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Institutional organization among artisan fishers in Bocas del Toro, Panamá

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INSTITUTIONAL ORGANIZATION AMONG ARTISAN FISHERS IN BOCAS DEL
TORO, PANAMÁ

A Thesis

Presented to

the Faculty of the Department of Environmental Studies

San José State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

by

Robert “BJ” Atanasio

May 2006

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ABSTRACT

Institutional Organization among Artisan Fishers in Bocas del Toro, Panamá

by

Robert “BJ” Atanasio

Using interviews, field observations, and document research, the history and structure of the Unión de Pescadores Artesanales Bocatoreños (UPESABO) are described. Drawing on those same sources, an institutional analysis was performed using Common Pool Resource (CPR) theory as an investigative framework. Four classes of CPR characteristics were identified and evaluated against theoretical conditions found in the literature. In addition, a sampling of members was surveyed regarding ethnic identity and relevant demographic attributes. Though the CPR evaluation indicates deficiencies in the cooperative’s management strategies, the presence of key characteristics allows for potential improvements. The questionnaire results were analyzed for correlations between ethnicity and selected attributes. These results did not indicate any significant patterns, suggesting that differing social norms do not hinder participation in the coop. To improve management, the author suggests the organization increase its membership, improve fishery data, and implement specific conservation strategies.

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1. Introduction

The Role of Resource Users in Management

In communities dependent upon a specific natural resource, the likelihood of overexploitation and eventual collapse of the resource increases when the local economy becomes more connected to regional and global markets. In the late 1960s, Garret Hardin published “The Tragedy of the Commons” (1968), a paper that dramatizes the decision-making and behaviors that lead to the collapse of these resources. In doing so, Hardin set the tone for conceptualizing the problems of resource use and governance. As a result, over the past thirty years resource management has emphasized centralized control and privatization in order to maintain the availability and quality of a resource. However, many ethnographers working in small communities with strong linkages to natural resources have discovered alternative strategies at work. They found numerous instances of informal and cooperative management practices successfully maintaining a resource over generations.

Both of these models of resource management share a common observation. The group of individuals using a resource, or appropriators, plays an important role in natural resource management. Appropriators respond to the external pressures of economics, governmental regulation, and technology. If there is a change in the market, appropriation levels follow suit. In addition, governmental regulations, international treaties, and agreements on endangered species and biodiversity may conflict with local practices. When this occurs, appropriators and the resource can suffer unintended consequences.

For example, in the Honduran lobster fishery this occurred when exploitation increased beyond subsistence levels to meet the demands of external markets (Mackenzie and Stehlick 1996). This case demonstrates how a number of factors coalesce to shift appropriator behavior to unsustainable practices. In Honduras, artisan fishers dominated the crustacean and mollusk fishery before the mid-1980s. These fishers used breath-holding techniques, called free diving, to catch lobsters. This limited them to shallow-water environments. Both the practice of free diving and decentralized association of fishers kept harvesting pressures low. As the market demand increased, behaviors of the fishers changed. They organized and the fishery became industrialized. Lobsters and conch became scarce in the shallow coastal waters. In response to this overexploitation, fishers moved into new territories. Trapping and the use of SCUBA gear allowed the exploitation of new fishing grounds while increasing total take. The nature of fishing culture also changed. Fishers moved further offshore. Larger boats allowed them to stay out for longer periods and provided packaging and freezing of the catch on board (Mackenzie and Stehlick 1996).

A case study of the Jamaican conch fishery illustrates how regulations designed for species conservation can inadvertently threaten the species. Management of the conch fishery proved to be problematic because the species remains listed under the Convention on International Trade in Endangered Species (CITES). This treaty requires signatory governments to evaluate the stock and award export permits only after scientific authorities indicate that local harvesting is not detrimental to the species. An exporter attempted to corner the processing market and thus control the fishery. The

Jamaican government sought to implement a quota system but legislative inconsistencies and court challenges by international exporters derailed the process. In order to abide by CITES, the government closed the fishery, which displaced fishers. With no fishers harvesting, deterrence of illegal poachers diminished and consequently, both Jamaica's industry and the conch population were negatively impacted (Miller 2000; Neufville 2001).

But some studies show that appropriators can adapt to changes in the market place and political conditions without overexploitation. They respond in ways that insure effective management over time. These studies found that both appropriator group organization and the institutions they created contribute to successful management (Acheson 1987; Carrier 1987; and Ostrom 1990). Distinguishing between the factors that foster successful management and those that undermine it guided the development of Common Pool Resource (CPR) theory.

Research Focus

This case study examines a self-organized cooperative of fishers in the Bocas del Toro Archipelago off the Caribbean coast of the Republic of Panama. CPR characteristics were identified through document research, interviews, and observations. Then the cooperative was evaluated to determine the extent to which the situation and organization demonstrated characteristics described in CPR literature. Analysis of prior field studies on resource management, conservation behavior, and sustainability provided methodologies suitable for this study.

Background

A resource qualifies as a CPR if access to the resource is difficult or impossible to limit and if using the resource degrades its quality. CPR literature refers to these two features as exclusion and subtractability. Exclusion describes the difficulty in limiting access to the resource. In a CPR, anyone can be an appropriator because no efficient means exist to limit access to the resource. The second characteristic, subtractability, describes the degree to which benefits derived by one appropriator affect the benefits the remaining appropriators enjoy. CPRs generally have high subtractability because one appropriator's use of the resource decreases the quality of the resource for the remaining appropriators (Hardin 1968; Ostrom 1990; Ostrom, Gardner, and Walker 1994). These two properties predispose CPRs to unsustainable exploitation levels.

CPR theory favors an institutional analysis of resource management and use. How the community of appropriators solves—and in some cases, fails to solve—the problems of exclusion and subtractability provides the data for CPR theory. The CPR situation determines appropriators' actions because it includes economic, social, and environmental conditions that affect decision-making and the level of appropriation effort. The interactions of appropriators and their handling of CPR challenges give rise to institutions. These institutions can be informal or formal, official or social structures.

Fisheries represent a commonly studied CPR situation. Both Gordon (1954) and Scott (1955) recognized that overexploitation would be a persistent threat to fisheries. Since Hardin's influential paper on the Commons (1968), policy makers have favored centralized control of CPRs in order to avoid the collapse of these resources. Ostrom

(2000), however, summarizes the pitfalls of assuming that the only solution to problems of overexploitation and resource destruction lies in centralizing resource management. She cites studies of accelerated over-harvesting of forests after government assumption of control and instances where local management schemes outperform agency imposed regulations. She has synthesized a theory of CPRs that emphasizes the importance of institutions arising within the community of appropriators, which results in the sustainability and conservation of CPRs (Ostrom 1990). This CPR theory accounts for the ecological system underlying a CPR as well as the economic and social behaviors that arise from intrinsic resource characteristics. Each aspect arises from identifiable variables. These factors can be social (e.g., appropriators' interdependence), ecological (e.g., the CPR stock's rate of renewal) or economic (e.g., availability of alternate opportunities) (Ostrom 1990). These variables contribute to a complex array of principles that determine successful resource management (Table 1).

Reviews of Major Works

Agrawal (2001) and Schlager (2002) have synthesized the findings of Ostrom and other theorists to create a comprehensive list of optimal CPR strategies. These include: clearly defined user rights and resource boundaries; restrictions on access and appropriation; participatory decision-making; active monitoring; enforceable sanctions; conflict resolution through arbitration and mediation; and self-determination by the stakeholders to create their own institutions for management. Additionally, Baland and Platteau (1996) have examined the role of rural communities in conservation and sustainable development in a study commissioned by the United Nation's Food and

Agricultural Organization. Their writing confirms Ostrom's theory that successful CPR institutions, whether formal or informal, demonstrate consistent features. Baland and Platteau suggest additional principles that would facilitate the conservation of natural resources. In fact, focusing on institutions created by appropriators may prove informative for policy makers and for future research in the field of resource conservation (Agrawal and Gibson 1999).

Relevant Field Research

CPR theory derived its formulation from field studies on conservationist strategies in small communities. The question is how do appropriators avoid a "tragedy of the commons," that is, why do conservationist behaviors and successful CPR management persist? Field studies by Ruttan (1998), Thurborn (2000), Carrier (1987), and Acheson (1987) provide ample evidence of conservation resulting from the institutional controls present in small communities. These studies identify the situational variables shaping the institution responsible for conservation of the resource. Their works are reviewed below because they provide examples of characteristics considered in this study.

Group organization and institutional nesting. Ruttan (1998) and Thurborn (2000) studied the harvest of a marine mollusk (*Trochus niloticus*) in the Kei Islands of Indonesia. In comparing two villages, Ruttan attributed better conservationist strategies to the community that had a high degree of homogeneity: villagers were of the same religious denomination; had a strong sense of pride in the community, and strong kin allegiances. But Ruttan questions whether the goal of this management regime is

conservation or maximizing monetary gains. Regardless of the islanders' motives, her work underscores the importance of social interdependence and a community's dependence on a resource.

Thurborn notes that centralized regulation of *Trochus*— it is listed as commercially endangered— preempted the traditional harvest practice called *sasi lola*. Governmental management of *Trochus* contributed to its localized extinction on several islands with the abandonment of *sasi lola*. Once *Trochus* had been listed, the national government introduced a plan to regulate harvesting. Regulatory agencies issued permits to entrepreneurs who cultivated *Trochus*. The rationale held that aquaculture would produce a harvestable stock within three years. In practice, however, one company initiated an aquaculture project in an area ecologically unsuitable for *Trochus*. This company received a permit and used it to control pricing of *Trochus* and discouraged traditional management regimes; meanwhile the company abandoned its original aquaculture project. Again, CPR theory indicates that nesting institutions for managing the resource optimizes management; that is, local management strategies supported by governmental regulations contribute to optimal management. So, both studies demonstrate important situational variables relevant to user's interactions— namely, group cohesion, government intervention, self-determination and existing institutions.

Local knowledge and ecological theory. Carrier (1987) identifies local knowledge about the resource as a key variable in CPR situations. Local knowledge often reflects an aggregation of facts that no one person can attribute to a specific case or

instance (Ward and Weeks 1994). Its use as a variable in CPR strategies reflects the degree to which folk knowledge agrees with ecological theory. It also serves as a social norm, which influences appropriators' organization and decision-making. This connection between knowledge and behavior shapes several characteristics of CPR institutions, such as appropriation rates and rules governing access.

Acheson (1987) describes the informal sanctions and regulations arising among lobster fishers along the Maine coast. The group's interdependence arises from a strong identification as lobster fishermen. The institutions arising from the group range from vigilante justice in dealing with trespassing to traditional practices such as "notching" and releasing gravid females to increase fecundity. The "notch" obligated anyone else to release that lobster also. This practice correlates to biologists' understanding of size at reproduction and fecundity. A notched lobster has an increased likelihood of surviving to another molting. In fact, the folk practice became a fishery regulation.

Local knowledge reflects appropriators' understanding of how their resource functions. It provides a basis on which to evaluate their impact on the resource. The degree to which local knowledge reflects ecological theory affects the management of the resource. Carrier (1987) identified several divergences between these two in his study of Papua New Guinea. For example, the fishers in his study attributed the decrease in productivity at a given fishing site to the fishes becoming wary of hooks or, alternatively, that the fish had been chased out of the area. Fishery science does not support either of these explanations. A fishery scientist evaluating the situation would conclude that over fishing or other disturbance had reduced the local population.

On the other hand, Johannes (1981) found that Palauan fishers had an understanding of fish behavior and ecology that paralleled Western theory. As a marine biologist, Johannes was able to evaluate local knowledge and test it *in situ*. He found that Palauan knowledge enabled fishers to adjust their practices as the system changed. Palauans adapted their behaviors to accommodate the introduction of new gear and maintain a robust management regime.

Decision making among appropriators. Bene and Tewfick (2001) studied how government regulation, commercial institutions, and fishing practices affected the efforts and choices fishers made between targeting two species. Their study examines situational variables in a commercial fishery that is well coordinated with an international market. In this sense, it differs from many CPR studies, which presume local markets for the resource. The authors demonstrate how centralized regulation, market influences, technological innovation, and appropriator behavior can lead to unsustainable appropriation decisions.

Institutional roles in management. A recent study of Tongans found that successful CPR management occurred without any identifiable situational variables in place (Bender, Kägi, and Mohr 2002). Instead, the community used an informal insurance plan to regulate fishing practices and this induced sustainability. The insurance plan creates equity among villagers by guaranteeing a certain fraction of the daily catch. Thus, elderly members of the community received a portion of the catch. The fishers distributed the catch amongst themselves according to the total size of the catch. At and

below a lower limit, the community distributed all fish directly to members and the fishers. When the catch reached a certain threshold, additional fish went to the fishers to sell on the market. The researchers claimed that no resource specific rules or regulations existed for appropriators. However, the institution and the resource have many linkages. The Tongan system accounts for appropriators' behaviors within a network providing social security, but those rules also determine the level of fishing effort. Also, the insurance plan described demonstrates many of the situational variables one would expect in a CPR management strategy: interdependence of appropriators; clear rules for appropriation and user rights; high-level of dependency upon the resource; and clear boundaries. The institution demonstrates many CPR principles. The mistake these authors have made lies in assuming that CPR institutions exclusively concern the resource. They fail to realize the interplay of human and intrinsic resource variables that influence institutional development. If the researchers had emphasized evaluating identified CPR variables they would have avoided this.

Applicable Studies

These studies demonstrate how CPR theory was used to analyze appropriator organization and resource management. Unlike many field studies, these were not researchers attempting to discover variables. Rather, the researchers focused on existing CPR situations and analyzed the system at the institutional level. In each case, the researchers studied a CPR situation and determined variables that significantly influenced management outcomes. They provide the methodology used in this thesis.

CPR management in small communities can be undermined when economic development increases demands for goods not available in local markets and when the local resource is opened to wider exploitation (Agrawal 2001). Tang and Tang (2001) studied indigenous Taiwanese villages. They found that increased exploitation by outside appropriators undermined historically successful management of a small fishery. In one case, the village reclaimed control of the CPR by renewing historic institutions and implementing contemporary enforcement strategies to strengthen its position. Thus, the traditional fisher issued citations to those breaking institutional rules. Outreach also played a significant role. Appropriators educated the public and regional officials on the issues through a public relations campaign and garnered wider support for its conservation goals. A second village failed in its attempts to copy this success and the authors felt this failure occurred because the village failed to engage outside support.

Finally, Pomeroy (1994) used situational variables concerning resource boundaries and user rights to analyze a lake-based fishery in Mexico. Her findings reveal the utility of CPR theory as an analytical tool. Her analysis determined that boundaries were lacking in both the physical sense and in terms of appropriator status. She attributes these shortcomings to territorial disputes, differing interpretations of government regulation and conflicting definitions of membership among the organized fishers' unions. Ameliorating the issues confronting this CPR situation requires government recognition of the fishers unions as rule makers and enforcers. Also, inter-union conflicts require arbitration and mediation. Her study provides a strategy for resource managers to

evaluate the potential for sustainable development of a CPR by its stakeholders and she gives policy makers a framework for increasing interagency cooperation.

Study Relevance

This thesis represents an application of CPR theory to analyze the Unión de Pescadores Artesanles Bocatoreños (UPESABO, Union of Artisan Fishers of Bocas del Toro). The results provide resource managers with strategies to foster CPR institutions, particularly in developing communities. In underdeveloped nations, the shortcomings of centralized control or privatization become apparent. Governments often lack the finances, infrastructure, or the political will to enforce laws and regulations designed to manage marine resources. CPR theory offers alternative strategies that are adaptable, inexpensive, and community based. A CPR institution can function as a regulatory agency, provide enforcement of rules, and optimize the benefits derived from the resource.

Ostrom has described herself as a “new institutionalist,” meaning that she emphasizes the role of institutions in resource management, particularly the informal institutions that arise within a community. These institutions are informal because they lack the infrastructure of a government agency or non-governmental organization. Often, they arise spontaneously and evolve through time, closely reflecting changes in members’ values. These changes correspond to the effectiveness of communication, members exchange and interpret information and give it meaning. The ability of an institution to respond to new information and adapt accordingly requires that members participate in decision-making and can modify or create suitable rules.

In exploring CPR situations, a productive line of inquiry focuses on institutions and their members. Institutions operate as a political extension of their membership, collectively expressing their aims and values. Institutions reveal underlying cultural and social relations. This interaction between the individual and the organization best represents the theme of CPR theory: successful exploitation of a resource over generations through cooperation and self-regulation.

Research Objectives

This study develops a systematic description of UPESABO and its membership using CPR theory as an investigatory framework. Characteristics of CPR theory are identified and classified. This study also analyzes the performance of UPESABO according to the characteristics of CPR theory. The description and analysis of UPESABO are accomplished by meeting four objectives.

Objective 1: Describe history and structure of UPESABO. Using interviews, observations and documents, the study describes the formation of UPESABO. The organization's by-laws and work plan are analyzed to determine management structure, decision-making processes, institutional goals, and membership roles. This section also presents the rationale for classifying UPESABO as a CPR institution.

Objective 2: Categorize observed CPR Characteristics. CPR theory has several classes of characteristics. The first two are the situational characteristics. This includes physical, biological, and ecological features about the resource itself. The next class of characteristics concerns the appropriator group and represents important factors in CPR

theory. The size of the group as well as its cultural and social makeup influences the efficacy of resource management. These characteristics are identified through interviews, analysis of a questionnaire, and examination of production records provided by UPESABO.

A third class of characteristics comprises the interrelationship of appropriators and the resource. These characteristics concern demographic features: the location of members' homes and communities relative to the fishery; the level of exploitation and the equity of benefits they derive from the fishery as well as the availability of alternative incomes. These characteristics are identified using sources previously mentioned.

Finally, the organizational level involves characteristics specific to an institution or organization: UPESABO's structure; the presence of conservation strategies and means of enforcement, and relationships with other agencies. UPESABO's by-laws and work plan provide the bulk of this information. Interviews with members, UPESABO organizers, and officials are used for supplementary data.

Objective 3: Compare observed conditions against CPR theory. This section addresses the problems of characteristics not identified in the field or characteristics for which data are lacking. Observations are evaluated against the optimal characteristics described in CPR theory. The evaluation of characteristics provides the basis for determining the potential for UPESABO to manage the fishery using CPR strategies.

Objective 4: Determine cohesiveness of members. In UPESABO, membership reflects the ethnic diversity of the region. So, the composition of the membership is

evaluated for correlations between ethnicity and attributes relevant to participating in the fishery or in UPESABO's programs. Differences in participation may indicate culturally specific factors related to social norms. These differences might interfere with group dynamics and hinder cooperation, thus reducing the effectiveness of UPESABO.

Ethnic divisions in Bocas del Toro fall into three cultural categories. This statistical analysis attempts to answer the question of whether the following attributes are dependent on cultural identification:

1. Years working in the fishery.
2. UPESABO membership status.
3. Boat ownership.
4. Participation in UPESABO lending program.
5. Income derived from fishing.

Summary of Objectives

The following research questions summarize this study's objectives.

1. How is UPESABO structured and organized?
 - a. What is the history of the organization?
 - b. What operational rules are present?
 - c. Who participates in decision-making?
2. Does the situation demonstrate CPR characteristics found in the literature?
 - a. What resource characteristics are present?
 - b. What appropriator characteristics are present?

- c. What characteristics linking appropriators and the resource are present?
- d. What institutional characteristics are present?
- 3. How well do the observed characteristics meet the optimal characteristics described by CPR theory?
- 4. Does a member's participation in UPESABO or other attributes relate to cultural identification?
 - a. The number of years a member works in the fishery:
 - i. H_0 : Is independent of cultural identification.
 - ii. H_A : It is dependent.
 - b. The date a member first joined UPESABO:
 - i. H_0 : Is independent of cultural identification.
 - ii. H_A : It is dependent.
 - c. Boat ownership by members:
 - i. H_0 : Is independent of cultural identification.
 - ii. H_A : It is dependent.
 - d. A member's use of the gear lending program:
 - i. H_0 : Is independent of cultural identification.
 - ii. H_A : It is dependent.
 - e. A member's income derived from fishing:
 - i. H_0 : Is independent of cultural identification.
 - ii. H_A : It is dependent.

2. DESIGN AND METHODS

Research Aims

Field studies of CPR situations use qualitative methods for data collection and analysis. Qualitative methods describe a social or cultural setting and the researcher postulates explanations based on observations and field experiences, a technique called grounded theory. This contrasts sharply with quantitative methodology that uses statistical testing to accept or reject a carefully defined hypothesis to answer a specific question. This case study attempts to describe a CPR situation using qualitative and quantitative methodologies. A qualitative study informs suitable and productive questions for hypothesis testing and interpretation of results could draw from both. Thus, the study first provides a grounded theory about the function of UPESABO and its relation to the fishery. Then, a statistical method of hypothesis testing answers additional research questions.

The researcher derived methods from works cited previously to gather data. These included ethnographic techniques such as: participant observation, wherein the researcher interacts with the subjects in their community; interviews to determine fishers' attitudes towards and understanding of fishery management; and learning through work to gather data on behaviors, technology, and knowledge. Document research provided supplementary data. The inclusion of demographic data derived from questionnaires allowed limited quantitative analysis.

Study Setting: Resources and Institutions

The setting includes both ecological and social components. The fishery is centered on Isla Colon, Republic of Panama (9° 25' N, 82° 15' W). Isla Colon is part of the Bocas del Toro Archipelago. This group of islands off the Caribbean Coast in the western half of the Panamanian isthmus (Figure 1) lies near the Costa Rican frontier. The fishery includes near shore areas of Isla Colon, fishing grounds within Almirante Bay, and sites off shore in the Caribbean Sea. The major towns in the area are Bocas del Toro, Almirante, and Changuinola. The area covered by the Archipelago, the contiguous waters, and adjacent mainland is equivalent to the San Francisco Bay region (Gordon 1982). Based on a regional topographic map of the archipelago, it is estimated that fishers travel throughout an approximately 2400 square-kilometer area to reach various fishing sites. The following description relies on Gordon's investigation into the natural history of the region (1982) and observations made by the researcher during site visits in 2002, 2003, and 2004.

Climate. The Bocas del Toro Archipelago lies within the tropics. Typically hot and wet, Panama's climate has a dry season from January to April and a wet season from May to December. However, few residents in Bocas del Toro agree with this description. Flanked by the Pacific on the West and Caribbean Sea on the East and divided by a high mountain range running from North to South, local variations to general climate patterns seem plausible. Local wisdom holds that there are in fact two wet/dry cycles each year. A break in the rains occurs during September and October and then again from February

to March. One person interviewed said that rain could fall at anytime and no apparent pattern existed (Dixon 2003).

Related ecosystems. Terrestrial features include rainforests and mangrove forests. Fringing and patch reefs lie in the shallow near shore waters. Many of the target species within the fishery have strong associations with both the mangroves and reefs.

Several anthropogenic impacts affect these biomes. Road building and housing construction fragment the forest. Locals cut large, old tropical hardwoods for boat making. The government perceives this as problematic enough to finance a program to encourage fishers to buy fiberglass boats (Arauz 2003). The practice of clearing the forest for roads, construction and materials tends to put more sediment into streams. In turn, this increases sedimentation on the reefs fringing the islands.

In the coastal waters, the reefs show signs of disturbance. In part, this resulted from the mass mortality of the urchin *Diadema antillarum* during the 1980's. Urchins in Panamá were the first to exhibit symptoms of this plague, which spread throughout the Caribbean. Consequently, with the diminishment in population of this important herbivore, Caribbean reefs shifted from coral dominated communities to algae dominated. This, in addition to global climate change, may jeopardize these systems (Scheffer et. al. 2001). Other sources of disturbance include agricultural pollution from banana farming that may influence reef ecology and species composition. Along coastlines with larger communities, simple sanitary facilities dump raw sewage directly into the waters (Figure 2). Additional impacts, such as freshwater inflow and increased

sedimentation resulting from runoff during heavy rains on the reefs, may be intrinsic but intensified by current human activities.

Social and economic factors. Tourism plays a significant role within the local economy, with the greatest concentration of hotels, restaurants and associated businesses in the town of Bocas del Toro, the provincial capital. In contrast to the growth of Bocas, a lack of employment and limited opportunities have plagued the mainland town of Almirante since the late 1990s (Machazek 2004). The contribution of fishing to the local economy remains unknown, but many individuals depend on fishing as a primary income or for subsistence (Arauz 2003; Machazek 2004; Prescott 2003). Of seventeen fishers questioned, ten reported monthly incomes of \$200 or less. Fishers' families often live in impoverished conditions (Machazek 2004). Many fishers have alternative employment opportunities available when they chose not to fish, and farming, construction, and forestry were often named as optional sources for income.

Communities include the larger towns mentioned above and numerous settlements. These settlements represent the land-holdings of the Ngöbe families. Extended families of Ngöbe occupy these settlements, creating small villages throughout the islands. The larger towns' populations represent a blend of cultures. In Bocas del Toro, Almirante, and Changuinola, Afro-Caribes, Mestizos, and Ngöbe own homes and businesses. On Isla Bastimentos, Afro-Caribes make up the majority of those living in the town of Bastimentos.

Literacy rates in Panamá are generally high, but vary by region and community. Though schooling is mandatory and free for the first six years, many outlying settlements

do not have a local school and children need to travel to attend the nearest one. This may include inter-island travel. A teacher from the grammar school at Boca del Drago complained that the poorest of the students tended to have the worst attendance. Secondary schools, the *colegios*, are tuition based and the costs of attendance can exclude poor families. Again, attending the secondary schools can require traveling between islands; most secondary students live with relatives near their *colegio*.

The fishery. In all, approximately 600 people use the fishery as their primary wage source. Fishers reported targeting many different species (Table 2). Of these, the researcher observed that just a few species dominate most landings. Fishers use a variety of gear (see Table 3) and all fishers interviewed owned or had use of a boat with an outboard motor. Generally, the Ngöbe tended to use traditional cayucos-- a traditional dug out-- and paddles, though a few Ngöbe had modified their dugouts to accommodate small outboard motors. One Ngöbe fisher reported that for him and some others the high costs of buying, fueling and maintaining an outboard excluded them from using engines.

Most fishing observed entailed the use of trammel nets or hand lines. Trammel nets are essentially gill nets. The ones observed consisted of three sections, each 100 meters long and 9 meters deep. One man described the mesh size as “number three” or three inches (7.5 cm). Most fishers in UPESABO set the net several times in the course of a fishing trip (Figure 3); a set could last from 60 minutes to three hours. However, the researcher observed fishers setting nets at dusk and retrieving them the next morning. Fishers using hand lines display ingenuity and thrift in assembling their gear. Inexpensive hand lines are put together from lengths of monofilament, hooks, weight and

a spindle to wrap the line around. Fishers substitute spark plugs, batteries or bolts for the traditional lead weights; plastic bottles and blocks of wood were used to spool the line (Figure 4).

By free diving, fishers caught two target species-- lobster and octopus. A common method for capturing octopus is to squirt a bleach solution into its den and capture it by hand when it flees the poisonous solution. The local MIDA office has begun an outreach program to discourage the use of bleach and substitute less destructive methods. Ngöbe on Isla Colon often take lobster from near shore reefs to which they have easy access. Several people interviewed complained that lobsters had been overexploited and one Ngöbe fisher reported that the number of lobsters had decreased and those remaining were smaller.

Institutional involvement. Several government agencies are responsible for regulating the fishery (Table 4). The *Ministerio de Desarrollo y Agropecuario* (MIDA, Ministry of Development and Agriculture) works with local fishers on issues of sustainability and conservation. One current program aims to replace traditional cayucos-- dugouts formed from hardwoods-- with fiberglass boats. In addition, MIDA has been working on an aquaculture project to take harvesting pressures off certain species. The *Autoridad Nacional de Ambiente* (ANAM, National Environment Authority) enforces policies and regulations implemented by the national body, *Dirección General de Recursos Marinos y Costeros de Autoridad Marítima de Panamá* (AMP, Director General of Marine and Coastal Resources of the Maritime Authority of Panamá). ANAM

manages the Isla Bastimentos National Marine Park, which includes waters in Almirante Bay and the Caribbean Sea.

In addition, several local NGOs exist. MIDA and the Nature Conservancy helped form the *Asociación de Pesca y Conservación del Archipiélago de Bocas del Toro* (ADEPESCO, Association for Fish and Conservation) which represents Ngöbe fishers from a dozen communities throughout the islands. Businesses and local community organizers founded the *Alianza para el Desarrollo Sostenible del Archipiélago de Bocas del Toro* (ADESBO, Alliance for Sustainable Development of the Bocas del Toro Archipelago) to encourage sustainability in the tourist industry. In Almirante, fishers established a local cooperative, *Unión de Pescadores Artesanales Bocatoreños* (UPESABO). Together, these agencies influence the actions of fishers. Inquiries did not determine the extent to which the individual agencies support and relate to one another. However, the quality and extent of those interactions ultimately determine the effectiveness of resource management in this system (Figure 5).

Unión de Pescadores Artesanales Bocatoreños (UPESABO). The membership of UPESABO includes members from Almirante, Isla Colon, Bastimentos and other communities within the Archipelago. Its 120 members represent about a fifth of all fishers working in the archipelago (Prescott 2003). Fishers who join UPESABO receive a number of benefits; however, UPESABO also provides some benefits to non-members.

Shortly after its founding in January 2000, the Unión de Pescadores Artesanales Bocatoreños refurbished a building to serve as a collection, holding, and distribution center (Figures 6-8). Documents provided by UPESABO refer to it as “*el centro de*

acopio” (the collection center) while members and neighborhood residents refer to it as “*la planta*” (the plant). At the distribution center, fishers can obtain ice, gear, gasoline and other goods at competitive prices. The center will purchase the landings of any fisher who comes to the plant, but the offering price differs for non-members. Since the plant serves as a focal point for members and others, most interviews and observations took place there.

Research Aspects and Instruments

The study occurred from May through September of 2004. During this time, the researcher engaged in field observations at several sites. This included twenty-five visits to the UPESABO plant. Additional field observations occurred in the communities of Boca del Drago, Bocas del Toro, and Almirante. Document research and analysis provided material that supplemented the fieldwork. The field data provided the basis for a description of the system and for developing a grounded theory of UPESABO’s role in the fishery. The study derived quantitative data from a formal questionnaire and catch records provided by UPESABO.

Participant observation and learning through work. Following the protocol established in an ethnographic textbook (Emerson, Fretz, and Shaw 1995), the researcher made repeated visits to the UPESABO plant between May and October of 2004. The researcher established relationships with the founder of UPESABO, its President and Secretary. These individuals received a brief description of the study. They granted

permission to make observations at the plant and arranged fishing trips with a UPESABO member.

Observations lasted from one to four hours starting between 7 and 8 a.m. This insured that observations coincided with the arrival of fishers bringing in their catches. Observations ended when more than forty-five minutes passed after the last arrival of a fisher. Most times this occurred between 11 a.m. and noon. During onsite observations, the researcher introduced himself to fishers, employees, buyers and other individuals at the plant and gave a short description of the study and its purpose. This strategy seemed to put people at ease when the researcher was present and facilitated communication amongst the participants.

Observations on fishing trips lasted approximately sixteen hours. On each occasion, the researcher met with the fisher on the dock at 2 p.m. After preparing the boat, it departed at 4 p.m. and returned between 7 and 8 a.m. the following morning. After returning to the plant, observations continued on site for an additional hour.

The researcher also participated in additional fishing activities over the course of several months. A resident Ngöbe man leased a small cayuco and mentored the researcher in using and caring for the dugout and provided guidance in the techniques of hand line fishing. Engaging in these activities provides insight to the meanings and understandings that fishers assign to their actions. Johannes (1981) used this technique to evaluate local knowledge for its effectiveness and to compare it to Western theory of fish ecology.

During the observations, the researcher made jottings in a notebook. The jottings concerned individuals, interactions, and the researcher's experiences. Within a few hours of completing field observations, the researcher produced field notes in the form of a narrative using the jottings to reconstruct events and recall details. At times, circumstances prevented recording notes during observations and the researcher wrote a narrative upon returning from the field. Later, a line-by-line reading led to the identification of codes to categorize field observations. The author reviewed the codes and organized them thematically. These themes became the basis for the description of UPESABO, its membership, and a grounded theory of the institution.

Focused interviews. Interviews provided the main source of data for this study. Approximately twenty interviews were conducted over the course of the fieldwork. These included informal interviews with individuals during participant observations. This type of interview focused on non-member fishers, buyers, and residents and took place in a variety of settings including the UPESABO plant. The format followed a casual, conversational style with no prepared questions. These interviews were not tape recorded, but jottings were used to record information pertaining to UPESABO, the fishery and community dynamics. Later, the interviews were summarized in daily field notes.

More structured interviews were undertaken with fishers at the UPESABO plant. After initial participant observations, the researcher chose interview subjects through convenience sampling. Using this strategy, the researcher asked fishers arriving at the plant to participate in an interview. The choice of convenience sampling allowed direct

follow up after field observations. Several ethnographic studies on CPR situations indicate this technique was employed (Acheson 1987; Carrier 1987; Ruttan 1998). Subjects agreed to audio-recording of the interview and a translator assisted in clarifying key points and idiomatic references.

Thirteen structured interviews were conducted with fishers. The interviews attempted to elicit information about the subject's knowledge of the fishery and opinions about the role of fishers and UPESABO in managing the fishery. Several sources influenced the researcher's choice of questions: the stated goals of UPESABO in its work plan; conversations during participant observations, and follow up within the interview. Generally, interviews entail the risk of introducing bias. The study required frank discussion of issues that could generate a defensive response, or the respondent could answer in a way that anticipated the researcher's biases. To avoid these problems, interview questions were open-ended and often prefaced with a statement that emphasized the member's values. For example, one aim of the interviews was to evaluate whether the fishery stock demonstrated any effects of over fishing. These effects can include changes in species composition of catches or a reduction in the size of individual fish, as well as a reduction in abundance over time. So the question was presented this way: "Some fishermen have told me that fishing is worse now than in the past. Why do you think they would say this?" This question reflected statements recorded during observations that suggested fish stocks were declining. Follow-up questions concerned changes in catch size, individual size and changes in the composition of the catch. It represented an attempt to qualify the kinds of change, if any,

fishers observed over time. In addition to this question, the investigator prepared several other questions for each interview:

- Describe what happens when you go fishing.
- How do you decide where to fish?
- Why do you think some sites are better than others?
- What type of fish do you catch?

The questions followed no particular order. The researcher asked the prepared questions to introduce new subjects or transition between topics. Questioning emphasized follow-up to specific statements made during the interview. This gave the researcher flexibility and allowed interviews to proceed in a conversational style.

In addition to interviews with fishers, the founder of UPESABO, its current president, and a representative from the *Ministerio de Desarrollo y Agropecuario* (MIDA) were also interviewed at separate times. The interviews with UPESABO personnel focused on the history, goals, and organizational structure of UPESABO. The representative from MIDA was asked about government agencies and regulations and the participation of NGOs in conservation and management.

After the conclusion of data collection, the interviews were transcribed and then coded. As with the participant observations, thematically grouping the codes furthered the development of a grounded theory.

Document research. De Castro and McGrath (2003) and Pomeroy (1994) used records from fishers' cooperatives to analyze aspects of CPR management. To this end, UPESABO provided several documents for analysis. These included the organization's

work plan and bylaws. The researcher translated and coded the documents. These codes provided additional themes to those developed from field observations and interviews. Additional archival research included study of Panamanian regulations and documents related to fishery management.

UPESABO began collecting catch and effort data shortly after it began operating the plant and provided monthly data collected from January 2003 through August 2004. Each record consists of the total number of pounds of each species brought into the plant and the total number of trips made by the fisher for that month. These records were examined for information about fishers' preferences for species and gear.

Survey. Seventeen members of UPESABO responded to the questionnaire that was distributed at a general membership meeting (Appendix 1). It consisted of twelve questions with close-ended responses to determine attributes of the group relevant to group cohesion. The initial questions elicited information on personal history. The latter half of the questionnaire concerned the fisher's career, participation in UPESABO, fishing effort and income.

Of central importance was the question of cultural identification. Field observations and inquiries with locals indicated that individuals identified themselves as being from one of three cultural groups: *Afro-Caribe*, *Mestizo*, or *Indio*. These cultural groups serve as indicators for social norms. The analysis of the questionnaire determines whether any other attributes studied depend upon ethnicity. Where correlations exist, social norms may differ among members and therefore hinder the development of successful CPR management.

The development of questions and responses followed consultations and discussions with Panamanians during field observations. This was particularly important for the question on cultural identification. Panamanians made it clear that they construct concepts of race and cultural identity differently than in the United States. The researcher spoke at length with individuals to determine the appropriate categories to include and an acceptable phrasing of those categories. The investigator took care to insure that the intended sample population would understand the questions and how to record responses. Several individuals assisted in the study by reviewing the questionnaire before its distribution.

Tabulating the frequency of the responses made some problems of analysis apparent (Table 5). Due to the small sample size, some response frequencies are very low. So responses were grouped together into binary categories (Table 6). Finally, the categories were broken down by cultural identifications. Two-by-two contingency tables were then constructed. Columns indicate cultural identification and the rows represent the observed frequency of an attribute within a class. To retain the cultural composition of the membership and still use this format, the researcher analyzed the three classes of cultural identification pair wise (Table 7).

Fisher's exact test was used to analyze the tables. Fisher's exact test is similar to χ^2 testing but works with small sample sizes and frequencies. The test corroborates whether an attribute is independent of a group. In other words, this study uses it to test whether statistically significant associations exist between cultural identification and a given attribute.

Fisher's exact test calculates the probability of observing a set of frequencies in a two-by-two contingency table according to the formula:

$$p = \frac{(A+B)!(C+D)!(A+C)!(B+D)!}{A!B!C!D!N!}$$

Here A , B , C , and D are the values in the table cells and N is the sample size. Then contingency tables with the same marginal frequencies are created; that is, the column and row sums equal the column and row totals of the original table. The sum of probabilities for configurations with less probability than the observed configuration produces the p -value for the test (Weisstein 1999). This study considered a p -value equal to or less than .10 as significant. Analysis was accomplished with a statistical program, InStat (GraphPad Software 2003).

3. FINDINGS AND ANALYSIS

This chapter presents the results according to the original order of research questions. First, it begins with a description and history of UPESABO. Second, the results for identifying and describing CPR characteristics displayed in this case study are reviewed. Third, an evaluation of these results compares the characteristics to the optimal conditions of CPR theory. Finally, the results of the survey analysis follow and the decision making rule for each hypothesis is interpreted within the context of the research questions and issues of methodology and data collection. Field observations also serve to inform this analysis.

UPESABO: Background, Organization, Goals, and Purpose

At the time of this study, UPESABO had existed for nearly two years. During this time, it accomplished a number of its stated goals and fulfilled several of its original purposes. However, other goals remain unrealized and lack detailed strategies.

UPESABO intended to create a sustainable fishery guided by ecological practices. One organizer admitted that this goal required more work. On the other hand, UPESABO supports over one hundred fishers through its programs, including a type of micro-lending program. As an institution, UPESABO also moved beyond its function as an assistance program. The plant now serves as more than a warehouse and distribution point. It provides a gathering place and serves as an informal community center for people who otherwise feel disenfranchised. By providing material aid, UPESABO improved the standing of fishers within the community. UPESABO accomplished this in two ways. Through UPESABO's lending program, fishers receive material assistance

and training. With membership, fishers gain political power and influence by participating in decision making within the organization. The term *social capital* describes activities that build community and is best defined as a shared successful experience. Appropriator groups that share social capital are more likely to create successful CPR strategies (Baland and Plateau 1996).

History. The lead organizer, Marta Machazek, is both a teacher at the local *colegio* and also the daughter of a fisherman. During the 1990s, Almirante suffered a major economic setback. Machazek describes it as a period of unrest and uncertainty. Chiquita Brands International modernized its shipping facilities and the port to handle large, standard shipping containers. Prior to this, loading and off-loading cargo required a large crew of longshoremen. Upgrading the facilities resulted in the termination of many dockworkers. For the least skilled workers, fishing offered some opportunity, and so entry into the fishery increased. However, these additional fishers increased the volatility of the market. Fishers competed with one another and undercut each other in order to sell their catch. Damage from gear and intense harvesting decreased the productivity of the near shore fishing grounds and reefs in Almirante Bay.

Machazek realized that improving the status of fishers required protecting the resource and stabilizing the market. She believed that fishers overexploited the reefs and fishing grounds of Almirante Bay because they lacked boats and engines capable of reaching fishing grounds offshore. The presence of so many fishers in direct competition also undermined pricing in the market. Finally, fishers lacked the skills to manage their finances and their profits could not dependably cover costs. To remediate this situation,

she wrote a proposal to form a cooperative to create economic support, market incentives and training.

Fishers she approached rejected this initial idea. They were suspicious of an organization formed as a cooperative. There is a general distrust of the government by many fishers. In Panamá, a cooperative (*cooperativo*) is an association funded and administered by the national government. In the 1970s, a fishery cooperative in the region lost the support of fishers because of corruption and mismanagement. As Machazek (2004) described it:

... it (the *cooperativo*) was established through the government, and it was regulated through IPACO, the Dirección Nacional that regulates *cooperativos* in Panamá. In Panamá, the government appoints the administration in cooperatives. So the cooperative did not give the fishermen enough weight, there was bad administration.... the name cooperative acquired a bad connotation, a bad shadow.

Fishers were reluctant to become involved with a cooperative again. They supported the idea of organizing, but wanted a format that would allow them independence. With this in mind, Machazek recast the organization as a union. This would be a self-governing association of fishers. The union would act as a collective to represent fishers in the market. The union held its first meeting in 1999.

UPESABO was incorporated as a small business in January 2000. The first year, it had no more than twenty members. During this time, the union prioritized obtaining gear for its members. Using membership fees and dues, UPESABO obtained fiberglass boats equipped with outboards. These were rented to the members and the income from the rents was put back into a fund for purchasing more boats and maintaining those in the fleet. UPESABO set a goal of obtaining ten full sets of gear. A set includes a boat with a

fifteen horsepower outboard engine, a net, lines and hooks. Rather than simply renting members the boats, UPESABO intended that members participate in a lease-to-own program.

Machazek found it difficult to obtain funding from national agencies because of UPESABO's independent status. She applied for an international aid grant from the Japanese International Cooperation Agency (JICA). She contacted the Japanese embassy and enlisted the interest and support of the ambassador. JICA awarded UPESABO \$34,450 and the union purchased the gear needed to outfit ten boats. These became the basis for UPESABO's gear loan program. A portion of the grant money went into training members to maintain fiberglass boats. Most fishers were using wooden boats and few knew how to repair or maintain fiberglass boats, but they last longer and are more durable than wood. UPESABO offered members training and they learned how to modify the boats to improve their strength and how to handle fiberglass resins to make repairs (Figure 9).

With the remaining grant money, UPESABO obtained and refurbished a building to serve as a collection, storage and distribution center. The building that housed the defunct fishing cooperative was acquired from the government and rehabilitated. UPESABO felt that acquiring the plant was important to increasing fishers' influence in the market. Before the union, the fishers sold their product independently, from store to store. Since they had no place to store their catch, fishers were constrained to accept whatever prices the stores or buyers offered. With the ability to hold and preserve landings, UPESABO could negotiate better prices on behalf of the fishers. The union

reinvests the profits from the sale of fish into the gear program and plant improvements. In addition, the plant provides services to the fishers including the sale of ice, gear and gasoline.

The plant also serves the larger community. Non-members can sell their catch to the plant, although they receive a price that is slightly lower than that given to members. In addition, they can buy supplies and goods through the plant. Retail customers can buy directly from the plant and pay the prices charged to wholesale buyers. A number of locals take advantage of this arrangement to guarantee the freshness of their purchase. Retail customers often wait dockside to meet fishers.

By July 2003, membership had grown to 126 members. UPESABO has distributed twenty boats through its gear-lending program. In February of 2004, the union reincorporated as a non-profit to reflect better its organizational philosophy. At the time of the study, the union was in negotiations with the Technical Mission of Taiwan to obtain funding for an expansion of the loan program. The union continues to expand its influence and standing within the fishing community. To this end, UPESABO began working with several communities on Peninsula Valiente, Isla Popa, and Cayo Coral: an agent from UPESABO makes regular trips to purchase these fishers' landings. Discussions have begun about including these fishers in the union. The fishers have been reluctant to apply for membership because they find the dues and fees too expensive. UPESABO is considering reducing membership fees and dues for these fishers and accepting in-kind payments of fish. In addition, organizers have proposed building or purchasing another collection center to serve these communities.

Structure. UPESABO operates on several fronts and each aspect of its administration reflects this. Its primary function is to represent its members as stakeholders in the community and pursue goals and policies in the best interests of its members. The articles of incorporation, work plan, and bylaws embody principles consistent with the organizers' intentions to empower fishers. It also discharges the gear loan program and has created specific requirements for participating in it. In addition, the distribution center represents another facet of UPESABO's structure. The day-to-day operations of the center are designed to serve members and the community. The comings and goings of fishers, customers, and neighbors promotes communication within this network. Members also come to the center to attend scheduled meetings. In addition to field notes and interviews, the description of UPESABO's administration draws from the articles of incorporation notarized in 2004 (Appendix 2) and the bylaws enacted in 2000 (Appendix 3).

The administration is divided into two parts, the Board of Directors (*Junta Directiva*) and the General Assembly (*Asamblea General*). The Board focuses on providing support for its members through implementation of policy, financial planning, managing membership issues, and facilitating decision-making. The General Assembly is composed of the entire membership and allows direct participation in the governance of UPESABO. Members participating in General Assembly meetings nominate, elect, and guide the Board of Directors.

UPESABO has simple and straightforward membership requirements (Table 8). In general, these requirements are readily achievable. Members may be classified as

inactive if they fail to meet certain obligations. Inactive members cannot participate in the gear program nor vote at meetings. Members participating in the gear-lending program have additional obligations; missed payment or abuse of gear results in disciplinary actions overseen by the board. UPESABO maintains the right to expel any member participating in scandalous or illegal actions that threaten the reputation of the organization or any members.

The general membership elects board members to their positions. There are ten seats on the board (Table 9). All seats are nominated and elected by the members through the assembly. Three of the seats are reserved exclusively for members. The remaining seven seats may be filled by anyone who has received majority approval from the assembly. Candidates from outside the general membership can qualify for nomination if they have the sponsorship of the general assembly. Qualification for a member-reserved board seat requires a minimum of one-year membership and fulfillment of membership obligations. At the time of the study, only the treasurer was not from within the membership. In addition, the board created the coordinator position to facilitate relations with other agencies and organizations. Machazek currently holds this position.

The by-laws give a variety of responsibilities to the board. These include pursuing the goals and objectives of the organization; entering into agreements on behalf of the membership; and other functions associated with business administration. Responsibility for obtaining financial support and backing for UPESABO also lies with the board of directors. Because UPESABO avoids accepting money from Panamanian

aid programs, the board actively seeks funding from international programs. Though the board has instructions to seek national sources of funding, individuals express apprehension about accepting government assistance citing examples of corruption and abuse. Compromising UPESABO's independence of government involvement also concerns its members.

Though board members exclusively vote on organizational issues, members may attend board meetings and receive the right to speak before the board on any issue. At regular meetings of the membership, the board brings all decisions before the general assembly for final approval. Thus, the general membership ultimately governs UPESABO. This process ensures members have a voice in decision-making.

Goals. From the start, UPESABO's founders aspired to create an organization that would improve the economic and social condition of fishers and conserve the fishery. The organizers and original supporters formulated an argument to justify the need for a fishers' union, one that linked sustainability of the fishery with fishers' welfare:

The principal natural resource is the sea. There is an important necessity to conserve...there is a need for an organization dedicated to responsible, sustainable, artisan fishing...that takes care of the ecosystem, protects vegetation, but also would be a source of income and livelihood for the Corregimiento de Almirante (Machazek 2004).

These objectives are reiterated in the by-laws and document of incorporation. They depend on a combination of financial assistance and training described in the work plan (Appendix 4). UPESABO enumerates several goals to improve the status and condition of fishers by improving the quality of gear available to fishers, enhancing market

conditions, and increasing opportunities within the fishery. UPESABO created the foundation for this support by investing in infrastructure to support the artisan fishery.

First, UPESABO created a type of micro-lending program for its members. Under this program, fishers apply for membership in UPESABO. Once approved, they become eligible to participate in a lease-to-own plan for boats, engines, nets and other gear. Members are loaned goods that they pay for in regular installments. Normally, a member obtains a set of gear: a boat with outboard, net and hand lines. After making full repayment, UPESABO transfers ownership to the member. To increase fishers' understanding of the loan program and to avoid defaulting on repayment, UPESABO requires members to attend a series of trainings on small business administration and financial management upon acceptance to the organization. The program appears successful. Responses from the survey show that of eleven members owning their own boat, six obtained the boat through this program. Also, one respondent identified as independent, meaning not a member, received a boat through UPESABO, but the terms upon which he acquired it are not known. Originally, UPESABO purchased ten boats and engines with an international aid grant from the Japanese government. At the time of this study, UPESABO had assigned twenty boats to its members. The Board of Directors currently has a funding request with the Technical Mission of Taiwan for another grant.

Buying and refurbishing a building to serve as a collection and distribution center made a significant contribution to UPESABO's ability to influence the local market. Here, members sell their catch for a fixed price. The Board of Directors consults with the fishers to set the price, and prices depend upon the species of fish. The plant then

resells fish at a markup. The union actively markets the fishery and works with local tourist franchises to insure a market for its landings. Many hotels and restaurants in the town of Bocas del Toro have agreements to purchase fish and seafood from UPESABO. Profits from sales return to UPESABO to cover administrative costs, to make improvements in the plant and its services, and to finance the loan program. In some instances, fishers opt to sell directly to consumers. In this case, a member may sell a few pounds on his own, but sells the balance to the plant. When asked what they received in their direct sales, fishers reported amounts similar to the retail prices charged by the plant. One restaurateur guarantees these freelancing members the same price per pound that they get through the plant. Several fishers said they did this as a courtesy to long-standing customers and did not see any conflict with UPESABO's retail sales.

Additional goals stated in UPESABO's documents include increasing its role in the supply chain. One objective is to process landings into products for packaging, such as fish sticks. The current administrator for the plant speculated about increasing distribution within the province. UPESABO performs additional education and outreach programs. Members attend workshops on safety, navigation, and fishery management. The Board of Directors organizes these workshops and calls for attendance at its discretion.

The mission statement and work plan make several mentions about advancing roles for women in the community by providing training and opportunities in the fishery. Specifically, implementation of processing and packaging products is mentioned as suitable venues for women's involvement in the fishery. This study did not focus on the

role of women in the organization, but it may be considerable. First, Marta Machazek has great influence in the organization and is well respected by the community. Also, another woman holds the secretary's seat on the board and she is also instrumental in administering operations at the plant. A number of women attended the General Assembly observed for the study. Five women were in attendance besides Machazek and the secretary. At first, it appeared they were family sitting in proxy for a fisher. In one case, this was true. When surveys were distributed, a woman asked if "*pescadoras*" should fill out a questionnaire and four identified themselves as fishers with UPESABO membership and took surveys.

UPESABO's bylaws and work plan emphasize economic assistance and development within the fishery. As described above, these aims have been pursued and the union demonstrates some success. The articles of incorporation, work plan and by-laws all state that one of UPESABO's objectives is to "protect the environment" or "conserve our environment and maritime resources." However, the organizational documents lack a specific framework and means for achieving the goals of conservation and sustainable management.

Instead, the organization and its members believe that some incidental conservation effects arise through the implementation of the loan program and equipping fishers with better boats and gear. Members explained that the ability to travel outside Almirante Bay helped conserve the reefs and the fishery. They report that those with the new boats and outboards do not fish within the confines of the bay. In theory, harvesting

pressures have decreased within the bay proper. Still, a large number of fishers operate without the benefits of UPESABO membership and they continue to use these areas.

Additional practices of UPESABO relate to conservation and sustainability. The union has adopted regulations set by the Maritime Authority of Panamá (AMP) for standards on limiting catch. The minimum size for fish the plant will buy is expressed as a one-pound-minimum rule. Fishers that obtain nets through the loan program receive nets with a minimum mesh size of three inches (Figure 10). This measurement reflects the maximum size of the mesh when stretched, as it would be when deployed with the weighted edge, the floats and current all acting upon the net. UPESABO does not distribute nets with smaller mesh.

In one case, UPESABO has limited gear on its own through its sale of hooks to fishers. No official regulation exists on hooks for hand lining. The smallest hooks sold at the plant have a bite of approximately 2 cm. (Figure 11). The bite determines the minimum size that may be taken with a hook in that a fish's extended jaws must be equal to or larger than the hook's bite. Of course, fishers can buy gear through other suppliers, but UPESABO offers gear at competitive prices and fishers can use their credit to purchase them. So, at least in the case of hooks, UPESABO indirectly sets gear limits for its members.

Decision-making through consensus. The researcher observed a general assembly during the course of field observations. Twenty-five people attended this particular meeting. During the six hours of the meeting, members had the opportunity to comment on a range of issues. These included a discussion about a member missing payments on

his equipment. The board turned to the members for suggestions about handling defaults on the loan. Members expressed concern about the effect of missed payments on UPESABO's credit and standing with the bank. One man told the board to refer to the by-laws; he wondered if the by-laws did not provide for this situation. Others felt it did, in that the by-laws call for the return of the equipment. However, some felt that there should be several attempts to recover payments before repossessing the gear.

Consensus building proved to be the preeminent form of decision-making. A discussion about selling baseball hats for a fund-raiser demonstrates this. The hats had the UPESABO acronym stitched on them. The secretary asked members what price to set on the sale of hats. She quoted the wholesale cost of \$6.50 and explained that UPESABO would sell them at a local fair. Suggestions on price came from several members. One proposed a price of ten dollars noting that was the cost of a good quality cap in most stores. Others questioned if turning a profit was the goal. Several people suggested lower prices with the rationale that they should be affordable and it was a way to increase awareness of UPESABO during the fair. Many of the members agreed to this and when the final price was set at two dollars above wholesale, the secretary asked for a vote. Though not everyone raised a hand, nods and body language indicated that the majority of those present supported the decision.

A second example of consensus building concerns rule making for a fishing tournament to celebrate the union's second anniversary. For this, members expressed their intention to participate in the tournament. This immediately led to questions about allowed gear and the types of fish included in the competition. Individuals offered

suggestions couched in the terms of jokes or jibes at other fishers. For example, a young man insinuated about conflicts over the sub-treasurer's participation as a judge and competitor. This introduced a discussion about a format to the contest with entry cut-off times and final weigh-ins.

Secondary functions. In addition to its role as a collection and distribution center for fishery landings, the plant developed into an important social space. Located as it is, the comings and goings of fishers can be observed from many points on the harbor. People tend to recognize individual boats from a distance and so they time their visits to the plant accordingly. Since the plant also sells snacks and soft drinks and has a television, it functions as a community center attracting people from the barrio. This role helps facilitate the exchange of information amongst fishers, buyers and the local community.

Those who come to the plant to purchase fish may spend several hours there. A restaurant owner frequently appeared as the first boat arrived in the early morning. She had specific types of fish she wanted to purchase and would wait for several different boats to bring their landings hoping to get her first choice, *macarela* (*S. maculatus*). She explained that though her customers preferred *pargo* (*Lutjanus spp.*) she made a greater profit on the *macarela*. This relationship between buyer and fisher provides an essential market signal. Fishers recognize her preferences and can inform her of the availability of the fish. Communication at this level gives fishers information about market demand and allows appropriate decision making for the fishery. This situation provides the

opportunity for UPESABO to realize its goal to increase the market for artisan fishery products described in its work plan.

Other activities take place that are not directly related to buying and selling fish. In this particular community, the costs of telephone service and cell phones prevent most people from owning them. Thus, direct personal communications occur only when people meet or visit with one another. The restaurant owner passed her time talking to friends and neighbors who also came to purchase fish. Their conversations involved discussions of personal and community events. One discussion between two men revealed the difficulty of finding employment in Almirante and the low pay offered. Fishers, of course, talked about fishing and gathered information about conditions and asked for reports from those landing their catches. The dock and open area behind the plant provide a space for gear repair and maintenance. Family members often come down to meet returning fishers.

When a boat returned with three large *mero*, the dock was crowded with bystanders (Figure 12). Children and curious neighbors supplemented the regular crowd waiting on the dock. Jokes and off-color comments circulated as fishers struggled to filet the large fish with machetes and axes. One curious boy picked up a string of vertebrae thrown aside and examined it carefully before passing it on to another. One man took charge of the process of preparing the *mero*; he directed a fisher in how to separate the filet from the spine and make a cut into the fish's flesh to use as a handle to manipulate it. Once cut and brought in for weighing, the fisher who had landed the *mero* allowed one man to take the head and tail fins with him to make a soup.

Also, the plant provides a place for youth to socialize with their peers and with adults. Children spend time on the dock observing catches as they are landed. Both girls and boys scavenge bits of fishing line and hooks. They use these to catch small fish that school around the dock. One fisher's daughter took responsibility of maintaining her father's ledger. She brought the ledger from home to the plant where she entered the day's credits and debits. At the plant, UPESABO members, customers and people from the community intermingle and so it serves as a node in the local social network (Figure 13).

UPESABO as a CPR institution. There is a difference between CPR situations and CPR institutions. By its nature, the Bocas del Toro fishery meets the conditions of a CPR situation: exclusion is difficult and subtractability is high. A CPR institution arises when appropriators organize to address the problems created by this state of affairs. Issues of access and effort are common troubles amongst fishers, but in this fishery the concerns are broader and involve questions of equity. UPESABO attempts to address and solve these problems. The founding of UPESABO and the participation of fishers signify a desire to manage the fishery; therefore, the union qualifies as a CPR institution. The next section identifies the specific CPR characteristics functioning in this case.

CPR Characteristics of the Bocas del Toro Fishery and UPESABO

In the CPR literature, characteristics fall into six categories (Table 1). The categories concern the resource, the resource users, their institutions and interactions between classes of characteristics. This study focuses on four of these classes. These

were chosen because each one includes characteristics that can be identified through the methods employed. Table 10 lists the classes considered and the characteristics identified.

Resource. Characteristics pertaining to the resource concern its physical, biological, and ecological properties. An important aspect of these elements is that they may not be fixed and can change over time. Also, these characteristics tend to be viewed as innate, but in fact may be defined by the fishers themselves.

Size and boundaries. Fishers reported traveling to a variety of sites within the archipelago. Fishing grounds lie in the coastal waters stretching from near the Costa Rican border to the easternmost islands in the chain (Figure 14). This covers well over 2400 square kilometers. Isla Bastimentos National Marine Park lies on the eastern edge of the fishery. Regulations nominally prohibit fishing within park boundaries and fishers reported that they avoided fishing within the park. However, some of the sites preferred by fishers are contiguous with these boundaries and may be within the park. For example, some sites near Cayos Zapatillo probably straddle the boundary there.

The furthest site is Escudo Veraguas an island that lies outside the main part of the archipelago, off the Peninsula Valiente. Traveling to Escudo Veraguas requires a full day from Almirante and fishers only make this trip during the March or September *veranillo*, a seasonal condition when the sea is at its calmest and storms and strong winds are uncommon.

Mobility. In general, this characteristic refers to the distribution of the resource in an area and also variations in distribution. In a fishery, these features depend upon the

biology and ecology of fish. Specifically, it reflects the fact that fish do not stay in a fixed place. Fisheries in general have a high degree of mobility.

Fish migrate within the area and their movement can include migrations out of one fishery and into another. This is true of ocean going species. However, there are species of fish that remain close to a specific location and this applies to many reef fish. Among fishers in the Bocas fishery, catch effort is divided between highly mobile species and those whose life histories fix them to a particular locale. Of the first type, fishers caught pelagic or open water species with trammel nets; the trammel net is essentially a gill net and the type of net available through UPESABO's gear program. Fish caught with this gear include *macarela*, species of the family *Scombridae* or Mackerels and *jurel*, from the family *Carangidae* or Jacks (Figures 15 & 16). Using hand lines, fishers targeted species associated with the nearshore, shallow reefs including *pargo*, various Snappers from the *Lutjanidae* and *mero*, Groupers representing *Serranidae* (Figures 17-18).

Predictability. A resource that demonstrates clear patterns of abundance and scarcity allow users to better manage it. Anticipating changes in abundance in a fishery requires knowledge about the past and an understanding of present conditions. Fishers interviewed apparently lack important information about the fishery stock and the ecosystem.

First, fishers disagree on the historical production of the fishery. Though their age was not asked in the interview, these fishers appeared to be 35 years old or more and they reported working in the fishery for more than ten years. They described a time

frame encompassing the previous ten to thirty years. Several observed that some species declined in abundance over the years. They also mentioned that larger fish seemed scarcer. Younger and less experienced fishers do not report seeing these changes. But in one instance where one younger fisher acknowledged that many others felt this way, he explained that it was only the fishers working inside Almirante Bay who saw this. For fishers like him working outside the bay, there was not a problem.

Those citing a change in productivity offered different explanations for the effects. One man attributed the decline in fish stocks to pollution in the harbor and bay. Another young man working as a crewman on a member's boat blamed the changes in the increased use of nets. He felt the nets allowed less skilled people into the fishery and they tended to overexploit it; take away the nets, he said, and you will see who the real fishers are. In two interviews, the fishers felt that the number of fishers had increased over time and this increase caused the changes in production. Other fishers interviewed felt that fish tended to leave an area when fishing pressure increased.

Appropriators. The user group determines the effectiveness of CPR management and many CPR field studies and experiments have examined the strategies that appropriators employ to enforce rules. Classifying the characteristics of resource users requires considering economic, social, and cultural elements. Confusingly, appropriator characteristics also include size and boundaries and they are applied in a similar way as in resource characteristics.

Size and boundaries. The president of UPESABO estimates that 600 fishers live in the Bocas del Toro Archipelago (Prescott 2003). Of these, 126 fishers are members of

the union and some fifty more regularly use the plant's services or sell fish to representatives of UPESABO. ADEPESCO (Association for Fish and Conservation) claims members from twelve indigenous communities on the island, but does not have a firm membership count. Two UPESABO members mentioned that they had worked with ADEPESCO in the past, but described the organization as existing only in name.

The uncertainty about the size of the appropriator group is related to the issue of boundaries of the group. Here, boundaries refer to what requirements an individual must meet to be considered a fisher. In the loosest sense, simply fishing makes one a fisher. UPESABO has a stricter definition of a fisher and uses it to determine eligibility for participation in the gear program. In this case, an individual must: reside in one of the towns of Bocas del Toro province; participate in fishing as his principal subsistence activity, and verify their status as a person of low-income living with more than two dependents. Fishers themselves use a more populist definition. When asked why they chose to work in the fishery, most fishers described themselves as a "true fisher," someone who depends on fishing for his livelihood, loves the sea and has dedicated his life to it. In interviews, some stated that owning a boat or having access to a boat was a requirement to being a successful fisher. So, in Bocas del Toro, a fisher is defined by his dependence on the fishery as a main source of income and by boat ownership.

Shared norms. Norms represent a system of values and behaviors. Norms vary from culture to culture and in a society that is multi-cultural, they may vary within that society. This is the case with the fishers of Bocas del Toro where three cultural groups exist, each distinguished by ethnicity. Instead of attempting to catalog the norms of each

group and comparing them, this study analyzes demographic attributes by ethnicity, looking for patterns that may indicate differences in norms. These results are included in the final section of this chapter.

The Guaymí or Ngöbe represent the original people of the Bocas del Toro region and one of several indigenous groups in Panamá. Collectively, Panamanians refer to them as *indios*, but each indigenous group recognizes itself as a unique people. The Afro-Caribbean population consists of immigrants from the Antillean Islands and other Caribbean nations. They describe themselves as *Afro-caribes*; though Spanish is the official language of Panamá, many *Afro-caribes* speak English and some use a patois called *wari-wari*. The third group represents people of mixed heritage, which can include European, indigenous, Asian or African sources. They apply the term *mestizo* to describe their background.

Leadership. No local organization or agency has succeeded in gaining the support of all fishers within the region. Participation by fishers is fragmented, though UPESABO's inclusion of non-members helps increase recognition for the collective. ADEPESCO and UPESABO both draw their leadership from fishers active in the community. Humberto Duguel, an Ngöbe elder, headed ADEPESCO and worked with the International Union for the Conservation of Nature (IUCN) and the Nature Conservancy to organize Ngöbe communities in Bocas. However, ADEPESCO never broadened its membership base beyond the Ngöbe fishers. Instead, with the support of the IUCN, it pursued a management strategy using indigenous rights to control access to

the fishery. To date, the Panamanian government has not responded to ADEPESCO's proposal.

As described above, UPESABO's leadership comes from within the membership or has the expressed support of the membership. Marta Machazek is recognized as the driving force behind the founding of UPESABO and she continues to play a significant role in the organization. However, fishers fill all positions but one on the board and in the plant. UPESABO continues to expand its influence within the fishing community and has started working with indigenous communities to encourage their participation and membership in the union.

Endowments, interests, and concerns. A fisher's gear represents his endowment. In this fishery, nets and hand lines are used are the predominant fishing gear. Many fishers have their own boats and the use of motors, but a fair number rely upon oars. The fishery supports more than 500 people and both UPESABO and ADEPESCO indicate that their members consider conservation a priority; fishers are aware that they depend on the productivity and health of the fishery along with its supporting eco-systems.

Poverty. As described by Machazek and by others, many fishers have few resources. In addition, the economy has taken several downturns hitting the least-skilled workers the hardest. Several men complained that jobs were scarce and offered low wages. Construction crews are filled with workers brought from outside the Archipelago because they will accept lower wages than local workers. The growing tourism economy favors Isla Colon, the destination for most tourists, while towns like Almirante and other communities are bypassed.

Relationships between appropriators and the resource. Successful CPRs featured in field studies demonstrate several commonalities: the resource is near appropriators' communities; levels of exploitation do not exceed subsistence levels, and the resource provides appropriators with their chief income. These factors determine the magnitude of resource exploitation.

Overlap. Fishers have residences throughout the Bocas del Toro islands. Most members of UPESABO live in Almirante and travel long distances to fishing grounds. Other fishers live in communities closer to some of the favored fishing grounds. For example, fishers on Cayo Agua travel a short distance to reach Cayos Zapatillos, whereas fishers from Almirante may spend several hours traveling to fish there.

The Escudo Veraguas fishing site lies beyond the typical range of most fishers. The island has a small population of fishers year round, but during the *veranillo*, fishers from the archipelago make trips to this remote site. This increases the relative size and range of the fishery.

Dependence. Individuals interviewed reported having alternative incomes to fishing, but they indicated that these were short-term jobs that supplemented their income. In another interview, a fisher explained that his catch was divided up in several ways: the best and biggest fish he would sell; his family ate those he didn't sell; the smallest or least desirable fish were dried and preserved. So, this fisher earned income and directly provisioned his family through fishing activities. Fishers acting independently-- that are without UPESABO membership-- tend to sell a portion of their catch and retain the rest for their own use. UPESABO members normally sell all their

catch to the plant and occasionally reserve a fish or two for a meal. Overall, the main source of wages earned by UPESABO members is fishing.

Fairness. Selling fish is extremely competitive. Fishers selling directly must negotiate their prices with buyers. UPESABO has mitigated some of the inequity in this system by negotiating prices to retailers and setting prices at which the plant buys fish. Non-members benefit from this because the UPESABO price acts as a touchstone; it sets a baseline for negotiations. Fishers reported receiving the same prices from direct sales as they received selling to the plant.

Institution. A CPR institution can operate informally, relying upon the casual interactions of its members to achieve its goals. In instances where organizers have implemented community-based management, CPR institutions have structures similar to non-profit organizations, unions or collectives. CPR institutions function primarily as rule making and enforcement agents. These functions require the consent of the appropriators, who participate in the decision-making that determines the rules and then enforce them.

Rule making. UPESABO uses democratic and participatory processes to establish rules. As described earlier, all members have a voice in creating rules and can provide input at any stage from inception to execution. This is important because members can modify the rules to accommodate the growth of the union and its influence.

Access and management rules. A number of government agencies implemented regulations to manage Panamanian fisheries and to control access to fishing grounds. UPESABO adopted these rules without modification and operates according to all laws

and conditions of the Maritime Authority of Panamá (AMP). Otherwise, the union restricts its rule making to considerations of membership eligibility and participation in its loan program. Through the gear loan program, the union aims to redirect fishing pressure from reefs in the bay to grounds offshore, but no explicit directive states this. Fishers with motors prefer to use spots outside the bay, but do set nets in the deeper channel separating the mainland from Isla Colon off of Boca del Drago when sea conditions outside are hazardous.

Enforcement. UPESABO takes action against members that violate bylaws or requirements of the loan program. Disciplinary actions are discussed before the *Junta Directiva* and the *Asamblea General*, so that members can discuss governance and appropriate consequences. The union does not directly enforce violation of management rules, such as size limits. Instead, its approach is passive: size limits are enforced by the characteristics of the gear it sells through the plant. UPESABO sells only gear that adheres to specific standards and this selects for a minimum catch size. AMP sets these gear standards and UPESABO has adopted them accordingly. Fishers that obtain nets through the loan program receive nets with a minimum mesh size of three inches (Figure 10). In addition, the smallest hooks sold at the plant have a bite of approximately 2 cm. (Figure 11). The bite determines the minimum size that may be taken with a hook in that a fish's extended jaws must be equal to or larger than the hook's bite.

Similarly, the union takes a hands-off approach to its goal of reducing fishing in Almirante Bay. When asked what would happen if a member was seen fishing on reefs in Almirante Bay, members dismissed the scenario. Fishers reported that the small size

and low numbers of fish in the bay gave them reason enough to stop fishing there. Members expressed a general attitude that fishing the reefs is not worth the effort and only those fishers without an engine would do so.

The boundaries of Isla Bastimentos National Marine Park create additional access rules that UPESABO acknowledges. Fishers expressed a preference for sites near the boundaries, but interpreted the boundaries and rules governing it differently. In interviews one reported that no fishing was permitted, others reported that only hand lines were permitted. It is worth noting that all those who spoke of the park expressed support for the idea of protecting part of the area from fishing and development, but simultaneously felt that the government had acted irresponsibly in creating the park without consulting with the fishers. This uncertainty and ambivalence probably result in violations of the rules, but UPESABO and its members look the other way in these instances, leaving enforcement to ANAM (*Autoridad Nacional del Ambiente*).

Summation of observed characteristics. Table 11 compares and summarizes the characteristics described in CPR theory against those identified in this case. Two points become apparent. First, this case does not demonstrate an instance of every characteristic in each class. Second, of all the identified characteristics, several vary from the standard set by theory.

Evaluating Characteristics

Characteristics were rated on a simple scale to evaluate their status. When an observed characteristic appeared to meet the theoretical, it was given a plus sign; when

observed conditions failed or did not strongly fulfill theoretical requirements, the characteristic was assigned a minus (Table 12). Altogether, nineteen characteristics were identified. Of these, seven appear to meet theoretical conditions while twelve do not fit the proscribed conditions or fail to meet them. The unidentified status of three conditions from the twenty-two considered does not imply their absence from this situation; the available data was insufficient to evaluate them.

Some class characteristics are better represented than others. The relationships between the resource system and group have three of four characteristics present and these appear to reflect theoretical conditions. Only one institutional characteristic is favorably represented of the six identified in this class. In many instances, the observed characteristics marginally correspond to CPR theory.

Resource class characteristics. In comparing the observed characteristics to the requirements stated in the literature, it became clear that observations diverged from theoretical values and that the literature does not sufficiently define these variables. In the literature, the size parameters are not specific and elastic. For example, the necessary condition that the resource is of “small size” does not seem to hold true in the case of the Bocas del Toro fishery. The fishery covers territory from near the Costa Rican border at the mouth of *Rio Sixaloe* to the offshore island of *Escudo Veraguas*, or about 900 square miles (Figure 14). However, this is comparable to conditions described by Acheson (1987).

The fishery’s boundaries are not clearly established and fishing territory increases when sea conditions allow fishers to travel safely in the open sea. The boundaries of the

marine park are recognized, but the demarcating lines are irregular and not drawn relative to significant landmarks (Figure 19). This makes the boundaries uncertain and difficult to enforce. Fishers regularly exploit this “gray zone,” particularly the waters around Cayos Zapatilla.

The fishery demonstrates high mobility in terms of the open water species targeted, but is less so when considering reef fish. This dependence on multiple species complicates coral reef fishery management (Sparre and Venema 1998). Also, there is not enough information to determine whether the fishery shows patterns of abundance and decline. Long-term data on fishery production was not available.

Appropriator class characteristics. Of eight characteristics listed as theoretical conditions, only three are favorably represented in this case and two characteristics have uncertain or undetermined rating (Table 11). In the case of shared norms, appropriate data was unavailable. However, proxies for these are considered in the last section. Given the failure of the *cooperativo* and the impasse that ADEPESCO reached, it seems the community of fishers lacks a history of successes and fishers put little faith in organizations, though the accomplishments of UPESABO have benefited many fishers and for these, it is well-regarded by the larger community.

Fishers have distinct attributes they use to define who belongs in the group. On the other hand, this does not exclude anyone from fishing. Being a *pescador* indicates a social status and not an entitlement. UPESABO requires fishers who participate in the gear loan program to meet several conditions (see Table 8). Ultimately, there are no effective prohibitions that could prevent an individual from fishing, which is the gist of

this characteristic. However, there is a sense that fishers identify strongly with their status and this is also a significant aspect of this characteristic; lobstermen in Acheson's study (1987) demonstrate this.

The variety of equipment used by fishers range from handmade dugouts to lightweight fiberglass boats. There is a mix of gear used in the fishery and the fishery does not appear over-capacity, which occurs when the fishery cannot support the type and the amount of gear in use. In addition, fishers depend on their gear and catch for their livelihood. In their synthesis, Baland and Plateau (1996) consider these features important among appropriator characteristics because they temper appropriation rates. Finally, leadership in UPESABO originates from within the membership or the members may nominate leaders from outside the membership. In either case, leaders are accountable to members.

The remaining characteristics come up short in meeting requirements. The number of fishers may be larger than ideal, though again, no study establishes a maximum size. This characteristic might be relative to the resource size; for the Bocas fishery, 600 people using over 900 square miles may be appropriately small. In a successful CPR situation, appropriators often act altruistically, that is they forego individual gain and share benefits through cooperation. Outside of UPESABO and ADEPESCO, fishers tend to act on their own and rarely cooperate; they are independent agents, though some fishers have entered partnerships in which they share gear, split captainship and divide profits. The group does not display the interdependence shown in other studies (Ruttan 1998; Bender, Kägi, and Mohr 2002). Bocas del Toro appears to

fail the low levels of poverty requirement. It is widely acknowledged that fishers have the lowest incomes in the region. This marginalizes their concerns and influence. As a result, fishers feel ignored by politicians and underserved by assistance agencies.

Relationships between resource system and group characteristics. The three characteristics identified fit the conditions described by CPR theory and by the literature. First, though the fishery encompasses a large area, fishers live throughout this range (Figure 19). Thus, any fishing site is likely to be near a community where fishers live. This means fishers can identify one another even though they may live in different communities. In one case, this ability allowed appropriators to enforce rules and punish those who break rules (Acheson 1987). Also consistent with the theoretical characteristics is that the fishery provides the primary source of income. This makes fishers dependent upon the benefits they derive from the catch and sale of fish. In Bender, Kägi, and Mohr's study (2002), a high level of dependence insures participation in the institution and determines how much effort fishers exert.

The third characteristic concerns fairness and equity in distributing the benefits from a resource. Ruttan (1998), Tang and Tang (2001), and Pomeroy (1994) detail both fairness and inequity in allocating benefits and these effects on appropriator participation in an institution. UPESABO has improved the equity in the market by negotiating prices with most wholesalers throughout the region and by accepting landings from non-members. This has stabilized the market price for fish and decreased the risk fishers face in selling their catch.

The last characteristic in this class was not determined. Though UPESABO provided catch data collected over an eighteen-month period, the data had too many gaps to provide a useful analysis. Also, the data includes only landings from its members and did not include non-member landings. Determining user demand requires a fuller description of total catch and effort within the fishery.

Institutional characteristics. From the Ostrom's viewpoint (1990), this class of characteristics influences the quality of CPR management most strongly. At this level, rules are made, enforced and amended. Without simple, transparent procedures to accomplish these objectives, an institution fails to garner the support of its members. The institution must also have autonomy and equal standing with other agencies working in the area. UPESABO does not fully function in this capacity. Of the six theoretical conditions, only one can be identified. UPESABO does demonstrate an accessible rule making process that is inclusive of its members and its rules are straight forward and simple in their requirements.

However, the rules concern only participation within the organization and for eligibility to the loan program. UPESABO maintains a *laissez-faire* policy in fishery management. The rules for access and management come directly from AMP and ANAM; UPESABO has no explicit management strategy of its own. Further, UPESABO has no protocol for dealing with fishers who break government regulations. This, coupled with the sporadic and inconsistent enforcement by ANAM, makes for a fishery with little oversight. The distrust fishers have for government agencies and fishers' lack

of political influence further undermines the effectiveness of UPESABO. These shortcomings trump UPESABO's goal of conserving and protecting the fishery.

Cultural Identification and Attributes

An underlying assumption of CPR theory holds that when individuals within the appropriator group share norms then the likelihood of cooperation increases and institutions function more effectively. An idealized CPR situation would consist of a small community of appropriators sharing kinship networks and religious beliefs with historical ties to the resource. In the Bocas del Toro fishery, fishers live in communities throughout the archipelago. Some settlements consist only of Ngöbe families whose social and economic networks may be very insular. This may reduce communications among fishers that contribute to the formation of institutions. In contrast, Almirante is a relatively large town with an ethnically mixed population. This diversity may inhibit cooperation and the formation of institutions. Overall, the situation in Bocas del Toro appears antithetical to the enabling conditions of CPR theory. It certainly complicates the identification of norms functioning within these dissimilar and widespread communities.

Therefore, instead of comparing norms between these communities, UPESABO's membership provided a sample population to test for relationships between ethnic identity and attributes of its members. In this analysis, the ethnic categories serve as proxies for norms. So, if the attributes are independent of ethnic identification, then they will appear to be randomly distributed throughout the membership. In this case, norms may still differ between cultures, but they are not relevant to the attributes studied.

Alternatively, correlations between ethnicity and other attributes may indicate differences in norms which can hinder the functions of UPESABO and warrant further investigation.

Of the various attributes explored in the survey, the five chosen for comparisons between cultures were as follows:

1. The number of years working in the fishery.
2. The length of time the fisher has been an UPESABO member.
3. If the member owned a boat.
4. If the boat was obtained through UPESABO's program.
5. The member's monthly income earned from fishing.

The analysis of the five attributes required fifteen comparisons using Fisher's exact test (see Table 7). In order to reject the null-hypothesis of independence, the correlation between a given attribute and cultural classifications required a p -value of less than .10 (Table 13). No comparisons resulted in a significant p -value and, in fact, were much higher than the cut-off value. The questionnaire data indicates that cultural identification does not unduly influence the status of the attributes examined. This result suggests that individual demographics have little to do with ethnicity and that any differences in norms between groups do not effect members' participation in the fishery or in UPESABO.

Of course, the data may contain shortcomings that reflect sampling bias. Since only attendees at a general membership meeting responded to the survey, the potential sample population represented a small part of the membership. Attendees from Almirante have less difficulty getting to the plant than those living further away. And of those coming from other communities, they can afford the costs incurred to travel to

Almirante; this means poorer members living outside of Almirante are less likely to attend meetings. Also, the survey considers a narrow range of attributes. These may not be meaningful to members of these communities. For example, considering the importance of family in Panamanian society, asking a respondent if other family members are involved in fishing might be a better line of inquiry to determine cultural patterns. In the end, the sample and the survey may be biased and unrepresentative of the membership.

4. CONCLUSION AND RECOMMENDATIONS

The findings from this case study indicate that UPESABO does not fulfill the functions of a successful CPR institution and its prospects to do so present some knotty challenges. First, the organization does not engage itself directly in rule making and enforcing policies that are integral to managing the fishery. Second, robust ecological information about the state of the fishery is missing. This is not a shortcoming on UPESABO's part, but it is in a unique position to rectify the situation. Finally, UPESABO's membership represents about one-fifth of all the fishers within the archipelago. It seems unlikely that this small percentage makes a "critical mass" that can influence fishery management.

However, UPESABO is a relatively young organization and is still growing. An important feature of CPR institutions concerns their ability to evolve if certain conditions are in place. Some of these conditions were identified in the evaluation of characteristics and the organization promotes their development. UPESABO can also focus on specific strategies that would advance its role within the fishery. Based on the findings and results of this study, UPESABO has the potential to become a true CPR institution.

UPESABO Fosters Enabling Conditions

The findings from the qualitative section suggest that as UPESABO develops as an institution, it affects the community beyond the immediate benefits of membership. For example, each member that participates in the gear-leasing program becomes part of a network of fishers who share a common risk. This creates a sense of interdependence and unifies stakeholder's interests and concerns. Defaulting on a loan has repercussions

for all members because it endangers the credit UPESABO has established with financial institutions and defaulted loans jeopardize the reputation UPESABO's leaders established with sponsoring institutions. Furthermore, failing to repay debts undoes the goodwill the organization fosters among fishers and their communities.

Further, the growth of UPESABO creates social capital or shared successes. For members and the community, sharing successful experiences builds trust. As a result, members may allow experimentation that promotes the growth of the institution. As an example of this, UPESABO has agreed to extend a specialized membership to indigenous fishers living on Isla Cayo Agua and Isla Popa. These fishers pay membership fees through an in-kind exchange for their catch. UPESABO is also considering setting up a distribution center with an ice-maker in one of these outlying communities to handle landings and prepare them for shipment to Almirante. The distribution center would be managed and maintained by residents there.

Because the plant serves as gathering place where fishers and the public meet and exchange information, the community becomes privy to the administration and organization of the Union. This informs non-members about the status of UPESABO projects and goals. As UPESABO communicates its management goals through its achievements and objectives, it establishes standards for fishery management. The presence of children and youth at the plant puts them in close contact with fishers and could transmit new values about the importance of the fishery and conservation to another generation. The plant also gives the community a cornerstone. Other businesses in the barrio are restaurants and markets. Neighbors gain from having an industry like

the distribution center in the barrio and the community benefits from the economic stability that fishers gain through membership. Retailers from markets and restaurants have a dependable supply of fish with regulated prices that minimize losses across the supply chain. In turn, this increases the efficiency of the fishery.

Finally, UPESABO makes leadership opportunities available to its members. According to its bylaws, members qualify to run for a seat on the board of directors upon completing their first year of membership and satisfying the requirements of membership during that time. Also, all members may attend meetings of the board and can speak at these meetings. Though only board members may vote on issues brought before it, general membership meetings allow everyone a vote and the board of directors brings its decisions before the general membership for final approval. In a population where a sense of disempowerment is common, the Union allows direct participation in its proceedings. This gives members procedural skills that can be valuable in other forums. They also experience the satisfaction of participating in decision making for the institution.

Recommendations

Increase membership. Interviews with members and non-members indicate that the organization has unified its membership and engendered support for its program within the communities of Almirante and nearby islands. However, it is unlikely that UPESABO has achieved sufficient membership to effectively influence fishery management. Currently, members number around 120. The president of UPESABO estimated that some 600 fishers worked in the bay and near shore waters. Through recent

outreach to other communities in the archipelago, membership will increase and possibly UPESABO's clout with all fishers will too.

Further growth of membership seems likely. The inclusion of fishers from remoter communities shows that UPESABO recognizes the need to include more of the archipelago's appropriators in its membership. To achieve its goals of conservation and sustainable management, UPESABO ultimately requires a decisive majority of fishers to participate in its programs. Under lesser conditions, conflicts may occur between members and non-members. Unilateral management decisions made by UPESABO members would lack sufficient support and serve largely as symbolic gestures; UPESABO's effectiveness as an institution would be limited.

Improve knowledge about the fishery. In order to implement management decisions at the production level, UPESABO requires better information about the fishery. UPESABO began collecting catch and effort data shortly after it began operating the plant. UPESABO breaks down the information by member. Each record consists of the total number of pounds of each species brought into the plant and the total number of trips made by the fisher for that month (Table 14).

Several shortcomings in UPESABO's methodology complicate its usefulness. First, because it is a monthly summation, the data does not indicate the species composition of each trip. That is, if a fisher had landings of 6 different species, then the record treats each trip as bringing in the same species in similar proportions each time. Thus, it fails to identify variations in catch composition during a particular month. It does allow comparisons of month-to-month variations.

The second problem concerns the effectiveness of fishing gear. Observations indicate that fishers use either nets or hand lines on a trip; gear is never mixed on the same trip and conversations with fishers bear this out. Since UPESABO records only the number of trips, the effort of using hand line or net has to be considered equivalent. An informal evaluation of the landings data suggests a weakness in this. For example, fishers predominantly use nets to catch *macarela*. In any given month, the total landings for *macarela* exceed those for *pargo* – a class caught with hand line – by several fold. Thus, in terms of effort, nets appear more effective than hand line. Standardizing the effort unit in terms of trips loses this distinction. Finally, UPESABO includes a landings class named *revoltura*. This translates loosely as “scramble” and refers to fish not classified during embarkation and might consist of any given species including those that may be classified elsewhere.

Given the constraints of its current landing information, UPESABO should consider improving catch data by emphasizing more detail in its records. It is difficult to implement conservation or sustainability strategies without a clear idea of how many fish exist and the status of those populations. Unfortunately, this requires a time-series of several years of catch and effort data to make a production model capable of predicting sustainable yields. Alternative methods include stock assessments based on length-weight or length-age relationships of target species (Sparre and Venema 1998). A sampling of landings for length comparisons done over a period of one year can reveal patterns that indicate basic biological aspects of the target species, such as the frequency at which individuals recruit into the fishery. Somewhat more difficult, determining the

age structure of landings requires some training in the removal of otoliths (ear bones) for calculating the age of the fish. Establishing growth rates from this information gives insight to some of the more dynamic aspects of the fishery, such as productivity.

All of these methods require good record keeping and some training. UPESABO could draw upon the expertise of local government agencies to provide training. The local *colegio* could serve as a source of technicians to collect and record this information. Community based management programs in other regions have successfully incorporated local students to track data. Investigating other issues mentioned by fishers, such as pollution within the bay and its effect on the fishery, could help establish the ecological conditions of habitats within the archipelago.

Improve interagency cooperation and relations. Garnering more allies within the hierarchy of agencies and organizations working in the region can benefit UPESABO. Generally, feelings about other agencies are negative. UPESABO organizers and members do not view government agencies as effective and consider them corrupt. UPESABO values its independence from governmental association and it attributes much of its success to that autonomy. Members also express skepticism about other non-governmental organizations working in the archipelago. While maintaining its self-determination, the board of directors can initiate informal relations with other parties. For example, hosting guest speakers to lead trainings or workshops helps educate members, increases UPESABO's visibility and allows UPESABO to demonstrate its success.

Create local fishery rules and enforce them. Threats to the stability of the fishery and the ecosystems that sustain it require prioritizing. UPESABO must begin a discussion among its members about their livelihood and conservation. The fishers must identify the issues and challenges of sustainability and begin to address them. This process entails securing expertise in fishery management and could be part of the outreach mentioned above. Then, UPESABO could start a conversation about self-regulation as a means to fishery management and conservation.

To begin with, rules about the minimum size limit are worth examining. The current limits come directly from government regulations and similarly UPESABO enacted a policy that restricts net and hook sizes. Thus, there is a precedent for discussing size limits and these limits have real and observable effects. Taking smaller fish tends to reduce the average size at maturity over generations. Along with that effect, smaller fish have a reduced reproductive capacity; they produce smaller eggs and less of them. Taken together, this creates declining populations of smaller fish.

It appears that UPESABO does not strictly enforce minimum size rules. Regulations place a one-pound minimum on all species taken. Using information gathered in the course of the study, the author looked at size and weight relationships in three families of fish brought into the plant for sale. From a sampling, 22.0 cm was the minimum size observed for *Carangids (jurel)*, 15.9 cm for *Lutjanids (pargo)* and 17.5 cm for *Pomacanthids (potcover)* (Figure 20). Sizes reflect the method of using the standard length, the distance from the snout to the last bony process in the peduncle, where the tail attaches to the body. Because fishers process their catch in the field and remove the gut

organs, samples were not weighed. However, using a length-weight calculation, the expected weight of these smallest sizes was under a pound (Table 15). These calculated weights indicate that the size limit goes unobserved. This may be due to the use of nets in the fishery because it appears that nets target smaller fish (Figure 21). As a purely precautionary action, UPESABO should consider increasing the minimum size requirements.

Some of the fishers' responses in interviews and observations of fishers lead to speculation about decision making in this fishery. The price that fishers receive for a specific type likely influence the targeting of species and is another factor that deserves analysis. In the *mero* fishery, fishers identified a handful of sites that yield large individuals, often over 100 hundred pounds: Cayo Zapatilla, Cayos Tigre and Escudo de Veraguas. Fishers receive the highest price per pound for this fish, but these sites can be reached only during the best sea conditions. The targeting of *mero* risks overexploiting these populations. These large groupers are slow growing fish and the International Union for the Conservation of Nature (IUCN) has red-listed several species and short-listed even more for consideration (IUCN 2000). These lists include species found in the waters of the archipelago. Based solely on coloration and markings, the *mero* landed at the plant were tentatively identified as *Mycteroperca venenosa*, a species listed as near threatened by the IUCN (Cornish, Brule, and Garcia-Moliner 2004). Intensive targeting could endanger local populations and given that *mero* receives a premium price, this seems likely. Over the period covered by the landings data, there appears to be a trend to more heavily target *mero* (Figure 22). Considering the lack of regulatory enforcement, it

may be that the only practical limitations on harvesting arise from variation in sea conditions. If UPESABO wishes to implement sustainable practices within the fishery, it must consider the use of seasonal closures and quotas for sensitive fish stocks such as *mero*.

The process for making and enforcing such rules will likely prove contentious. Fortunately, UPESABO has a clear and accessible protocol in place for undertaking such a challenge. Its open and transparent consensus making process means that decisions will be made with input from members. This is UPESABO's greatest strength as an institution and integral to effective CPR management.

Equipment and expansion of capacity. During interviews, many fishers expressed a desire to obtain larger boats. The advantages in terms of safety and convenience are clear, but introducing new gear without knowing the condition of the fishery introduces risk. With a larger boat, fishers may begin to increase their effort because its size offsets some of the risks of using a smaller boat in rougher seas. Alternatively, increasing the distance fishers can travel may lessen the effort put on some populations. Fishers also expressed interest in obtaining fish finding gear and GPS devices for marking fishing sites and navigating at night. But these also entail risk because it could increase effort in an unsustainable way.

However, one piece of technology that can improve effort and safety exists, though fishers did not mention it. Providing fishers with cell phones is a practical way to safeguard fishers and refine effort. First, the phone itself is relatively inexpensive and a simple dry bag suffices to protect it from adverse conditions on the boats. Since most

service in Panamá uses a pay-as-you-go plan, the fishers and UPESABO avoid unnecessary purchases for service. Second, cell phone towers exist on Isla Colon, Bastimentos and the mainland; given that these are visible from many places within the archipelago, they provide a means for emergency communication. Moreover, fishers can coordinate their activities with each other and UPESABO. Fishers could notify buyers of availability and UPESABO could warn fishers of potential surpluses and recommend fishers target other species. This could streamline the market and increase efficiency.

Summary

UPESABO has succeeded as an organization that provides economic assistance to its members. Its function as an institution committed to improving the livelihoods of fishers has spilled over into other areas, benefiting the community and becoming a part of its social network. As far as achieving goals of sustainability and conservation of the fishery, the study did not identify concrete accomplishments. UPESABO lacks a specific conservation strategy that addresses issues key to fishery management: limits on harvest, the question of access and need for enforcement of rules or regulations. The ability to accomplish all this requires cooperation with the government and other organizations. The means to influence these outcomes requires wider support among regional fishers and other organizations. UPESABO demonstrates that institutions can influence a community of appropriators and hopefully it will fulfill its potential to guide future development of the fishery.

FIGURES

Figure 1. Map of Bocas del Toro Archipelago, Republic of Panamá. The Archipelago lies on the Caribbean coast of Panamá near its border with Costa Rica. The area covered by the Archipelago is equivalent to the San Francisco Bay Area. Map scale 1: 333,333.

Figure 2. Anthropogenic Impacts. Coastal inhabitants create impacts on the reef and near shore environment. Untreated sewage pollutes the waters of the Archipelago. In the inner harbor of Almirante, outhouses stand over the water and waste drops directly into the harbor.

Figure 3. Setting a trammel net off of Boca del Drago. This net is approximately 300 meters long and nine meters deep. The top line is fitted with floats and the bottom line with lead weights. The plastic cape worn by the fisher prevents the net from snagging on clothing while playing it out. After setting the net, the boat and net drift with the current.

Figure 4. Hand-line gear is often improvised. Here, a sparkplug serves as a weight and a short piece of wood as a spool.

Figure 5. Institutions within the Study System. Institutional arrangements affect local management regimes. In this representation of some institutions in the study area, the actual extent of overlap is hypothetical. According to CPR theory, the greater the degree of “nesting,” the more successful local institutions become at maintaining a resource.

Figure 6. The Collection Center (*El Centro de Acopio* or *La Planta*) of UPESABO. Before UPESABO refurbished it, the abandoned building served as a drug user's hangout. Though outside of the center of Almirante, buyers, as well as individuals from the neighborhood, visit the plant daily. The majority of Barrio Francisco's residents are Afro-Caribbean.

Figure 7. Side View of *La Planta*. Another view shows the collection center in Barrio Francisco. The building originally served as a processing plant for a *cooperativo* in the 1970s.

Figure 8. View of the UPESABO Collection Center from Its Dock. The boats in the foreground are those made available through the leasing program. These are the last two of ten purchased with the Japanese International Cooperation Agency (JICA) grant. By October 2004, the Union assigned these last boats to members.

Figure 9. Fiberglass Boats Used in the Fishery. These views were taken while sitting inside a boat obtained through UPESABO. The fisher added the awning to provide shelter on overnight trips. Left: The holding box serves as a seat and strengthens the hull. Right: Mounting an engine requires installing a board on the stern to reinforce the fiberglass.

Figure 10. Trammel Net. Close-up of net shows mesh without strain applied. When deployed, the forces applied by the floats, weights and current would stretch the size of the mesh to its maximum.

Figure 11. Hooks and Bite. UPESABO sells several sizes of hooks at the plant. Hooks select for minimum size of catch by the size of the bite. The distance from the bend in the shaft of the hook to the tip determines the bite of a hook.

Figure 12. Crowd Gathered on Dock. The UPESABO plant regularly becomes a gathering place for customers, on-lookers and fishers. Residents from the neighborhood and others gather around to watch as fishers prepare to clean and fillet three large *mero* on the dock behind the plant.

Figure 13. Fishers at UPESABO. Fishers socialize and talk with customers during the collection center's hours of operation (7 am - 4 pm). UPESABO offers its members equipment such as gasoline, hooks and line at competitive prices. The center also sells drinks, snacks, and supplies.

Figure 14. Relative locations of fishing communities to fishing grounds identified during study. The fishers travel to places (shaded areas) as far west as the mouth of the Sixaloa River (upper left) on the Costa Rican border eastward to Isla Escudo de Veraguas off the Valiente Peninsula. Map scale 1:835,000.

Figure 15. Comparing *Macarela*. *Scomberomorus maculatus* and *S. cavalla* differ in coloration, but are lumped together as *macarela*. Though fishers recognize them as individual species, on a practical level, the effort required to land them is the same. The top photo shows *S. maculatus* with its distinctive rows of spots. The bottom photo shows *S. maculatus* and *S. cavalla* side by side.

Figure 16. Three Types of *Jurel*. Fishers identify several species of *Carangidae*, but often group them together. Variations in coloration and markings pose a challenge in some instances and fishers disagreed on the final identification. The author used a dichotomous key to confirm identifications. The species below are, from top to bottom: *C. bartholomaei*, *C. ruber*, and *C. latus*.

Figure 17. Different Kinds of *Pargo*. These two species of *Lutjanidae* can be misidentified based on coloration and markings. The top photo shows *L. apodus* and the bottom is of *L. campechanus*. These examples clearly show differences in markings, but variations can impede accurate identification based on these features alone.

Figure 18. Big Fish. A large *mero* landed at the UPESABO dock. These groupers grow slowly and live a long time. This combination makes them vulnerable to overexploitation if harvest is not limited.

Figure 19. Boundaries of the Marine Park. Dashed line indicates boundaries of the Parque Nacional Marino Isla Bastimentos. Without a GPS unit or charts and compass skills, determining boundaries on the open sea is nearly impossible. Map Scale 1:103,125.

Figure 20. Comparison of Size Classes across Three Target Species. UPESABO states that it follows the one-pound minimum rule set by AMP (Autoridad Marítima de Panamá). However, the predominance of smaller size classes suggests this regulation may be routinely violated.

Figure 21. Size Classes and Gear. Size class comparisons of *C. crysos* taken with net and by hand line suggest that nets select for fish of smaller size.

Figure 22. Increasing Monthly Catch Weights. Monthly landings for *mero* indicate that fishers have started to increase targeting of this species.

TABLES

Table 1. Discovered characteristics of long enduring CPRs. Initials refer to studies done by: R. Wade, E. Ostrom, Baland and Platteau, and Arun Agrawal. Based on Table 2, *Critical enabling conditions for sustainability on the commons* in Agrawal (2001).

Resource system characteristics	<ul style="list-style-type: none"> • Small size (RW) • Well defined boundaries (RW, EO) • Low levels of mobility (AA) • Possibilities of storage of benefits from the resource (AA) • Predictability (AA)
Appropriator characteristics	<ul style="list-style-type: none"> • Small size (RW, B&P) • Clearly defined boundaries (RW, EO) • Shared norms (B&P) • Past successful experiences (social capital) (RW, B&P) • Appropriate leadership (B&P) • Interdependence among group members (RW, B&P) • Heterogeneity of endowments, homogeneity of interests and concerns (B&P) • Low levels of poverty (AA)
Relationships between resource system and group characteristics	<ul style="list-style-type: none"> • Overlap between user group residential location and resource location (RW, B&P) • High levels of dependence by group members on resource system (RW) • Fairness in allocation of benefits from common resources (B&P) • Low levels of user demand (AA) • Gradual change in levels of demand (AA)
Institutional arrangements	<ul style="list-style-type: none"> • Rules are simple and easy to understand (B&P) • Locally devised access and management rules (RW, EO, B&P) • Ease in enforcement of rules (RW, EO, B&P) • Graduated sanctions (RW, EO) • Availability of low cost adjudication (EO) • Accountability of monitors and other officials to appropriators (EO, B&P)

Table 1- *Continued.*

Relationship between resource system and institutional arrangements	<ul style="list-style-type: none"> • Match restrictions on harvests to regeneration of resources (RW, EO)
External environment	<ul style="list-style-type: none"> • <u>Technology</u>: <ol style="list-style-type: none"> 1. Low cost exclusion technology (RW) 2. Time for adaptation to technological changes (AA) 3. Low level of articulation with external markets (AA) • <u>Political</u> : <ol style="list-style-type: none"> 1. Central governments do not undermine local authority (RW, EO) 2. Supportive external sanctioning institutions (B&P) 3. Appropriate levels of external aid to compensate local users for conservation activities (B&P) 4. Nested levels of appropriation, provision, enforcement, government (EO)

Table 2. Target Species in the Bocas del Toro Artisan Fishery.

Common Name (Spanish)	Common Name (English)	Scientific Nomenclature
Pargo	Snapper	<i>Lutjanus sp.</i>
Jurel	Jack	<i>Coranx sp.</i>
Mero	Grouper/Jewfish	<i>Epinephelus sp.</i>
Salmone	Almaco Jack	<i>Seriola rivoliana</i>
Barracuda	Barracuda	<i>Shyraena barracuda</i>
Bonito	Wahoo	<i>Aanthocybium solandri</i>
Bonito	False Albacore	<i>Euthynnus alletteratus</i>
Atun	Tuna (Yellowfin)	<i>Thunnus albacares</i>
Potcover	Grey Angel	<i>Pomacanthus arcuatus</i>
Ronco	Grunt	<i>Haemulon sp.</i>

Table 3. Appropriator Group Characteristics.

Cultural Affinities	Community Localities	Institutional Affiliations	Gear Used
<ul style="list-style-type: none"> Guaymi (Ngöbe) Panamanian (Mestizo) Afro-Caribbean 	<ul style="list-style-type: none"> Isla Colon Isla Bastimentos Mainland (Almirante) 	<ul style="list-style-type: none"> UPESABO¹ Fishing partners ADEPESCO² 	<ul style="list-style-type: none"> Nets Hook and line Set line Free diving Bleach fishing

1. Unión de Pescadores Artesanales Bocatoreños.

2. Asociación de Pesca y Conservación del Archipiélago de Bocas del Toro.

Table 4. Institutions Relevant to Fishery Management.

Agency	Effective Influence	Activities and Oversight
Dirección General de Recursos Marinos y Costeros de Autoridad Marítima de Panamá (AMP) ¹	National	<ul style="list-style-type: none"> – Licenses and permits – Quotas and size limits – Gear restrictions – Species restrictions
Autoridad Nacional de Ambiente (ANAM) ²	National/Local	<ul style="list-style-type: none"> – Enforcement
Ministerio Desarrollo y Agropecuario ³ (MIDA) Office	Local	<ul style="list-style-type: none"> – Assistance projects – Education – Consulting with local communities
Unión de Pescadores Artesanales Bocatoreños (UPESABO) ⁴	Local	<ul style="list-style-type: none"> – Organizing local fishers – Membership benefits

1. Director General of Marine Resources and Coastal Areas of the Maritime Authority of Panama.
2. National Authority of the Environment.
3. Ministry of Development and Agriculture.
4. Union of Artisan Fishers.

Table 5. Tabulation of Responses to Questionnaire.					
<u>Age Range</u>					
<i>15-20</i>	<i>21-30</i>	<i>31-40</i>	<i>41-50</i>	<i>51-60</i>	<i>>60</i>
2	3	5	4	3	0
<u>Household Locations</u>					
<i>Almirante</i>	<i>Changuinola</i>	<i>Bastimentos</i>	<i>Punta Robala</i>	<i>Punta Laurel</i>	
11	2	1	2	1	
<u>Education</u>					
<i>Primary</i>			<i>Secondary</i>		
<u><6 yrs</u>	<u>Completed</u>		<u><6yrs</u>	<u>Completed</u>	
4	3		2	8	
<u>Religious Affiliation</u>					
<i>Adventist</i>	<i>Baptist</i>	<i>Catholic</i>	<i>Evangelical</i>	<i>Methodist</i>	<i>Other</i>
1	0	7	5	0	4
<u>Cultural Group</u>					
	<i>Mixed</i>	<i>Afrocaribe</i>	<i>Indian</i>	<i>Other</i>	
	10	4	2	1	
<u>Years as Fisher</u>					
<i><1</i>	<i>1 to 5</i>	<i>6 to 10</i>	<i>11 to 20</i>	<i>>20</i>	
2	1	4	5	5	
<u>UPesABo Membership (years)</u>					
	<i><1</i>	<i><2</i>	<i>2</i>	<i>Independent</i>	
	2	0	12	3	
<u>Boat Ownership</u>					
	<i>Yes</i>	<i>No</i>			
	7	10			

Table 5- Continued.

<u>Program Participation</u>					
<i>Yes</i>		<i>No</i>			
7		10			
<hr/>					
<u>Trip Frequency (per week)</u>					
<i>1</i>	<i>2 to 3</i>	<i>4 to 5</i>	<i>6 to 7</i>	<i>>7</i>	
5	4	2	3	3	
<hr/>					
<u>Monthly Fishing Income (Dollars)</u>					
<i><100</i>	<i>101-200</i>	<i>201-300</i>	<i>301-400</i>	<i>401-500</i>	<i>>500</i>
6	4	5	2	0	0

Table 6. Grouping of Questionnaire Results for Analysis.

<u>Age Range</u>		
<i>15-40</i>	<i>41-60</i>	
10	7	
<u>Household Locations</u>		
<i>Almirante</i>	<i>Other</i>	
11	6	
<u>Education</u>		
<i>Primary</i>	<i>Secondary</i>	
7	10	
<u>Religious Affiliation</u>		
<i>Catholic</i>	<i>Other</i>	
7	10	
<u>Cultural Group</u>		
<i>Mixed</i>	<i>Afrocaribe</i>	<i>Indian</i>
10	4	2
<u>Years as Fisher</u>		
<i>less than 11</i>	<i>11 or more</i>	
7	10	
<u>UPesABo Membership (years)</u>		
<i>Independent or less than 1</i>	<i>1 or more</i>	
3	14	
<u>Boat Ownership</u>		
<i>Yes</i>	<i>No</i>	
7	10	
<u>Program Participation</u>		
<i>Yes</i>	<i>No</i>	
7	10	
<u>Trip Frequency (per week)</u>		
<i>1 to 3</i>	<i>4 to 7 or more</i>	
9	8	
<u>Monthly Fishing Income (Dollars)</u>		
<i>200 or less</i>	<i>Over 200</i>	
10	7	

Table 7. Pairings for Fisher's Exact Test of Independence. Cultural identities were compared pairwise to determine whether any attributes correlated to ethnicity. Each attribute requires three comparisons.

Attributes		Afro Caribe	Indio	row totals	Afro Caribe	Mestizo	row totals	Mestizo	Indio	row totals
Years Working as Fisher	<= 10	1	1	2	1	5	6	5	1	6
	> 10	3	1	4	3	5	8	5	1	6
	column totals	4	2	6	4	10	14	10	2	12
Length of Membership*	<= 1 year	2	0	2	2	1	3	1	0	1
	> 1 year	2	2	4	2	7	9	7	2	9
	column totals	4	2	6	4	8	12	8	2	10
Boat Ownership	Yes	3	1	4	3	7	10	7	1	8
	No	1	1	2	1	3	4	3	1	4
	column totals	4	2	6	4	10	14	10	2	12
Program Participation	Yes	1	1	2	1	5	6	5	1	6
	No	3	1	4	3	5	8	5	1	6
	column totals	4	2	6	4	10	14	10	2	12
Monthly Income from Fishing	<= 200	1	1	2	1	7	8	7	1	8
	> 200	3	1	4	3	3	6	3	1	4
	column totals	4	2	6	4	10	14	10	2	12

*Fishers identifying as independent (*independiente*) are not included in this analysis.

Table 8. UPESABO Membership Requirements. Fishers must meet specific criteria to gain membership and retain it.

Potential members must:	<ul style="list-style-type: none"> • Live in Bocas del Toro Province • Fish regularly as their primary wage earning activity • Obtain approval from Board of Directors
Membership is maintained by:	<ul style="list-style-type: none"> • Payment of dues and fees • Attending meetings of the General Assembly • Work in good faith towards the goals of UPESABO
Membership becomes inactive when a member:	<ul style="list-style-type: none"> • Fails to pay dues or fees • Misses more than six consecutive meetings of the General Assembly
Members participating in the gear loan program also:	<ul style="list-style-type: none"> • Make regular payments on their gear • Keep gear in good condition until full payment is made

Table 9. Responsibilities of the *Junta Directiva*. The Board of Directors is drawn from the membership or from candidates sponsored by the *Asamblea General*.

<i>Title</i>	<i>Responsibilities</i>
President	<ul style="list-style-type: none"> – Represents the organization – Presides over all meetings – Reports to the members
Vice-President	<ul style="list-style-type: none"> – Represents President in absentia – Presides over Education Committee – Fulfills obligations assigned by the President
Secretary	<ul style="list-style-type: none"> – Stands in for President and Vice President in absentia – Presides over Public Relations Committee – Maintains records
Sub-Secretary	<ul style="list-style-type: none"> – Replaces Secretary in absentia – Fulfills obligations assigned by the President
Treasurer	<ul style="list-style-type: none"> – Maintains financial records – Presides over the Finance Committee – Makes and receives payments – Maintains inventories
Sub-Treasurer	<ul style="list-style-type: none"> – Replaces Treasurer in absentia – Fulfills obligations assigned by the President
Oversight	<ul style="list-style-type: none"> – Implement statutes, rules and agreements – Presides over Discipline, Honor, and Affiliation Committee
Member Representatives (3)	<ul style="list-style-type: none"> – Carry out functions as directed by the board – Provide input from the general membership

Table 10. Characteristics Considered for Evaluation. The definitions are drawn from theoretical work on CPR strategies and field studies.		
CLASS	CHARACTERISTIC	DEFINITION
Resource system	— Small size	— Not rigidly defined; may vary from a few to several hundred square km.
	— Well defined boundaries	— Landmarks or margins establish extent of resource.
	— Low levels of mobility	— The resource units (e.g., trees, water, fish) do not move outside of boundaries.
	— Predictability	— Productivity shows clear patterns of abundance and decline.
Appropriator	— Small size	— Definition varies; may consist of a small village or an extended network.
	— Clearly defined boundaries	— Individuals define themselves with specific attributes.
	— Shared norms	— Values, beliefs and behaviors specific to the culture.
	— Past successful experiences (social capital)	— Accomplishments and achievements realized by the group.
	— Appropriate leadership	— Direction and guidance comes from within the group.
	— Interdependence among group members	— Individuals form a social network providing for everyone's welfare.
	— Heterogeneity of endowments, homogeneity of interests and concerns	— Resource exploitation levels vary by member, but all members share in the derived benefits.
Relationships between resource system and group	— Low levels of poverty	— Sufficient wage earning opportunities available.
	— Overlap between user group residential location and resource location	— Appropriators live in close proximity to or within the resource boundaries.
	— High levels of dependence by group members on resource system	— Resource exploitation is primary subsistence source or wage earning income source.
	— Fairness in allocation of benefits from common resources	— Gains from exploitation are distributed so that equity is maintained among appropriators.
	— Low levels of user demand	— Exploitation does not exceed ability of resource to renew itself.
Institutional	— Rules are simple and easy to understand	— Regulations use terminology and references employed by users.
	— Locally devised access and management rules	— Appropriators participate in rule making and decision-making.
	— Ease in enforcement of rules	— Appropriators function as enforcers; free-riding is not tolerated.
	— Graduated sanctions	— Consequences increase in severity with repeated violation.
	— Availability of low cost adjudication	— Appropriators have access to mediation and legal services.
	— Accountability of monitors and other officials to appropriators	— Government agents answerable to stakeholders.

Table 11. Comparison of Theoretical and Observed Conditions. The descriptions of observed characteristics are drawn from field observations, interviews and documents provided by UPESABO.		
CLASS	THEORETICAL CONDITIONS	OBSERVED CONDITIONS
Resource system	<ol style="list-style-type: none"> 1. Small size 2. Well defined boundaries 3. Low levels of mobility 4. Predictability 	<ol style="list-style-type: none"> 1. Fishing sites strewn throughout 900 square miles. 2. Anyone may fish at any site; little enforcement of park boundaries. 3. Pelagic fish migrate in and out of fishery; reef fish tend to be fixed. 4. Information is insufficient or unclear.
Appropriator	<ol style="list-style-type: none"> 1. Small size 2. Clearly defined boundaries 3. Shared norms 4. Past successful experiences (social capital) 5. Appropriate leadership 6. Interdependence among group members 7. Heterogeneity of endowments, homogeneity of interests and concerns 8. Low levels of poverty 	<ol style="list-style-type: none"> 1. 120 members but total number of fishers estimated at 600. 2. Status is popularly self-defined; UPESABO uses specific criteria. 3. Uncertain. 4. Undetermined. 5. Within UPESABO, fishers fill leadership roles and make decisions. 6. Members tend to be individualistic; no indication of a strong sense of interdependence besides membership identification. 7. Membership represents a diversity of income levels; members consider fishing central to their livelihood. 8. Fishers earned low wages and have few assets.
Relationships between resource system and group	<ol style="list-style-type: none"> 1. Overlap between user group residential location and resource location 2. High levels of dependence by group members on resource system 3. Fairness in allocation of benefits from common resources 4. Low levels of user demand 	<ol style="list-style-type: none"> 1. UPESABO Membership concentrated in Almirante, but members and other fishers live in other locations throughout the archipelago. 2. Many fishers report having other employment available, some members appear more heavily involved than others. 3. UPESABO mediates effects of market place for members and non-members choosing to sell through distribution center. 4. Undetermined.

Table 11. <i>Continued.</i>		
Institutional	<ol style="list-style-type: none"> 1. Rules are simple and easy to understand 2. Locally devised access and management rules 3. Ease in enforcement of rules 4. Graduated sanctions 5. Availability of low cost adjudication 6. Accountability of monitors and other officials to appropriators 	<ol style="list-style-type: none"> 1. UPESABO's rules implemented by its members; consensus allows direct participation. 2. Rules derived from government requirements; no indication of additional, voluntary rules. 3. Clear and simple procedures written in bylaws. 4. Sanctioning concerns only participation in equipment program and membership conduct. 5. By-laws do not indicate protocol for legal arbitration or mediation. 6. Leadership shows no inclination to cooperate with other agencies; members tend to distrust agencies. UPESABO lacks influence with government agencies.

Table 12. Scoring of Observed Characteristics. Scores represent the extent to which observed conditions meet theoretical conditions: appears consistent (+); fails or incomplete (-); insufficient data to score (ND).		
CLASS	CHARACTERISTIC	SCORE
Resource system	Small size	+
	Well defined boundaries	-
	Low levels of mobility	-
	Predictability	ND
Appropriator	Small size	-
	Clearly defined boundaries	+
	Shared norms	ND
	Past successful experiences (social capital)	ND
	Appropriate leadership	+
	Interdependence among group members	-
Relationships between resource system and group	Heterogeneity of endowments, homogeneity of interests and concerns	+
	Low levels of poverty	-
	Overlap between user group residential location and resource location	+
	High levels of dependence by group members on resource system	+
	Fairness in allocation of benefits from common resources	+
	Low levels of user demand	ND
Institutional	Rules are simple and easy to understand	+
	Locally devised access and management rules	-
	Ease in enforcement of rules	-
	Graduated sanctions	-
	Availability of low cost adjudication	-
	Accountability of monitors and other officials to appropriators	-

Table 13. Results of Fisher's Exact Test. Calculated p-values exceed the .10 cut-off, suggesting there are no correlations between the studied attributes and cultural identification.

<i>ATTRIBUTE</i>	<i>Comparisons and p-values</i>		<i>Afro-Caribe</i>	<i>Indio</i>	<i>Mestizo</i>
	<i>Years as Fisher</i>	<i>Afro-Caribe</i>	----	.600	.406
		<i>Indio</i>	.600	----	.773
		<i>Mestizo</i>	.406	.773	----
	<i>Length of Membership</i>	<i>Afro-Caribe</i>	----	.400	.236
		<i>Indio</i>	.400	----	.800
		<i>Mestizo</i>	.236	.800	----
	<i>Boat Ownership</i>	<i>Afro-Caribe</i>	----	.600	.689
		<i>Indio</i>	.600	----	.576
		<i>Mestizo</i>	.689	.576	----
	<i>Program Participation</i>	<i>Afro-Caribe</i>	----	.600	.406
		<i>Indio</i>	.600	----	.773
		<i>Mestizo</i>	.406	.773	----
	<i>Fishing Income</i>	<i>Afro-Caribe</i>	----	.600	.175
		<i>Indio</i>	.600	----	.576
		<i>Mestizo</i>	.175	.576	----

Table 14. Sample Catch Data. UPESABO supplied 18 months of landings information in the form of monthly records.

April 2003														
	Pargo	Seda	Bonito	Macarela	Salmon	Yellowtail	Mero	Jurel	Pati	Pargo	Revoltura	Filete	Trips	Total Vol
Ayarza Ricardo								57.00	13.00				1	70.00 0.00
Cubilla Rafael	82.00			1199.00	9.00			45.00		130.00	8.00		18	1473.00
Chiu Patricio	26.00							13.00		125.00			1	164.00 0.00
Machaseck Javier				178.00				105.00	9.00		25.00		3	317.00
Nunez Eligio		2.00		871.00				677.00	63.50	101.00	93.00	52.00	23	1859.50
Prescott Corneli	429.00				101.00		50.00	129.00		34.00	8.00		5	751.00
Quiroz Aquiles				243.00				148.00		9.00	4.00	10.00	8	414.00
Rule William				442.00				87.00	21.00			2.00	8	552.00
Smith Clarens				63.00				283.00	233.00	146.00	401.00		7	1126.00 0.00
Valencia Aristide	230.00			168.00		21.00		41.00		19.00			4	479.00
Valencia Marcia	43.00			135.00				83.00					4	261.00
Santamaria Osia	83.00			56.00		23.00		297.00	102.00	173.00	301.00		7	1035.00
Machuca Justo				20.00				33.00		5.00	7.00		2	65.00
Jurado Manuel				10.00				87.00		37.00	27.00		1	161.00
Jurado Benito				54.00				15.00		17.00	2.00		3	88.00
Ortiz Humberto				68.00				19.00		19.00	6.00		1	112.00
Production (lbs)	893.00	2.00		3507.00	110.00	44.00	50.00	2119.00	441.50	815.00	882.00	64.00	96	8927.50
Price (\$)	0.95	0.20		0.60	0.50	0.75	0.95	0.50	0.75	0.75	0.30	0.50		

Table 15. Calculated Weights of Landings Sampled at UPESABO Plant. <i>SL</i> : standard length; <i>TL</i> : tail length; <i>E</i> : expected weight ¹ . Formulas and variables taken from FishBase (Froese and Pauly 2005).									
Pomacanthus a=0.0345, b=2.968				Caranx a=.0463, b= 2.78			Lutjanus a=.0075, b= 3.16		
<i>SL</i> (cm)	<i>TL</i> (cm)- <i>SL</i> *1.165	<i>E</i> (g)= <i>a</i> * <i>TL</i> ^b	<i>SL</i> (cm)	<i>TL</i> (cm)- <i>SL</i> *1.299	<i>E</i> (g)= <i>a</i> * <i>SL</i> ^b	<i>SL</i> (cm)	<i>TL</i> (cm)- <i>SL</i> *1.184	<i>E</i> (g)= <i>a</i> * <i>SL</i> ^b	
17.5	20.4	265.5	22.0	28.6	249.8	15.9	18.8	46.9	
18.5	21.6	313.1	22.1	28.7	252.9	18.2	21.6	71.9	
18.8	21.9	328.4	22.4	29.1	262.6	19.1	22.6	83.8	
18.9	22.0	333.6	22.5	29.2	265.9	19.7	23.3	92.4	
19.1	22.3	344.2	22.6	29.4	269.2	19.9	23.6	95.4	
19.2	22.4	349.6	22.9	29.7	279.2	20.2	23.9	100.0	
19.2	22.4	349.6	23.0	29.9	282.6	20.3	24.0	101.6	
19.2	22.4	349.6	23.2	30.1	289.5	20.5	24.3	104.8	
20.2	23.5	406.4	23.2	30.1	289.5	20.5	24.3	104.8	
20.4	23.8	418.5	23.5	30.5	300.0	21.0	24.9	113.1	
20.5	23.9	424.6	23.5	30.5	300.0	21.0	24.9	113.1	
20.7	24.1	437.0	23.5	30.5	300.0	21.1	25.0	114.8	
20.9	24.3	449.6	24.1	31.3	321.8	21.7	25.7	125.4	
21.0	24.5	456.1	24.2	31.4	325.5	22.5	26.6	140.6	
21.5	25.0	489.0	24.7	32.1	344.6	22.5	26.6	140.6	
22.0	25.6	523.6	24.8	32.2	348.5	22.7	26.9	144.6	
23.4	27.3	628.8	24.9	32.3	352.4	23.0	27.2	150.7	

Table 16- Continued.											
Pomacanthus a=0.0345, b=2.968				Caranx a=.0463, b= 2.78				Lutjanus a=.0075, b= 3.16			
SL (cm)	TL(cm)= SL*1.165	E(g)= a*TL ^b	SL (cm)	TL(cm)= SL*1.299	E(g)= a*SL ^b	SL (cm)	TL(cm)= SL*1.184	E(g)= a*SL ^b	SL (cm)	TL(cm)= SL*1.184	E(g)= a*SL ^b
24.4	28.4	711.9	25.0	32.5	356.3	23.2	27.5	154.9			
25.4	29.6	802.1	26.1	33.9	401.6	23.8	28.2	167.9			
25.8	30.1	840.2	26.2	34.0	405.9	25.2	29.8	201.1			
26.0	30.3	859.6	26.5	34.4	419.0	--	--	--			
28.0	32.6	1071.1	27.6	35.9	469.1	--	--	--			
29.3	34.1	1225.6	28.0	36.4	488.3	--	--	--			
30.1	35.1	1327.6	28.5	37.0	512.9	--	--	--			
37.5	43.7	2549.2	29.5	38.3	564.5	--	--	--			

[†] One pound is approximately 454 grams.

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APPENDICES

APPENDIX 1Survey Questionnaire

Le agradezco para su participación en este estudio. Hay doce preguntas, seis por lado. Por favor, conteste cada pregunta por haciendo un equis (X) en el cuadro cerca de su respuesta.

1. Cuantos años tiene usted?

- ☐ entre 15 a 20 años
- ☐ entre 21 a 30 años
- ☐ entre 31 a 40 años

- ☐ entre 41 a 50 años
- ☐ entre 51 a 60 años
- ☐ mas de 60 años

2. ¿Vive en Almirante usted?

- ☐ Sí
- ☐ No

Si usted contestó "No", escriba el nombre de su pueblo en la línea de abajo:

3. ¿Que nivel de educación cumplió usted?

- ☐ Primaria (menos que el sexto grado)
- ☐ Primaria (por el sexto grado)

- ☐ Secundaria (primero a tercero años)
- ☐ Secundaria (cuarto a sexto años)

4. ¿Que lengua usa usted en su mayor parte?

- ☐ Español
- ☐ Inglés

- ☐ Ngobe (Guaymi)
- ☐ Otro

5. ¿De que religión es usted?

- ☐ Adventista
- ☐ Baptista
- ☐ Católico

- ☐ Evangélico
- ☐ Metodista
- ☐ Otro

6. ¿Con cual grupo cultural se identifica usted?

- ☐ Mestizo
- ☐ Afrocaribe

- ☐ Indio
- ☐ Otro

7. ¿Hace cuanto tiempo que usted es pescador?

☐ menos que 1 año	☐ 11 años a 20 años
☐ 1 año a 5 años	☐ mas que 20 años
☐ 6 años a 10 años	

8. ¿Hace cuanto tiempo que usted es un socio de la Unión de Pescadores Artesanales?

☐ menos que 1 año	☐ 2 años
☐ mas que 1 año pero
menos que 2 años	☐ independiente

9. ¿Tiene un bote usted?

☐ Sí	☐ No

10. ¿Compró su bote usted del programa de la Unión de Pescadores Artesanales?

☐ Sí	☐ No

11. ¿En la semana, cuantas veces sale de pesca usted?

☐ 1 vez	☐ 6-7 veces
☐ 2-3 veces	☐ mas que 7 veces
☐ 4-5 veces	

12. ¿En un mes, cuanto es su ingreso en la pesca?

☐ entre 0 a 100B	☐ entre 301-400B
☐ entre 101 a 200B	☐ entre 401-500B
☐ entre 201-300B	☐ mas que 500B

APPENDIX 2

Articles of Incorporation, March 12, 2004

PAPEL NOTARIAL	
NOTARIA DEL CIRCUITO DE BOCAS DEL TORO	
ESCRITURA PUBLICA NUMERO CIENTO CINCUENTA Y SEIS (156)-----	
por la cual la señora MARTA MACHAZECK DE SERRUTT, Protocoliza Documento de Personeria	
aridica-----	
ocas del Toro, doce (12) de marzo del año dos mil cuatro (2004) -----	
n la Ciudad de Bocas del Toro (Cabecera) del Circuito Notarial de la Provincia del mismo nombre en la	
epublica de Panamá, hoy, doce (12) de Marzo del año dos mil cuatro (2004), ante mí, el Licenciado	
elipe Arturo Edmonds Rivera, Notario de Bocas del Toro, con cédula número 8-188-614 (ocho guión	
no ocho ocho guión seis uno cuatro), compareció personalmente la señora MARTA MACHAZECK DE	
SERRUTT, mujer, panameña, mayor de edad, casada, portadora de la cédula de identidad personal núm	
o 1-18-2575 (uno guión uno ocho guión dos cinco siete cinco), con residencia en el Corregimiento de	
Almirante, persona a quien conozco y me solicitó que elevara a Escritura Pública la presente Protocoliza	
ción, que a continuación transcribo: -- ESTATUTOS: Nombre: Unión de Pescadores Artesanales Boca	
oreños (U.P.E.S.A.B.O.). ARTICULO 1. Esta organización se denominará (U.P.E.S.A.B.O.). Consiste	
n una organización sin ánimo de lucro y de responsabilidad limitada. ARTICULO 2: La Unión de Pes-	
cadores Artesanales Bocatoreños tendrá su sede en el Corregimiento de Almirante, Barrio Francés, Pro-	
vincia de Bocas del Toro, en la Casa del Pescador Bocatoreño y celebrará sus reuniones en este mismo	
Corregimiento. ARTICULO 3: El periodo administrativo de la organización será de cuatro (4) años. Si	
algún directivo deja vacante su cargo por cualquier causa se convocará a la Asamblea para elegir al ----	
miembro que lo reemplazará. ARTICULO 4: La Organización tiene los siguientes objetivos: A. Desarro	
lar la pesca artesanal. B. Fomentar más fuentes de empleo. C. Proteger la ecología. D. Mejorar la cali--	
dad e vida de los pescadores miembros. ARTICULO 5: Para cumplir con sus objetivos la organización	
realizará las siguientes actividades: A. Se dictarán Seminarios de Seguridad y Mantenimiento, relacione	
humanas, motivación y autoestima a los miembros en la provincia de Bocas del Toro. B. Gestionar y	
administrar financiamiento nacional e internacional para fomentar el desarrollo de la pesca artesanal en	
n nuestra provincia (Bocas del Toro). C. Promover charlas, cursos y seminarios a los miembros desem	
pleados de nuestra provincia a fin de capacitarlos para que se integren a la organización como pescador	
o vendedores de pescado. D. Financiar equipos e implementos relacionados con la pesca y distribuir pro	
ductos marinos dentro de la provincia de Bocas del Toro. E. Aportar a la nutrición de la comunidad de	
Almirante, Prov. de Bocas del Toro, apoyando al comedor escolar y al asilo de ancianos. CAPITULO II	
DE LOS MIEMBROS: ARTICULO 1. Son miembros activos de la organización los que hayan sido ad-	

1	mitidos de acuerdo a los reglamentos de la organización; y participen activamente en reuniones, activi
2	des, seminarios, otros. <u>ARTICULO 2:</u> Son miembros pasivos los que han servido de apoyo a los pesca p
3	dores <u>sin serlo</u> y que no participan activamente en las actividades que se realicen dentro de la organiza
4	ción. <u>ARTICULO 3:</u> Para pertenecer a la organización el interesado debe reunir los siguientes requisitos
5	A. Gozar de reconocida honradez y prestigio. B. Conocer y obligarse a cumplir con los objetivos, y co
6	diciones expuestas en este estatuto. C. La solicitud de afiliación debe ser aprobada por la Junta Directiv
7	<u>CAPITULO III: Derechos y Deberes de los Miembros. ARTICULO 1:</u> Todo miembro activo tendrá los
8	siguientes derechos: A. Que se le <u>conceda carné</u> de identificación correspondiente como miembro de la
9	Organización. B. Tener voz y voto en las deliberaciones de la Asamblea General y voz en las reuniones
10	de la Junta Directiva. C. Elegir y ser elegido para <u>desempeñar</u> los puestos directivos de la organización.
11	D. Participar en todos los eventos que programe la organización. E. <u>Velar</u> por que se cumplan los Estat
12	tos, Reglamentos y Acuerdos de la organización. F. Cumplir con los Estatutos, Reglamentos y Acuerdos
13	de la organización. G. <u>Asistir</u> con puntualidad a las reuniones ordinarias y extraordinarias. <u>ARTICULO</u>
14	<u>2:</u> Son deberes de los miembros activos: A. Pagar puntualmente las cuotas acordadas. B. Aceptar y <u>de-</u>
15	<u>desempeñar con esmero los cargos</u> que le hayan sido asignados por la Junta Directiva o Asamblea General
16	E. Ser activo en los programas de la organización, labrando <u>con esmero</u> por la realización de sus objeti-
17	vos. <u>De las controversias. ARTICULO 3:</u> Queda estrictamente prohibido, en las reuniones de la Organi
18	zación <u>discusiones sobre los temas Políticos, partidos y religiosos. De las cuotas. ARTICULO 4:</u> Los -
19	miembros de la Organización pagarán la siguiente cuota: A. <u>Por concepto de inscripción o admisión B/</u>
20	<u>35.00. B. Por concepto de pago mensual B/ 1.00. C. Es obligación de cada miembro pagar dentro de los</u>
21	<u>30 días de cada mes. D. Para cambiar la cuota mensual o de inscripción es necesaria una resolución de la</u>
22	<u>Asamblea General. ARTICULO 5:</u> La organización podrá expulsar a sus miembros por los siguientes m
23	tivos: A. Provocar escándalo infundado en perjuicio de la Organización o de alguno de los miembro de
24	la Junta Directiva o de alguna comisión especial de la Organización, en relación con el <u>desempeño de</u>
25	su cargo. B. <u>Pro ejercicio de comercio ilícito</u> o por la comisión de cualquier delito comprobado. C. Por
26	<u>morosidad injustificada, por mas de seis meses, de las cuotas acordadas. D. Inasistencia injustificada, de</u>
27	<u>los miembros activos, por una total de seis (6) reuniones. CAPITULO IV: Asamblea General. ARTICU</u>
28	<u>LO 1:</u> La Asamblea General es la Autoridad Máxima de la Organización y se reunirá en el Corregimiento
29	de Almirante, provincia de Bocas del Toro, 1 vez cada 3 meses, según lo determine la Junta Directiva,
30	la cual <u>comunicará</u> la fecha y hora de dicha reunión, a <u>más tardar durante la última Asamblea General.</u>

REPUBLICA DE PANAMÁ PAPEL NOTARIAL	
NOTARIA DEL CIRCUITO DE BOCAS DEL TORO	
activa	ARTICULO 2: Habrá Quórum en la Asamblea General cuando la mitad más uno de sus miembros estén
pesca	presentes, de no haber quórum deberá citarse a otra reunión o Asamblea General dentro de los próximos
ganiza	veinte (20) días. De no haber quórum en la segunda citación se realizará la asamblea con el número de
quisie	miembros activos presentes y las decisiones tomadas será válidas. De la Junta Directiva: ARTICULO 1:
y co	La Junta Directiva de la organización está integrada por. Un Presidente, un Vicepresidente, un Secretario
rectiv	un Sub-Secretario, un Tesorero, un Sub-Tesorero, un Fiscal y Tres Vocales. ARTICULO 2: La Junta Di
los	rectiva celebrará sus sesiones ordinarias todas las semanas y las extraordinarias cuando el Presidente o
de la	la mayoría de sus miembros lo estimen conveniente. ARTICULO 3: Constituirá quórum en las reuniones
nes	de Junta Directiva la presencia de seis (6) de sus miembros. ARTICULO 4: Todos los miembros de la
ón.	Organización podrán asistir a las reuniones de la Junta Directiva y participar en estas sin derecho a voto
rat	ARTICULO 5: Las funciones de la Junta Directiva son: A. Ejecutar y dirigir las actividades y objetivos
dos	de la Organización. B. Cumplir y hacer cumplir los estatutos así como los acuerdos y resoluciones de la
Q	Asamblea General. C. Representar y ser el Organismo ejecutivo de la organización. D. Autorizar el pa-
3	go de cuentas o gastos en que incurra la organización, según el presupuesto aprobado. E. Nombrar las
4	comisiones de trabajo y hacerlas cumplir. F. Rendir informes anuales a todos los miembros al finalizar
5	el periodo fiscal. G. Convocar a las reuniones de la Asamblea General. ARTICULO 6: Son funciones
6	del Presidente: A. Representar a la Organización. B. Presidir las Asambleas Generales y las reuniones
7	de la Junta Directiva. C. Informar a la Junta Directiva de todos los informes que este haya recibido y de
8	su gestión como presidente. D. Firmar con el Tesorero y el Secretario los cheques y similares para efec-
9	tuar los pagos a las cuentas de la organización. E. Firmar con el Secretario las actas de las sesiones de
20	la organización. F. Firmar la correspondencia de la organización. G. Asistir a las reuniones como miem-
21	bros en oficio. ARTICULO 7: Son funciones del Vice-Presidente: A. Representar al Presidente en sus
22	ausencias. B. Presidir la comisión educativa. C. Las que le asigne la presidencia. ARTICULO 8: Son
23	funciones del Secretario: A. Ocupar la presidencia en ausencia del Presidente y el Vice-Presidente. B.
24	Presidir la Comisión de Relaciones Públicas. C. Copiar en los libros las notas de las sesiones y firmarlas
25	con el presidente. D. Llevar al Día las correspondencias y llevar un archivo de la organización. E. Citar
26	los miembros de la organización a las reuniones. F. Firmar con el Presidente y el Tesorero los cheques
27	y similares para efectuar los pagos a las cuentas de la organización. ARTICULO 9: Son funciones del
28	Sub-Secretario: A. Reemplazar al Secretario en su ausencia temporal o definitiva, sobre la última, miem-
29	tras no haya sido elegido el nuevo secretario. B. Las que el presidente le asigne. ARTICULO 10: Son
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1	funciones del Tesorero: A. Llevar un control de los fondos de la organización. B. Presidir la Comisión
2	de Finanzas. C. Efectuar los pagos que debe hacer la organización. D. Llevar los registros de los miembros
3	de la contabilidad y del inventario de los bienes. E. Firmar con el Presidente y el Secretario las
4	cuentas y los cheques de cancelación de las mismas; y presentar a la Junta Directiva el estado financiero
5	de la organización. F. Dar informe de actividades financieras, mensualmente a la Asamblea General. <u>ARTICULO 11:</u> Son funciones del Sub-Tesorero: A. Reemplazar al Tesorero en su ausencia temporal o
6	definitiva, sobre la última, mientras no haya sido elegido el nuevo tesorero. B. Las que la presidencia le
7	asigne. <u>ARTICULO 12:</u> Son funciones del Fiscal: A. Hacer cumplir los Estatutos, Reglamentos y Acuerdos. B. Presidir la Comisión de Disciplina, Honor y Afiliación. <u>ARTICULO 13:</u> Son funciones de los
8	Vocales: A. Desempeñar las funciones que le señale la Junta Directiva o el Presidente. <u>De las Comisiones:</u> <u>ARTICULO 14:</u> Habrán dos tipos de Comisiones: A. Las permanentes. B. Las especiales. * Las
9	permanentes son nombradas por la Junta Directiva. * Las especiales son nombradas por el presidente
10	con consentimiento de la Junta Directiva. C. Comisiones permanentes. A. Finanzas. B. Las especiales.
11	C. Educativa. D. Comisión de Honor, Disciplina y Afiliación. <u>ARTICULO 15:</u> El presidente nombrará
12	las comisiones especiales y sus funciones cesarán en el momento que termine su actividad. * Las atribuciones de las comisiones permanentes y especiales serán determinadas en el Reglamento Interno de la
13	Organización, dictado por la Junta Directiva. <u>Las Sesiones:</u> <u>ARTICULO 16:</u> El orden a tratar en las reuniones será el siguiente: A. Abrir la sesión. B. Pasar lista y verificar el quórum. C. Aprobación de la --
14	Agenda. D. Lectura y consideración del Acta anterior y correspondencia. E. Informe de comisiones. F.
15	Asuntos de tesorería. G. Asuntos varios. H. Cortesía de la sala. I. Cierre de la sesión. <u>ARTICULO 17:</u>
16	para ser postulado como candidato a la presidencia o ala junta directiva deberá ser un miembro que haya
17	pertenecido a la organización por un periodo no menor de un año (1). <u>Patrimonio:</u> <u>ARTICULO 18:</u> El
18	Patrimonio de la organización lo constituirá la cuota de admisión, las ordinarias, los ingresos provenientes de actividades así como las contribuciones, donaciones, intereses. La organización puede ejecutar toda
19	clase de actos permitido por la Ley. Ningún miembro tendrá derecho de propiedad sobre los bienes, estos son solo de uso común. <u>De la reforma de los Estatutos:</u> <u>ARTICULO 19:</u> Los Estatutos de la organización sólo podrán ser reformados con el voto de las dos terceras partes de la totalidad de sus miembros
20	en caso de reforma, estas deben presentarse ante el Ministerio de Gobierno y Justicia para que este los apruebe. <u>Disolución:</u> <u>ARTICULO 20:</u> La organización se disolverá por mutuo acuerdo de la Asamblea
21	General. <u>ARTICULO 21:</u> Acordada la disolución la Asamblea General designará tres liquidadores que
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REPUBLICA DE PANAMA PAPEL NOTARIAL					
NOTARIA DEL CIRCUITO DE BOCAS DEL TORO					
1	se ocuparán de inventariar el activo y pagar el pasivo. La Asamblea General decidirá como se invertirá				
2	el saldo restante, lo cual siempre será en beneficio de la comunidad y por medio de otra organización sin				
3	ánimo de lucro. (fdo) Marcial Valencia, Presidente. (fdo) Marta Machazeck, Coordinadora. Es fiel copia				
4	de su Secretaria. (fdo) Fediciana D. de Garay, 1-34-363. Es fiel copia de su original, (fdo) Dirección de				
5	Asesoría Legal. <u>ACTA DE CONSTITUCIÓN</u> , El día 29 de Enero del 2003 se reunieron en el corregi-				
6	miento de Almirante un grupo de pescadores artesanales de la Provincia de Bocas el Toro, dicha reunión				
7	Tuvo como objetivo la formación de un grupo organizado de pescadores artesanales de la provincia de				
8	Bocas del Toro. Dicha organización se denominará Unión de Pescadores Artesanales Bocatoreños. En				
9	dicha reunión quedaron como directivos los siguientes asociados: Presidente: Marcial Valencia, 1-21-22				
10	27. Vicepresidente: Patricio Chiu, 1-10-370. Secretaria: Fediciana de Garay, 1-34-363. Sub-Secretario:				
11	Eligio Núñez, 4-192-936. Tesorera: Marta Machazeck, 1-18-2575. Sub-Tesorero: Cornelio Prescott, 1-				
12	33-519. Fiscal: Javier Machazeck, 1-26-1360. Vocal N° 1: Ignacio Morales, IPI-13-690. Vocal N° 2:				
13	Wilfredo Rule, 1-22-1311. Vocal N° 3: Aquiles Quiroz, 1-19-1763. La suscrita secretaria de la sociedad				
14	certifica por este medio que la presente acta es fiel copia de su original. (fdo) Marcial Valencia, Presiden				
15	te. (fdo) Marta Machazeck, Coordinadora-Tesorera. (fdo) Fediciana D. de Garay, 1-34-363. Es fiel copia				
16	de su original, (fdo) Dirección de Asesoría Legal. <u>LISTA DE LA JUNTA DIRECTIVA</u> : Presidente: ---				
17	Marcial Valencia, 1-21-2227, (fdo). Vicepresidente: Patricio Chiu, 1-10-370, (fdo). Secretaria: Fediciana				
18	de Garay, 1-34-363, (fdo). Sub-Secretario: Eligio Núñez, 4-192-936, (fdo). Tesorera: Marta Machazeck,				
19	1-18-2575, (fdo). Sub-Tesorero: Cornelio Prescott, 1-33-519, (fdo). Fiscal: Javier Machazeck, 1-26-1360				
20	(fdo). Vocal N° 1: Ignacio Morales, IPI-13-690, (fdo). Vocal N° 2: Wilfredo Rule, 1-22-1311, (fdo). ---				
21	Vocal N° 3: Aquiles Quiroz, 1-19-1763, (fdo). Es fiel copia de su original, (fdo) Dirección de Asesoría				
22	Legal. <u>Acta de Aprobación de los Estatutos de la Unión de Pescadores Artesanales Bocatoreños</u> . Por me				
23	dio de la siguientes resolución la Junta Directiva de la Unión de Pescadores Artesanales Bocatoreños en				
24	ejercicio de sus facultades aprueba la veracidad y legalidad de nuestros estatutos. La misma ha sido acep				
25	tada unánimemente por parte de los asociados que conforman esta organización. Dado en Almirante a				
26	los 29 días del mes de Febrero del 2003; anexo a la firma de los asociados de la Junta Directiva. Presi-				
27	te Marcial Valencia, 1-21-2227, (fdo). Vicepresidente: Patricio Chiu, 1-10-370, (fdo). Secretaria: Fedi-				
28	ciana de Garay, 1-34-363, (fdo). Sub-Secretario: Eligio Núñez, 4-192-936, (fdo). Tesorera: Marta Macha				
29	zeck 1-18-2575, (fdo). Sub-Tesorero: Cornelio Prescott, 1-33-519, (fdo). Fiscal: Javier Machazeck, 1-26				
30	1360(fdo). Vocal N° 1: Ignacio Morales, IPI-13-690, (fdo). Vocal N° 2: Wilfredo Rule, 1-22-1311, (fdo)				

1	Vocal N° 3: Aquiles Quiroz, 1-19-1763, (fdo). -- La suscrita secretaria de la sociedad certifica por este
2	medio que la presente acta es fiel copia de su original. (fdo) Marcial Valencia, Presidente. (fdo) Marta
3	Machazeck, Coordinadora-Tesorera. (fdo) Fediciana D. de Garay, 1-34-363. Es fiel copia de su original,
4	(fdo) Dirección de Asesoría Legal. <u>Unión de Pescadores Artesanales Bocatoreños. Plan de Trabajo. I.</u>
5	<u>Objetivos:</u> • Promover la pesca artesanal. • Generar fuentes de ingresos económicos. • Aliviar la pobreza
6	extrema y la desnutrición de nuestra comunidad. • Conservar nuestra ecología y recursos marinos. <u>II.</u>
7	<u>Metas:</u> 1. Adquisición permanente del centro de acopio en el corregimiento de Almirante. 2. De reali-
8	zarse dicho proyecto se mejorará el nivel socio económico de las personas que se benefician con la par-
9	ticipación, mediante la generación de puestos de trabajo alejando el espectro de la extrema pobreza que
10	conduce a graves problemas sociales como; la desnutrición, delincuencia, prostitución y drogadicción.
11	<u>III. Estrategias:</u> 1. La asociación implementará un plan de capacitación y desarrollo organizacional con
12	la finalidad de elevar el nivel socio económico de las comunidades pesqueras en la Provincia de B. Del
13	Toro. 2. Incentivar el procesamiento de productos pesqueros con la participación de la mujer. 3. Brindar
14	a las mujeres de nuestra provincia (madres solteras otra alternativa de subsistencia). 4. Capacitación a
15	los pescadores para explotar nuestros recursos marinos respetando y protegiendo nuestro ecosistema. 5.
16	Evitar el desarrollo de pesca industrial en nuestros mares. IV. <u>Instituciones Participantes:</u> • Misión Téc-
17	nica de la República de Taiwán. V. <u>Descripción del Programa:</u> La pesca artesanal: la asociación la con-
18	forman 25 embarcaciones involucrado al menos 75 pescadores. Estos se dedican principalmente a la cap-
19	tura de peces. Su rendimiento no se da al máximo ya que no se cuenta con los recursos necesarios como:
20	buenas embarcaciones acondicionadas según las necesidades de nuestro mar y las distancias de nuestras
21	áreas de pesca. También se presenta cierta dificultad de almacenamiento en el centro de acopio como
22	falta de una máquina de hielo de mayor capacidad para el almacenamiento y abastecimiento de las em-
23	barcaciones pesqueras. La ausencia de apoyo financiero formal por parte de las instituciones y autorida-
24	des en el programa de desarrollo pesquero nos lleva a solicitar apoyo a organizaciones internacionales.
25	es importante señalar que el personal involucrado en la pesca carece de una adecuada capacitación que
26	les permita incursionar en mejores técnicas de pesca y alternativas actuales que le permitan mejorar la
27	calidad y cantidad de diferentes especies a las actualmente capturadas, como también capacitación de la
28	extracción de los recursos marinos respetando la sostenibilidad del mismo. VI. <u>Cronograma de trabajo:</u>
29	<u>Primer Año:</u> 1. Se realizará capacitación y orientación para el mejor aprovechamiento de recursos mari-
30	nos. 2. Capacitación en servicio para la captación de la información que se produzca de los actores admi-

REPUBLICA DE PANAMA PAPEL NOTARIAL

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1	nistrativos y de la producción de los socios, creando de esta forma u sistema estadístico. 3. Se llevará
2	acabo capacitación en artes de pescas alternos a los actuales, haciendo énfasis en los que utilizan anzue
3	los como son la línea de mano vertical y el palangre horizontal dirigidas a la captura de especies de alto
4	valor económico como el pargo, la cherna, el dorado y otros. 4. Se capacitará a los socios pescadores
5	en los principios básicos de la navegación costera como es la utilización de las cartas náuticas y traspasar
6	conocimientos sobre posición geográfica, rumbos, distancia, velocidad y tiempo; con la finalidad de
7	que los participantes puedan planificar un viaje de pesca y haber más segura su actividad en el mar. 5. -
8	Capacitación para la aplicación de aparatos como el GPS, sonar, brújula y otros equipos que ayuden al
9	pescador a localizar y marcar la áreas de pesca. 6. Se brindará capacitación en el manejo y procesamien
10	to de productos pesqueros, dirigidos principalmente a los socios para que adquieran habilidades en có-
11	mo manipular los productos capturados tanto al bordo de las embarcaciones, como en la planta o centro
12	de acopio. Así mismo obtendrán conocimientos en la transformación de los productos pesqueros en ---
13	Hamburguesas, delitos de pescado, nuggets, albóndigas y otros; para hacerlo más apetitosos y con esto
14	contribuir al incremento del consumo de pescado en nuestra provincia y lo cual fomentará nuevas fuen-
15	tes de empleo. 7. Se capacitarán a los socios y en o referente a la organización y administración de la
16	asociación pesquera. 8. Se iniciaran los procesos de adjudicación de la ayuda que proviene de los orga-
17	nismos internacionales que apoya a la asociación. <u>Segundo Año:</u> 1. Se reforzarán los conocimientos sobr
18	el sistema estadístico de pesca. 2. Se reforzarán y se aplicarán nuevos conocimientos en las artes de pes
19	ca. 3. Se hará énfasis en la administración y conceptos organizativos de la asociación. 4. Se revisarán y
20	mejorarán según lo establezcan las últimas tecnologías los conceptos y procedimientos sobre la manipu
21	lación y procesamiento de productos pesqueros. 5. Se continuará con la utilización de artes de pesca al-
22	ternos, principalmente los basados en el uso de anzuelos. 6. Se establecerán los servicios básicos para
23	los pescadores a través de la asociación como el facilitar el hilo o cuerda, combustible y lubricantes,
24	carnadas, artes de pesca y otros a los pescadores más eficientes y economizar su labor en el mar. 7. Se
25	continuará con la ayuda que proviene de los órganos internacionales que apoyan a la asociación. <u>Tercer</u>
26	<u>Año:</u> 1. Se continuará con la aplicación del sistema estadístico y para su mejor ejecución se realizarán
27	las capacitaciones necesarias y específicas. 2. Se continuarán y profundizarán las capacitaciones sobre
28	artes y métodos de pesca con la finalidad de mantener actualizados a los pescadores de la asociación en
29	estos aspectos que son fundamentos para mejorar la producción principal en lo relacionado a la calidad
30	y cantidad. 3. Se actualizará a las mujeres d la asociación en la metodología de procesamiento y manipu

1	lación de productos pesqueros. 4. Se hará un uso frecuente de las artes de pesca continua tal como se es-
2	tableció en la capacitación recibida. 5. Se continuará brindando, por parte de la asociación los servicios
3	básicos para el buen uso y funcionamiento de las actividades extractivas de los pescadores asociados. 6.
4	Se continuará con capacitación para la actividad de extracción y aprovechamiento de nuestros recursos,
5	implementando la sostenibilidad y protección de nuestro ecosistema marino. <u>Cuarto Año:</u> 1. Se dotará a
6	los pescadores Asociados una planta o centro de acopio con todos los implementos y mobiliarios nece-
7	sarios para que tenga mayor capacidad de funcionamiento. 2. Brindar a manera de créditos artículos e
8	implementos de pesca a los pescadores socio, para hacer más efectiva su producción. 3. Mejorar las em-
9	barcaciones de los pescadores, para que sus pescas sean más productivas y mejorar aprovechando su es-
10	fuerzo. 4. Diversificar la actividad productiva para que haya mayor cobertura de beneficios a los socios.
11	<u>Quinto Año:</u> 1. Continuar con las capacitaciones en el sistema estadístico, artes y métodos de pesca, na-
12	vegación costera, administración de la asociación, protección del ecosistema, legislación pesquera y ---
13	otros. <u>Actividades:</u> 1. Reunir periódicamente a los pescadores para capacitación y desarrollo organiza-
14	cional. 2. Coordinar con las diferentes instituciones gubernamentales y no gubernamentales para solu-
15	cionar los inconvenientes que se presenten. 3. Gestionar la consecución de los mejores precios para los
16	productos capturados para los pescadores asociados. 4. Coordinar con las instituciones gubernamentales
17	el mejoramiento de los pescadores dentro de la comunidad bocatoreña. <u>Coordinadora:</u> Marta Machazack
18	Teléfono 758-0434, Almirante, Bocas del Toro. Administrador: Cornelio Prescott, celular. 623-1583, --
19	Almirante, Bocas del Toro. REPUBLICA DE PANAMA. MINISTERIO DE GOBIERNO Y JUSTICIA
20	Resuelto N° 082-PJ-42. panamá, 5 de marzo de 2004. PERSONAERÍA JURÍDICA. Mediante apodera
21	do legal, el señor MARCIAL VALENCIA, varón, panameño, mayor de edad, con cédula de identidad
22	personal N° 1-21-2227, en su calidad de Presidente y Representante Legal de la entidad denominada
23	"UNION DE PESCADORES ARTESANALES BOCATOREÑOS", solicita al Ministerio de Gobierno
24	y Justicia que se le reconozca PERSONERÍA JURÍDICA. Con esta solicitud se acompaña los siguientes
25	documentos: 1. Acta de Fundación. 2. Acta de aprobación de Estatuto. 3. Estatuto Aprobado. 4. Lista
26	de los miembros de la Junta Directiva. 5. Plan de trabajo a realizar durante los primeros cinco (5) años.
27	del examen de la documentación presentada, ha quedado establecido que la entidad no persigue fines lu-
28	crativos y que sus objetivos, entre otros son: a) Desarrollar la pesca artesanal, b) Fomentar más fuentes
29	de empleos, c) Proteger la ecología; d) Mejorar la calidad de vida de los pescadores miembros. Como
30	estos fines no son contrarios a la Constitución Política de la República de Panamá, ni a las disposiciones

REPÚBLICA DE PANAMÁ PAPEL NOTARIAL
NOTARIA DEL CIRCUITO DE BOCAS DEL TORO	
1	Legales vigentes que rigen la materia, debe accederse a lo solicitado. Por lo tanto, quien suscribe, EL--
2	MINISTERIO DE GOBIERNO Y JUSTICIA, en uso de sus facultades legales. RESUELVE: APRO--
3	BAR el Estatuto de la entidad denominada "UNION DE PESCADORES ARTESANALES BOCATO--
4	REÑOS" y reconocerle PERSONERÍA JURÍDICA. Toda modificación posterior al Estatuto, debe ser--
5	sometida a la aprobación previa del Ministerio de Gobierno y Justicia. La PERSONERÍA JURÍDICA
6	concedida, no ampara actividades distintas a las indicadas en el Estatuto aprobado. Este resuelto surtirá
7	sus efectos legales, a partir de su inscripción en el Registro Público. FUNDAMENTO DE DERECHO:
8	Artículo N° 39 de la Constitución Política de la República de Panamá, artículo 64 y 69 del Código Civil
9	y el artículo 14 de la Ley N° 33 de 8 de noviembre de 1984, Decreto Ejecutivo N° 169 de 27 junio de --
10	2000, modificado por el Decreto Ejecutivo N° 3 de 24 de enero de 2001. NOTIFIQUESE Y CUMPLA
11	SE, (fdo) ARNULFO ESCALONA ÁVILA, Ministerio de Gobierno y Justicia. (fdo) ILKA VARELA
12	DE BARES, Viceministra de Gobierno y Justicia, Encargada. Es fiel copia de su original (fdo) Dirección
13	de Asesoría Legal. Sello redondo. Leída como fue la presente Escritura Pública a la compareciente en
14	presencia de los testigos instrumentales JUAN EULALIO PETERSON, varón, panameño, mayor de
15	edad, soltero, portador de la cédula de identidad personal número 8-120-384 (ocho guión uno dos cero
16	guión tres ocho cuatro), y MARIA PIERRE, mujer, panameña, mayor de edad, soltera, portadora de la
17	cédula de identidad personal número 1-9-521 (uno guión nueve guión cinco dos uno) ambos con residen
18	cia en esta ciudad personas a quienes conozco y se que son hábiles para el cargo la encontraron correcto
19	le impartieron su aprobación y se firma por todos ante mí el Notario que de todo doy fe. Esta Escritura
20	lleva en su orden el número CIENTO CINCUENTA Y SEIS (156)-----
21	LA COMPARECIENTE: (fdo) MARTA MACHAZECK. LOS TESTIGOS: (fdo) JUAN EULALIO PE
22	TERSON y (fdo) MARIA PIERRE. (fdo) LICENCIADO FELIPE ARTURO EDMONDS RIVERA,
23	NOTARIO PUBLICO. Concuerta esta primera copia a su original la cual expido, firmo y sello, hoy, do
24	ce (12) de marzo del año dos mil cuatro (2004)-----
25	LICENCIADO FELIPE ARTURO EDMONDS RIVERA
26	NOTARIO PUBLICO.
27
28	
29	

Ingresado en el Registro Público de Panamá	
1	Provincia: Panamá Fecha y Hora: 2004/03/19 11:34:07:6
2	Tomo: 2004 Asiento: 33430
3	Presentante: MARTA MACHAZECK DE SERRUTT Cédula: 4-18-2575
4	Liquidación No.: 8600816 Total Derechos: 70.00
5	Ingresado Por: DUDO
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11	mercantil 20456 C.
12	597304
13	Reservación jurídica
14	20.00
15	59.00
16	Panamá 29 de febrero 2004
17	Producta
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APPENDIX 3

UPESABO Bylaws

UNIÓN DE PESCADORES ARTESANALES BOCATOREÑOS

REGLAMENTO DE FUNCIONAMIENTO PARA BENEFICIARIOS DEL PROYECTO PANAMÁ – JAPÓN 2,000

Por medio de la cual se reglamentan y regulan las actividades y las relaciones entre los beneficiarios del Proyecto Panamá – Japón y la Unión de Pescadores Artesanales Bocatoreños. (U.PES.A.BO)

Título I

Capítulo I

Los Beneficiarios

Artículo 1: Son beneficiarios del Proyecto Panamá – Japón 2,000

aquellos que hayan sido seleccionado por la Junta Directiva, luego de cumplir con los siguientes requisitos:

- a- Residir en los corregimientos de Almirante y Bocas del Toro.
- b- Haber ejercido hasta la actualidad, la pesca artesanal como actividad económica principal para su subsistencia.

- c- Comprobar su condición de persona de bajos ingresos con actitud positiva hacia el trabajo, comportamiento honesto y responsable y con más de (2) dependientes directo.
- Verify his condition as a person of low income with a positive attitude toward working & honest disposition & responsible and with more than 2 direct dependents*

Artículo 2: Los beneficiarios seleccionados deberán asistir obligatoriamente a un ciclo de charla (3) que en materia de administración de recursos en la pequeña empresa se dictarán por especialistas contratados para tal fin, por la junta directiva.

The selected beneficiaries should attend obligatorily one round of talks in administrative matter of resources in small business given by contracted specialists. Such ends by the junta

Artículo 3: Las formas de organización que escojan los beneficiarios no los exime del cumplimiento del presente reglamento.

The organizational method that the beneficiaries choose do not exempt them from completion of the present regulations

Artículo 4: Cada beneficiario será legalmente responsable ante la Unión de Pescadores y la ley por administración, uso, mantenimiento, reparación y productividad del equipo, herramientas, materiales y recursos asignados para el desarrollo de la actividad de pesca artesanal.

Each beneficiary will be legally responsible before the Union of Fishermen & the law for admin. use, maintenance, repair & productivity of gear, tools, materials & assigned resource for the develop. of artisanal fishing activities

Artículo 5: El beneficiario del Proyecto Panamá - Japón 2,000 sólo podrá renunciar a su condición de beneficiario luego de haber devuelto en perfecto estado de operación y funcionamiento todo el equipo, herramientas, materiales, etc. que se le hubiese asignado.

only will revoke his beneficiary condition as soon as he returns in good operating condition all equipment, tools, materials etc. that were assigned to him

Artículo 6: El beneficiario no podrá vender, cambiar, ceder, permutar, alquilar, traspasar, negociar, empeñar, ni ejecutar ninguna acción de los bienes de trabajo para la pesca que la junta directiva le ha asignado.

TÍTULO II

CAPÍTULO II

Los Derechos y Deberes de los Beneficiarios

Artículo 7: Los derechos: El beneficiario tendrá los siguientes derechos:

- a- Asignación de un bote de pesca de 23 pies de fibra de vidrio.
- b- Asignación de un motor fuera de borda de 15 caballos de fuerza.
- c- A utilizar las facilidades de venta de la captura de peces diaria que le brinda la Unión de Pescadores.
- d- Participar en los eventos, reuniones, competencias, que realice la asociación.
- e- Escoger su forma de organización.

Artículo 8: Los beneficiarios recibirán cualquier otro beneficio adicional que durante la primera etapa genere el proyecto mismo o la Unión de Pescadores (UPESABO).

- a- Becas - grants
- b- Donaciones - donations
- c- Capacitaciones - training

Artículo 9: Los beneficiarios tendrán derechos a llevar para sus respectivas viviendas y puertos sus botes, equipo y materiales, con lo cual se facilita su custodia y disponibilidad a tiempo completo.

will have rights to keep at their respective dwellings and ports their boats, gear, material, with which they are furnished. All custody and availability in full time.

Artículo 10: Los siguientes deberes son responsabilidad del beneficiario:

Obligations are responsibility of the beneficiary.

- a- Mantener y reparar, por cuenta propia, el bote de pesca, el motor y todos los artículos asignados a él por el proyecto para el desarrollo de la actividad de la pesca artesanal.
 - b- También es responsabilidad de pagar la suma de B/. 3.50 (tres balboas con 50/100) de lunes a sábado, en concepto de aporte para el manejo de proyecto y contribución al fondo de extensión del proyecto que se administra para la asociación.
 - c- Asistir a la capacitación, reuniones y actividades que convoque la directiva.
- at his own cost, as contributor to the project management and contribution to the project's extension fund which is administered by the association. Attend training meetings activities called by the directive.*

- d- Cumplir fielmente con el reglamento de funcionamiento para beneficiarios del Proyecto Panamá - Japón 2000.
Comply faithfully with the functioning rule for beneficiaries
- e- Dedicarse a la actividad de la pesca artesanal diariamente.
Dedicate himself to daily fishing
- f- Custodiar y salvaguardar los bienes asignados y su integridad física.
Keep and safeguard the goods assigned and his physical well-being
- g- Respalda con su preferencia de compra las ofertas de proveduría de insumo y servicio para la pesca que brinda la asociación, siempre que los mismos estén en precios menores o iguales a los mercados locales.
Support through his buying preference the goods and service for fishing that the association offers, always that they will be at prices less or equal to local markets

Régimen Disciplinario

Artículo 11: Para la observación y cumplimiento de los deberes y derechos de las partes, se establece el siguiente régimen disciplinario:
In order to observe and comply with the obligations & rights of the parties, the following disciplinary rules are established

- a- Tanto los beneficiarios como los miembros de la asociación (UPESABO) deberán observar relaciones basadas en el respeto y la tolerancia mutua. La violación de esta norma, por parte del beneficiario dará lugar al llamamiento de atención oral y personal; por escrita si es reincidente y su expulsión del proyecto si vuelve a reincidir. En caso de la violación de
Both beneficiaries and members of the association (UPESABO) should observe relations based on mutual respect and tolerance. The violation of this norm, by the beneficiary will give rise to oral and personal attention; by written if it is recurrent and its expulsion from the project if it occurs again. In case of the violation of

capacitaciones y eventos relacionados con la
training and events related to
 actividad.

La violación de esta disposición dará lugar a la
violation of this order will occasion
 pérdida inmediata de la condición beneficiaria.
immediate loss of the beneficiary's status.

TÍTULO III

CAPÍTULO III

Artículo 12: Los botes y todo el equipo de pesca asignado a cada uno
 de los beneficiarios son patrimonio de la Unión de
 Pescadores Artesanales Bocatoreños hasta cubrir la
 cantidad de _____.

Artículo 13: Los ingresos producto de los aporte para manejo y fondo
Income produced from the contributions for management
 de extensión del proyecto constituyen patrimonio de la
and expansion of the project constitute property of
 Unión de Pescadores Artesanales Bocatoreños (UPESABO).

Artículo 14: La junta directiva es la única instancia facultada para la
 realización del contrato. *Sole authority for the*
fulfillment of the contract

Artículo 15: El beneficiario y la junta directiva acuerdan por voluntad
agree voluntarily
 propia que cumplido el pago de B/. _____
thereafter to complete the price
 ininterrumpidos de relación entre el beneficiario y la junta,
uninterrupted for relation between
 en observación y cumplimiento de los reglamentos y
in observation & completion of the regulations &
 acuerdo vigentes, el beneficiario seguirá usufructuando el
agreement in force, he will follow benefiting

bote, el motor y demás equipos asignados por la junta
directiva. ^{also}

Queda claro que la Unión de Pescadores será la única
entidad que ^{State clearly} garantiza al beneficiario ^{with the} las relaciones y
protección de ^{guarantees to receive the} los bienes asignados, sin embargo el
beneficiario seguirá ^{However} cumpliendo con las disposiciones
vigentes, con excepción que ^{will follow complete} ha de partir del artículo 13
pagará la suma de 0.50 centavos diarios siempre y cuando
el proyecto esté en funcionamiento. ^{in force with exception it has been split to}
^{could pay always}

Paragrafo: La junta directiva de UPESABO que una vez cumplido con
dicha cantidad estipulada en el artículo 13, se entregará un ^{once fully complied with}
documento que lo acredita como dueño absoluto y legal de ^{Said quantity stipulated in}
los bienes antes mencionados. ^{will deliver a}
^{it has accredited owner absolute & legally}
^{Goods before mention}

APPENDIX 4**UPESABO Work Plan****Unión de Pescadores Artesanales Bocatoreños****Plan de trabajo****I. Objetivos:**

- Promover la pesca artesanal.
- Generar fuentes de ingresos económicos.
- Aliviar la pobreza extrema y la desnutrición en nuestra comunidad.
- Conservar nuestra ecología y recursos marinos.

II. Metas:

1. Adquisición permanente del centro de acopio en el Corregimiento de Almirante.
2. De realizarse dicho proyecto se mejorará el nivel socio económico de las personas que se beneficien con la participación, mediante la generación de puestos de trabajo alejando el espectro de la extrema pobreza que conduce a graves problemas sociales como; la desnutrición, delincuencia, prostitución y drogadicción.

333.50

III. Estrategias

1. La asociación implementará un plan de capacitación y desarrollo organizacional con la finalidad de elevar el nivel socio económico de las comunidades pesqueras en la Provincia de B. Del Toro.
2. Incentivar el procesamiento de productos pesqueros con la participación de la mujer.

3. Brindar a las mujeres de nuestra provincia (madres solteras otra alternativa de subsistencia)
4. Capacitación a los pescadores para explotar nuestros recursos marinos respetando y protegiendo nuestro ecosistema.
5. Evitar el desarrollo de pesca industrial en nuestros mares.

IV. Instituciones Participantes.

- Misión Técnica de la República de Taiwán.

V. Descripción del programa.

La pesca artesanal en la asociación la conforman 25 embarcaciones involucrando al menos 75 pescadores. Estos se dedican principalmente a la captura de peces. Su rendimiento no se da al máximo ya que no se cuenta con los recursos necesarios como: buenas embarcaciones acondicionadas según las necesidades de nuestro mar y las distancias de nuestras áreas de pesca.

También se presenta cierta dificultad de almacenamiento en el centro de acopio como falta de una máquina de hielo de mayor capacidad para el almacenamiento y abastecimiento de las embarcaciones pesqueras.

La ausencia de apoyo financiero formal por parte de las instituciones y autoridades en el programa de desarrollo pesquero nos llevan a solicitar apoyo a organizaciones internacionales.

Es importante señalar que el personal involucrado a la pesca carece de una adecuada capacitación que les permita incursionar en mejores técnicas de pesca y alternativas actuales que le permitan mejorar la calidad y cantidad de diferente especie a las actualmente capturadas, como también capacitación de la extracción de los recursos marinos respetando la sostenibilidad del mismo.

VI. Cronograma de Trabajo**1er Año.**

1. Se realizará capacitación y orientación para el mejor aprovechamiento de los recursos marinos.
2. Capacitación en servicio para la captación de la información que se produzca de los actores administrativos y de la producción de los socios, creando de esta forma un sistema estadístico.
3. Se llevará acabo capacitación en artes de pescas alternos a los actuales, haciendo énfasis en los que utilizan anzuelos como son la línea de mano vertical y el palangre horizontal dirigidas a la captura de especie de alto valor económico como el pargo, la cherna, el dorado y otros.
4. Se capacitará a los socios pescadores en los principios básicos de la navegación costera como es la utilización de las carta náuticas y traspasar conocimiento sobre posesión geográfico, rumhos, distancia, velocidad y tiempo; con la finalidad de que los participantes puedan planificar un viaje de pesca y hacer más segura su actividad en el mar.
5. Capacitación para la aplicación de aparatos como el GPS, sonar, brújula y otros equipos que ayuden al pescador a localizar y marcar las áreas de pesca.
6. Se brindará capacitación en manejo y procesamiento de productos pesqueros, dirigidos principalmente a los socios para que adquieran habilidades en cómo manipular los productos capturados tanto al bordo de las embarcaciones, como en la planta o centro de acopio. Así mismo obtendrán conocimientos en la transformación de los productos pesqueros

en hamburguesas, deditos de pescado, nuggets, albóndigas y otros, para hacerlos más apetitosos y con esto contribuir al incremento del consumo de pescado en nuestra provincia y lo cual fomentará nuevas fuentes de empleo.

7. Se capacitarán a los socios y en o referente a la organización y administración de la asociación pesquera.
8. Se iniciarán los procesos de adjudicación de la ayuda que proviene de los organismos internacionales que apoya a la asociación.

Segunda Etapa.

1. Se reforzarán los conocimientos sobre el sistema estadístico de pesca.
2. Se reforzarán y se aplicarán nuevos conocimientos en las artes de pesca.
3. Se hará énfasis en la administración y conceptos organizativos de la asociación.
4. Se revisarán y mejorarán según lo establezcan las últimas tecnologías los conceptos y procedimientos sobre la manipulación y procesamiento de productos pesqueras.
5. Se continuará con la utilización de artes de pesca alternos, principalmente los basados en el uso de anzuelos.
6. Se establecerán los servicios básicos para los pescadores a través de la asociación como el facilitar el hilo o cuerda, el combustible y lubricantes, carnadas, artes de pesca y otros a los pescadores más eficiente y económica su labor en el mar.
7. Se continuará con la ayuda que proviene de los órganos internacionales que apoyan a la asociación.

3era etapa.

1. se continuará con la aplicación del sistema estadístico y para su mejor ejecución se realizarán las capacitaciones necesarias y específicas.
2. Se continuarán y profundizarán las capacitaciones sobre artes y métodos de pesca con la finalidad de mantener actualizados a los pescadores de la asociación en estos aspectos que son fundamentos para mejorar la producción principal en lo relacionado a la calidad y cantidad.
3. Se actualizará a las mujeres de la asociación en la metodología de procesamiento pesquero y en las técnicas de manipular productos pesqueros.
4. Se hará un uso frecuente de las artes de pesca continua tal como se estableció en la capacitación recibida.
5. Se continuarán brindando, por parte de la asociación de los servicios básicos para el buen funcionamiento de las actividades atractivas de los pescadores asociados.
6. Se continuará con capacitación para el conocimiento de extracción y aprovechamiento de nuestros recursos implementando la sostenibilidad y protección de nuestro ecosistema marino.

Cuarta etapa

1. continuar con las capacitaciones en el sistema estadístico, artes y métodos de pesca, navegación costera, administración de la asociación, protección del eco sistema, legislación pesquera y otros.

Actividades.

1. Reunir periódicamente a los pescadores para capacitación y desarrollo organizacional.
2. Coordinar con las diferentes instituciones gubernamentales y no gubernamentales para solucionar los inconvenientes que se presenten.
3. Gestionar la consecución de los mejores precios por los productos capturados para los pescadores asociados.
4. Coordinar con las instituciones gubernamentales el mejoramiento de los pescadores dentro de la comunidad.

APPENDIX 5**Research Permits and Agreements**

San José State
UNIVERSITY

**Office of the Academic
Vice President
Academic Vice President
Graduate Studies and Research**

One Washington Square
San Jose, CA 95192-0025
Voice: 408-283-7500
Fax: 408-224-2477
E-mail: gradstudies@sjsu.edu
<http://www.sjsu.edu>

To: Robert Joseph Atanasio
146 Henry St.
San Francisco, CA 94114

From: Pam Stacks,
Interim AVP, Graduate Studies & Research

Date: April 30, 2004

The Human Subjects-Institutional Review Board has approved your request for exemption from human subjects review under category "B" in the study entitled:

"Community, Cooperation and the Commons."

This approval is contingent upon the subjects participating in your research project or the subject's data collected for the research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project and concerning all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must immediately notify Pam Stacks, Ph.D. Injury includes but is not limited to bodily harm, psychological trauma, and release of potentially damaging personal information.

Please also be advised that all subjects need to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate, or withdrawal will not affect any services that the subject is receiving or will receive at the institution in which the research is being conducted. This approval is granted for a one-year period and data collection beyond April 30, 2005 requires an extension request.

If you have any questions, please contact me at (408) 924-2480.

cc: Dr. Gary Klec

The California State University:
Chico State's Office
Diversified, Channel Islands, Chico,
Domergue Hills, Fresno, Fullerton,
Hayward, Hayward, Long Beach,
Los Angeles, Maritime Academy,
Monterey Bay, Northridge, Pomona,
Sacramento, San Bernardino, San Diego,
San Francisco, San Jose, San Luis Obispo,
San Marcos, Sonoma, Stanislaus

Acuerdo para participante

1

Acuerdo para participar en Investigación
Investigador Responsable: Robert BJ Atanasio
Título del Protocolo: "Comunidades, Cooperación, y la Propiedad Comunal"

Propósito de la investigación: El investigador busca describir sistemáticamente la actividad pesquera en el archipiélago de Bocas del Toro. Esto incluye: información demográfica sobre los pescadores e información sobre esta actividad, el equipo utilizado y las especies sujeto.

Método: El investigador coleccionará información sobre la actuación y las decisiones de los pescadores mediante la observación directa, la participación en las actividades pesqueras y mediante encuestas y cuestionarios.

Análisis: El investigador desarrollará una teoría basada en las observaciones acerca de la organización de los pescadores, el conocimiento sobre esta actividad y la relación que existe entre la actividad pesquera y los pescadores.

Resultados: Este estudio satisface los requerimientos del programa de Maestría en Estudios Ambientales de la Universidad de San José. La investigación será revisada por el comité evaluador y formará parte de la colección Bibliográfica de la Universidad de San José. El investigador enviará los documentos derivados de esta investigación a revistas especializadas y profesionales sobre Ecología Humana, Manejo de Recursos y Antropología. La Unión de Pescadores Artesanales recibirá una copia dichos documentos.

Patrocinador: Esta investigación es realizada bajo el respaldo de la Universidad Estatal de San José y el Instituto Tropical de Ecología y Conservación (ITEC), el cual es miembro de Ciudad del Saber.

Acuerdo: Los pescadores y el investigador acuerdan lo siguiente:

1. El investigador solicita la cooperación de la Unión de Pescadores Artesanales para participar en la investigación sobre pesca y pescadores.
2. El investigador acompañará a los pescadores en sus actividades diarias, participará durante la pesca, aplicará cuestionarios y registrará las observaciones.
3. Es posible que los miembros de la Unión se sientan incómodos proporcionando alguna de la información solicitada.
4. Los participantes no recibirán ningún beneficio directo como resultado de este estudio.
5. A pesar de que los resultados de este estudio puedan ser publicados, la información personal de los encuestados no será incluida.
6. No habrá compensación monetaria por participar en este estudio.
7. Cualquier pregunta acerca de esta investigación puede ser dirigida a:
 - Robert BJ Atanasio: 1-415-552-4726 (U.S.A.); 507- 626-1934 (Rep. d. Panama)
 - Quejas sobre esta investigación pueden ser presentadas a:
Lynne Trulio, Ph.D.: Chair, Environmental Studies, College of Social Sciences
1-408-924-5445
 - Preguntas sobre temas de la investigación, derechos o lesiones relacionadas con la investigación pueden ser dirigidas a:
Pamela Stacks, Associate Vice President, Graduate Studies and Research
1-408-924-2427
8. Usted no perderá o se arriesgará a perder ningún servicio al que usted actualmente tenga derecho si decide "no participar" en este estudio.
9. Usted está dando su consentimiento voluntariamente. Sin embargo, la Unión de Pescadores Artesanales puede rehusarse a participar en todo el estudio o en una parte del mismo en el momento que lo desee. Si usted decide participar en el estudio, es libre de retirarse en cualquier momento sin consecuencia negativa para sus relaciones con San José State University o con cualquiera otra de las agencias o instituciones participantes.

Acuerdo para participante

2

10. Al momento en que usted firme este formulario de consentimiento, recibirá una copia del mismo para sus archivos, firmada con fecha por el investigador.

- La firma de una persona en este documento indica que está de acuerdo con participar en el estudio.
- La firma de un investigador en este documento indica que está de acuerdo en incluir la persona arriba mencionada en la investigación y atestigua que la persona a sido completamente informada de sus derechos.

Firma
Fecha
Firma del investigador
Fecha

**San José State
UNIVERSITY**

**Department of
Environmental Studies**

One Washington Square
San José, CA 95192-0115
Voice: 408-924-5450
Fax: 408-924-5477

Acuerdo de Participación en Investigación
Investigador Responsable: Robert BJ Atanasio
Título del Protocolo: Estudio de la Pescadores en la Isla Colón

1. A usted se le ha pedido participar en una investigación sobre pesca y pescadores.
 2. A usted se le harán preguntas acerca de cómo pesca usted; dónde y cuándo va usted a pescar; qué clases de pescado atrapa usted; qué hace usted con el pescado que atrapa. También se le harán preguntas sobre usted mismo. Sus respuestas serán grabadas en magnetófono y escritas.
 3. Es posible que usted se sienta incómodo dando alguna de la información que se le pida.
 4. Usted no recibirá ningún beneficio directo de este estudio.
 5. Aunque es posible que los resultados de este estudio sean publicados, no se incluirá ninguna información que permita identificarlo a usted.
 6. No hay compensación por participar en este estudio.
 7. Preguntas sobre esta investigación pueden ser dirigidas a:
Robert BJ Atanasio: 1-415-552-4726 (U.S.A.); 507-626-1934 (Rep. de Panama)
 - Quejas sobre esta investigación pueden ser presentadas a:
Lynn Trulio, Ph.D. Chair, Environmental Studies, College of Social Sciences
1-408-924-5445
 - Preguntas sobre temas de la investigación, derechos o lesiones relacionadas con la investigación pueden ser dirigidas a:
Pamela Stacks, Associate Vice President, Graduate Studies and Research
1-408-924-2427
 8. Usted no perderá o se arriesgará a perder ningún servicio al que usted actualmente tenga derecho si usted decide "no participar" en este estudio.
 9. Usted está dando su consentimiento voluntariamente. Usted puede rehusarse a participar en todo el estudio o en una parte del estudio. Si usted decide participar en el estudio, usted es libre de retirarse en cualquier momento sin ninguna consecuencia negativa para sus relaciones con San José State University o con cualquiera otra de las agencias o instituciones participantes.
 10. Al momento en que usted firme este formulario de consentimiento, usted recibirá una copia del mismo para sus archivos, firmada con fecha por el investigador.
- La firma de una persona en este documento indica que está de acuerdo con participar en el estudio.
 - La firma de un investigador en este documento indica que está de acuerdo con incluir la persona arriba mencionada en la investigación y atestigua que la persona a sido completamente informada de sus derechos.

EXAMPLE

Firma	Fecha
_____	_____
Firma del Investigador	Fecha
_____	_____
Testigo	Fecha
_____	_____

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