



# Tambuli

A Publication for Coastal Management Practitioners

## Provincial Coastal Resource Management: Bohol, Masbate and Davao del Sur Forge Ahead

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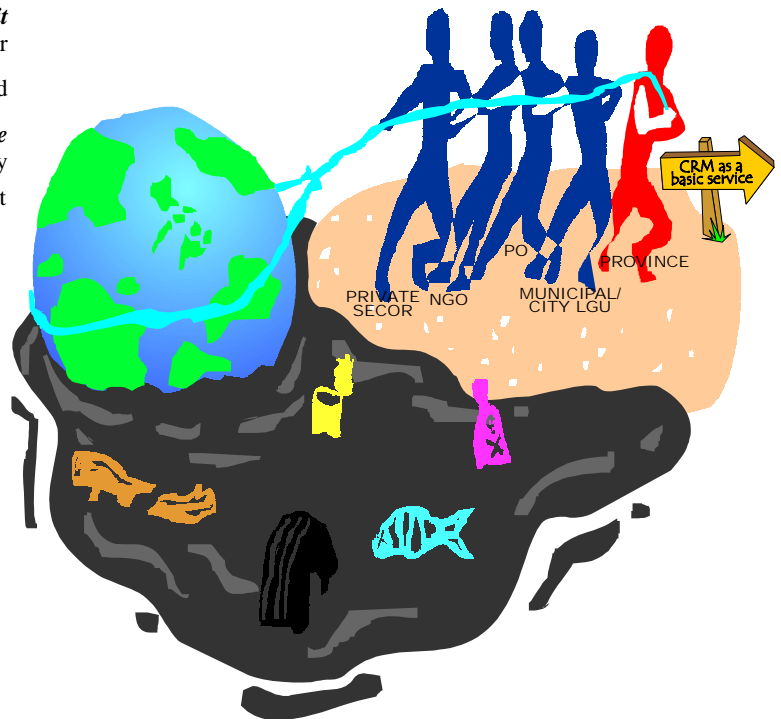
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### INTRODUCTION

Philippine coasts are under stress, and interventions are actively being implemented by government, private and nongovernment organizations (NGOs), academic institutions, and communities to protect and conserve coastal resources for sustained use. Integrated coastal management (ICM) and, more commonly, coastal resource management (CRM) are the thrust of institutions whose concern is to address coastal issues and problems.

CRM is a process of planning, implementing, and monitoring activities for the sustainable use of coastal resources. In the last few years, CRM is starting to be adopted by local government units (LGUs) in the Philippines as a development framework and basic service to coastal communities. With the mandate given to them by the Local Government Code of 1991 and the Philippine Fisheries Code of 1998, LGUs now have greater power and responsibility in the conservation, protection, and management of all coastal



*Strong provincial leadership and technical assistance is key to rational use and sustained management of coastal resources by municipalities and cities.*

and marine resources, including fisheries. Municipalities and cities, in particular, are the primary LGUs responsible for CRM, but provinces also have key roles and are responsible for adopting appropriate measures to protect coastal and marine resources within their territorial jurisdiction (Courtney and White 2000).

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## Future Themes for Coastal Management and New Philippine Policy Directions

### Tambuli—A Newsletter for Coastal Management

**Practitioners** is on its seventh and last issue under the Coastal Resource Management Project of the Department of Environment and Natural Resources. We have covered much material in six years and have received many positive comments and many requests for more information. Our Philippine and international audience is definitely hungry for good examples of coastal management in all shapes and forms. Hopefully, we have provided enough to satisfy most appetites, but we realize that there is still a tremendous demand. From now on, unless another project takes on the publication of **Tambuli**, all **Tambuli** and related information will be available on the website: [www.oneocean.org](http://www.oneocean.org). This includes all past **Tambuli** articles and most publications of CRMP to date. Please send your comments and requests to [oneocean@mozcom.com](mailto:oneocean@mozcom.com).

This issue is forward-looking. It provides examples of what is to come in coastal management in the Philippines. It highlights the role of provinces in shaping the coastal management agenda for local governments through the article comparing Bohol, Masbate and Davao del Sur provincial coastal programs.

Monitoring and evaluation of coastal management, a key to sustainability, is a major theme emerging in this new century. Without more effective baseline information, monitoring and feedback, we cannot move forward towards sustainable use of our coastal resources as shown in the article by Courtney, Deguit and Yambao.

Ecotourism is an economic force that cannot be ignored. It will affect and support more coastal management than we realize and can be used constructively as an economic conservation thrust. Olango Island provides a window of what could work in other parts of the Philippines for coastal ecotourism involving local communities.

Finally, the theme of carrying capacity and management of fisheries and water quality within semi-enclosed water bodies is addressed in two articles that show how easy it is to reach the limits of fishing and waste dilution in bays and estuaries. And, although they are not easy to implement, methods for solving these problems are also illustrated.

What must we focus on now in this new century to make coastal management work in the Philippines? A big question but not beyond a direct answer! The newly proposed "National Coastal Resource Management Policy for the Philippines" (NCRMP) is taking shape through ongoing consultations between DENR, other national agencies, and the NGO and academic community. This well-stated and progressive policy document deserves recognition in this last **Tambuli**. It lays out a clear and holistic agenda for coastal management that must be endorsed at all levels of government and by the private sector. The thinking and experience represented in this policy statement cannot be surpassed and thus it should have an excellent chance for full endorsement of government. Summarized below are the three policy

agendas that form its core. Although a small subset of the whole, they give the flavor of the policies absolutely necessary to foster and improve coastal management in the Philippines. The agendas are:

## Encouraging Local Leadership

Policy Agenda 1: To promote coastal resource management as a basic service of local government through the following:

- a. Adopt and implement municipal and city coastal resource management plans;
- b. Establish effectively managed marine reserves and sanctuaries in all coastal municipalities and cities;
- c. Improve enforcement of national and local laws in municipal waters; and
- d. Adopt and implement provincial coastal resource management framework plans.

## Realigning National Institutions and Responsibilities

Policy Agenda 2: To support local government initiatives in coastal management by realigning national institutions and responsibilities through the following:

- a. Prepare department mission statements reflecting the goals and objectives of the National Coastal Resource Management Policy;
- b. Complete institutional audits of department performance and results review in cooperation with other departments;
- c. Establish a national certification and incentive system for local coastal resource management plans and programs;
- d. Publish a national report on the state of the Philippines' coastal environment; and,
- e. Serve and satisfy the information and technical assistance needs of local government.

## Enhancing the Effectiveness of Multisectoral Support Systems

Policy Agenda 3: To enhance the effectiveness of multisectoral support systems in coastal resource management through the following:

- a. Establish a regular multisectoral review system to identify and resolve overlapping, conflicting, and inconsistent policies, laws, and programs related to coastal resource management and the goals and objectives of the NCRMP;
- b. Establish regular multisectoral review and assessment of all national marine protected areas;
- c. Establish regular multisectoral review and assessment of all shoreline and foreshore development policies, laws, and implementation mechanisms;
- d. Establish regular multisectoral review and assessment of the Environmental Impact Assessment System;
- e. Establish regular multisectoral review and assessment of the small and medium scale commercial fishing industry;
- f. Provide relevant and reliable data on the status of municipal fish stocks, marine water quality, and coastal habitats to local government and assisting organizations for use in managing coastal resources;
- g. Develop CRM training and technical assistance core groups at national, regional, and provincial levels;
- h. Develop and implement a targeted policy-relevant research agenda for enhanced management and stewardship of coastal resources; and
- i. Increase public awareness of environment-related responsibilities for coastal resources.

This may seem like too much to ask, but what are the consequences of failing to act? What will the Philippines look like, be like, if we lose our coastal heritage? Very simply, it will become a poorer nation with per capita well-being declining. The natural resource base of the Philippines has always been the main source of income for the majority of the people. As this resource base erodes, so will the fundamental economic base and individual and collective well-being. Let us take this to heart and support these needed policies for Philippine coastal management!

Editor

### Provincial *from page 1*

Sixty-four out of the 78 Philippine provinces border coasts and thus play a crucial role in the success of CRM at the local level. National laws and regulations give provinces the mandate to undertake program planning and implementation, legislation and enforcement, taxation and revenue-generation, monitoring and evaluation, capability building, and

inter-agency and inter-LGU collaboration (DENR *et al.* 2001) (Table 1).

Recognizing this important role of the province, the Coastal Resource Management Project (CRMP) has evolved since 1996 from assisting mostly municipalities and cities to a strong emphasis on providing support to “learning area provinces” to help them as service providers for CRM in LGUs. The

experiences of three provinces are highlighted in this article to illustrate different strategies undertaken at the provincial level to deliver CRM as a basic service to coastal municipalities and cities (Figure 1). The Provinces of Bohol and Davao del Sur encompass two of the original learning areas of CRMP that commenced work in 1996, while the Province of Masbate became a CRMP expansion area in 2000.

**Table 1. Specific roles and functions of the province in CRM.**

<b>Planning</b>
<ul style="list-style-type: none"> <li>■ Formulate socioeconomic development plans, including CRM plan</li> </ul>
<b>Legislation</b>
<ul style="list-style-type: none"> <li>■ Approve ordinances which help ensure the efficient and effective delivery of CRM (including pollution control) as a basic service</li> <li>■ Review ordinances enacted by municipal/city government</li> </ul>
<b>Regulatory</b>
<ul style="list-style-type: none"> <li>■ Issue permit and collect fees for guano collection</li> <li>■ Issue permit to extract sand, gravel, and other quarry resources</li> </ul>
<b>Enforcement</b>
<ul style="list-style-type: none"> <li>■ Enforce all laws and ordinances relating to pollution and environmental protection</li> <li>■ Protect the environment and impose appropriate penalties for the following acts:               <ul style="list-style-type: none"> <li>■ Dynamite fishing and other forms of destructive fishing</li> <li>■ Illegal logging and smuggling of logs</li> <li>■ Smuggling of natural resource products and endangered species</li> <li>■ Slash-and-burn farming</li> <li>■ Other activities which will result in pollution, acceleration of eutrophication of rivers and lakes, or ecological imbalance</li> </ul> </li> <li>■ Prescribe criminal penalty prescribed under the Fisheries Code</li> <li>■ Enforce forestry laws in community-based forestry areas</li> <li>■ Enforce small-scale mining laws, subject to policies of the DENR</li> <li>■ Verify and adjudicate conflicts on guano collection and on sand, gravel, and other quarry resources</li> </ul>
<b>Taxation and Revenue Generation</b>
<ul style="list-style-type: none"> <li>■ Impose taxes on sand, gravel, and other quarry resources</li> <li>■ Define the geographic criteria for application of LGU taxes and levies based on the location of the transaction or the operation branch, outlet, or office</li> <li>■ Formulate special levies on real property and the procedure for allocating proceeds</li> <li>■ Receive share from the internal revenue allotment (IRA)</li> <li>■ Receive share of proceeds from government agencies or government-owned and controlled corporations</li> </ul>
<b>Extension/Technical Assistance</b>
<ul style="list-style-type: none"> <li>■ Provide agricultural extension and on-site services and facilities, which include the organization of farmers and fishers cooperatives and other collective organizations</li> <li>■ Integrate operations for agricultural extension services and undertake annual evaluation of all municipal extension programs</li> </ul>
<b>Intergovernmental Relations</b>
<ul style="list-style-type: none"> <li>■ Group together, consolidate, or coordinate efforts, services, and resources for commonly beneficial purposes</li> <li>■ Group together and coordinate with each other to achieve the objectives of integrated fishery resource management</li> <li>■ Share with the national government the responsibility in the management and maintenance of ecological balance within the territorial jurisdiction</li> </ul>
<b>Relations with People's Organizations and Nongovernment Organizations</b>
<ul style="list-style-type: none"> <li>■ Promote the establishment and operation of POs and NGOs</li> <li>■ Enter into joint ventures and other cooperative arrangements with POs and NGOs</li> <li>■ Develop local enterprises and provide assistance to POs and NGOs</li> </ul>

Source: DENR *et al.* (2001).

## BOHOL: CHARTING CRM THROUGH LEGISLATION

Bohol is one of the four provinces comprising Central Visayas. Its population of 1,137,268 includes approximately 100,000 marginal fishers, gleaners, and fish vendors (NCSO 2000). Bohol has one city (Tagbilaran) and 47 municipalities, of which 30 are coastal. Its coastline of 642 km

borders about 6,427 km<sup>2</sup> of municipal waters that, historically, supported one of the richest fisheries in central Philippines (Green *et al.* 2000a, 2000b). Today, Bohol is plagued by extreme poverty in the coastal communities that is exacerbated by rampant illegal and destructive fishing, increasing pollution and sedimentation, and uncoordinated and weak coastal law enforcement.

## Highlights

Bohol has a strong foundation for environmental management, particularly for CRM. The province is a preferred pilot area for coastal management projects, with several development initiatives completed, in progress and proposed. It was a beneficiary of the World Bank-assisted Central Visayas Regional Project (1984-1992), its first ever community-based resource management project. Since 1996, it has benefited from three USAID-funded projects that focused on governance and environmental management: the Governance and Local Democracy (GOLD) Project, CRMP, and Industrial Initiative for Sustainable Environment Project. Other projects are also being implemented by Manila-based and local NGOs. These CRM initiatives have encouraged provincial legislation that allows legal and institutional arrangements for CRM to operate at the provincial level. Major highlights of this process are:

### *Creation of provincial CRM task force*

The Department of Environment and Natural Resources (DENR) initiated the formation of a provincial CRM task

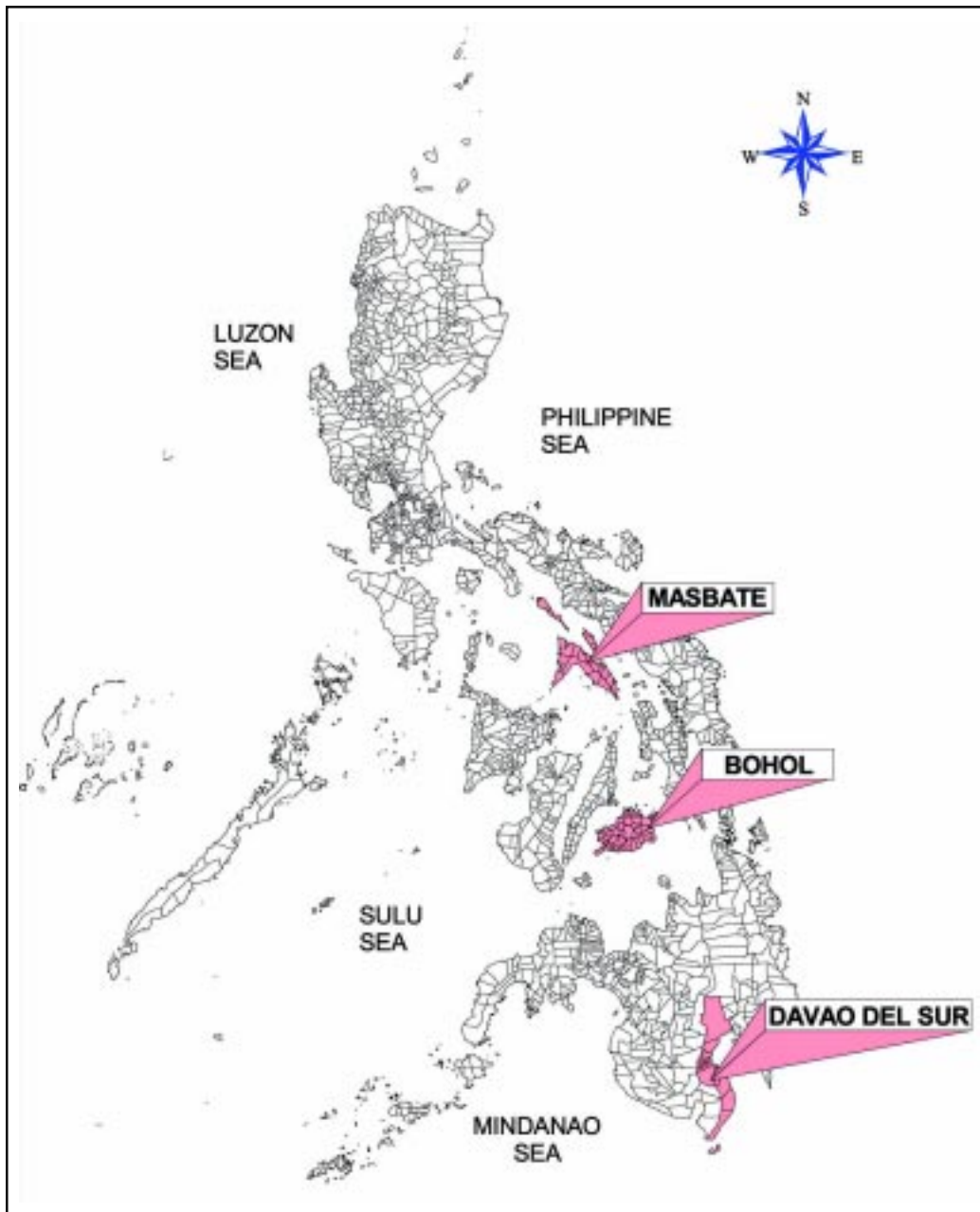


Figure 1. The provinces of Bohol, Masbate, and Davao del Sur.



BIPC/M. B. Dolotina

The Bohol Provincial Capitol is the home of the Bohol Environmental Management Office, a strong proponent of CRM in the province.

Aquatic Resources (DA-BFAR), and the province signed a memorandum of agreement (MOA), which defined their roles in CRM. This MOA also served as a “road map” for CRMP’s technical assistance at the provincial level. As provided in the MOA, CRMP shifted the focus of its technical assistance towards operationalizing the CRM Section through staff and resources within the BEMO. The main goal was to leave the BEMO CRM Section with the “institutional memory” of CRMP technical assistance and enable it to take over CRMP’s role as technical assistance provider to Bohol LGUs.

**Bohol Environmental Management Office**

Once operational, the BEMO CRM Section, together with CRMP and USAID-GOLD, created its own CRM learning areas in the eastern and southern parts of the province, where few CRM initiatives had taken place. It has since provided technical assistance to about 10 municipalities in the conduct of PCRA and CRM planning and implementation, led in the implementation of province-initiated environmental programs, and assisted in the conduct of monitoring and evaluation in the learning area municipalities of CRMP in 2000 and 2001. Together, BEMO and CRMP have now reached over 70% of the coastal municipalities of Bohol. For certain components such

force as laid down in Executive Order No. 118, which identified Bohol as one of 20 priority provinces for CRM, to ensure proper coordination between and among the national government agencies (NGAs) in the province, provincial offices, NGOs, and foreign-funded projects. Some members of the task force were trained in facilitating participatory coastal resource assessment (PCRA), mangrove management, marine protected area (MPA) establishment and management, and CRM planning.

**Formulation of Bohol environment code**

In 1997, the Governor, in coordination with the GOLD Project, called an environment summit to enhance public awareness and target specific areas for government intervention. The main output of the summit was an environment code that integrates existing national laws into the local governance system (*Sangguniang Panlalawigan* 1998). CRM is one of nine major sectors addressed in the code, which mandated the creation of the Bohol Environmental Management Office

(BEMO) responsible for its implementation. Municipalities use the code as legal basis and guide in formulating their CRM policies and plans, with BEMO acting as umbrella for and integrator of all CRM activities in the province (Table 2).

In 1999, to support the implementation of the code with respect to CRM, the *Sangguniang Panlalawigan* adopted a resolution creating a Sub-Committee on Marine and Coastal Resources and a CRM Special Project Unit. In the same year, the DENR, Department of Agriculture-Bureau of Fisheries and

**Table 2. Responsibilities of Bohol Environmental Management Office on CRM.**

<ul style="list-style-type: none"> <li>■ Development of provincial framework and formulation of plans and programs;</li> <li>■ Provision of technical assistance to municipalities and city on planning, implementation, and monitoring of programs and projects;</li> <li>■ Coordination of province-led activities, including information, education and communication and other social mobilization activities;</li> <li>■ Establishment of linkages with national and international organizations for purposes of fund-sourcing, research and development, and technical assistance;</li> <li>■ Research and development, including information and database management; and</li> <li>■ Provision of technical advice to the Governor and the <i>Sangguniang Panlalawigan</i></li> </ul>
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as coastal law enforcement, all coastal towns in the province have benefited from BEMO's technical assistance.

In line with the Regional Development Council's resolution creating a CRM certification system for Region 7, BEMO, through an executive order from the Governor, has also been directed to be the Secretariat for the provincial CRM Certification Technical Working Group (TWG). As Secretariat, it facilitates annual monitoring of CRM plans and programs and evaluates the performance of municipalities in CRM.

#### ***District coastal law enforcement councils***

Coastal law enforcement is a key strategy of the province for sustaining CRM. To enhance inter-LGU collaboration, the provincial government formed coastal law enforcement councils (CLECs) in its three congressional districts. BEMO serves as the coordinating office of the CLECs. Law enforcement is now conducted by the councils with full support from the provincial and municipal governments in coordination with the Philippine National Police, Philippine Coast Guard, and community-based organizations.

#### **Facilitation Role of CRMP**

CRMP began work in Bohol in 1996 in the five northwestern municipalities of Calape, Tubigon, Clarin, Inabanga, and Buenavista. Here, the Project conducted PCRA, ICM and CRM training, mangrove management, sanctuary management, enterprise development, and planning, in partnership with the province through BEMO, other provincial government offices, and NGOs.



*Masbate Provincial Capitol.*

CRMP played a crucial role in capacitating the province in CRM. Since 1998, CRMP and BEMO have worked together in both the CRMP learning areas and the BEMO learning areas in the south and east of Bohol, with strict counterparting of staff, resources and technical assistance. The 1999 MOA between CRMP, DENR, DA-BFAR and the province concretized this partnership.

In preparation for CRMP's exit, BEMO has beefed up its CRM Section from one person in 1998 to seven staff, all of whom have become well-versed and competent in the tools, methods, and materials developed by CRMP, through their progressive activities and demands for technical assistance from LGUs.

#### **MASBATE: POLITICAL WILL IN ACTION**

Masbate, one of the six provinces of the Bicol Region, lies exactly in the center of the Philippine archipelago. It has 39 islands and islets, an aggregate coastline of 968 km, and jurisdiction over about 10,000 km<sup>2</sup> of municipal marine waters. Its 20 municipalities and one city all border the coast.

Surrounded by the major fishing grounds of Masbate Pass, Asid Gulf, Samar Sea, Sibuyan Sea, Ticao Pass, Burias Pass and Visayan Sea (PPDO 2001), Masbate relies heavily on fisheries, with about 67 percent of its

total population of 707,668 (NCSO 2000) directly dependent on fishing for livelihood. As in many other Philippine provinces, since 1990, Masbate-based fishers have seen a decline in catch due to destruction of corals, illegal and destructive fishing practices, and inadequate coastal law enforcement.

#### **Highlights**

In the past, coastal programs in the province were focused mainly on fishery production and conservation. The Masbate Fishery Development Program, which started in 1994, sought to improve the living condition of fishers primarily by employing sustainable technology and community-based fisheries conservation measures (CRMP 2000). This changed in 2000, when the province began implementing an expanded program covering other aspects of CRM and environmental management. With encouragement from the Governor and Vice-Governor, the provincial government allocated PhP2.2 million for its Marine Conservation and Fishery Development Program in 2000, and PhP2.5 million for its Environment Management Program for 2001. For a relatively underdeveloped province, this allocation was a major commitment. The CRM budget came from the 20 percent Economic Development Fund and is detailed in Table 3.

**Table 3. Masbate's budget allocation for CRM in 2001.**

PROVINCE OF MASBATE	
Name of Project: Environment Management Program for Year 2001	
Total Budget: PhP 2.5 million	
Source of Fund: 20 percent Economic Development Fund	
Activities	Budget (in PhP)
Development and installation of CRM monitoring and evaluation (provincial/municipal) and certification and incentive program for municipalities	500,000
Conduct of PCRA	150,000
Meetings and conferences	45,000
Post-training technical assistance and other services to municipalities: Follow-up activities related to establishment of MPA; mangrove management; fisheries management/licensing; and other CRM interventions	145,000
Reproduction of information, education, and communication materials	160,000
Trainings (MPA establishment and enforcement; coastal tourism; shoreline development; monitoring and evaluation; and MCD)	400,000
Conduct of Provincial Environment Summit	300,000
Biodiversity mapping	300,000
Purchase of diving paraphernalia	150,000
Activities to strengthen Municipal Fisheries and Aquatic Resource Management Councils	350,000
<b>Total</b>	<b>2,500,000</b>

The major achievements of Masbate are:

***Creation of provincial CRM core group***

Aware of the need to promote inter-agency collaboration, the provincial government created the provincial CRM core group composed of technical staff from the Provincial Planning and Development Office (PPDO), the provincial government's Department of Fisheries and Aquatic Resources (DFAR), *Sangguniang Panlalawigan*, Provincial Agricultural Office, Environment and Natural Resources Office (ENRO), DENR, DA-BFAR, Department of Trade and Industry, Department of Science and Technology, and Department of the Interior and Local Government.

The core group was organized primarily to promote CRM as both framework and program of development among Masbate LGUs, and coordinate all CRM-related activities being undertaken by NGAs, NGOs and LGUs in the province. As

planned, it would also serve as an interim task force responsible for delivering technical assistance in CRM to the municipal LGUs, at least until such time when the province has established a permanent office to perform this critical function.

To capacitate them as technical assistance providers, core group members were first exposed to field-level implementation of CRM during a cross-visit to Bohol and Negros Oriental, and subsequently trained in the various aspects of CRM. The growing demand for technical assistance from municipal LGUs has allowed them to hone their skills as CRM trainers and implementors, and at the same time develop into a cohesive group of technically competent CRM service providers focused on the felt needs of the coastal communities they are tasked to serve. Regular meetings among members, as well as frequent consultations with municipal LGU partners, enable the group to keep track of current issues, assess

program implementation, and come up with a consensus on targets and strategies for CRM in the province.

***Capability building***

The provincial CRM core group was the focus of CRMP assistance, but technical staff from the province's 20 municipalities and one city were also trained to help ensure that there would be "CRM champions" to push for and undertake CRM at the community level. CRMP facilitated provincial government-sponsored trainer's trainings on ICM and PCRA, mangrove management, coastal tourism and shoreline management, monitoring and evaluation, and coastal law enforcement. Core group members have, in turn, served as facilitators and resource persons at various seminars and activities at the municipal level.

***PCRA and CRM planning***

Using the Province's Fishery Development and Marine Conservation Fund with counterpart funding from the municipalities, the provincial core group has completed PCRA and CRM planning in 10 municipalities. In some municipalities, the core group is helping coordinate CRM activities being undertaken by NGOs and donor projects, such as Plan International, the World Bank-funded Community-Based Resource Management Project, and the German-funded Visayan Sea Project, among others.

The direct involvement of key provincial government staff in CRM has influenced policy-making and planning at both the provincial and municipal levels. Some core group members are also members of the Provincial Land Use Committee

(PLUC), which is now in the process of reviewing the proposed land use plans of the municipalities. Through these members' representation, the PLUC has taken steps to ensure that coastal management issues and concerns pertaining to shoreline and foreshore area management are addressed, and management strategies are integrated in the proposed plans.

With NAMRIA assistance, the core group has also taken the lead in the delineation of the municipal water boundaries of all municipalities. In 2000, the province sponsored a workshop where LGU-designated municipal representatives delineated and delimited their municipal waters using the technical guidelines prescribed by DENR Administrative Order 17-2001. Delineation is expected to be completed in 2002, when NAMRIA shall have submitted the complete technical description of Masbate's municipal waters for adoption, through a municipal or city ordinance, by the respective LGUs.

#### ***Formulation of Masbate environment code***

Masbate is only the third province in the country to formulate an environment code (after Bohol and Misamis Occidental). Inspired by the Bohol example of enacting an environment code, the province initiated in early 2000 a year-long process that resulted in the adoption of the Masbate Provincial Environment Code. The formulation process was largely participatory, with extensive public consultation and intensive analysis and legal review. The code was approved by the *Sangguniang Panlalawigan* in December 2000.

An important component of the code is the creation of the Provincial Office on Environment and Natural

Resource Management (POEM) by merging the ENRO and DFAR. The POEM's main tasks are to oversee the implementation of the code, coordinate the implementation of environmental programs, and monitor the enforcement of laws, rules and regulations on environment and natural resource management in the province. CRM is a banner program of the newly created office.

#### **Facilitation Role of CRMP**

When the Governor requested CRMP to provide assistance to Masbate, CRMP made it clear that it could only provide assistance in the form of training and materials for government and community education. The support shown by the Governor and the *Sangguniang Panlalawigan*, and the dedication and commitment of the provincial CRM core group encouraged CRMP to include Masbate as an expansion area. It was agreed that Masbate would provide all the financial and logistical support needed in the implementation of CRM programs at the provincial and municipal levels, and that CRMP would provide the technical expertise for the different phases of project implementation. CRMP's overall strategy was to develop a pool of technically competent personnel at the provincial level who would be ready and able to provide technical assistance, on demand, to the municipalities (CRMP 2000). Since 2000, CRMP has provided resource persons and facilitators to the

different trainings and seminars initiated by the provincial government. CRMP also served as lead facilitator in the formulation of the environment code.

Key to CRMP's sustainability strategy for Masbate is the establishment of a mechanism in the provincial government to ensure continued support to municipalities as they perform their CRM work. Such mechanism is lodged in the PPDO, which has a mandate to allocate resources for the implementation of the Masbate Environment Management Program out of the 20 percent Economic Development Fund, and the provincial CRM core group, which, because of its growing reputation among municipal LGUs as a



*Trust exercise: Teambuilding, Provincial Office on Environment and Natural Resources Management, Masbate.*

competent source of technical assistance in CRM, has developed into a reliable CRM service provider that sustains and reinforces itself. Eventually, as its programs and mandates become more clearly defined, the newly created POEM is expected to assume a bigger role as technical assistance provider in CRM in Masbate.

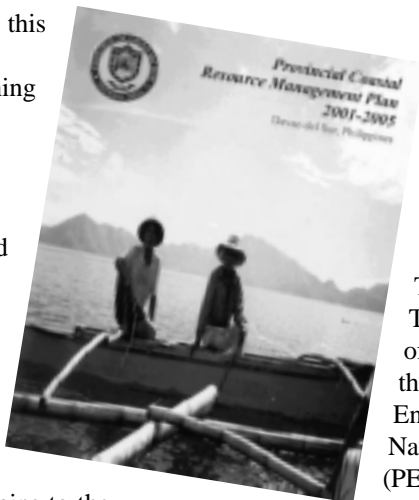


The new Davao del Sur Provincial Capitol is the home of first province-wide CRM plan in the country.

### DAVAO DEL SUR: STRENGTH IN COLLABORATION

Davao del Sur in Mindanao is bounded by Davao City on the North, Davao Gulf on the east, and Celebes Sea on the south. All of its 11 municipalities, including Digos City, border the coast. The province has a total population of 758,801 (NCSO 2000). Its coastal and marine waters cover part of the Sarangani Strait, Celebes Sea, and Davao Gulf.

Once blessed with abundant, diverse, and economically productive coastal and marine resources, Davao del Sur is now experiencing a significant decline in fisheries resulting from the degradation of its coastal resource base. The main factors causing this decline are destructive fishing practices and overfishing; pollution from domestic, agricultural, and industrial sources; and sedimentation of waterways from deforestation in the uplands that drains to the sea (Valle *et al.* 2000). These and



related socio-economic problems – increasing poverty in coastal communities, weak legal and institutional support at the LGU level, and limited community awareness and participation in CRM – as well as several new CRM initiatives in the province, encouraged Davao del Sur to plan for a more integrated approach to CRM (Provincial Government of Davao del Sur 2001).

#### Highlights

An important component of Davao del Sur's CRM approach was the strengthening of inter-agency collaboration in CRM. It includes:

#### *Creation of provincial CRM Technical Working Group*

At the onset of CRMP's intervention in the five municipalities within the Malagal Bay area, steps were taken to create a provincial CRM TWG. The provincial CRM TWG was composed of representatives from the Provincial Environment and Natural Resources Office (PENRO), Fisheries Unit under the Provincial Governor's Office, PPDO,

and CENRO-DENR, with CRMP providing technical assistance and guidance. When the Integrated Fisheries and Resource Management Council (IFARMC) was formed, its president became an active member of the TWG, and, later, the Provincial Fisheries Officer of BFAR also joined the group.

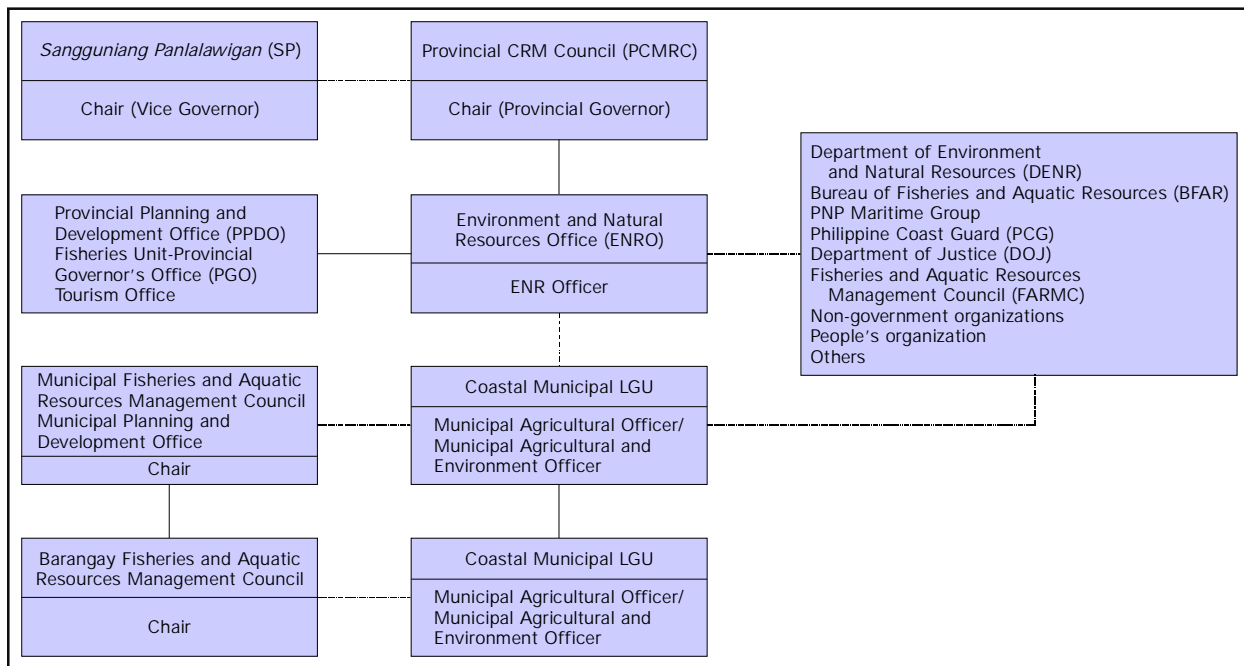
To strengthen their technical capability to implement CRM, the TWG members were trained in, among others, ICM, PCRA, and mangrove management. The provincial LGU's role in CRM is reinforced by an executive order issued by the Governor mandating the PENRO to be the lead coordinating office in the protection, conservation, rehabilitation and management of the coastal resources of Davao del Sur.

#### *PCRA and CRM planning*

With support from CRMP, the Malagal Bay area municipalities took the lead in conducting community-level PCRA activities, while the provincial CRM TWG provided technical and training assistance to the municipal TWG, both in processing PCRA results and helping facilitate CRM planning at the *barangay* and municipal levels.

#### *Monitoring and evaluation*

Part of the responsibility of the provincial CRM TWG was also to assist Digos City and the municipalities within the Malagal Bay area in the monitoring and evaluation (M&E) of program implementation. Following an orientation on the monitoring strategies and guidelines prescribed by CRMP, the provincial CRM TWG conducted municipal M&E orientations, and spearheaded provincial meetings where municipalities presented their M&E results.



**Figure 2. Inter-agency coordinating structure for Davao del Sur.**

***Formulation of CRM framework plan***

The formulation of the Five-year Provincial CRM Plan was a 10-month planning process led by the provincial ENRO, with the participation of other TWG members in numerous write-shops and consultations with the municipalities concerned. The PCRA results and the municipal CRM plans of the Malalag Bay area municipalities and Digos City served as vital inputs to the development of the provincial CRM framework plan.

***Inter-agency implementing mechanisms***

As planning progressed, it became clear to the members of the TWG that inter-agency collaboration to implement CRM at the provincial level was crucial and could produce concrete and positive results. While finalizing the provincial CRM framework plan, the group also developed a coordinating mechanism for plan implementation. This inter-agency coordinating structure (Figure 2) was eventually

included in the framework plan, in addition to the implementation structure (Figure 3).

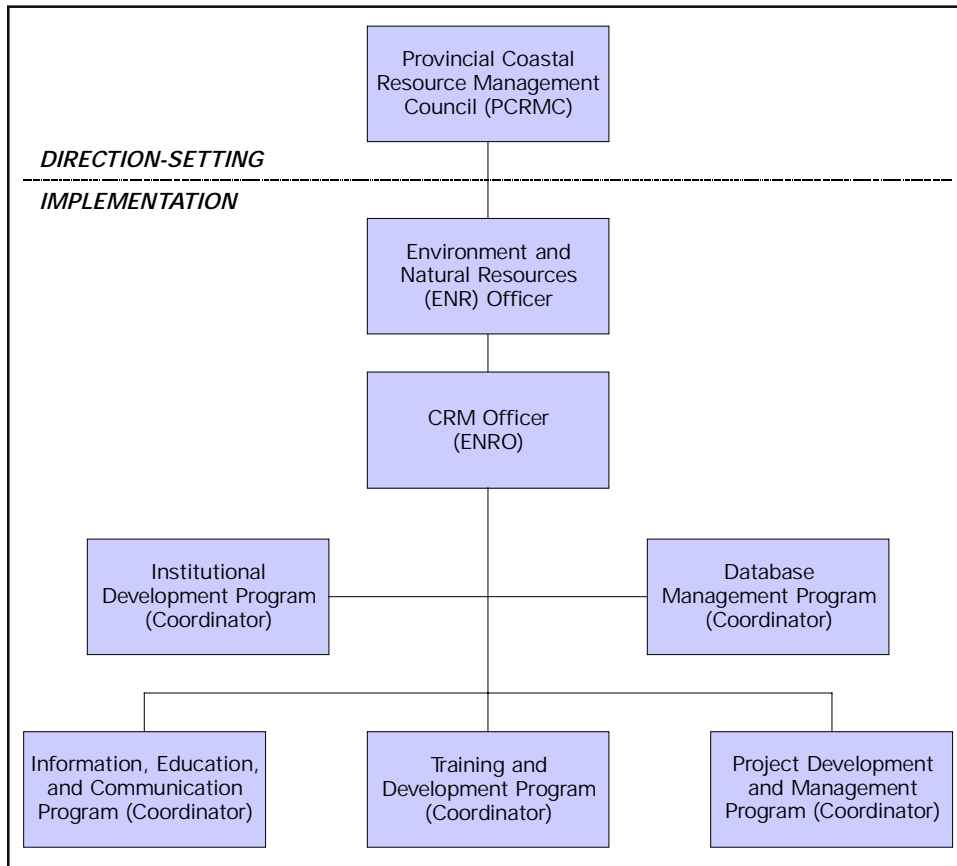
**Facilitation Role of CRMP**

The role of an external agent such as CRMP was crucial in enabling the provincial government to take the lead in forging partnerships with relevant offices within the province, NGAs, and other organizations, such as the IFARMC. To strengthen inter-agency collaboration, CRMP facilitated initial meetings, where each agency’s role and functions were clarified, and a coordinating structure that included all key players was developed. Also important in building the provincial TWG’s capability for CRM was the training and hands-on experience that members went through in providing technical assistance to the municipalities and in developing a provincial CRM framework plan. In addition to facilitation, CRMP found mentoring and guiding to be effective strategies for strengthening the TWG’s technical capabilities.

**LESSONS LEARNED**

**Bohol**

The Bohol experience highlights the importance of strengthening the legal arrangements and institutional development at the provincial level to institutionalize CRM. The legislation of the environment code clarified the policy framework and set the management direction of the province for CRM. The creation of BEMO ensures that the framework and direction of the province are translated into concrete programs. In BEMO, the province has a “one stop shop” that has systematized and standardized CRM implementation methodologies and processes, thus allowing for lessons to be drawn and shared. Although the management of municipal waters is not a direct mandate of the province, the Bohol experience shows that, by implementing the specific powers and functions delegated to the province by national laws, such as legislation and enforcement of measures that protect the environment, the province could



**Figure 3. Davao del Sur Provincial CRM implementation structure.**

provide needed technical assistance and capacitate the municipalities and cities in CRM. CRM in Bohol and its permanence at the provincial level would have not been realized had the province not installed the necessary legal and institutional arrangements with budget support.

#### **Masbate**

Effective implementation of development projects is often hindered by weak leadership and the lack of political will by local government officials. Political will is the determination and sincerity of the one in power to implement programs and enforce law. Although often misused, political will has translated into real actions in CRM for Masbate. The commitment shown by the provincial CRM core group has inspired the provincial officials to be proactive in CRM

implementation. The concept of CRM as a development strategy is new to the province, but the provincial government, driven by a pool of trainable and competent technical staff, moved quickly to enact an environment code, to allocate budget for CRM, provide technical assistance to municipalities, and to create an office, all concrete manifestations of support from the provincial leaders.

#### **Davao del Sur**

The experience of Davao del Sur points to the importance of strengthening inter-agency collaboration and coordination in ensuring effective implementation of CRM programs at the provincial level. The role of a facilitating agent (internal or external) is essential in the early stages of the group's formation. It is also important that

roles and responsibilities are clarified and the lead group or agency is identified. Jointly implementing concrete CRM activities like assisting municipalities with PCRAs, development of CRM plans, conducting training, and monitoring and evaluation, sustains the group's momentum and builds team spirit. Given its defined and implied functions relative to CRM, the provincial LGU proved to be an effective lead coordinating body of the provincial CRM TWG. A key lesson is that official support and legal mandate – which, in Davao del Sur's case, is articulated in an executive order – are needed to mainstream CRM functions and

responsibilities within the provincial structure.

#### **INSTITUTIONALIZATION**

The sustainability of CRM at the local government level cannot be attained simply by strengthening municipalities and cities – it is also necessary to capacitate provinces in providing technical assistance to municipalities and cities. To ensure sustainability of CRM at the provincial level, the following elements must be in place:

- **Good programs and policies.** These can be translated in the form of framework plans, environment codes and other ordinances. Stakeholder participation in the development of plans and formulation of policies should be encouraged to ensure a high level of support and compliance.

- **Good governance and commitment to sustainability.** This should be supported by employing and nurturing dedicated and trained technical staff, allocating increasing budget for CRM, and defining roles and responsibilities of all institutions, organizations, and individuals involved in implementing programs and policies.



*Davao del Sur Provincial Conference on CRM.*

- **Financial resources to support good programs and policies, good governance, and commitment to sustainability.** Allocating budget for personnel services, maintenance and other operating expenses, and equipment is crucial in CRM.
- **Non-financial resources such as political and community support, human resources, transparency, and good reputation are prerequisites for success.**
- **Inter-agency collaboration (provincial TWG, partnership with NGAs, NGOs, academe).** Implementing a CRM program at the provincial level requires the participation of different sectors and agencies to address a wide array of issues related to CRM, e.g., pollution, shoreline development, law enforcement,

decline in fishery resources, and more. To strengthen inter-agency collaboration, a clear coordinating structure that clarifies roles and responsibilities, and identifies a lead coordinating office should be established.

## SUPPORT MECHANISMS

### Database and Information Management

Accurate information is vital in planning and managing coastal resource use. Information on the status of habitats, fisheries, and management interventions is generated at the municipal and *barangay* levels. Most LGUs do not have the

capacity to maintain accurate databases since they lack systems for collecting and analyzing data and for managing information. Provinces can provide this important support and service.

CRMP has developed the Municipal Coastal Database (MCD), a system that simplifies and standardizes database management on CRM activities at the LGU level for planning, monitoring and evaluation. The province, through the PPDO, can serve as the consolidation node for the MCD and other environmental and natural resources management data. Data generated through the MCD can be used in developing programs to support local level implementation.

### Training and Capability Building

For the province to provide technical and training assistance to

municipalities, a pool of trainers should be formed at the provincial level. The province must allocate regular funds for personnel to build up its CRM unit. Continuous training of provincial personnel in CRM planning and implementation, data management, fisheries management, biophysical assessment and monitoring, MPA establishment and monitoring, and other aspects is essential. DENR, BFAR, other training organizations, and the academe can be tapped to provide training.

### Policy Advocacy and Reforms

The province has a responsibility in developing and promoting policies that support CRM through analysis of problems in the area, and developing guidelines for management or an environmental code. Provinces can develop framework plans that highlight the needs of CRM in the area and set the stage for required legislation to strengthen management and enforcement. Developing and promoting a unified fishery ordinance for all municipalities in the province is an example of policy reform that can translate to improved municipal fisheries management. Similarly, policy guidance on shoreline management can first evolve through provincial policy analysis.

### Monitoring and Evaluation

To serve its mandate in overseeing the operations of the municipalities and cities, the provincial government should monitor and evaluate how programs and projects are implemented, and their impacts on resources and communities. Presently, very few provinces in the country monitor and evaluate their constituent municipalities and cities' development plans and programs in a systematic manner.

M&E should be conducted annually and in a participatory manner to assess LGU performance and progress of program implementation, and review the prevailing condition in the physical, social, and political environment. Feedback is needed by the province in planning interventions to improve the LGUs' efficiency and effectiveness in the delivery of CRM as a basic service.

An M&E for CRM certification system has been developed by CRMP. This system highlights the role of the province as the lead facilitator for annual M&E of municipal and city CRM programs. In it, the province has a key role in initiating the annual M&E at the municipal or city level and in evaluating the M&E report for certification by a regional body. The system is now being piloted for the provinces of Negros Oriental, Bohol, Davao del Sur, Sarangani, and Palawan.

## FUTURE DIRECTIONS

The evolving role of the province in CRM in the Philippines holds important potential to support the functions and effectiveness of CRM at the *barangay*, municipal, and city levels. Several important trends that must be supported to encourage effective provincial contributions to CRM include:

- Test and adopt CRM certification system, and use this as incentive and basis for prioritizing allocation of funding support to municipalities seriously implementing CRM programs;
- Establish CRM databases at the provincial level that utilize the MCD as designed by CRMP;
- Institutionalize CRM through CRM offices with budget and personnel;

- Assist municipalities in delineating municipal waters; and
- Support CRM planning and implementation at the municipal and city levels by providing guidelines, policies, framework plans, unified ordinances, or other guidance that assists the local level implementation of CRM

**[The involvement of provincial governments in CRM is growing, but technical assistance will continue to be needed to build their capacity in planning and information management. Editor]**

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# Applications of Mapping to Local Coastal Resource Management in the Philippines

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## INTRODUCTION

Coastal resources in the Philippines are being severely degraded by a wide variety of human activities. Coastal resource management (CRM) is needed to rehabilitate and sustain the benefits provided by coastal resources. Accurate information and data presented in a format that is easily communicated to others are vital to improving local management of coastal resources. The use of maps is fundamental to planning and implementing sound CRM at the local level.

In the Philippines, the responsibility for managing coastal resources and municipal waters, which extend to a distance of 15 km from the shoreline (Figure 1), has been largely devolved to the local government unit (LGU) under the 1991 Local Government Code

(Republic Act 7160). This mandate was recently reinforced with the passage of the 1998 Philippine Fisheries Code (Republic Act 8550). The CRM process adapted to local government is a five-phase process (Figure 2) including: CRM plan preparation; action plan and program implementation; monitoring and evaluation; and information management, education and outreach. Many LGUs are beginning to implement CRM programs in their coastal municipalities. However, few know where their jurisdiction extends because maps delineating the municipal water boundaries have yet to be made. With the recent signing of Department of Environment and Natural Resources (DENR) Department Administrative Order 17, series 2001, Guidelines for Delineating/Delimiting Municipal Water Boundaries, coastal LGUs now have



Figure 1. Municipal waters of coastal municipalities and cities in the Philippines (unofficial map).

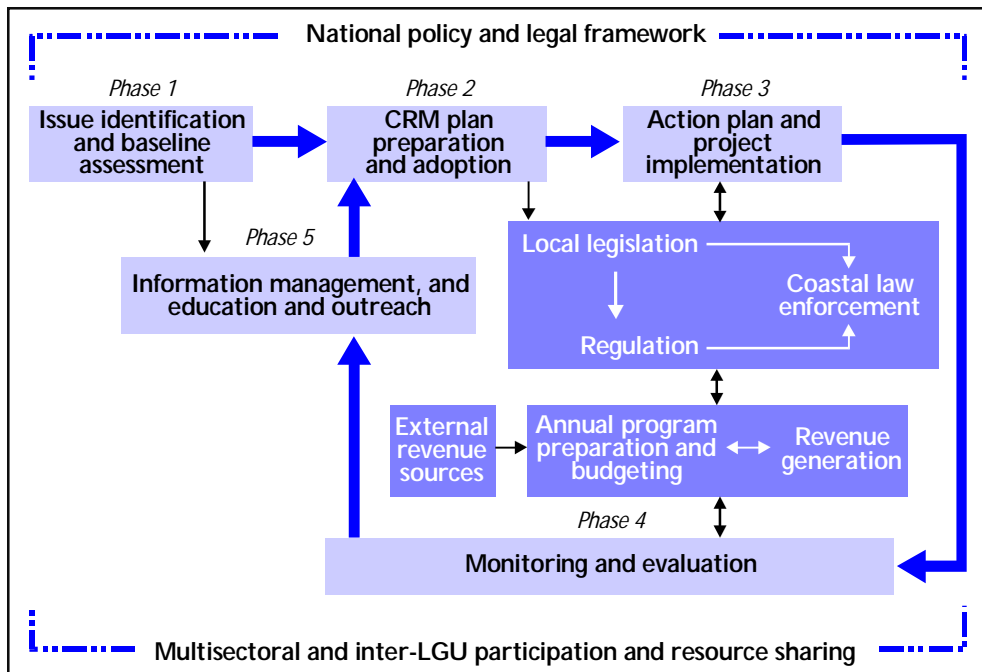


Figure 2. Five-phase CRM planning process adapted for Philippine local government.

- Municipal water use zones including sustainable use, strict protection, and rehabilitation zones;
- Marine sanctuary boundaries;
- Community-based mangrove management areas; and
- Shoreline setbacks.

The Coastal Resource Management Project (CRMP), a project of DENR, provides assistance to coastal LGUs and communities to improve the

the procedures and process to delineate their municipal waters.

### COASTAL MANAGEMENT APPLICATIONS

Maps showing spatial data such as municipal water boundaries and use zones, coastal habitats, coastal resource conditions, uses, and issues are needed to assist planners and decision-makers in the CRM process, from assessing coastal resource conditions to developing

CRM plans, policies, and ordinances. The use of relevant maps and global positioning system (GPS) also helps in the enforcement of municipal water boundaries and coastal laws.

Spatial features represented on maps that are key to CRM include:

- Municipal water boundaries;
- Area of coastal habitat;

management of coastal resources and municipal waters. CRMP assists coastal municipalities and communities map coastal habitats, resource uses, and issues through participatory coastal resource assessment. These data are used to develop a municipal CRM plan that articulates the needed strategies and actions to sustain or rehabilitate coastal resources.



Participatory coastal resource assessment and mapping conducted by municipal government staff and community members.

### Municipal Water Boundary Maps

Delineating municipal water boundaries provides spatial data that LGUs need to determine, as shown in Figure 3:

- Area of jurisdiction of the municipality;
- Area where only municipal fishers using boats 3 tons or less are allowed to fish; and
- Availability of an area between 10.1 to 15 km from the shoreline where small and medium scale commercial fishers may be allowed to fish after meeting specific requirements articulated in RA 8550.

### Coastal Resource Assessment Maps

Coastal resource assessment provides spatial information that the

LGU needs to develop a CRM plan. Coastal resource assessment maps such as those shown in Figures 4, 5 and 6 provide information on:

- Area and condition of coastal habitats;
- Location of coastal resource uses and issues; and
- Location of fisheries spawning grounds.

### Municipal Water Use Zone Maps

Municipal water use zones define the types and area of human activity that are permitted in particular zones of municipal waters, thus enabling the LGU to legislate and regulate the use of coastal resources. Municipal water use zone maps, as shown in Figure 7, provide information on:

- Sustainable use zones;
- Strict protection zones, e.g. marine protected areas;
- Rehabilitation zones; and
- Navigation lanes.

### Storing and Analyzing Spatial Information

The use of geographic information system (GIS) in mapping enables the analysis of other parameters such as the area of municipal waters and other coastal habitats that can be computed for management purposes. For instance, analysis of the land-to-municipal-water ratio of coastal municipalities from three provinces in Region 7 (Table 1) provides an estimate of the areal magnitude of responsibility of the local government in managing municipal waters. For a small island

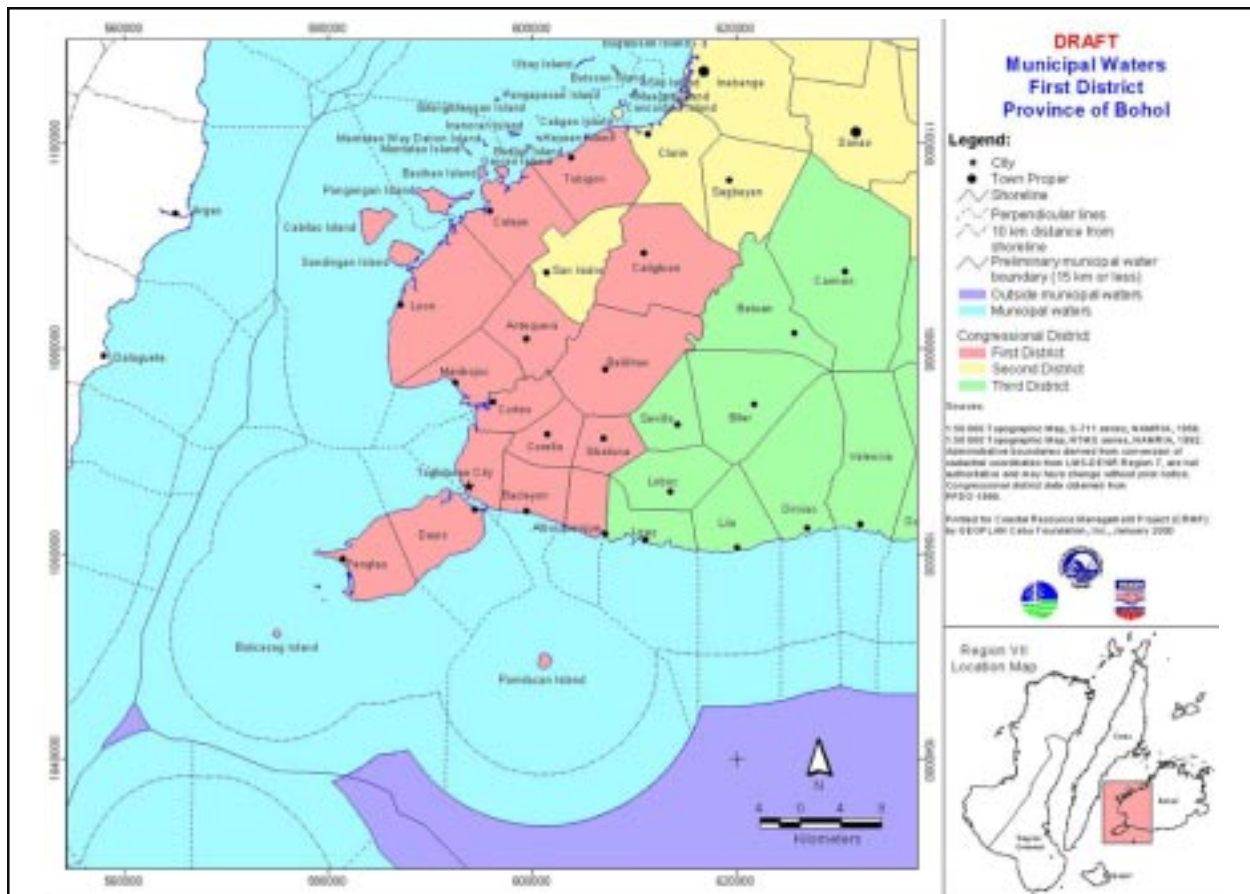


Figure 3. Map showing unofficial boundaries of municipal waters for Tagbilaran City and some municipalities in Bohol.

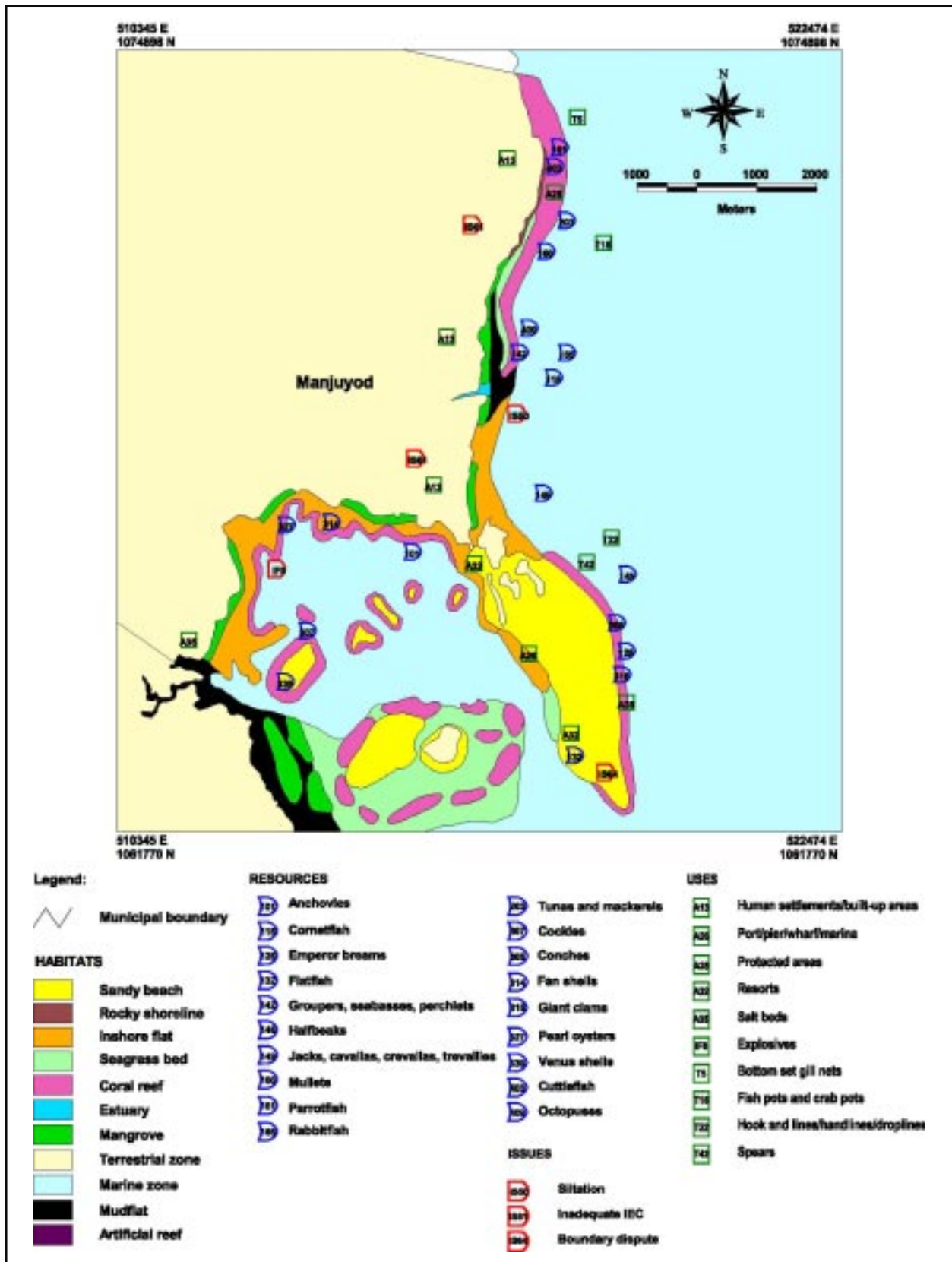
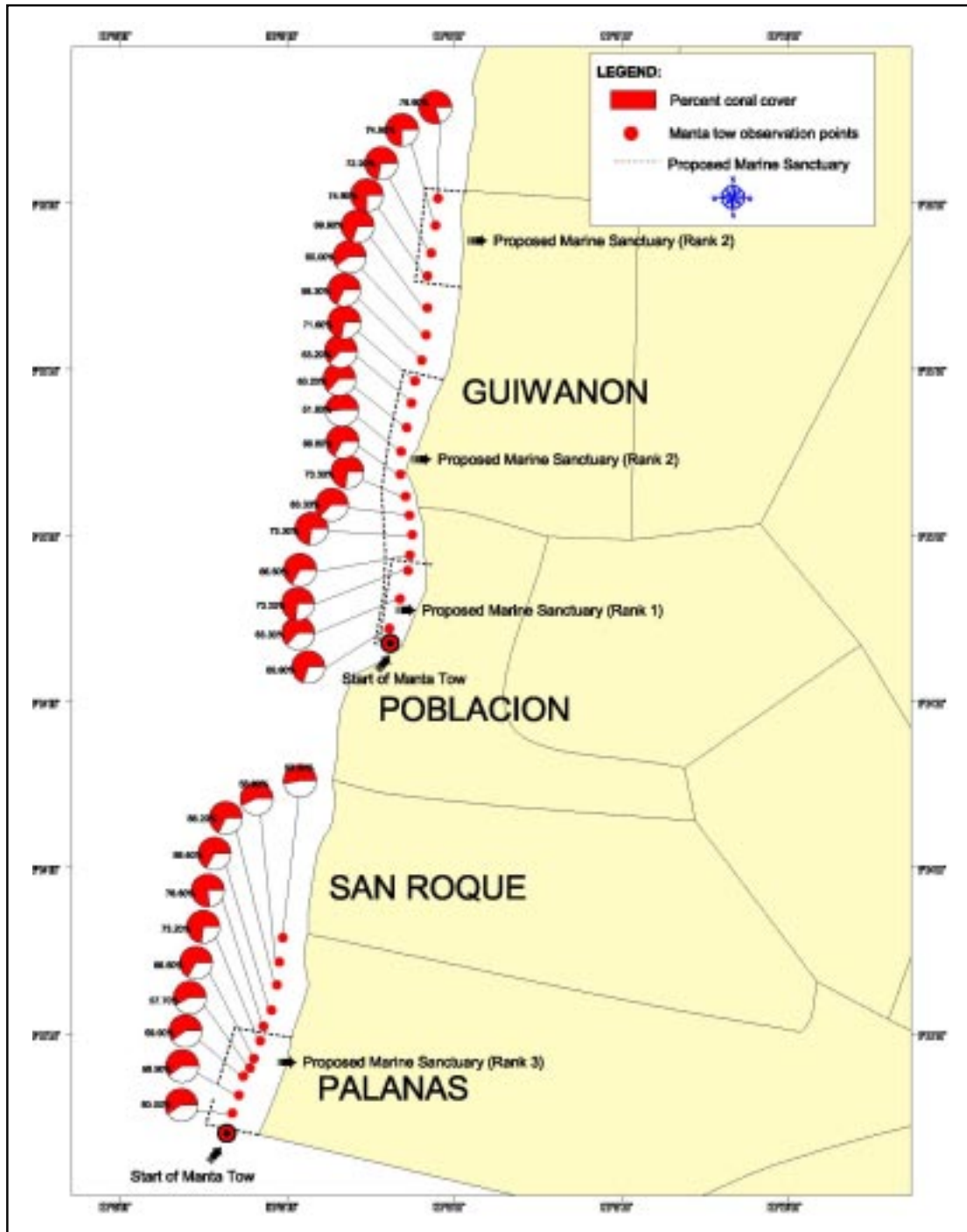


Figure 4. Coastal resource management map developed through a participatory process involving coastal communities, local government units, and other partners.

**Table 1. Comparison of municipal water area and land area for coastal municipalities of 3 provinces.**

Province	Coastal Municipalities			Shoreline Length
	Municipal water area (km <sup>2</sup> )	Municipal land area (km <sup>2</sup> )	Water:land ratio	
Siquijor	1,715	318	5.4	102
Bohol	6,427	2,329	2.8	642
Negros Oriental	3,260	4,336	0.8	369



**Figure 5. Map showing percent living coral cover determined from manta tow surveys conducted in Barangays Palanas, Poblacion and Guiwanon, Municipality of Ginatilan, Cebu by coastal residents and local government staff.**

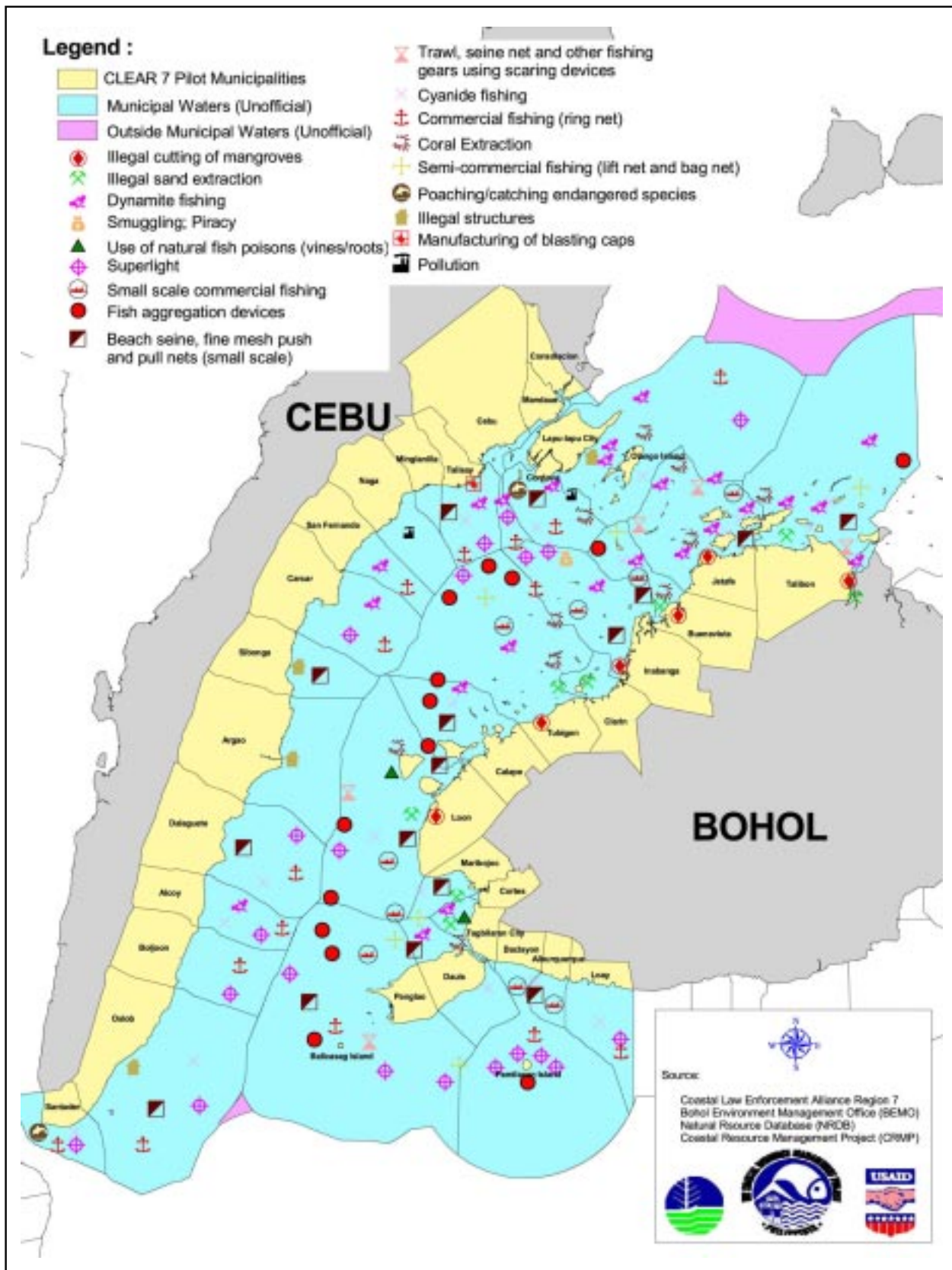


Figure 6. Coastal law enforcement issues identified through multisectoral forums with law enforcement agencies, Bureau of Fisheries and Aquatic Resources, NGOs, and *Bantay Dagat*.

province such as Siquijor, the area covered by municipal waters is 5 times the land area of the coastal municipalities. For Bohol, the water-to-land ratio is 2.8, whereas, for Negros Oriental, the land area is only slightly greater than the municipal water area. The Fisheries Code calls for 15 percent of the available area of municipal waters to be designated as fish sanctuaries. Areal extent can be determined by analyzing spatial data stored in a GIS.

### Using Maps as an Information, Education, and Communication Tool

Maps serve as an important information, education and communication (IEC) tool for communicating the results of coastal

resource assessment and planned interventions to coastal stakeholders. Maps developed and distributed by the local government to coastal communities and commercial fishers can be used to explain policies and laws aimed at improving the condition of fisheries and coastal habitats.

### CONCLUSIONS

Maps provide vital spatial data in a form that can easily be used by planners and decision-makers in CRM. While LGUs, being closest to the day-to-day problems, will have the unique insight and incentive to implement sound practices in CRM, they also represent the coastal environment's last safety net.

Increased capacity, technology, and leadership are needed to manage the coastal resource base that supports economic development in coastal areas. Management of spatial information and mapping can serve as a catalyst for coastal management initiatives.

**[As pointed out in the lead article on the role of provinces in CRM, mapping is becoming a key function of provincial environment offices. This is a service essential to good CRM at the municipal and community levels. Note also that maps in this article showing municipal water boundaries are unofficial. Editor]**

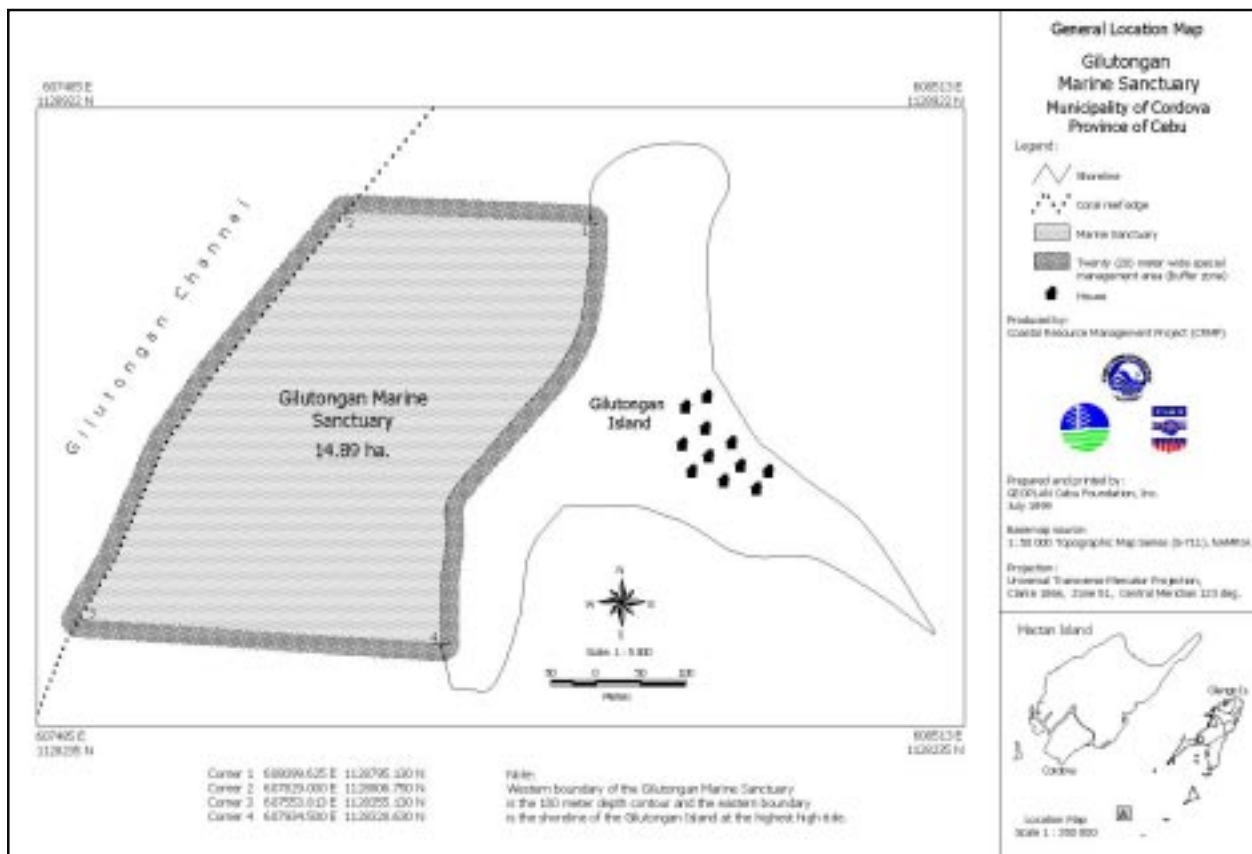


Figure 7. Map showing area and geographic coordinates of a marine protected area in Cordova, Cebu.

# Olango Birds and Seascape Tour: A People-oriented Ecotourism Venture



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## INTRODUCTION

The Olango Birds and Seascape Tour (OBST) is an ecotourism business venture in the island of Olango, Cebu Province, Philippines. Residents of Suba, a fishing village in Olango Island, own and operate it. The business successfully integrates the elements of full community benefit and participation, contribution to environmental conservation and education, product differentiation and marketability, economic viability, and promotion of local culture.



*Olango migratory and resident birds.*

OBST started in March 1998 and was made possible through the Coastal Resource Management Project (CRMP). The goals of the project were to:

1. Develop environment-friendly livelihood alternatives for resident fishers;
2. Model sustainable tourism development in islands as a strategy for improving coastal management by local stakeholders; and
3. Promote local cooperation in the conservation of natural protected areas.

## UNIQUE PROJECT ATTRIBUTES

1. *The ecotourism venture is built around the unique environmental attributes and serene beauty of Olango Island's coast, seas, reefs, and bird life.* Bird watching, coastal trekking, canoe paddling, snorkeling, swimming, visiting seaweed farms, and island hopping are among the low-impact recreational activities offered.
2. *The tour promotes and showcases local conservation of threatened coastal habitats and marine and bird life.* Tourists can snorkel and witness the abundance of fish in a protected coral reef that has been declared by the local government, and is managed by the community, as a marine sanctuary. Community members help monitor the reef, and boat and dive operators pay user fees and observe user guidelines. Such local efforts pay off in terms of better regulation of human activities, generation of tourism revenues, and improved regeneration of marine life.
3. *The project showcases the potential, viability, and benefits of full community participation in the ownership and operation of ecotourism ventures.* By actively managing the protected area, the community has gained substantial economic benefits, a growing sense of pride in their achievements and the technical skills they have acquired, and confidence in their ability to provide a better future for themselves and their children.



Cooking, craft, and fishing demonstrations help promote local culture.

## EVOLUTION

Olango Island is located about 4 km from the east coast of Mactan Island in Lapu-Lapu City, Cebu Province, the second largest tourist area in the Philippines. Mactan has an international airport, five-star resorts, and numerous tourism businesses. Olango's proximity to Mactan and mainland Cebu adds to the island's potential as a coastal tourism destination.

Mainland Olango's flat and elongated dry land measures about 1,000 ha. The intertidal wetland, known as the Olango Island Wildlife Sanctuary (OIWS), extends the island further south by 904 ha. The OIWS is the first area in the Philippines to be declared as a RAMSAR site, a recognition of its international importance as a wetland for birds belonging to the East Asia Migratory Flyway. An extensive, submerged reef that connects the island to six other islets in the south also surrounds Olango. One of these islets is Gilutongan Island, which harbors a protected reef that serves as a strategic spawning ground for marine organisms, and an increasingly popular destination for diving, snorkeling, and swimming.

Olango has around 23,000 residents, 75 percent of whom are dependent on fishing and related

activities such as harvesting of shells, starfish, sea cucumbers, sea urchins, tropical aquarium fish, live food fish, corals, mangroves, and others. Olango's fisheries have declined considerably due to overfishing and the destruction of coastal habitats by cyanide and dynamite fishing, transformation of wetlands in reclamation, and coastal pollution. Declining resources, high population density, and insufficient basic service delivery all contribute to the low income, low education, and low occupational mobility of fishing families in Olango. Early initiatives in coastal tourism development have marginalized the community in terms of participation in decision-making and benefit-sharing.

CRMP saw in Olango the challenge as well as the opportunity to assist the community and key public and private stakeholders in the island by introducing sustainable tourism and participatory development.

OBST went through the following stages of development prior to commercialization in 2000:

**Stage 1. Assessment.** A rapid survey of Olango's resources determined product options for enterprise development, including ecotourism products that had low environmental

impact, marketability, and community benefit.

**Stage 2. Participatory ecotour product development.** Meetings and workshops were conducted with community members interested in the project to orient them on the nature of and potential benefits, constraints, and problems related to tourism and ecotourism development.

**Stage 3. Development of linkages.** Linkages were established with public institutions and tour companies for marketing, policy, program, and promotional support.

**Stage 4. Capability building.** Community capacity was strengthened in tour operations and business development.

**Stage 5. Transfer of business administration to community.** Two years after the project started, the community assumed full control of the administration of tour operations and formalized collective ownership of the business.

## KEY STRATEGIES FOR SUCCESS

**Sociocultural strategies** consisted of: (a) orientation of the product around the use of local skills, everyday activities, local crafts/arts and music; (b) community ownership of the tour product; (c) participatory processes and mechanisms; (d) implementation of a training strategy of "learning by doing"; (e) delivery of immediate economic returns; (f) spreading benefits through local sourcing of services and goods; (g) CRMP support of community organization to influence planning and policy development through a high media profile, generation of multi-institutional support, and endorsements by visitors; and (h) managing the number, frequency, and behavior of visitors; community users of the natural resource; and

other development interests within the locality.

**Marketing strategies** included: (a) tapping the development sector as the primary market to jumpstart and test-run the tour; (b) developing a tour product to capture tourist segments from resorts and hotels in nearby Cebu City; (c) designing the tour product to capture niche markets, e.g. study tour programs, corporate incentive and training participants; (d) making the OBST different from existing tours by providing expert interpretation, interaction with coastal villages, visit to a marine sanctuary, and other nature- and culture-based activities; and (e) making the OBST the country's leading community ecotourism product.

**Environmental strategies** consisted of: (a) promotion of shoreline management among landowners, residents, and public resource managers; (b) implementation of participatory resource assessment, integrated coastal management and ecotourism planning; (c) formulation and implementation of resource use guidelines; (d) designing the tour as a low-impact itinerary; and (e) a training and accreditation system with strong emphasis on environmental consciousness and practice.

**Stakeholder strategies** were composed of: (a) a multiple stakeholder development approach and sharing of roles and resources among stakeholders; and (b) identifying areas for stakeholder involvement and support, such as policy enactment, planning and enforcement, tenurial and resource access rights, marketing and promotions, community organization

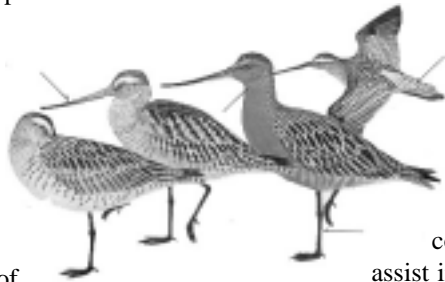
and education, and institutional linkages.

## SUSTAINABILITY STRATEGIES

During OBST's second year of operation, CRMP established marketing support and environmental management systems, and began preparations for its exit from the project.

Mechanisms were developed for booking services under co-management by the community and its partners outside the island; networking with tour operators, guides, hotels, and resorts; and building community capability in and understanding of the marketing of the product.

Primary emphasis was given to coastal resource management as a motive and tool for sustainability.



A proposal was presented to the government agency in charge of managing OIWS, seeking to deputize the cooperative to assist in protection, rehabilitation, and research activities at the sanctuary. CRMP saw that the long-term sustainability of the OBST depended on its integration into OIWS's comprehensive management plan, enforcement of environmental laws outside the sanctuary boundaries, and harmonization of land use practices in adjacent villages.

CRMP phased out from providing technical assistance to the community ecotourism project in December 2000, allowing the community and local institutions to begin to manage the enterprise on their own. CRMP then monitored the project for a brief period before fully leaving its management to the community, and sharing its lessons with a broader audience.

## HIGHLIGHTS

Highlights of the project include:

- Environment initiatives were the foundation upon which OBST was established and flourished.
- Product development and differentiation for OBST were achieved by designing the product around unique environmental themes and experiential activities based on the values of and initiatives in marine and bird life conservation by communities.
- Local perspective on and plans for the long-term sustainability of the community ecotourism business were integrated with strategic management of the natural environments that comprised the tourism attractions.
- The volume of tourists to OBST increased by 30 percent in 2000. Sales volume is projected to increase even more dramatically by 70 percent in 2001.
- OBST's environment initiatives consisted of: integrated coastal management planning and development in Olango and adjacent islands, environmental education of communities and tourists, formulation and enforcement of visitor management and ecotour operation guidelines, ecological destination management framework plan for the OIWS, local legislation and establishment of a local marine sanctuary, implementation of user fees in protected areas, training of community in environmental laws, best practices, and promotion of environmental support from the tourism industry and the public.



# Water Bodies Big and Small Have Their Limits: The Case of Siyt Bay, Negros Oriental

[This article is an excerpt from a study conducted by staff of Silliman University Marine Laboratory (SUML) with inputs from the Center of Excellence in Coastal Resource Management, Ting Matiao Foundation, the Environment and Resource Management Division of Negros Oriental, and students and faculty of the Silliman University Biology and Chemistry Departments with financial support from the Coastal Resource Management Project (CRMP) under the auspices of the United States Agency for International Development. The complete report, edited by Dr. Hilconida P. Calumpong, Director of SUML, is available from CRMP and SUML.]



Siyt Bay, Siaton, Negros Oriental.

## BACKGROUND

Siyt (Siit) Bay is a 52-ha bay located 48 km south of Dumaguete City, Negros Oriental, Philippines at about 9°04' 13"N latitude, 123°09' 00"E longitude. On the northern side is a diverse fringing

mangrove forest, on the southern side is a coral reef, and on the eastern and western sides are seagrass beds. The bay opens into Mindanao Sea. The major substrate is sand in the fringes and mud in the middle. Five fish cages are located in the middle of the bay. The fishing communities are located on the northern tip (Lutuban) and western part (Siit-Baybay).

The bottom profile of the bay is quite homogeneous. The nearshore area in the eastern part is an intertidal that extends flat to 150 m from the shore at depths of 0.5 to 2.5 m and gradually slopes thereafter. The western side is a short flat intertidal extending to 80 m from the shore at a depth of 0.5 to 1 m, followed by a deep channel that breaks the shallow western and eastern sides of the bay.

In 1997, fish cages culturing milkfish (*bangus*, *Chanos chanos*) were established in Siyt Bay. Recently, there have been reports of algal bloom and sediment accumulation in the bay.

## THE STUDY

The Silliman University Marine Laboratory (SUML) conducted a study sponsored by the Coastal Resource Management Project to determine whether these fish cages exceeded the carrying capacity of the bay, thereby causing pollution.

Using standard oceanographic and chemical procedures, the study determined water quality and sediment parameters. It also investigated the floral and faunal composition and diversity of the bay; the socioeconomic level of fisherfolk in the area; the fish catch; and the fish cage operations.

The five fish cages operating in the bay employed 51 persons. Each of the four cages had a mean of 14.25 subcages and were owned and operated by four different operators. A subcage had a mean area of 6 x 8 m and depth of 7.62 m, enclosing an average of 346.14 m<sup>3</sup> of seawater. The fish cages occupied 2,580 m<sup>2</sup> or 53 percent of the total bay area but enclosed a total of 19,498.30 m<sup>3</sup> of seawater. They were of the floating type, culturing milkfish, and using the intensive, high-density culture system.

Stocking density was 23-47 individuals per m<sup>3</sup>. Milkfish was often reared starting at an average body weight (ABW) of 20-50 g, and harvested at an ABW of 200-450 g, usually after 4-6 months of culture. Except for one cage, which had a longer culture period (365 days), fish cages were usually harvested twice a year. The average survival rate was 85 percent.



*Milkfish cages, Salvino Corp., Siyt Bay, Siaton, Negros Oriental.*

T. Parras

Feeding was regular in the form of manufactured feeds. Feed ration was usually given 3-4 times per day at 5 percent of the biomass. Daily feed ration ranged from 62.62 to 7,361.44 kg of artificial feeds per unit of floating fish culture device. On the average, each unit of floating fish cage (=14.25 cages/unit) needed at least 751.56 MT of artificial feeds in order to produce 105.48 MT of milkfish per cropping.

## RESULTS

### Water Quality Parameters

Based on the values above, the mean food conversion ratio (FCR) value of the floating fish cages would be  $4.95 \pm 2.41$ . This is way above the accepted FCR value (1-2.5) in aquaculture, indicating higher food losses, which usually accumulated in the sediment. Results of nutrient analysis of the sediment confirmed this. Available nitrates and phosphates inside the bay were higher compared to those found outside.

Nutrient and organic waste, in dissolved and particulate forms, generated from uneaten food and

excreta generally resulted in increased suspended solids (SS) and biological oxygen demand (BOD) and decreased dissolved oxygen (DO). Results of water quality investigation show that water transparency was poor in the river mouth and fish cage stations.

Surface DO and BOD values obtained were within the standards set by the Department of Environment and Natural Resources (DENR); water nutrient values (nitrates and phosphates) were low.

Since aquaculture operations invariably result in the release of metabolic waste products (feces, pseudo-feces, and excreta) and uneaten food into the aquatic environment, they have the potential to cause nutrient enrichment, possibly followed by eutrophication. Organic enrichment of the benthic ecosystem may result in increased oxygen consumption by the sediment and formation of anoxic sediments, with, in extreme cases, outgassing of carbon dioxide, methane, and hydrogen sulfide;



Milkfish or bangus, Salvino Corp. fish cages, Siyt Bay, Siaton, Negros Oriental.

enhanced remineralization of organic nitrogen; and reduction in macrofauna biomass, abundance, and species composition.

Anaerobic conditions were prominent in samples collected near fish cages, which exhibited a noxious odor (hydrogen sulfide).

### Sediment Parameters

Sediment pH values obtained from the river mouth and the fish cage were very high (12.46 and 10.66, respectively). Very high (alkaline) pH and negative redox potential are indicators of anoxic condition. Waste loading was exacerbated by the slow underwater current. Salinity reading was highest in the opening of the bay (38 ppt) and lowest in the mouth of the river (30 ppt).

Enclosed and narrow bays such as Siyt Bay are expected to exhibit relatively very slow underwater current readings, implying that the turnover rate of the water in the bay is also rather slow. With a slow water turnover rate, the tendency for the bay to accumulate silt is high. Though a river exits into the bay, it does not

have enough flow or pressure to influence the current brought about by the tidal fluxes. The river, in fact, also contributes to the siltation of the bay.

Because of the small size of the bay (52 ha) and the slow current speed, which encourages waste loading in the area, the present aquaculture practice can lead to an eventual degradation of the bay and the promise of intensification and expansion for a very lucrative enterprise may come to naught.

Already, all stations covered in the study yielded positive results for human and animal coliform, *Escherichia coli* and *Salmonella typhimurium*, with highest coliform contamination around the fish cages. This can be attributed to the 51 workers employed in the fish cage operation, who live at the fish cage site in huts without toilet facilities.

The area falls within the DENR standards of Class SB using *E. coli* as a fecal coliform indicator and Class SC using *S. typhimurium* and *E. coli* as total coliform indicators. Class SB

waters are Recreational Water Class I safe for bathing and swimming and Fishery Water Class I suitable as spawning ground for milkfish and other species. Class SC waters are Recreational Water Class II for boating and Fishery Water Class II for commercial and sustenance fishing.

### Floral and Faunal Composition and Diversity

The bay is very diverse. It has an undisturbed mangrove forest of 16 species fringing its shores, dominated by three viviparous species, which indicate a system of high regenerative potential. Its 6-ha seagrass bed with five species of seagrass, dominated by *Enhalus acoroides*, and about 29 species of algae, is productive, with 36 species of finfish from 28 families, one species of mollusk, and one species of crustacean collected using beach seine in two settings. Species richness ranged from 4.07 to 5.57. Catch per unit effort was 0.40-2 kg/man-hour.

The bay has a fair reef with 34.4 percent hard coral cover composed of 78 species of hard corals and six soft coral genera/species. The most abundant were the branching corals, with Acroporids having the highest relative cover in the deep and the non-Acropora species (*Porites* and *Montipora*) predominating the shallow areas. These species are common species in protected turbid waters and in sandy floors. Fish biomass in the reef was very low. Using the set gill net, only five species of finfish from five families were collected in two settings.

Meiofauna, particularly polychaetes, which are used as

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indicators of pollution-related disturbances in estuarine and neritic waters, showed population differences among stations. The designated control site (near the mouth of the bay) had the highest number of species (39 species) and individuals, while those from around the fish cages had 5-7 species. Results are consistent with benthic infaunal community changes generated by mariculture activities: there is often a zone of low species richness with high infaunal density of opportunistic species near the perimeter of the culture site, and a decline of population densities.

The composition of plankton for both inside and outside the bay did not vary greatly. This may be due to the effect of the tidal cycle in the bay, which would allow mixing of water from inside the bay with the water from outside.

### Socioeconomic Aspects

Twenty respondents were surveyed (14 from Siit-Baybay and 6 from Lutuban area). Fifteen percent of the respondents were fishers; 4 percent cage workers; 3 percent farmers; 9 percent domestic helpers; 3 percent construction workers; beautician and factory workers, and 7 percent without income. The rest were housewives. Fifty-five percent owned a farm, mostly planted to corn.

Their average annual income was only PhP12,000 but their expenses averaged PhP31,000 per year, mostly on food, household needs, education, livelihood such as fishing and farming needs and also medicine.

There was no land vehicle in the area. Eighty percent of the fishers owned *bancas*, and 50

percent owned more than one boat.

The average number of fishing years was 25. Twenty-five percent of the fishers had been fishing 1-10 years.

Siyt Bay was the most common fishing ground; 50 percent fished in other areas during unfavorable weather in Siyt Bay. Fishers spent an average of 11 hours in the sea.

Forty-five percent said that there was no more illegal fishing in the area. Forty percent said the number one illegal fishing method was the use of compressor.

### Fish Catch

The gear with the most catch was gill net (*pokot*), while small hook-and-line caught the most species.

### Fish Cage Operations

According to 75 percent of the respondents, before the fish cages started to operate, the bay was so productive that they did not need to go outside to fish. Twelve percent noted a decline in fish catch since the fish cages first operated in 1997.

Thirty-five percent said the fish cages competed with their livelihood, pointing to a conflict of resource allocation in the bay; 65 percent said their livelihood could not generate enough income to improve their living condition; and 45 percent said the problem is the pressure from the fish cages and decreased catch.

### STABILIZING THE BAY'S CONDITIONS

The following recommendations are made to stabilize the conditions of the bay:

- 1) No expansion of existing units nor addition of new units;
- 2) Close monitoring of stocking density and feed input to attain optimum food conversion ratio;
- 3) Regular monitoring of environmental parameters, such as (a) location, number, and area of fish cages; (b) stocking density; (c) redox; (d) organic matter level in the sediment; and (e) dissolved oxygen, by the local government unit, Bureau of Fisheries and Aquatic Resources, and the Environment and Natural Resource Management Division of Negros Oriental. Recommended frequency of monitoring is 2 times per cropping;
- 4) An environment bond of PhP20 per m<sup>2</sup> of fish cage, including its buffer zone, to be collected yearly by the local government unit from the fish cage operators upon renewal of permit; and
- 5) A zoning scheme, which is part of a coastal management plan, so as to prevent disruption of fishing activities and the sustenance fisherfolk, preserve the existing ecosystems, and have a regeneration area (marine sanctuary).

**[There are numerous semi-enclosed marine bays in the Philippines that warrant monitoring to determine water quality in relation to the bay's carrying capacity for fish cages and other uses. Editor]**



# Power Politics or Rational Resource Management: Fish Corrals Versus Trammel Nets in Danao Bay

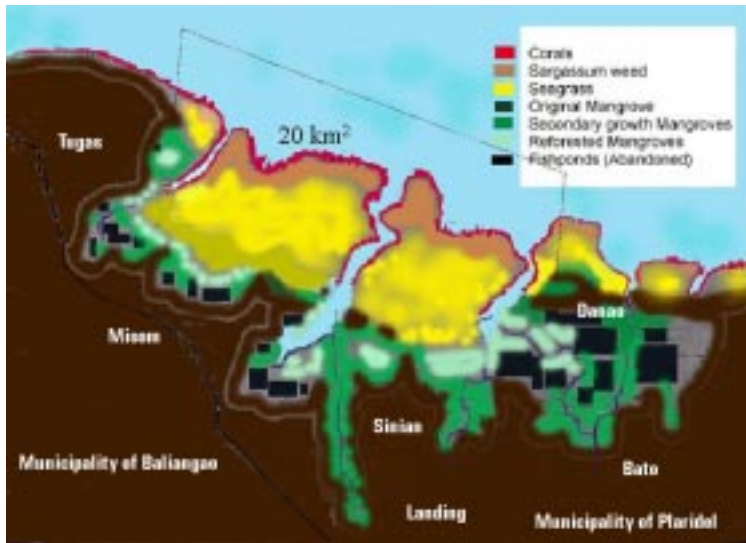
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**Figure 1. The ecosystems in Danao Bay, existing sanctuary and political boundaries and proposed exclusive use zone or special fisheries demarcated area.**

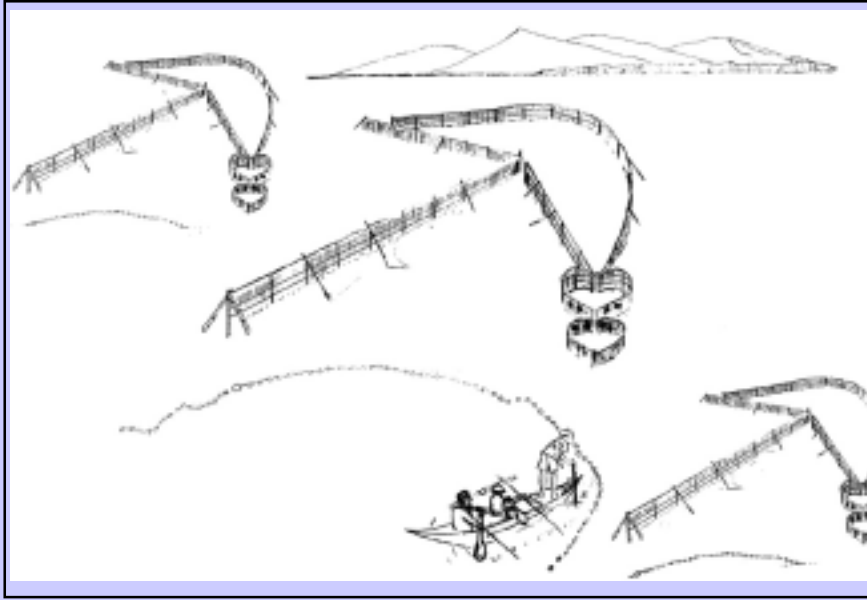
## DANA O BAY AND ITS RESOURCE BASE

Danao Bay is a small bay on the northern shores of Mindanao shared by two municipalities: Baliangao and Plaridel in Misamis Occidental (Figure 1). With 300 ha of mangroves, 1,200 ha of seagrass fields, and 120 ha of

protective coral reefs, it is a potentially rich source of food and income for the surrounding population.

A little more than 1,000 people from 600 households use the bay for part of their livelihood. There are 82 fish corrals placed in the bay and 96 fishers reported to be using trammel nets (Figure 2) during the time of the Danao Bay resource users survey in 1998. Trammel net and fish corral users are vastly outnumbered by reef gleaners (446), hook and line fishers (144), and other gear users (338).

Fish corrals abound in Danao Bay. They are mostly placed on reef flats in waters up to 1-m deep at low tide. A fish corral is a passive, trap type, gear with catching chambers measuring 60 m<sup>2</sup> or more. Fishers prefer sandy and muddy substrates on which to place the wooden or bamboo stakes, which hold the nylon net. The traps are placed right at the edges of mangroves, on mudflats and in seagrass meadows up to the reef crest. Some fish corral owners have a historic claim over the area where they place their trap. This claim is respected by other operators of this gear. Prime areas are those where the rabbitfish (*danggit*) pass during their spawning run in April. Fish corrals have been used in the bay since the 1940s. Between 1980 and 1997, the number of traps in the bay increased from 50 to 82. The traps are operated by a single operator, who is most of the time a part-time fisher-farmer.



**Figure 2. Trammel nets (front) and fish corrals competing over the few remaining fish in Danao Bay.**

Trammel nets are nets with several layers of netting. In Danao Bay, three layers are used—a central layer with a 3-cm mesh size and two outer layers with 5-cm mesh-size netting. Lengths of nets range from 150 to 1,000 m. Nets are placed near the edge of the mangroves, on the seagrass areas, or on the reef. Fish are scared into the nets by banging on the water with a stick. Generally, three people operate one net. Trammel nets were introduced in 1984 by fishers from a neighboring municipality. Most people involved in this kind of fishing are full-time fishers.

Of the 300 ha mangroves, only 20 ha can be considered as primary growth (16 species). There are more than 100 ha of reforested areas (one species) and 180 ha of secondary growth (two species). Still, mangrove cover is much better than 30 years ago when the area was almost totally logged over for charcoal making.

Seagrass areas were damaged by push nets and small seines in the posts. These gears are no longer present and the seagrass has recovered well.

The coral reefs at 2 to 40-m depth are almost all destroyed. Fishing with explosives used to be “just like planting rice,” but this has been minimized and almost totally stopped in mid-2000. No clear signs of recovery have been found yet.

In the center of the bay, the Pipuli Foundation, a nongovernment organization based in Ozamis City, in cooperation with the local government set up in 1991 a 74-ha sanctuary, which is functional up to the present.

#### **CATCH**

Ever since people started to fish, individual fish catch has been declining. The catch per fish corral is presently 1.3 kg per trap per day and the catch per 150-m trammel net per setting is 500 g. These values are less than one-third of the catch in 1985 and, in the case of the fish corral, less than 5 percent of the catch in 1950.

The feeling that there is very little fish and shells left on the reef and that this is their major problem is shared by 85 percent of the fishers and shell gleaners (Quist and Fraser 2000).

#### **THE CONFLICT**

A few years after the introduction of the trammel nets, fish corral owners started to complain about these nets fishing too close to their traps. When confronted, the trammel net owners often replied: “Our families also like to eat.” They did not recognize the right of the fish corral owners on a part of the bay outside the area physically impounded by the fish corral net. They pointed out that almost the entire bay was occupied by these traps.

The fish corral owners got together and complained to the mayor. Being the more powerful, the fish corral owners had their way. In 1987, trammel net operators agreed to stay away from the fish corrals. For some time, the agreement was enforced, but gradually the trammel nets came closer and closer again.

Some 10 years later, the story repeated itself. This time, the fish corral owners threatened not to pay their taxes for lack of catch caused by the trammel nets. Again, trammel nets were told to stay away; again, some were apprehended; and, again, after some time, trammel nets started to fish close to the fish corrals.

#### **ROLE OF THE NGO**

By 1995, the area-based staff and board of the Pipuli Foundation realized that, in order to maintain the gains of the sanctuary and to further assist the fishers in improving their relation with the resource, a more community-based approach covering the whole of Danao Bay was needed. In 1996, a community-based coastal resource management program started, with funds from OXFAM-GB and technical assistance from Netherlands Development Organization.

## Box 1. Who is catching the small ones? Comparing catch composition of fish corrals and trammel nets

In 1997, faced with intensifying conflicts between trammel net operators and fish corral operators, fishers leaders, NGO staff, and the MAO of Baliangao decided to monitor fish catch from Danao Bay to determine whether or not one or the other gear type, or both gears, were catching undersized and immature fish, as well as to monitor impacts of future management measures. The program and its findings are described below.

### *Fish corral sampling*

In January 1997, the CBCRM program of the Pipuli Foundation started a one-year sampling of 10 selected fish corrals in Danao Bay. The fish corrals were selected based on their position in the bay and the willingness of the operator to spend time assisting the researcher. All those who decided to cooperate averred that the sanctuary that Pipuli Foundation helped set up in 1991 had improved their livelihood.

Four samples were taken each month during the sampling period. To incorporate the effects of the lunar cycle on the catch (Fraser and Agudolo 1997; Heinen 1998), samples were taken one day before each new moon, one day before every first quarter moon, one day before the full moon, and one day before the last quarter moon.

Fishers were met at the beach by the researcher (JM Fraser) or his assistant. Two landing sites were monitored: one in Barangay Tugas and one in Misom. The catch was sorted by species and the local names recorded. The number of fish from each species was counted and the total group weighed. The data were recorded on a printed form and encoded into a computer. A total of 314 samples, weighing a total of 541 kg, was taken.

### *Trammel net sampling*

A special sampling of the catch of the trammel nets was undertaken in April 1997.

During a two-day period, 20 net settings were recorded. Nets were placed on the reef flat in the seagrass areas, on the river side, and on the reef slope. Fish were measured individually and weighed by species.

### *Determining what is considered undersized*

Not all small fish caught were undersized. Sardines (*malangs*) and cardinal fishes (*ibis*) of less than 7 cm were found trapped in the fish corrals, but these were not considered undersized. For monitoring purposes, the analysis focused on five genera/species that comprised a large part of the catch of both gears (see Table 1) and were known to be caught in both their juvenile and adult stages.

To determine what size was considered undersized, a few fishers were shown drawings of rabbitfish, spinefoot, and parrotfish arranged by species and size (6 to 18

**Table 1. Percentage in catch of 5 genera/species by fish corral and trammel net.**

Scientific name	English name	Local name	Percentage (in terms of weight) in catch	
			Fish corral	Trammel net
Siganidae	Rabbitfish	<i>Danggit</i>	25	31
<i>Siganus guttatus</i>	Spinefoot	<i>Kitong</i>	4	10
Scaridae	Parrotfish	<i>Mol-mol</i>	3	12
Mugilidae	Mullet	<i>Banak-banak</i>	2	4
Lethrinidae	Snapper	<i>Katambak</i>	3	3
<b>Total</b>			<b>37</b>	<b>60</b>

cm). They were asked what they considered the size of fish that could be harvested and the size of fish that should be allowed to grow some more. All fishers considered fish of less than 9 cm too small to be harvested, irrespective of the species. Half of them also considered fish of less than 11 cm too

small. Answers were often based on how saleable a fish size would be. A size of 11 cm is equivalent to around 20 g. From an economic point of view, target species fetch a higher price when they reach 15 cm or 50 g.

Based on these observations and comments, the catch monitoring data were reviewed and average weight of the five key species (rabbitfish, spinefoot, mullets, parrotfish, and snapper) in the catch were calculated by trap, day, and species. A weight-frequency distribution was made using the following categories:

- 0–20 g = undersized
- 20.1–50 g = cheap fish
- 50.1 g and bigger = good catch

### *Results*

The similarity in catch composition of both gear types was striking. Around 85 percent of the potentially valuable fish species were caught when they were still below 50 g and thus fetched a low price. Ten percent was even caught at a size when they were not even good to eat (Figure 3).

It appeared that the fish corrals were catching smaller size fish than the trammel nets, but the differences were small. To catch one fish of a valuable size, an average fish corral had to take eight potentially valuable but undersized fish out of the bay. For the trammel nets the ratio was 6 to 1.

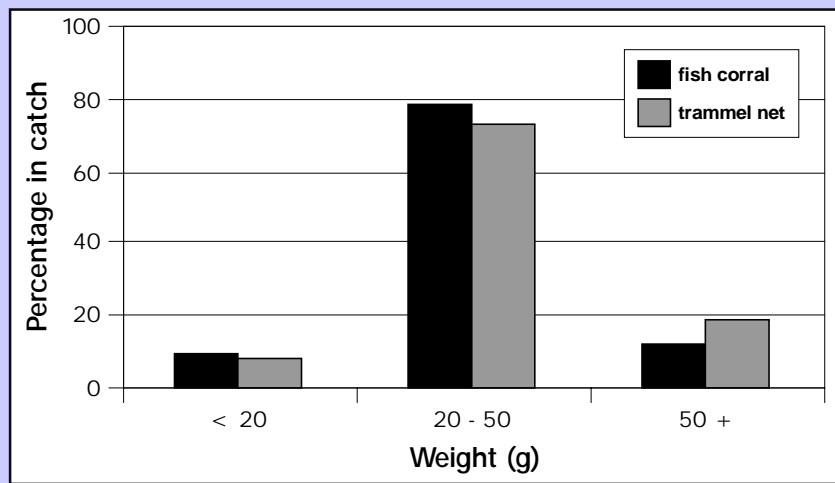


Figure 3. Weight distribution of the major fish species in 2 gear types used in Danao Bay.

The two gear types were also comparable in terms of species composition in the different size classes. Both gear types caught a significant number of parrotfish of less than 20 g. The weight group of 20-50 g consisted mostly of rabbitfish (Figure 4).

The relatively few undersized rabbitfish in the catches of both gears can be explained by the fact that most of the fish of this species were caught during the spawning runs in April and November.

The sampling year 1997 saw very little recruitment of rabbitfish in Danao Bay. Had there been a good recruitment and thus many small rabbitfish, the part of the catch of both gears consisting of undersized rabbitfish would have been even bigger.

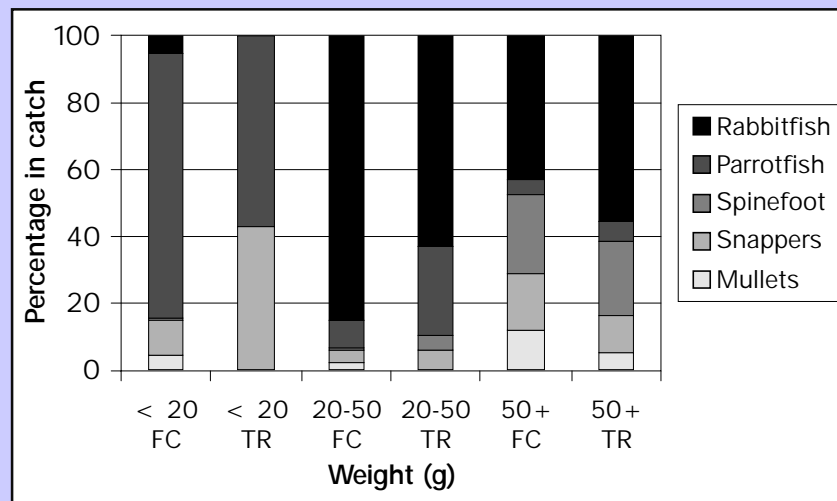


Figure 4. Species composition in catches of fish corral (FC) and trammel net (TR) in Danao Bay in different weight groups.

The program started to organize fishers around the issue of declining catches and the need for a structural change in the way the resources were managed. Seven resource management organizations (RMOs) were established along *barangay* boundaries. In Barangay Tugas, two

organizations had to be formed, because of the conflict between the users of trammel net and fish corrals, who refused to sit together in one organization. During the first year, the RMOs mainly discussed mangrove management issues and started to voluntarily replant

mangroves. Also, the RMOs chose their leaders. With these 14 leaders, the NGO started to work intensively in what turned out to be a kind of shadow management body for Danao Bay.

The group was named Danao Bay Resource Management Council

(DB-RMC) and was composed of five female reef gleaners, two hook-and-line fishers, one wife of a spear fisher, one gill net fisher, three fish corral operators, and two trammel net fishers. It was the first time that these individuals had to work together.

Focusing on bay-wide issues, the group tried to resolve conflicts on resource use. The conflicts between the trammel nets and fish corrals stood out as a primary issue, with both sides accusing each other of catching undersized and immature fish, an argument also expressed by the fish corral owners when they presented the problem to the mayor.

### ROLE OF THE RESEARCH

The group decided to investigate both sides' allegations (see related story in Box 1). They found out that both gear types were catching large numbers of immature, low value fish as by-catch.

During other study sessions, the fishers came to realize that the density of fish in the bay had plunged so low (to less than 10 percent of its maximum) that the overall production of the bay had been reduced drastically. Agreeing on these observations, the leaders included in their draft resource management plan a ban on the use of trammel nets in the bay and a 3-cm minimum mesh size for the catching chamber of the fish corral. They realized that this would entail a major sacrifice on the part of the operators, and that the only way they could defend this major sacrifice to their members was if the present resource users from Baliangao and Plaridel would be granted exclusive use rights over the bay's resources. They also figured that the fish corral operators would not agree to a management measure that would allow shrimp and small fish to swim through their nets if these would just be harvested by fishers from other

municipalities and other new resource users.

The leaders decided that the municipalities could follow the example of the Municipality of Culasi in Antique where a fishers organization was granted, through an ordinance, the exclusive use rights over part of the municipal waters (Agbayani *et al.* 2000).

### A JOINT ORDINANCE FOR DANA O BAY

In 1999, the resource management plan was translated into a draft proposed joint municipal ordinance for Danao Bay. The fishers and the NGO involved were assisted by the Municipal Agricultural Officers (MAOs) of Baliangao and Plaridel and an expert on local government and legal matters.

This draft was presented to the *Sangguniang Bayan* (SB) of both municipalities. After first reading, both councils found some provisions to be potentially controversial among the fishers, and decided to hold public hearings in the six communities around the bay. The public hearings gave the leaders the opportunity to explain the provisions and answer questions posed by those fishers that had not yet been involved in the process. Most of the fishers' questions focused on the registration of resource users and the need for their involvement in guarding the bay. Some of the SB members, five out of six *barangay* captains, and the two MAOs also actively participated in clarifying the provisions of the ordinance.

Satisfied with the results of the public hearings, the SB of Plaridel passed a resolution approving the ordinance. They urged the SB of Baliangao to sit together and sign a joint municipal ordinance for Danao Bay. As of this writing, the SB in Baliangao is still studying the

ordinance but is expected to pass the legislation within 2001.

### POWER POLITICS: A STUMBLING BLOCK

While in the process of hammering out a structural solution to the ever-recurring conflicts among the fishers, the municipal government of Baliangao succumbed to pressure from fish corral owners using power politics. The SB passed an ordinance banning the use of trammel nets in their municipal water. Since then, several of these nets have been confiscated by the police and the *Bantay Dagat* (volunteer fisher guards, assisted by a paid coordinator and organized by the NGO). There have even been some cases where violators of the ordinance and *Bantay Dagat* members threatened each other with their *bolo* (long knives). Under these pressures, many trammel net users have shifted to bottom set gill nets. At some future time, violations will probably stop completely, but new conflicts will surely emerge unless fishers, legislators, and executives shift their attention from power politics to rational resource management.

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# Mangroves: Innovative Training of Trainers for Management in Davao del Sur

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## BACKGROUND

Various studies have highlighted the importance of mangroves to fisheries and environmental protection, prompting the Philippine government to pursue programs aimed at protecting and rehabilitating the country's once extensive mangrove resources. These studies have shown:

- the direct correlation between shrimp catch and the mangrove area (Primavera 1995, 1997);
- that detritus is the main source of food for marine life in brackish water;
- that 72 percent of commercial fishes are mangrove-dependent;
- that an average mangrove stand produces 6-8 tons of litterfall (ADB 1992), which eventually turns to detritus and thus feeds marine life;
- that, for every hectare of mangrove destroyed, about 1 ton of fish/shrimp is also lost per year;
- that mangroves are teeming with marine life because of their rich nutrient, water turbidity, and the presence of prop roots, which offer protection (Kraus 1994); and



*Members of the Provincial Training Team put in a hands on planting exercise.*

- that, productive mangroves provide products and ecological services worth at least US\$600 per hectare annually (Melana *et al.* 2000).

From 1989 to 1993, the Asian Development Bank (ADB), after subsidizing mangrove destruction through a US\$22-million loan for massive, ill-advised fishpond development during the shrimp culture boom in the 1980s, bankrolled the massive mangrove

reforestation in the Philippines under the ADB Loan I contract reforestation project. The rehabilitation effort failed. Despite the huge amount (PhP11,600/ha) spent, survival rate was very low, and the program faced many technical and administrative problems. At that time, information on mangrove rehabilitation, especially on such a big scale, was scarce.

The program, however, succeeded in increasing public awareness about the importance of mangroves, so that many local government units (LGUs) were moved to allocate a budget for mangrove planting. The province of Davao del Sur is one LGU that installed mangrove rehabilitation as a flagship project. In 1990, the province embarked on a 200-ha mangrove contract reforestation project with the Department of Environment and Natural Resources (DENR) along the coast stretching from the town of Hagonoy to the municipality of Malalag. The plantation was, however, wiped out by barnacle and nematode infestation.

In 1996, Davao del Sur was chosen as one of the 6 learning areas of the Coastal Resource Management Project (CRMP). In 1999, through representation made by the CRMP Learning Area Coordinator, the province sought assistance from CRMP in developing a training program on mangrove management for its Provincial Training Team (PTT).

This came at a time when demand for training in mangrove management, spurred by increasing interest in mangrove rehabilitation among LGUs, was growing dramatically and CRMP needed to reach out to the many communities requiring training services in the fastest, cost-



*A mangrove nursery established through the assistance of the Provincial Training Team.*

effective, most strategic way. Davao del Sur's intention to create a training team corresponded with CRMP's objective to create well-trained, well-equipped provincial CRM core groups that could "echo and re-echo" its training programs.

#### **LAYING THE GROUNDWORK**

An important task of the Learning Area Coordinator was to secure the commitment and support of CRMP partner-agencies through a Memorandum of Understanding to ensure that the team would continue beyond the terms of its members' respective heads of office.

The Trainers' Training in Mangrove Management was held on 28-30 July 1999 at the Office of the Provincial Agriculturist in Digos City, the capital of Davao

del Sur. The trainees came from LGUs, the DENR, the Department of Agriculture-Bureau of Fisheries and Aquatic Resources, the academe, and nongovernment organizations.

CRMP's mangrove team designed a training program that encompassed the wide range of skills and techniques needed by the trainers and included the following seven modules: (1) Mangrove ecosystems; (2) Mangrove species identification; (3) Nursery establishment; (4) Plantation establishment and management; (5) Community-based forest management; (6) Livelihood options; and (7) Planting plan and design.

The key to the trainees' learning experience was participation in the hands-on and field exercises in a mangrove area in the town of Sta. Cruz, where they identified mangrove species, collected seeds, bagged and potted, gathered wildlings, and planted. At the end of the course on 30 July, the trainees officially formed the PTT for mangrove management.

#### **ORGANIZING THE TEAM**

Based on their background and experience, members selected one or two subjects in which to specialize, but they were also trained as resource speakers on other topics (see Table 1).

During the first year (1999), funding for the mangrove management training came from

**Table 1. The Davao del Sur provincial training team for mangrove management.**

Member	Office/Agency	Major topics	Minor topics
Pedro P. Campaño Jr. Redentor Magno Leland C. Briones	PG-ENRO DENR-CENRO DENR-CENRO	CBFM/Coastal ecosystem CBFM/CEP Mangrove identification/ Plantation establishment	Livelihood/Philippine ecosystems Philippine ecosystems Nursery establishment
Armando A. Señeres Leofer C. Alviola	PPDO PPDO	Planning and design Plantation establishment	Plantation establishment Livelihood options
Anselmo C. Alajenio Marion M. Tambilawan	PGO-FU PGO-FU	Nursery establishment Livelihood options	Livelihood options Nursery establishment
Araceli T. Exclamador Jefry S. Velasco	PGO-FU PGO-FU	Livelihood options Coastal law enforcement	Mangrove ecosystems Livelihood options
Roquelito Mancao Lucina A. Diluao	CRMP MFARMC	Coastal ecosystems Mangrove identification	Planning and design Nursery establishment

*PG-ENRO - Provincial Government Environment and Natural Resources Office; DENR-CENRO - Department of Environment and Natural Resources-Community Environment and Natural Resources Office; PGO-FU - Provincial Governor's Office-Fisheries Unit; CRMP - Coastal Resource Management Project; MFARMC - Municipal Fisheries and Aquatic Resources Management Council*

the provincial government's Environment and Natural Resources Office. Consequently, as a result of intensive lobbying by the PTT, the *Sangguniang Panlalawigan* through the Committee on Environmental Protection, allocated a budget for the training program. Before the year ended, the PTT conducted its first training in Guihing, Hagonoy, Davao del Sur, with 34 participants from the municipalities of Hagonoy, Digos, and Sta. Cruz. Most of the participants were members of the Fisheries and Aquatic Resources Management Council, LGUs, the academe, line agencies, and the private sector.

### COACHING TEAM MEMBERS

The CRMP team attended and evaluated the second training. Pointers were given on improving delivery; public speaking techniques such

as eye contact, voice modulation, and audience interaction; and use and presentation of training materials. Members were encouraged to assess the speakers' effectiveness and to offer comments and suggestions.

The exercise showed the need to improve the CRMP team's own delivery of its trainers' training program. It was realized, for instance, that training could be extended from 3 to 4 days to allow a full day to practice under the supervision of the CRMP team.

Coaching, it was learned from the participants, not only improves the trainers' skills but also boosts their capabilities as resource speakers and makes succeeding training activities both easier and rewarding.

### ACHIEVING MILESTONES

The Davao del Sur PTT has conducted 10 training sessions (see Table 2) for 436 participants at an average cost of PhP110 per person per day (compared to PhP700 in the cities and capital towns) and even helped BFAR organize a training in Davao City. From these training activities, the communities

**Table 2. Training conducted/area planted (all with nurseries).**

Location	No. of trainees	Cost (PhP)	Sponsor	Plantation area (ha)	Remarks
Guihing, Hagonoy	34	15,000	PG-ENRO	1.5	Ongoing
Ladeco, Hagonoy	40	18,000	PG-ENRO	1.0	Ongoing
Bitao, Zone IV, Sta. Cruz	35	10,500	PG-ENRO	1.0	Ongoing
Tuban, Sta. Cruz	40	12,000	PG-ENRO-Tuban	12.0	Ongoing
Zone I, Sta. Cruz	37	11,100	Sta. Cruz/MLGU	0.5	New
MVPI - Paligue, Hagonoy	43	12,900	MVPI	2.0	Ongoing
Buhangin, Malita	63	18,900	PG-ENRO/BLGU	1.5	Ongoing
Tuban, Malita	52	15,600	PG-ENRO/BLGU	0.5	Ongoing
Cogon, Digos City	45	13,500	PG-ENRO	1.5	New
Provincial Project Hagonoy	47	14,100	PG-ENRO	0.5	New
				3.5	Ongoing
				2.0	Ongoing
<b>Total</b>	<b>436</b>	<b>141,600</b>		<b>27.5</b>	

*PG-ENRO - Provincial Government-Environment Natural Resources Office; MP Coop - Multi-purpose Cooperative; MLGU - municipal local government unit; BLGU - barangay local government unit; MVPI - Malalag Ventures Plantation, Inc.*

were able to establish 12 mangrove forest nurseries and planted about 27 ha in different villages and towns in the province. The nurseries and plantations serve as “learning laboratories” for the PTT members as part of their continuing education in mangrove management. The skills and knowledge the team members learn in the supervision and management of these facilities are shared with the community through training and dissemination of information materials.

The team also conducted a planning workshop in January 2001 on mangrove rehabilitation for the Hagonoy Pilot Community-based Mangrove Management Project in Guihing, Hagonoy. The workshop, sponsored by the Provincial Government Environment and Natural Resources Office (PG-ENRO), was organized in preparation for the establishment of a nursery and plantation by the coastal villages of Hagonoy.

The Hagonoy project, with an initial budget of PhP400,000, is an offshoot of two cross-visits of technical staff of the provincial government and the mayor of Hagonoy to Banacon, Getafe, Bohol, where they toured a *bakauan* (*Rhizophora* sp.) plantation. The provincial government initiated a human resource development program designed for the PTT members (Table 3).

### CHALLENGE

After one year, the Davao del Sur PTT could count many achievements. The multisectoral composition of the PTT initially presented difficulties in coordinating the members’ schedules, but the team has since come up with a workable solution. Now, a member is

**Table 3. Skills upgrading of PTT members.**

Training/Cross-visit	No. of persons	Cost and sponsor
Cross-visit to Bohol Province	4	PhP30,000/Provincial Governor
Information, education and communication	2	DENR-SMICZMP
Top-level	3	DENR-SMICZMP
Database/ISP training	1	DENR-SMICZMP
Cross-visit to Mati (Pujada Bay), Davao Oriental	3	PhP 12,000/Provincial Governor
SCUBA diving (amateur)	2	DENR - Coastal Environment Program

*DENR-SMICZMP - Department of Environment and Natural Resources-Southern Mindanao Integrated Coastal Zone Management Project*

assigned as coordinator to ensure that a speaker for each topic is available when needed. At the community level, FARMC members and deputy fish wardens are tapped to mobilize participants from the community. A new Provincial Executive Order (No. 6) has designated the PG-ENRO as the coordinating office for the PTT.

Funding remains inadequate. It is hoped that the adoption of the Davao del Sur Provincial Coastal Resource Management Plan will mean increased funding for mangrove management in the coming years. The PTT needs financial support to meet the growing demand for training from municipal LGUs. There will be a continuing need to produce informational and training materials, recruit new members, and upgrade and update the members’ skills through continuing education and cross-visits.

PTT members can do much on their own. They must hone their skills, read technical publications about mangroves, apply what they learn through field exercises, and help in the monitoring of nurseries and plantations established by the communities.

The Davao del Sur PTT should tie up with training institutions such as the regional offices of the Agricultural Training Institute, Regional Fisheries Training Center, and the Human Resources

Development Division of the DENR, which can lend their resources and provide facilities and venues for training within the region.

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# Live Fish Trade Threatens Tourism in El Nido, Palawan

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Local investors and government officials are at odds over the entry of traders in the live food fish business, an industry that is often linked with the illegal use of sodium cyanide and destruction of coral reefs in El Nido, Palawan.

In a public hearing held on 24 February 2001, supporters of the trade insisted that they only use the environment-friendly hook-and-line method to catch groupers, but opponents said even this method would lead to overfishing in the already degraded reefs of this popular tourist destination. Around 50 supporters of Mayor Edna Lim, who granted a permit to a live fish trader in January, attended the hearing.

El Nido was proclaimed a Managed Resource Protected Area, along with neighboring Taytay municipality, in October 1998. The reserve covers 90,321 ha of forest and marine habitats that harbor endangered species such as Hawksbill turtles and the *Dugong* (sea cow).

Joselito Alisuag, chairman of the Protected Area Management Board (PAMB) that oversees the nature reserve, said that if live fish trade is allowed in El Nido, the resorts there should consider closing down in 5 to 10 years. He cited the experience of Coron town, center of the live fish trade in northern Palawan, where live coral cover dropped to zero when the industry flourished in the last decade. Many resorts in Coron now only offer wreck diving as coral reefs in the Calamianes island group have suffered much damage.

Aside from its scenic rocky isles and white sand beaches, El Nido relies on its abundant marine life to



*Sweetlips, a popular food fish now absent in many coral reefs.*

A. T. White

attract tourists. Coral bleaching, or dying out of reefs due to extremely warm waters, during the El Niño phenomenon in 1998 has already damaged much of El Nido's extensive coral reefs.

In a meeting following the public hearing, the PAMB affirmed its resolution on 25 September 2000 to ban the catching of coral-dwelling groupers locally known as *suno* and *señorita* varieties, wrasses, and ornamental fish inside the protected area. However, limited catching of green grouper, lobster, and *bangus* (milkfish) fry is allowed. Despite the restrictions, some local investors, pointing to a lack of boats and personnel, doubt the capability of local government agencies to patrol the area effectively.

Local businesswoman Romilyn Maggay de la Cruz said that allowing live fish trade without strict regulations is a mockery of the law that made El Nido a protected area.

For the past five years, the local Protected Area Office had been receiving funds from the European Union for the conservation of El Nido, but the project ended in March 2001. Last February, the PAMB was able to raise only PHP99,000 to finance its operations.

### FIVE FISH IN TWO DAYS

A live fish trader from Taytay has been making shipments using the plane of the Ten Knots resort for about a year now, but the issue became controversial only in the last few months when Ko's Aquamarine, an investor from Coron, started operating in El Nido. Last October, the company set up a storage plant in the coastal village of Corong-Corong and started catching and shipping live fish in violation of protected area regulations.

Pedro Timbancaya, local manager of Ko's Aquamarine, said that no other livelihood can give fishers a better life than the live fish trade. He said fishers can get up to PHP1,200 for every kilogram of live red grouper compared to PHP80 per kilogram for fresh (but dead) fish of the same species. The live fish are brought to expensive Chinese restaurants in Manila and abroad. In Hong Kong, they can fetch up to PHP5,000 per kg, according to PAMB Chairman Alisuag.

Spurred by the demand for luxury food fish and the prospect of quick profits, many fishers have resorted to the use of sodium cyanide to stun fish near the coral reefs, making them easier to catch. The poisonous substance kills coral reefs, creating underwater graveyards devoid of fish and other marine life. The practice has decimated reefs in many parts of Palawan where the live fish trade was introduced.

El Nido Protected Area Superintendent Loreto Rodriguez reported the violations of Ko's

Aquamarine to Alisuag, who threatened to cancel the company's accreditation for live fish trading in Coron if they continued to operate in El Nido despite lack of permits. Timbancaya explained that the company was merely training local fishers and conducting demonstrations of their techniques while waiting for their permits to be granted.

To prove that the company was not using sodium cyanide, he asked a group of live fish catchers to accompany a media group out to sea and test their hook-and-line method. The group traveled an hour by boat to reach a coral reef 20 fathoms deep, where five fishers tried to catch grouper with fish bait tied around a fist-size stone that served as a sinker.

Due to the depth of the reef, boat owner Cesar Diago said illegal fishers who use cyanide often have to use compressors that make it possible for them to breathe underwater. This is the reason many municipalities in Palawan, including El Nido, have banned compressor-aided fishing in their waters.

After an hour, the fishers managed to catch only one 250-g red grouper, which is not among the target species in the live fish trade. Diago said his catch often averages five good-size (about 1 kg each) of fish in two days of fishing. One-third of the revenues go to the boat owner while the catchers split the expenses and the remaining amount.

Normally, the fishers travel up to three hours toward the deep sea, near the oil drilling areas, to catch live fish, Diago said. He reckoned that the trade will not cause any conflict with tourism as the coral reefs in areas where their target species are found average a depth of 20-30 fathoms, beyond the range of most recreational divers. According to him, most of the coral reefs where they operate are also outside the waters of the protected area.

### THREE SACKS OF STONES A DAY

Live fish catchers bring three sacks of stones a day on average from their normal operation. Community organizer Rolando Olano of the environmental group Haribon-Palawan says that, at this rate, substantial damage is done to the reefs from the dumping of stones. Olano also questioned how fishers can sustain the trade, especially with catchers flocking to El Nido from Coron and other parts of Palawan where there is no more fish to catch.

Very few fish, most of them small size, were seen during a brief snorkel survey in a popular coral reef in El Nido over the weekend, indicating that the area is overfished. The record of shipments from the private El Nido airstrip in November 2000 alone showed that between 40 and 280 kg of live fish, mostly red groupers, are transported to Manila daily from traders in Taytay. In many coastal towns with a burgeoning live fish industry, most coral reefs no longer have target species such as groupers and wrasses.

The prospect of easy money often drives fishers to exploit nearshore areas for live fish instead of going out to deeper waters. Even then, very few live fish catchers are able to improve their lives. After earning a thousand pesos in two days, most fishers spend their earnings on drinking binges, then go back to the sea to catch more fish, Diago said. His story indicates that the live fish industry cycle breeds poverty and not prosperity.

Mayor Lim has vowed to crack down on illegal fishers, but admits that her government does not have regular patrols to protect El Nido's municipal waters. Some residents suggest the organization of fishers' cooperatives and the setting up of hatcheries so that target species do not have to be caught from the wild. One drawback is that most hatcheries breed only green grouper, which is half the price of the red variety.



# Monitoring and Evaluation: A Key to Sustainability of Coastal Resource Management Programs



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How do we know if our coastal resource management (CRM) plans and programs are working? Monitoring and evaluation (M&E) is the fourth and very critical phase of the CRM process as adapted for Philippine local government units (LGUs) (Figure 1). It provides the information and data required to assess the success of municipal and city efforts to effectively manage coastal resources. Having completed Phases 1 to 3 (Figure 1), coastal municipalities and cities need to monitor the implementation of their CRM plans and programs

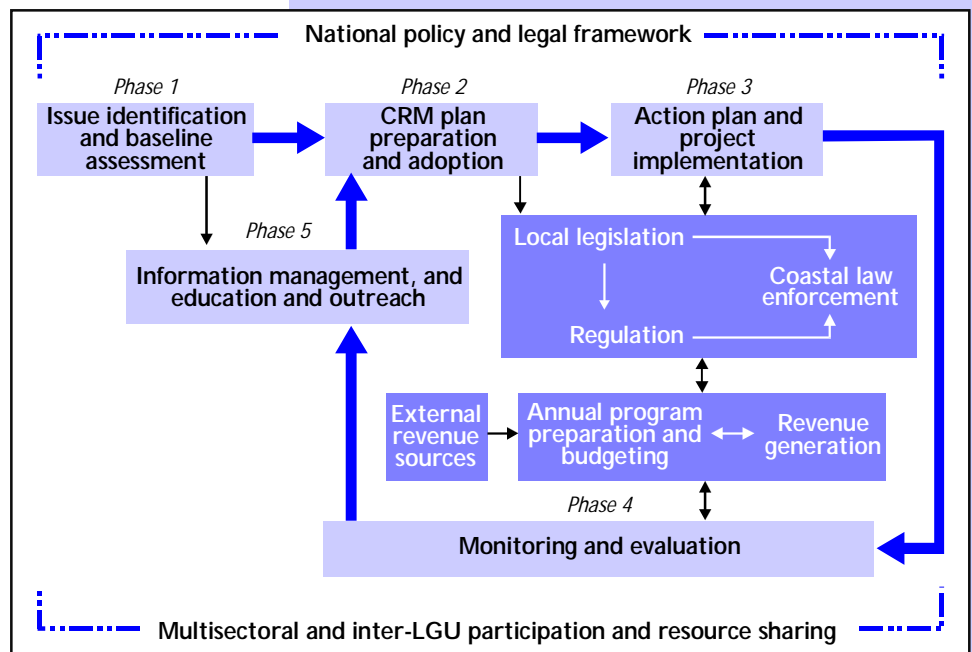


Figure 1. Five-phase CRM planning process adapted for Philippine local government.

as a basis for evaluating performance, monitoring progress, budgeting, and identifying possible refinements to plans and programs. During the M&E phase, the effectiveness of municipal CRM plans and programs are reviewed and assessed against benchmarks of performance and best practices and can be “certified” through an independent review process. Annual M&E helps to answer questions such as:

- *How far have we come in implementing the plan?*
- *Are the strategies addressing the issues and plan objectives?*
- *Is the plan working?*
- *Is the capacity of the municipal staff, Municipal Fisheries and Aquatic Resources Management Councils, and coastal law enforcement units adequate to implement the plan?*
- *Is the legal and institutional framework adequate for CRM plan implementation?*
- *What issues have arisen since the plan was implemented?*
- *What is the level of community support for the actions being implemented?*
- *Have the fish catch and coastal habitat quality improved?*
- *What refinements to the plan are needed to improve implementation?*

Municipal CRM plans prepared and adopted in Phase 2 of the process should serve as a basis for M&E. Evaluation of the plan and plan implementation (Phase 3) should be conducted

**Table 1. Illustrative questions for monitoring and evaluation of a typical CRM plan and implementation.**

Contents of CRM plan	Illustrative evaluation questions
Description of area	<ul style="list-style-type: none"> <li>■ Is relevant and adequate information used to describe the coastal zone and municipal waters?</li> <li>■ Are municipal and <i>barangay</i> profiles complete?</li> <li>■ Does the baseline assessment provide adequate data for monitoring and evaluation?</li> </ul>
Maps	<ul style="list-style-type: none"> <li>■ Are spatial data presented on maps?</li> <li>■ Are municipal water boundaries, marine sanctuaries, and other use zones accurately delineated with coordinates and displayed clearly in a map?</li> <li>■ Are coastal resource uses and conditions detailed?</li> </ul>
Management issues	<ul style="list-style-type: none"> <li>■ Are the issues clearly articulated?</li> <li>■ Is the process used to identify and prioritize the issues described?</li> </ul>
Goals and objectives	<ul style="list-style-type: none"> <li>■ To what extent do the goals reflect the issues that have been identified?</li> <li>■ Is the purpose of the plan understood by those who are likely to be affected?</li> </ul>
Strategies and actions	<ul style="list-style-type: none"> <li>■ Is the basis upon which the management strategies and actions were designed validated?</li> <li>■ How have the strategies been revised over time?</li> <li>■ What is the impact of groups or individuals?</li> <li>■ Are there measurable socio-environmental impacts resulting from CRM plan implementation?</li> <li>■ Are biophysical conditions improving compared to baseline conditions?</li> </ul>
Institutional and legal framework	<ul style="list-style-type: none"> <li>■ Is the Municipal Fisheries and Aquatic Resources Management Council (MFARMC) formed and active?</li> <li>■ Have adequate numbers of trained LGU staff been assigned to a municipal CRM unit?</li> <li>■ What is the quality of work, on time and in accordance with terms of references, performed by consultants or assisting organizations tasked to assist the LGU in plan implementation?</li> <li>■ Do implementation activities balance regulatory and non-regulatory actions?</li> <li>■ Have local ordinances necessary for plan implementation been drafted and passed?</li> <li>■ Are registry and licensing systems for fisherfolk institutionalized?</li> </ul>
Timeline	<ul style="list-style-type: none"> <li>■ Are planned interventions and actions being implemented as scheduled?</li> <li>■ What delays and why have delays been experienced?</li> </ul>
Monitoring and evaluation	<ul style="list-style-type: none"> <li>■ Is the monitoring and evaluation system functional?</li> <li>■ Is there a functional information management system?</li> </ul>

annually (Table 1). CRM plans are not static documents and CRM programs should be flexible and adaptive. Goals and strategies often have to be refined or adapted to meet changing circumstances

or when better information or a new understanding of the coastal issues has been gained. Insights into the viability or utility of management strategies or better knowledge about the agencies or

individuals responsible for implementation can also lead to program changes. The plan may require refinements and adaptations to incorporate community feedback and improve its support and credibility within the community. The results of annual M&E are used as a basis for updating the Municipal Coastal Database (MCD) and as input to education and outreach campaigns (Phase 5). In addition, revisions or adjustments to the municipal CRM plan and implementation strategies should be based on the results of annual M&E as shown by a feedback loop returning to Phase 2 in Figure 1. Annual programming should reflect these refinements for budgeting purposes.

A CRM plan identifies various management interventions or best practices (Table 2) that need to be implemented to address priority issues. M&E of these CRM best

practices is essential in determining the success of plan implementation. For example, establishing marine sanctuary user fees for tourists may have been identified as a revenue-generating strategy for the community and municipality; however, implementing this one seemingly simple intervention may uncover a number of problem areas that require refinement. A review of the implementation of this strategy may reveal, for example, that the mechanism for fee collection is cumbersome or inadequate, or revenues generated may not be accruing toward community benefits, or the fee established is too high or too low. M&E of CRM plan implementation is the only way to identify issues that have arisen since the plan was formulated, and to make necessary refinements or adjustments.

Monitoring programs should be developed to track both processes and results. Process indicators are used to monitor the governance aspects of CRM plan implementation, including how and when planned activities are progressing, how social processes (such as community organization) are proceeding, and whether there was adequate participation by all stakeholders in CRM planning. Results indicators are used to monitor the outcome or impacts of these processes on behavior change and socioeconomic and biophysical conditions.

## **BENCHMARKING LGU PERFORMANCE**

The concept of certifying municipal CRM plans and programs to benchmark LGU performance is new. CRM Certification (CRMC) is being developed and tested by the

**Table 2. Illustrative list of CRM best practices.**

<ul style="list-style-type: none"> <li>✓ Local legislation drafted, passed, and implemented: e.g. ordinances for CRM plan adoption, unified fisheries ordinance, environment code</li> <li>✓ Fisheries management measures and regulatory mechanisms established and implemented: e.g. registry of municipal fishers; licensing system for boats</li> <li>✓ Coastal law enforcement units operational: e.g. coastal law enforcement units trained; seaborne assets operational; patrols conducted; apprehensions, arrests, and convictions made</li> <li>✓ Shoreline management measures planned, implemented, and effective: e.g. setback requirements enforced</li> <li>✓ Marine protected areas functional: e.g. marine sanctuaries established by municipal ordinance with strong community support</li> <li>✓ Mangroves managed under community-based forest agreements or other management regimes</li> <li>✓ Municipal water boundaries certified and officially established through municipal ordinance and enforced</li> <li>✓ Fee system established for generating revenue from the use of coastal resources and municipal waters</li> <li>✓ Environment-friendly enterprises established: e.g. enterprises are aimed at reducing pressure on coastal resources</li> <li>✓ Shoreline protection measures established: e.g. shoreline setback requirements established and regular monitoring and other regulatory measures installed to protect the coastal zone and foreshore; construction of seawalls in foreshore areas stopped</li> <li>✓ Solid waste management system implemented</li> <li>✓ Environmental impacts of infrastructure and high-impact projects in coastal areas avoided or appropriately mitigated: e.g. proper siting of facilities away from sensitive coastal habitats; environmental infrastructure for port and harbor facilities required; reclamation projects in mangrove areas stopped</li> <li>✓ Soil and water conservation practices implemented</li> <li>✓ Coastal recreation and tourism activities carefully planned and implemented to avoid environmental degradation</li> <li>✓ Other habitat protective measures and open-access restrictions in place</li> </ul>
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Department of Environment and Natural Resources (DENR) through its Coastal Resource Management Project (CRMP) in response to the interest and commitment expressed by over 700 coastal mayors to plan, implement, and monitor CRM plans and programs articulated in the League of Municipalities of the Philippines Resolution No. 01, Series of 1999, a resolution calling for the enactment/implementation of measures empowering government LGUs for integrated coastal management.

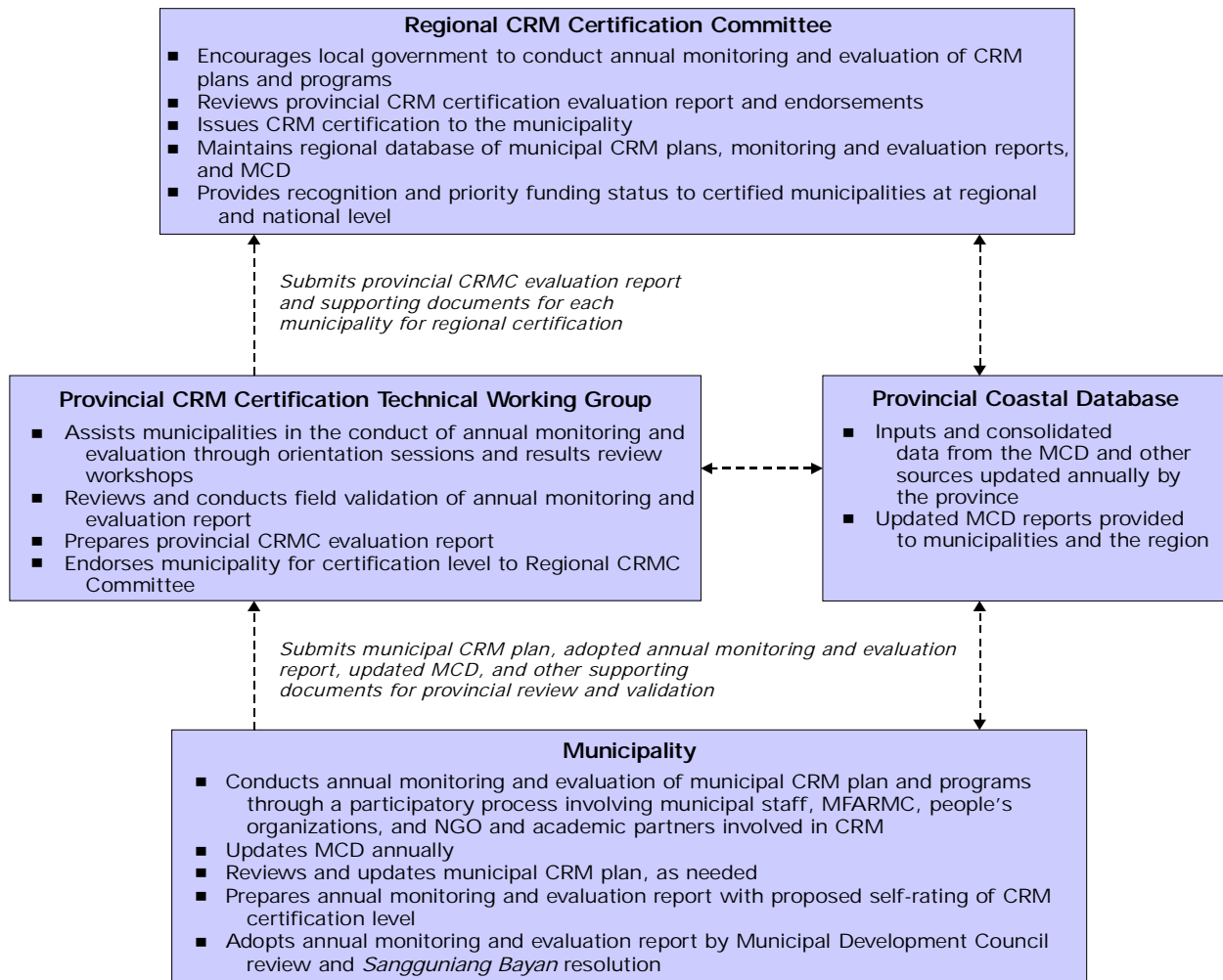
Patterned after international standards for organizational and environmental management systems (ISO 9000 and ISO 14000), certification is a voluntary process in which an independent third party provides a written certification that a product, method, or service satisfies certain predetermined requirements or criteria. Certification has been used largely by various industries (e.g. manufacturing, processing, tourism) to improve efficiency in operations and to achieve voluntary compliance with environmental laws through the establishment of environmental management systems. Firms that have been “ISO-certified” enjoy competitive advantages and improved public image over non-certified firms. International certification standards and procedures for establishing environmental management systems have been adopted in the Philippines under *Philippine National Standard 1701 (PNS 1701), Environmental management systems – Specification with guidance for use*. The benefits of CRMC are listed in Table 3.

**Table 3. Benefits of CRM certification.**

<ul style="list-style-type: none"> <li>■ Encourage self-assessment by municipalities and cities through annual monitoring and evaluation of their CRM plans and programs</li> <li>■ Encourage provinces to provide planning and information management assistance to coastal municipalities and cities and to serve as an information consolidation node for CRM</li> <li>■ Encourage multi-institutional collaboration between local government and national government agencies at provincial and regional levels to achieve improved management of coastal resources</li> <li>■ Validate results and benchmark local government performance in CRM through a multisectoral review committee</li> <li>■ Provide a standardized system to evaluate progress towards achieving Medium-Term Development Plan targets of integrated coastal management adopted by 250 LGUs along 6,000 km of shoreline for the improved management of municipal waters by the year 2004</li> <li>■ Provide recognition and priority funding status to certified municipalities and cities</li> </ul>
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**Table 4. Summary benchmarks for local government performance in CRM.**

<p style="text-align: center;"><b>Level 1 - Beginning CRM</b></p> <p style="text-align: center;">Acceptance of CRM as a basic service of municipal/city government with planning and field interventions initiated (1 to 3 years)</p> <ul style="list-style-type: none"> <li>■ Multi-year CRM drafted</li> <li>■ Municipal Fisheries and Aquatic Resources Management Council formed and active</li> <li>■ Baseline assessment conducted</li> <li>■ Annual CRM budget allocated</li> <li>■ Shoreline management planned</li> <li>■ Planned CRM interventions initiated</li> </ul> <p style="text-align: center;"><b>Level 2 - Intermediate CRM</b></p> <p style="text-align: center;">Implementation of CRM plans underway with effective integration into local governance (2 to 5 years)</p> <ul style="list-style-type: none"> <li>■ Multi-year CRM plan finalized and adopted</li> <li>■ Annual monitoring and evaluation of CRM plan and interventions conducted</li> <li>■ Financial and human resources assigned permanently to CRM activities</li> <li>■ Shoreline management guidelines developed and implemented</li> <li>■ Planned CRM interventions implemented with measured success</li> </ul> <p style="text-align: center;"><b>Level 3 - Advanced CRM</b></p> <p style="text-align: center;">Sustained long-term implementation of CRM with monitoring, measured results, and positive returns (5 years or more)</p> <ul style="list-style-type: none"> <li>■ Multi-year CRM plan implementation fully supported by LGU and collaborators for at least 5 years</li> <li>■ Regular monitoring of biophysical and socioeconomic impacts of CRM interventions</li> <li>■ Annual programming and budget based on results of monitoring and evaluation</li> <li>■ Shoreline management effective</li> <li>■ Illegal acts stopped</li> <li>■ Biophysical improvement measured</li> <li>■ Socioeconomic benefits accrue to coastal residents</li> <li>■ Positive perceptions of CRM interventions among stakeholders</li> </ul>
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**Figure 2. Monitoring and evaluation and the CRM Certification review process.**

CRMC provides a framework for benchmarking LGU performance in the delivery of CRM as a basic service, as well as a roadmap for planning future directions and initiatives. Certification criteria have been developed based on the LGU's CRM mandate and internationally recognized best practices in CRM. These criteria are used to benchmark LGU performance at three levels of certification—Beginning, Intermediate, and Advanced (Table 4).

The results of annual M&E of municipal CRM plans and programs are reviewed against

criteria established for each level and “certified” by an “independent” multisectoral committee. CRMC is voluntary and should be initiated by the municipality. It must be maintained annually through M&E with the goal of achieving higher levels of certification over time.

CRMC is being piloted in Regions 4, 7, and 11 with technical assistance from CRMP. M&E has been conducted by coastal municipalities in the provinces of Palawan, Negros Oriental, Bohol, Davao del Sur, and Sarangani (Figure 2). Provincial CRMC Technical

Working Groups (TWGs) validate M&E results, and evaluate the municipal M&E report. A provincial CRMC M&E report is then submitted to the Regional CRMC Committee for review and certification. CRM-certified municipalities will be recognized for their efforts and given priority status for funding and the receipt of other programs of the provincial and national government.

Regional CRMC Committees are chaired by DENR and composed of the Department of the Interior and Local Government, Bureau of Fisheries

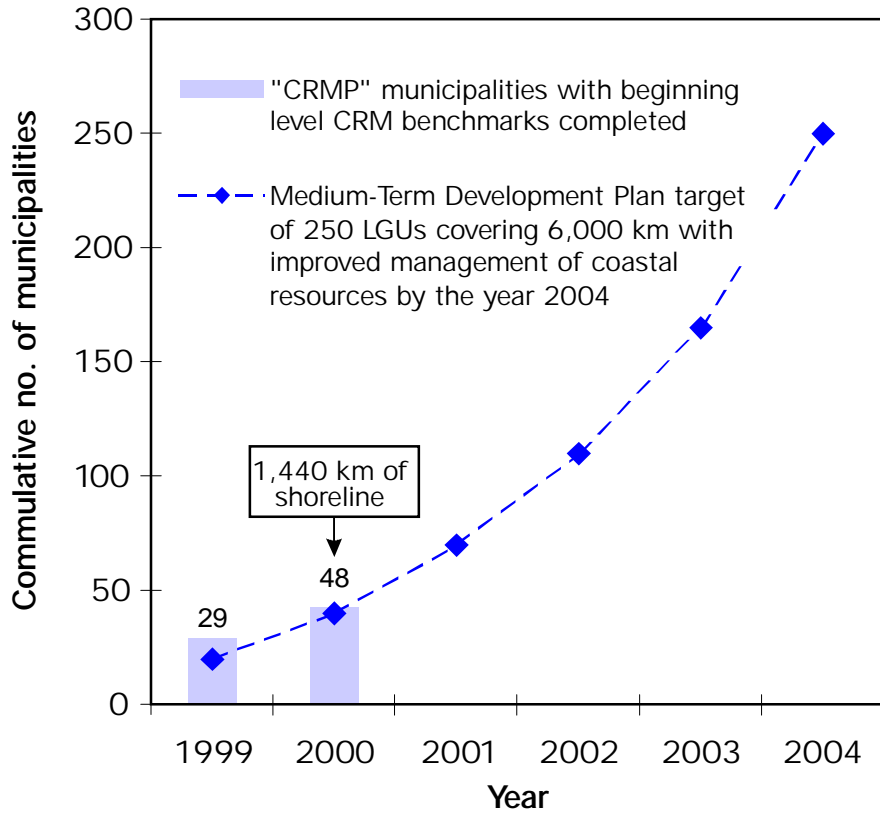


Figure 3. Coastal municipalities achieving beginning level benchmarks in CRM (see Table 4) and National Medium-Term Development Plan targets.

and Aquatic Resources, National Economic and Development Authority, other national government agencies, nongovernment organizations (NGOs), and academic institutions. The regional CRMC Committee serves as the catalyst for CRMC by establishing close communication links with the provincial CRMC TWG, sending out a schedule with deadlines, and ensuring M&E guidelines are distributed in a timely manner to all coastal cities and municipalities within the region.

The CRMC process is timed to coincide with the budget cycle.



It is conducted yearly based on the annual M&E reports prepared by coastal municipalities and cities. The guidelines for annual M&E of municipal CRM plans and programs provide the format and benchmarks for municipal reporting and Regional CRMC review.

#### BUILDING A COMMON VISION

Under the recently defined goals and objectives of its National Medium Term Development Plan for 1999-2004, the Government of the Philippines has highlighted the role of local government in improving the management of coastal resources in the Philippines. The targets for coastal

and marine resources include integrated coastal management adopted by 250 local governments covering 6,000 km of shoreline (30 percent of all coastal municipalities and shoreline) for the improved management of municipal waters by the year 2004 (Figure 3). Annual M&E and CRMC provide a process for evaluating goals and objectives against national targets and aligning local and national resources towards achieving a common vision of sustainable CRM.

**[Monitoring and evaluation is another key role of the province (our issue theme). Editor]**



## Alvarez Signs Administrative Order on Delineation of Municipal Waters

Environment Secretary Heherson Alvarez signed last 11 June 2001 DENR Administrative Order (DAO) 17, which prescribes the “Guidelines for Delineating/Delimiting Municipal Waters”. The Order, approved to coincide with the celebration of the foundation day of the Department of Environment and Natural Resources (DENR), was met with jubilation from various sectors, including the League of Municipalities, League of Provinces, League of Cities, fisherfolk organizations, and nongovernment organizations (NGOs).

The Order has also been endorsed by Agriculture Secretary Leonardo Montemayor, who declared in an interview with the media that he “recognized the authority of DENR in delineating our fishing grounds, which is vested on it by the Fisheries Code”. Another endorsement came from Senate President Aquilino Pimentel, Jr., who urged commercial fishers to comply with the law. Pimentel said the scope of the municipal waters was defined by Congress to benefit small fishers who have been increasingly marginalized by the operations of big-time commercial fishers.

On 29 June 2001, a panel of DENR officials presented and explained the delineation guidelines to a forum of representatives from several NGOs and local government units, fisherfolk organizations, the academe, and the Alliance of Philippine Fishing Federations, Inc. The panel was composed of Secretary Alvarez; DENR Undersecretary for Legal and Legislative Affairs Gregorio Cabantac; Director Isidro Fajardo, Commodore Renato Feir, and Engineer Enrique Macaspac of National Mapping and Resource Information Authority (NAMRIA); Director Florendo Barangan of the DENR Coastal Environment Program (CEP), and Director Reinerio Albano of the Philippine National Police Maritime Group.

The forum was organized by NAMRIA and CEP, with assistance from the Coastal Resource Management Project.

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



## DENR Fast-tracks Development of the National Coastal Resource Management Policy

Several meetings among DENR bureaus and offices were held from May to June 2001 to fast-track the development of the National Coastal Resource Management Policy (NCRMP) highlighted in the editorial to this issue. In the meeting held on 21 June 2001, representatives from the Policy Studies Services, Partnership in Environmental Management for the Seas of East Asia, Coastal Environment Program, Ecosystems Research and

Development Bureau, Land Management Bureau, National Mapping and Resource Information Authority, Office of the Undersecretary for Policy and Planning, and Coastal Resource Management Project agreed that the NCRMP should build on the gains made in the last 10 years in coastal resource management, and define the priority actions that local and national institutions must take to preserve the Philippine coastal

heritage and fight growing poverty in Philippine coastal communities.

The policy priorities and actions proposed in the NCRMP are being formulated based on an extensive body of experience and information, including:

- Review and analysis of the 20-year history of coastal management initiatives in the Philippines;

- Review and compilation of policy reviews and studies conducted by academic institutions, nongovernment organizations, and donor-assisted projects;
- Review and analysis of field-level experiences gained by local government, national government, nongovernment organizations, and the academe throughout the country since the passage of the 1991 Local Government Code and the 1998 Philippine Fisheries Code;
- Formal and informal consultations, roundtable discussions, conferences, workshops, and forums with local government, national government, nongovernment, and the academe;
- Quantitative and qualitative research surveys of fisherfolk and Local Chief Executives conducted in 2000.

Nationwide consultation on the NCRMP will be conducted by DENR starting in late 2001.

By **Leo Pura**  
Research Assistant,  
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## Marine Protected Areas Focus of Pew Fellows-Supported Project



Marine protected areas (MPAs), more popularly known as marine sanctuaries, is the focus of the recently-launched three-year program implemented by the Sulu Fund for Marine Conservation Foundation, Inc. with support from The Pew Charitable Trusts and the Pew Fellows Program in Marine Conservation.

Launched in April 2001, the Marine Protected Area Project is envisioned to help promote better management and conservation of the Philippines' coral reef ecosystems, long recognized as being severely damaged and exploited.

The project will assess how various MPA management systems

are working and how they can be improved. Field observations indicate that, of the over 400 legally-declared marine sanctuaries in the Philippines, only 10 percent are actually achieving the goal of habitat protection. The research component will look into the level of management of these areas as well as their impact on overall effectiveness. Coral reef resource uses, values, and benefits will be quantified in monetary terms by computing their relevance to education and improved human value formation.

A standard MPA rating instrument, which will be tested in selected sites, is currently being developed to allow a uniform assessment and reporting of the progress of marine sanctuaries.

The rating instrument will give way to the development of a

functional certification and rating system, linked with the valuation framework, for existing MPAs in the Philippines to be implemented through local and national government agencies with support from NGOs. The certification system, in turn, will build on existing and tested management guidelines.

The certification system will be tested on 100 MPAs through strategic field monitoring that considers governance, functional age, and size gradients of the existing MPAs. Up to 10 MPAs will be selected for in-depth monitoring and implementation assistance by the project.

The results of the MPA Project will be disseminated through publications, brochures, video productions, websites, posters, and national seminars. Publication of the project results will promote best practices and encourage sustainability for better coral reef management.

The MPA Project is supported by The Pews Fellows Program in Marine Conservation, which annually awards 10 fellowships of US\$150,000 each that contribute to

advancing solutions in fisheries management, marine contamination, coastal conservation and marine ecosystem health. The program seeks to foster greater public understanding of the direct and crucial relationship between life in the sea and life on land.

All organizations involved in assisting MPAs in the Philippines are encouraged to link with this new project.

For more information about the MPA Project of Sulu Fund, contact Anna Meneses or Alan White at [sulufund@mozcom.com](mailto:sulufund@mozcom.com) or at No. 2

Topaz Street, Saint Michael Village, Banilad, Cebu City, Telephone No.: (32) 231-1521.

By **Rosario E. Mariño-Farrarons**  
Social Marketing Specialist  
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## Negros Oriental Coordinator Now Vice-Mayor of Dumaguete City

William Ablong, CRMP Provincial Coordinator for Negros Oriental, was elected Vice-Mayor of Dumaguete City in the last (May 2001 ) elections. In winning his first elective post, William, a “neophyte” politician facing an incumbent, achieved what pundits call an “unexpected victory.”

Just three months into his new position, the neophyte ran unopposed to become the President of the Vice-Mayors’ League of Negros Oriental.

William brings to the second highest elective position in the university city his aspiration of making meaningful contributions to improving society. He counts his experience as an environment advocate among the factors that clinched his victory, and vows to push the same program of government that won him the vice-mayoral seat. Environmental management is a major feature of the



platform of government of William and his running-mate, Mayor Agustin Perdices.

The Vice-Mayor’s vision for Dumaguete City reflects his bias for the environment: “... a University City; a leadership model in terms of sustainable use and management of environment and natural resources; a center of environmentally aware citizens, effective people’s participation in local governance, and joint actions to address sectoral and common concerns of the different sectors, such as labor, urban poor, women, students, fisherfolk, farmers, senior citizens and others.”

William now divides his time between his family (who was recently blessed with a long-awaited baby girl), CRMP, and his duties at City Hall. He says, “The influence of

my position in government can facilitate the accomplishment of our (CRMP) goals, targets and objectives.”

William has been CRMP Provincial Coordinator for Negros Oriental since 1996. The promotion of CRM in fast-growing Dumaguete City was among his first tasks as CRMP Coordinator; it was also among the first tasks he tackled as Vice-Mayor.

The Vice-Mayor has initiated the restructuring of the Environment and Natural Resources Office to include a strengthened CRM component. He has also reviewed his city’s ordinance creating the *Bantay-Dagat*, saying there is a need to review the commission’s functions to improve its law enforcement capabilities.

As presiding officer of the City Council, the vice-mayor has put the Comprehensive CRM Ordinance of Dumaguete City high on his agenda. The Ordinance has passed committee reviews.

Meanwhile, multisectoral meetings are planned to facilitate the drafting of the Dumaguete City environment code.

Other priorities of the Perdices-Ablong administration are the

establishment of sectoral desks for students, labor, urban poor, fisherfolk, farmers and senior citizens; creation of the Anti-Poverty Commission; promotion of a more progressive business atmosphere; campaigns against illegal gambling, prostitution and criminality; health improvement; traffic management; and livelihood and tourism promotion.

William and his peers in the Vice-Mayors' League are also looking at enacting an environment code for every municipality or city in Negros Oriental, and passing a Comprehensive CRM Ordinance in all of the province's coastal municipalities and cities. As well,

they are pushing for the zoning of the coastal areas of all of Negros Oriental's 20 municipalities and five cities.

William's wife and three children are coping well, albeit reluctantly, with being in the limelight. "They have learned to entertain visitors at home," he says of his family. Like most politicians' homes in the Philippines, the Ablong residence has become a hub for people seeking assistance.

The demands of politics and his job are growing, but William is determined to keep a balance between his work and family. Sunday lunch, as well as the family's

traditional beach outings, is strictly "family time" for the Vice-Mayor.

Expressing confidence in the Council he leads, the Vice-Mayor promises: "We will give the programs of the present administration full backing in terms of legislative support. Our party ran on a platform of family, environment and economic development. As far as that goes, I can say without a doubt: the entire City Council will be on our side."

By **Rosario E. Mariño-Farrarons**  
Social Marketing Specialist  
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## Gilutongan Marine Sanctuary Makes "Brisk Sales"

If the visitors' fees collected by the Cordova municipal government are any indication, the fame of Gilutongan's "smart" fishes has spread. From January to August 2001, over half a million pesos' worth of visitor's tickets were collected from visitors to the Gilutongan Marine Sanctuary, off the municipality of Cordova, Cebu.

Foreign and local tourists are finding thrills in snorkeling and scuba-diving at the 15-hectare protected area, previously part of the dynamite fishers' territory. The main attraction are the "smart" fish that Project Director Timoteo Menguito convinced through unorthodox "language" to stay in the sanctuary to keep safe.

Menguito says the fish have become chummy with visitors. When they used to get agitated at the sight of divers in the reef area, the fish

now lap up bread and rice treats out of the hands of the appreciative humans. Divers swear the fish avoid getting out of the sanctuary, even if lured with food.

Dive shop operators in the area have thrown their support around the community. Part of the revenue generated by Gilutongan comes from accreditation of dive shop operators paying for a permit to bring guests to the area. These operators have even offered to give free diving lessons to village volunteer-guards.

The sanctuary is guarded round-the-clock by residents of the fishing community of Gilutongan Island. Women do two-hour shifts



Batfish.

A. T. White

each at the guardhouse at daytime. Village police (*barangay tanods*) are on the lookout from dusk until late evening. Menguito takes over, with volunteers, for the graveyard shift.

During the low season, the sanctuary receives a daily average of 20 visitors. Foreign divers are charged PhP50 and locals PhP25. Gilutongan earned PhP309,000 in

visitors' fees from June to December 2000. With the tourist season still to begin, receipts for 2001 are expected to be at least double last year's revenues. The fund is divided between the municipality and the *barangay*. It fuels community activities like waste management programs, shoreline greening and beautification, information and education programs, coastal law enforcement, and livelihood schemes.

To Gilutongan residents, the sanctuary has become the virtual center of community life. The villagers are not only involved in

guarding their sanctuary, they are also actively monitoring its progress.

After being trained in reef check techniques, Gilutongan fishers now lead in annual data collection activities. The information is submitted to the local government, the academe and CRM partners, who are all also watching and assisting Gilutongan.

Officials and fisherfolk of neighboring municipalities have come to Gilutongan eager to learn the techniques of sustaining a community-based marine resources protection program. Gilutongan folk, and the fish there, are only too

willing to share their wisdom.

For more information, see the article by Ross et al. 2000 cited below.

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By **Rosario E. Mariño-Farrarons**  
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## CRMP to Close in 2002, New Project to Take on Technical Assistance for Local Environmental Governance

The Coastal Resource Management Project (CRMP) is set to phase out in June 2002, as it completes its six-year technical assistance program. CRMP is a joint undertaking of the Department of Environment and Natural Resources (DENR), funded by the United States Agency for International Development (USAID) and managed by Tetra Tech EM, Inc.

Over its five-year core operation phase and one-year extension, CRMP developed various tools that enable local government

units to effectively manage coastal resources within their respective jurisdictions. The Project has succeeded in soliciting endorsement for the enactment of a national policy that would ensure consideration of coastal and marine concerns as essential in achieving harmony in the total ecosystem.

Among the tools developed by CRMP are the CRM certification system, Participatory Coastal Resource Assessment, Municipal Coastal Database, and CRM planning process.



CRMP will turn these tools over to the Local Environmental Governance (Eco-Governance) Project, a new program to be supported by USAID.

Eco-Governance, while integrating management of both upland and coastal resources, will build on CRMP-developed processes. It is a three-year technical assistance project set to begin in the first quarter 2002.

CRMP field activities will wrap up in December 2001. Turnover of project responsibilities is scheduled during the first half of 2002.

By **Rosario E. Mariño-Farrarons**  
Social Marketing Specialist  
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## Palawan to Promote CRM Practices

The Provincial Government of Palawan has pledged to promote coastal resource management (CRM) in all the 24 local governments that comprise the province. Provincial Board Member Antonio Alvarez articulated the province's support to CRM initiatives of the municipalities at the close of the 10-day CRM Refresher Course at Puerto Princesa City on 16 August 2001.

The training program combined seven CRMP-designed courses, namely, Integrated Coastal Management, Participatory Coastal Resource Assessment, Marine Protected Area Establishment and Management, Monitoring and Evaluation, Municipal Coastal Database, Coastal Law Enforcement and Information, Education and Communication and Facilitation Skills.

The municipal government of San Vicente initiated the activity with assistance from the United States Agency for International

Development (USAID) and the Silliman University Center of Excellence in Coastal Resource Management. Represented during the training course were the municipal governments of Aborlan, Bataraza, Cagayancillo and Nara. Also represented were the provincial government, national government agencies and nongovernment organizations.

Ms. Leila Peralta, Program Manager of USAID's Environment Office stressed the need to integrate efforts of addressing the steady dwindling of fishery resources through effective resource management. Atty. Gerthie Mayo-Anda of the Environmental Legal Assistance Center, a CRM partner-organization, provided inputs on the importance of legislative support, rules of evidence, criminal and administrative procedures, and courtroom presentations. The Palawan Tropical Forestry Protection Programme and Fisheries Resource Management Project provided a

province-wide context of environmental management.

Participants were briefed on methods and techniques of baseline data collection and monitoring, particularly of marine protected areas and critical habitats. Planning tools like the SWOT, Problem Tree, Solution Tree, Criteria Matrix Analyses methods, and vision-mission-goal formulation were extensively discussed.

Data gaps were identified as participants assessed their respective municipalities' status against established CRM indicators in the Municipal Coastal Database. Involvement in the activity helped strengthen local governments' resolve to pursue CRM.

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## Olango Tour "Highly Commended" by Tourism for Tomorrow Awards



The Olango Birds and Seascape Tour (OBST) is in the limelight once again. The project was recently conferred the "Highly Commended" status by the British Airways' "Tourism for Tomorrow" Awards in London.

The Tour package was chosen based on pre-determined criteria, namely, aims, impact and successes. The panel of judges included the

Director of the Smithsonian Environmental Research Center, Ross B. Simon; Professor Paul Eagles of International Union for the Conservation of Nature, and Sir Crispin Tickell. The Chairman of the Global judging panel is Professor David Bellamy.

British Airways has been running the Tourism for Tomorrow Awards since 1992 in support of the values it has developed towards the mission of becoming "the undisputed leader in world travel". The awards are given to encourage organizations to protect the natural and cultural environment while

bringing benefits to the local community.

The award was accepted on behalf of the OBST by Monina Flores, former CRMP Enterprise Development Specialist, in August 2001 in London.

The Award for the OBST is its second "Highly Commended" citation. The tour program was also placed among the "Highly Commended" by Conservation International Ecotourism Excellence Award in 1999.



<http://www.oneocean.org>



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Marine Protected Area Establishment and Management

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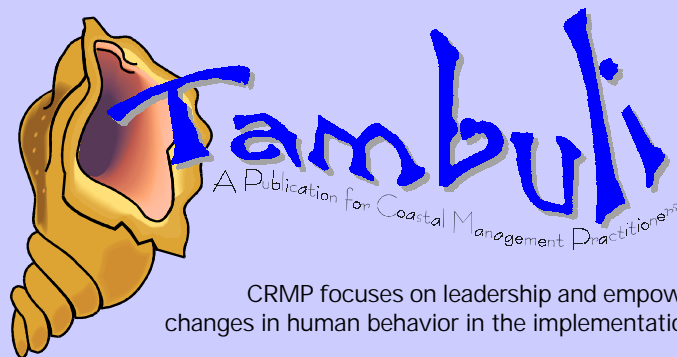
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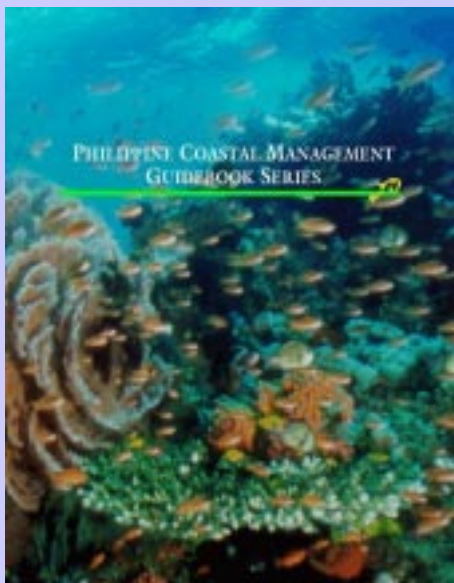
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