

## RESOURCE MANAGEMENT IN OLANGO ISLAND, CEBU: THE CHALLENGES AND OPPORTUNITIES

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Olango Island is located five kilometers east of Mactan Island, Cebu. This low-lying limestone island, with its surrounding islets to the south, is known for its extensive intertidal mudflats, wide fringing coral reefs and seagrass beds, and mangroves. More than half of Olango is comprised of diverse coastal and marine habitats, part of which is a national bird sanctuary. Unfortunately, these resources have been under siege in past years and are currently not nearly as productive as their natural potential would permit. For this reason, Olango (including the surrounding islets) was selected as a learning area of the Coastal Resource Management Project (CRMP) which started work there in July 1996.

The topography of Olango is very rugged. Being a low-lying coral island (the highest point barely reaching 10 meters above sea level), Olango is flat with a hard limestone bedrock and a very thin layer of topsoil. Hence, there is very little terrestrial vegetation resulting in an extremely hot, dry climate. Jagged limestone outcroppings protrude all over the landscape. Few crops do well. Cassava is one exception and it is mainly consumed locally as a food staple.

Freshwater is scarce. There are no rivers or streams in the island. Many of the wells are located in the center of the island. Many of the wells are located in the center of Olango and even then, less than 10% of these are purely fresh. Due to saltwater intrusion, the remainder



*PCRA participants identify the different seagrasses and try to estimate the space each kind occupies within a quadrat that is fashioned by the participants themselves.*

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## TAMBULI—A NEWSLETTER FOR COASTAL MANAGEMENT PRACTITIONERS

is on its fourth issue. Our circulation is now more than 1,500 and our extra copies are usually gone several months after printing. We are increasing the number printed to 3,000. The demand for information on integrated coastal management is, indeed, increasing in the Philippines and worldwide. We are trying to fill an expanding niche and we are extremely pleased with the response so far. We get many positive comments but we also need good articles and news items to broaden our coverage of the country and some international events. We really encourage you, our readers, to send in useful material. And, if your writing skills are lacking, do not worry, our editorial staff is willing to assist with corrections and improvements!

Olango Island and its coastal resources are analyzed in the lead article of this issue. Olango Island represents one of the worst case scenarios of coastal management challenges in the Philippines. As the article describes, it is an over-populated island with communities too dependent on coastal resources for sustenance. The result is that the fisheries are severely depleted, the coral reefs are in poor condition, an increasing state of poverty is evident and the alternatives for livelihood are not obvious or easy. Olango Island is one of the six "learning areas" of the Coastal Resource Management Project. In many ways, it may be the most difficult learning area because of the deep-seated problems. Yet, where there is a challenge, there are people trying to find solutions and indeed some exist.

Olango is surrounded, first of all, by a large and potentially rich coral reef complex. The coral reefs and their fisheries could supply a sizable amount of food and income to people on the island if managed properly. In fact, more than 20 tons of edible marine organisms could be captured from one square kilometer of reef area if sustainable approaches were used. Instead, Olango reefs probably provide only about 5 tons of edible catch rather than 20 because of past and present destructive fishing activities, overfishing and a lack of sanctuaries or areas where no fishing is allowed. If good management practices could be installed, fish catch might increase more than two-fold. Hence, the potential positive return—and the challenge, for of course, to do this, the people affected must be willing to change their ways, make some choices and work together.

More opportunities emanate from this situation. Examples are the increased opportunity for coral reef tourism if the reefs were better protected. A few good marine

# editorial

sanctuaries could attract paying divers and snorkelers billeted at the many hotels on Mactan Island or from the growing Cebu City population looking for day trips out of the city. This is only the tip of the iceberg, so to speak. Olango Island has a large (1,000 ha) wetland and bird habitat area which is a national park. It is one of a kind in the Philippines and offers tremendous experiences for bird watchers, kyakers, hikers and others interested in outdoor experiences. This kind of tourism is low-impact and can bring substantial revenue to the island. A parallel challenge is to make sure that island communities can tap into this tourism trade and interest.

As you can surmise, Olango Island represents many Philippine coastal areas. Another thread that connects Olango to the world is fishing for aquarium fish, the theme of the second article in this issue. Unknown to many, Olango is the home of many aquarium fish gatherers, some of whom have the dubious reputation of using sodium cyanide in their fishing operations. To do this, they often use what is called a compressor fishing rig which enables them to stay at the bottom longer, go deeper and catch more fish than they could if they were only free diving. Although, I do not want to make enemies here, I would like to raise the questions about why compressor fishing is allowed in the Philippines and not in many other countries? It is also ironic that the Philippines has the distinct reputation of exporting cyanide-laced fish which were mostly caught using compressors. In countries where compressors are not used, such as in Sri Lanka, there is also no use of cyanide. This correlation may not necessarily hold true for the Philippines but we can at least raise the question and discourage more use of compressors by aquarium fishers.

Proponents of compressors will say that it will not be possible to catch fish without them. This may be true in the Philippine context, but in places where the reefs are not so overfished, aquarium quality fish can still be captured in shallow water using hand nets. With this in mind, maybe we should rethink our management strategy for aquarium fish capture in the Philippines—only a thought! I did not mention any names or organizations!

Your thoughts and comments on these subjects are welcome! Please send your contributions to the Editor of Tambuli. This is one way we can spread our experiences and ideas so others can learn from them. We look forward to hearing from you!

Editor

## Challenges from page 1

are either brackish or completely saltwater. Some islanders collect rainwater for their freshwater needs. The surrounding islets have even less water and rely on Olango for the little freshwater that is available. The residents of Pangan-an pay as much as P5 (\$0.15) per gallon unlike in other areas where the rate is as low as P0.50.

Olango is composed of 11 barangays (villages), 8 belonging to Lapu-Lapu City of Mactan, and 3 to Cordova (Figure 1). The total population is approximately 20,000, consisting of an estimated 4,000 households. Population density is high and earnings are typically low.

There is one hospital and one post office in Olango but no general marketplace. Almost all commodities must be brought in from mainland Cebu. Gasoline is sold in liter soda bottles. Electricity is available for only a few hours each evening. Most islanders are without toilet facilities. Educational level is low, with less than 10% of the residents completing high school, and about 80% attaining only some level of elementary education. There is one high school in barangay Santa Rosa, and as no public transportation is available, students from distant barangays must pay for a tricycle ride which many find too expensive.

Roughly 76% of Olango's residents are engaged in fishing of one kind or another. During low tide, while boats are grounded, fisherfolk take to the shallows on foot, gleaning the seagrass and algal beds for shells, starfish, sea cucumbers and sea urchins, or netting for tiny baitfish which they place in small bamboo traps to catch eels and small fish. Shells and starfish are used for the craft/curio market while sea cucumbers and sea urchins are sold to the mainland for sale to restaurants. The others are either consumed locally or sold to the mainland as food.

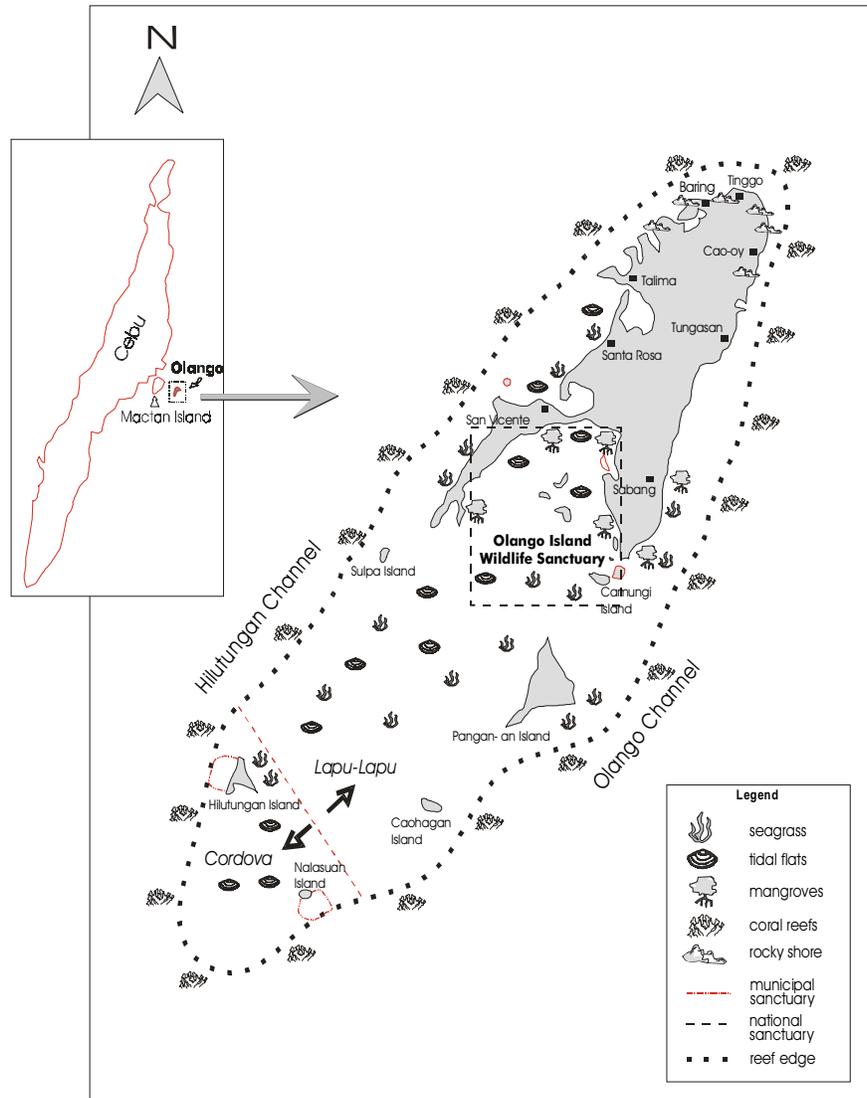


Figure 1. Map of the Olango Learning Area.

On the eastern side of Olango, facing Bohol, where deeper water is closer to shore, spearfishers use compressed air supplied from the surface (hookah) to hunt for various reef species, including parrotfish, snappers and groupers which they market in Cebu. Prices range from P35 (\$0.94) per kilogram for eels, P80 (\$2.16) for snappers and parrot fish, and up to P 120 (\$3.24) per kilogram for the more priced species, such as large groupers or rabbitfish. Prices may vary significantly according to weather conditions and availability of species. Sometimes hookah divers will also collect deep-water shells which have a very high market value.

Fishing methods vary from one community to another. Traditional hook and line fishing takes place in Tinggo. Spearfishers using hookah are found around barangays Caw-oy and Tinggo to the north. Other fishers here use *panggal* or bamboo traps placed on the reef flats. Tinggo residents are also engaged in the live reef fish trade, while a few Caw-oy residents employ floating cages for grow-out of higher value species like groupers. Aquarium fishers, some using cyanide, live predominantly in Santa Rosa, San Vicente and Sabang, while blast fishing takes place virtually all over. Starfish gathering is concentrated in San Vicente in the west, while abalone collection

centers around Tungasan to the east.

Shellcraft, on the hand, is widespread. Interestingly, due to a lack of materials around Olango, many of the shells used for this trade come from other islands, such as Bohol, Caubian, Siquijor or Palawan. Traders from the mainland furnish the islanders with supplies. The shells are then fashioned into chandeliers, place mats and other home decorations which are then sent back to the mainland to be sold in tourist markets or exported.

Although traditionally, Olango residents were fishers, as many still are today, overharvesting has forced some people to take up new occupations: small sari-sari (convenience) store owners, tricycle drivers, wood gatherers or water suppliers and occasional boatmen for tourists (Figure 2).

Located in the Southern portion of Olango Island is the Olango Island Wildlife Sanctuary (OIWS), recognized as a critical stopover for tens of thousands of birds travelling the East Asian Migratory Flyway. Included in these bi-annual travellers are a number of endangered (e.g. *Limnodromus semipalmatus* or asiatic dowitcher, *Egretta eulophotes* or Chinese egret) and threatened (e.g. *Numenius sp.* or eastern curlew) species. The 920 hectares of tidal flats, mangroves, seagrass beds and sandy ridges were officially declared a sanctuary in 1992 and is managed by the Department of Environment and Natural Resources (DENR), under the policies set forth by the Protected Area Management Board (PAMB). The OIWS has the unique distinction of being the first and only Ramsar Site in the Philippines. The Ramsar Convention is the world's oldest international-multilateral conservation treaty in which signatory countries designate and protect wetlands of international importance especially waterfowl habitat.

Encompassing all of 1,041 hectares, Olango is the smallest of

CRMP's six learning areas. It is also one of the most challenging.

### Coastal Resource Management Issues

The main problems cited by Olango residents and others are destructive and illegal fishing methods (cyanide and blast fishing and coral extraction). Issues concerning the bird sanctuary are commonly voiced by both residents and DENR officials, but for different reasons, reflecting various perspectives and values. High population

\$10 M to the Philippine economy. This high demand provides the incentive for relying on sodium cyanide. Similarly, catch volume and associated returns from blast fishing make this method more desirable to fishers than more traditional techniques.

Because of the prolonged use of destructive methods such as blast and cyanide fishing around Olango, fisherfolk have to travel farther and farther away from their own waters to catch anything of substantial value. Consequently, fishers from

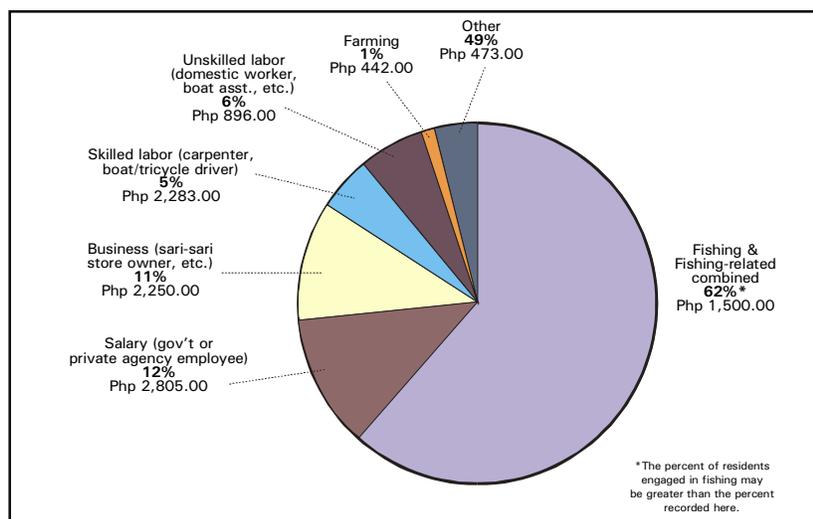


Figure 2. Sources of Livelihood in Olango and the Income Derived from Each.

density, low education, lack of freshwater, lack of a waste disposal system, intrusion of commercial trawlers, and lack of alternative livelihood are some of the other issues contributing to the degradation of Olango's resource base.

#### Destructive fishing practices.

Most of the fisherfolk are poor. Oftentimes, children quit school to help their family fish or glean to earn a living, or simply eat. From this critical viewpoint, fishers are forced to use whatever methods produce the highest catch, although they are aware of the damage caused by some of these methods. For instance, the Philippines alone supplies up to 80% of the world's ornamental fish for the aquarium market. The trade is worth more than

Olango are notorious for being nomadic and for utilizing destructive methods, particularly cyanide, in O'Negros, Siquijor, Leyte, Samar and as far as northern Indonesia.

#### Open access to fisheries.

Another major issue cited by residents, especially around Pangan-an Island, is the encroachment of trawlers in their municipal waters. Fishing boats larger than three gross tons can reap in one evening a month's worth of fish catch to a small-scale fisher. In the past, when a certain trawler entered the island's territorial waters, Sabang and Pangan-an fishers flocked to the Save Nature Society (SNS) Field Station in Sabang to ask CRMP's staff to contact the Coast Guard for assistance. The Coast Guard tried to stop the trawler but was inhibited by

its political connections. Reportedly, islanders resort to blast fishing in a desperate measure to harvest the resources of their own waters rather than have the commercial trawlers benefit.

Similar to the open access issue for fisheries is non-compensation for use of resources. Tour operators from Mactan Island bring visitors to Olango's waters, particularly those around Hilutungan Island, to scuba dive in the marine sanctuary. These guests are not required to pay an entrance fee for use of the island's reefs. Furthermore, fishing blatantly takes place inside the sanctuary and islanders have no means of patrolling the waters and enforcing restrictions.

**Poverty and alienation.** The average monthly family income in Olango is as low P450 (\$12.16) for unskilled laborers and P1,500 (\$40.54) for fishers (Figure 2). There are not many opportunities for employment. Because of the historical dependence of Olango

ment. As tourism enterprises developed in recent years, local equity is notably lacking. Local communities claimed that they were not consulted regarding the establishment of the Olango Island Wildlife Sanctuary. Today, they assert a lack of benefits from its existence.

There are two sides to this story. The Philippines needs viable parks and sanctuaries for its rich biodiversity; at the same time, residents need to benefit from a sanctuary designation. Unlike today, fisherfolk once traversed the area to reach their fishing grounds or to glean. While the preserve is touted as being potentially beneficial to the residents, to them it is not. Still, the significance of the site as a critical habitat for migratory and resident bird populations cannot be dismissed. Clearly, a compromise between the needs of the residents and the necessity to protect this unique and environmentally sensitive area must be sought.

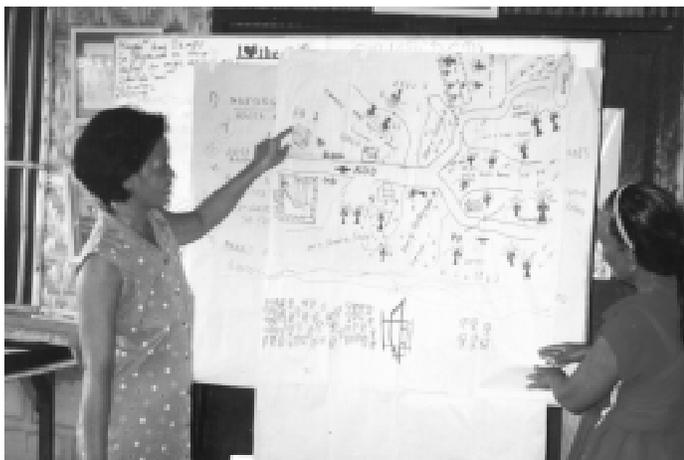


*Starfish being dried for the curio market.*

engaged in CRM efforts to help address the issues plaguing Olango and to provide long-term, viable solutions.

In April 1997, the Olango Synergy Group was created, with members from different sectors including local government units (LGU), national government agencies (DENR, Department of Agriculture-Bureau of Fisheries and Aquatic Resources or DA-BFAR), CRMP, non-government organizations (NGO) such as the SNS, the University of San Carlos (USC) and various church and youth groups. The purpose of the group is to share information to prevent overlapping of activities and to determine the best plan of action for development in Olango. As part of their information, education and communication drive, the Olango Synergy Group conducted an "information caravan" in all the barangays. The event consisted of audio-visual presentations on CRM issues and discussions on potential alternative economic activities for the island.

In January 1998, a group comprised of Lapu-Lapu city council members, Olango barangay officials and CRMP's facilitators embarked on an observation and study tour of Apo Island and Bais Bay, two protected areas in Negros Oriental. The object of the tour was for policy-makers to observe and appreciate the value of a marine

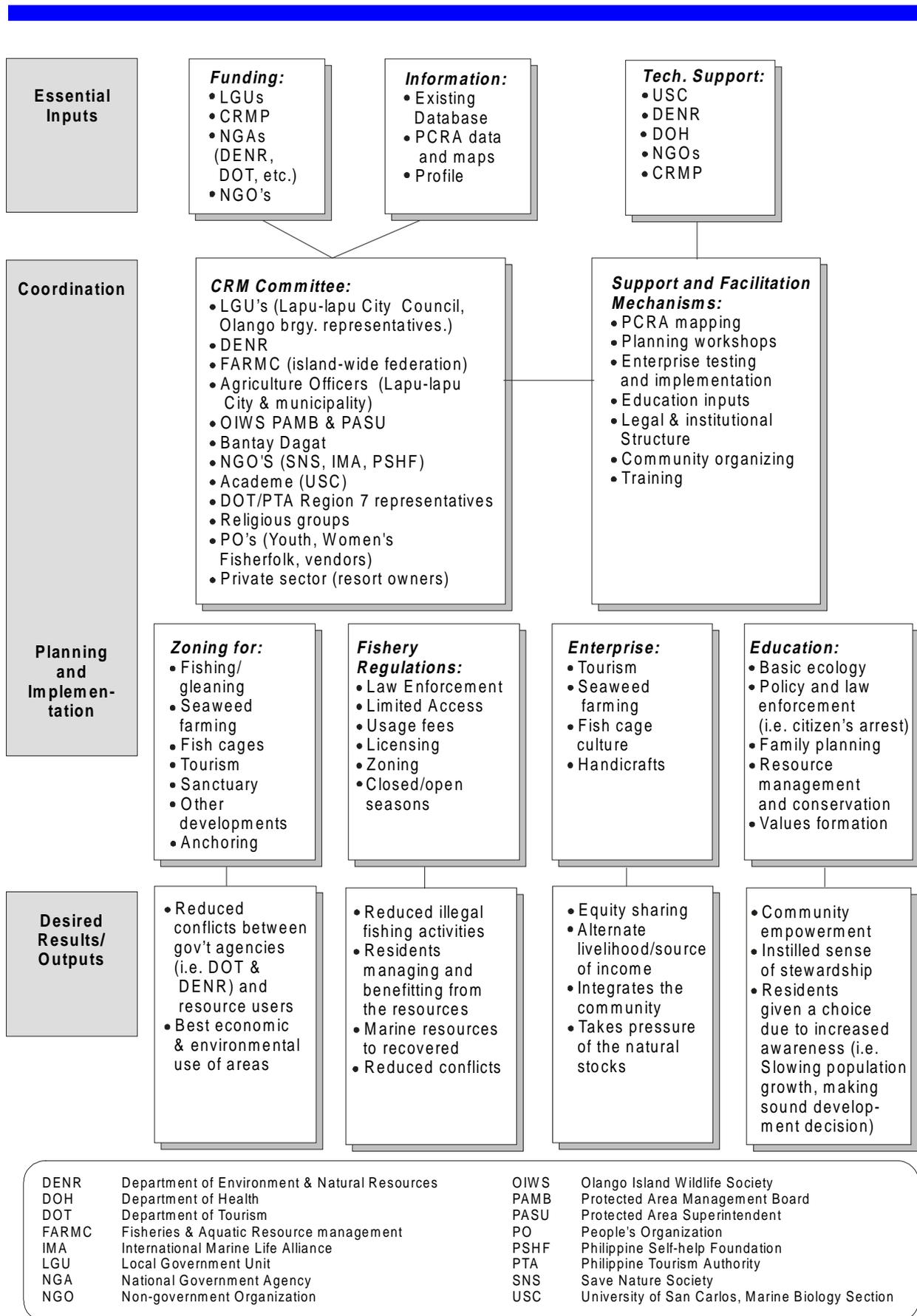


*Members of the Women's organization illustrating the village of Suba, Sabang in Olango Island during the workshop on Tour Itinerary Development.*

residents on their coastal resources, together with a growing population, depletion and destruction of these resources continue to rise sharply. Other contributing factors include low education levels and lack of participation in the island's develop-

Olango Island residents have seen the beginnings of coastal resource management (CRM) in years past and now it is starting to take hold. Different entities are

### **CRM Planning and Implementation in Olango**



**FIGURE 3. COASTAL RESOURCE MANAGEMENT PROCESS IN OLANGO.**

sanctuary as a valid management tool in considering management options for Olango. Participants were very impressed with the success of the management effort in these two sites and went home with talk on marine reserves abounding. But implementation of marine sanctuaries is not the cure-all. It must be accompanied by a clear process which involves community input and stewardship, efforts to phase out destructive fishing practices and exploration of alternative livelihood options. As some Olango residents pointed out, the issues in Olango are more complex than those in island communities like Apo and Bais Bay.

At the end of 1997, a team of trainers and community development workers from the International Marinelife Alliance (IMA) entered the community to teach fishers alternative method of catching fish. This technology transfer is aimed to help both cyanide and blast fishers. Some 300 ornamental fish collectors have been identified, most of them from San Vicente and Santa Rosa. At the initial training course held in September 1997, over 90 aquarium fish collectors were trained in the use of the barrier net method. These workshops are on-going, and a series of similar training courses are targeted for an additional 250 live fish collectors in priority areas. IMA also has a training program for blast fishers in the use of hook and line techniques.

The over all CRM planning process has been facilitated by CRMP in collaboration with the local government. Two of the many CRM-related activities are the conduct of participatory coastal resource assessment (PCRA) and enterprise development.

### **Participatory Coastal Resource Assessment**

The PCRA aims to mobilize the local community to be actively involve in assessing their own resources and in looking at ways to better manage these resources. Participants are a cross-section of the community that includes barangay officials, leaders and members of youth and women's group and fisherfolk. CRMP staff, representatives of the DA, DENR, IMA and marine biologist from the USC facilitate the PCRA.

Before the actual PCRA, participants are presented with the basic steps.

- *Gathering documented information* - This includes the kind of information which may be relevant and where these information can be obtained.
- *Conducting interview(s)* - This involves gathering of socio-economic information by interviewing.
- *Assessing habitats* - This entails the study of various habitats (mangrove, seagrass and coral reefs) and a description of their current status (species and abundance).
- *Mapping* - All information that had been gathered are presented on the base map of the site.
- *Diagramming* - Factors most relevant to the community and which occur seasonally; trends over a period of time; as well as the profile of the area are illustrated as diagrams.

To date, more than 100 Olango residents have participated in actual site assessments with the different groups surveying mangroves, seagrass beds and coral reefs, and conducting interviews. Participants

record and present their finding and ultimately construct a detailed map of their barangay. Habitats are designated with color codes, resources with arabic numbers, uses with letters, issues and problems with roman numerals. This provides a good information base from which potential CRM plans can be drawn.

Benefits from the PCRA are many, accumulating information and guiding communities towards CRM planning and implementation. PCRA results are being incorporated into the coastal area profile presently being compiled by the University of San Carlos. Not only does this data provide baseline information necessary for planning and future resource monitoring and assessment, it enables the residents themselves to evaluate CRM issues, and constraints in Olango. One of the next steps is to form community groups and make recommendations specific to each site, such as the passing of appropriate resolutions and enterprise development.

### **Enterprise Development**

The goal of enterprise work in Olango is to help conserve two unique and critical coastal environments: the Olango Island Wildlife Sanctuary and the Hilutungan Marine Sanctuary. This can be done by establishing enterprises that enhance the way local residents use their coastal resources in strategically positioned communities. The enterprises are site specific and commodity or product specific. For instance, enterprise activities in Sabang are focused on ecotourism development in the wildlife sanctuary, with fishers, youth and women identified as beneficiaries. In Pangan-an Island, enterprise is centered around seaweed farming and is aimed at converting blast fishers and coral extractors to become partners in conservation. In Hilutungan, ventures will include

seaweed farming as well as ecotourism to encourage upkeep of the marine sanctuary. San Vicente enterprises will focus on alternative crafts production and marketing aimed at marine collectors and shellcraft makers.

After identifying a particular enterprise venture for a target site based on an assessment of the area, a study is performed to determine its market viability. Then product development and testing take place. Once the community product gains market approval, production and marketing systems are set up. In Sabang, a pilot tour of the bird sanctuary was undertaken utilizing local community fishers, youth and women, with attendees covering a range of nationalities. Response to this test was very positive and plans to promote this package through an established tour operator are being set up. In Pangan-an Island, a test plot of seaweed has been planted and is growing well. Technical training to set up farms for ten beneficiaries have been conducted. Farms are established in cooperation with the Lapu-Lapu city Agriculturist's Office, CRMP and the local residents.

A key factor for successful enterprise implementation is the involvement of and cooperation among government, the industry sector and community residents. Establishing market linkages and providing technical assistance in product development are also critical. The challenge behind enterprise development in Olango is providing sufficient economic benefits for the community stakeholders in a manner that is environmentally sustainable as well.

### Future Plans

The on-going activities in Olango are aimed at long-term use of resources through community

participation. It is hoped that an increased level of awareness about the surrounding coastal resources would be instilled among the community members and with this a heightened sense of stewardship for those resources. Other goals for Olango include the formation of an island-wide CRM council to include representatives from each barangay, the DENR, PAMB, NGO's, and the private sector (resort owners, tour operators, etc.). This committee will examine CRM issues and begin to form resolutions to address them.

Another goal is the creation of a zoning plan which will designate specific uses for different zones based on the best feasible economic and environmental use of the area, e.g., seaweed farming, fish cage culture, scuba diving, marine sanctuary, etc. This will address several problems. For instance, San Vicente is complaining that seaweed farms in Hilutungan are encroaching into San Vicente waters, preventing residents from fishing there. Another example is the creation of a marine sanctuary by a private resort in Nalusuan Island which needs to be reviewed in light of the various stakeholders involved.

The CRM process for Olango must evolve to meet the ever-changing needs of the people and their environment. At this time, the process and its outcome (Figure 3) can provide substantial benefits to all the stakeholders if it is supported over the next 10 years.

It is essential for the LGUs involved to facilitate the development of Olango with an eye for sustainable projects and equity for people in the area. Tourism will play an increasing role in economic development. This must be accomplished with local participation. Olango remains to be a challenging case and with the dedication and hard work of the many government,

non-government and educational entities, volunteers from various church, women and youth groups, together with island residents and barangay officials, the future will bring more prosperity.

[Each issue of tambuli will review one of six learning areas of the Coastal Resource Management Project. This article is the first in the series. Editor]

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# Cleansing the Seas: Strategies to Combat Cyanide Fishing in the Indo-Pacific Region

[This paper summarizes data and conclusions found in **Sullied Seas: Strategies for Combating Cyanide fishing in Southeast Asia and Beyond** by Charles Victor Barber and Vaughan R. Pratt, published by the World Resources Institute and the International Marinelifelife Alliance, 1997.]

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## Cyanide Fishing: A Poison Tide on the Reef

Since the 1960s, more than a million kilograms of deadly sodium cyanide has been squirted in coral reefs in the Philippines to stun and capture ornamental aquarium fish destined for the pet shops and aquariums of Europe and North America. More recently, a growing demand for larger reef food-fish has vastly increased the incidence and spread of cyanide fishing. Chinese consumers in Hong Kong and other major Asian cities greatly value certain reef fish, paying up to \$300 per plate for some species, when they are plucked live from a tank, cooked and served minutes later. The live reef fish in Southeast Asia has an estimated annual retail value of at least \$1.2 billion, about \$1 billion from the live food-fish trade (mostly with Hong Kong), and nearly \$200 million from exports of aquarium fish to Europe and North America. The combined demand for aquarium and live food-fish has spread cyanide fishing throughout Indonesia and into neighboring



*Cyanide diver at work.*

countries such as Papua New Guinea and Malaysia. In the past year, officials in countries as far-flung as Eritrea, the Marshall Islands, Tanzania and Vietnam have voiced suspicions that their fast-growing live-fish export industries may also be using cyanide.

Far from Hong Kong's restaurants and the pet stores of Europe and North America, fishers in Southeast Asia, the Indian Ocean and the Pacific dive into the sea with "hookah" tubes in their mouths attached to air compressors on small boats and makeshift squirt-bottles in their hands. These fishers squirt cyanide into coral formations, stunning then collecting their prey. Sometimes a crowbar is necessary to pry apart the coral heads and reach the stunned fish that hide in crevices. The rewards are high, with some cyanide divers making more than the university professors in their countries, but so are the risks. Untrained in diving safety, many fishers fall prey to decompression sickness (bends). Contributing to this chain of poison are a variety of intermediaries, vessel and holding-tank facility owners, fish exporters and importers as well as civilian, police and military officials who look the other way for a cut of the profits.

Cyanide kills corals and reef invertebrates along with many non-target fish. Large percentages of the fish that are captured live die in transit, due to their poison-weakened state. Deadly in any marine environment, the spread of cyanide fishing is particularly tragic in the biodiverse rich countries of the Indo-Pacific.

The effectiveness of cyanide in catching more fish was accidentally discovered in the Philippines. To its credit, it is also the only country with a program in place to eradicate the practice. Since the early 1990s, the Bureau of Fisheries and Aquatic

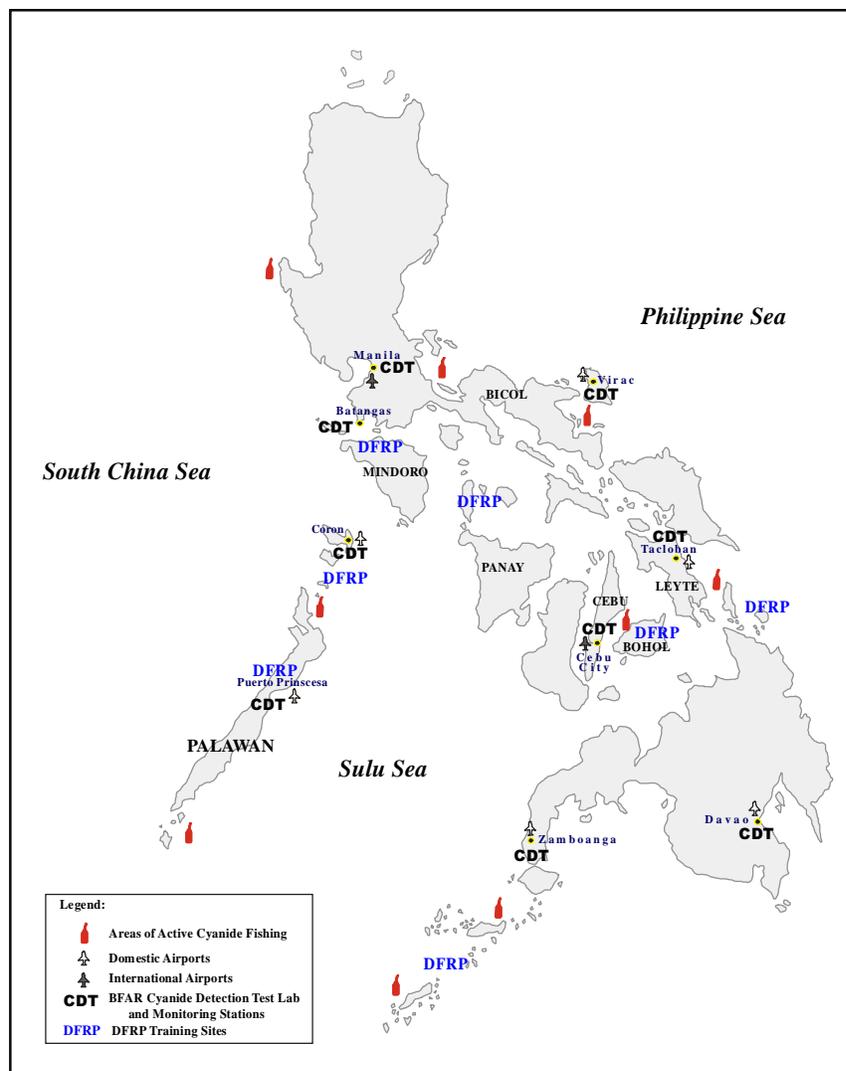


FIGURE 2. PHILIPPINE CYANIDE FISHING REFORM PROGRAM OPERATION AREAS.

Resources (BFAR) and a non-government organization (NGO), the International Marinelife Alliance-Philippines (IMA), have jointly developed and implemented the Destructive Fishing Reform Program (DFRP). Experience with the DFRP in the past shows that cyanide fishing can be reduced through a combination of the right policies and laws, improved enforcement efforts, enhanced public awareness, cyanide testing of live-fish exports, training of cyanide fishers in cyanide-free live-fish capture techniques, development of livelihood alternatives and community-based

resource management that transform local fishers into marine stewards and protectors.

**Cyanide Fishers.** The number of cyanide fishers operating in Southeast Asia and neighboring countries is unknown. Based on Philippine estimates of about 4,000, the number of hard-core cyanide fishers throughout the Indo-Pacific region probably does not exceed 20,000. In short, cyanide fishing is not an ubiquitous problem like slash-and-burn farming. Nor is poverty the root cause of cyanide fishing although, many cyanide fishers are certainly very poor. Experience in