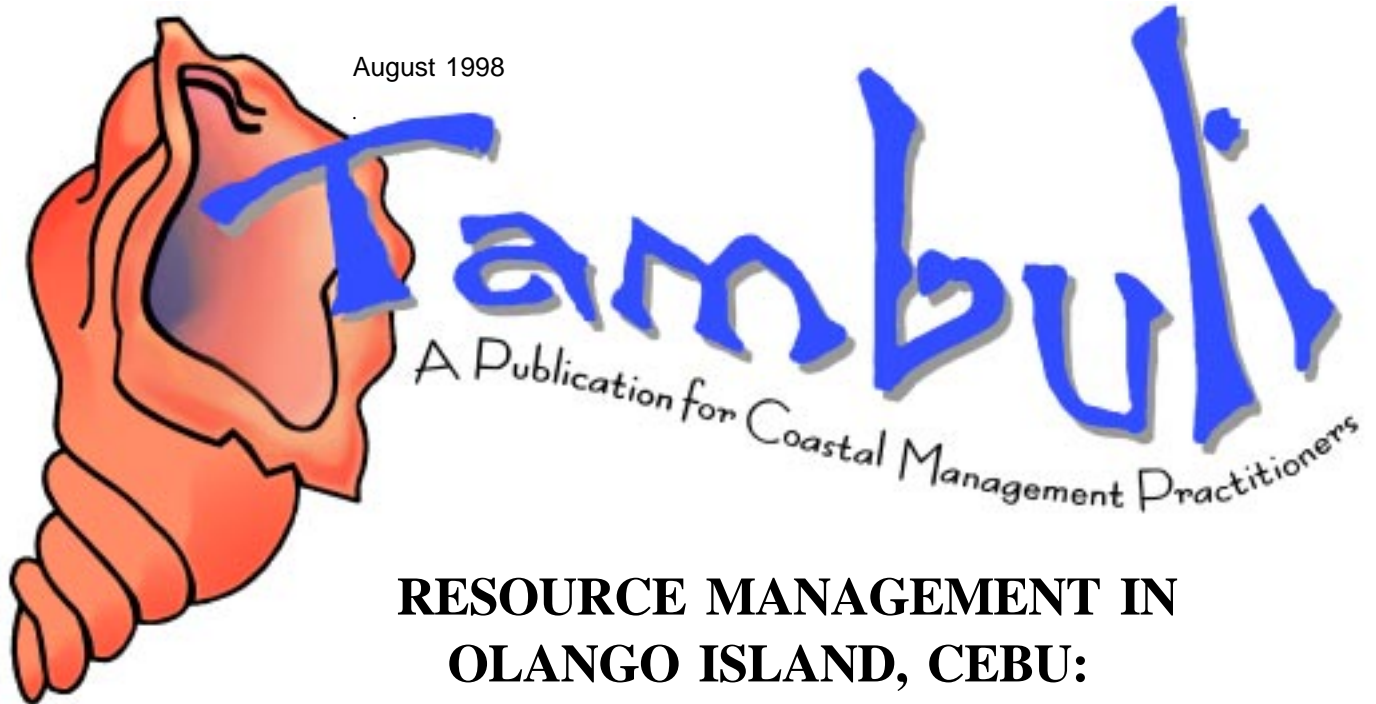


August 1998



## 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.*

*Continued on page 3*

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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.

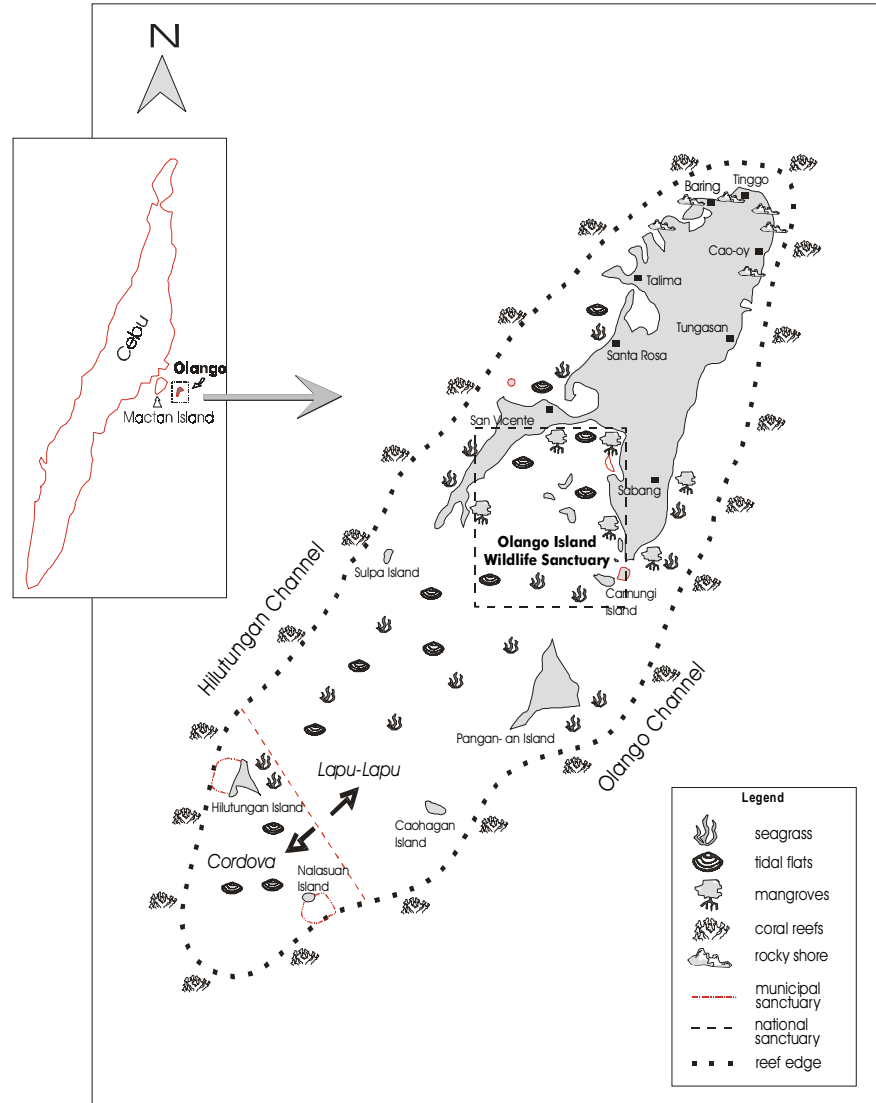


Figure 1. Map of the Olango Learning Area.

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

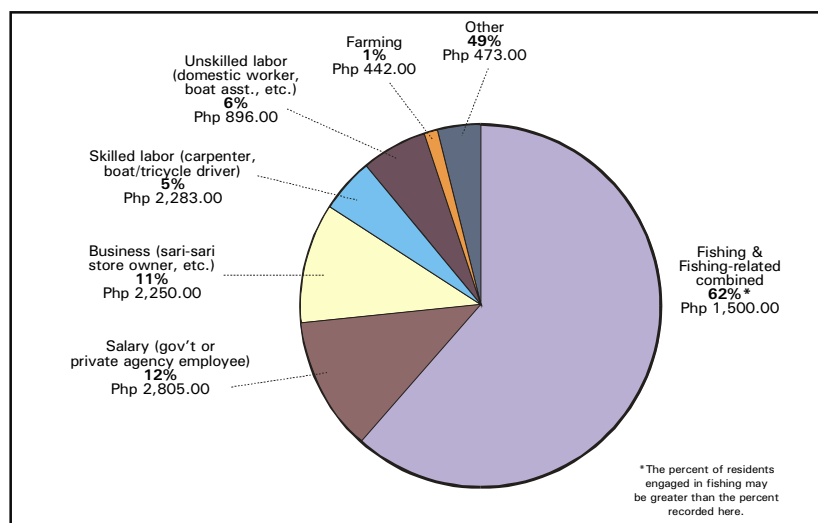


Figure 2. Sources of Livelihood in Olango and the Income Derived from Each.

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 ONegros, 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.

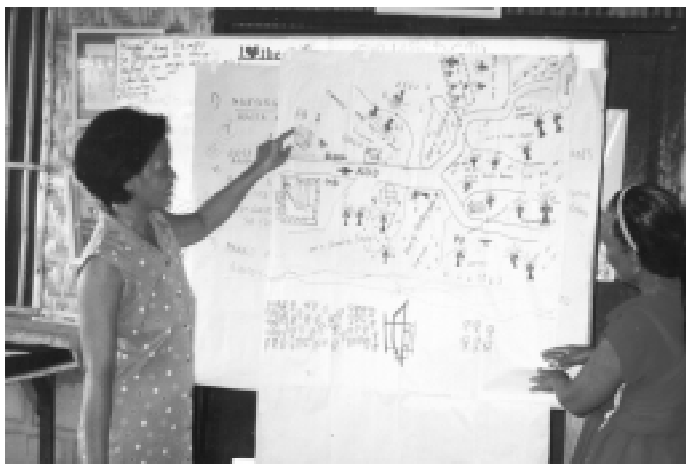


*Starfish being dried for the curio market.*

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

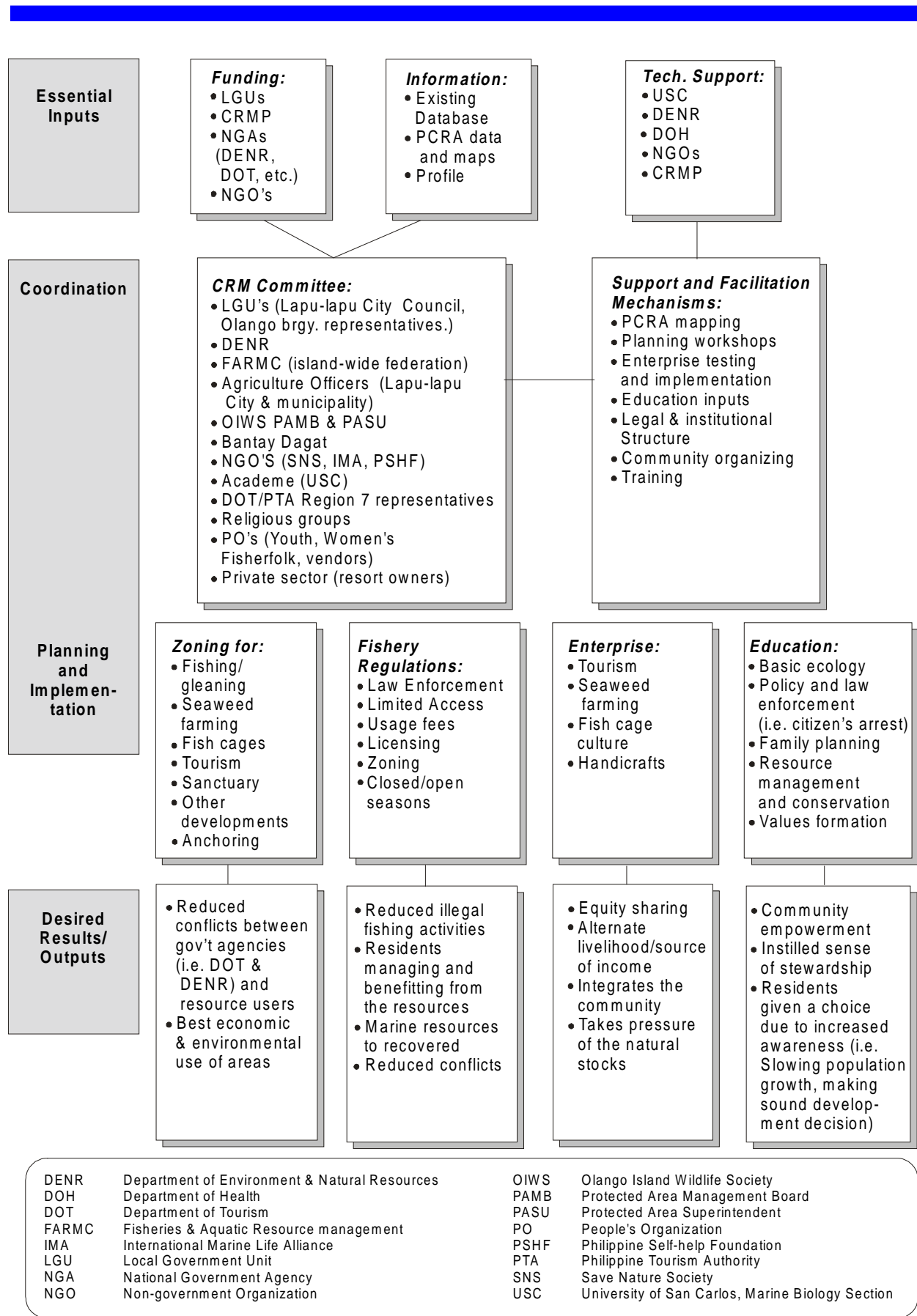


*Members of the Women's organization illustrating the village of Suba, Sabang in Olango Island during the workshop on Tour Itinerary Development.*

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



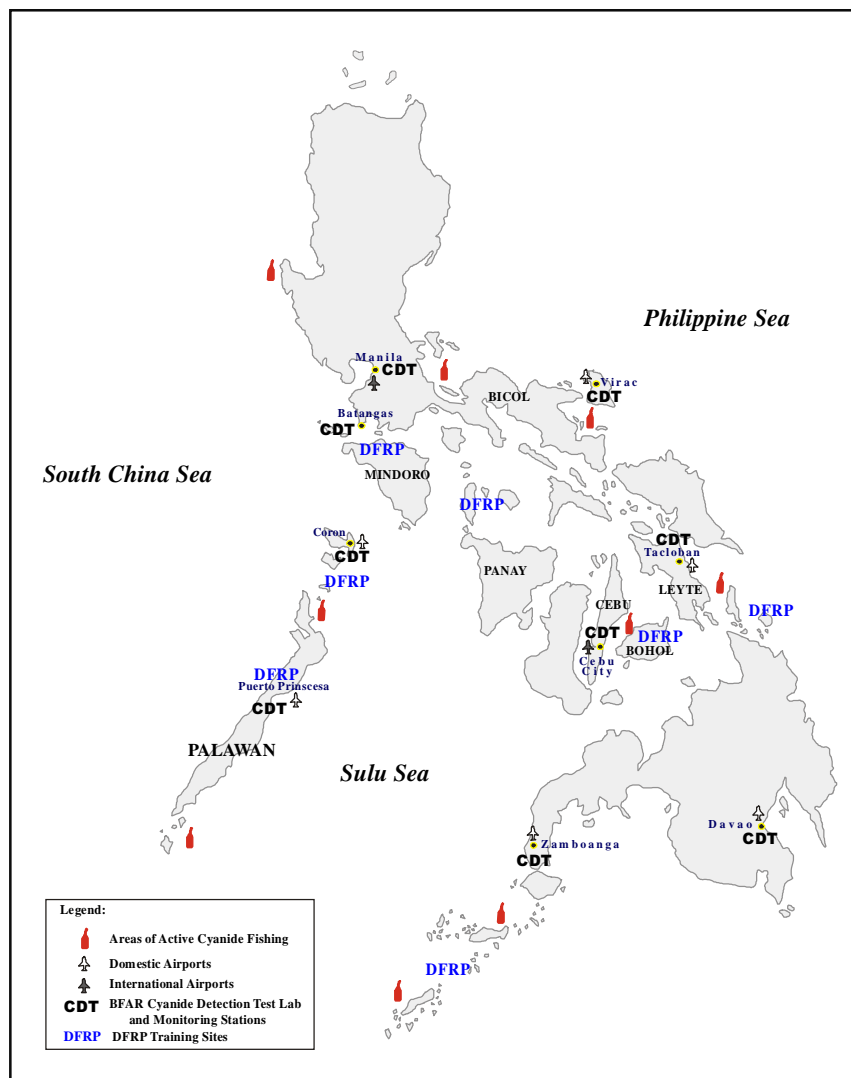
*Cyanide diver at work.*

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

the Philippines suggests that when cyanide fishers are introduced to cyanide-free techniques for live-fish capture and ensured a fair price for their catch, they are willing and often eager to give up using the poison and are equally enthusiastic to talk about ways to ensure the long-term sustainability of their local reefs and fisheries. Development of reliable alternative sources of income strengthens these incentives and strict government enforcement of anti-cyanide fishing laws further reinforces them.

**Live Reef Fish Exporters.** The number of companies involved in the live-fish export business in Southeast Asia is also unknown, but it appears to be expanding rapidly. In the early 1960s, for example, there were only three companies exporting aquarium fish from the Philippines and export of live food fish did not yet exist. By the 1990s there were some 45 aquarium fish exporters in the country and 8 companies exporting live food-fish. At least 10 companies run holding tanks for live food-fish in Bali, Indonesia, a major transshipment point. Conservative estimates of the annual volume of Asian trade in live food-fish alone range between 20,000-25,000 metric tons, mostly from Indonesia, and the real total may be far greater. Philippine government statistics show that as many as 6 million aquarium fish were exported in 1996 and Indonesia is catching up quickly.

**Live Reef Fish Importers.** Businesses that import live food and aquarium fish are in essentially the same position as exporters, without government pressure to ensure that the fish they import were not caught with cyanide, they have little incentive to take action on the issue. As one large importer of live food fish argued: “We the Hong Kong importers do not participate in any catching of fish or its activities. We

just finance the people by equipping them with boats and fishing gear. We just buy fish from them. The production side is left to them.”

**Live Reef Fish Consumers.** Consumers have an important role to play in this trade. Publicity and consumer pressure may move the aquarium-fish industry to take action on imports of cyanide-caught fish. Consumer pressure against cyanide fishing is virtually non-existent among the Chinese consumers of live food fish, though. As one Hong Kong observer noted, “being endangered actually seems to spur demand.”

**Divers and Dive Operators.** Scuba diving and snorkeling on tropical reefs is a big and growing business throughout the Indo-Pacific. Divers and dive operators have a strong interest in maintaining healthy reefs and fish populations and are often vocal in their support for marine conservation. Effective mechanisms have not yet been developed however, to fully tap this group for political and financial support in combating cyanide fishing, although some efforts such as PADI’s (Professional Association of Diving Instructors) Project Aware are working to instill greater general environmental consciousness in divers and dive operators.

Engaging these divers to combat cyanide fishing requires two elements: a) government policies must provide a structure of negative and positive incentives which make cyanide fishing unattractive for the whole range of actors involved in the trade and make sustainable alternatives attractive; and b) partnerships must be directly developed with fishing communities to assist them in abandoning the cyanide fishing tradition and instead, to adopt techniques, technologies and economic strategies that would improve their

livelihood while protecting their rich marine environment.

## **Policy Reforms to Combat Cyanide Fishing**

Cyanide fishing will not end until governments set in place effective policies to eradicate it and encourage sustainable live-reef fisheries. “Policy reform” in this context therefore, means establishment of effective institutions to monitor the live reef fish trade, enforce the laws and provide economic incentives for fishers, traders and consumers to shift to ecologically sustainable, cyanide-free reef fisheries. Experience with the Philippines’ DFRP suggests the following priority areas for policy reforms to combat cyanide fishing in the many countries of the Indo-Pacific region where it is a growing threat.

### **Policy Reforms in Live Reef Fish Source Countries**

Establish cyanide detection test (CDT) laboratory facilities at all major live-fish collection and transshipment points. A simple test to determine the presence of cyanide in live fish was developed by IMA and BFAR and has been in use for over five years in the Philippines. Currently, CDT laboratories (see map on page ?) test over 6,000 samples annually. An effective CDT testing network is key for a strong effort to reduce cyanide fishing. Without testing, authorities cannot determine whether fish have been caught with cyanide or obtain convincing evidence to prosecute violators.

To be successful, CDT labs must also be backed up by a larger network of agencies and monitoring posts, and staff trained in sampling prospective live fish shipments and rapid sample transport. Such a network requires directives on participating in sampling and monitoring from central agencies to

their local offices and training in correct sampling and shipping-to-lab procedures. Although testing is not a panacea, it is the best technical tool presently available to identify cyanide-tainted fish and provide hard evidence with which to prosecute violators.

Establish a national system of data gathering and monitoring that provides useful data for regulating the live fish trade. In order to monitor and regulate the live-fish trade, governments need accurate and appropriate data on how many individuals of a particular species were collected in a particular location, exported in a given month or year, or who did the collecting and exporting. There is no way to regulate cyanide use in the live-fish trade until such data are regularly collected.

The Philippines now collects live-fish data in ways that allow the government to keep a watch over total numbers of particular fish species moving through domestic and international airports and major international seaports, activities of exporters and other relevant information. IMA collects the data through its CDT and monitoring network and provides it to all relevant national and provincial government offices.

Establish a firmer legal framework to detect and prosecute cyanide fishing and trade in cyanide-caught fish, ultimately requiring mandatory testing and certification of all live reef fish exports. While fishing with cyanide and other poisons is banned in virtually every country in Southeast Asia and the Pacific, a much firmer legal framework is needed to make these bans effective. Once a CDT laboratory and monitoring network is established, all prospective exporters should be required to submit to random sampling and testing,

inspection and government licensing. All shipments should require a certificate showing the origin, volume and species composition of the shipment and that it has been subject to random CDT procedures and is cyanide-free.

A mandatory certification system (as will be established by law in the Philippines by the end of 1998, when draft regulations are finalized) provides key positive as well as negative incentives for exporters. Uncertifiable fish become liabilities while certified fish can obtain an “environmental market premium” in markets where importing governments regulate imports and consumers prefer fish caught without cyanide.

Local cyanide divers should be educated that what they are doing, for whatever reasons, is illegal, and that repeat offenders will be punished harshly. Targeting the big cyanide fishing interests also reduces incentives for local divers to join in the trade.

Ban or restrict the export of especially vulnerable species such as the napoleon wrasse (*Cheilinus undulatus*). Blanket bans on the live reef fish trade are both unwise and unworkable and just drive the trade underground. When the Philippines attempted a ban in parts of Palawan province several years ago, cyanide fishers continued to use the poison but killed the fish after capture and sold them in the fresh fish market.

Also, bans deprive local communities of one of the most lucrative sources of income to be found in the coastal zone. The cyanide-free capture of live fish at sustainable levels with a fair return to local fishers should be the objective of live fishery policy.

That said, the pressures on particular species may become so great that governments may want to ban altogether their capture and



*The entire family gets involved in making nets and other gears in the barrier net collection method.*

export. For the napoleon wrasse, highest-valued of the live food-fish species, over-exploitation may soon reach critical levels, warranting a complete ban. A ban is unlikely to stop the napoleon wrasse trade altogether, but it may reduce the total volume of catch.

Regulate the import, distribution and use of cyanide. Cyanide has many legitimate uses in industry but a considerable amount of the poison is diverted into the live-fish collection business. In most countries of the Indo-Pacific region, import, distribution and use of

cyanide is virtually unregulated. To remedy this problem, a draft “Sodium Cyanide Act” that would strictly regulate the import and use of cyanide was introduced in the Philippine House of Representatives in late 1996. The draft bill requires all cyanide imports to be authorized in advance by the government and that the poison’s sale to be “strictly controlled.”

While this type of law will undoubtedly be difficult to enforce, it should nonetheless increase the price of cyanide on the black market thus, making non-destructive techniques of live fish capture more economically attractive to fishers.

Address corruption within vulnerable government units such as fisheries, the navy, customs and police forces. Governments can only eliminate corruption if officials at the highest levels take firm public stands against it and when corrupt officials are dealt with harshly under the law. The media can help by exposing instances of corruption related to cyanide fishing in the press. Finally, an effective CDT lab and monitoring network, backed up by community-based monitoring, can provide government with a great deal of information about potential corruption problems.

Mount public awareness campaigns in the media and schools. NGOs and government leaders should work systematically to build public awareness about the threat of cyanide fishing and the steps that must be taken to stop it. Press releases, symbolic public events and the steady provision of information to journalists are all tools that can raise public awareness and strengthen other anti-cyanide fishing incentive measures.

Cyanide fishing is a learned behavior that becomes a tradition over time. By teaching the cyanide-free tradition in coastal-area schools

from an early age, countries can help to ensure that children are fully aware of the alternatives to cyanide fishing and their positive consequences.

Divers are also potential allies in raising awareness and gathering information. In the Philippines in 1994, IMA initiated a voluntary Status of Coral Reefs survey, or SCORE, using a simple questionnaire on reef conditions which divers were asked to complete and return by mail. This provided the first new primary data on the condition of Philippine coral reefs since a survey done in 1983 including reports on suspected cyanide fishing locations.

#### ***Policy Reforms in Live Reef Fish Importing Countries***

As in any transnational trade, source countries for live reef fish need the cooperation of importing country governments if their efforts to stem cyanide use at home are to be effective. At present, no importing country requires proof that imported live fish were not caught using cyanide or penalizes firms that import fish caught with the poison. Key steps for setting up more helpful incentives in importing countries include the following:

Monitor imports of live fish and provide data to exporting countries. Importing country governments should establish data collection and storage systems to keep track of the number by species of live fish imported and the country of origin. They should then share that data with relevant government agencies in source countries. In this way, monitoring agencies in source countries can compare their own export statistics with import statistics and thus determine the validity of those export statistics—provided exporting countries begin to collect detailed export data as the Philippines is already doing.

Phase in a legal requirement that all live reef fish imports be certified as cyanide-free. When live fish exporting countries require cyanide-free certification for all exports, as the Philippines is about to do, importing countries should reciprocate by requiring all live-fish importers to provide certification from the source-country government that the fish they are importing have been certified as cyanide-free. Although, Indonesia and other exporting countries do not currently have testing and certification systems in place, importing country governments, and importers, can move in this direction by gradually phasing in a prohibition on non-certified live-fish imports, simultaneously working with exporting countries to develop testing and certification procedures, laws and technical capacities.

Provide donor assistance to live-fish exporting countries to help them combat cyanide fishing. Live-fish importing countries that are providers of development assistance (e.g. United States, Canada, Japan and the countries of the European Union) should offer financial and technical assistance to exporting countries to assist them in developing Destructive Fishing Reform Programs and certification procedures. The Asian Development Bank has set a good example in this regard, providing nearly \$1 million for the Philippines’ DFRP as part of a new Fisheries Sector Loan slated for implementation in mid-1998. The United States Agency for International Development is also providing support through a cooperative agreement with IMA in the Philippines and Indonesia.

Strengthen consumer awareness about the impacts of cyanide fishing. As in other areas of environmental certification, it is crucial to build consumer awareness.

It is also important to note that **testing of live-fish imports on their arrival in importing countries is not an effective strategy and is likely to be counterproductive.** Cyanide metabolizes out of fish relatively rapidly and tests conducted at import destinations are likely to be negative for cyanide, regardless of whether the fish was caught with cyanide or not.

### **Community -based Strategies**

Without fishers in the equation, there is simply no solution to the cyanide fishing problem. There is no policy, law, or technology that can replace the need to work directly with cyanide fishers. Training, community organization, income enhancement and establishment of community-based coastal management systems in communities currently using cyanide or in those vulnerable to its introduction is the core partnership necessary to end cyanide fishing.

***Train fisherfolk in cyanide-free fishing technologies.*** When fishers are presented with effective cyanide-free technologies for capturing live-food and aquarium fish and given greater awareness about the legal, health and ecological risks of cyanide fishing, many choose to convert to cyanide-free techniques.

In the Philippines, IMA has trained over 2,000 cyanide fishers in cyanide-free live-fish capture techniques. A typical one-week local training program targets 20-30 fishers who are currently using cyanide to catch either live food or aquarium fish and have developed an interest, whether through IMA awareness activities or their own experiences, in learning cyanide-free techniques.

These sessions are specialized to address specific types of live-fish capture. Fishers who primarily collect aquarium species are trained

in the use of fine-mesh barrier nets. Fishers for whom food fish are the target species are trained in hook-and-line techniques for capturing groupers and, importantly, simple techniques for decompressing the air bladders of captured fish to ensure their post-harvest survival and health. Because particular grouper species favor distinctive bait sizes and shapes, bait preparation is a key part of the hook-and-line training as well.

Following the “classroom” sessions, the fishers and trainers carry out four days of in-water training in either net or hook-and-line techniques. The intensive one-week training is followed by a three-week follow-up period of monitoring by the trainers to ensure that trainees have mastered fishing techniques and proper post-harvest care. Other activities such as organizing local fishing associations and cooperatives and developing value-added livelihood activities take more time and involve periodic follow-up participation by the trainers over months or years.

***Enhance local income from the live-fish trade and other sources.*** Fishers’ incentives to forsake cyanide fishing increase—and partnerships between fishing communities and outsiders such as IMA grow stronger—when local income from sustainable use of marine and other local resources rises. Beyond training in cyanide-free fishing techniques, IMA therefore, works with fishing communities to promote a variety of livelihood enhancement activities.

When fishers can get more money for cyanide-free live fish, they are extremely enthusiastic about converting to cyanide-free techniques. By helping fishers obtain post-harvest equipment and know-how and assisting them develop their own marketing

cooperatives and outlets, the local share of the profits can be increased.

In the area of North Sulawesi, Indonesia where IMA initiated a training program in July 1997, for example, the local partner organization is the provincial cooperative of retired military veterans. By providing the fishers with diving compressors (previously, the only one in the village was owned by a live-fish broker with a local monopoly on the trade) and offering higher prices for fish through the cooperative, the program will break the power of the middleman and help the fishers obtain higher prices for the cyanide-free aquarium fish they capture. Fortunately, the cooperative’s director is also a dive-tour operator concerned about the effects of cyanide on the reefs which have made the province a premier dive destination.

Few fishing communities however, subsist wholly from the live-fish trade. They pursue a “portfolio” of economic strategies combining live fish, fresh and dried fish, agriculture, wage labor and other activities. An effective livelihood enhancement strategy needs to target all of these activities and introduce new ones where an opportunity exists.

***Strengthen community-based management of local fisheries and reefs.*** Partnerships with fishing communities must go beyond training and income enhancement. Sustainable coastal management requires the participation and support of the local communities that directly earn their living from the sea, in cooperation with government agencies—an arrangement often called “co-management.” Cyanide fishing, blast fishing, coral mining, mangrove destruction and many other sources of coastal degradation can only be slowed when the

communities on the front line become central players in protection efforts and beneficiaries of sustainable management.

In some areas of eastern Indonesia and the western Pacific, long-standing customary systems of marine tenure and management provide a sound institutional basis for community-based efforts. Where they exist, governments should recognize and support these customary systems and provide technical and financial inputs to assist traditional communities in adapting to rapid economic and technological changes.

Most coastal communities in Southeast Asia however, do not possess functioning customary systems for managing and conserving coastal resources. Many are comprised of a heterogeneous mix of immigrants and natives who lost such systems long ago. This loss does not mean that viable community management systems cannot be nurtured. The Philippines, where customary coastal management systems have vanished, has the most extensive and active community-based coastal resources management (CBCRM) initiatives in Southeast Asia.

***Build the capacity of local communities to serve as front-line agents in anti-cyanide monitoring and enforcement.*** Building on training, community organization and livelihood enhancement initiatives, an effective destructive fishing reform program needs to enlist local communities as partners in the specific tasks of monitoring and enforcement. Local fishers are on the water far more regularly and know their areas better than government fisheries officers. With minimal training, these groups can serve as an “early warning network,” letting officials know when cyanide fishing operators appear in an area.

In the Philippines, members of local fishers’ organizations and cooperatives have been deputized as “fish wardens” to patrol and monitor their fishing grounds.

Although, local community groups cannot be expected to directly confront well-organized—and often well-armed—cyanide fishing vessels, they can perform important norm-setting and self-policing activities within the community. After all, a “community” does not decide to renounce cyanide fishing. More often, one group of individuals within a community may make that decision, while others continue using cyanide. Peer pressure is thus important in spreading the cyanide-free tradition throughout the community.

## **Conclusion**

Cyanide fishing is not the only threat to the coral reefs and other coastal ecosystems of the Indo-Pacific region. But the training and community-organization strategies essential to stopping cyanide fishing also provide an important catalyst for communities to address a broader range of threats to their local reef environment. Four unique characteristics of cyanide fishing provide hope that it can be stopped or at least significantly reduced faster than some of the other threats to coral reefs.

- Cyanide fishing is relatively localized and a discrete target for control efforts since it is generally focused on isolated reefs far from the effects of coastal habitat conversion and sedimentation.
- Cyanide fishing is a relatively recent technique and the practice is not yet deeply embedded in local cultures and economies.
- Cyanide fishing targets a very

specific and “high-end” market—live food and aquarium fish—with some food species selling for as much as \$180 per kg and some aquarium species fetching \$350 per individual making the consumers and their suppliers an identifiable and a fairly limited group.

- There is a clear and not-too-complicated set of actions to address the problem if governments set the right incentives in place and partnerships are developed among fishing communities, exporters and importers of live-fish, scientists and NGOs.

The difficulties in stopping cyanide fishing should not be underestimated. It is important to note though, that people have long captured and sold live fish without using cyanide, and they still do in many places such as the Caribbean and Hawaii where live aquarium fish have been collected with fine-mesh nets for decades. But cyanide fishing is fast becoming a deadly tradition in the Philippines, handed down from father to son. It will soon be just as firmly established in Indonesia and other countries throughout the Indo-Pacific. Our challenge is to eradicate the growing cyanide tradition and replace it with a cyanide-free fishing tradition.

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# The Fisheries Code of 1998: Something Old...Something New... Something Better?

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For fishery resource stakeholders and for the broader sector encompassing integrated coastal management, the passage of Republic Act (RA) 8550 or “The Philippine Fisheries Code of 1998” (hereinafter referred to as the “Code”) by the Tenth Congress on February 19, 1998 is the culmination of many years of feverish research, critical analyses, representations, “mis”representations, compromises, consultations, technical working group meetings and hearings. After all, two past congresses, the equivalent of at least ten years, have attempted to pass a Fishery law of the same scope and breadth. The fact that the Code was passed now, and not later, attests to the urgency of improving the legal and institutional framework for fishery management, going beyond the developmental thrust of its predecessor notably, Presidential Decree (PD) 704.

## Something Old

The “old” features of the Code comprise two facets. First is the consolidation of the body of fishery laws by incorporating existing ones. This facilitates enforcement, research, and local legislation. For example, the Code

has consolidated previous laws dealing with electrofishing (RA 6541); blast and cyanide fishing (PD 704 as amended by PD 1058); use of fine mesh nets (Fishery Administrative Order or FAO 155, series of 1986 and FAO 155-1, s.1994); gathering of corals (PD 1219 as amended by PD 1698); and the use of superlights (Department of Agriculture [DA]-Department of Interior and Local Government [DILG] Joint Administrative Order of April 1996).

The second deals with prevailing interpretations of existing laws that are upheld by the Code. Notable here are the forms of limiting access, the jurisdiction of local government units (LGU), priority on assigning use rights and enforcement.

**Forms of limiting access.** The establishment of closed seasons and closed areas, specifically fish refuges and sanctuaries, is a form of limiting access (temporal and spatial). Before the Code, the *Sangguniang Bayan* (Municipal Council) and Mayor had jurisdiction over the establishment of closed seasons and closed areas within municipal waters and the concerned government agency, through its Secretary, in waters beyond the municipal boundaries. This has been reiterated by

**BOX 1****Functions and Responsibilities**

- prepare and implement a Comprehensive National Fisheries Industry Development Plan;
- issue licenses for the operation of commercial fishing vessels;
- issue identification cards free of charge to fishworkers engaged in commercial fishing;
- monitor and review joint fishing agreements between Filipino citizens and foreigners who conduct fishing activities in international waters, and ensure that such agreements are not contrary to Philippine commitment under international treaties and convention on fishing in the high seas;
- formulate and implement a Comprehensive Fishery Research and Development Program, such as, but not limited to, sea farming, sea ranching, tropical/ornamental fish and seaweed culture, aimed at increasing resource productivity, improving resource use efficiency, and ensuring the long-term sustainability of the country's fishery and aquatic resources;
- establish and maintain a Comprehensive Fishery Information System;
- provide extensive development support services in all aspects of fisheries production, processing and marketing;
- provide advisory services and technical assistance on the improvement of quality of fish from the time it is caught (i. e. on board fishing vessel, at landing areas, fish markets, to the processing plants and to the distribution and marketing chain);
- coordinate efforts relating to fishery production undertaken by the primary fishery producers, LGUs, FARMCs, fishery and organizations/cooperatives;
- advise and coordinate with LGUs on the maintenance of proper sanitation and hygienic practices in fish markets and fish landing areas;
- establish a corps of specialists in collaboration with the Department of National Defense, Department of the Interior and Local government, and the Department of Foreign Affairs for the efficient monitoring, control and surveillance of fishing activities within Philippine territorial waters and provide the necessary facilities, equipment and training therefore;
- implement an inspection system for import and export of fishery/aquatic productions and fish processing establishments consistent with international standards to ensure product quality and safety;
- coordinate with LGUs and other concerned agencies for the establishment of productivity enhancing and market development programs in fishing communities to enable women to engage in other fisheries/economic activities and contribute significantly to development efforts;
- enforce all laws, formulate and enforce all rules and regulations governing the conservation and management of fishery resources, except in municipal waters, and to settle conflicts of resource use and allocation in consultation with the national FARMC, LGUs and local FARMCs;
- develop value-added fishery-products for domestic consumption and export;
- recommend measures for the protection/enhancement of the fishery industries;
- assist the LGUs in developing their technical capability in the development, management, regulation, conservation and protection of the fishery resource;
- formulate rules and regulations for the conservation and management of straddling fish stocks and highly migratory fish stocks; and
- perform such other related functions which shall promote the development conservation, management, protection and utilization of fisheries and aquatic resources.

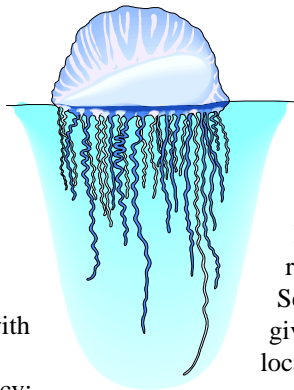
the Code, with additional clarification: a) that of prior consultation with the Fisheries and Aquatic Resources Management Council (FARMC); and b) in cases where the concerned government agency wishes to establish a closed season within municipal boundaries, concurrence and approval has to be secured from the appropriate LGU and FARMC.

***Jurisdiction of local governments.*** The Code reiterates the responsibilities of municipal/city governments including the:

- a) enactment of appropriate ordinances in accordance with the National Fisheries Policy;
- b) enforcement of all fishery laws, rules and regulations as well as valid fishery ordinances;
- c) issuance of licenses for the operation of fish pens, cages, traps and other structures within duly designated areas in municipal waters.

The ordinance-making function of local governments is enumerated by the Local Government Code (LGC) in Sections 447(a)(1)(vi) for the *Sangguniang Bayan* and 468(a)(1)(vi) for the Provincial Board or *Sangguniang Panlalawigan*. It is not necessary for LGUs to seek approval of such ordinances from national agencies (Sec. 534(f) of the LGC which repeals Sec. 4 of PD 704); and LGUs may enact ordinances which have not been dealt with sufficiently by any national law provided that it does not contradict any other. Enforcement of all fishery laws, rules and regulation, both nationally and locally promulgated,

is within the jurisdiction of the LGU as provided for by Section 17 of the LGC. The issuance of licenses for the operation of fish pens, cages, traps and other structures, municipal fishing vessels, concessions and the delineation of demarcated fishing areas are within the purview of the LGU through the local council. The Code has not changed these provisions although the consultative role of FARMCs has been stressed.



***Priority to municipal fisherfolk.*** The preferential use rights to subsistence fishers for the use of communal fishing and marine areas is guaranteed by the Constitution (Art. XIII, Sec. 7) and also by the LGC (Section 149). This is reiterated by the Code in Section 7, priority should be given to resource users in the local communities adjacent to municipal waters; and in Section 17, through organized fisherfolk organizations.

***Enforcement.*** The full breadth of the enforcement spectrum is dealt with sufficiently by the Code. The lowest level of enforcement begins with the citizenry's vigilance in averting crimes and where such are committed, to act as responsible resource stewards. Strengthening the FARMCs is a thrust that will enhance vigilance amongst fisher communities.

The next level of enforcement occurs when the crimes are actually committed. The Code maintains the multiplicity of government agencies and other entities tasked to enforce fishery laws. Persons and deputies who are authorized to enforce the code include: law enforcement officers of the DA, Navy, Coast Guard, Philippine National Police-Maritime Command, law enforcement officers of the LGU and other government enforcement agencies,

and deputy fish wardens (government officials and employees, *Punong Barangay* or Barangay chairpersons, and officers and members of fisherfolk organizations). Such sharing of responsibilities enhance strength and coverage of enforcement; nevertheless, such sharing, without clear delineation of tasks both from the geographical and legal perspective can be a bane.

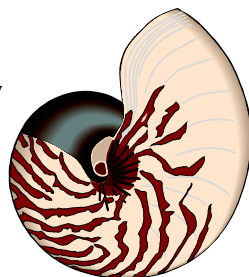
## **Something New**

The section on definition of terms is an indication of the breadth and magnitude of the Code. A total of 73 definitions are provided including those that have been previously defined in existing national laws and fishery administrative orders (e.g. fine mesh net, electrofishing, superlight, artificial reef). Definitions have also been provided for key management concepts such as catch ceiling, fishery management areas, limited access, maximum sustainable yield (MSY), resource rent and total allowable catch.

***Limiting access.*** More than mere definitions, these concepts represent the institutionalization of limiting access and use rights. For example, fees and other fishery charges shall be based on **resource rent**. This concept considers social benefits from using the fishery as a resource, over and above financial profits of users. By considering only the latter, there is a tendency to expand fishing effort (both labor and capital) to levels at which society is suffering a net loss. Akin to the paradigm of resource rent is that of MSY which is related to quotas and total allowable catch. Estimating such parameters has traditionally involved a huge and lengthy time series of data; moreover, the expertise is lodged in very few institutions. It becomes essential to develop appropriate and

understandable guidelines to be used by both national as well as local level institutions preferably with the use of available data.

The Code also provides for some relatively “radical” procedures to limit access including the limited entry of both commercial and municipal fishing vessels in areas deemed as overfished by either the DA or the concerned LGU. The term overfishing however, is not defined



in the Code; thus, it is presumed that guidelines on determination of overfishing should be developed. Another type of control is the absolute prohibition on the use of active (e.g. trawl, purse seine, Danish seine and bag net) fishing gears in municipal waters.

**People empowerment.** The Code highlights the need for people empowerment by consolidating and strengthening Executive Order (EO) 240, the creation of FARMCs (Table 1). FARMCs act as consultative bodies to LGUs in: a) determining priorities on fishing activities of municipal fisherfolk; b) maintaining a registry of municipal fishing vessels by gear and boat; c) assisting the LGU in formulating mechanisms to include or exclude fisherfolk or groups in the use of municipal

TABLE 1. ASSESSMENT OF INTERPRETATIONS OF SELECTED FISHERY MANAGEMENT ISSUES BASED ON PRE AND POST FISHERIES CODE REGIMES.

| Issue   | Laws existing prior to the Fisheries Code and interpretations thereof  | New Fisheries Code   |
|---|--|--|
| 1. Commercial fishing in municipal waters                                   | Commercial fishing is not allowed within the 15-km municipal waters (Jurisdictional Guidebook, Q 5.1.4, pp. 5-6).  | The municipal or city government may, through its local chief executive and acting pursuant to an appropriate ordinance, authorize or permit small and medium scale commercial fishing vessels to operate within the 10.1 to 15 kilometer area (Sec. 18).  |
| 2. Municipal fisherfolk fishing in waters beyond their municipal boundaries | There is no national law that prohibits municipal fishers from fishing beyond their municipal boundaries; however, the <i>Sangguniang Bayan</i> may promulgate rules and regulations regarding the issuances of fishing boat licenses and the possibility of prohibiting non-resident municipal fishers from fishing in said municipal waters (Jurisdictional Guidebook, Q. 5.1.5, pp. 5-7). | The LGU shall maintain a registry of municipal fisherfolk, for the purpose of determining priorities among them, of limiting entry into the municipal waters, and of monitoring fishing activities and/or other related purposes; <i>and</i><br>The LGU, in consultation with the FARMCs, shall formulate the necessary mechanisms for inclusion or exclusion procedures that shall be most beneficial to resident fisherfolk (Sec. 19). |
| 3. Disposition of public lands for fishery purposes                         | Public lands suited for fishpond operations shall not be disposed or alienated;<br>There is no express provision on the granting of priority rights to fisherfolk organizations (PD 704).  | Public lands suited for fishpond operations shall not be disposed or alienated; Lands that are declared as available for fishpond development will be turned over to qualified fisherfolk cooperatives/associations; However, upon expiration of existing FLAs, the current lessees shall be given priority and be entitled to an extension of 25 years in the utilization of their respective leased areas (Sec. 45).                   |
| 4. Lease area for fishponds   | For individuals, 50 hectares; for associations and corporations, 500 hectares, with possibility to extend lease area subject to approval of the Secretary (PD 704)   | For individuals, 50 hectares ( <i>unchanged</i> ); for corporations, or fisherfolk organizations, 250 hectares (Sec. 45 a)   |
| 5. Establishment of FARMCs  | EO 240 recommends the creation of FARMCs in coastal barangays, cities and municipalities. However, in the absence of penal provisions to the contrary, the LGU is not obligated to establish a FARMC (Guidebook, Q. 5.7.1, pp. 5-46).  | The establishment of FARMCs is obligatory; FARMCs should be established at the national level and in all municipalities abutting municipal waters; FARMCs shall be formed by fisherfolk organizations/cooperatives and non-government organizations in the locality and be assisted by LGUs and other government entities (Sec. 69).   |

waters; d) determining license fees, catch ceilings, closed seasons, fish sanctuaries and/or refuges; and e) the enactment of appropriate ordinances.

***Integrated management.***

Within the purview of integrated management is the Code’s realization and acceptance of a broader environment that nurtures the fishery resource. This is affirmed by the Code’s subscription to the Environment Impact Statement system (Sec. 12) and supported by the drafting of a code of practice for sustainable aquaculture. The imposition of penalties against entities causing aquatic pollution (presumably including point and non-point sources!) further reinforces the wider environmental framework. In the area of habitat management, the Code provides that at least 25% but no more than 40% of bays, foreshore lands, continental shelves or any fishing ground shall be set aside for the cultivation of mangroves to strengthen the habitat and spawning grounds of fish. Lastly, the Code further posits that management of contiguous fishery areas should not be made based on political subdivisions but resource management systems.

***Institutional strengthening.***

The Bureau of Fisheries and Aquatic Resources (BFAR) could not be considered as a “new” creation, albeit, the restoration of its line functions and a general institutional strengthening can very well be an improved feature. Among the general provisions of the Code in relation to BFAR are:

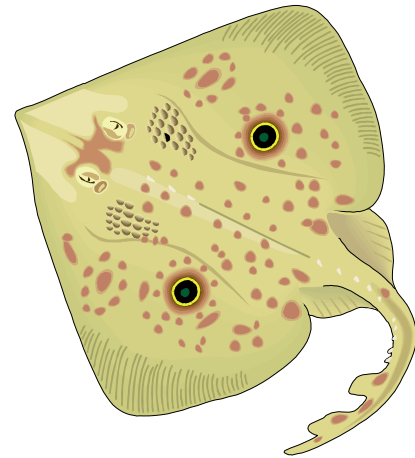
- the appointment of an Undersecretary of Fisheries and Aquatic Resources;
- its reconstitution as a line bureau under the DA with functions outlined in the Box on page??; and

- that as a line bureau, the BFAR shall be headed by a Director and assisted by two assistant Directors, one each for administrative and technical services; regional, provincial and municipal offices are to be established if deemed appropriate and necessary.

***Caveat: the need for implementing guidelines.*** These new concepts and provisions imply the necessity of developing implementing guidelines or mechanisms to avert confusion and varying interpretations. Specific sections in the code explicitly mention the need for developing implementing guidelines for the :

- licensing of fishing gear for commercial fishing vessels (Sec. 29);
- duty and tax rebates on fuel consumption for commercial fishing operators engaged in high seas fisheries (Sec. 35c);
- operation of radio communication facilities in coordination with the National Telecommunications Commission (Sec. 43);
- number and wattage of superlights to be regulated by the DA (Sec. 44);
- identification of species which are by nature small but already mature in relation to exemption in using fine mesh net; also, the mesh size to be fixed by the DA (Sec. 89);
- determination of gears destructive to coral reefs and other marine habitats (Sec. 92);
- list of endangered species outside of CITES (Convention on the International Trade of Endangered Species) (Sec. 97); and

- list of breeders/spawners (Sec. 98).
- Other sections implicitly state the need to develop or affirm existing guidelines such as:
- Guidelines on reversion of abandoned, undeveloped and underutilized fishponds (Sec.



49). The DA-Department and Environment and Natural Resources (DENR) Joint General Memorandum of Agreement Order No. 3, s1991, prescribes the guidelines for the reversion of Fishpond Lease Agreements (FLA) into mangrove forest lands and the DA-Department of Agrarian Reform AO No. 18, s1991, prescribes the guidelines to be followed in the redistribution of cancelled and/or expired FLAs to agrarian reform beneficiaries.

- Determination of catch ceilings (Sec. 101) which emanates from the DA.
- Guidelines on determining point and non-point sources of aquatic pollution and of monitoring and enforcement thereof. Collaboration with other government agencies such as the DENR and Coast Guard need to be specified.

| Illegal Fishing Activity  | Pre-RA 8550 Law   | RA 8550 Law  | Comment   |
|---------------------------|---|--|---|
| Blast or dynamite fishing | <p><b><i>PD 704; as amended by PD 1058</i></b></p> <ul style="list-style-type: none"> <li>• Mere possession of explosives: imprisonment ranging from 12 to 25 years</li> <li>• Fishing with explosives: imprisonment from 20 years to life imprisonment provided that if the use of explosives results in <ul style="list-style-type: none"> <li>• Physical injury to any person; the penalty shall be imprisonment ranging from 25 years to life imprisonment.</li> <li>• The loss of human life, the penalty shall be life imprisonment to death.</li> </ul> </li> <li>• Knowingly possessing, dealing in, selling or in any manner disposing of, for profit illegally caught/gathered fisheries: imprisonment ranging from 5 to 10 years.</li> </ul> | <ul style="list-style-type: none"> <li>• Mere possession of dynamite, other explosives, and chemical compounds which contain combustible elements: imprisonment ranging from 6 months to 2 years.</li> <li>• Fishing with explosives: imprisonment ranging from 5 to 10 years without prejudice to the filing of separate criminal cases when the use results to physical injury or loss of human life.</li> <li>• Dealing in, selling, or in any manner disposing of, for profit illegally caught/gathered fisheries: imprisonment ranging from 6 months to 2 years.</li> <li>• The fishing vessels, fishing equipment, and catch shall be forfeited.</li> </ul>              | <ul style="list-style-type: none"> <li>• Penalty has decreased.</li> <li>• Penalty has decreased.</li> <li>• Penalty has decreased but ignorance of the fish condition is not an alibi.</li> <li>• Additional penalty.</li> </ul>       |
| Cyanide fishing           | <p><b><i>PD 704; as amended by PD 1058</i></b></p> <ul style="list-style-type: none"> <li>• Fishing with noxious or poisonous substances: imprisonment ranging from 8 to 10 years, provided that if the use of substance results in</li> <li>• Physical injury to any person; the penalty shall be imprisonment from 10 to 12 years; or</li> <li>• The loss of human life, the penalty shall be imprisonment from 20 years to life or death.</li> <li>• Knowingly possessing, dealing in, selling or in any manner disposing of, for profit illegally caught/gathered fisheries: imprisonment ranging from 5 to 10 years.</li> </ul>  | <ul style="list-style-type: none"> <li>• Mere possession of noxious or poisonous substances such as sodium cyanide: imprisonment ranging from 6 months to 2 years.</li> <li>• Fishing with noxious or poisonous substances such as sodium cyanide: imprisonment ranging from 5 to 10 years without prejudice to the filing of separate criminal cases when the use results to physical injury or loss of human life.</li> <li>• Dealing in, selling, or in any manner disposing of, for profit illegally caught/gathered fisheries: imprisonment ranging from 6 months to 2 years.</li> <li>• The fishing vessels, fishing equipment, and catch shall be forfeited.</li> </ul> | <ul style="list-style-type: none"> <li>• New prohibition and penalty.</li> <li>• Penalty has decreased.</li> <li>• Penalty has decreased but ignorance of the fish condition is not an alibi.</li> <li>• Additional penalty.</li> </ul> |
| Electrofishing            | <p><b><i>RA 6541</i></b></p>  | <ul style="list-style-type: none"> <li>• Imprisonment ranging from 2 to 4 years.</li> <li>• Mere possession of equipment or device for electrofishing: imprisonment ranging from 6 months to 2 years.</li> <li>• Imprisonment ranging from 5 to 10 years without prejudice to the filing of separate criminal cases when the use results to physical injury or loss of human life.</li> <li>• Dealing in, selling, or in any manner disposing of, for profit illegally caught/gathered fisheries:</li> </ul>   | <ul style="list-style-type: none"> <li>• New prohibition and penalty.</li> <li>• Penalty has increased.</li> <li>• New prohibition and penalty.</li> <li>• Additional penalty.</li> </ul>   |

|   |   |   |   |
|---|---|---|---|
| Use of fine mesh nets   | <p><b>FAO 155, s1986</b></p> <ul style="list-style-type: none"> <li>• A fine of not less than PhP500.00 but not more than PhP5,000.00 or imprisonment of not less than 6 months to 4 years, or both such fine and imprisonment, at the discretion of the court: Provided, however, that the Director of BFAR is empowered to impose upon the offender an administrative fine of not more than PhP5,000.00 including the confiscation of the fishery nets or paraphernalia and the fish catch.</li> </ul>  | <p>imprisonment ranging from 6 months to 2 years.</p> <ul style="list-style-type: none"> <li>• The fishing vessels, fishing equipment, and catch shall be forfeited.</li> </ul>   |   |
| Exportation of <i>bangus</i> (milkfish) fry   | <p><b>Section 36 PD 704</b></p> <ul style="list-style-type: none"> <li>• Imprisonment of 1 year to 5 years or a fine of PhP1,000.00 to PhP5,000.00 or both.</li> </ul>  | <ul style="list-style-type: none"> <li>• A fine from PhP2,000.00 to PhP20,000.00 or imprisonment from 6 months to 2 years, or both such fine and imprisonment at the discretion of the court: Provided, that if the offense is committed by a commercial fishing vessel, the boat captain and the master fisherman shall also be subjected to the penalties provided herein; Provided, further, that the owner/operator of the commercial fishing vessel who violates this provision shall be subjected to the same penalties herein: Provided, finally, that the Department is hereby empowered to impose upon the offender an administrative fine and/or cancel his permit or license or both.</li> <li>• Imprisonment of 8 years, confiscation of the breeders, spawners, eggs or fry or a fine equivalent to double the value of the same, and revocation of the fishing and/or export license/permit.</li> </ul> | <ul style="list-style-type: none"> <li>• Fine has increased but duration of imprisonment has decreased. Included also as liable to the law are the boat captain, master fisherman and the owner/operator of the commercial fishing vessel.</li> <li>• Severity of penalty has increased.</li> </ul> |
| Fishing in Philippine waters with the use of <i>muro-ami</i> (drive-in-net), <i>kayakas</i> , scareline or <i>serosca</i> ) | <p><b>FAO 163, s1996</b></p> <ul style="list-style-type: none"> <li>• Imprisonment of 6 months to 4 years or fine of PhP500.00 to PhP5,000.00 or both.</li> </ul>   | <ul style="list-style-type: none"> <li>• Imprisonment of 2 to 10 years or a fine of PhP100,000.00 to PhP500,000.00 or both such fine and imprisonment at the discretion of the court to the operator, boat captain, master fisherman.</li> <li>• The catch and gear used shall be confiscated.</li> </ul>   | <ul style="list-style-type: none"> <li>• Severity of penalty has increased. Included as liable to the law are the operator, boat captain, and master fisherman.</li> <li>• Additional penalty.</li> </ul>   |
| Operation of trawls and purse seine   | <p><b>FAO 156, s1986</b></p> <ul style="list-style-type: none"> <li>• A fine of not less than PhP500.00 but not more than PhP5,000.00 or imprisonment of not less than 6 months to 4 years, or both such fine and imprisonment, at the discretion of the court to those that fish using trawl or purse seine within 7 km from shorelines of all provinces: Provided, however, that the Director of BFAR is empowered to impose upon the offender an administrative fine of not more than PhP5,000.00 including the confiscation of the fishery nets or paraphernalia and the fish catch.</li> </ul> | <ul style="list-style-type: none"> <li>• The boat captain and master fisherman of the vessel using active gears such as trawls, purse seines, bag nets, Danish seines, <i>paaling</i>, drift gill nets, tuna longlines, and other fishing devices characterized by gear movements and/or pursuit of target species shall suffer imprisonment from 2 to 6 years. The owner/operator of the vessel shall be fined from PhP2,000.00 to PhP20,000.00 upon the discretion of the court: provided that if the owner/operator is a corporation, the penalty shall be imposed on the chief executive officer of the Corporation: provided further that if the owner/operator is a partnership the penalty shall be imposed on the managing partner.</li> <li>• The catch shall be confiscated.</li> </ul>   | <ul style="list-style-type: none"> <li>• The number of gears covered has increased. Penalty has increased. The penalty of the fishers differ from the penalty of the owner/operator.</li> </ul>   |

## Something Better

First, the Code consolidates previous laws governing fishery resources and affirms traditional “working” models. The important role of LGUs in legislation, enforcement and overall management is stressed including that of the corollary features of devolution.

Interventions such as sanctuaries, closed seasons and licensing of municipal fishing vessels are affirmed to be within the purview of the local government. However, a traditional

model which was carried over and is questioned for its seeming failures is that of law enforcement. As discussed in the previous section, the multiplicity of agencies involved in law enforcement is a bane.

Second, the Code resolved conflicts between existing fishery laws and the Local Government Code. The issue of commercial fishing in municipal waters is one such issue that has been settled and clarified (Table 1). Although, other sectors would like to focus on the downside of this issue, i.e., entry of commercial vessels up to 150 gross tons in municipal waters, this article invokes the power of LGUs to determine this situation; otherwise, the default condition is for no commercial fishing to occur. Meanwhile, the power of LGUs to exclude non-resident fishers as a form of limiting access is affirmed and strengthened by the Code (Table 1). This clarifies the notion that all Philippine waters is owned by

the state and should be accessible to any citizen. Residents of particular municipalities shall have priority over the use of its municipal waters.

Third, the Code introduces novel concepts for limiting access, subscribes to the integrated management framework and provides ample support mechanisms for community participation.

Fourth, the Code reflects the way society views crimes and offenses related to the fishery resource. There is a prevailing pattern of viewing crimes against fishery

resources as a grave offense.

This is reflected in the higher level of fines, facilitation in the handling of evidence and additional prohibitions (Table 2). In cases (e.g. blast and cyanide fishing) where the imprisonment period was shortened *vis-à-vis* the pre-RA 8550 regime, additional prohibitions were incorporated and handling of evidence was made more simple. The final level of enforcement is lodged with the Courts. This ultimate and definitive step is dogged by problems that beset the

augmentation of prosecutorial efforts dedicated to fishery-related crimes and offenses. This will help in solving some of the enforcement bottlenecks.

Fifth, the Code restored essential line functions to BFAR. This should not be viewed as a re-centralization of fisheries functions rather, as a technical support to LGUs especially in the implementation of new management interventions such as MSY, total allowable catch and municipality-based licensing.

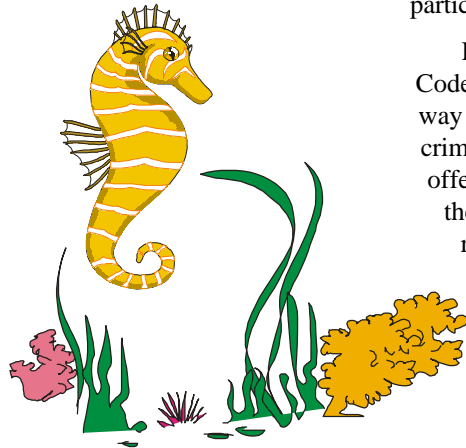
There are more achievements and probably some imperfections and misgivings, depending on who acts as the evaluator. However, the Fisheries Code does provide a solid framework to address coastal and fishery management issues.

### Acknowledgement

Many thanks to Mr. Leo Pura, Policy Research Assistant of CRMP, who helped develop the penalty tables and Mr. Pol Zara of the Office of Senator Leticia Shahani.

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entire justice system (such as low ratio of prosecutors/judges to offenders) and those that are unique to fisheries (handling of evidence, witness support and protection). The Code provides for the

# Banacon, the First Mangrove Community-based Forestry Management Area in a Protected Area

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Banacon Island has come a long way since Nong Denciong's initial effort at mangrove farming in 1959 (see related story on page \_\_). From a humble plantation eked out to provide household needs, it has since put Banacon on the map. Banacon is now known for its vast tracts of *bakauan* (mangrove) plantations.

From 1984 to 1992, Banacon was made a model for the Community-based Mangrove Reforestation component of the World Bank funded Central Visayas Regional Project. The island has also been a popular site with fishermen's associations for cross visits; local and foreign scientists doing research studies; and policy makers who are challenged by the biggest and most successful *bakauan* plantation initiated by a community without assistance from the government. Fulgencio Factoran Jr. and Victor O. Ramos, former Department of Environment and Natural Resources (DENR) Secretaries and even Fidel V. Ramos, President of the Republic of the Philippines, were keen enough to visit the area. At present, there is a pending bill by Congressman Aumentado of the Second Congressional District of Bohol declaring the island an eco-tourism site.

Banacon Island is located seven kilometers north of Getafe, Bohol, Philippines. It consists of 30 hectares of Alienable and Disposable land and 37 hectares of timberland. The island is one of several islets within the Danajon Bank. The other two adjacent islets west of Banacon, Jaguliao and Nasingin, are also surrounded with plantations. In the east, Calituban island has 300 hectares of young plantation. This makes Getafe the

center of community-based mangrove forest management, with Banacon as the flagship with 400 hectares of *bakauan bato* or spider mangrove (*Rhizophora styloza*) plantation, half of which were planted by the community.

Mangrove planting in Banacon began with Nong Denciong who recognized the values of *bakauan*. As the plantation near his house grew, some of his neighbors started to plant *bakauan*, too. After a few more years, the islanders started staking claims around west of the island where the area is shallow with sandy substrate suited for *bakauan bato*. Through time, the plantation has grown and expanded into other plantations extending to a total of 60 hectares by 1984. *Bakauan* planting has become a regular activity of the islanders.

*Bakauan* growers earn income from the plantation by selling *bakauan* poles for fish fences and as housing materials. Each pole measuring 10 cm in diameter at breast height and 10 m long sells at P50 (\$1.35). They are more highly prized though, as firewood for bakeries, selling at P300 (\$8.11) per cubic meter (Melana 1995). In dire times, whole plantations of approximately 0.5 hectare each of half a year old mangroves can be sold to businessmen as some people did back in the late 1970s. Aside from timber, the community also earns by selling the propagules (mangrove seeds) at approximately P0.20 each. Business is brisk with orders ranging from 100,000-200,000 per year. Banacon has been the main supplier of propagules in the Visayas and Mindanao

since the start of the first wave of mangrove reforestation in the late 1980s and early 1990s when DENR started the Contract Reforestation Program. Banacon itself got a contract for 200 hectares. Today, selling of propagules is managed by the people's organization (Alcaria, pers. comm.)

Three species are found in the island: *bakauan bato*, *pagatpat* (*Sonneratia alba*), *bungalon* or grey mangrove (*Avicennia marina*) and a few *piapi* (*A. lanata*). In an attempt to improve biodiversity in the island, the Ecosystem Research and Development Bureau (then Forest Research Institute) of the DENR introduced several new species: *tangal* (*Ceriops tagal*), *busaing* or black mangrove (*Brugueira gymnorrhiza*), *nipa* (*Nypa fruticans*), *tabigi* (*Xylocarpus granatum*), *tabyao* (*X. mekongensis*), *bakauan babae* (*R. mucronata*) and *bakauan lalaki* (*R. apiculata*). Of these species, only *Ceriops*, *Brugueira*, *X. mekongensis* and the two *Rhizophora* species have survived, with some already fruiting. *Nipa* and the others failed, probably due to

high salinity.

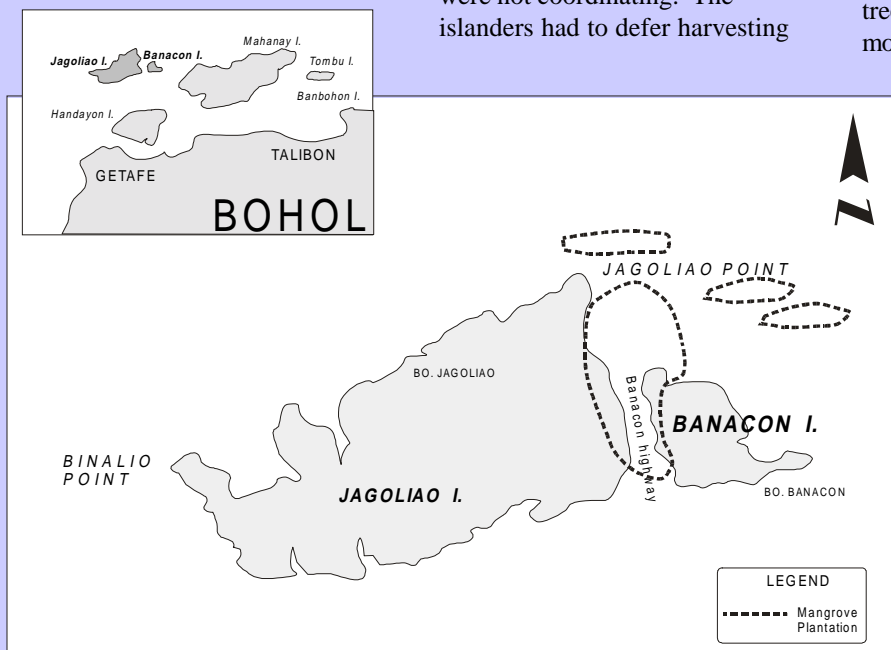
Some conflicts exist in Banacon about the vast mangrove reserves and how they are used. When the old Bureau of Forest Development became aware of the large bakauan plantation in Banacon in 1981, it was placed under the Integrated Social Forestry (ISF) Program. At that time, no one checked whether there were users of this resource and on how much were natural growth. At any rate, under the ISF the community could still harvest what they had planted. Unfortunately, in 1984, while processing the Certificate of Stewardship Contract (CSC) for the tenurial instrument in Banacon, it was discovered that Presidential Proclamation 2151 Series of 1982 had declared the island as a Wilderness Area. Subsequently, the NIPAS (National Integrated Protected Areas System) law included it as a Protected Area, together with Jaguliao and Nasingin. The proclamation and the NIPAS law ban extraction of mangroves and would render the CSC useless. Obviously, the concerned government agencies were not coordinating. The islanders had to defer harvesting

and wait until they could start earning from the plantation again.

Then, as if 2151 was not enough to contain harvesting in Banacon, Republic Act 7161, banning cutting of all mangroves, was passed in 1991. This time, not only the community protested. The DENR said that the law contradicted the department's mission on social equity and people empowerment. The said law did more harm than good to the coastal dwellers. The Community-based Forestry Management (CBFM) Program, the banner program of DENR, in line with its paradigm shift from the traditionally, regulatory approach to a more pro-people orientation, is in jeopardy if this law is not changed.

Regulated harvesting is the best reason to join the program. Without it, the community will not waste time and effort protecting the mangroves knowing that they would not get any return. As stated by Mayor Camacho of Getafe, the said government policy is "forcing the islanders to violate the law." To date, for plantations that have not been cut because of the ban, some trees are already 30 years old or more.

After some deliberation, the DENR formulated Department Administrative Order No.10 Series of 1998, permitting the cutting of planted mangroves as long as they are under a CBFM area. Unfortunately, because of Presidential Proclamation 2151 of 1982, Banacon can not readily apply for the CBFM program. It is also part of a protected area by virtue of the NIPAS law. The plantation has to be zoned as a Multiple Use Zone before harvesting can be granted. This means that the fate of the islanders are now in the hands of the



MANGROVE PLANTATIONS IN BANACON AND VICINITY.

Protected Area Management Board that is responsible for zoning. The DENR, the local government units (LGU) and non-government organizations (NGO) need to facilitate zoning.

The Coastal Resource Management Project is coordinating with DENR to facilitate the establishment of CBFMA in four municipalities in Bohol (Getafe, Inabanga, Mabini, Candijay) through its Mangrove Management Component (MMC). The MMC team are coordinating with the DENR, appropriate LGUs and NGOs in helping the community apply for CBFMAs. Also, the MMC will assign a community organizer in each municipality to help the community implement CBFM effectively. Of particular concern is making Banacon the first mangrove CBFMA under a Protected Area. Banacon is the cradle of community-based mangrove forest management in the country and the people of Banacon deserve that honor.

In order to facilitate implementation of CBFM in Banacon and effectively manage their mangrove forest, including natural mangrove stands, the MMC recommends the following:

- Immediate appointment of PAMB members to effect zoning at the soonest possible time.
- Harvesting of overmature trees and replanting with bigger bakauan species, *R. apiculata* and *S. alba*. Old plantations hardly grow anymore due to over-crowding, a result of the community's planting technique. It is better to harvest these trees and invest the proceeds in other livelihood activities.



- Establishment of a seed production area by thinning 5-10 year old plantations or developing a new plantation using *R. apiculata* and *S. alba*.
  - Establishment of a "Mangrovetum" for conservation and seed production purposes and as a tourist attraction. A "Mangrovetum" is a plantation consisting of several genera and species planted by blocks per genus per species for easy identification and growth comparison of look-alike species among the mangroves. This would also complement the proposed Eco-tourism Bill.
- *Amatong* (an indigenous way of catching fish using an excavation filled with rocks and mangrove branches that provide a niche to fishes) fisherfolk should practice conservation measures such as releasing juveniles and gravid fish.
- DENR should also work toward the granting of CBFM agreements, good for 25 years and renewable for the same period, to beneficiaries who could guarantee protection of the remaining mangrove stands.
- Concerned people's organizations and LGUs should pledge accountability for abuse of the privilege and inability to enforce forest protection through an ordinance.

[If Banacon has been declared as "ecotourism" area, it might be useful to preserve some of the 30-year old trees since these are unusual in Philippine mangrove forests. Editor]

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## Acknowledgement

J.A. Atchue III, Field Operations Leader of CRMP's Mangrove Management Component, reviewed this article.



# Lobster Farming

Sea farming is the growing of fishes, molluscs, seaweeds or crustaceans to marketable size on the sea bed or in special structures. Pen culture near the shore is an environment-friendly sea farming activity that employs simple technology and low investment. The most recent trend in pen culture is growing of lobsters and is practised in Singapore, Thailand, Australia and now, in the southern part of the Philippines.

Lobsters are crustaceans from Family Homaridae. Common to Guimaras Island near Iloilo, Philippines are *Panulirus ornatus* (tiger), *P. versicolor* (green) and *P. longipes* (red). These spiny lobsters are characterized by a hard shell, stalked eyes, four pairs of walking legs, a pair of antennae below the eyes and a pair of chelipeds for grabbing food.

Lobsters are valued in the export and local market for their delicate flesh. At present, Guimaras fishers sell them at P800 (\$21.62) per kilogram from a total island catch of about 100-160 kilograms a month from the wild. The capture method from the wild include use of gillnets and spears (hookah fishing is not advisable). For the newly introduced culture method, juveniles are caught from shallow reef flats at night using kerosene lamps, scoop nets and gillnets.

## Site Selection

Critical to any sea farming activity is site selection. Below is a list of parameters and requirements that would guide the potential entrepreneur in selecting a site for lobster farming.

## Steps in Lobster Pen Construction

A cubical pen measuring 5x5x4-6 meters is the most widely used. It is made with 3 cm mesh synthetic net, framed by wood or bamboo. It takes only 15 days to construct, from the lay-out to the construction of the caretaker's hut.

**1. Lay-out.** Mark the corners of the area measuring 5x5 m with stout poles.

**2. Staking.** Prepare the stakes. These are materials made from bamboo stumps or

Ipil-ipil, sharpened at one end and driven into the substrate 40-60 cm deep and carefully placed 20 cm apart to form all sides of the pen. They are secured to each other by means of a bridging (molding poles made from similar materials tied perpendicular to the stakes).

**3. Installation of screens, netting or bamboo slats for enclosure.** Dig a third of a meter-deep canal prior to the installation of netting materials. Make sure that the netting reaches the bottom of the canal and cover again with the substrate to prevent burrowing lobsters from escaping. Two people, one person "inside" and the other "outside", can set up the screen with an 80 lbs. nylon twine.

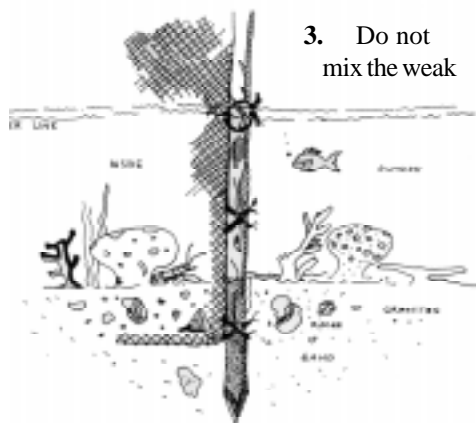
**4. Division of compartments.** Large mesh size nets and bamboo slats are also used to install these compartments to provide protection to stocks in the molting stage. There are 3 main compartments: the rearing area (15 sq m), transition area (6 sq m) and the nursery area (4 sq m). Steps in dividing the pen into these compartments are similar to step 3. Note the recommended stocking density and corresponding weights in the sample pen layout.

**5. Construction of caretaker's hut.** A caretaker's hut is essential in every pen to provide protection against inclement weather, not only for the workers but also for the lobsters during harvest. Local materials (e.g., nipa, cogon) are recommended.



## Management of Pen

- Lobsters grown in pens have the tendency to accumulate algae on the external portion of their exoskeleton probably due to the low level of salinity and exposure to sunlight. To control: (a) provide shelters made from old tires, bamboo and rock piles on pen floors, with coconut, nipa or *Buri* leaves as roof; (b) polyculture with siganids and other herbivorous fish species; (c) harvest the lobster one week after molting; and (d) regularly clean the nets.
- Clean the netting twice a month by scrubbing it with coconut husk or net bag material to take away barnacles and other debris, allowing for the smooth flow of water.



- Do not mix the weak

and newly molted ones with the healthy juveniles. Put the weak lobsters in the nursery compartment for them to recuperate.

- Feed twice daily. Weigh 10 of the lobsters (representative sample) in the pen and compute the average. The amount of feed for each lobster would be 15-20 % of the body weight. Lobsters may be fed with chopped or ground rays, shark meat, sea urchins and other animal foods. Food may be broadcasted. Wet weight food

| PARAMETERS                         | REQUIREMENTS  |
|------------------------------------|---|
| <b>substrate</b>                   | sandy/rock/ coralline, with patches of seagrass if possible   |
| <b>location</b>                    | marine waters, away from rivers and creeks; free from domestic, industrial and agricultural wastes and from other environmental hazards |
| <b>water quality</b>               | always clear, with abundant plankton and other food organisms, salinity not less than 30 parts per thousand                             |
| <b>water current</b>               | minimum of 10-35 cm/sec or moderate current exchange; free from strong wave action  |
| <b>water depth</b>                 | not less than one meter during the lowest low tide (neap tide) and not more six meters during high tide                                 |
| <b>availability of the species</b> | indigenous species preferred to ensure supply of juvenile   |

conversion ratios (wet weight food consumed: increase in body weight) between 3.6:1 and 9:1 have been reported with natural foods.

- Monitor the growth rate twice a month to determine the feed requirement and for record purposes.
- Establish perimeter stakes with light or kerosene lamp to warn off boats at night.
- Constantly monitor and record all activities and finance-related aspects of the project.

## Harvesting

- Selective harvesting is done six



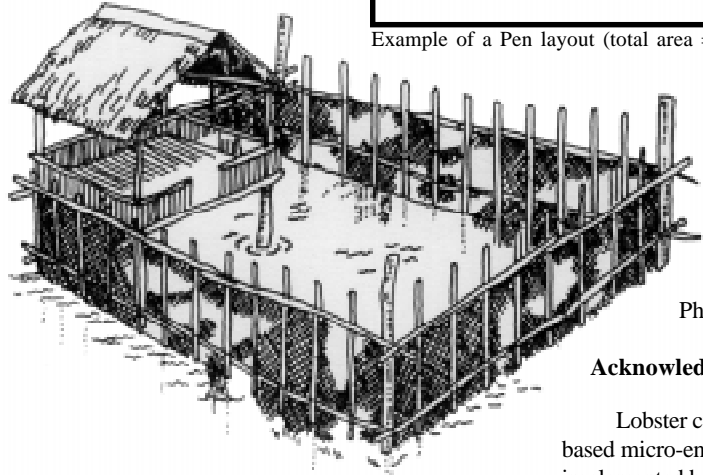
months after the first stocking, when the lobster weighs an average of one kilogram a piece and every month thereafter, depending on the available marketable lobster.

- The ideal time for harvesting is from 6:00 to 8:00 in the morning, or when the weather is particularly cloudy.
- Use scoop net in harvesting or simply pick the lobsters. Goggles and snorkels may be needed. Weighing scales should be ready to immediately determine the weight of the animals before packing for transport to the restaurant or market. Care must be exercised

to ensure that all appendages are intact. Damage to any part will reduce the market price. Survival is high at 90% for stocks of 250 gm for the culture period of four to seven months. Thus, the culture of juvenile lobsters in pens is also a profitable micro-project.

|   |   |
|---|---|
| <p><b>Rearing Compartment</b></p> <p>area = 15 sq m<br/> SD = 10:1<br/> = 150 pieces<br/> w = below 800gm/pc</p> <p><i>Note:</i><br/> SD or stocking density = no. of lobsters per square meter<br/> w = weight of the lobster during stocking</p> <p><b>Selective harvesting can be done when the lobster reaches about 1 kg/pc.</b></p> | <p><b>Nursery Compartment</b></p> <p>area = 4 sq m<br/> SD = 40:1<br/> = 160 pc<br/> w = all below 300 gm/pc</p> <p><b>Grading/transfer can be done when the lobster is about 400 gm/pc.</b></p>    |
|   | <p><b>Transition Compartment</b></p> <p>area = 6 sq m<br/> SD = 25:1<br/> = 150 pc<br/> w = all below 600 gm/pc</p> <p><b>Grading/transfer can be done when the lobster is about 700 gm/pc.</b></p> |

Example of a Pen layout (total area = 5x5 m)



By **Leonides C. Tan**  
Fishery Technology Specialist, Zone 1 Small Islands Agricultural Support Service Programme Guimaras, Iloilo, Philippines.

**Acknowledgement**

Lobster culture is a community-based micro-enterprise project jointly implemented by the Provincial Government and the European Union through the SMISLE Programme in Guimaras. SMISLE aims to accelerate development in several Visayan Islands in the Philippines using the participatory approach.

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- Always use a floating box made of plastic screen, partially buoyed by bamboo poles, styropore or just an ordinary floatation device, with dimensions of 60x60x60 cm to keep the lobster in the water thereby reducing stress until the collection is over.
- Newly molted lobster should not be harvested as it could not withstand stress during transportation.

**Marketing**

| Classifications |          | Price by species or color |            |            |
|-----------------|----------|---------------------------|------------|------------|
| Weight (gm)     | Category | Red                       | Green      | Tiger      |
| all below       | juvenile | N/A                       | N/A        | P200.00/kg |
| 200-299         | small    | P200.00/kg                | P200.00/kg | P370.00/kg |
| 300-499         | medium   | P400.00/kg                | P400.00/kg | P650.00/kg |
| 500-1.7 kg      | large    | P600.00/kg                | P600.00/kg | P850.00/kg |



*Economics of Production (1997 Guimaras Prices)*

| # OF UNIT | UNIT   | BUDGET ITEM   | TOTAL COST |
|-----------|--------|---|------------|
|           |        | Investment Cost   | 6,000.00   |
| 90        | meters | Plastic Screen # ½  | 2,500.00   |
| 50        | meters | Polyethylene net # 3 cm x 100 mesh                        | 1,300.00   |
| 10        | kg     | Nylon twine # 100 lbs                                     | 650.00     |
| 5         | kg     | Nylon twine # 180 lbs                                     | 750.00     |
| 5         | rolls  | Nylon cord # 8  | 300.00     |
| 30        | pcs.   | Bamboo stumps - 4 m                                       | 750.00     |
| 30        | pcs.   | Bamboo poles  | 400.00     |
| 6         | pcs.   | Coconut trunk - 5 m each                                  | 1,600.00   |
| 1         | unit   | Weighing scale (with clear gram readings)                 | 14,250.00  |
|           |        | Operating Cost  | 3,200.00   |
| 160       | pcs.   | Lobster juvenile at P20.00/pc.                            | 9,500.00   |
| 500       | kg     | Feeds for 180 days  | 3,600.00   |
| 15        | days   | Construction of farm: 3-persons x P80.00                  | 5,100.00   |
| 60        | days   | Labor: P85.00   | 3,000.00   |
|           |        | Less annual repair (maintenance)                          | 24,400.00  |
|           |        | Summary   | 76,800.00  |
|           |        | Total revenue from expected harvest of 96 kg @ P800.00/kg | 38,650.00  |
|           |        | Cost of Production  | 38,150.00  |
|           |        | Net Return  |            |

Note: Assumptions were based on 20% mortality rate. 80% of total stocks are harvested after 6-10 months.

## Nong Denciong and His Legacy

Banacon Island, lying eight kilometers north of Getafe, Bohol, Philippines, was noted for *banak* (*Mugil caeruleomaculatum*), the silvery thick scaled fish belonging to family Mugilidae, from which the island got its name. Banacon is one of several islets that has been supplying Cebu City with fishes, blue crabs and shells daily. On the way back, traders bring basic goods thus, establishing trade and commerce between Pasil, Cebu City and Banacon.

It was only in the early 1980s that Banacon started to make waves when visitors began to come in droves to see the biggest *bakauan* (mangrove) plantation in Central Visayas—if not in the whole country (Yao 1984)—established through community effort without government assistance (see article on page ??). The increasing number of visitors encouraged the islanders further to plant more *bakauan*, specially the late Eugenio Paden, popularly known as Nong Denciong, the man who started it all.

When Nong Denciong established his first *bakauan* plantation in 1959, he had no inkling

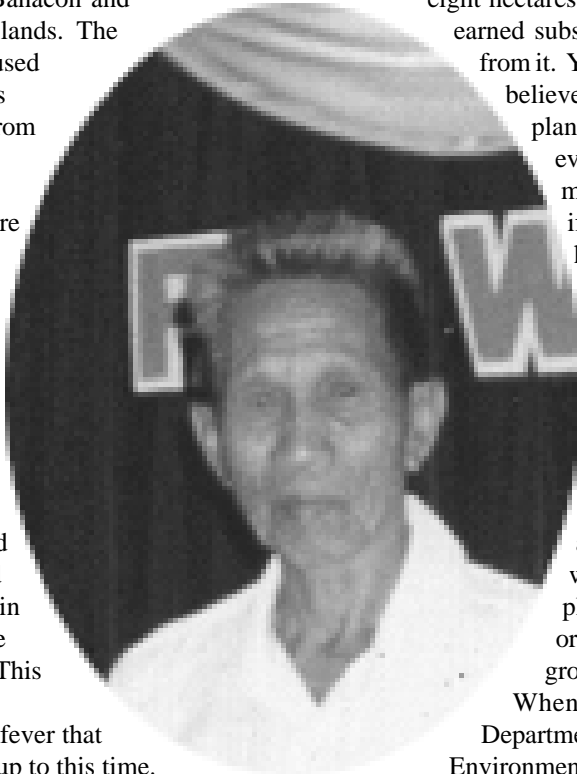
that he would put Banacon in the map as a model for community-based mangrove restoration 25 years later. He planted *bakauan* with a simple objective, that he would not have to go far to cut or buy firewood and poles for his housing needs.

Nong Denciong started planting with propagules collected from a few mother trees of *Sonneratia alba* and *Avicennia marina*, the dominant species at that time, and floating propagules found in fish pens (Cimagala pers. comm). He established his first plantation of about 500 square meters at the eastern side of the island. The trees grew up to 9 m with an average diameter at breast height of 8 cm. They had an initial spacing of about 30 cm x 30 cm so the propagules could protect each other from strong waves and winds especially in the exposed areas. This strategy has been adopted by other planters not only in the island but in the whole province as well. Where and how Nong Denciong learned the technology, nobody seems to know. It is possible that he learned it from Mindanao where he spent some time working as a carpenter in the early 1950s.

Not long after Nong Denciong established his plantation, others, like the brothers Sotero and Milan Torreon, also planted bakauan along the now popular “Banacon Highway”, the 30 m boat passage presently surrounded by about 400 hectares of mangroves and connects Banacon and Jaguliao Islands. The Torreons used propagules collected from Ipil river in Trinidad, Bohol where they did their marketing. Not to be outdone by several planters, Nong Denciong established his second plantation in front of the Torreons. This started the plantation fever that continues up to this time.

In the 1960s, a self proclaimed firewood permittee tried to control the island’s mangroves, including the plantations. Many were discouraged to plant until Nong Denciong, together with his nephew, Erning Paden, who was an employee of the then Bureau of Forestry, confronted the guy. It turned out that the alleged permittee had no proper documents.

By 1970, there were several plantations established already and some capitalists from Cebu started buying young plantations, proving that bakauan is truly bankable. During a financial crisis, a bakauan plantation would always come in handy. More people therefore, were encouraged to plant more bakauan.



Nong Denciong, the silent type who simply wanted to mind his own business, was happy that his initiative has created an opportunity for his fellow Boholanos, making money out of the bakauan. Nong Denciong himself planted a total of about eight hectares and earned substantially from it. Yet, he believed that the planters could even make more money if the island had not been proclaimed as a Wilderness Area where harvesting was not allowed, whether planted or original growth.

When Department of Environment and Natural Resources (DENR) Undersecretary Victor O. Ramos visited Banacon in 1989, Nong Denciong requested that DENR do something to amend the said proclamation and let the people harvest their plantation so they can sell bakauan to Cebu City at a higher price. It finally happened but unfortunately, Nong Denciong did not live long enough to see the effort of the Department come to fruition, the issuance of Department Administrative Order 98-10 that permits harvesting plantations provided the area is under the Community-based Forest Management Program (CBFM). The CBFM is the most recent DENR program that integrates all the pro-people programs in line

with the Department’s new paradigm shift, from the traditionally regulatory to community-based management.

For his pioneering effort on mangrove restoration, Nong Denciong received several citations including DENR’s Likas Yaman Award given by President Corazon Aquino in 1989 and the outstanding Tree Farmer Award given by Her Royal Highness Princess Maha Chakri Sirindhor in Bangkok, Thailand in 1991 under the auspices of the Food and Agriculture Organization (Melana 1991). Recently, in posthumous recognition by the people of Banacon, the Banacon Barangay Council passed a resolution naming the Banacon Highway as Paden’s Pass in honor of the man who put Banacon in the map, including the small boat passage in honor of other original bakauan planters. It is in poignant remembrance of how Nong Denciong was always on the lookout for new plantations that encroached in the boat passage, aware that the passage was one of the attractions of the island. He would pull out new plantings whenever he found some in the effort to keep the passage clear. Nobody challenged him. He was recognized and respected as the pioneer of bakauan planting. True to the spirit of environmentalism, Nong Denciong also practised the use of *amatong* (Calumpong 1996), an indigenous way of catching fish using an excavation filled with rocks and mangrove branches that serve as a niche to fish, aside from pioneering bakauan planting.

Days before he passed away on January 17, 1993, he ordered a walking stick made from mangrove wood to support his weakening legs. He held the stick as though holding to the trees he loved so much. His last request to his eldest daughter was to take good care of his mementoes.

Nong Denciong's bakauan plantation lives on and Banacon continues to make waves as the candidate for the first Community-based Forest Management area under the protected area system and as visitors continue to journey among the mangroves of the island.

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By **Calixto E. Yao**, Mangrove Technical Specialist, CRMP



## Development of SimCoast™ Continues

### the news

After a series of workshops in the Philippines last year, SimCoast™ prepares to take on other parts of the world in its continuing effort to make the program even more efficient for coastal and regional planners. SimCoast™ had its debut in 1995, the first phase of a European Union-Association of Southeast Asian Nations (EU-ASEAN) funded project resulting in SimCoast™, a fuzzy logic rule-based expert system and PC based software that was developed by Prof. Jacqueline McGlade. SimCoast™ is designed as a management tool for coastal and regional planners, supplying guideline information during development programs. The second phase, initiated in 1997, was comprised of a series of workshops, the first of which was hosted by the Philippine Council For Marine And Aquatic Research And Development in Manila in August 1997. The workshops were designed as a forum in which the SimCoast™ expert system can be further refined for release in its PC based format. Further programs have now been initiated in Africa and America.

The marine environment has been exposed to many pressures by both social and economic forces, emanating from land and aquatic based developments world-wide. These environmental stresses take the form of conflicts over resource allocation, degradation of habitats, exploitation of resources, land and water misuse coupled with pollution by chemical and biological wastes. The resulting decline in condition of the marine environment has exposed social and institutional issues which are relevant to future development programs and need to be addressed. Through the EU-ASEAN study on Interdisciplinary scientific methodologies for the sustainable use and

management of coastal resource systems, experts from Europe and the ASEAN countries are being brought together to determine key issues within the coastal zone and to develop a transect based environmental management system.

A large part of integrated coastal management deals with the creation of a framework in which information from many diverse sources can be evaluated and explicit guidelines issued. Managing coastal areas requires an interdisciplinary approach which takes into account interactions between natural, social and economic elements. Therefore, an integrated system such as SimCoast™ based on an intelligent knowledge based expert system is required.

The sustainable management model involves the development of analytical techniques based on an information data base; which, when coupled with software designed to set policies and monitor the effects of changes, results in a dynamic process promoting conservation and sustainable multiple use of resources. As a direct result of the coordinated allocation of environmental, socio-cultural and institutional resources, the values, interests and goals of people, many of which are in competition with each other, can be integrated.

There are three key intelligent systems techniques which can be used in different combinations for sustainable coastal zone management: expert systems, neural networks and genetic algorithms. The expert system is comprised of a knowledge base where the information is stored, an inference engine which decides how that information should be applied to a task and a user interface through which commands are issued to the system by the user. Fuzzy logic combined with an expert system, takes into account imprecision

within the knowledge data base. On the other hand, issue analysis combined with an expert system facilitates analysis of qualitative data from many fields and indicates overall environmental policy priorities. In some expert systems, results are given as either “true” or “false”. In fuzzy systems, variables become words or sentences and operate with the same “natural” language as that used in everyday life. SimCoast™ itself uses fuzzy logic embedded in an expert system together with issue analysis.

The other components utilized in SimCoast™ software are inference nets which are composed of data groups supporting the ideas and hypothesis of experts. These link together the knowledge stored within the data base and can be encoded into a network of connections or relations between evidence and hypothesis. In most inference nets, the data sets and connections are

fixed so the relationship within the knowledge base is retained. However, the most important feature of the SimCoast™ system is that the inference net is dynamic, allowing for connections between data sets and probabilities to have no fixed connections.

The resulting soft intelligence system uses stored knowledge to make inferences and deductions which are presented through a multilingual user interface. This incorporates a multidisciplinary lexicon enabling users from different countries to find key words and derive new information, in conjunction with a 2D visual representation of the transect.

SimCoast™ unites expert knowledge from different fields within one system creating a powerful tool for identifying which processes and issues have the most significant

impact within an environment. It examines their importance in terms of the influence each activity exerts on itself and others within the transect zone and also takes into account the effect of activities taking place outside the designated area. This produces a weighting of activity impacts in terms of targets such as biodiversity or fisheries within the designated area. Policy changes related to activities within the coastal zone and the order of their priority are indicated by SimCoast™. The weighted impacts can then be used by policy makers and planners during coastal development programs.

By **Ann Novello Hogarth**, Project Manager, FUGRO GEOS, Singapore and **Jacqueline McGlade**, EU-ASEAN Co-ordinator, England.



## Three Cheers for Caliling, Cauayan, Negros Occidental

Caliling residents are excited over their close encounters with large schools of fish like jacks, snappers and rabbitfishes in the

Hulao-hulao Fish Sanctuary. According to the people, catches have been increasing in nearby waters. Also, salt production, a

supplementary livelihood which began in 1994 has yielded about two metric tons of salt up to the present. Salt production in this *barangay* (village) is mainly dependent on direct solar energy so operations take place only during summer.

Overfishing was one of the coastal management issues in Caliling. In order to improve the nearshore fishery, the community, together with the local government, Department of Environment and Natural Resources and professionals from a research institution, established the Hulao-hulao Fish Sanctuary in 1994 through a project that terminated in 1997. Hulao-hulao is one of four coral reefs in Caliling.

To date, Hulao-hulao boasts of 63.13% live coral cover up from a dismal 27.0% in 1984 (SUMML 1997,



*Salt production, a supplementary livelihood of fisher and family in Barangay Caliling.*

Alcala 1996, Luchavez *et al.* 1984). Live coral cover in the other reefs are still low: Takot, 26%; Buta, 18.66%; and Sojotan Pt., 14.88% (SUML 1997). Catch landing has increased from 2.0 mt to 4.9 mt. The estimated *bangus* (milkfish) fry seasonal collection also increased from 249,770 in 1995 to 305,956 in 1997 (Luchavez in prep.). These data however, are based on observations made for two seasons only. While the results are very much encouraging, it will take more studies to determine the exact trends in harvest.

Out of three groups initially organized in 1994, the Calaogao Marginal Fishers and Farmers Association has persisted to continue management of the reef upon the project's termination. Whereas at the start, the Association was equipped with only an outrigger canoe, manned by four *bantay dagat* (community

volunteers deputized by the government to patrol the coasts against illegal fishing activities), today, they, numbering 20, have two motorized patrol crafts. Some local stakeholders donated an engine for the patrol boat, binoculars, 2 units of VHF radio transceivers, 2 units of CB radio transceivers, a searchlight and T-shirt uniforms. Thus far, more than 10 groups of illegal fishers, all from other barangays, have been apprehended and fined. More importantly, the number of violators has recently diminished.

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By **Teodulo F. Luchavez**, Silliman University Marine Laboratory, Dumaguete City, Negros Occidental, Philippines



## Malang, Indonesia Hosted International Symposium for Agenda 21 Strategy

An international symposium focusing on Chapter 19, Integrated Management and Sustainable Development of Coastal and Marine Areas, of the Indonesian Agenda 21 Strategy was convened in Malang, East Java, Indonesia in November last year. The symposium was jointly organized by the National Technology Institute (ITN Malang), the National Coordination Agency for Surveys and Mapping (BAKOSURTANAL) and Proyek Pesisir (the Coastal Resources Management Project of the Natural Resources Management Program of the United States Agency for International Development which is implemented through the Coastal

Resources Center of the University of Rhode Island (URI). It was attended by 170 representatives from the government, industry, academia, non-government and community organizations as well as aid organizations.

The Indonesian Agenda 21 Strategy was released by State Minister for Environment Sarwono Kusumaatmadja in March 1997. The strategy is designed as a "one policy package with the objective of making sustainable development, with an environmental perspective, a reality in Indonesia." The Malang symposium sought to provide a forum for sharing information among integrated coastal management (ICM)

practitioners that would enrich and enhance Indonesian ICM knowledge and capacity to implement the Agenda 21 Strategy.

About 39 papers were presented within 5 thematic sessions corresponding to parts of Chapter 19 of the Indonesian Agenda 21 Strategy. The 5 thematic sessions were: 1) Integrated Coastal Zone Management; 2) Marine and Coastal Mapping, Monitoring and Environmental Protection; 3) Utilization of Marine and Coastal Resources for Sustainable Development; 4) Vulnerability to Sea Level Rise, Climate Change and Tsunami; and 5) Training, Education and Research.

In addition to these five sessions, a special evening seminar on coastal and marine geographic information sessions (related to item no. 2) was conducted by the Marine and Coastal Information Systems team of the Marine Resources Evaluation and Planning Project, an Asian Development Bank and Government of Indonesia project. Five papers dealing with various aspects of coastal and marine information systems, including Geographic Information System and remote sensing applications, metadata and spatial data standards were presented.

In the concluding session, co-convenors Prof. Jacob Rais (National Research Council) and Ian Dutton (Coastal Resources Center, URI) noted that the symposium generated an unprecedented level of interest in ICM as a framework for resolving the many challenges of managing Indonesia's vast marine and coastal estate. The symposium "showcased" aspects of Indonesia's rapidly developing ICM capability and highlighted key strategic needs for further development of capacity. Of particular note, the symposium assisted in linking Indonesian ICM practitioners with

the broader global ICM community.

The Symposium proceedings are now being edited and will be published by ITN Malang in 1998. Copies may be ordered directly from Mr. Leo Pantimena (ITN Malang) via e-mail (geodesi@malang.wasantara.net.id) or fax (62-341-553015).

By **Ian Dutton**, Proyek Pesisir (Coastal Resources Management Project), NRM Secretariat, Jl. Madiun No. 3, Mentang 10320, Jakarta, Indonesia, Tel: 62-21-3926424, Fax: 62-21-3926423



## updates

## Enterprising Olango

On March 28, 1998, the Enterprise component of the Coastal Resource Management Project (CRMP) conducted a special tour of Olango Island to help stimulate development and explore feasible alternate livelihood for the learning area. The endeavor, fully supported by Region VII's Department of Tourism, Department of Environment and Natural Resources (DENR) and the Protected Area Management Board of the Olango Island Wildlife Sanctuary (OIWS), was organized by Monette Flores, CRMP Enterprise Development Specialist. A test group of "tourists" were taken on a day trip to the site to determine its viability as a tourist destination (see lead article on page 1).

Located in the southern portion of Olango Island, the area which is now the Olango Island Wildlife Sanctuary was recognized as a critical stopover point for tens of thousands of birds travelling the East Asian Migratory Flyway, an important international route for migratory birds. The 920 hectares of tidal flats, mangroves, seagrass beds and sandy ridges were officially declared a sanctuary in 1992 and is managed by the DENR. The OIWS is the

first and only Ramsar Site in the Philippines. The Ramsar Convention is the world's oldest international conservation treaty in which signatory countries designate and protect wetlands of international importance.

The tour group comprised of delegates from the Global Congress of the Pacific Asia Travel Association (PATA), in town for the yearly international conference on tourism development and operation. The PATA delegates who joined the tour were from Germany, the United Kingdom, Malaysia, Monaco, Canada, the United States, Australia and New Zealand. Also present was a Filipino tour operator. The tour consisted of a boat ride beginning from Mactan Island, then around the southern islands and islets of Olango, finally landing in Sabang, one of the gateway villages to the wildlife sanctuary. The "tourists" were greeted and served refreshments by a women's group from one *barangay* (village) and then escorted to small paddleboats rowed by members of the community youth group and fishers for site-seeing in the mangroves and bird sanctuary.

The response to the pilot tour was extremely positive. Evaluation results unanimously show that the trip can be successful as currently packaged. Virtually all respondents desired more interaction with the local community. This is a key indicator that low-impact ecotourism that **integrates and benefits the local residents** is a viable livelihood option for Olango. Plans to set up an actual tour operation are in the works as well as plans for a variation of the tour which will focus on the southern islands and will include snorkeling around the Hilutungan marine sanctuary.

Caution must be exercised however, in choosing a national tour operator. The tour operator's goals must be in keeping with CRMP's objective to help local islanders prosper and become co-managers of the environment. This means that the residents must be an essential partner in the operation and not alienated from their own resources,



*Paddling through the shallows and mangroves.*

as is oftentimes the case when tourism enters a small island. This pilot tour initiated by CRMP puts particular importance on community involvement in resource conservation and providing them optimum economic benefit from the enterprise.

By **Diane Antoinette Parras**, Intern, CRMP

For more information, contact: **Ma. Monina Flores**, Enterprise Development Specialist, CRMP



## CRMP's Mangrove Management Component Begins Pilot Operations in Bohol

The Mangrove Management Component of the Coastal Resource Management Project (CRMP) began full operation in January of this year and has been moving towards establishing its pilot areas in Bohol. As of March 16, the MMC staff have identified four municipalities and obtained verbal approval from the concerned mayors or from senior municipal staff to initiate the program. The pilot program will encompass Candijay, Getafe, Inabanga and Mabini.

Locally hired community organizers (CO) will work in two sites in each of the municipalities to strengthen or form organizations that are interested in managing mangroves. After they have been

organized, the CO will work with the groups to develop and apply for Community-based Forest Management Agreements.

When awarded with these agreements, the organizations will be able to pursue a variety of livelihood activities (more than 35 have been identified) including use of amatong (a local method of catching fish using an excavation filled with rocks and mangrove branches that provide a niche to fishes), manufacture of nipa alcohol and nipa shingles and bee keeping. As a result of the new Department Administrative Order (DAO) 98-10, the participants will now be able to cut mangroves that have been planted unlike before when it was banned. The DAO will enable the

people to pursue livelihood such as charcoal manufacture, sale of tangal (Ceriops tagal) bark and the sale of mangrove timber.

The pilot program aims to hire and train the four community organizers and to initiate organizing activities immediately thereafter. The community organizers will work for CRMP for one year. After that, CRMP hopes that the COs will eventually be absorbed by the Municipal Agriculturist Office or in other appropriate offices in the municipality. This will help institutionalize the mangrove management process.

By **J.A. Atchue**, Field Operations Leader, Mangrove Management Component, CRMP

## Philippine Navy, Coast Guard and BFAR Awarded for Coup

On March 19, 1998 the Coastal Resource Management Project presented certificates of appreciation to the Philippine Navy, Coast Guard and Bureau of Fisheries and Aquatic Resources for confiscating a stash of illegally extracted corals.

The corals were found in a deserted field near the University of Visayas marine office training outpost in Mactan Island. Most were left out in the open to dry, some were in styrofoam boxes soaking in bleach while others were already

packed for shipping. A relatively fresh batch was found just near the shore piled in a heap.

This makes the third truckload of illegally collected corals seized within recent months. The entire assemblage is estimated to be worth P70,000.00 (US\$1,891.00). The extractors sell the corals for about P15-20 per piece to souvenir shops, who then turn around and sell them to tourists for US\$5-10 per piece, depending on the kind and quality of each individual specimen. Some are

also smuggled abroad, mostly to Europe and the United States.

Most of the corals sold in trinket shops are illegally extracted. Please do not support this industry. It is better to have the living coral in the sea where it belongs, than a lifeless one wasting away on your mantel-piece!

By **Diane Antoinette Parras**, Intern, CRMP



## Sharing ICM Experiences from Rhode Island

Hermenigildo J. Cabangon, Learning Area Coordinator for Sarangani Bay of the Coastal Resource Management Project (CRMP) and one of four Filipino participants to the Summer Course on Coastal Zone Management held at the Coastal Resources Center, University of Rhode Island (URI), Rhode Island, USA from June 1-28, 1998, came back exuberant after four weeks of sharing experiences on integrated coastal management (ICM) with representatives from Fuji, Hongkong, Sri Lanka, Barbados, Jamaica, Trinidad, Tobago, Ghana, Kenya, Tanzania, Mexico, Nicaragua, Sweden and the Philippines.

The course helped participants to better understand many of the elements in a strategically designed ICM program and the strategies, tools and techniques that promote its sustainability. The major topics were:

- Introduction to coastal management.
- Coastal management tools and solutions.

- Managing geographic areas of concern.
- Applying the coastal management tools.

Sessions were loaded with case studies, meticulously examining a myriad of coastal management approaches. Exercises focused on community participation, networking, tapping of resources and mobilization. According to Mr. Cabangon, this aspect "is not different from the Philippines' community organizing and development approach to management. In fact, the Philippine experience has more options to offer "although perhaps, efforts at sustaining the momentum and elevating it to the next step still need to be improved."

After exploring the coastal management models provided by both the URI and the participants, they all realized that they were practically doing the same things, only at different levels, with varying approaches depending on culture, the

willingness and the capacity of the people to accept change as well as how much the government is willing to commit.

The last three days were spent mostly in trying to say "goodbye" and sharing ideas on how to optimize the opportunity provided by the course. Indeed, the 14 country participants found much in common with respect to their coastal management problems and solutions!

The other Filipino participants were Ms. Emma Melana of the Department of Environment and Natural Resources Region VII, Ms. Rose-Liza Eisma of the Silliman University and Ms. Mercy Teves of the Provincial Government of Negros Oriental. Their participation were supported by the CRMP as part of its institutional strengthening effort.

By **Dolores Ariadne D. Diamante-Fabunan**, CRM Specialist, CRMP





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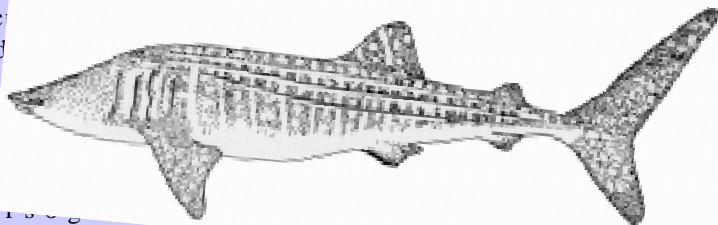
## Saving the Whale Sharks and Manta Rays

On March 25, 1998, the government promulgated Fisheries Administrative Order (FAO) No. 193, Series of 1998. The law took effect on April 12, 1998 prohibiting the catching, selling, buying, possessing, transporting and exporting of whale sharks and manta rays in Philippine waters. The Order also forbids wounding or killing these animals while in the course of targeting other fish. Whale sharks and manta rays accidentally caught must immediately be released unharmed. Those that die and are washed ashore must be turned over to the regional office of the Department of Agriculture (DA) or to the Bureau of Fisheries and Aquatic Resources (BFAR) regional or provincial office. These offices are responsible for the disposal of the carcasses. Exempted from the ban are scientists doing research work. However, they must first get a permit from the Secretary of Agriculture. Violators of this Order could be fined from P500 (\$13.50) to P5,000 (\$135) and/or imprisoned from six months to four years or the BFAR Director could fine them a maximum of P5,000 and/or cancel their fishing license and confiscate the whale shark or manta ray.

In some parts of the Philippines, hunting whale sharks as well as manta rays, whales and dolphins mainly for local consumption is a tradition among fishers who are highly dependent on fishing for their livelihood. However, whereas before, the purpose of the hunt was limited to local consumption, now it is more in response to increasing export demand. Today, at least two companies, one of which is the Filmosa Trading Corporation, buy the sharks from fishers at P10,000 (\$270) to P20,000 (\$540) each, to export mainly to Taiwan, Hong Kong, Singapore and Japan. These companies sell each shark, cut and frozen, for as much as P800,000 (\$21,000) each. Whale sharks are considered delicacies and it is thought prestigious to serve them in banquets.

However, articles in the national press, such as the *Philippine Daily Inquirer*, and coverage by the GMA television network brought public attention to the issue. The slaughter of whale sharks and manta rays is a tragedy.

Whale sharks and manta rays are large, slow-moving, filter-feeding animals. They are highly valued by fishers, and the demand for their products has increased significantly in recent years. This has led to overfishing and a decline in their populations. Soon after the exposé, the press and environmental groups, joined by candidates in the May election, denounced the supposed atrocity and demanded quick action from BFAR to stop the killing and unequal trade. However, there is no regulation specific to the issue which could immediately be invoked. It seems that whale sharks are being over-fished, yet, despite studies by the Silliman University, Worldwide Fund for Nature-Philippines, BFAR, Hubbs Sea World Research Institute and the United States National Oceanic and Atmospheric Administration, information about its biology, population dynamics and on catch effort and production is still inadequate to be able to determine a more precise measure. Amidst these



Whale sharks and manta rays of the subclass *asmobranchii (Selachii)* are cartilaginous fishes with a skeleton of cartilage and a skin covered by a layer of scales. Today, there are about 250 species of sharks and about 300 species of rays and skates. Whale sharks or *Rhincodon typus* are locally known as balilan, butanding, tawiki, isdang tuko, or tuki-tuki. They measure from 12 to 21 m, and can weigh up to 25 t. They are pelagic and can be found in all tropical seas. Their bodies may be dark and gray, blue gray, purplish to reddish brown, reddish or greenish grey above, with large white or yellow spots and transverse stripes. Whale sharks have small, conical teeth on their huge, almost terminal mouths for filter feeding. They feed on plankton, squids, crustaceans and small fishes like anchovies and sardines. Whale sharks are oviparous (egg-layers).



price to P80,000 (\$2,162), even offering boats and other means of support to the fishers. To facilitate enforcement and compliance of FAO 193, BFAR will soon launch a public information drive. It will include basic information about whale sharks and manta rays. The government could also increase the penalties by classifying the resources under the rare, threatened or endangered species categories and listing them in the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Then, violations would be punishable by 12 to 20 years imprisonment, P120,000 (P3,243) fine, forfeiture of the catch and cancellation of the permit (sec. 97, RA 8550). Still, what law is strong enough when there are poor, hungry, desperate fishers? To date, fishers from Bohol and Mindanao made it clear that they will stop hunting the whale sharks, which they claim to be their traditional right, only when they are given alternative livelihood. Obviously, other income diversification alternatives, which have to be site-specific, need to be explored, too. Thus, management has to be both resource- and people-oriented, employing the “stick” of enforcement and the “carrot” of incentives for compliance.

By **Ruperto Sievert**, Technical Assistant, CRMP

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## Mangrove Cutting Is Now Allowed... in CBFM areas!

Finally, cutting of planted mangrove is allowed. Department administrative Order (DAO) 98-10 provides the guidelines for the establishment of community-based forest management (CBFM) projects within mangrove areas. Section 3 of said DAO states that “cutting or harvesting of mangrove species shall be allowed provided that these are planted by CBFM agreement holders themselves and that the harvesting operations are included in the affirmed Community Resource Management Framework, Ancestral Domain Management Plan or Protected Area Management Plan, as the case may be, and Annual Workplan; provided, further that replanting of area harvested shall be undertaken within six months after harvesting operations and provided, finally that the harvesting operations shall be closely monitored by the Community Environment and Natural Resource Office concerned.”

DAO 98-10 is consistent with other issuances that reflect the Department of Environment and Natural Resources’ (DENR) policy of “putting people first so that sustainable forestry may follow”. Such issuances include Executive Order 263, adopting community-based forest management (CBFM) as the national strategy to ensure the sustainable development of the country’s forestland resources and providing mechanisms for its implementation; DAO 96-29, its Implementing Rules and Regulations that pertains to its operationalization; and AO 96-30, Integration of all community-based forest management strategy and people-oriented forestry programs and projects into the DENR regular structure. A key feature of the CBFM is the assignment of access and use rights to CBFM agreement holders including indigenous peoples and migrant forest-dependent communities, the frontline managers or stewards of the resource. The CBFM also integrates all types of tenurial instruments including that of the Mangrove Stewardship Agreement.

By **Annabelle Cruz-Trinidad**, Policy Advisor, CRMP, PRIMEX,  
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Pasig City, Philippines

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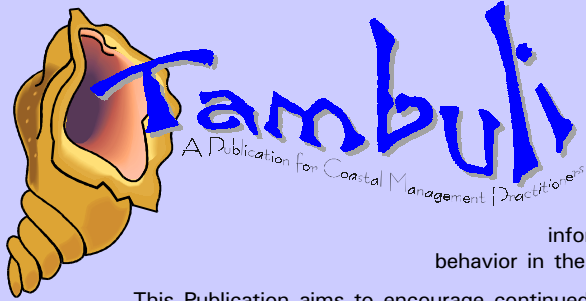
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