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COMMUNITY-BASED DEVELOPMENT OF MULTIPLE-USE MARINE PROTECTED AREAS: PROMOTING STEWARDSHIP AND SHARING RESPONSIBILITY FOR CONSERVATION IN THE SAN ANDRES ARCHIPELAGO, COLOMBIA

Marion Howard, Ernesto Connolly, Elizabeth Taylor, and June Marie Mow
CORALINA, San Luis Road, Bight, San Andres Island, Colombia

ABSTRACT The San Andres Archipelago in the western Caribbean includes some of the largest and most productive coral reef ecosystems in the hemisphere. Declared the Seaflower Biosphere Reserve by UNESCO in 2000, this Colombian archipelago has 3 inhabited islands, 5 atolls, and an oceanic area of 300,000 km^2. CORALINA, the local representative of the National Environment System, is responsible for environmental planning, management, and education. While setting up the Seaflower Biosphere Reserve, this agency had hundreds of meetings with the islands' communities, listening to their concerns. Issues, conflicts, and threats to marine and coastal areas were identified during these consultations. In response, CORALINA developed a project to establish a system of multiple-use marine protected areas (MPAs). Stakeholder consultation and community outreach programs were set up to facilitate participation in planning and implementation. Language and cultural differences, poverty, a history of powerlessness, and negative attitudes toward authorities are realities that have to be confronted when working with these communities. Although only in the design stage, the high level of stakeholder involvement in planning has resulted in widespread support of the MPAs. Lessons have already been learned that lead to recommendations on engaging local communities in MPA development.

Introduction

The Archipelago of San Andres, Old Providence and Santa Catalina, Colombia, is in the southwestern Caribbean. Declared the Seaflower Biosphere Reserve in November 2000 by UNESCO's Man and the Biosphere (MAB) Program, this archipelago is made up of 3 small inhabited islands and several uninhabited cays (Figure 1). Maritime borders are shared with Jamaica, Cayman Islands, Honduras, Nicaragua, Costa Rica, and Panama. The largest island, San Andres, is 800 km northwest of Colombia and 150 km east of Nicaragua at 12°32′N and 81°43′W. The islands of Old Providence and Santa Catalina (OPSC), which are separated by a narrow seagrass-lined channel 155 m across, lie 80 km north of San Andres. Oceanic reef systems included in the archipelago are Courtown (ESE Cay), a kidney-shaped atoll 6.4 km by 3.5 km; Albuquerque (SSW Cay), a circular atoll with a diameter over 8 km; Roncador, an atoll 15 km by 7 km with a 12-km reef to windward; Serrana, an atoll 36 km long and 15 km wide with a complex reef system 37 km by 30 km; and Quitasueño (Queena), the archipelago's largest coral structure, 60 km long and 10 to 20 km wide with a 40-km reef wall (Geister and Diaz 1997). Coral structures found in the archipelago's northernmost area are Serranilla, New Shoal, and Alice Shoal.

San Andres has an area of 27 km^2 and an official population of 61,000. However, estimated population is over 80,000. The majority are immigrants from mainland Colombia, who have come during the last 25 years. Native islanders, who descend from early settlers, have the protection granted to ethnic minorities (groups with a racial and cultural identity distinct from the dominant society) by the 1991 Constitution. Their culture is defined by Anglo-puritan/African heritage, Protestantism, and English mother tongue. Official population density is 2,260 inhabitants per km^2, the highest of any oceanic island in the Americas. In contrast, OPSC is one of the least environmentally and culturally degraded spots in the Caribbean. Land area is 18 km^2 with a population of 4,200.

Being designated a free port in 1953 shifted the economic base from agriculture and fishing to commerce and tourism. Immigration from the mainland and the resulting economic and political marginalization of native islanders led to poverty and inequity, loss of environmental health, competition over resources, cultural tensions, and worsening quality of life. Unemployment is 53.6%, with an estimated 48.6% of the population having less than the World Bank's poverty criterion of US$1 per person per day (van't Hof and Connolly2001). Economic activities are tourism, commerce, government employment, fishing, and small-scale agriculture. There is also an active informal economy.

In spite of these problems, the archipelago's coral reef ecosystems are among the healthiest in the Caribbean, including barrier and fringing reefs, lagoons and atolls stretching 500 km. Reef structure is particularly complex because of the open ocean location and adaptation to heavy waves (Geister and Diaz 1997). Man-

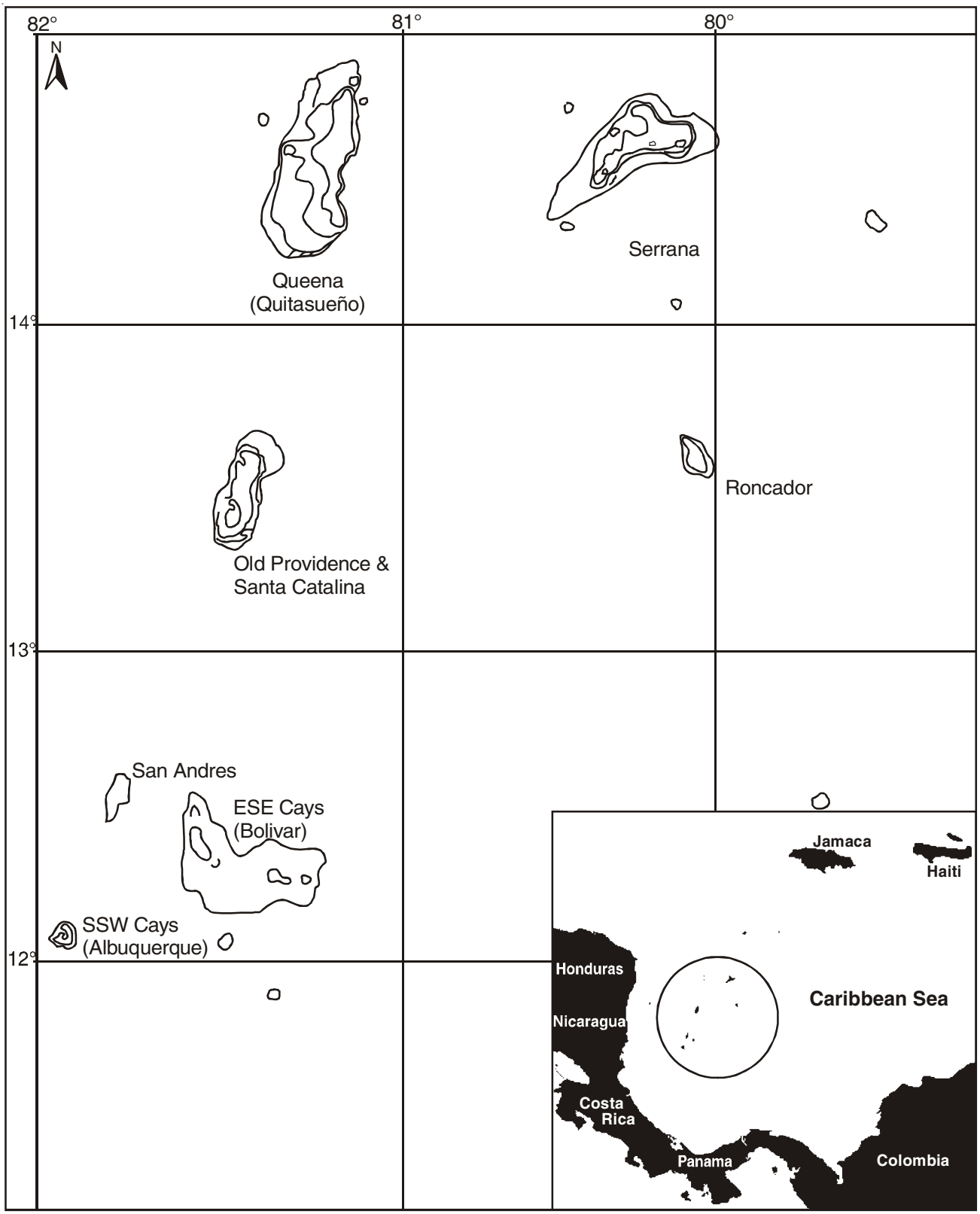

Figure 1. Sites within the Seaflower Biosphere Reserve.

groves and seagrasses surround the islands. The San Andres barrier reef, although not unbroken, runs for 15 km along the island's east coast and is 60 to 80 m wide. The OPSC barrier reef is 32 km long and covers an area of 255 km^2, making it one of the largest true barrier reefs in the Americas (Geister and Diaz 1997). Tourism and fishing directly depend on coastal and marine resources.

The establishment of the decentralized National Environment System (SINA) in 1993 was the prerequisite to address the growing socioeconomic and environmental problems. The cornerstone of SINA is 34 regional environmental corporations (CARs), which were created by congressional law and given unprecedented local control. CORALINA—the Corporation for the Sustainable Development of the Archipelago of San Andres, Old Providence and Santa Catalina—represents SINA in the archipelago. Its mission is to promote sustainable development, managing the archipelago's natural resources in accord with Environment Ministry policies. As one of 7 sustainable development agencies in SINA and the only CAR with marine jurisdiction, CORALINA has even more powers than other CARs. Because of the value and vulnerability of the archipelago's natural resources, its mandate combines environmental management, planning, and education. It can enact and enforce environmental regulations, but is not armed. Jurisdiction over both land and sea strengthens the potential for effective integrated coastal management (ICM).

Although SINA allows environment and development issues to be effectively addressed for the first time at the local level, ambiguities and mixed mandates mean that the new authority structure is still evolving. The Navy's Maritime and Ports Division (DIMAR) has the primary role in fisheries enforcement and in shipping management, shipboard pollution, and land use for ports. DIMAR includes the port captains, coast guard, and national oceanographic institute. The National Institute for Fisheries and Aquaculture (INPA), CORALINA, and national and local agriculture secretariats share authority over fisheries. These national, regional, and local entities lack coordinated management, program development, and enforcement protocols (CORALINA 1999).

Within this context, in 1995 CORALINA began working on the archipelago's varied and widespread environmental problems. An international partnership project, *Appropriate Marine Resource Management and Conflict Resolution Techniques in Island Ecosystems,* led by Scotland's Heriot-Watt University with funding from the European Union's International Cooperation with Developing Countries (INCO-DC) program, allowed CORALINA to begin concentrating on marine issues in 1998. By gathering information on problems and then identifying methods to address these problems, this project led to the marine protected area (MPA) project. This purpose of this paper is to demonstrate how working with communities from the outset can strengthen MPA planning. The emergence of the MPA vision during the INCO-DC project is discussed, as are the first-year advances of the resulting Global Environment Facility (GEF) project, *Caribbean Archipelago Biosphere Reserve: Regional Marine Protected Area System.*

PROBLEMS

Identification of stakeholders

In 1999, as part of the INCO-DC project, a stakeholder consultation structure was set up to work on marine resource issues. The first step was to inventory users. These included fishers, watersports businesses, marinas, water taxis, tourism associations, government offices, environmental NGOs, and native rights groups. The final list totaled 81 organizations and institutions. User groups in San Andres are ethnically divided: artisanal fishers are natives while tourism and watersports enterprises are run by non-natives. In OPSC all stakeholder groups are controlled by natives. Industrial fishing is based off-island, involving few locals.

After the inventory was completed, a joint meeting was held. Because of the ethnically-based tension in San Andres, this meeting was acrimonious. The level of distrust between natives and resident continentals precluded productive exchange. Hostility also stemmed from the language barrier and differences in social customs, making communication even harder.

In a reevaluation of the approach, common interest groups were envisioned in which stakeholders would meet in their own language, in places of their choosing, and in accordance with their customs. To define interest groups, organizations were categorized as fishers, recreational users, traditional users, conservation interests, educational institutions with marine programs, or government agencies. Working groups were set up in each category. Since 1999, between 50 and 70 stakeholder meetings have been held each year. Working separately fostered trust, dialogue, and empowerment. As common concerns were defined and conflicts were reduced, groups began to meet together.

To reach the general public, an outreach program was developed that targeted organizations not represented in the working groups. Another inventory was made of neighborhood associations, churches, sectoral boards, and cooperatives. Community promoters visited

leaders of organizations to arrange group meetings with CORALINA representatives. The organization itself defined the terms, selecting time, place, language, and format. Giving the community control over meetings put a government agency and the people on a more equal footing, which has greatly increased participation. The outreach program also targeted schools.

Identification of issues

During outreach and working group meetings, marine issues were defined. The most common topic, raised at nearly every meeting, was legal and illegal industrial fishing by national and foreign vessels. Issues mentioned were the failure to respect or acknowledge historical fishing rights, lack of local benefit and management autonomy, overfishing, use of illegal gear that damages habitats, and inadequate enforcement. Both artisanal fishers and dive operators believed that overfishing the north banks has affected fish populations and distribution throughout the archipelago.

Other issues frequently raised were related to overpopulation and conflicts with authorities. Steady immigration from mainland Colombia has led to resource competition, particularly in San Andres. Native islanders said they resented use and depletion of marine resources by migrants, exporters, and the tourist industry. The large population has overloaded inadequate public services and infrastructures. Related social problems (including poverty, drug addiction, and inequity) promoted uncontrolled resource exploitation, particularly in accessible coastal ecosystems.

In regard to the authorities, important issues included militarization and ineffective enforcement. Drug smuggling through archipelago waters and national strategies to assert sovereignty have led to an increased military presence. Although major abuses of power were not reported, harassment and an oppressive atmosphere intimidated and alienated native islanders and have been detrimental to the development of international tourism. In spite of the authoritarian presence, a recurring complaint was the lack of consistent and impartial enforcement of fisheries regulations. Besides failing to arrest illegal fishing boats, authorities rarely enforced bans on spear fishing, size limits and closed seasons for some commercial species, regulations against capture of endangered and threatened species, and prohibitions on certain fishing gear. Since military personnel are continentals temporarily stationed in the islands, language and cultural differences exacerbated conflicts.

Threats to coastal and marine ecosystems from human activities were also identified. Overfishing and catching juveniles and species while spawning were major concerns, as was the use of illegal gear like long lines, scuba, and seines and other nets. Stakeholders also singled out siltation from poor land-use practices including deforestation and urbanization, sand mining, and pollution from sewage outfalls, leachate, direct dumping, and improper disposal of oils and solid waste. Physical damage resulted from anchors, propellers, groundings, contact, and souvenir collection. Poverty led to unsustainable gathering of renewable and non-renewable resources.

METHODS

As solutions to the identified problems were examined with stakeholders, establishing MPAs within the context of ICM and UNESCO Biosphere Reserve guidelines emerged as the preferred management method. To raise funds to set up the MPAs, CORALINA developed a project that was accepted by the GEF. The World Bank is the implementing agency, with The Ocean Conservancy and Island Resources Foundation as technical partners. Other international collaborators include the National Ocean Service of the United States National Oceanographic and Atmospheric Association (NOAA), the United Nations Environment Program (UNEP), the Mangrove Action Project, and the Coral Reef Alliance.

The 4-year project began in September 2000. A multi-disciplinary project team includes a coordinator, marine biologists, a geographic information system (GIS) specialist, an economist, an engineer, a communications specialist, educators, community promoters, and a legal consultant. Job preference was given to locals, and personnel must be bilingual. First-year priorities were to agree on objectives, sites, and types of zones and to start collecting physical, biological, and socioeconomic information. Based on these data and the objectives, zones and management can be implemented.

MPA objectives

The project document defined the mission, which is to conserve biodiversity and ensure sustainable use of coastal and marine resources while enhancing equitable benefit distribution for the local community (CORALINA 2000). When the project began, the team worked with local stakeholders and international partners to agree on objectives. These are preservation, recovery, and long-term maintenance of species, biodiversity, ecosystems, and other natural values including special habitats; promotion of sound management practices to ensure long-term sustainable use of coastal and marine resources;

equitable distribution of economic and social benefits to enhance local development; protection of the rights pertaining to historical use; and education to promote a stewardship and community involvement in management.

MPA sites and zones

Based on community concerns, sites were selected and types of zones were defined. To be selected, sites had to have the ecological, social, and economic significance to meet objectives and had to be feasible to designate and manage. The chosen sites are valued locally for fisheries, tourism, and shoreline protection, as habitats, and by tradition, but also satisfy national and global conservation priorities. In addition to corals, seagrass beds, and mangroves of the inhabited islands, the oceanic reef systems of Courtown, Albuquerque, Serrana, Roncador, and Quitasueño are MPA sites. Deep water between sites is also included.

Five basic zone types were designed to achieve objectives: 1) no-entry, where use is restricted to research and monitoring; 2) no-take, allowing a variety of non-extractive uses; 3) artisanal fishing, for use by traditional fishers only; 4) special use, for specific uses identified during MPA planning, particularly where there is a high potential for conflicts such as ports, marinas, or heavily used recreation areas; and 5) general use, where minimal restrictions apply to protect water quality and preserve MPA system integrity. To zone each MPA, biological, socioeconomic, and historical information must be known. This information is being collected in a variety of ways, including expeditions, stakeholder interviews, and social mapping.

Community participation

To develop MPAs that are not just "paper parks", the project is based on local realities and limits. Typical of many developing countries, these include poverty and lack of institutional resources, a centralized political system in which power and information were until recently concentrated in a few hands, tensions between national and local interests and between resident ethnic groups, a history of institutional corruption, and ineffective enforcement. To achieve objectives within this context, voluntary compliance, local ownership, and community-based management are necessities.

A partnership must be forged between the management authority and stakeholders. First, trust has to be built on both sides, since institutions have not traditionally considered community needs or welcomed participation. To do this, the project continues the community programs set up during project identification: 1) island-wide education on resource management to raise awareness and promote stewardship, through the outreach program; and 2) participation in all levels of planning and implementation to facilitate MPA development by the stakeholders themselves, through the working groups. Based on institutional transparency and respect for the community's input, these programs foster bilateral exchange and local empowerment.

Outcomes

The MPAs are being developed by completing activities in 4 work programs: data collection and evaluation, legislation and policy, MPA management, and capacity building. Stakeholders participate in every work program and have access to all information. During the first year, user groups shared information and traditional knowledge about marine resources and use, recommended boundaries, mapped zones, met with authorities to resolve conflicts, discussed mechanisms to fund the MPAs, and received training.

To gather data to set up the MPAs, field and desk studies are being carried out by the project team and collaborators, including collecting information from stakeholders. During the first year, 50 consultations were held with resource user groups and authorities, of which 27 focused on issues and objectives, 9 evaluated financing mechanisms, and 14 were community mapping workshops to gather information on resources, uses, and zoning. Although many stakeholders participated, the groups most actively involved were artisanal fishers and watersports operators. During the same period, 57 schools and community groups were visited in the outreach program.

Of particular interest to measure the success of the community participation programs were the results of questions about marine conservation asked in socioeconomic surveys done from November 2000 to July 2001. One study surveyed the two primary user groups, artisanal fishers and watersports operators. General questions were asked about MPA zoning and use. Other studies concentrated on the non-market value accorded marine ecosystems by the general public (Newball 2000, Wilson 2001).

User study

In this study, 50 artisanal fishers on each island were interviewed along with 26 watersports businesses. These included dive shops, water taxis, tour boats, and motorized (personal watercraft) and non-motorized (kayak, sail boat, windsurfer) equipment rentals. Fishers were chosen randomly at landing sites, where they congregate, and were from every village. Most fish indepen-

dently. In San Andres, 26% belonged to a cooperative, but there was no cooperative at that time in OPSC. Members of the fishers' working group were not surveyed to avoid bias in the sample. All fishers were native islanders, as were dive operators in OPSC. As expected, all watersports operators surveyed in San Andres originally came from mainland Colombia. Consequently, questionnaires and interviews were given in English or Spanish, as appropriate, to improve understanding and promote receptiveness by respecting participants' cultures.

During consultations native islanders consistently mentioned their ownership of the marine area. Since an MPA objective is to protect rights of traditional use, fishers were asked related questions. When asked if their parents were fishers, 82% answered yes. Grandparents of 77% also fished, and 96% said they hoped their descendants will fish. When asked how important fishing is to native islander tradition, 99% said very important. The same percentage believed that native people have traditional or historical rights to fishing grounds throughout the archipelago. As statistics on the number of fishers are unavailable, respondents were asked to estimate the current number of active artisanal fishers. Averages were 379 in San Andres and 221 in OPSC, with 96% believing the number of fishers has grown in the last 10 years. Reasons given were the lack of jobs, layoffs, low wages, poverty, and renewed pride in the traditional islander way of life.

Fishers were also asked about zoning and use. When asked if the MPAs should have zones in which only artisanal fishing is allowed, 80% said yes, 13% said no, and 7% didn't know. Asked if industrial fishing by off-island companies or vessels should be allowed in the MPAs, 93% said no. However, 72% felt controlled industrial fishing by locals would be acceptable. Fishers were also asked if there should be zones for conservation of species and habitats that are closed to fishing; 97% said yes (San Andres 98%, OPSC 96%). Asked if water sports could take place in these zones, in OPSC 86% answered yes, compared with 62% in San Andres. Most fishers, 100% in San Andres and 92% in OPSC, said MPAs will benefit them. The main reasons given were improved marine conservation and productivity.

Surveys of watersports businesses also included questions on zoning and use. Exclusive artisanal fishing zones were supported by 73%, 92% opposed industrial fishing by off-islanders, and 58% believed controlled industrial fishing by locals could be permitted. When asked if the MPAs should have conservation zones closed to all use, 85% responded yes. As to whether MPAs would benefit them, 81% said yes, 15% said no, and 4% didn't know. It is worth noting that of the 5 businesses answering no or don't know, 4 were personal watercraft rentals and 1 was a water taxi business. All dive operators, tour boats, and non-motorized equipment rentals said that MPAs will improve business.

General public studies

Studies examined the non-market value of coral reefs and mangroves. Surveys were given to a random sample of households throughout San Andres. In the coral study, which included 140 households, over 70% responded that coral reefs benefited them, with 72% willing to pay a monthly assessment for coral conservation. When asked who should manage this money, 75% said CORALINA or CORALINA in cooperation with a local NGO, 10% picked departmental government, 5% said national government, and 10% chose an NGO.

In the mangrove study, 69% of the 149 households interviewed said that conservation and recovery of marine ecosystems (coral reefs, seagrasses, and mangroves) were very important. Even more households were willing to pay for mangrove conservation; 88% would pay a monthly assessment. To manage the money, 42% chose CORALINA and the departmental government, 20% selected CORALINA alone, and 4% preferred CORALINA and an NGO. About 25% chose an NGO. The remaining 9% were divided between local and national government and no response.

CONCLUSIONS

When consultations began in 1999, the community had never had a voice in marine management. Virtually no one on the islands had heard of a marine reserve. No functioning terrestrial parks existed, and most residents had never visited a natural park. Similarly, few residents had knowledge about coastal and marine ecosystems or awareness of human impacts on the environment. Conservation and sustainable use were concepts new to the archipelago. Additionally, public education and curriculum were centralized until 1991, so natural history and science focused on the Andean environment.

The high rating given ecosystem conservation indicated that the community participation programs have helped build a conservation ethic. It is noteworthy that artisanal fishers gave zones closed to fishing higher priority than exclusive fishing zones (97% compared with 80%). When asked if water sports should be allowed in conservation zones, responses of San Andres and OPSC fishers differed more than on any other question

(62% and 86% in favor, respectively). Since an issue frequently raised by natives was that outsiders are taking over the sea, the non-native control of water sports in San Andres probably explains this variation. Tourist numbers in San Andres are also higher and ecosystems more degraded, so there is competition over sites.

Although the study helped identify differences, similar responses can be even more useful for management. To resolve stakeholder conflicts, finding common concerns is important. Support for marine conservation and confidence in MPAs are shared values that should help groups work together in the long term, but more important in the short term is agreement about industrial fishing. Artisanal fishers said uncontrolled non-local fishing is the most serious threat to sustainable fisheries and marine conservation. Because watersports operators are mainlanders, like industrial fishers, the native community's perception has been that they supported non-local fishing. Results (92% opposed) showed that this was far from the truth.

The nearly universal support for MPAs that resulted from involving stakeholders since the beginning — working together to define problems and choose solutions, as well as to implement the resulting project — was unexpectedly high. Since the majority of respondents in the non-market value studies chose CORALINA, either alone or in combination with another group, to manage the money collected from conservation assessments, results also showed a faith in CORALINA that was exceptional for a government institution. Involving the community in the process from the outset fostered trust. Very active participation during planning has resulted. It remains to be seen if this support will translate into action such as compliance, volunteerism, and soft enforcement when MPAs regulations and zonings are in place.

However, nearly 100% approval so early in the process also brings problems. User groups want positive change immediately. Intangibles like conservation awareness and group empowerment, while very important, are not obvious advances to many stakeholders. Even if people understand the need for MPAs, most do not understand the work, time, and money needed to implement them. Such faith in the benefits of MPAs means expectations are high. To meet community expectations, practical actions need to be implemented in the medium time frame that provide interim project accomplishments. But in places where equipment and financial resources are scarce, it is often more feasible to work with communities than to do expensive implementation. For little expense, CORALINA meets with the community in schools, churches, yards, and even private homes. On the other hand, installation and maintenance of mooring and marker buoys, enforcement, monitoring, daily operations, and the publication of maps and management plans are expensive and can require equipment and technical support not locally available.

Recommendations for engaging communities

Although still in the planning stage, the San Andres MPA project already offers valuable lessons on how to engage communities. Participation should be predicated on respect for opinions, customs, and traditional knowledge to forge an effective partnership between the community and the management authority. Ideally, communities themselves should identify local problems and choose MPAs as their solution. Objectives, design, and management should address local issues as well as broader conservation values.

Local knowledge should be incorporated into planning. Culturally sensitive surveys and interviews with stakeholders are useful tools to gather information for management, quantify community concerns, and involve stakeholders in planning. To resolve conflicts between stakeholders, shared concerns should be identified. This can bring groups together to work on common problems, achieving positive action and building trust before tackling conflicts.

Timing is important. To meet community expectations while setting up MPAs, planning and implementation should be balanced, being done concurrently when possible. Goals and timelines should be flexible enough to accommodate this. To allow timely implementation, financial and technical support for high ticket items like buoys and administrative and enforcement infrastructure should be sought early in the process. Long-term MPA funding options should be examined and discussed with stakeholders from the beginning.

Future directions

To address problems as they arise, specific goals are developed at the beginning of each project year. To ensure that the project meets community expectations, goals developed for the second project year are to declare external boundaries and define internal zones; strengthen inter-institutional cooperation, including cooperation between terrestrial and marine authorities; define the situation of industrial fishing in relation to the MPAs; focus on enforcement, seeking and evaluating alternatives; and promote the MPAs locally, nationally, and internationally.

Based on these goals, practical actions with visible results were agreed upon for the second year. These include producing zoning maps, installing mooring buoys at priority sites, forming a board of stakeholder representatives on each island, bringing user groups together to work on strategies to control non-local fishing, and distributing flyers on marine conservation to tourists and households. Now that the community supports the MPAs, the biggest challenges are to create effective enforcement mechanisms, define an equitable collaborative management system, strengthen inter-institutional cooperation in fisheries management, and continue to build capacity so the community can turn awareness into active management responsibility.

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