certification operates within community-based fisheries, it may be possible to successfully apply an ecolabeling program. The MSC and WWF could create another certification program to credit the communities that are instituting environmentally responsible practices (as opposed to the resulting products). For example, the market for supporting communities has been developed and expanded by the producers and buyers of Fair Trade coffee. The purchase

of coffee from small-scale producers in developing countries grew out of a social justice movement directed at providing a fair price to impoverished, family farms that produce coffee and must compete with a floor price set by large-scale production plantations. Fair Trade coffee developed networks that connect poor producers with privileged gourmet consumers across thousands of miles, and attained a special status outside of the conventional agro-food business (Rice, 2001).

This kind of community certification is non-existent in fisheries. A gap exists between the luxury product – lobster, in this case – and a collection of consumers willing to pay more money for a product that comes from a place fishing in an environmentally responsible manner. Brazil's experience with certification reveals the potential for this sustainability gap to be filled and expanded just as Fair Trade coffee created and expanded a market for labor practices in Latin America. Fair Trade coffee now includes over 240 producer organizations representing over 430,000 growers worldwide. European markets show (depending on the nation) between one and five percent penetration by Fair Trade coffee, numbers that are on the increase (Rice, 2001). The Fair Trade coffee framework proves that consumers not only care about the nature of their food, but about the people who produce it.

In contrast to the Fair Trade coffee network that certifies people, the MSC certifies products. The Marine Stewardship Council seeks to provide the best environmental choice to contentious consumers across the globe, but fails to deliver a service that applies to the numerically superior, community-based fisheries. Certification of communities would have a greater impact on the sustainability of the overall fishery, and the food security of the surrounding area. The MSC and WWF should use their

global associations to provide the link between gourmet consumer and small-scale producer, thereby better achieving their mission and promoting much-needed sustainability in community-based fisheries around the globe.

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APPENDIX I

IUCN/ SCBD Side Event: MCPAs and Networks for Biodiversity: Practical Applications of SBSTTA Recommendation VIII/3B
11 February 2004

CONSERVATION AND COASTAL FISHING COMMUNITIES: SOME COMMENTS
Chandrika Sharma, International Collective in Support of Fishworkers

I would like to talk of issues of conservation and sustainable use from the perspective of coastal and small-scale and artisanal fishing communities. The focus will be mainly on the tropical multi-species fisheries of the developing world, which also supports the largest numbers of fishworkers and fishing communities. I will attempt to highlight the plurality and diversity of community conservation initiatives, and to place them in a historical context.

I would like to start with a bit of history. Most of us are aware that in most parts of the world communities have evolved some systems to regulate resource use, particularly in adjacent coastal waters. There are several documented examples of these systems, but many more undocumented ones. These, no doubt, played a role in ensuring sustainable use of resources and contributed to sustaining the ecological integrity of the ecosystems.

All this changed however with changes in technology, markets and general levels of industrial and other development.

Long before issues of conservation and sustainability of coastal and marine resources became part of the international agenda, fishworkers in several countries of the developing world, starting in the 1970s, drew attention to the destructive impact of technologies, such as bottom trawling for shrimp, on coastal biodiversity and, as important, on their livelihoods. Fishworkers in India, for example, likened bottom trawling in mangrove areas as the equivalent of running a road roller over a maternity hospital!

In most cases their demand was for an exclusive artisanal fishing zone, where trawling, pushnets and other destructive technologies were prohibited. In some cases they were successful. In Indonesia, for example, the government was forced to ban trawling in certain areas. In India, most states declared a zone exclusively for artisanal fishers. This took place in several parts of the world. The successes, in most cases, though were hollow, as incursions by the industrial fleet into inshore waters, the most fragile and the most productive, continued, as enforcement was negligible and ineffective.

A key issue was that artisanal fishworkers did not have the right to regulate use of their resources—they did not have the power to exclude those using unsustainable and destructive technologies, in what was essentially, a *de facto* open access resource.

We have to look at all conservation initiatives by communities against this background.

APPENDIX II

NORMATIVE INSTRUCTION NO. 32, OF 28 MAY 2004

THE PRESIDENT OF THE BRAZILIAN INSTITUTE OF THE ENVIRONMENT AND OF RENEWABLE NATURAL RESOURCES (IBAMA), in the use of the attribution previewed in art. 24, Annex I, of the Regulatory Structure approved by Decree no. 4,756, of 20 June 2003, and art. 95, item VI of the Internal Statute approved by Order GM/MMA No. 230, of 14 May 2002;

Considering that which is prescribed in Decree-law No. 221 of 28 February 1967; and

Considering that which comprises Process IBAMA/CE No. 02007.005286/2001-11, RESOLVES:

1st Art. To prohibit the capture, unloading, conservation, processing, transport, industrialization, commercialization, and export in any form, and in any location of lobsters of the species Panulirus argus (Spiny Lobster) and Panulirus laevicauda (Smoothtail Lobster), of sizes smaller than the ones established below:

Species	Tail Length (cm)	Cephalothorax Length (cm)
Spiny Lobster	13	7.5
Smoothtail Lobster	11	6.5

1st § For the purposes of this article the following is established:

I - length of the tail is the distance between the anterior edge of the first abdominal segment and the extremity of the attached telson;

II - length of the cephalothorax is the distance between the notch formed by the rostral spines and the posterior margin of the cephalothorax;

III - the measurements referenced above are taken with basis in the median dorsal line of the individual or the tail, on a flat surface with attached telson;

IV - in the case of whole lobsters the length of the cephalothorax will be adopted.

2nd § For the purposes of inspection a tolerance of up to 2% of the lobster will be permitted, in relation to the total weight, with a minimum size inferior to that permitted, as long as the difference below the limit does not exceed 2mm (two millimeters).

3rd § In the act of inspection, the beheading of the lobster will be permitted for the purpose of measuring the tail, when solicited by the party concerned.

2nd Art. To prohibit the unloading, conservation, processing, transport, warehousing, commercialization, and export of lobsters of the species P. argus (Spiny Lobster) and P. laevicauda (Smoothtail Lobster), in any form that deforms the tail of the individual, impeding its identification and measurement.

3rd Art. The fishing of lobsters with any method of fishing is prohibited, in the following natural reserves:

I up to the distance of 3 maritime miles from the coast in the boundaries:

a) from the Mouth of the Megaó River to the Point of Ramalho, in the State of Pernambuco (XXXX); and

b) from the Lighthouse of Mundaú to the Falls of the Anil River, in the State of Ceará (XXXX).

II - in the region of Galinhos, in the State of Rio Grande do Norte, between the latitudes of X and X and the longitudes of X and X.

4th Art. To permit the capture of lobster only with the use of traps of the *covo* [truncated cone-shaped] or *manzuás* and *cangalha* [triangle of wood] types.

Unique paragraph The covo or manzuá and the cangalha net should be square and have at least 5.0 cm (five centimeters) between consecutive knots with a tolerance of 0.25 cm (twenty-five hundredths of a centimeter).

5th Art. To permit the capture of lobster with the use of dragnets, until 31 December 2004, [the nets being] made with monothreaded or multithreaded nylon, of the *caçoeira* [high-seas] type, with a minimum net of 130 mm (one hundred thirty millimeters) between the opposed knots of the outstretched net and use of *calão* [piece of wood] is required.

1St § For the purposes of the Normative Instruction, *calão* is understood as pieces of wood which are secured to the upper line (floating line) and the lower (sinking line) of the net, to maintain it open during the operation of fishing.

2nd § The permission which the "caput" of this article mentions does not apply to the coast of the States of Amapá, Pará.

6th Art. To prohibit the capture of lobsters by means of diving of any nature.

Unique paragraph The sea-craft which operate in lobster fishing cannot carry any type of compressed-air device nor instruments adapted to the capture of lobsters by means of diving.

7th Art. To the infractors of this Normative Instruction shall be applied the sanctions provisioned in Decree No. 3,179 of 21 September 1999.

8th Art. This Normative Instruction goes into effect on the date of its publication.

9th Art. Normative Instruction No. 28 of 30 April 2004, published in the Official Daily of the Union of 3 May 2004, is revoked.

APPENDIX III

Pledge Letter to the Fishermen

1. To create a National Secretariat of Fishing and Aquaculture, seeking to integrate the diverse Ministries that relate to the fishing sector in such a way as to make compatible the diverse actions related to fishing in the Country.
2. To elaborate a National Plan of Sustainable Development for Fishing and Aquaculture specific to each of the regions of the Country, which permits the planning of the sector for the short, medium and long term, preserving natural riches.
3. To maintain Ibama as an inspector, granting it material and human resources compatible with good discharge of the activity.
4. To establish a Program of Renovation of the Fishing Fleet that supports the recuperation of the shipbuilding industry and encourages the substitution of current sea-craft with other more modern ones.
5. To establish a Program of Professional Qualification of the Fisherman, with the objective of empowering the labor directed towards the various subsectors – maritime and fluvial, corporate and artisanal and aquaculture – taking advantage of and revitalizing the structures of the existent Schools of Fishing.
6. To develop the infrastructure of unloading, processing, warehousing and commercialization of fish products, through Terminals and Waypoints of Fishing, encouraging the aggregation of value for fish products through industrialization.
7. To make effective the current Program of Satellite Tracking of the sea-craft that permits greater security for them, as well as greater management and inspection of the activity.
8. To create lines of credit specified by region in order to support artisanal fishing and aquaculture, seeking the improvement of the systems of production, processing and commercialization of fish.
9. To promote the development of activities supporting fishing in the areas of research, commercial promotion and market information.
10. To encourage, through partnerships with the states and municipalities, the establishment of fishing and credit Cooperatives in order to function specifically together with the artisanal fishing segment.
11. To encourage the development of tourism related to the activities of aficionado and sport fishing in fluvial waters, especially in Amazônia and in the Pantanal, as well as on the coast of the Country.

Luiz Inácio Lula da Silva

August of 2002