

Developing Integrated Coastal Management Into a Natural Response: The Story of Bohol

Stuart J. Green
Provincial Coordinator
Coastal Resource Management Project, Bohol

Reigh P. Monreal
Information, Education and Communication Specialist
Coastal Resource Management Project, Bohol

and

Dolores Ariadne D. Diamante-Fabunan
Coastal Resource Management Specialist
Coastal Resource Management Project

Thomas G. Bayer
Donor Portfolio Manager
Coastal Resource Management Project

Mere mention of Bohol conjures images of pristine beaches and captivating dive sites. Images that speak of adventures that make the island province a tropical haven for tourists. This is hardly surprising since Bohol has almost one-and-a-half times more coastal water area than land. Its one coastal city, Tagbilaran, also the capital, 29 coastal municipalities and 72 smaller islands are surrounded by approximately 643,000 ha of municipal waters, compared to an aggregate land area of only 412,000 ha.

From a population of just over 1.1 million (NCSO 1995) there are some 100,000 who are dependent on the sea for their livelihood, making fishing second only to agriculture with respect to employment. Approximately one-third of the population resides in the 349 coastal villages (*barangay*) that stretch along the province's 642 km



School children preparing to plant mangroves in Inabanga, Bohol.

Calixto E. Yao

coastline, giving Bohol not only the largest stretch of coastal waters but also the longest coastline in Central Visayas (Courtney and Traub 1999).

Continued on page 3

contents

ARTICLES

Developing Integrated Coastal Management Into a Natural Response: The Story of Bohol	1
Between the Slaughterhouse and Freedom: A Matter of Man's Choice or a Whale's Right?	10
I Love the Ocean Movement: The Adventure that is Marine Conservation	13
Coral Bleaching: The Whys, the Hows and What Next? ..	16
Beyond the Mangrove Path: Coastal Resource Management in Pangangan, Bohol, Philippines	19
Fisheries in the Philippines and in the World: An Overview	23
Philippine Community-based Coastal Management: The Challenges	26
TECHNO-PACK	
Environment-Friendly Mariculture in Malalag Bay, Davao del Sur, Philippines	29
LEADERSHIP MODELS	
The Man Who Talks to Fishes	34
NEWS	
DENR and LMP Ink Memorandum of Agreement on Best CRM Awards	36
DENR and DA-BFAR Complete Joint Memorandum Order Implementing RA 8550	36
US Coast Guard Provides Technical Assistance to Philippine Marine Law Enforcers in Region 7	37
Municipality Gets Patrol Boat for Achievements in Coastal Resource Management	38
Sea-borne Patrol Goes to Action	39
UPDATES	
Coastal Law Enforcement Group Vows to Fight Illegal Fishing	39
Gilutongan Community Ups Competency in Marine Sanctuary Management	40
Community Ecotourism Ventures Cited by International Awards Body	41
CRM HOTLINE	
Foreshore Areas: Questions and Answers	42
INFORMATION SECTION	
References	44
CRMP Training Courses for Coastal Management	45
Announcements	47

TAMBULI—A NEWSLETTER FOR COASTAL MANAGEMENT PRACTITIONERS

is on its sixth issue. As planned now, the Coastal Resource Management Project will produce one more issue of TAMBULI—its seventh and last. As that issue takes shape in early 2001, all important articles and news—available in TAMBULI will be accessible through the website: oneocean.org so that our readers will not be left without TAMBULI. And don't forget your letters to the editor!

Who has not heard about "global warming"? How many of you think that global warming is affecting the Philippines in some noticeable way? Although it is not scientifically proven that global warming is fully responsible, as most of you know, we had a serious rise in sea-surface temperatures from August through November 1998 that resulted in a major coral bleaching event in the Philippines and other parts of the world. This coral bleaching event resulting from sea temperatures of up to 35°C associated with the "El Niño" weather cycle is unprecedented in this part of the world. If this situation repeats itself in the near future, our coral reefs are in severe danger of collapse. What is causing this and what are the alternatives we need to consider?

First, if you doubt that this phenomenon affected the coral reefs in the Philippines, please read the article on page 16 about coral bleaching. In addition to evidence presented in that article, I returned in May from a 10-day coral reef monitoring trip to Tubbataha Reefs in the Sulu Sea. It is always a treat to visit Tubbataha but it is less so when more than 20% of the living coral cover seen in 1996 is dead. In fact, surveys in 7 sites in the Tubbataha Marine Park through hundreds of line-intercept transects measured an average living coral cover decline of 24.8% since 1996. Because no other signs of damage were evident and the Park is being actively protected from fishers of all kinds, the only explanation was the coral bleaching.

The good side of the Tubbataha story for the Philippines is that local human destruction has stopped and that the fish diversity and abundance have increased markedly since 1996. The overall abundance of fish counted per 500 m² areas has increased on average by 26%. This is an important

editorial

achievement for the management of the park in an area that provides larvae to the whole Sulu Sea and contains some of the highest diversity of marine life in the world.

In thinking more about the coral bleaching in Tubbataha and the Philippines, we begin to realize that this impact is out of our immediate control. This is frustrating after so much effort has been put into protecting reefs locally through all the programs described in the TAMBULI and elsewhere. But, is it really out of our control?

Evidence suggests that a majority of Americans support action on global warming. A recent poll finds that 70% of Americans believe that global warming is a serious problem, and 66% favor taking action now. Of course for those of us who drive cars or are in businesses that use fossil fuel, we may wonder what is the solution and how can we stop adding to the carbon dioxide build-up in the atmosphere. We may also worry about the fuel dependent economy we all participate in. But, another striking finding from the poll in the United States is that more people believe that implementing the Kyoto treaty on control of carbon emissions will improve the economy rather than hinder it. This is an exciting thought, that we do not have to be afraid of carbon emission controls but rather that we may all find more jobs because of it. It is true that technologies are being sought on alternative sources of energy that will help clean up our atmosphere and build new economies at the same time! But, before this happens, we may need to rely on simple conservation measures to minimize the amount of fossil fuel used on this small earth we inhabit!

In the meantime, let's not forget our best coastal resource management practices. These are key to minimizing local human induced impacts on coral reefs and other important habitats. Without good local stewardship, our reefs will be gone before "global warming" has a chance to finish them off. Let's at least give the reefs an opportunity to resist the influence of future warm water events. After all, they may adapt to and like warmer water!

Editor

Developing from page 1

The Issues

Bohol's natural wealth, however, has been subjected to a variety of undesirable practices and their consequences such as destructive fishing methods, overfishing, siltation and simple lack of management. The rapid degradation of precious and interdependent resources has resulted in an equally rapid reduction in their ability to produce food and other benefits that Boholanos have been enjoying for centuries.

Likewise, the low productivity of arable land, growing population and lack of alternative forms of income generation in other areas have forced many to look for greener pastures in the coastal zone. An open access regime, however, resulted in increasing numbers of people exploiting the remaining resources of Bohol's coasts, encroaching upon the once rich mangrove areas and non-settlement land.

Fish catch, as well as quantity of other marine organisms caught or gleaned from the sea, have dropped to alarming levels in recent years along with size and species abundance. Older members of the fishing communities around Bohol remember the old days when a quick visit to the shoreline or trip to the sea would yield a rich variety of fish and shells.

In the 1970s, the tide began to change for the fisheries of Bohol. More and bigger boats introduced the use of fine-mesh nets. Highly efficient and destructive fishing gear rapidly became popular. These, along with the aforementioned factors, led to the present situation where an eight-hour fishing trip can

no longer guarantee a decent subsistence for most of Bohol's 100,000 fishers.

Today, an average daily catch of only 2-3 kg of fish seems to be the norm as evidenced by the results of participatory coastal resource assessments (PCRAs) held in 1998. Most fishers consider themselves lucky if they could maintain this level of catch in contrast to an average reported catch of approximately 20 kg per day in the 1960s (Green *et al.* 2000)

In past years, efforts at integrated coastal management (ICM) were disorganized and, most of the time, overlapping in focus. Implementing agencies were inadequately prepared to plan and implement projects. Fisheries development projects tended toward



Banacon Island, Getafe, Bohol.

Box 1. ICM Made Easy: the Story of Tubigon

ICM is never really easy but it can be less difficult where the people and local government are receptive. In Tubigon, provision of ICM technical assistance has been relatively easy. Due to Tubigon's pro-ICM officials, the town already had a strong coastal management program when CRMP began operations in Bohol. The municipal government was already well aware of ICM and its benefits having been into it since the early 1990s. The pro-development attitude of the municipality has likewise attracted a variety of NGOs such as Feed the Children-Philippines, PROCESS-Bohol, International Marinelife Alliance, Local Government Development Foundation (LOGODEF) and Haribon which also undertake different ICM activities.

Under this circumstance, the best way that the municipality could be assisted was through the conduct of a series of workshops to level off and coordinate the multitude of ongoing activities. These workshops were facilitated by the Bohol Environment Management Office (BEMO). Once the various organizations started working together, the municipal government requested CRMP assistance in the preparation of a participatory ICM plan for the municipality. In partnership with all the NGOs and with funding by the LGU and LOGODEF, the town underwent the planning process that resulted in a five-year, multisectoral, multi-program ICM plan for the proper management and development of Tubigon's coastal zone. This plan is being institutionalized through municipal legislation.

Every town in the learning area is now emulating this process. Multi-partner technical working groups have been established in each municipality, allowing the coastal resource users and stakeholders to work together with the LGU in managing their coastal resources. Ultimately, it is hoped that the LGUs will begin to develop inter-LGU agreements with neighboring municipalities. The delineation of municipal waters is underway in Bohol, and once the areas of jurisdiction are clearly marked, management should become much easier.

Box 2. Building Partnerships with Existing NGOs: the Haribon Foundation

After considerable deliberation on a suitable partner from the NGO sector already working in Bohol, the project subcontracted and fully financed the Manila-based Haribon Foundation for Conservation of Natural Resources to handle the social component for the learning area with assistance of the Project Seahorse, also of Haribon Foundation.

Initially, the Haribon-CRMP staff worked in two pilot *barangays* to establish the methodology that would work best for the learning area's coastal community members. Based upon their experiences in the two model *barangays*, Haribon-CRMP then expanded to a total of eight *barangays* throughout the entire learning area thereby, ensuring that all municipalities could access their resources, skills and "lessons learned."

Emerging Role of the LGU

For years, LGUs have been hounded by problems such as poor enforcement of existing regulations due to confusion over national and local laws, lack of properly trained personnel, political interference, lack of community awareness of relevant regulations and non-priority status for coastal law enforcement among law enforcement agencies, among others.

The advent of the Local Government Code (Republic Act 7160) in 1991, however, eased the LGUs into their new role, that of managing its municipal waters (adjacent coastal waters previously managed by the national government) in order to contextualize different uses upon the development of ICM, a concept not well known to local chief executives. In line with this, the CRMP also hopes to develop the concept of ICM as a basic service of local government.

The CRMP's learning area in Bohol stretches along 85 km of coastline and covers seven towns along northwestern Bohol. This begins in the north with Getafe and goes down through Buenavista, Inabanga, Clarin, Tubigon, Calape, ending at Loon in the south (Figure 1). The learning area covers some 60,929 ha of land that has an estimated population of 197,463 (NCSO 1995). There are 81 coastal and 42 island *barangays* within the learning area, with approximately 50% of the inhabitants dependent upon fishing as a major source of livelihood.

Approximately 60% of these coastal inhabitants live below the poverty line of PhP 6,000 per month per family (SUML 1997).

The CRMP began its technical assistance to Bohol in mid-1997 with the signing of a Memorandum of Agreement (MOA) with the DENR and the concerned municipal LGUs. The MOA defined roles and assigned resources and budget for ICM activities throughout the life of the project. Major activities to be undertaken included mangrove management; enterprise development; information, education and communication (IEC); social mobilization; provincial institutionalization and training.

The initial thrust of the project was on activities conceptualized in partnership with the relevant LGUs. This led the LGUs to develop a sense of ownership over ICM with CRMP serving as a facilitator. Over time, the project shifted to a more demand-driven process where the LGUs now request specific technical assistance services from CRMP. Many NGOs and national government agencies

(NGAs) already had ongoing interventions within the learning area ranging from community-based research to implementation strategies and projects. The CRMP attempted to collaborate with all organizations within the learning area to better focus resources towards the ultimate goal of assisting the LGUs better manage their coastal resources in order to benefit all stakeholders. In this light, CRMP offered strategic technical assistance, filling in the gaps to complete an initiative.



Gov. Rene Relampagos alongside Vice Gov. Ed Chatto, Mayor Leandro Tirol, Mayor Trifon Sanchez, Mayor Julius Caesar Herrera and Mayor Cesar Tomas Lopez as Bohol's first "Festival of the Sea" is officially opened in Buenavista on May 4, 2000.

Stuart J. Green

The main issues that the project initially tried to address were illegal fishing; lack of opportunities on capacity-building in ICM; lack of resources allocated by the LGUs; and the lack of coordination among stakeholders. At present, with strong support from and assistance of the

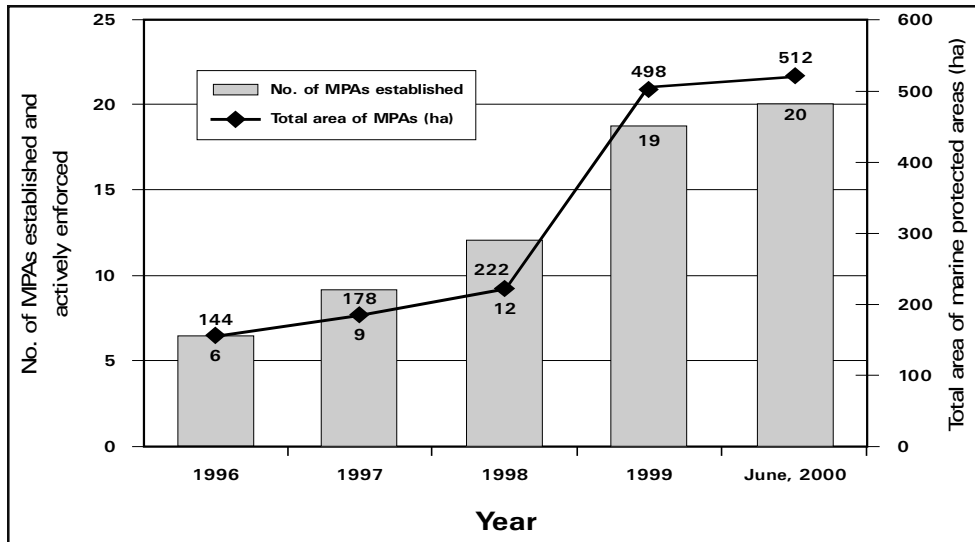


Figure 2. “Functional” marine sanctuaries established within the Bohol learning area since 1996.

provincial government, the CRMP is now able to spread the lessons learned from the learning area to other municipalities.

Apart from strategic coastal planning, CRMP also assists

municipalities in facilitating a variety of “best practices” within the learning area. These include the establishment of marine protected areas (Figure 2) and several community-based mariculture and

ecotourism ventures, in addition to PCRA activities. The DENR has also collaborated through the Community-based Forestry Management Agreement (CBFMA) program by awarding large tracts of mangrove areas to communities for stewardship purposes (Figure 3).

Moving Towards Environment Advocacy

The dynamic leadership of Rene L. Relampagos and Edgardo M. Chatto, Governor and Vice-Governor of the Province of Bohol, and the Provincial Board has given top priority to environmental concerns in the local

Box 3. Functions of the Bohol Environment Management Office

- Assist municipal governments and *barangay* councils, including environmental organizations, through the provision of technical assistance such as, but not limited to, development of environmental management organizational capability, participatory formulation of environmental programs, mobilization of local and external pool of environment specialists and guidance in the formulation and implementation of environmental laws;
- Develop a multi-year environment management framework plan for the promotion of LGU-driven community-based and livelihood oriented initiatives particularly tree enterprises, watershed management, ecotourism, coastal resource management, solid waste management and participatory land use planning;
- Establish operational internal and external linkages and networking system that will maintain and expand LGU-driven environmental initiatives;
- Develop and implement environmental programs through the promotion of best-of-the-moment methods, processes and approaches by establishing showcases within Bohol for the LGUs to adopt in their respective jurisdictions;
- Establish linkages with national and international institutions for purposes of fund sourcing, network building, research and information/databank generation;
- Organize a network of advocacy groups by maintaining a provincial network of environmental organizations;
- Facilitate and coordinate the holding of provincial environment summits in June or July of each year where a cross-section of the Boholano community will resolve issues with regard to natural resource utilization and management;
- Install a quick response desk that will be manned by an interdisciplinary, inter-agency and multisectoral team whose task will be to facilitate calls for fact-finding missions, monitoring and investigation of controversial environmental issues in the province;
- Encourage municipalities to group themselves into clusters to address common concerns such as law enforcement in municipal waters, protection of river systems, watershed management and pollution control as stipulated in the Local Government Code; and
- Recommend to the governor implementing rules and regulations for the Bohol Environment Code.

province's development agenda for Bohol. Together with all concerned sectors, the provincial government launched the Bohol Environment Summit in 1997. Over 400 representatives from the municipal and provincial LGUs, NGAs, NGOs, POs, the academe, the church and the private sector participated.

Major accomplishments of the summit were: a) the Bohol Covenant for Sustainable Development characterized by the province's initiative to set up Bohol's very own development agenda for the twenty-first century; b) the Bohol Environment Code which consolidated and institutionalized all the outputs of the Bohol summit; and c) the fact that it provided an avenue for the many stakeholders to be heard. The Code now serves as a model for all other provincial LGUs in the Philippines in the areas of environment and natural resource management.

The Multi-faceted Bohol Environment Management Office

A landmark mandate of the Bohol

Environment Code is the creation of the BEMO under the direct supervision of the Governor. The BEMO shares responsibility with the municipal governments, the DENR and other NGAs for the effective

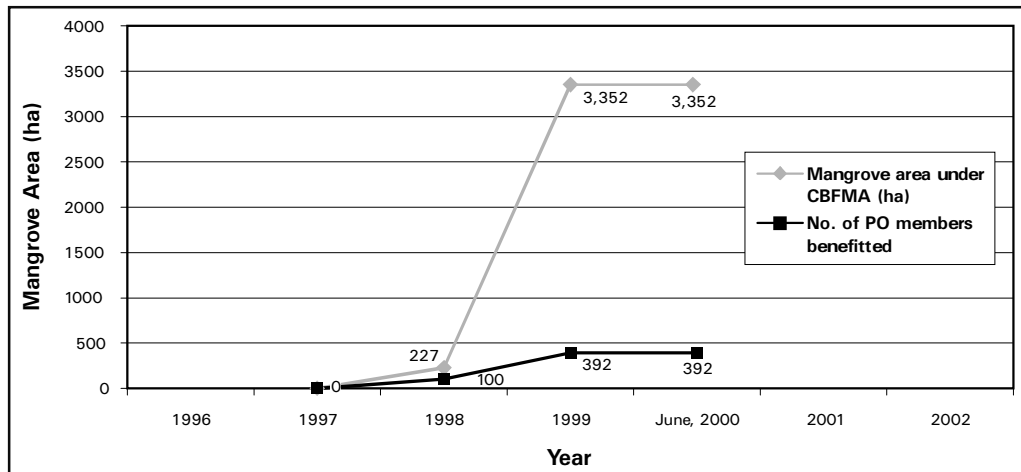


Figure 3. Mangrove management under CBFMAs, Province of Bohol.

protection, development, management, rehabilitation and conservation of the environment and natural resources of the province; the regulation and operation of licensees, lessees and permittees for the taking or use of natural resources; the implementation of LGU-driven coastal, forest, mineral, ecotourism and water resources management, including waste management and the control of water and air pollution; and the enforcement of environment and natural resources laws, rules and regulations.

Before the creation of the

and law enforcement and information, education and communication to the municipal LGUs. With the establishment of the BEMO, the OPA now focuses on agri-business and coastal livelihood development that are sub-components of ICM. Serving as a "one-stop shop" for environmental initiatives, the BEMO is expected to act as an umbrella organization, coordinating all ICM-related activities in Bohol.

To date, the BEMO, in coordination with the Voluntary Service Overseas, is developing the Bohol Natural Resources Database

Box 4. Current Activities/ Projects of the BEMO

- Integrated Coastal Management
- Participatory Land-Use Planning
- Forest/Watershed Management/Bohol Tree Enterprise Program
- Integrated Solid Waste Management
- Water Quality Monitoring
- Environmental Management System for the Provincial Government
- Provincial Natural Resources Database
- Development of the Office as a One-stop-shop and Resource Center for Other Partners in the Province

BEMO, the Office of the Provincial Agriculturist (OPA) rendered such services as planning and management, community organizing and stewardship, resource rehabilitation, policy development

continues to create a more complete picture of Bohol, it becomes a better planning tool. Ultimately, the CRMP intends to institutionalize ICM in Bohol, the latter able to offer the necessary technical assistance

as an information management tool. This comprehensive database will include the municipal coastal database that CRMP is finalizing. As the database

throughout the province through the BEMO.

During the launching of the Bohol Provincial Coastal Resource Management Task Force-sponsored “Our Seas, Our Life” exhibit in August 1999 at the Bohol Cultural Center, Gov. Relampagos, the DENR Regional Executive Director, the Bureau of Fisheries and Aquatic Resources Regional Director and the CRMP Chief of Party signed a Memorandum of Agreement defining the roles and functions of the four partners. The MOA included the allocation of resources and staff to counterpart those of the CRMP. A one-to-one staff matching policy between the CRMP and the BEMO is currently proving very effective in doubling ICM impacts across Bohol. The most recent output of this MOA is the creation of a sub-committee in the *Sangguniang Panlalawigan* (SP or Provincial Council) that focuses solely on marine and coastal resources by virtue of SP Resolution No. 99-618. This will greatly accelerate the passing of suitable ordinances relating to ICM in the province. Additional staff have also been assigned to the BEMO to complement CRMP activities. This manifests the local government’s support for the environment as mandated in the Bohol Environment Code.

Likewise, the MOA implies that the CRMP, hand in hand with the CRM Section of the BEMO, can also begin to look beyond its Northwestern Bohol learning area. The CRMP, in full coordination with the BEMO, can now work with any coastal LGU of Bohol that would request technical assistance—a welcome move as far as the province is concerned.

Next Steps

There are many ICM endeavors going on in Bohol. The greatest challenge now is how to develop them into one holistic ICM program.



Tubigon fisherfolk.

With the BEMO in the lead, the LGUs can begin to focus and address main issues logically and systematically. A major activity towards this end will be participatory assessments and planning in the various municipalities where none have yet been conducted. Sharing relevant experiences will also be a priority. The municipalities of Northwestern Bohol are in a position to showcase their numerous ICM experiences and serve as models to the southeast. A stakeholders’ summit, focusing on coastal law enforcement and facilitated by the provincial government in coordination with the provincial CRM Task Force, is currently being held as a spin-off of the Bohol Environment Summit.

During the culminating activity, an MOU was drawn up and signed, creating three district-wide coastal law enforcement councils. During Governor Relampagos’ provincial “Coastal Law Enforcement Agenda” speech held on the same day, he agreed to donate one patrol boat to each of the three district-wide councils to begin law enforcement activities in earnest.

The provincial government of Bohol maintains an “open door policy” with regard to partnerships in an effort to increase the efficiency and effectiveness of ICM implementation. The BEMO and the CRMP are expanding their network of partners by linking with the League of Municipalities of the Philippines-Bohol Chapter. The Provincial Coastal Resource Management Task Force, under the direction of the DENR Provincial Environment and Natural Resources Officer, will continue to be the unified voice of the NGOs and NGAs especially since it has the legal mandate to coordinate all their activities in the coastal zone.

Lessons for the Future

Northwestern Bohol has shown us that strong leadership does make a difference. From the province down to the local chief executives and their municipal officials, together with the fisherfolk, fish wardens, NGOs, NGAs and the Fisheries and Aquatic Resources Management Councils, have formed the critical mass that would continue wise management and development of Bohol’s coastal resources well into the future, a proof of which is the resulting increases in budget allocations for ICM activities (Figure 4).

Once ICM is mainstreamed, it can—and will—provide for the recovery of Bohol’s once abundant coastal resources and with it a proportional increase in the quality of life of local resource users and POs, NGOs as well as LGUs can be proud to say that they made it all possible.

References

Bohol Environment Management Office (BEMO). 2000. **Pagdumala sa**

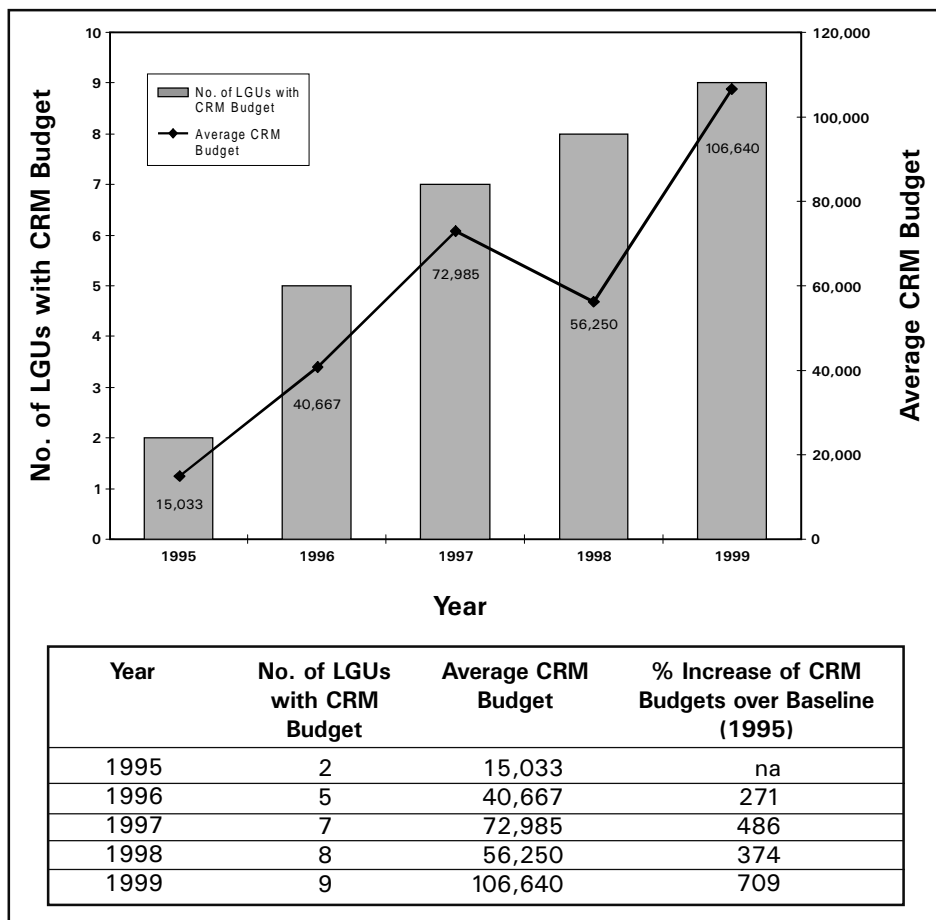


Figure 4. Changes in CRM budget allocation 1995-1999: Bohol learning area municipalities (*Municipal Coastal Database 2000*).

mga Kapanguhaan sa Kabaybayunan ug Kadagatan sa Bohol (Bohol ICM brochure). Bohol Environment Management Office. Provincial Capitol, Tagbilaran City, Philippines.

Courtney, C. and K.P. Traub. 1999. **Local Government Management of Coastal Resources: Defining the Outer Limits of Municipal Waters in the Philippines**. TAMBULI. No. 5. May. pp. 14-18.

Department of Tourism (DOT). 1997. **Bohol Ecotourism Development Framework**. Office of Product Research and Development, Philippines.

Green, S.J., R. P. Monreal, A.T. White and T.G. Bayer. (eds.). 2000. **Coastal Environmental Profile of Northwestern Bohol**. Coastal Resource Management Project.

Cebu City.

National Census and Statistics Office (NCSO). 1995. **Population Census for the Province of Bohol**. NCSO, Philippines.

National Economic and Development Authority (NEDA). 1999. NEDA website: www.neda.gov.ph

Provincial Planning and Development Office (PPDO). 1992. **Bohol Provincial Profile**. Province of Bohol, Philippines.

Provincial Planning and Development Office (PPDO). 1993a. **Provincial Physical Framework Plan**. Province of Bohol, Philippines.

Provincial Planning and Development Office (PPDO). 1993b. **Socioeconomic Provincial Profile**. Province of Bohol, Philippines.

Sangguniang Panlalawigan. 1998.

Provincial Ordinance No. 98-01 Series of 1988. An Ordinance Enacting the Environment Code of the Province of Bohol. Office of the Sangguniang Panlalawigan, Tagbilaran City, Philippines.

Segura-Ybañez, M. E. 1997. **Sustainability of Community-based Resource Management in the Central Visayas Regional Project – I Sites after 1992**. In: *Community-based Resource Management – the Central Visayas Experience (1984-1992)*. Regional Center for Community Based Resource Management, Central Visayas Regional Development Council, Cebu City, Philippines.

Silliman University Marine Laboratory (SUML). 1997. **Profile of the Bohol Learning Area**.

SUML. Dumaguete City, Philippines.

Uychiaoco, A.J., H.O. Arceo, S.J. Green and F.I. Castrence, Jr. 1997. **Monitoring the Effects of Marine Sanctuaries in Lomboy, Calape and Cangmating, Sibulan**. Coastal Resource Management Project, Cebu City and University of the Philippines-Marine Science Institute, Quezon City, Philippines.

White, A.T. 1999. **Essential Elements of a Good ICM Plan**. Coastal Resource Management Project. Cebu City.



Between the Slaughterhouse and Freedom: A Matter of Man's Choice or a Whale's Right?



Kai-J. Kuhlmann
Consultant for Aquaculture and Coastal Resource Management
German Development Service
Guiuan Development Foundation Inc.
6809 Guiuan, P. O. Box 47856
Eastern Samar, Philippines



The pygmy killer whale (Feresa attenuata) too weak to escape from playing kids.

It was a sunny day of June 30 when Cathy, supervising community organizer of the Guiuan Development Foundation Inc. (GDFI), excitedly barged into the office, “Kai, there is a whale on the shore in front of the market. Alive! Alive and I saw it. Children are riding on its back!” I could not believe what I heard and so I asked over and over to check if I had understood correctly. Sensational photographs shot with my camera came into my mind—a visual testimony to a totally unexpected yet, utterly exciting experience during my two-year assignment as consultant for community-based coastal resource management at the GDFI in Eastern Samar, Philippines.

As we reached the market shore, we saw, from a distance of about 100 m, a small black dorsal fin gleaming out of the dark blue bay polluted by market and household wastes. From that distance the whale seemed to be weak and was rather floating than swimming. About seven children enjoyed playing and

riding on its back. Luckily, Cathy met some members of one of our organized fisherfolk associations at the market side who have just arrived in a pump boat. They gave us a ride toward the distressed marine mammal. As we drove nearer to the approximately 1.5 m long whale, the muffled sound of exhaling air was clearly audible through its 3-cm diameter circular. According to Tan (1995), we had a baby pygmy killer whale (*Feresa attenuata*) right in front of us.

The whale's head and pectorals showed bloody grazes which may have been caused by net traps. Remarkable high pitch sounds from the whale made us immediately realize that this young whale was lost and looking for its group or parents through acoustic sounds. I searched for larger whales in the vicinity but it was in vain.

The fishers' children riding on the whale's back saw its weakness. It was quite probable, too, that profits from its slaughter have crossed everybody else's mind. We, on the other hand, asked ourselves how we could contribute to save the whale.

Since GDFI has no legal authority over the protection of marine mammals, Cathy and I decided to return back to land to inform the local fisheries authority, the Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR) Substation. Anzel, responsible for recording marine mammals at the BFAR Substation, obligingly joined us back to the bay. The whale was no longer at the site! What happened? Where was it? Fishers quickly

informed us that the whale was brought to the slaughterhouse. Rushing to the slaughterhouse, about five fishers were busy pulling the cord-bound whale out of the water. What a surprise for them to see us back together with the BFAR-



Busy fishers pulling the cord-bound whale out of the water prior to slaughter.

representative! Their questioning eyes were on us, partly respectful, simply waiting. The whale laid on the wooden floor, breathing heavily, eyes closed. Anzel, as the legal representative decided to set it back to the sea to check its condition. "If the whale dies it can be slaughtered anyway," he concluded.

The fishers agreed seemingly sympathetic despite the potential profits. Together, we sailed towards the open sea, the whale beside us. Reaching cleaner shores away from the polluted market bay, the whale started to become more active and tried to dive and leap anticipating its freedom, back to the open sea, back home. After about 30 minutes, the whale started diving under the pump boat, swimming faster than the diesel engine could power us that we almost capsized. Although, we had not reached the open sea yet, we decided to set it free.

Soon enough, the pygmy killer whale swam around the boat

repeatedly diving and surfacing in increasing frequency that culminated in small jumps.

Suddenly, the whale plotted a torpedo-like motion by diving under the boat starboard and jumping out of the water at the port side. "That was a thank you," Anzel mentioned relieved. From a distance, we observed the pygmy killer whale swimming large rounds of about 500-1000 m in diameter hopefully, towards home.

Regulatory Measures

Historically, whaling provided food and served as a source of income for the coastal populations of Samar. Later, processed whale products were

developed, products that subsequently gained a high market value. Whales were chased and caught like fish although the whales' reproductive capacity is by far lower compared to fish. Whales give birth only every one or two years to a single calf that requires more than a year of maternal care, while fish produces more fishes in the same time period. As companies strove to maximize their profits, commercial and traditional or "by-catch" whaling in gill nets resulted in continuous over-exploitation of some species. Agricultural or industrial development, in addition, caused degradation of natural habitats that negatively affected the recruitment of whale populations.

To globally regulate whaling and to keep under review measures for proper conservation of whale stocks, the International Whaling Commission (IWC) was founded in 1946. The Philippines participated in the IWC from 1981 to 1986 and

focused its endeavor in proper whaling by setting annual coastal whaling seasons from January to July (Barut 1994). Also, the Philippines ratified the Convention on International Trade in Endangered Species (CITES) in 1981 wherein *Feresa attenuata* is classified as a species which is “not necessarily now threatened with extinction but may become so unless trade is strictly regulated” (BFAR 1996). In 1992, the BFAR issued Fisheries Administrative Order No. 185 that banned the catching, selling, purchasing, processing, transporting and exporting of dolphins. This was expanded to whales and porpoises in 1997. In addition, the Department of Environment and Natural Resources established an Inter-Agency Task Force on marine mammal conservation in 1993 to survey and assess whale populations in the country as well as to give popular education on how to rescue and salvage stranded or captured animals.

All these activities serve to regulate whale catch and contribute to its conservation. However, countless little steps are demanded to realize proper whale management in the Philippines especially in rural areas.

Enforcement

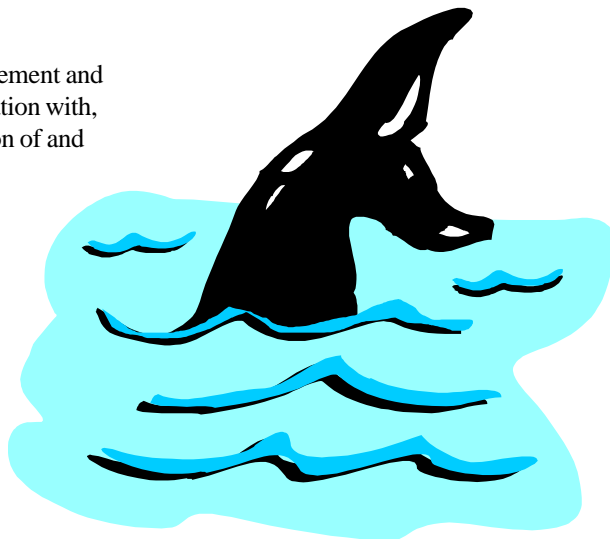
To enhance enforcement and development, collaboration with, environmental education of and alternative economic activities must be provided to the rural population. Non-government organizations (NGOs) can act as catalysts to strengthen the collaboration between local government units and

fishers and farmer families. NGOs can focus on environmental awareness while the government can support various livelihood endeavors (e.g., fishing technologies appropriate to local needs)(McCloskey 1986). With this, the community can be capable to earn higher income as well as act more responsibly toward the environment. Non-consumptive utilization of whales (e.g., whale watching projects), for example, can supplement fishers’ income (Barstow 1986).

Conclusion

After setting the whale free, fishers asked why the whale should be freed. To them, there are many and slaughtering it would have made good business for the day. Besides, “Is there really a law prohibiting whale catching?” A “seminar” on the value of such species was immediately held. Days later, fishers reported that they observed the whale in nearby Guiuan waters, but did not harm it.

Such attempts at protecting marine mammals, in general, might have been sparked during that event. In a matter of weeks, the local government released a “Legal Basis for Marine Mammal Protection Ordinances” to protect marine mammals like



whales and dolphins in the municipal waters of Guiuan, Eastern Samar. Perhaps, this is a sign of better times ahead.

[We need to hear more stories with this positive outcome! Editor]

References:

- Barstow, R. 1986. **Non-consumptive Utilization of Whales.** *Ambio*, 15(3): 155-163.
- Barut, N.C. 1994. **Policy and Management of Dolphins and Whales in the Philippines.** Proceedings of a Symposium-Workshop on Marine Mammal Conservation: 35-37. Marine Science Institute, University of the Philippines, Diliman, Quezon City, Philippines. April 7-8, 1994.
- BFAR. 1996. **Convention on International Trade in Endangered Species of Wild Fauna and Flora.** National edition (Brochure). Bureau of Fisheries and Aquatic Resources, Quezon City, Philippines. 12 p.
- McCloskey, M. 1986. **Educational Campaigns for Marine Mammals.** *Ambio* 15(3): 164-167.
- Tan, J.M.L. 1995. **A Field Guide to Whales and Dolphins in the Philippines.** Studio Graphics & Bookmark Inc., Makati City, Philippines. 129 p.
- Yu, V.P.B. 1998. **Legal Memorandum on the Legal Basis for a Municipal/City Ordinance to Protect Whales, Dolphins and Other Marine Mammals.** Legal Rights and Natural Resources Center Inc.-Kasama sa Kalikasan/ Friends of Earth Philippines, Quezon City, Philippines. 3 p.



I Love the Ocean Movement: The Adventure that is Marine Conservation

[The original of this article first appeared in The Freeman's Sunday Magazine, Vol. 4 No. 89, June 4, 2000.]

● ● ● ● ● ○ ○ ○ ○

Rosario E. Mariño-Farrarons
Social Marketing Specialist
Coastal Resource Management Project

*"I'm just a kid who wants out of my stroller
And even though I know how to crawl
I'd be so much faster, I'd keep up with my mother
I think this would be the right move for me."*

— from the Disney Playtime album

Children inevitably grow up. While they demand so much time and nurturing as infants, children move on to become toddlers, t-e-e-t-e-r-i-n-g but raring to take on the world. And even as spectators are anxious about the outcome of kids' ambitious experiments with the world around them, children rarely ever fail in their "explorations". In fact, more than allowing children to adapt to the world, these experiences teach adults the art of letting go, of trusting in the little ones' capacities.

The "I Love the Ocean" Movement might as well be that little one and earnestly singing that tune from Disney, too. Now two years old, I Love the Ocean is taking a huge load off the world around it—the planet earth, in fact—taking on responsibilities towards sustainable seas in a more exciting way.

If the growth of its membership base is any indication, I Love the Ocean may well be here to stay.



Map reading at the Sea Camp.

The Movement now has 13,000 members nationwide—and the numbers keep coming. Students, professionals, entrepreneurs, children and their parents come to the office of the Coastal Resource Management Project (CRMP) at CIFIC Towers, North Reclamation Area, Cebu City, Philippines, where the Movement was conceptualized and where the organization is now based, to heed the call of the environment and fill out a one-page information sheet.

When Sunburn Doesn't Hurt

A Sea Camp Story

Who says sunburn hurts? Or that it's unsightly? Violent opposition is what you are likely to get from participants of the I Love the Ocean Sea Camp on Olango Island if you ever so much as comment on their suffering from intense sunburn pain. Keep noticing and you're sure to hear, "It does not matter. This is the mark of Olango!" They do not mind if people stare at that super-burned look because more than being proof that they have been under the glaring sun for four full days, it bespeaks of the numerous experiences shared during the camp.

On March 23-26, 2000, the I Love the Ocean Movement, in cooperation with the University of Cebu, held a Sea Camp at Suba, Sabang, Olango Island, Lapu Lapu City in central Philippines. The Sea Camp was not just a plain-ol'-camp-with-bonfire-at-night thing although, candles were lighted during reflection sessions in the evenings. The camp was a training course that taught participants the values of preservation and concern for the marine environment. Well, that's just the tip of the iceberg. You should have been there. The sunburn did not hurt.

The camp brought together young people of different backgrounds, melding the participants' own set of values with shared experiences and a new set of values—that of conserving and promoting the sustainability of coastal and marine resources. This fusion of unique personalities and backgrounds enriched the entire exercise, but it was the same uniqueness of individuals that made it seem intimidating at the onset. Some participants sported an authoritative look, they seemed rather daunting; others looked menacing, giving one second thoughts about approaching them.

The trip to Olango Island felt drawn-out and dizzying—must be the combination of the boat ride and hungry stomachs. Little wonder that silence reigned through most of the trip, a silence broken only when the island came into view. With an amazing stretch of white sand beach and a waterway flanked by lush mangroves on both sides, Olango was a sight to behold. And the birds, the ones that make Olango famous, were there to welcome us, making us momentarily forget our rumbling tummies. Amidst a chorus of oohhs and aahhs, our group finally got acquainted. A lively chatter broke out, and that, I was to find out, was just a taste of the many spirited interactions we would have over the course of this three-day camp.

We certainly found many things to talk about. Olango was the best place in which to hold the Sea Camp. The place has all of the three major tropical marine habitats—mangroves, seagrass beds and coral reefs. Here, we were exposed to them and made to better understand the roles that they play in the very fiber of our lives.

We learned that these habitats are intimately connected and functionally interactive, each one playing a critical role in improving and maintaining the quality of tropical marine environment. We also learned that this role is little understood by many, sometimes even those living along our coasts and making their living from our seas, and that human activities have placed our marine environment and the lives of humans and animals in great peril.

Each day of the camp started with morning praise and ended with evening rituals. These activities helped each participant realize that there is a Creator who provides everything we need and that each creation exists for a purpose.

We earned a hefty dose of sun during morning praise; the rest of the sunburn was gained from outdoor team-building activities and games. We had the greatest fun doing these exercises but the games were not mere play, they also served to give participants a better appreciation of the values of cooperation and interdependence and magnified the concept of interrelatedness between and among creatures and habitats.

Take the game called "Spider Web", for instance. Each member of a team, with help from his teammates, was required to pass through a "cell" in the web without any part of his body touching the sides of that cell. It was a game of strategizing, a little hair-pulling, scratches and crumpled clothing well worth the trouble.

There were regular discussions during the camp, quite like what we have in school, but in a different setting: on the beach, several "*banig*" (mats) spread under a tree, and the balmy sea breeze. Now, what could be more cool?

Necks would stiffen in the evenings as we tried to locate the Big Dipper. A few arguments here and there eventually led us in the right direction. Some even mistook a firefly for a star—that's navigating!

Commodore Gaudencio Peña, President of the I Love the Ocean Cebu Association, was there to share his myriad experiences in "Oceaneering", Navigation and Survival Aids. His lessons came in handy throughout the camp, especially when we went into hands-on learning.

"Oceaneering," a module designed to teach participants weather forecasting and the concepts of tides, winds and other oceanographic processes, was applied during the most keenly awaited part of the camp—environment-friendly water sports! And off we paddled on our kayaks and swam in crystal clear waters. Even the birds joined the fun.

The Sea Camp brought about an obvious change for the better in the way participants view their environment. It helped us recognize the integral and interdependent relationships between humanity and the rest of creation. We now fully appreciate that, as humanity is dependent on the fruits of Nature, so is Nature's very survival greatly dependent on humanity.

By **Eloisa Roa**, Member, I Love the Ocean Movement

These information sheets, initial “contracts” of commitment to sustainable development, are the same ones being filled out in Manila, Davao, Compostela Valley, General Santos City, Siquijor, Dumaguete and Bohol. In each of these cities and provinces, an organization is taking on the cause as a “chapter” of the umbrella Movement. In Manila, ABS-CBN’s Bantay Kalikasan Foundation manages the Movement. In Davao, the anchor organization is the Davao City Chamber of Commerce and Industry. In Dumaguete and Bohol, the social action arms of the Roman Catholic parishes carry the torch.

While CRMP, an initiative of the Department of Environment and Natural Resources (DENR) and the United States Agency for International Development, started the Movement in celebration of the International Year of the Ocean 1998, it has now released the somewhat “wobbly” but eager-to-do-its-share Movement into the world, merely providing the occasional helping hand when necessary. The Movement has already reached a maturity level that allows CRMP to view and treat it as it does its institutional partners like government agencies, non-government organizations and the academe. And this faith in a two-year-old is not borne out of blind belief.

I Love the Ocean has moved from merely being a statement on someone’s car bumper into an organization with real activities creating bigger and bigger ripples. Take for instance the group’s Sea Camp, a field-based experiential coastal resource management appreciation course. About a hundred youths and “I Love the Ocean” prime movers have been graduated from the course where each has vowed to initiate or help undertake activities that would multiply the effects of conservation efforts in Cebu province. Modules, carrying such titles as Oceaneering and Navigation, Leadership Skills Development and Ecology come together, tugging at participants’ heartstrings—enough to motivate them into contributing to the cause.

Celebrities have also stepped forward to endorse the Movement. Famous artist Jim Paredes, virtually coordinating the participation of diver-celebrities in dive events says, “It is not all that difficult for us, artists, to put in our time for the environment. We fully comprehend that if we continue the destruction of our marine and coastal environment, everyone, rich or poor, famous or unknown, young and old, will suffer—and that is not at all a pleasant condition.”

Celebrity events are a magnet for fishing communities and the general public to identify with coastal resource management. Entire villages have come out to witness their favorite movie stars plunge into marine sanctuaries, take debris out of the sea or make their pitch for the environment. These events make the concept of saving the marine and coastal resources from further destruction more real and understandable.

Local government units (LGUs), meanwhile, support special events by providing accommodation, transfers, sound systems and fulfilling other logistical requirements. LGUs, of late, have displayed increased interest in coastal and marine resources management—even appropriating funds out of the annual municipal budgets for CRM. They also help in the procurement of private sector donations for I Love the Ocean Movement activities.

On its second anniversary, the Movement undertakes its most ambitious project, so far—planting “A Million Mangroves for the Millennium” that includes the establishment of what probably is Asia’s first mangrovetum (mangrove plantation established for conservation).

Mario Gasalatan, I Love the Ocean Movement coordinator, says members have stepped forward to assist in the multi-faceted “A Million

Mangroves for the Millennium” project – from selling 99-centavo tickets to raise funds to wading in squishy mud to plant the seedlings themselves.

“There were over 450 thousand hectares of mangrove areas in the Philippines in the early nineteenth century. Now we are left with barely one-fourth of that. This is why we saw the need to replant our mangrove marshlands in Cebu and promote the same program to other provinces,” explains Commodore Gaudencio Peña, Philippine Coast Guard Auxiliary, President of the I Love the Ocean Cebu Association, Inc.



Mangrove planting: an “I Love the Ocean” activity.

Fueled by the spirit of unity and environmental responsiveness, the Cebu association now conducts regular checks on the one-hectare former fishpond where the first of the “million mangroves of the millennium” are taking root, the establishment of the mangrovetum, in particular. Various species of the hardy shrubs are now growing on the property. Seedlings are also being cultivated to reforest other denuded mangrove areas in Cebu.

To wade in the squiggly, soft mud is a pleasurable experience for these conservationists. Ditto plunging into rubbish-ridden waters. To them, this is all kid’s play. After all, the I Love the Ocean Movement is just a two-year-old doing its bit for Mother Earth.



Coral Bleaching: the Whys, the Hows and What Next?

Dolores Ariadne D. Diamante-Fabunan
Coastal Resource Management Specialist
Coastal Resource Management Project



Bleached polyps, Balicasag Island, Bohol, January 1999.

The El Niño phenomenon has been around for years but it is only recently that impacts have reached alarming levels. Most of the unusual weather experienced worldwide in 1998 has been attributed to El Niño. It is also suspected to cause the development of a hot seawater mass along the African East Coast in early 1998 that reached the Maldives in late March of the same year, raising the water temperature to 31°C, even higher in some areas, for long periods of time. The Philippines has not been spared this scourge, devastating reefs in the southern parts in August and September of 1998. Indeed, these elevated water temperatures in 1998 led to global coral bleaching and coral death.

Corals are temperature-sensitive animals. They can only function effectively within a narrow temperature range. When the ambient (water) temperature reaches above a certain level, hard coral polyps expel their symbiotic algae in what is referred to as a bleaching event. Without the algae in their tissue, the corals become white hence, the term. Also, the microscopic algae or zooxanthellae that normally live inside the corals provide them with most of their food through photosynthesis. If the situation persists, the coral does not get

enough food and eventually dies. On the other hand, if the water temperature returns to normal (below 29.5°C) within about six weeks, the coral accepts the algae back and generally recovers.

Unfortunately, the warm water in 1998 persisted. The ensuing global coral bleaching and die off is unprecedented in geographic extent, depth and severity (Maniku 1999). Tropical sea surface temperatures in 1997 and 1998 have been higher than in any other time in modern history. Coral bleaching associated with high sea surface temperatures affected almost all species of corals and many other invertebrates. Coral reefs of all the countries in the Western Indian Ocean, East African region, Bahrain and the Gulf as well as the South Indian Ocean have been affected. Heavy damage to reefs more than 1,000 years old has been recorded in the South China Sea areas indicating the severity of this event. The only major reef region that seems to have been spared is the central Pacific.

The water temperature around the Indian Ocean reef systems and parts of the Philippines reached 32°C in May 1998, too warm for hard coral species. Coral reefs in the Indian Ocean suffered high levels of mortality following severe coral bleaching leaving some reefs uniformly white in appearance. In some of the portions of the Indian Ocean, mortality in the upper 6-10 m has been as high as 90% while western Palawan, Philippines suffered 40% mortality.

In the Maldives, the abnormally high temperatures that persisted for too long affected the whole archipelago killing most of the branching corals such as the Acroporids and the Pocilloporids. However, approximately 50% of the brain corals and the massive corals such as *Porites* survived after the bleaching incident. In order to understand the implications of bleaching on the fisheries and tourism of the Maldives, great effort has been made to collect valuable information that may reveal any negative impact. The Marine Research Centre (MRC) monitored the reefs throughout selected sites in the north, central and southern part of the Maldivian archipelago in May 1998. A more comprehensive

Alan T. White

survey was carried out from September to October 1998 when a number of dead corals have already been covered with algae. Very few bleached corals were identified. An abundance of herbivore (plant eaters) fish species was observed. With regard to the fisheries for the period September 1998 to February 1999, Maldives had the highest tuna catch in the past 30 years. During the same period, there has been an abundance of plankton, specifically zooplankton. This has brought in a number of filter feeders such as whales and mantas into Maldivian waters.

Reef monitoring in April 1999, almost one year after the bleaching incident, yielded encouraging observations. In a number of reefs and the monitoring sites visited by MRC scientists, recovery was evident and new recruits were found. In addition, many bleached corals that should have been resistant to bleaching in the first place, such as the massive growth forms, were recovering well from the bleaching incident. In one site close to Malé, in a 5x10 m² area, more than 100 new recruits measuring 5-15 mm in diameter have been observed. Similar recruitment has also been observed in the northern atolls.

The Maldives is lucky. Damage on the reef was overshadowed by the positive change in the fish assemblage. This has been attributed to the unpolluted nature of the Maldivian environment. The Maldives has a fairly pristine and low impacted reef system, perhaps, the very reason for its rapid recovery. Observed recruitment shows that within a very short period of time, the reefs can return to a healthy state.

In the Philippines, Ma. Fe Divinagracia evaluated the extent and degree of coral bleaching in selected sites in Central Visayas from May to June 1999 in order to help understand coral bleaching and its impact on Philippine reefs more fully. The degree of bleaching among genera, growth forms and water depths was determined among the reefs in Apo Island, Dauin, Negros Oriental; Sumilon Island, Oslob, Cebu; Balicasag Island,



Bleached soft coral, Bais Sanctuary, Negros Oriental, September 1998.

Alan T. White

Panglao, Bohol; and Pamilacan Island, Baclayon, Bohol. Divinagracia likewise described evidences on reef recolonization.

Among the sites, Apo appeared to be the most affected by the 1998 bleaching episode at 35% (0.37 km²) and least affected was Pamilacan at 6.4% (0.16 km²). Significant differences existed with respect to bleached cover among genera in all sites surveyed.

It is probable that along with increased water temperature, sea conditions at that time in Apo were extremely calm with exceptionally clear water such that light could have been able to penetrate farther into the water. In the absence of organic and inorganic matter in the water column, coupled with less mixing by wave action, higher than average intensities of UV (ultraviolet radiation) probably reached much deeper depths (Gleason and Wellington 1993 in Divinagracia 2000). According to Glynn (1993), many workers have reported coral bleaching during periods of low wind velocity, calm seas and low turbidity where such favor heating of shallow waters and high solar radiation penetration. Also, there is less oxygen in the water column at higher temperatures.

In terms of coral genera and growth forms, variation in the degree of bleaching was observed among the sites. *Galaxea* was the most

significantly affected by bleaching in Apo, *Seriatopora* in Sumilon, *Montipora* and *Pocillopora* in Balicasag and *Pocillopora* in Pamilacan. This may be related to physiological differences among species of zooxanthellae present (Goenaga *et al.* 1989 in Divinagracia 2000). Based on Buddmeir and Fautin (1993) and Ware *et al.* (1996), bleaching is an adaptive mechanism that allows the coral to be repopulated with a different type of alga, possibly conferring greater stress resistance (Divinagracia 2000). Physiological and genetic studies showed that different strains of zooxanthellae exist both among different and within species of coral hosts and that different strains of algae show varied physiological responses to both temperature and irradiance exposure (Glynn 1993 and Brown 1997 in Divinagracia 2000).

Among the different growth forms, highly affected by bleaching were the branching corals. They have been observed to be highly susceptible in various bleaching events in French Polynesia, Australia, Hawaii, Eastern Pacific, Papua New Guinea. The massive bleaching that occurred in Apo Island was probably due to the extent of surface area exposed to solar radiation.

Some zooxanthellae in reef corals are known to produce an UV absorbing pigment, S-320, in response to UV light (Glynn 1993 in Divinagracia 2000). The intensity of UV radiation diminishes with increasing depth and presumably less of this protective pigment is required at greater depths (Fitt *et al.* 1993 in Divinagracia 2000). Deeper corals therefore, may be more susceptible to increases in UV radiation (Goenaga *et al.* 1989 in Divinagracia 2000). This may explain the occurrence of bleaching at all depths that was observed in the study.

Most of the affected colonies were recolonized by small filamentous and encrusting algae. Some coral colonies had white spots all over the surface that may be a kind of coral disease (white band disease). This would require further investigation, however.

Divinagracia recommends that a

monitoring site should be set up to allow for rapid and accurate recognition of bleaching events that will also enable a quick and appropriate response. Likewise, more sensitive techniques to measure temperature tolerance combining morphological, ecological and molecular genetic approaches, a range of responses and the potential for physiological and genetic adaptation are needed.

Indeed, post-bleaching is likewise critical because survivors depend on previous energy reserves (Wilkinson *et al.* 1999 in Divinagracia 2000). Survivors can only produce fewer larvae to repopulate damaged areas.

Worldwide, many coral scientists believe that this mass coral bleaching, although primarily caused by rising tropical sea temperatures, was exacerbated by other direct stresses on the reefs. In addition to high water temperatures, there are factors such as storms, pollution and other impacts due to global warming.

A dramatic warning comes from a recent study by Dr. Ove Hoegh-Guldberg, Director of Sydney University's Coral Reef Research Institute (NEWS 1999). Using a variety of climate change models, he predicts that the continual rise in tropical sea temperatures will lead to increased coral bleaching and calculates that events as severe as 1998 could become commonplace by 2020. He reports that corals do not have the genetic ability to acclimatize rapidly enough to rising water temperatures. According to Hoegh-Guldberg (1994), coral bleaching around the world will increase in frequency and seriousness until it occurs annually by 2030, unless global warming is reversed. Although he would not expect coral reefs to become extinct due to mass bleaching, he estimates that it could take up to 500 years for them to recover.

Researchers from the University of Georgia have also discovered that higher sea temperatures degrade the ability of the zooxanthellae to convert light into energy, thus cutting off the corals' food supply.

Likewise, other studies show that excess heat impairs the corals' ability to reproduce. Chin predicts a severe negative impact of increased atmospheric CO₂ concentrations on coral reefs. An increase in dissolved CO₂ concentration in seawater will enhance the solubilization of calcium carbonate, decreasing the saturation state of aragonate therefore, reducing calcification. The authors predict that between preindustrial times and the middle of the next century, there will be a drop in reef calcification of 14-30% (Chin 1999).

While the problem seems too big for an individual to do anything about it, we all need to do what we can to help. If humankind would make an effort to minimize adverse anthropogenic influences, recovery of affected corals may be faster. Even small actions (like reducing carbon dioxide emissions by driving our cars less) may contribute to the solution.

In the meantime, everyone must continue to strongly support projects that protect local coral reef areas. Without effective local protection, many coral reefs will be lost in the next few decades—even without the effects of bleaching.

[See the "Editorial" for this issue for more discussion on this topic. Editor]

References:

- Brown, B. 1997. Coral bleaching: causes and consequences. **Coral Reefs**. 16:129-138.
- Buddemeier, R.W. and D.G. Fautin. 1993. Coral bleaching as an adaptive mechanism. **BioScience**. 43(50):320-326.
- Chin, Gilbert J. (ed.). 1999. **Coral Reef Peril**. Science. April. 284:9.
- Divinagracia, Ma. Fe. B. (2000). **Extent and Degree of Coral Bleaching in Selected Reefs in Central Visayas**. M.S. Thesis. Silliman University, Negros Oriental, Philippines.
- Fitt, W.K., H.J. Spero, J. Halas, M.W. White and J.W. Porter. 1993. Recovery of the coral *Montastrea annularis* in the Florida Keys after the 1987 Caribbean bleaching event. **Coral Reefs**. 12:57-64.
- Gleason, D.F. and G.M. Wellington. 1993. The intensities of ultraviolet radiation that induce bleaching of Caribbean coral. **In: Proceedings of the 7th International Coral Reef Symposium, Guam**. 1:71.
- Glynn, P.W. 1993. Coral reef bleaching: ecological perspectives. **Coral Reefs**. 12(1):1-17.
- Goenaga, C., V.P. Vicente and R.A. Armstrong. 1989. Bleaching induced mortalities in reef corals from La Parguera, Puerto Rico: A precursor of change in the community structure of coral reefs? **Caribbean Journal of Science**. 25(1-2):59-65.
- Hoegh-Guldberg, O. 1994. Mass bleaching of coral reefs in French Polynesia. Report Prepared for Greenpeace International. 36 p.
- Maldives Coral Reef Update**. 1999. Sports Diver Magazine. February.
- Maniku, Maizan Hassan. 1999. **Coral Recovery Underway**. Malé Marine Research Centre. March.
- NEWS. 1999. **Bleaching in the News: The Science Behind the Headlines**. NEWS: The Newsletter of The Coral Reef Alliance, Fall. p.1.
- Truth about Coral Bleaching**. 1998. Maldives Tourist Promotion Board. December.
- Ware, J.R., D.G. Fautin, R.W. Buddemeier. 1996. Patterns of coral bleaching: modelling the adaptive bleaching hypothesis. **Ecological Modelling**. 84: 199-214.
- Wilkinson, C., O. Linden, H. Cesar, G. Hodgson, J. Rubens and A. Strong. 1999. Ecological and socioeconomic impacts of 1998 coral mortality in the Indian Ocean: An ENSO impact and a warning of future change? **AMBIO**. 28(2):188-196.



Beyond the Mangrove Path: Coastal Resource Management in Pangangan, Bohol, Philippines



Anthony L. Kintanar
Development Communication Specialist
Department of Environment and Natural Resources 7
Ecosystems Research and Development Service
Greenplains, Banilad, Mandaue
Cebu, Philippines

Pangangan Island, lying 4 km off the western coast of Calape, Bohol, Philippines, has a land area of 1,040 ha and a population of 3,500. It has 8 *barangays* (villages) namely: Magtongtong, Kinabag-an, Madangog, Lomboy, Lawis, Talisay, Looc and Kahayag. Pangangan is separated from the mainland by a tidal flat. In the early 1900s, the island was reached by foot, which exposed the hiker to sharp rocks, or on a *banca* that tended to run aground during low tide.

The Mangrove Path

According to accounts, village heads urged fishers to line up stones from Calape to Pangangan. These served as the foundation for the causeway that was completed in the early 1950s. Strong waves and typhoons, however, easily destroyed the causeway. Islanders would repair the bridge, only to have it damaged again. Then Felipe Ytac, the elementary school principal, led students in planting mangroves along the



Peanut production/harvest in Pangangan Island, Calape, Bohol.

causeway. Continued by succeeding principals, Eduardo Rueras and Anastacio Toloy, it became a yearly activity.

Seeing positive results, more Panganganons joined in, and by the 1980s, the plantation had extended 2 km into the mainland. Today, mangroves on both sides of the causeway cover over 50 ha. Declared as a Mangrove Reserve and a component of the National Protected Areas System in 1982,

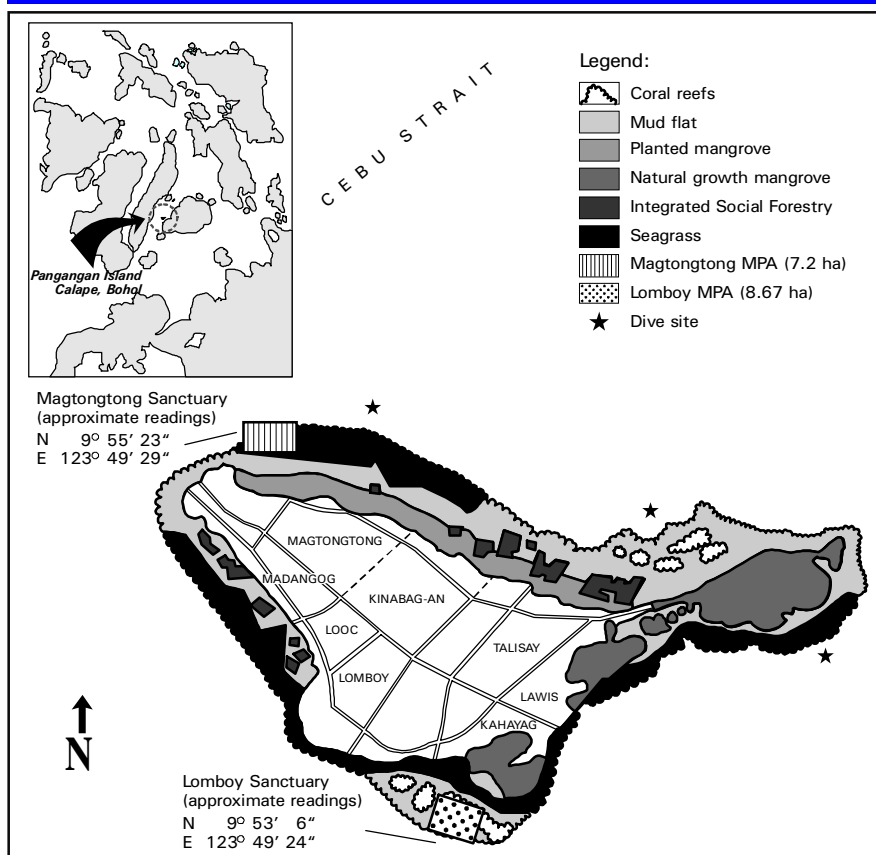


Figure 1. Map of Pangangan Island, Calape, Bohol.

over 15% of Pangangan's land area is mangrove and Barangay Kinabag-an was reportedly named for its thick stands.

The Coastal Environment Program: Advancing the CRM Tradition

The Panganganons however, had other problems. Population growth, coupled with open access to the island's waters by commercial fishing boats, steadily exhausted the coastal resources. Commercialization, in turn, encouraged the use of fine mesh nets, explosives and poison, thus causing further damage.

By 1993, the coral cover and fish stock in Pangangan waters became sparse. Each fisher caught only an average of 1 kg of fish per day and the average monthly income per family barely reached PHP 2,000.

In 1994, Pangangan was made a site by the Coastal Environment

Program (CEP). CEP was created by Department Administrative Order No. 19-1993, and is a regular program of the Department of Environment and Natural Resources (DENR). DENR aims to conserve and develop the country's coastal resources through a community-based approach.

In April 1994, the island's mangrove, seagrass and coral areas were surveyed. Likewise, a socio-economic profile was made. The next step was to organize people's organizations (POs) to serve as conduits of collective action.

CEP community development workers explained the concepts of sustainable resource use and other premises of CEP in *barangay* assemblies. Since many islanders have seen projects fail in the past, it took many visits and conservation efforts for them to accept the program's relevance.

Eventually, planning workshops were held and officers chosen in October 1994. The constitution and by-laws were ratified in 1995. The common vision: rehabilitate and protect the natural resources, improve livelihood and develop the POs.

The POs first addressed the open access to their municipal waters and were oriented on fishing laws. By 1995 deputized local fish wardens have conducted patrols with the Philippine National Police, apprehending illegal fishers.

Marine Sanctuaries and Fish Wardens: Marshalling Pockets of Sustenance

The CEP worked early to have Marine Protected Areas (MPAs) established in Pangangan. This is due to the recognition that MPAs have helped degraded habitats recover.

At first, most of the fishers were against MPAs, contending that these would only further lessen their fishing area.

Acceptance finally came after cross-visits by *barangay* officials and PO representatives to the marine sanctuaries in Apo Island, Negros Oriental and Tulapos, Siquijor. Having seen the beauty and livelihood potential of undisturbed marine areas, the cross-visitors helped their fellow islanders understand the importance of MPAs.

After *barangay* consultations, MPAs were established in Magtongtong and Lomboy. Municipal ordinances were approved in 1995 and 1996 prohibiting fishing and other extractive activities inside the MPAs and allowing only hook-and-line in the 150-m buffer zone.

Since then, resource assessments of the MPAs were

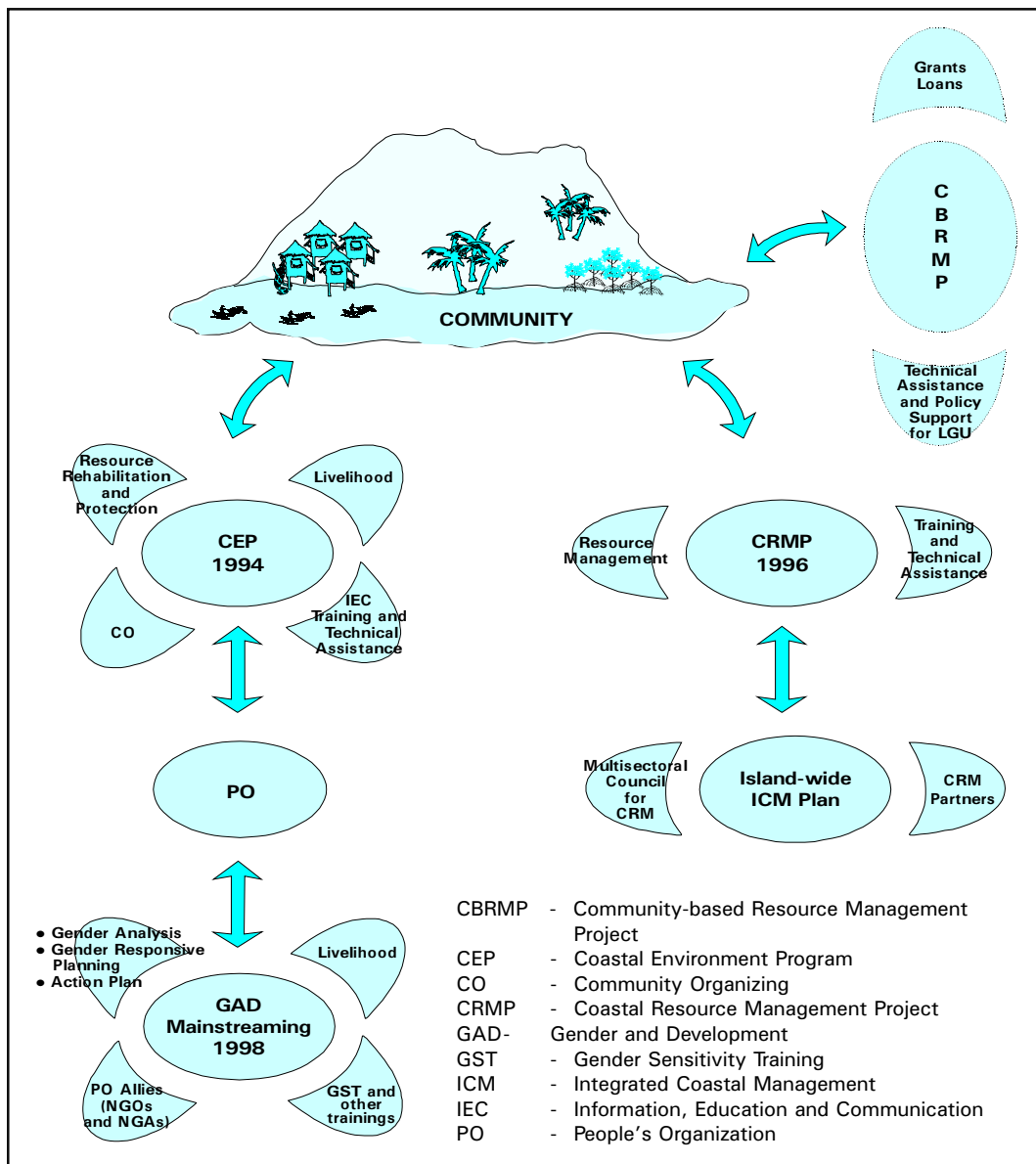


Figure 2. The CRM process in Pangangan Island, Calape, Bohol.

conducted regularly. To strengthen community ownership and management of the sanctuaries, islanders were trained in resource assessment methods.

In two years, the Panganganons reported improvements in their fish and shell catches, particularly near the MPAs' buffer zones. DENR MPA resource surveys found 51 fish species in Magtongtong and 65 in Lomboy in 1999, up from 42 and 11 respectively in 1998. According to CEP Pangangan Site Coordinator Marcial Ugay, successful

implementation of the MPAs is due to the cooperation of the islanders and the vigilance of the fish wardens who voluntarily conduct patrols every night.

Alternative Livelihood: The Essential Gesture

The CEP, learning from past projects that lectures on resource conservation would be irrelevant if not accompanied by steps directly benefiting the fishers' lives, aimed not just to minimize destructive fishing, but to develop alternative sources of income among the

Panganonons.

Through meetings, PO members identified livelihood projects for their area. While the CEP provided some seed funding for livelihood projects, its assistance was more focused on training and planning sessions and in getting assistance from other organizations.

Taking the initiative, the POs started operating community credit systems and added backyard gardening, increasing the availability of foodstuffs. Then, the POs set up

consumer stores, hog growing, fish pots, goat dispersal and peanut and mango production.

Looking back, PO leaders admit that lack of feasibility studies, deficiencies in the members' skill and commitment and the pervading El Niño phenomenon affected the livelihood projects, some of which did not prosper.

Yet, all of the organizations gradually increased their total capital. The assets of the PO in Looc, for instance, grew from an initial PhP 800 to 13,000 while that of Lawis and Kinabag-an grew from

Php 1,000 to 26,000. Likewise, the Talisay PO's assets increased from Php 900 to 18,000.

Monetarily, the gains are not big. But they have given the PO leaders and members a taste of the benefits of managing their resources. Ultimately, it is the fishers' belief in their competence and power to shape the future that makes alternative livelihood efforts an essential gesture.

Integrating Gender and Development: Cooperation at the Home Level

By the late 1980s, the growing women's movement has led a demand to improve the status of women in Philippine society. Likewise, women who were active in development work sought to enhance their involvement in the development sector.

In response, the government's Philippine Plan for Gender-Responsive Development (PPGRD), 1995-2005 provided for mainstreaming gender concerns into the environment and natural resource development process. In 1996, the DENR adopted a focal point system for integrating Gender and Development (GAD) into its community-based projects, creating management structures and assigning personnel for the task.

In August 1998, workshops on gender sensitivity were conducted among Pangangan's POs and their partners from the local government units (LGUs), DENR, Bureau of Fisheries and Aquatic Resources, Parish Council and the Coastal Resource Management Project (CRMP). Each organization made action plans for GAD integration. In October 1998 an agreement was signed by the PO allies pledging participation in the GAD component of CEP in Pangangan.



Gmelina plantation in Pangangan Island, Calape, Bohol.

The GAD component transformed the backyard gardening projects into means of supplementing food supply, promoting nutrition, greening the environment and giving the families a venue for cooperation at the home level. Prior participation of women in organizations and politics eased the process.

The women reported that through PO activities, they are given more venues for expression and leadership.

Attesting to this endeavor's value, the CEP in Pangangan won as the most gender-responsive project of DENR for 1998. The POs divided the modest prize equally

among the eight *barangays* for more livelihood projects.

The Larger Picture: Multisectoral Management and the Calape ICM Plan

Coastal resource management (CRM) in Pangangan was established through the efforts of the CEP, LGUs, DENR, Department of Agriculture, Office of the Provincial Agriculturist, BFAR, University of the Philippines-Marine Science Institute, Bohol Integrated Development Foundation Inc., CRMP and others. Thus, illustrating the importance of networking in community development work.

Previously, the LGU's support to coastal management was mainly in law enforcement. With the introduction of integrated coastal management (ICM) through the CEP and the CRMP of the DENR, the Calape LGU took steps in adopting the concept.

At present, the LGU has obtained data on Calape's coastal resources,

facilitated CRM planning workshops in its coastal *barangays* and is zoning its coastal areas through the assistance of the CRMP and DENR. The proposed ICM Plan aims for the rehabilitation and conservation of the municipal waters, establishment of sanctuaries, improvement of livelihood and setting up a multisectoral CRM council.

Gerry Cuadrasal, Jr., head of the town council's environment committee, expects that by early 2000 the town council will have concretized the plans and allocated a special budget for CRM in Calape.

Mixed Prospects: CEP Phaseout, PO Federation, CRMP and CBRMP

In their pre-phaseout planning workshop last September 1999, the POs reviewed and rated accomplishments. Their verdict: 75% success in organization, 70 to 90% in resource protection and 10 to 80% in livelihood development.

The gaps identified were barely offset by the strengths. Operational *Bantay Dagat* (fish wardens) vs. intruders, active vs. passive organization, MPAs vs. stubborn fish pen owners — these dichotomies continue to shape the daily struggles of the organized Pangangan communities. Yet, attempting to move on to higher ground, the eight POs have formed a federation and are formulating an island-wide CRM plan.

Meantime, other institutions are increasing their presence in the island. The CRMP, having Calape as its learning area, is assisting the POs' enterprise development. The LGU is applying for the Community-based Resource Management Project (CBRMP) and, with CRM endeavors in Pangangan, might get a 70% grant.

Whether the gains of the CEP in Pangangan survive its phase-out remains to be seen. But as expressed by the POs and other CEP partners, there has been a qualitative change in their view of the environment and their capability to manage it.



Fisheries in the Philippines and in the World: An Overview



Daniel Pauly
Professor
Fisheries Centre
University of British Columbia
2204 Main Mall
Vancouver, B. C., Canada V6T 1Z4

Fisheries are in decline, or at best stagnating, both locally and globally. The good news is that the trend **can be reversed**, if concerned groups, particularly the local government units (LGUs), will act quickly and in a concerted manner to implement the necessary remedial measures.

Globally, marine catches are stagnating or declining, a trend which could be mistaken for sustainability. In fact, while capture in terms of tonnage may remain the same, there is a “devious” change in the size and the number of fish caught. Fishers are catching smaller and smaller fish, lower and lower down the food web, an indication that global fish stocks are being harvested beyond their sustainable yield.

Industrial-scale fishing has contributed to the decline of fisheries in many parts of the world. Canada, as an example, was characterized by 400 years of sustainable small-scale fishing. This changed upon the introduction of large-scale fishing. After reaching a peak



Ruperto F. Sievert

Fishers are catching increasingly smaller fish.

in the late 1960s, fish catch suffered a steep decline—after less than 50 years—a result of overfishing by trawlers.

Increased human population aggravates the problem. This is evident in the Philippines where population has grown by an average of 5.4% per year from 1900 to 1977 compared

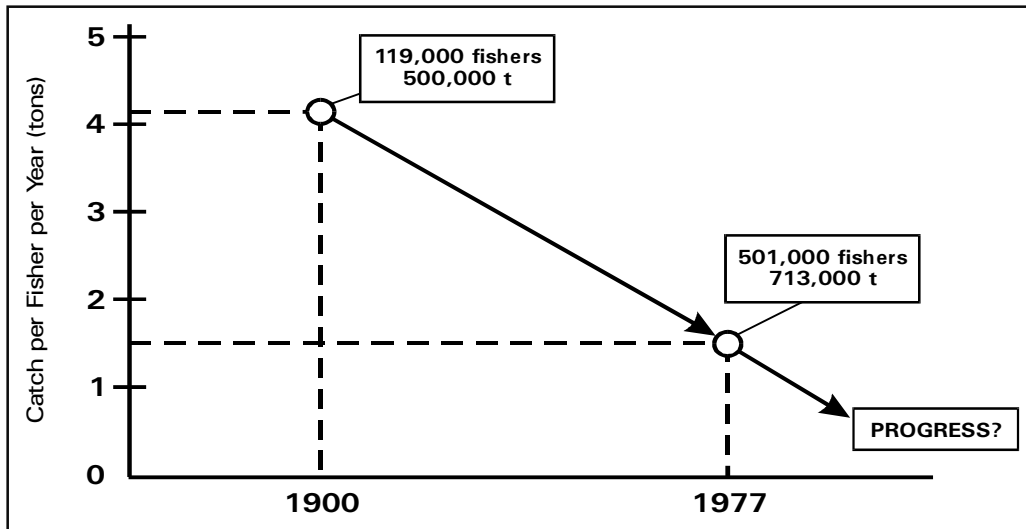


Figure 1. Progress of Philippine municipal fishing (*Censo de las Islas Filipinas 1905*).

to fishery production which grew by 1.8% per year. In 1900, each of the country's 119,000 fishers enjoyed a catch of more than 4 tons per year. In 1977, 501,000 fishers caught 713,000 tons of fish or roughly 1.4 tons per fisher per year (Figure 1). Until 1995, both commercial and municipal fish catches increased steadily. In 1995, total fish catch continued to increase but municipal fish catch declined. This meant that municipal fishers were catching less and commercial fishers were catching more. By 1996, even the commercial catch started to decrease.

An economic analysis of costs (fishing effort) and revenues (volume and value of catch) of Philippine fishery indicates that it is economically overexploited (Figure 2). The cost and revenue curves provide benchmarks for management, notably maximum sustainable yield (MSY), the highest catch that can be sustained through time and maximum economic yield (MEY), the level of catch that maximizes economic profit. On the other hand, the equilibrium point—that point where cost and revenues are equal and profits, zero—shows that

there are too many fishers exploiting a decreasing fish stock.

Subsidies to minimize the effect of commercial fishing to municipal fisheries do not seem to work based on the experience in other countries. In Canada, the government reacted to 20 years of industrial-scale fishing by foreign trawlers and the sharp decrease in fish catch in the late 1960s by taking control of the fisheries, regulating fishing by foreign operations and subsidizing local fishers. Except for a slight

recovery in the 1980s, fisheries continued to fall. In 1990, it had to be shut down altogether putting 40,000 people out of work. Overall, subsidies are dangerous because they lower the cost of fishing thereby encouraging more people to fish (Figure 3). One way to stop the downhill trend of fisheries is to designate marine protected areas (MPAs) in each municipality. An MPA is an area or zone within the marine or coastal environment where resource extraction and/or human access are strictly regulated or entirely prohibited. It is an effective way to protect breeding and juvenile fish, guard against overfishing and ensure a sustainable supply of fish stock. There is conclusive evidence that areas where no MPAs are built will suffer continuous decline of fisheries while those areas with MPAs experience an

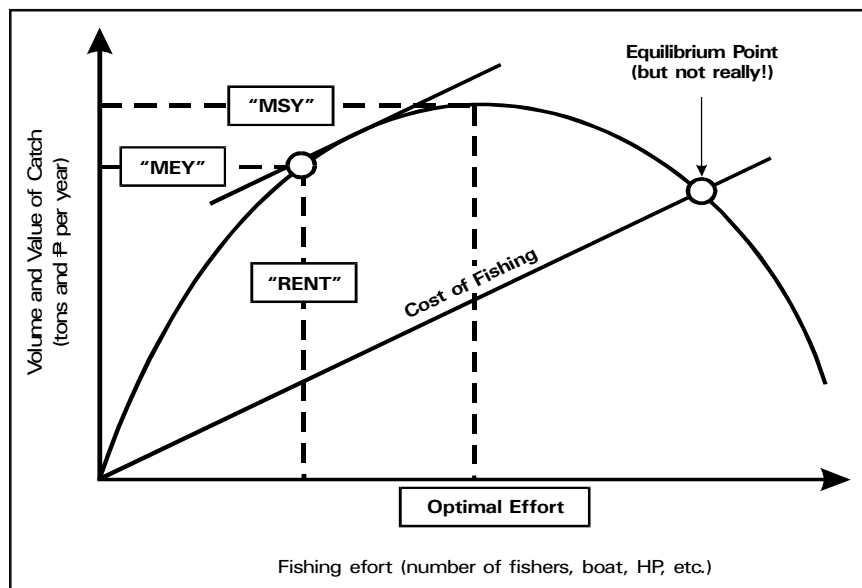


Figure 2. Economic analysis of costs and revenues.

increase of fish catches (Figures 4 and 5).

Under the Philippine Fisheries Code, LGUs are mandated to designate “at least 15%, where applicable, of the total coastal area in each municipality” as MPAs. Thus, the Philippines has become a world leader for MPAs. Knowing what is correct helps. Indeed, Philippine mayors can play a crucial role in coastal environment conservation, both nationally and as an example to the world.

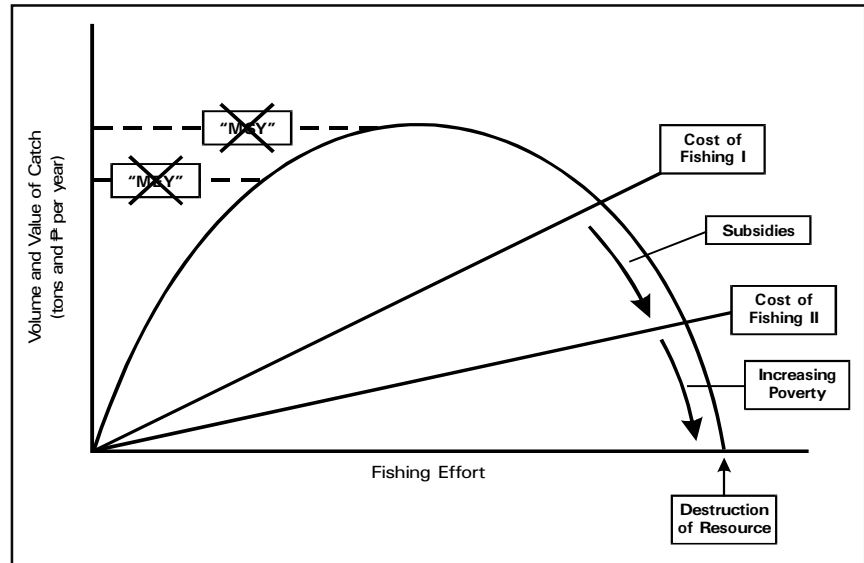


Figure 3. Effect of subsidies on cost of fishing.

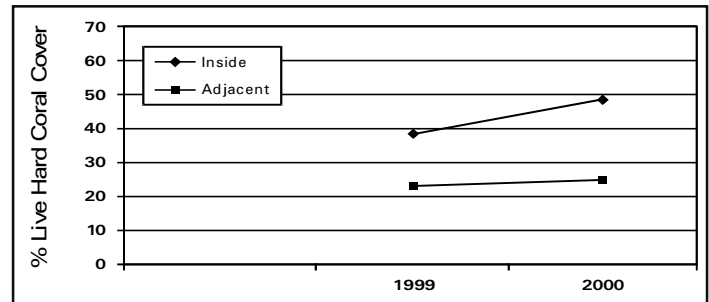
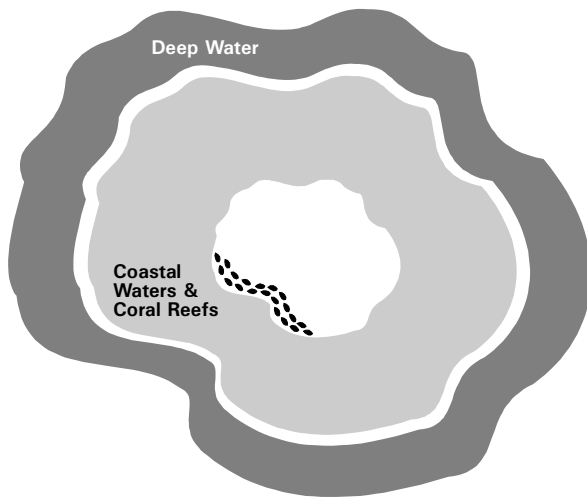
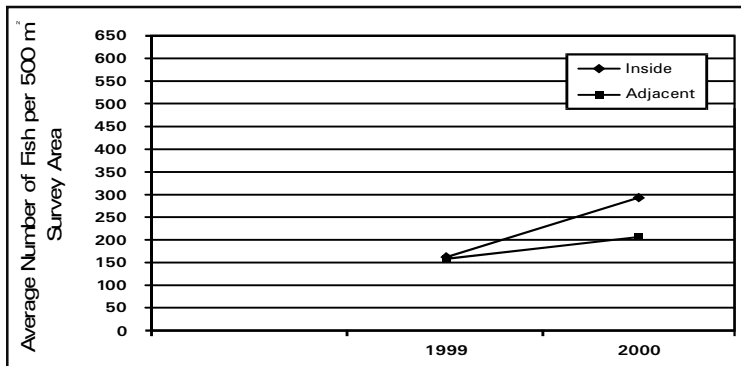
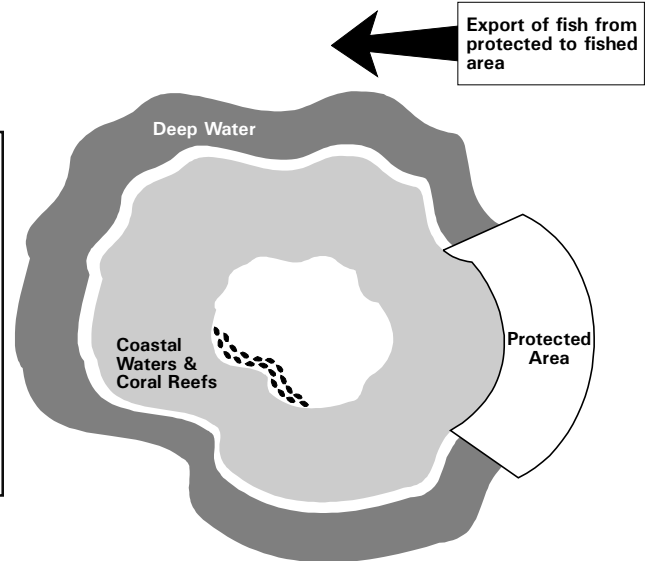


Figure 4. Live hard coral cover inside and adjacent to Gilutongan Marine Sanctuary, Cordova, Cebu.



Note: Surveyed target fish species include the following: goatfish, snappers, parrotfish, angelfish, sweetlips, surgeonfish, wrasses, emperors, moorish idols, spinecheeks and groupers.

Figure 5. Fish abundance (target species) inside and adjacent to Gilutongan Marine Sanctuary, Cordova, Cebu.



Philippine Community-based Coastal Management: The Challenges



Alan T. White
Deputy Chief of Party
Coastal Resource Management Project

and

Evelyn T. Deguit
Advisor
Community Organizing and Community Development
Coastal Resource Management Project

Introduction

Coastal resource management (CRM), employing mostly community-based methods, has been practised in the Philippines over the last two decades to try to stem the increasing tide of damage to habitats and the decline of fishery production. CRM has been supported and nurtured by a variety of institutions, i.e., government, non-government and people's organizations, research institutions and by multilateral and bilateral donor organizations, employing different strategies and approaches. Such projects, working with coastal communities, have targeted nearshore fisheries, mangrove and coral reef habitat management and poverty among coastal communities as a primary focus.

Generally, the Philippine's 18,000 km of coastline are under siege from a variety of activities and impacts



Ma. Fe L. Portigo

Community members drawing a map of their coastal resources, Olango Island, Cebu.

that are eroding the natural resource base and the area's potential for future sustainable use. The lack of control of almost all development in the coastal zone is symptomatic and indicative of what is to come if much stronger and more

effective institutions and procedures for integrated coastal management (ICM) are not put into place in the near future. The challenges of coastal management are of such magnitude that Philippine institutions are beginning to respond with more concern and integrated approaches than in the past. But, the path ahead is still not well defined.

An important question that needs to be addressed is whether the current community-based approaches can be successful in stemming the tide of resource degradation and increasing poverty in coastal areas. The Philippines is often looked up to for models in “community-based coastal management” where many well designed and successful projects have accomplished their objectives. Yet, given this outwardly positive trend as often voiced in the literature or suggested by the organizations responsible for successful projects, what are the real trends and what will be needed to scale-up community-based efforts to more integrated management of coastal areas in the country?

The Evolution of Coastal Management in the Philippines

The development of coastal management in the Philippines has been influenced by two major forces in recent years. The first is a series of donor-assisted projects that have provided a number of large experiments in CRM that is also referred to now as ICM. These are described in various publications and briefly reviewed by Courtney and White (2000). The second major influence affecting the evolution of coastal management is the devolution of authority to the local governments (municipal and

provincial).

The challenge created by the devolution of coastal management responsibility is that few coastal municipal governments in the country have the capacity to manage their natural resources. They generally lack trained personnel, budget and technical knowledge. In spite of these limitations, the motivation among municipal



Coastal resource assessment: community perspective, Olango Island.

governments to manage their resources is increasing rapidly as they realize the seriousness of the problem and what they stand to lose if no action is taken. Thus, the opportunity to improve ICM in the country is tremendous given the 832 coastal municipalities bordering the extensive coastline. Yet, realized gains in coastal resource management are small.

A key lesson generated by coastal management projects to date is that it is extremely difficult to plan and implement successful ICM programs without a multisectoral approach which has sufficient support from the government and its partners and a strong level of acceptance among the resource dependent communities. It is still difficult to claim success for ICM in any of the major projects except at a very localized level where the geographic scope is small and the

number of stakeholders limited. How can these successes be scaled up?

New Directions for Coastal Management in the Philippines

Past experience in the Philippines shows that an essential element of successful coastal management is active participation by the entire community. This includes day-to-day resource users such as fishers and

other local stakeholders. At the same time, while community-based CRM has come a long way since its birth among small, fairly isolated islands, community-based interventions alone have not solved critical CRM problems in the Philippines. With the passage of the Local Government Code in 1991 and the 1998 Fisheries Code, the responsibility for managing municipal

waters and the resources therein has largely devolved to the local government level. With these realities in mind, current trends and new paradigms in coastal management in the Philippines include:

- ICM replacing fisheries development and habitat management approaches of past projects;
- Local government units (LGUs) assuming responsibility for and allocating resources to manage municipal waters and resources;
- A redefined role of national government agencies to provide primarily technical assistance on CRM to local government and to influence policy formulation, modification and clarification; and
- Multisectoral collaboration becoming essential to solve complex ICM problems.

Ma. Fe L. Portigo

Key activities presently seen as essential for success at the community and local government levels include:

- Participatory coastal resource assessments;
- Participatory and integrated coastal management planning;
- Economic development for coastal resource users through environment-friendly enterprises;
- Implementation of limited access regimes such as marine sanctuaries;
- Formation and strengthening of CRM organizations;
- Training in skills relevant to ICM planning and implementation;
- LGUs allocating budget for CRM;
- Legal instruments required for effective support of ICM;
- Policy analysis and formulation; and
- Participatory monitoring and evaluation.

One important difference from the past is that these key activities must be fully integrated with local (municipal, city and provincial) governments. National agencies have an important supportive role to play but no longer have the full responsibility for environmental management as in the past. This changes their orientation.

The Challenges Ahead

Several themes that will most likely permeate coastal management discussions in the Philippines and in other tropical developing countries are suggested below. Future ICM and CRM projects need to incorporate more efforts to address these concerns.

- *Expanding from community level to nationwide projects.* There will increasingly be questions about how this can be done, particularly in relation to

national policy frameworks for support. Scale of effort and geographic extent of projects are concerns that need more analysis in relation to government capacity to govern and their redefined roles.

- *How to build local government capacity in meaningful ways.* This follows again from national policy and how local governments support localized ICM efforts. A key may be how to build more local leadership with emphasis on technical skills. Obtaining increased environmental budgets needs exploring.
- *Developing a broader environmental management framework.* A link between watershed management, waste management and other pollution problems with CRM is becoming critical in many areas.
- *Developing databases that work and are practical to maintain.* Measuring success and returns in any form requires keeping track of certain data over time. Databases and how to take all kinds of information systems work in the context of ICM for measuring change over time is essential.
- *Measuring changes in environmental quality.* Environmental parameters need to be better understood in the context of community management and monitored both for the measurement of success in the program and as an incentive for local participation to continue and increase.
- *Designing institutional arrangements with local and national government.* The reality emerging in the Philippines is that collaborative management is the only means to sustainability of community institutions. Institutional

arrangements that include municipalities, national agencies, non-government organizations, academe and others are becoming the norm and needs further refinement and more working models.

- *Linking population programs to natural resource management.* This is needed to highlight the connection of population with carrying capacity in coastal areas. This is important considering the conservative stand of the Catholic Church.

Community-based coastal management has many small successes to its credit in the Philippines. But with the scale of problems becoming more apparent, we need to develop new models. “Community” is often being replaced with “collaborative” and experience is showing that multi-sectoral arrangements are basic to success. Another ingredient more commonly being considered is economic and the role of value. The “values” of resources are important using whatever measures appropriate since it is value and the perception of people about value that motivates people into action. Our models can place more emphasis on environmental value formation and how to derive economic benefits from healthy coastal environments using non-destructive and non-extractive techniques. This will help communities and government to justify investment in coastal management and build stronger partnerships.

Reference

Courtney, C.A. and A.T. White. 2000. **Integrated Coastal Management in the Philippines: Testing New Paradigms.** Coastal Management. 28(1): 39-53.



Environment-Friendly Mariculture in Malalag Bay, Davao del Sur, Philippines

Malalag Bay, one of the learning areas of the Coastal Resource Management Project (CRMP) of the Department of Environment and Natural Resources, has become an important seafarming center in southern Mindanao suitable for culturing economically important marine species of seaweeds, molluscs and finfish. The relatively good water quality, moderate water current, shallow depth, muddy-sandy-coralline substrate and the protected cover from strong winds and big waves make the bay ideal for mariculture.

In the mid-1990s, there occurred a boom in cage culture of milkfish that contributed largely to the environmental degradation of the bay as assessed by a study commissioned by CRMP. Accordingly, the bay with its relatively small area of 20.5 km² has surpassed its carrying capacity for fish culture by 2.5 times so it was necessary to reduce mariculture activities by the same amount (Baleña 1998). Aggravating the situation is the resulting crash of market price of milkfish

that led to the bankruptcy of several fish farmers and the drastic reduction of fish culture activities in the area due to surplus production.

The Enterprise Development component of the CRMP, in developing a sustainable marine-based livelihood for the fisherfolk in the area, considered the critical environmental situation of the bay while revitalizing the faltering mariculture industry. The project developed and piloted low-cost and environment-friendly mariculture technology in collaboration with the coastal communities. In contrast, many past CRM projects had failed in sustaining a coastal livelihood program due to the introduction of high investment and highly degrading fish farming projects. Furthermore,



A seaweed farm of Eucheuma established through the assistance of a CRMP Seaweed Enterprise Development Consultant in Olango Island.

most of these projects were largely conducted by technical people who imposed on the community rather than enjoining it in all stages of enterprise development.

Specifically, the CRMP communities ventured in the culture of the seagrape seaweed, *Caulerpa lentillifera*, the donkey's ear abalone *Haliotis asinina* and the rabbitfish *Siganus canaliculatus* and *S. guttatus*. All have the good attributes of high market demand, low investment and most importantly, being eco-friendly technologies. Seaweed readily absorbs excess nutrients which may cause toxic algal blooms in the water while abalone and rabbitfish graze on natural marine vegetation (Csavas 1994). The use of commercial feeds in fish culture is being discouraged because of the poor flushing rate of the bay (Baleña 1998).

The culture techniques developed were based on latest mariculture technologies with some modifications and innovations to suit the scheme of a family-based operation, low input and maintenance cost and the use of indigenous materials. Moreover, the fact that the techniques were adopted to the open sea (in contrast to fishponds) make them inexpensive and more accessible to the fisherfolk. The field trials were conducted by fisherfolk-cooperators under the supervision of the

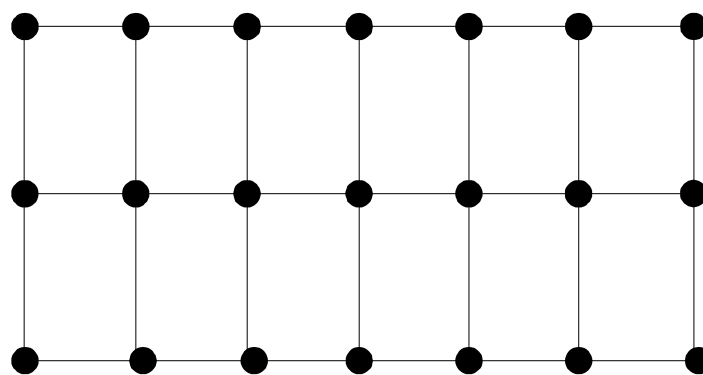
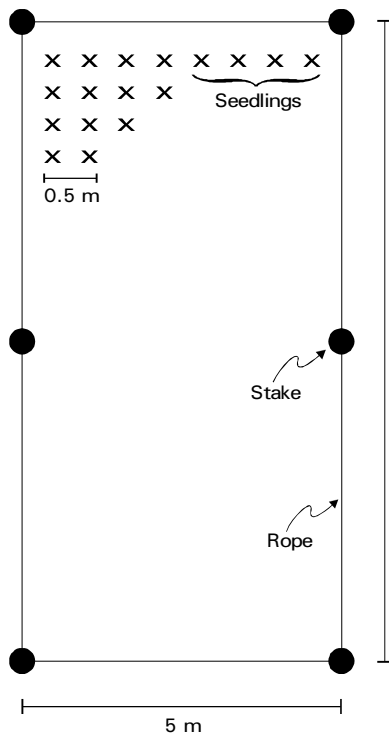


Figure 1. *Caulerpa* culture on the seabed.

project and this arrangement has proven beneficial to the community who had witnessed the day-to-day operations and thus, readily convinced of the feasibility of the project.

Seaweed Culture on the Seabed

Caulerpa lentillifera, locally known as “lato”, is a popular table salad that is traditionally grown in the fishponds in Mactan, Cebu. It has a good market nationwide but its production is constrained by limited pond areas. The field trial conducted in a muddy area in Malalag Bay proved its culture potentials on the seabed.

Site conditions

Caulerpa lentillifera favors muddy to sandy-muddy sea bottom with at least 1 m water depth at low tide. It thrives best in waters with salinity of 30-35 ppt (parts per thousand) and temperatures at 25-32 °C. Water current should be calm to moderate. The area should be

protected from strong winds and big waves and free from freshwater runoff and siltation.

Propagation Technique

You need about 300 m² of bottom area for a family-based operation. Divide this into six plots each of which measures 5 x 10 m² or 50 m². Demarcate the plots by stakes and ropes (see Figure 1).

Stake healthy seedlings of 100 g in the muddy substrate at 50-cm intervals in one plot. Allow the stock to grow for 45-60 days after which staggered harvesting can be done. That is, harvest the first plot, then harvest the second plot after one week, the third plot on the third, and so on. In this manner, sustainable weekly harvest is assured. During harvest, leave one-fourth of the stock on the seabed to serve as the seedling for the next cropping.

Problems that may be encountered during culture include poor growth due to siltation and low salinity during the rainy season. Grazing by the echinoderm *Synapta* was observed in the pilot site.

Pack the harvested plant in bamboo baskets lined with banana leaves and shaded from direct sunlight. Transport the product to the market as soon as possible since the seaweed easily wilts.

Production Economics

A. Assumptions

- Culture area : 300 m² of sea bottom
- Seedstock : 120 kg of *Caulerpa* seedlings
- Culture period : 45-60 days
- Harvest quantity : 270 kg
- Farm gate price : PhP 30/kg

ITEM	UNIT COST (PhP)	TOTAL COST (PhP)
1 roll of polyurethane (PE) rope #5	60.00/roll	60.00
21 wooden stakes	5.00/stake	105.00
120 kg <i>Caulerpa</i> seedlings*	30.00/kg	3,600.00
1 pair dive goggles	100.00/pair	100.00
Labor*		1,000.00
Contingency (5% of production cost)		230.00
Total		5,095.00

* Part of production cost

B. Input

C. Cost and Return Analysis

Gross sale (kg of harvest x farm gate price) = PhP 8,100.00

Gross profit (gross sale less production cost) = PhP 3,270.00

Return of Investment (gross profit/ input cost) = 64 %

Abalone Culture in Floating Raft

The abalone *Haliotis asinina* is a high value molluscan species, whose meat is savored as a delicacy while the shell is made into jewellery, fancy buttons and other aesthetic products. This marine organism has a big demand, both local and foreign, but the supply is limited because of the depleted natural stock. To encourage the development of the mariculture of this organism, the Southeast Asian Fisheries Development Center (SEAFDEC) at Tigbauan, Iloilo has ventured into the development of a hatchery. In fact, the juvenile abalone used in the trial culture under this project was provided by SEAFDEC.

The technique developed herein is dependent on the availability of commercial quantity of juvenile abalone and sufficient supply of the

seaweed *Gracilaria heteroclada* for feed. Only the technical aspect of culture is discussed while the economics of production is not yet determined pending the information on cost of juveniles, seaweed feed and market price.

Site Conditions

Suitable condition for abalone culture includes sandy-rocky substrate, clear water with moderate current, salinity range of 30-35 ppt and water temperature of 28-32 °C. The area should be free from freshwater runoff and protected from strong winds and big waves. It would be an advantage if natural stock of abalone could be found in the area.

Culture Technique

Place the juvenile abalone in a plastic crate measuring 55x40x30 cm and cover with a netting material. About 50 2-month old abalone can be stocked in one container where coralline rocks are placed inside to serve as substrate for attachment and as sinkers. Hang the container about 1.5 m from the surface and tie to a floating bamboo structure or to a fish cage (see Figure 2).

Every week, place a sufficient amount of *Gracilaria* inside the container. Other maintenance

activities include cleaning the container and netting of fouling organisms such as algae, sponge and shellfish. The abalone can reach the marketable size of 6 cm shell length in 6 mo or more from a 2-mo old juvenile.

Problems that may be encountered include transport stress that may cause large mortality among juveniles, insufficient seaweed for feed and high rate of fouling on the culture baskets.

Siganid Culture in Floating Cage

Locally known as “danggit” and “kitong”, *Siganus canaliculatus* and *S. guttatus*, respectively, rabbitfish is a popular foodfish that has excellent and tasty meat. Moreover, the abundant fry in the wild, the low cost of feed that is seaweed and the high market price make this fish a good choice for culture.

Basically, this technique is the same as that developed by research institutions and as practiced by fish farmers in the area. The only modification is the built-in feeding

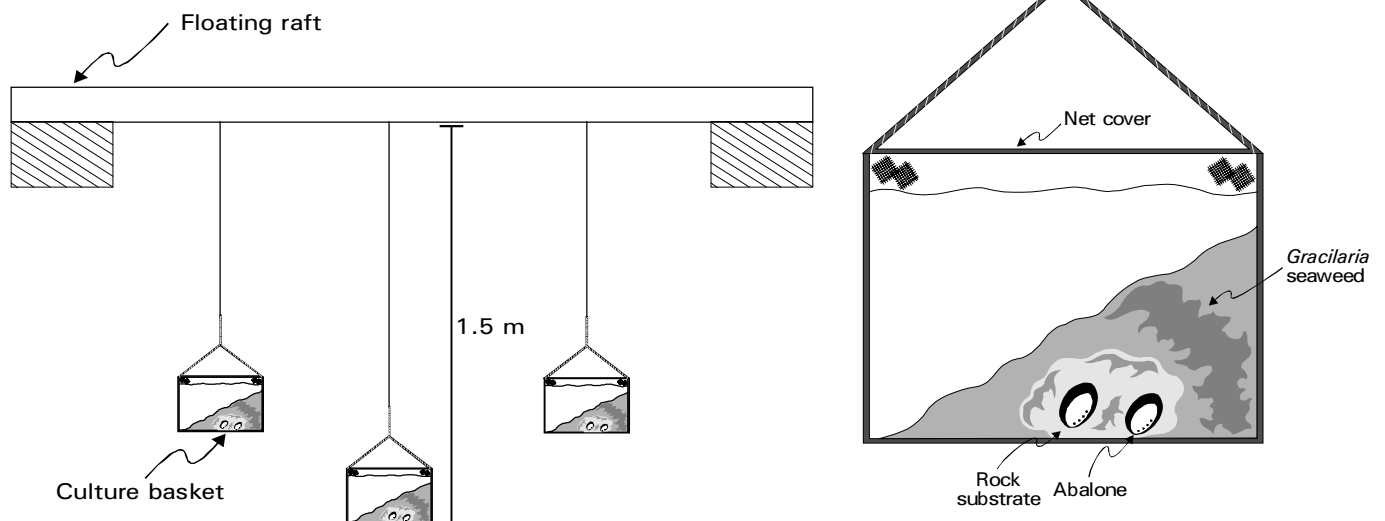


Figure 2. Abalone culture in floating raft.

system wherein *Gracilaria heteroclada* is simultaneously propagated to feed the fish.

Site Conditions

Criteria for site selection include sandy to sandy-muddy substrate, clear water with moderate current, depth of at least 4 m at low tide, salinity range of 26-32 ppt and water temperature of 26-32 °C. The area should be protected from big waves and strong winds. It will be an advantage if fry and feed sources are located nearby.

Culture Technique

Stock about 1,000 siganid fry, measuring at least 5 cm, in a 3x3x3 m floating cage or a total of 2,000 fry in a two-compartment cage module. Feed the fish with *Gracilaria* at 5 kg/1,000 fry daily and increase to 10 kg halfway in the culture period. Diet can be supplemented with filamentous algae (“lumot”), *kangkong* leaves, rejected banana, fish meal, soya meal or commercial feeds when there is short supply of the cultured seaweed.

Regular maintenance of the culture facility such as removal of fouling organisms on the net, bamboo frame and float; replacement of damaged bamboo poles or float; and repair of damaged nets are necessary.

Problems that may be encountered include mortality due to high water temperature during low tide, insufficient seaweed for feed and net fouling.

The growth rate of the fish stock is variable depending on several factors, thus, it is normal to find different sizes in one cage. Selective harvesting of 200-g fish can be done 6 mo from the time of

stocking. Undersized fish can be kept for further rearing or can be processed into the delicacy of boneless “danggit”.
 320 kg at PhP 70/kg = PhP 22,400.00
 Gross Profit (gross sale less production cost) = PhP 12,740.00

Production Economics

Assumptions:

- Cage design : two units of 3x3x3 m floating bamboo cage
- Stocking density : 40 fingerlings per m
- Feed : cultured

Return on Investment (gross profit/ investment cost) = 78 %

Conclusion

The sustainability of the above mariculture operations in any area is dependent on many factors. In any aquaculture activity, the availability and affordable cost of seedling or fry and feed are critical to the viability of

A. Development Cost

ITEM	UNIT COST (PhP)	TOTAL COST (PhP)
10 bamboo poles	60.00	600.00
½ bundle PE net (double; 17x400 md)	2,600.00	1,300.00
2 spools twine	30.00	60.00
½ roll PE rope #8	170.00	85.00
1 roll PE rope #16	400.00	400.00
2 kg monoline #150	190.00	380.00
4 pcs concrete sinker	150.00	600.00
6 plastic floats	200.00	1,200.00
Labor (construction and installation)		2,000.00
Total		6,625.00

B. Production Cost

ITEM	UNIT COST (PhP)	TOTAL COST (PhP)
2,000 siganid fingerlings (6 cm or 5 g)	1.00	2,000.00
2,400 kg <i>Gracilaria</i>	3.00	7,200.00
Contingency (5% of production cost)		460.00
Total		9,660.00

Note: No labor cost (feeding, maintenance and security done by fisherfolk)

- Culture period : 6 mo
- Survival rate : 80%
- Harvest size : 200 g or 5 fish per kg

the operation. Both the seaweed and siganid cultures rated high on this aspect as presented in the cost and benefit analyses. On the other hand, the success of the abalone culture will depend on the establishment of a hatchery in the area in collaboration with SEAFDEC.

C. Cost and Return Analysis

Total Investment Cost (development and production cost) = PhP 16,285.00
 Gross Sale (harvestxfarm gate price) =

Another is proper site selection based on the biophysical requirements

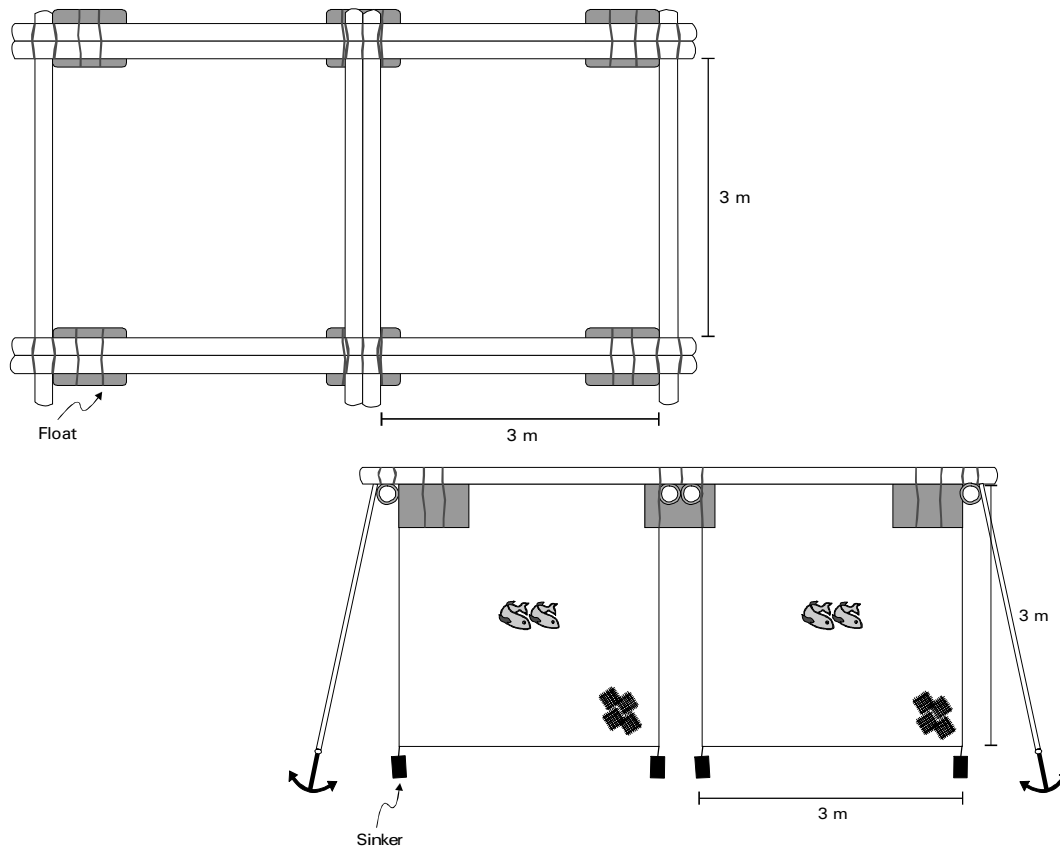


Figure 3. Cage design for siganid culture.

of the organism. Also, the availability of technical assistance or extension service to the fish farmer by research agencies or the local government itself should be adequate and regular. Under CRMP, local government units were given training and technical literature on the above techniques to enable them to provide adequate technical assistance at the local level.

Other matters that must be considered to attain sustainability of mariculture industry in the area are:

1. Development of a water use zoning plan to avoid resource use conflicts;
2. Enactment and enforcement of regulatory measures such as issuance of permits, collection of fees, pollution controls, etc.;
3. Regular monitoring of mariculture activities to ensure

the ecological integrity of the coastal resources;

4. Establishment of reserves for the protection of critical fish habitats such as coral reef, seagrass bed and mangrove from culture activities; and
5. Implementation of a community-based coastal resource management in the area.

By **Roberto P. Garcia**
Former Mariculture Specialist,
CRMP

[We should be reminded that these mariculture techniques are very dependent on the local context and level of careful maintenance to be successful. Quite often, these techniques fail! Editor]

Acknowledgement

The fisheries staff of the Office of the Provincial Agriculturist of Davao del Sur provided technical support and Mr. Samuel Anino of Mamacao, Sta. Maria maintained the culture trials.

References

- Baleña, R. 1998. **Analysis, Simulation and Prediction of Impacts of Fishpens and Cages in Malalag Bay, Davao del Sur**. CRMP. Cebu City.
- Csavas, I. 1994. **Recommendations for Sustainable Aquaculture**. Aquaculture Development in SE Asia. SEAFDEC, Iloilo, Philippines. 12 p.
- Duray, M. 1998. **Biology and Culture of Siganids**. Aquaculture Department, SEAFDEC, Iloilo. 53 p.
- SEAFDEC. 1997. **Abalone Culture**. Aquafarm News, 19(2). 40 p.
- Taw, N. 1993. **Manual on Seaweed Gracilaria Farming**. DA-BFAR-UNDP. 15 p.



The Man Who Talks to Fishes

Our destination was Gilutongan, an island about 5 km off the southernmost part of the municipality of Cordova, Cebu, Philippines. The sea was inhospitable. The waters seemed to have bared its teeth from a foaming mouth ready to devour me should I miscalculate the leap from the large outrigger boat to a smaller one. My heart hardly daring to skip a beat, I endeavored to make the jump when a hand reached out to me. Understanding my predicament, this man extended his hand to firmly grip mine and coaxed me to make that successful jump. That was my first meeting with Timoteo Menguito, a key leader in Gilutongan Island, Cordova, Cebu.

Family and friends call him either Tuti or Kuting. An unassuming name and an unassuming demeanor belie the fact that he holds key positions in various organizations: Chair of the *Barangay* (village) Fisheries and Aquatic Resources Management Council, Chair of the Gilutongan Seaweed Farmers Multi-purpose Cooperative and most recently, designated Project Director of the Gilutongan Marine Sanctuary. He is a well-respected leader, not because of the many positions he holds but because of the strength of character he exudes and many times, proved.

Tuti's popularity as a leader is invariably connected with the Gilutongan Marine Sanctuary that by itself also tells the story of a community attempting to regain the abundance of its seas. According to the village elders, in the early 1950s, the waters around Gilutongan teemed with fishes. Sadly however, the coastal resources declined due to overfishing and destructive fishing methods. When the people realized that poverty would forever haunt them because of their wanton disregard for their environment, many began to mend their ways. In their quest to make



Timoteo "Tuti" Menguito

Ma. Fe L. Borlido

things right, they found a partner in the Cebu Resource Management Office (CRMO) which provided them training courses and observation tours to places that were also in the process of protecting and conserving their natural resources. Subsequently, about 10 ha of the waters off the western part of Gilutongan were established as a marine sanctuary.

But Tuti's passion may have been greater than the rest. A son of a fisher himself, he learned early in life the generosity of the sea and, to this day, continues to fervently hope that it stays that way. Witnessing and experiencing the negative impacts of destructive fishing to both humankind and the sea sowed grief in his heart yet fueled his dedication to reach their collective quest. He volunteered through the sanctuary that was established through the CRMO. Monitoring activities were conducted even deep into the night, when prowlers thought the sanctuary was unguarded. At times he only had to admonish the violators. At other times, with great risk to his life, he had to use his wits and guts against the wealthy and the well-connected violators.

Hon. Jury Ompad, who had trained and worked with Tuti in the conservation initiative of the CRMO, recounted to me a story about Tuti's encounter with a scion of a politically powerful clan whose fishing boat intruded into the sanctuary. Visibly irked that someone would stop him from fishing in the area, this arrogant prowler and his friends harassed Tuti. Undaunted, Tuti brought them to the *Barangay* Captain to answer for their misdeed. The incident however, was settled amicably which meant no fine nor imprisonment was imposed on the violators. But for his huge effort in the protection of the sanctuary, he has secured a place in the hearts of his fellow community members.

When pressed for details on the incident, Tuti simply makes light of it, as if time has diminished the impact of his action now that he faces new challenges as the newly installed Project Director of the "revived" Gilutongan Marine Sanctuary. Fairly recently, a Technical Working Group (TWG) that was created to plan for its protection —

of whom Tuti is a member—discovered that the establishment of the sanctuary was not duly covered by the proper legal instrument. So the TWG assisted the Municipality in the legislation of Ordinance No. 4 Series of 1999—approved in May by the Mayor—defining the sanctuary’s new boundaries, having been extended from 10 to 14 ha, and Ordinance No. 8 Series of 1999—approved in November—defining the activities to be allowed, regulated and restricted and the penalties for violations.

Still, he admits that the weak support in law enforcement makes him feel helpless and so alone at times that during his night patrols, owing to his concern for the denizens of the sea and his community, he is driven to talk to the fishes. Like a father telling stories to his children as he tucks them to bed, he tells the fishes to stay deep in their waterbeds, away from the water surface where the poachers and illegal fishers are merely waiting to catch them. At the present state of law enforcement, he sometimes thinks that the preservation of fishes would depend on how the fish themselves avoid the destructive hand of humankind.

Nonetheless, today, as Project Director, his bigger responsibility lies in motivating a thousand people in the 11-ha Barangay Gilutongan, most of whom derive income from the sea, to take that leap from ignorance to knowledge, from indifference to involvement in the protection of the Gilutongan Marine Sanctuary.

This should not be difficult for 50-year old Tuti whose charisma is enhanced by his facility in communication. Visitors are always impressed at Tuti’s confidence in talking to an audience, whether they are fishers like him or high ranking officials like National Director Malcolm Sarmiento of the Bureau of Fisheries and Aquatic Resources. Indeed, he can hold the attention of his audience with his simple presentation, spiced with humorous

analogies and examples, whether he is presenting results of a fish census or explaining to visitors the latest technique in seaweed farming.

Such facility for communication came through hard work. Although he only finished elementary school, Tuti made use of every opportunity to gain new knowledge and skills, fully aware that his low educational preparation was a constraint to his development and his capacity to provide for his family. He would listen to people and observe their ways. He availed of training courses and opportunities at seminars and cross-visits to Apo Island and Guning, President Garcia, Bohol that were provided by the CRMO.

Tuti was also one of the first members of the Seaweed Growers Cooperative in Gilutongan. His farm was situated in what apparently was a less favorable site. But he tended to his garden with consistent loving care, ridding the bags of seaweeds of unwanted sand, cutting new seedlings from those growing beyond the capacity of the net bags and transferring the sick ones to favorable areas. After 6 months, Tuti made a substantial gain from his toil in contrast to others who suffered losses.

Last year, He attended the Training Course on Participatory Coastal Resource Assessment, the 11-

the University of the Philippines-Marine Science Institute (UP-MSI). The UP-MSI prepared and implemented the study plan. The study plan consisted of modules, each



Participatory coastal resource assessment for Gilutongan Island.

Ma. Fe L. Portigo

a step enabling simple fishers to learn the skill of fish census. During the first phase, Tuti was simply a skin diver who took part in the manta tow. Yet, equipped with this rudimentary training, he led the Gilutongan Monitoring team to win second place from among six similar teams from different provinces which participated in a Marine Protected Area Workshop/Contest held at Agutayem Island, Misamis Oriental from August 9-12, 1999. The latter part of the training, on the other hand, enabled Tuti to take the lead in mobilizing the community in the conduct of the fish visual census. Those who came and participated learned the true meaning of shared responsibility.

What Tuti does, he does well for he gives his all. This man, with his intense passion for the sea and its preservation, burns like a beacon, lighting the way and inspiring the people of his island towards the realization of their vision. Indeed, Tuti is a fisherfolk leader this country is proud to have. With more like him, there is hope that we can achieve sustainable management of Philippine coastal resources in the near future.

By **Manolita R.B. Morales**
Social Mobilization Assistant,
CRMP



Barangay planning, Barangay Hall, Gilutongan Island, September 16, 1999.

Ma. Fe L. Portigo

day Integrated Coastal Management Training Course as well as all the biophysical assessment activities jointly sponsored by the Coastal Resource Management Project and



DENR and LMP Ink Memorandum of Agreement on Best CRM Awards



DENR Secretary Antonio Cerilles (4th from left, seated) and Mayor Raymundo Roquero (3rd from left, seated) sign the MOA on the granting of awards for "Best CRM Programs" with Undersecretaries Mario Roño and Ramon Paje, Directors Medel Lim Suan and Eustaquio Tandug, and Ms. Venus Bermudo of DENR, and Ms. Abbie Trinidad of CRMP as witnesses.

The Hon. Antonio H. Cerilles, Secretary of the Department of Environment and Natural Resources (DENR), and Hon. Mayor Raymundo Roquero, Secretary General of the League of Municipalities of the Philippines (LMP), signed a Memorandum of Agreement (MOA) on the granting of awards for "Best CRM Programs" among coastal municipalities on April 7, 2000 at the DENR compound in Quezon City. The DENR and LMP agreed to jointly develop a work program, screening process and guidelines for the implementation of the "Search for Best CRM Programs 2000".

The first "Best CRM Program Awards" were given in 1998 to six coastal municipalities

by the Coastal Resource Management Project (CRMP) and the LMP. This undertaking was supported by the Japanese Embassy; Coca-Cola Bottlers Co.; Petron Foundation, Inc.; ABS-CBN Bantay Kalikasan; DENR, Department of Agriculture-Bureau of Fisheries and Aquatic Resources; Department of Science and Technology-Philippine Council for Aquatic and Marine Research and Development, the Silliman University; and the Fisheries Resource Management Project.

In May 1999, the "Search for Best CRM Programs Awards 2000" was re-launched during the historic Conference of Coastal Municipalities. Practically all coastal municipalities are eligible to join the Search that ends in May 31. Nomination forms will be evaluated and validated on-site by the National Search Committee until August. The awarding of the six winners takes place in September in conjunction with the LMP's 10th National Convention. Each winning municipality will receive a trophy from LMP, PhP 100,000 cash award and a patrol boat will be solicited from private and public sector donors.

DENR Undersecretaries Ramon Paje and Mario Roño, DENR Directors Florendo Barangan, Medel Limsuan, Eustaquio Tandug and Dr. Venus Bermudo as well as Annabelle Cruz-Trinidad of the CRMP witnessed the signing of the MOA.

By **Leo Pura**
Research Assistant,
Policy Component, CRMP



DENR and DA-BFAR Complete Joint Memorandum Order Implementing RA 8550

The Department of Agriculture (DA) - Department of Environment and Natural Resources (DENR) Joint Memorandum Order (JMO) 2000-1 entitled, "Identifying/defining the areas of cooperation and collaboration between the Department of Agriculture and Department of Environment and Natural Resources in the implementation of Republic Act No. 8550" was signed on May 17, 2000 by Secretaries Edgardo Angara and

Antonio Cerilles of the DA and DENR, respectively, as part of the Month of the Ocean. Included in the Order are the: a) joint establishment of common criteria and procedures for purposes of biosafety and protection of biodiversity and identification of areas "in environmentally critical condition"; b) formulation and enforcement of a Joint Administrative Order on Aquatic Pollution; and c) joint formulation and promulgation of the

National Integrated Coastal and Marine Management Strategy (NICMMS). The DA-BFAR and DENR shall also formulate and issue guidelines on the implementation of the ban on the gathering, selling or exporting of white sand, silica, pebbles and any other substances that make up any marine habitat within 3 months upon the effectivity of the Joint Memorandum Order. Likewise, the Secretaries of DENR and DA will create a Joint Quick

Response Team that shall address aquatic pollution cases and identify respective focal units to perform oversight functions and coordinate the formulation of required Joint Administrative Orders.

In addition, DENR and DA-BFAR agreed on the following delineation of roles and responsibilities: a) the identification and management of certain rare, threatened or endangered marine and aquatic species together with CITES-listed marine and aquatic species shall be the responsibility of DA-BFAR except for dugong, marine turtles and crocodiles which shall be managed by DENR and b) the determination, prescription and establishment of catch ceilings and closed seasons in Philippine waters shall be the responsibility of DA-BFAR except in municipal waters and areas covered by the National Integrated Protected Areas System. DA-BFAR shall also allocate sufficient funds to the National

Mapping and Resource Information Authority while DENR shall make its resources available for the conduct of the mapping of and charting surveys on coastal areas for purposes of fisheries management. Further, DA-BFAR is tasked to establish procedures, standards and criteria for the establishment of fish reserves, refuge and sanctuaries except in protected areas. DA-BFAR may also request DENR for the classification of a body of water according to its best use.

The success of this undertaking, as defined by Catherine Courtney, CRMP Chief of Party, could be measured thus: a) DENR and DA-BFAR initiated a constructive and meaningful dialogue after years of turf wars; b) DENR and DA-BFAR agreed to clarify and harmonize policy direction from the national government to enable local government to implement rational coastal resource management resource programs in municipalities

that address the needs of the poorest of the poor, the coastal communities of the country; and c) DENR and DA-BFAR simply recognized that the status quo must be changed and precautionary measures adopted to enable nationwide rehabilitation of coastal environment toward the achievement of food security from the sea.

The JMO was deliberated upon in a meeting held on April 4-5, 2000 at the Marriott Hotel in Cebu City. Atty. Roseller de la Peña, Undersecretary for Legal Services, headed the DENR delegation while Mr. Cesar Drilon, Undersecretary for Fisheries, headed the DA. The Coastal Resource Management Project organized the joint meeting.

By **Leo Pura**
Research Assistant, Policy
Component, CRMP



US Coast Guard Provides Technical Assistance to Philippine Marine Law Enforcers in Region 7

A team from the United States Coast Guard (USCG), headed by Captain Lawrence Eppler, went to Cebu and Bohol in July 1999 to confer with marine law enforcement agencies, *Bantay Dagat* (civilian volunteers in local law enforcement), local government units (LGUs) and peoples' organizations about illegal fishing and environmental pollution. The team, composed of LTJG Michel Nolland, LCDR Thomas Wigans and Rodney Patton, looked at ways to promote technical assistance and logistics support to improve Region 7's (Cebu, Bohol, Negros Oriental and Siquijor) capabilities in marine law enforcement through the Coastal Resource Management Project (CRMP), a special project of the Department of Environment and Natural Resources (DENR) that is assisted by the United States Agency for International Development

(USAID).

Visiting the following offices were high on the USCG's agenda: a) Philippine Coast Guard; b) Philippine Navy; c) Philippine Maritime Police; d) Bureau of Fisheries and Aquatic Resources; e) DENR; f) CALTEX; g) Investment Initiative for Environmental Sustainability Project; and h) Cebu City Bantay Dagat.

In Bohol, the USCG team also met with local government officials including Mayor Juanario A. Item of Talibon, who is a very active *Bantay Dagat*. Indeed, Mayor Item dispelled the myth that controlling illegal fishing is political suicide. In fact, he was re-elected due to his strong



Mayor Item of Talibon, Bohol (left), briefing Capt. Eppler (right), and Dr. Melana, Mangrove Management Coordinator, CRMP, and party, about the modest success of their Bantay Dagat and the support of the community.

campaign against illegal fishing. Overall, the visiting team was impressed by the present aggressive campaign against illegal fishing, particularly dynamite blasting,

despite the limited budget and manpower.

The observations of the USCG were discussed with CRMP to map out the next steps on how USAID could extend assistance. Listed below are the organizations that require further assistance and the areas where they could best be helped.

- Cebu City *Bantay Dagat* - more support in terms of facilities and manpower for sustained impact
- Marine Law Enforcers - closer coordination among LGUs, the *Bantay Dagat* and other stakeholders for more effective campaign against illegal fishing; conduct of training courses on oil spill cleanup; more and/or better communication facilities and patrol boats.
- LGUs - some municipalities remain indifferent or incapable

of going after illegal fishers so that violators simply transfer operations where there is less resistance.

The proposed USCG assistance is the first in the country with Cebu and Bohol as pilot areas.

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



Municipality Gets Patrol Boat for Achievements in Coastal Resource Management

A custom-built patrol boat was recently awarded to the municipal government of Gen. Carlos P. Garcia (Pitogo), Bohol in the first of a series of turnover activities for the winners of the 1998 Search for Best Coastal Management Programs of the League of Municipalities of the Philippines (LMP) and the Department of Environment and Natural Resources (DENR).

Winners of the Search will be awarded one patrol boat each. Pitogo is one of three winning municipalities awarded in the Externally-Assisted Category. Also to be awarded are Malalag, Davao del Sur and Prieto Diaz, Sorsogon. Calabanga and Pasacao in Camarines Sur and Tanauan, Leyte are cited as municipalities not externally assisted.

The Government of Japan through the Overseas Development Assistance funded the construction of the patrol boats. Counselor Eiji Ito of the Consular Office of Japan presented the boat to Pitogo Acting Vice-Mayor Moises Abing. He was joined by Bogo Mayor Celestino Martinez III, President of the LMP-Cebu Chapter, Undersecretary Roseller de la Peña of the DENR and Alfred Nakatsuma, Supervisory Natural Resources Officer of the United States Agency for International Development

(USAID).

The boats are expected to boost



Coastal law enforcement, particularly in the Municipality of Pitogo, is expected to get a shot in the arm with the recent turnover of a patrol boat to the local government unit.

coastal law enforcement efforts that are already gaining momentum nationwide. Constructed primarily out of fiberglass, the vessels also serve to demonstrate an environmentally sound, lower-maintenance and more durable alternative to the traditional wooden paddle- and pumpboats.

Destructive fishing is among the challenges faced by the municipality of Pitogo. Seaborne patrols have been conducted to deter destructive fishing and the encroachment of commercial fishing vessels into municipal waters. Likewise, the local government is taking measures to

strengthen its coastal law enforcement capability.

Pitogo now has six marine sanctuaries. Residents of the municipality are also into mariculture and enterprise activities that ease pressure off the marine environment and allows renewal of fish stocks. Coastal and marine resources conservation was intensified in Pitogo after it was chosen as a project site of the Small Islands Agricultural Support Services (SMISLE).

The municipality was among 17 nominated to the search launched by the LMP and the Coastal Resource Management Project (CRMP) in 1997.

Cash prizes were turned over to winning municipalities in 1998. The Government of Japan accessed funds for the construction of the vessels after these municipalities were recognized anew at the Conference of Coastal Municipalities of the Philippines held in Manila last year.

More than being an efficient sea craft, the boats symbolize a unique partnership for strengthening coastal law enforcement and coastal resource management.

By **Rosario E. Mariño-Farrarons**
Social Marketing Specialist,
CRMP



Seaborne Patrol Goes to Action

Boom! A dynamite blast broke the tranquility of the morning off the seas of Barangay island Caubian, Lapu-lapu City. On an ordinary morning, such illegal act would go on up to as many as 52 blasts, unchallenged.

But October 15 was a rather unusual morning. On prowl since the night before were soon-to-be appointed deputy fish wardens (*Bantay Dagat*) for Olango Island, accompanied by elements of the Maritime Police. They were aboard three outriggers. This sea patrol served as the practicum of the Orientation Seminar for Deputy Fish Wardens conducted at the Mini-City Hall of Talima, Olango Island, Lapu-lapu City from October 12-15, 1999.

The sun's rays were just breaking through the swirling clouds when came a familiar sight—a banca with two men, one of whom stood erect to hurl the death-bearing torch. After a matter of seconds, several fishers rushed to the scene and started gathering the illegally caught bounty when the team from the *Bantay Dagat* Commission, personally led by its

Program Director Elpidio de la Victoria, fired warning shots and closed in on the illegal fishers.

Not any force could dampen the spirit behind that night's patrol. A big wave hit the *Bantay Dagat* vessel that filled it with water. However, before their boat sank, Mr. de la Victoria was quick to send distress signals to participants in other nearby boats. The first boat blocked the fleeing illegal fishers. Those on the second boat assisted Mr. de la Victoria and his companions retrieve important equipment and personal belongings. The third boat chased the illegal fishers.

Three Caubian residents were apprehended off the seawaters of Caubian. Confiscated from them were 4 bottles of dynamite, 41 pieces of "danggit" or rabbitfish, 4 nets, a pair of underwater goggles and 2 outriggers, one with 7 hp Kohler



Seaborne patrol composed of Fish Warden trainees and Military Police escorts, October 1999.

Ma. Fe L. Portigo

engine and the other with a 5 hp Kubota engine. The violators and the evidences against them were later turned over to the Lapu-lapu City Police. On the other hand, the dynamited fish were brought to the Bureau of Fisheries and Aquatic Resources laboratory for examination.

By **Manolita R.B. Morales**
Social Mobilization Assistant,
CRMP



Coastal Law Enforcement Group Vows to Fight Illegal Fishing

The Coastal Law Enforcement Alliance for Region 7 (CLEAR-7) is fast gathering steam, bringing together government agencies and non-government institutions involved in the fight against illegal and destructive fishing.

With support from the United States Agency for International Development and in coordination with the United States Coast Guard through its Mobile Training Team, the alliance recently concluded a series of intensive seaborne patrol and planning courses. The Patrol Planners', Boarding Officers', Boarding Officers' Instructors' and Joint Boarding Officers' Courses graduated a total of 88 participants from various agencies and fisheries groups operating in the four provinces of Region 7 (Cebu, Bohol, Negros Oriental,

Siquijor).

The Patrol Planners' Course (PPC) was developed for participants responsible for planning and implementing field operations. The four-day course involved operations center organization, patrol planning, developing an apprehension plan and stress and crisis management. Participants included officials of the Department of Environment and Natural Resources (DENR), Bureau of Fisheries and Aquatic Resources (BFAR) 7, Philippine National Police Maritime Group (PNP-MARIG) General Headquarters and their provincial offices in Cebu, Bohol, Negros Oriental and Siquijor, PNP Regional Office 7 and their provincial offices in Bohol and Cebu and the Philippine Coast Guard (PCG) 2nd District and their provincial stations in Regions 7 and 8. The

Philippine National Association of Fish Wardens (PHILNAF) and the Asian Development Bank-assisted Fisheries Resource Management Project were also invited to take part in the training course.

On the other hand, the Boarding Officers' Course was attended by field personnel carrying out actual law enforcement functions. This five-day course covered classroom instructions on international law, fisheries law, interpersonal communications, use of force, fishing vessel identification, boarding preparations and procedures, identification of fishing gear, fisheries and environmental laws and courtroom techniques. Practical exercises on arrest procedures, simulated boarding, navigation with the use of handheld GPS (Global Positioning System), fish identification and scientific laboratory exposure were also conducted. The participants came from the PCG-2nd District, PNP-MARIG 7, BFAR 7 and the Cebu City *Bantay Dagat* Commission.

Twelve of the participants from the Boarding Officers' Course took

the Instructors' Course for Boarding Officers. The Instructors' Course provided them with student management, presentation, program development, adult learning and classroom skills to enable them to impart the lessons to future trainees.

The fourth module, Joint Boarding Officers' Course, is almost identical with the Boarding Officers' Course, except that the training course is designed to facilitate coordination between field personnel from various agencies working together on a single mission. Also, instructors came from a composite team of the US Coast Guard, PNP-Maritime Group and the Philippine Coast Guard. Thirty-four personnel of the PNP-Maritime Group, PCG and the National Bureau of Investigation attended the training course.

The CLEAR 7 consortium will soon set up an operations center. It is also touching base with local government units in Region 7.

The group is currently drafting an operational plan that will address the coastal law enforcement-related issues

of blast fishing and use of destructive gear, commercial fishing within municipal waters, municipal fisheries law enforcement and general public information, education and communication.

CLEAR 7 consists of the regional offices of Department of Agriculture-BFAR, PCG, PNP-MARIG, DENR, Department of Interior and Local Government, PHILNAF, Department of Justice-National Bureau of Investigation, the League of Municipalities of the Philippines and the Cebu City *Bantay Dagat* Commission. Technical assistance is provided by the Coastal Resource Management Project with the support of the United States Agency for International Development.

The group is set to begin its operation in earnest in May 2000. Already on the drawing board are joint patrols and anti-illegal fishing media campaigns.

By **Rosario E. Mariño-Farrarons**
Social Marketing Specialist,
CRMP



Gilutongan Community Ups Competency in Marine Sanctuary Management

In their continuing effort to enhance their competency in marine sanctuary management, the residents of Gilutongan Island in Cordova, Cebu joined a series of training courses conducted jointly by the Coastal Resource Management Project (CRMP) and the Marine Science Institute (MSI) of the University of the Philippines (UP). The first training course held in October of 1998 focused on the methods of monitoring while that in March of last year focused on summarizing data and analysis. However, it was the course conducted last November that put to test the preparedness of the community. The community was given considerable leeway in collecting, recording, organizing and presenting their findings to members of the *Sangguniang Bayan* (Municipal Council) of Cordova. Data collected revealed an increase in the number of individuals inside

and outside the sanctuary compared to that obtained in October 1998 and in March 1999. Particularly abundant were species like needlefish (*baw*), parrotfish (*molmol*), rabbitfish (*danggit*), bream (*silay*), goatfish (*timbang*) and fusilier (*sulid*). More individuals were also found inside than outside the sanctuary.

For someone who joined this activity for the first time, participant Ramil Añana gushes about his November experience, "One does not just swim around the area. There were procedures to follow like keeping to one's assignment along the transect line and working with a buddy while taking note of the kind, size and number of fishes." Ramil, who supports his wife and two children by selling food, drinks and souvenirs to tourists, said that in the past he had not given much attention to conservation. However, with his

recent experience in resource monitoring, Ramil is now considering actively participating in the protection of the Gilutongan Marine Sanctuary. "Now I can help in underwater patrols that may be initiated by the community," declared Ramil.

To those who pioneered the conservation efforts in Gilutongan such as Hon. Jury Ompad, *Barangay* (village) Councilor, Mr. Timoteo Menguito, *Barangay* Secretary and more recently, Mayor Arleigh Sito, the training program has been an effective tool in educating their constituents about their environment. Hon. Jury Ompad considers participation in resource monitoring as "a means of making people appreciate their resources ultimately contributing to understanding about their resources and the need for protection."

The November phase was

particularly challenging to Mr. Menguito or Tuti as he is fondly called (see related story on page 34). He was given the responsibility of mobilizing the community. This meant that he had to select and assign skin divers that would gather data on the number, size and kind of fishes. He had to brief the new participants on the procedures and other aspects of the work and had to encourage those who participated in the first two phases of the training to take the lead in the different tasks. Tuti was able to draw more members of the community to join the training. Remarkable was the participation of women, from data gathering to the presentation. Tuti believes that "those who participated learned the value of shared responsibility". "We hope to gain more in follow-up activities. But with the success of community action now, I am confident that the Gilutongan community can sustain the fish visual census even after the CRMP is gone. Agencies like the Department of Agriculture, CRMP and UP-MSI have pledged to support us. We look forward to obtaining material support consisting of calibrated steel transect line, masks, snorkels, fins and slate boards with pens," he states further.

The Gilutongan Monitoring Team won second place from among six similar monitoring teams from different provinces in a Marine Protected Area Workshop/Contest held at Agutayem Island, Misamis Oriental from August 9-12, 1999. The Gilutongan Team breezed through the process of collecting, recording, summarizing and presenting data. Indeed, soon they could be on their own.

Equally appreciative of the outcome of the November exercise were the members of the *Sangguniang Bayan* who graced the presentation of results in the afternoon of November 6, 1999. Hon. Nuñez and Hon. Tago hailed the people for their accomplishments and pledged that the Municipal government will always be there to support them in protecting their coasts and the sea. "The fish abundance in the sanctuary is a victory that the people of Gilutongan gained through their sacrifices," Hon. Nuñez added. From Hon. Celocia, Chair of the Environment and Agriculture, came the highest

compliment. "Those who protect and conserve the seas are modern day heroes. We owe to them the fish on our table."

By **Manolita R.B. Morales**
Social Mobilization Assistant,
CRMP



Fish Type	October 1998		March 1999		November 1999		March 2000	
	Inside Sanctuary	Outside Sanctuary	Inside Sanctuary	Outside Sanctuary	Inside Sanctuary	Outside Sanctuary	Inside Sanctuary	Outside Sanctuary
<i>Visayan English</i>								
<i>Lapu-lapu Groupers</i>		☉☉	☉		☉	☉	☉	☉
<i>Labayan Wrasse</i>			☉		☉☉	☉	☉☉	☉☉
<i>Lipte Sweetlips</i>			☉	☉	☉☉	☉	☉	☉
<i>Katambak Emperors</i>			☉	☉	☉☉	☉	☉☉	☉
<i>Sulid Fusilier</i>	☉☉	☉			☉☉☉	☉☉☉	☉☉☉	☉☉☉
<i>Timbungon Goatfish</i>		☉	☉	☉	☉☉	☉☉	☉☉	☉☉
<i>Silay Bream</i>			☉		☉☉	☉☉	☉☉	☉☉
<i>Alitangbang Butterflyfish</i>		☉☉	☉		☉☉	☉☉	☉☉	☉
<i>Indangan Surgeonfish</i>	☉		☉		☉☉	☉☉	☉☉	
<i>Kitong Rabbittfish</i>		☉	☉		☉☉	☉☉	☉☉	☉
<i>Baw/Balo Needlefish</i>			☉		☉☉			
<i>Molmol Parrotfish</i>	☉	☉☉	☉	☉	☉☉	☉☉	☉☉	☉☉
<i>Samak Mojarra</i>					☉☉		☉☉	

Legend (fish observed per 500 m² survey area)

☉ 1 - 5 fish ☉☉ 6 - 25 fish ☉☉☉ 126 - 625 fish

☉☉☉ 6 - 25 fish ☉☉☉☉ more than 626 fish

Source: Coastal Resource Management Project, University of the Philippines-Marine Science Institute. Community-based monitoring team includes representatives of the Municipality of Cordova, Barangay Gilutongan, Department of Environment and Natural Resources Region VII, Bureau of Fisheries and Aquatic Resources Region VII, the University of San Carlos-Marine Biology Section and International MarineLife Alliance-Philippines.

Community Ecotourism Ventures Cited by International Awards Body

The Conservation International (CI) Ecotourism Excellence Award has bestowed on the Coastal Resource Management Project (CRMP) the Highly Commended Status for its community-based ecotourism programs in Olango Island, Cebu and Cambuhat village in Buenavista, Bohol.

CI, which is dedicated to conserving the earth's natural ecosystems, recognizes "innovative leaders in the tourism industry whose conservation victories are helping us to protect our planet's natural heritage" through the Ecotourism Excellence Awards. Two winners were chosen this year.

CRMP bested 68 other international entries to the award—a record high in number of

applications. CRMP is one of only nine institutions awarded the Highly Commended Status "for having made significant contribution to biodiversity conservation and for serving as a model".

The Olango Bird and Seascape Tour and the Cambuhat River and Village Tour are owned and managed by local coastal villagers. These ventures promote and develop community-based products and businesses that help in the conservation of marine and coastal habitats. CRMP extended technical assistance to the Olango and Cambuhat communities to help them realize their respective goals in sustainable development.

Judging was based on "commitment to conservation,

environmental impact, leadership, vision and innovation and sensitivity to local environmental and cultural issues." A panel of experts in ecotourism, chosen from diverse industry sectors and from various countries, reviewed applications.

The awarding of plaques and announcement of winners was held at the April 2000 Travel and Leisure Show in Toronto, Canada.

The OBST was also awarded early this year the Anvil Award of Merit by the Public Relations Society of the Philippines.

By **Maita A. Verdote**
Volunteer, CRMP





CRM HOTLINE

HOTLINE

The Coastal Resource Management Project invites you to send in burning questions that you may have on any CRM-related issue. Please contact us at the CRMP, 5/F CIFIC Towers, J. Luna St. cor. J. L. Briones Ave., North Reclamation Area, Cebu City, Philippines Tel. 1-800-1-888-1823 Fax (032) 232-1825
E-mail: crmp@mozcom.com and/or crmp@oneocean.org

Foreshore Areas: Questions and Answers



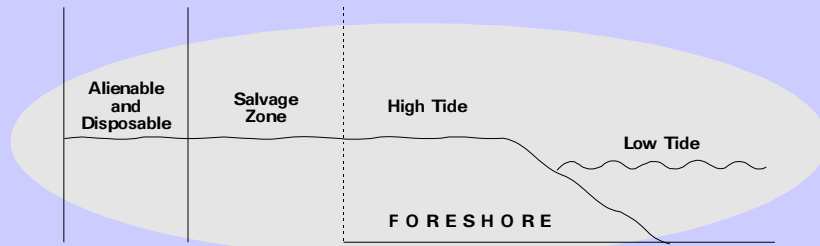
What is the legally accepted boundary for foreshore areas?

- The legally accepted boundary for foreshore areas is provided by the Fisheries Code as "a string of land margining a body of water, the part of a seashore between the low-water line usually at the seaward margin of a low tide terrace and the upper limit of wave wash at high tide usually marked by a beach scarp or berm" (see Figure).



Can foreshore areas be appropriated as private property?

- No, foreshore areas are part of the public domain.
- Commonwealth Act 141, Chapter IX lists the classification and concession of public lands suitable for residence, commerce and



A diagrammatic representation of the foreshore area
(Land Management Bureau).

- industry to include: a) lands reclaimed by the government by dredging, filling or other means; b) foreshore; c) marshy lands or lands covered with water bordering upon the shores or banks of navigable lakes or rivers; and d) lands not included in any of the foregoing classes. Lands classified as items (a), (b) and (c) shall be disposed of to private parties by **lease only** and not otherwise, as soon as the President, upon recommendation by the Secretary of Agriculture and Natural Resources, shall declare that the same are not necessary for the public service and are open to disposition under the same provision.
- A recent decision of the Supreme Court G.R. No. 68166, February 12, 1997, on the titling of accreted land in Manila Bay, invokes Article 4 of the Spanish Law of Waters of August 3, 1866 to establish the fact that foreshore areas constitute public lands, i.e., "Lands added to the shores by accretions and alluvial deposits caused by the action of the sea, form part of the public domain. When they are no longer washed by the waters of the sea and are not necessary for purposes of public utility, or for the establishment of special industries, or for the coast-guard service, the Government shall declare them to be the property of the owners of the estates adjacent thereto and as increment thereof." The decision states that the foreshore of Manila Bay is public land and is therefore not capable of being appropriated by a private person.



Who has jurisdiction over foreshore leases?

- The Department of Environment and Natural Resources (DENR) has jurisdiction over foreshore leases. The powers and functions of the Department include the "exercise of exclusive jurisdiction on the management and disposition of all lands of the public domain and shall continue to be the sole agency responsible for classification, subclassification, surveying and titling of lands in consultation with appropriate agencies" (Executive Order 192).



What is the maximum area that may be leased?

- Under the 1973 and 1987 Constitutions, an individual may lease not more than 500 ha and a corporation may lease not more than 1,000 ha.



What is the term of a foreshore lease?

- A period of 25 years and renewable for not more than 25 years.



What are the requirements in the filing of a foreshore lease application?

- 1) Approved plan and technical description of the land applied for;
- 2) Articles of incorporation and certificate of registration from the Securities and Exchange Commission;
- 3) Certification that the land applied for is not needed for public service from the heads of the following agencies/offices
 - a. Provincial Tourism Office
 - b. Philippine Ports Authority
 - c. District/City Engineer with concurrence of the Regional Director of Public Works and Highways;
- 4) Consent of the spouse, if married; and
- 5) Filing fee of PhP 50.00.



What are the rights and responsibilities of a foreshore lease holder?

- 1) Utilize the area for commercial, industrial or residential purpose as stated in the lease application and contract and comply with Presidential Decree 1586 or the Environmental Impact Study system;
- 2) Pay the annual lease fee amounting to 3% of the appraised value of the land plus 1% of the value of the existing or proposed improvements;
- 3) Construct permanent improvements appropriate for whatever purpose is stated in the lease agreement subject to approval of the Secretary of Public Works and Highways and within 18 months from the date of the award;
- 4) Ensure that the premises or any part thereof is not assigned, subleased or transferred to a third party without the approval (in writing) of the DENR Secretary;
- 5) Waive any right to any reduction of rent on account of any loss or damage suffered by reason of extraordinary, unforeseen, fortuitous events;
- 6) Submit annually to the Department of Finance for approval, a tariff of any and all rates and fees desired to be charged to and collected from any person in case any and all structures and improvements authorized to be constructed and made shall be let or hired for the use of the public; and
- 7) Comply with the easements as provided by law.



Who may approve foreshore leases?

- The approving authorities for original lease, renewal, transfer and sublease for foreshore areas are the following as provided for by the DENR Manual of Approvals (Department Administrative Order 98-24).
 - 1) Provincial Environment and Natural Resources Officer – up to 1,000 m²
 - 2) Regional Executive Director – above 1,000 m² to 3 ha
 - 3) Department Secretary – above 3 ha



What laws govern easement rights in public lands?

- Presidential Decree (PD) 1067, Art. 51. "The banks of rivers and streams and the shores of the seas, and throughout their entire length and within a zone of 3 m in urban areas, 20 m in agricultural areas and 40 m in forest areas, along their margins, are subject to the easement of public use in the interest of recreation, navigation, floatage, fishing and salvage."
- PD 705, Section 16. "Areas needed for forest purposes.... (7) 20-meter strips of land along the edge of the normal high waterline of rivers and streams with channels of at least 5 m wide.... (8) Strips of mangrove or swamplands at least 20 m wide, along shorelines facing oceans, lakes and other bodies of water and strips of land at least 20 m facing lakes...."
- RA 1273, Section 1 (1) "That the applicant agrees that a strip of 40 m wide starting from the bank on each side of any river or stream that may be found on the land applied for shall be demarcated and preserved as permanent timberland to be planted exclusively to trees of known economic value, and that he shall not make any clearing thereon or utilize the same for ordinary farming purposes even after patent shall have been issued to him or a contract lease shall have been executed in his favor."

Continued on next page

Foreshore Areas... *from page 42*

Obligations of the Foreshore Lease Holder

Guarantee and provide the general public free access to and full use and enjoyment of the beach and nearby coastal waters, either in the pursuit of the inhabitants' lawful occupation or their recreational needs. For this purpose, the lessee shall establish and provide a road right-of-way of suitable size that in no case shall be less than three meters in width and location that will permit the public access to the beach area and seawaters without paying any toll. Failure or refusal to comply with this condition shall be valid ground for rejection of application or revocation of the lease award or contract.

By **Annabelle Cruz-Trinidad** (Policy Advisor) and **Leo Pura** (Research Assistant), Policy Component, CRMP

Useful References and Sources of Information

The CRMP endeavors to publicize new and/or useful publications relating to integrated coastal management. CRMP encourages those who would like to have copies of any of the references listed to seek the authors or publishers.

1999

Chua, Thia-Eng and N. Bermas. (eds.). 1999. **Challenges and Opportunities in Managing Pollution in the East Asian Seas.** Proceedings of the International Conference GEF/UNDP/IMO/ Canada-ASEAN Centre/ Swedish International Development Cooperation Agency/ Marine Science Programme, Manila, Philippines.

Japan International Cooperation Agency. 1999. **Draft Final Report on the Study on Mapping and Land Cover Assessment of Mangrove Areas in the Philippines.** Philippines.

Lourie, Sara A., A.C.J. Vincent and H.J. Hall. 1999. **Seahorses: An Identification Guide to the World's Species and their Conservation.** Project Seahorse, London, UK. 214 p.

Sievert, Ruperto F. and D.A.D. Diamante-Fabunan. 1999. **Local**

Participation in Fishery Law Enforcement. Intercoast Network: International Newsletter of Coastal Management. (34): 16-17.

Uychiaoco, Andre J., H. Arceo, P. Gaité, S. Green, S. Curran and M. Comer. 1999. **Monitoring the Effects of Marine Sanctuaries in Lomboy, Calape; Cangmating, Sibulan; Gilutongan, Cordova; Tuka, Kiamba; and Port Barton, San Vicente.** Coastal Resource Management Project and University of the Philippines-Marine Science Institute, Philippines.

Volunteer Service Organization. (ed.) 1999. **Community-based Strategies in Natural Resource Management.** VSO/FPE/NIPA/ NGOs for Integrated Protected Areas, Aklan State College of Agriculture, Banga, Aklan.

World Bank. 1999. **Voices from the Village: A Comparative Study of Coastal Resource Management in the Pacific Islands.** USA.

1998

Froese, R. and D. Pauly. 1998. **FishBase '98—Concepts, Design and Data Sources.** International Center for Living Aquatic Resources Management. Makati City, Philippines.

Parras, Dianne Antoinette. 1998.

Coastal Resource Management in the Philippines: A Case Study in the Central Visayas Region. University of Miami, USA.

Primavera, J.H. 1998. **Tropical Shrimp Farming and Its Sustainability in Tropical Mariculture.** Academic Press. Philippines. pp. 257-289.

1996

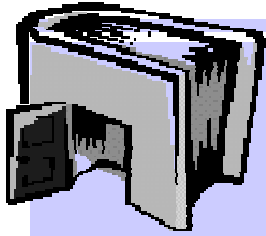
Philippine Fisheries Policy: Towards Sustainable Development of Fisheries Resources. 1996. *In:* Institute of Science and Mathematics Education and Institute of Fisheries Policy and Development Studies. University of the Philippines, Diliman, Quezon City.

1988

Fairbairn, Te'o I.J. (ed.). 1988. **Island Entrepreneurs: Problems and Performances in the Pacific.** Pacific Islands Development Program, Honolulu, Hawaii. 288 p.

1987

Hailey, John M. 1987. **Entrepreneurs and Indigenous Business in the Pacific.** Research Report Series No. 9. Pacific Islands Development Program, Honolulu, Hawaii. 94 p.



SELECTED CRMP PUBLICATIONS

Baleña, Rex. 1998. **A Technical Framework for the Sound Deployment of Passive Fish Capture/Culture Devices in Shallow Waters: Analysis, Simulation and Prediction of Impacts of Fish Pens and Cages in Malalag Bay, Davao del Sur.** CRMP. Document No. 18.

Courtney, C.A., J.A. Atchue III, M. Carreon, A.T. White, R.P. Smith, E.T. Deguit, R.F. Sievert and R. Navarro. 1998. **Coastal Resource Management for Food Security.** CRMP. Document No. 39.

Coastal Resource Management Project. 1999. **Policy Study on Proposed NAMRIA Guidelines for Delineation of Municipal Waters.** CRMP. Document No. 11.

Coastal Resource Management Project. 1999. **Primer on Coastal Resource Management.** CRMP. Document No. 6.

Legal Environmental Advocacy Program, Fisheries Resource Management Project and Coastal Resource Management Project. 2000. **Handbook for Local Coastal Law Enforcement.** CRMP. Document No. 11.

Melana, D.M., J. Atchue III, C.E. Yao, R. Edwards, E.E. Melana and H.I. Gonzales. 2000. **Mangrove Management Handbook.** Department of Environment and Natural Resources, Manila, Philippines through the Coastal Resource Management Project. Cebu City, Philippines. 96 p.

Pestaño-Smith, R., C. Courtney, M. Greiser and A. Sia. 1999. **Into the Mainstream: Promoting Coastal**

Resource Management in the Philippine National Agenda. CRMP. Document No. 13.

White, A.T., C. Courtney and R. Tobin. 1998. **Coastal Management in Asia: Are Donor-assisted Programs Sustainable and Beneficial?** CRMP. Document No. 43.

White, A.T., M. Ross and M.M. Flores. 2000. **Benefits and Costs of Coral Reef and Wetland Management, Olango Island, Philippines.** CRMP. Document No. 4.

White, A.T., A. Salamanca and C. Courtney. 2000. **Experience with Coastal and Marine Protected Area Planning and Management in the Philippines.** CRMP. Document No. 10.

CRMP TRAINING COURSES FOR COASTAL MANAGEMENT

CRMP has successfully implemented several training courses in collaboration with the Department of Environment and Natural Resources, Department of Agriculture-Bureau of Fisheries and Aquatic Resources, other government agencies and non-government organizations. These include:

- u Integrated Coastal Management
- u Participatory Coastal Resource Assessment
- u Local Coastal Law Enforcement
- u Mangrove Rehabilitation and Management
- u Strategic Rehabilitation and Planning for Coastal Management
- u Coastal Tourism Planning and Management
- u Seaweed Grower's Training

Integrated Coastal Management Training Course. This ten-day course is designed to meet the training requirements for individuals from national and local government, NGOs, and academic institutions who will be working in, and practicing, coastal resource management. The course is based on past experiences, but evolves to incorporate new coastal management

practices and tools.

The course is primarily meant for use in local training efforts in the Philippines, and can help to standardize integrated coastal management trainings by making the training functions of local institutions more routine. The implementation of this course always strives to improve quality, add value and enhance knowledge about the practice of coastal management in the Philippines.

Integrated Coastal Management Short-term Training Course. This three-day course consists of ten sessions covering a wide range of inter-related topics such as: coastal ecosystem, concept of ICM, coastal management options and strategic planning. The course aims to enhance the participants' awareness of coastal environmental issues and appreciate the integrated coastal management approach to address these challenges.

Training Objectives:

- u Introduce the participants to the economic, social and biological importance of coastal resources
- u Describe the existing institutional system of coastal resource

management in the Philippines

- u Describe the role of leaders and public participation in coastal management
- u Explain the importance of integrated coastal management for the Philippines in general, and for the participants' area in particular
- u Describe the strategic planning process and its relevance to coastal management
- u Design appropriate local institutional networks to implement coastal management plans

Participatory Coastal Resource Assessment. This three-day course was developed to assist the integration of local coastal resource user knowledge with the understanding of scientists and planners for effective integrated coastal resource management. Much of the content is based on project work and research conducted in the Philippines and other countries in geography, human ecology and various coastal resource management efforts.

The course is designed primarily

for use by municipal-level trainers involved in community development for sustainable coastal resource use. It has two main purposes: first, to assist local resource managers in maximizing the contribution they can make to initiate coastal resource assessment and project monitoring and evaluation; and second, to initiate dialogue and input from local community resource users in a relevant and meaningful fashion for planning purposes.

The output of this course will enable resource managers to work with local coastal resource users to generate valuable information for coastal management planning and implementation. This will be done simultaneously while improving community participation and local empowerment.

Training Objectives:

- u Illustrate the coastal resource management process
- u Enumerate the many benefits of a participatory coastal resource assessment
- u Identify the various stakeholders in a coastal community
- u Show the linkages between and among resources, people and sustainable coastal management and development
- u Apply the various PCRA techniques: (a) interview, (b) transect, (c) habitat assessment
- u Compile a preliminary coastal area profile based on PCRA results
- u Develop a PCRA map of the local coastal management area

Local Coastal Law Enforcement. This one-day course, which was developed by Silliman University's Legal Environmental Assistance Program, seeks to develop the community-based enforcement of coastal laws. It encourages the participation of the community in the enforcement process where such participation is sanctioned by law. To this end, trainers, coastal managers and enforcers should be equipped with a basic knowledge and understanding of the law.

Training Objectives:

- u Make "instant lawyers" out of trainers from LGUs, NGOs and Pos involved in organizing coastal communities for effective coastal resource management
- u Present fisheries and aquatic resource laws to lay persons and non-lawyers in a manner that is immediately understandable

- u Empower local fishing communities, particularly the *Bantay Dagat* and fisherfolk organizations in the immediate and effective enforcement of coastal laws
- u Complement the practical knowledge of trainers with the basic understanding of the law, especially at the enforcement stage
- u Encourage the participation of the people in all stages of community-based enforcement of fisheries and aquatic resource laws

Mangrove Rehabilitation and Management.

This three-day course is meant to enhance the capacity of trainers and implementors of the Community-Based Forest Management Program implemented through the DENR. This is a consolidation of technical information generated from scientific research, and the experiences of traditional mangrove farmers and mangrove reforestation managers. In addition, lessons gained from past local governance and mangrove advocacy projects are also considered in this training course.

Training Objectives:

- u Educate coastal community resource managers on the process necessary to secure a Community-Based Forestry Management Agreement
- u Ensure an integrated and participatory approach for mangrove rehabilitation
- u Ensure the future sustainability of mangroves

Strategic Rehabilitation and Planning for Coastal Management. This two-day workshop aims to impart the importance of strategic planning for coastal management to municipal-level resource managers and users.

Training Objectives:

- u Answer basic questions on the concept of integrated coastal management and identify the major characteristics
- u Define the unit of coastal management, as well as enumerate the goods and services derived from the coastal area
- u Relate the coastal environmental issues of the municipality with the need for a coastal management plan
- u Explain coastal management planning as a strategy
- u Enumerate various coastal management options

Coastal Tourism Planning and Management.

This five-day course introduces participants to the overall framework of integrated coastal management and to the role of coastal tourism as an available management option. It ties together the effects of human interventions within the coastal area to the health of the coastal ecosystem, and proposes "safe" methodologies for attaining economic security by local community members.

Training Objectives:

- u Define planning and management processes used in creating strategic ecotourism plans (SEP)
- u Endorsement of a local SEP, identification of key projects and development strategies by local decision-makers
- u Outline of specific measures and activities for the implementation of the SEP
- u Creation of a coordinating working group of public and private sector and communities for implementation

Seaweed Grower's Training.

This three-day course attempts to disseminate a "best CRM practice" through the grower-to-grower training center located in Gilutongan Island, Cordova municipality, Cebu. This is instituted with the end view that successful local seaweed growers can impart their technologies to fisherfolk who are currently undertaking, or are planning to venture, into similar enterprise(s).

The course consists of seven sessions covering the overall management of the whole production cycle of seaweed farming. It aims to develop and/or enhance participants' skills and techniques in growing seaweed through a grower-to-grower methodology which emphasizes a personalized teaching approach.

Training Objectives:

- u Compute simple economic analyses of seaweed farms
- u Identify appropriate sites and farm layout
- u Demonstrate at least one method of planting
- u Describe and demonstrate the basic techniques in identifying planting materials
- u Outline the basic management practices to successfully maintain farms
- u Enumerate simple environmental management measures in seaweed farming

UPCOMING EVENTS



2nd World Conservation Congress

October 4 - 11, 2000 • Amman, Jordan

The Amman Congress will include the following five main events:

- n **Meetings of IUCN's Six Commissions**
October 4
- n **A series of Members' Business Sessions**
October 6
- n **A Technical Meeting**
October 9
- n **A series of Interactive Sessions**
October 5, 7, 9
- n **An Exhibition organized by the Host Country**

Contact:

World Conservation Congress Officer

IUCN
Rue Mauverney 28
1196 Gland
Switzerland
Fax + + 41 22 999 0020

**Regional Workshop
on the Ecology of
Tropical Meso zooplankton
and Fish Larvae**

November 15 - 23, 2000

Phuket Marine Biological Center (PMBC)
51 Sakdidesh Road, Vichit Sub-district,
Muang District, Phuket Province, Thailand

Teachers

Peter Munk • Vudhichai Janekarn
Per Juel Hansen • Torkel Gissel Nielsen
Helge A. Thomsen

Contact:

Director of PMBC

Phuket Marine Biological Center, P. O. Box 60,
Phuket 83000, Thailand. Email:
<pmbcnet@phuket.ksc.co.th >

International Course

**“Alternative Approaches to
Fisheries Management;
the Relevance of Co-management.”**

January 15 - March 10, 2001
Wageningen, the Netherlands

Organizer:

International Agricultural Centre (IAC)

in cooperation with
Wageningen University & Research (WUR)

Contact:

The Director

International Agricultural Centre
P. O. Box 88
6700 AB Wageningen
the Netherlands
Fax: (+) -31-317-495395
Email: iac@iac.agro.nl

Call for Papers



**Hands Across the Water -
Linking Land, Lake, and Sea**

July 15 - 19, 2001 • Cleveland, Ohio

In keeping with the city's strong musical tradition, CZ01 is organized around four central themes:

- **Taking Care of Business**
- **Son of a Son of a Sailor**
- **Everyday People**
- **Here Comes the Sun**

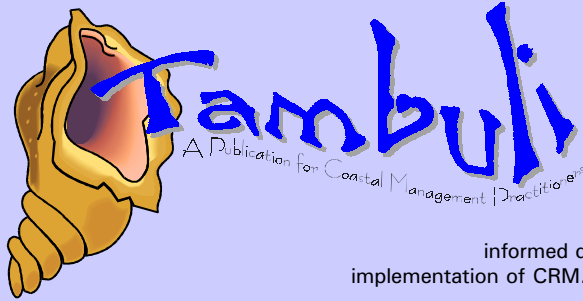
All abstracts must be submitted by

September 8, 2000

*Abstracts can be submitted on-line at
www.csc.noaa.gov/cz2001 or mailed to:*

Jan Kucklick

NOAA Coastal Services Center
2234 South Hobson Avenue
Charleston, South Carolina 29405
(843) 740-1279
Fax: (843) 740-1313
Jan.Kucklick@noaa.gov



TAMBULI: A PUBLICATION FOR COASTAL MANAGEMENT PRACTITIONERS is published biannually by the Coastal Resource Management Project, a five-year technical assistance project funded by the United States Agency for International Development (USAID), implemented by the Department of Environment and Natural Resources, and managed by Tetra Tech EM Inc.

CRMP focuses on leadership and empowerment, informed decision-making, and positive changes in human behavior in the implementation of CRM.

This publication aims to encourage continued exchange of information, experience and ideas on coastal management among planners, managers, community leaders and other coastal resource users, given the increasing need for improved coastal management and in recognition of the need for sustained environmental advocacy.

Readers are enjoined to contribute by sending:

- **Substantive articles** (1,000-2,000 words) that highlight coastal management issues, management plans and implementation, leadership for the responsible use and management of coastal resources, processes and methodologies, mitigating measures and other pertinent aspects of coastal management.
- **Short articles** (500-1,000 words) on topics relevant to coastal management.
- **News items** concerning coastal management activities.
- **Notices** of upcoming coastal management related events, meetings or workshops.
- **Letters and comments** for publication, or otherwise, which clarify views or **suggestions** on how to improve this publication.

We require both **diskette** and **hard copies** of the articles as well as their **appropriate illustrations**. Diskette copies should be in MS Word. Hard copies should be typewritten, double-spaced, with font (font size)—Univers (11). Illustrations (e.g., graphs, tables, maps, sketches), photographs and/or slides (colored) should have corresponding captions. Articles and corresponding visuals submitted will **not be returned**.

Please send all contributions and correspondence to: The Editor, TAMBULI, CRMP, 5th Floor, CIFIC Towers, J. Luna St. cor. J. L. Briones Ave., North Reclamation Area, Cebu City, Cebu, Philippines. Tel. No. (63-32) 232-1821 to 22, 412-0487 to 89, 412-0645; Fax No.: (63-32) 232-1825; Hotline: 1-800-1-888-1823; E-mail: crmhot@mozcom.com and/or crmp@oneocean.org; Website: www.oneocean.org

TAMBULI is distributed without cost to all network members and others upon request.

This publication was made possible through support provided by the USAID under the terms of Contract No. AID 492-C-00-96-00028-00. The opinions expressed herein are those of the authors and do not necessarily reflect the views of USAID or Tetra Tech EM Inc. Articles may be quoted or reproduced in other publications as long as proper reference is made to the source.

Editor: Alan T. White **Associate Editors:** Dolores Ariadne D. Diamante-Fabunan and Catherine A. Courtney. **Production and Artwork:** Leslie S. Tinapay. Photographs are by the authors or as indicated.

Editorial Board

The Editorial Board Members will be coordinating submission of news items and major articles from their respective agencies or countries and serve as resource persons for future network activities.

Ms. Jessica Muñoz

Bureau of Fisheries and Aquatic Resources (BFAR)
Department of Agriculture (DA)
Arcadia Bldg., Quezon Blvd. Ext.
Quezon City
Philippines

Tel: (63-2) 9265428
Fax: (63-2) 9267790

Dr. Rokhmin Dahuri

Director
Centre for Coastal and Marine Resources Studies
Bogor Agricultural University
Gedung Marine Center Lantai 4, Fakultas Perikanan IPB
Indonesia

Tel: (62-251) 621086
Fax: (62-251) 625556

Mr. Florendo Barangan

Deputy Project Coordinator
Coastal Environment Program (CEP)
Department of Environment and
Natural Resources (DENR)
Visayas Ave., Diliman, Quezon City
Philippines

Tel: (63-2) 9202211
Fax: (63-2) 9264826

Dr. Rafael D. Guerrero III

Executive Director
Philippine Council for Aquatic and Marine Research
and Development (PCAMRD)
Los Baños, Laguna
Philippines

Telefax: (63-94) 5361582

Dr. Hilconida Calumpong

Marine Laboratory
Silliman University
Dumaguete City 6200, Negros Oriental
Philippines

Telefax: (63-35) 2252500

Mr. Rathin Roy

Bay of Bengal Programme-FAO
91 St. Mary's Road
Abhiramapuram, Madras 600 018
India

Tel: (91-44) 4936294
Fax: (91-44) 4936102

Mr. Stephen Olsen

Director
Coastal Resources Center
University of Rhode Island
Narragansett, RI, 02882
USA

Tel: (1-401) 8746224
Fax: (1-401) 7894670

