crm framework

Chapter 5

CRM in the Philippines has evolved over two decades of local, national, and international interventions. Bohol also has had a long experience in fisheries development activities. Over the last 10 years, however, the seriously degrading status of coastal resources worldwide has highlighted the urgent need for CRM. As a result, the CRM process and essential ingredients have been defined for widespread use in local management initiatives. This chapter describes the CRM process adapted to Philippine local government and CRM benchmarks and best practices used in Bohol.

COASTAL RESOURCE MANAGEMENT PROCESS

CRM is a 5-phase cyclical process with feedback loops to encourage information and learning-based management (Figure 5.1). This CRM process builds on community-based CRM and incorporates, center-stage, the mandate of municipalities and cities to manage coastal resources and municipal waters and to protect the preferential use rights of small and marginal fishers to their exclusive use. It further highlights the various powers and autonomy of local government to develop plans, pass ordinances, regulate resource use, generate revenue, and other important functions.

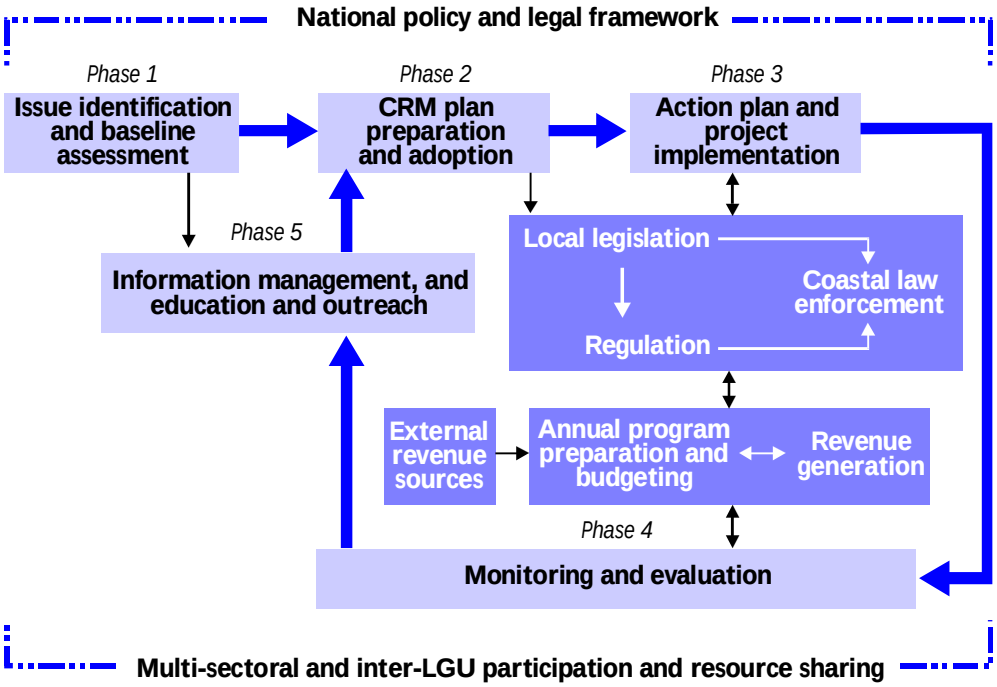


Figure 5.1. Five-phase CRM planning process adapted for Philippine local government

Phase 1
(minimum timeframe)
1 – 3 months

Issue Identification and Baseline Assessment

Development of Coastal Environmental Profile of the Area as Basis for Planning

- Secondary data gathering
- Participatory coastal resource assessment (involving local communities)/baseline assessment
- Issue identification
- Map development and application
- Databanking
- Preparation and publication of coastal area profile

3 – 6 months

Multi-sectoral Collaboration and Contact-building

- Involvement of local government officials (provincial, municipal and *barangay*)
- Involvement of national government agencies (DENR, DA, DECS, etc.)
- Community sectors and informal leaders contact-building
- Municipal CRM TWG formation
- Budget allocation
- FARMC/multi-sectoral resource management group establishment

7 – 12 months

Community Organizing and IEC

- Core group formation and PO institutionalization
- Leadership and skills development
- Community environmental education
- IEC activities
- Initial coastal law enforcement activities

Phase 2
13 – 18 months

CRM Planning

- Formation of multi-sectoral technical working group (LGU, FARMC, other stakeholders) that will facilitate in the planning process
- Initial identification of objectives, issues and opportunities
- Initial identification of policy guidelines
- Initial zoning of the municipal waters and identification of CRM interventions
- Community consultation re: initial zoning, interventions and policy guidelines
- Identification of support livelihood activities
- Process for implementation and identification of responsible parties
- Finalization of the plan
- Legislation of the plan
- *Barangay* consultations regarding the plan

- Approval and budgeting by the Municipal Development Council, SB and local chief executive
- Integration of plan with other local development plans, CLUP, etc.

Phase 3
19 months – 5 years

CRM Implementation

- Enactment of comprehensive fisheries ordinance and other CRM-related legislation
- Delineation of 15-km municipal waters
- Regulatory measures such as zoning municipal water use, establishing closed fishing seasons and areas
- Preferential treatment to small-scale municipal fishers in the grant of exclusive fishery privileges
- Registration and licensing of municipal fishers
- Establishment of marine or fish sanctuary
- Development of sustainable environment-friendly aquaculture
- Revenue generation for CRM activities
- Establishment of marine sanctuaries
- Mangrove management through awarding CBFMA to people's organizations, encouraging mangrove planting, or other management measures
- Establishment of coastal law enforcement units with trained local police and deputized fish wardens

Phase 4
Continuous since project begins

Monitoring and Evaluation

- Baseline assessment
- Bio-physical/socio-economic monitoring
- Shoreline development monitoring
- Plan review and revision
- Participatory monitoring and evaluation workshop and application for certification

Phase 5
Continuous since project begins

Information management and education and outreach

- Regular system established to manage CRM-related information and data in a computer and file cabinet
- Regular activities conducted to provide information and feedback to community, public hearings, training and technical assistance, and IEC

The CRM process can be summarized by a number of key benchmarks that need to be accomplished by the LGU in partnership with the community. By analyzing the activities of the LGUs using these benchmarks, you will be able to judge how good or how far their CRM programs are going.

CRM Benchmarks:

1. Annual CRM budget allocated by LGU (province, municipality and *barangay*)
2. Management councils, advisory groups organized for CRM
3. Participatory coastal resource assessment (PCRA) completed for all villages and towns
4. Multi-year CRM plan developed and adopted through active participation by coastal stakeholders
5. Planned CRM best practices being implemented

CRM best practices are those management measures that have been shown to produce successful results and should be replicated. The community and LGU may identify and plan a number of CRM best practices for implementation. LGUs should aim to have at least 2-3 of these CRM best practices initiated and hopefully develop all of these eventually.

Illustrative CRM best practices:

1. Municipal legislation enacted for coastal management
2. Operational coastal law enforcement units
3. Enterprise development and coastal tourism
4. Marine protected areas/marine sanctuaries functional
5. CBFMAs for mangrove areas declared
6. Delineation of municipal waters between neighboring and facing municipalities
7. Shoreline management
8. Coastal infrastructure and development managed
9. Diving sites managed
10. Information management

CRM best practices are characterized to:

- have resource management devolved to the day-to-day users of the resource;
- be simple, easy to implement, inexpensive, and use indigenous ideas and materials;
- have a scientific basis (i.e. they are proven to have positive impacts);
- sustain beyond the life span of any external inputs; technical assistance
- have a positive impact on the community, quality of living of the beneficiaries and the resources;
- show good examples of sustainable development models, which can be easily replicated and their impacts amplified;
- involve all interested parties and stakeholders in the whole process, allowing them to innovate and adopt the practice to their own needs;
- integrate local, cultural and socio-economic factors into the implementation stage;
- strengthen the capacity of the provincial, municipal and *barangay* governments and fisherfolk organizations to implement the activities;
- adopt an integrated approach, which enables full coordination between all stakeholders like the local and national government agencies, NGOs, POs and civil society;
- have continuous monitoring, assessment, documentation and feedback of the interventions allowing for micro and macro level project intervention adjustments on a regular basis; and

- follow a given "road map"/plan developed by the beneficiaries or that can be adjusted to local nuances.

Status of CRM in Bohol

In recent years, local government units, together with coastal communities in the province of Bohol, have made steady and substantial progress toward improving the management of coastal resources and municipal waters. Using data and information in Bohol's NRDB, progress in CRM can be documented and described by the CRM benchmarks and best practices.

CRM Benchmarks

Annual CRM Budget Allocated by LGU

In order for CRM to progress, regular and appropriate levels of investment must be made by the *barangay* and municipal governments. Annual CRM budgets must include manpower, equipment, transport allowance for cross visits, training, supplies and materials. Likewise, the NGAs and NGOs should be willing to counterpart resources for CRM implementation. The LGU should allocate budget for coastal law enforcement as an integral part of CRM in the form of training for coastal law enforcement units, capital outlay to purchase patrol boats and GPS units as well as maintenance and operating expenses for fuel and other expenses required to patrol, apprehend and prosecute violators.

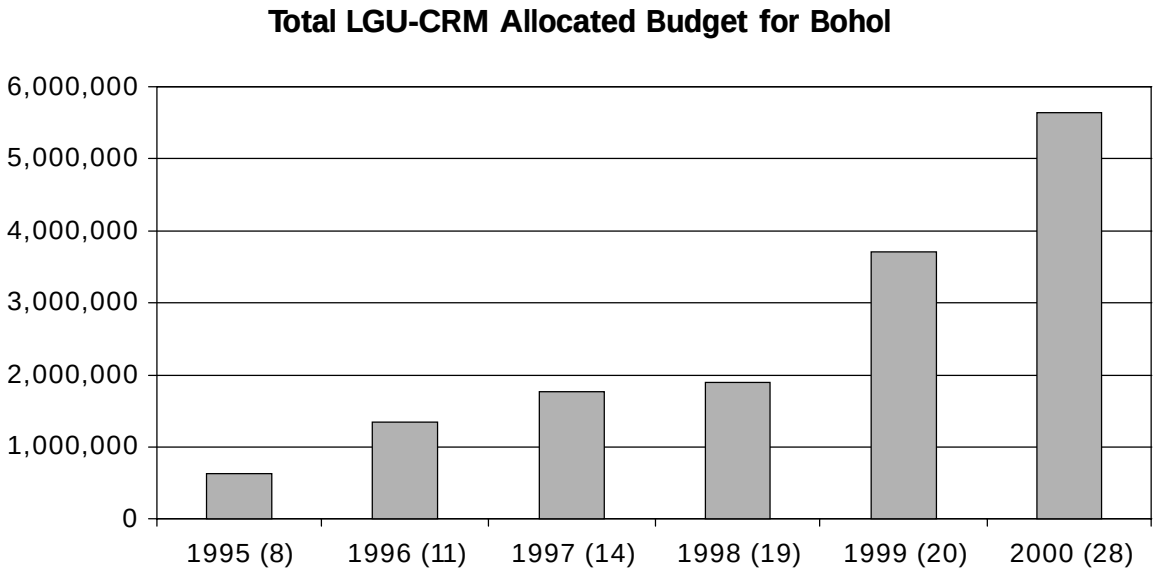
The annual CRM budget needed for a typical municipality in the Philippines has been estimated at approximately 1.36 million pesos. This annual management cost is what is required to sustain a potential annual revenue of 15.2 million pesos (economic average benefit from coastal resources in an average coastal LGU) from coastal resources (White and Cruz-Trinidad, 1998). Although the total annual CRM budget allocated by coastal municipalities has increased substantially by over 6 times in the last 5 years (Figure 5.2), the average annual CRM budget by municipality is still less than 100,000 pesos (Figure 5.3), or on average only one-tenth of the level of investment needed to sustain economic benefits from coastal resource use. Coastal LGUs must continue to increase their CRM investment annually in order to realize a return on the investment.

Management Councils, Advisory Groups Organized

For any intervention to be successful, it is important for all the stakeholders to participate in the CRM process. Different types of multisectoral or multi-institutional groups or councils may be required for various aspects of the CRM process.

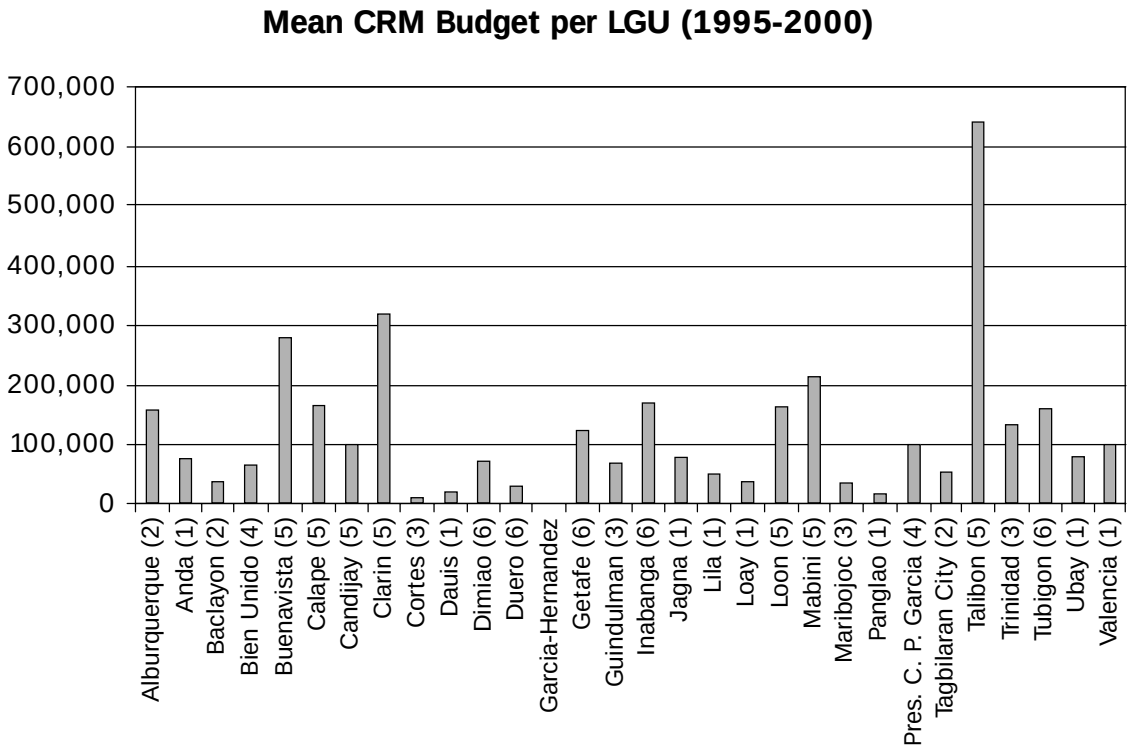
A. Municipal/City Fisheries and Aquatic Resource Management Councils

The Philippine Fisheries Code of 1998 mandates the formation of Municipal/City Fisheries and Aquatic Resource Management Councils (M/CFARMC) in all cities and municipalities in the



Source: Municipal Coastal Database. Figures exclude budgets used for CRM purposes e.g. Mayor's budget. Figure in brackets indicate number of municipalities used to calculate total

Figure 5.2. Average coastal LGU budget for CRM per year (1995-2000), Bohol



Source: Municipal Coastal Database. Figures exclude budgets used for CRM purposes e.g. Mayor's budget. Figure in brackets indicate number of years used to calculate mean.

Figure 5.3. Average CRM budget per coastal LGU per year (1995-2000), Bohol

Philippines. The purpose of M/CFARMCs is to enhance community participation in the management of coastal resources and ensure fisherfolk interests are represented in decisions related to fisheries and other coastal resource uses. M/CFARMCs have been institutionalized in coastal municipalities and cities as well as bay areas. The formation of FARMC at the *barangay* level is optional. The M/CFARMC is normally organized by the LGU in association with its development partners and the BFAR.

The M/CFARMC is composed of the following:

- Municipal/City Planning and Development Coordinator
- Chairperson of the Agriculture/Fishery Committee of the *Sangguniang Bayan/Panlungsod*
- Representative from the Municipal/City Development Council
- Representative from the accredited non-government organization
- Representative from the private sector
- Representative from the Department of Agriculture; and
- At least 11 fisherfolk representatives, composed of 7 municipal/city fisherfolk (including representatives of the youth and women sectors), 1 fish worker and 3 fish sellers

Because of the multi-sectoral nature of the FARMC, it is expected that it shall raise local issues to the municipal/city level for action. In essence, the council strengthens and supports the provision of the Local Government Code of 1991 that encourages the different concerned sectors to coordinate and collaborate in planning. The Philippine Fisheries Code of 1998 mandates that the FARMC should be the lead organization for matters concerning the management of and policy decisions for the municipal/city coastal resources.

Ideally, the FARMC should be the intermediate between the town and the *barangays*, and connect the two in coordination with the Municipal/City Agricultural Officer. It should have at least a budget, no matter how small, from the LGU to ensure that its members are able to attend meetings and visit the coastal *barangays* as they are mandated to do.

The FARMC is given the responsibility to resolve and discuss issues on a municipal/city-wide perspective and serves as an excellent forum for debate on CRM issues. *Barangay* FARMCs are optional but can be organized if there is no existing *barangay* fisherfolk group.

Things to Consider

- The organizational process must include the BEMO, BFAR and other support agencies, not just one agency. This will ensure the proper understanding and internalization of the role of the FARMC.

- A new FAO (FAO 196) has been released that sets up the management framework of the M/CFARMC. This should be disseminated widely for FARMCs to establish committees as recognized in this FAO.

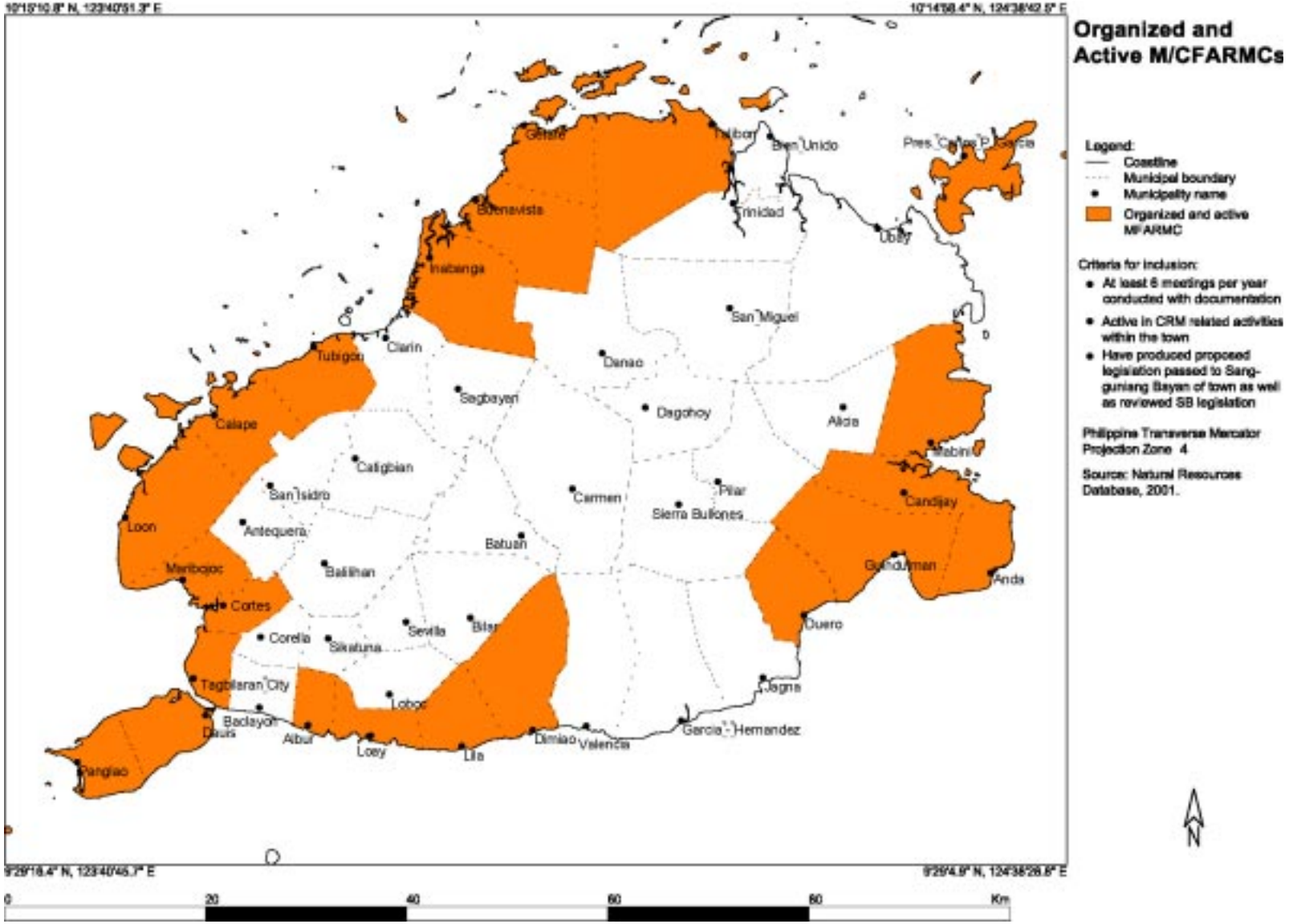


Figure 5.4. Map of organized and active M/CFARMCs in Bohol

Box 5.1. Functions of the FARMC

Based on Section 74 of Republic Act 8550, otherwise known as the Philippine Fisheries Code of 1998, the functions of the FARMC are to:

a. assist in the preparation of the Municipal/City Fishery Development Plan and submit such plan to the Municipal/City Development Council;
b. recommend the enactment of municipal/city fishery ordinances to the *Sangguniang Bayan/ Panlungsod* through its Committee on Fisheries;
c. assist in the enforcement of fishery laws, rules and regulations in municipal waters;
d. advise the *Sangguniang Bayan/Panlungsod* on fishery matters through its Committee on Fisheries, if such has been organized; and
e. perform other functions, which may be assigned by the *Sangguniang Bayan/Panlungsod*

- M/CFARMCs need support from the LGUs and some financial inputs to help them function properly.

- M/CFARMCs should not just be organized and left to be self-sufficient. The organizing agency and BFAR need to develop a capability-building program to strengthen them after they were elected.

- Integrated FARMCs should only be organized once the M/CFARMCs are already strengthened. In other words, the M/CFARMCs should get together and form an IFARMC provided there is really a need for managing a joint area such as a bay, e.g. Cogtong Bay.

- There is a need to distinguish the roles of the Municipal/City Agriculture and Fisheries Council (M/CAFC) and the M/CFARMC as they have conflicting or duplicating functions. The M/CAFC should consider devolving its fisheries-related responsibilities to the M/ CFARMC, and focus instead on agriculture.

- The MFARMC should be the main management group in the town while the *Barangay* FARMC should only be organized when there are no existing and active fisherfolk groups in the *barangay*.

- FARMCs should have and be guided by a regular working plan.

- Provincial FARMC should only be initiated once all the M/CFARMCs have been properly organized and strengthened.

B. Protected Area Management Board (PAMB)

Bohol is one of the provinces in the country that has a large number of protected areas established with legal basis, either through Presidential Proclamation (PP) or Presidential Decree (PD).

The present economic problem faced by the country has greatly affected all government agencies like the DENR, which has experienced major decrease in its yearly budget allocation. Consequently, budget for all sectoral operations costs were also cut to certain percentages. The

Box 5.2. Duties and functions of the PAMB

As stipulated under Section 18 of Department Administrative Order (DAO) No. 25, Series of 1992 of the DENR (Implementing Rules and Regulations of NIPAS Act of 1992), *each established protected area shall be administered by a Protected Area Management Board (PAMB). The Board shall, by consensus or majority vote, approve or take necessary actions to:*

a. *decide matters relating to planning, resource protection and general administration of the area in accordance with the General Management Planning Strategy (GMPS);*
b. *approve proposals, work plans, action plans, guidelines for management of the protected area in accordance with the approved Management Plan;*
c. *delineate and demarcate protected area boundaries, buffer zones, ancestral domains, and recognize the rights and privileges of indigenous communities under the provisions of the Act;*
d. *promulgate rules and regulations to promote development programs and projects on biodiversity conservation and sustainable development consistent with the Management Manual of the protected area;*
e. *ensure the implementation of programs as prescribed in the Management Plan in order to provide employment to the people dwelling in and around the protected area;*
f. *control and regulate the construction, operation and maintenance of roads, trails, water works, sewerage, fire protection and sanitation systems and other public utilities within the protected area; and*
g. *monitor and evaluate the performance of protected area personnel, NGOs and the communities in providing for biodiversity conservation and socio-cultural and economic development and report their assessments to the NIPAS Policy and Program Steering Committee (NPPSC) and the IPAF Governing Board.*

number of PAMB meetings for a particular protected area depends on the available funds indicated in the breakdown of the Annual Work and Financial Plan for the two CENROs, where the protected area is under jurisdiction. Ideally, general assembly meetings are held quarterly aside from special meetings that may be called as the need arises. Each protected area has a regular personnel designated as an interim Protected Area Superintendent (PASu).

Things to Consider

- The LGU still needs to be included in the management of the PA along with the DENR and should integrate the plan and activities of the PAMB into its CRM Plan.

- Logistics and manpower should be allocated to ensure the management of the resources within the protected areas.

- NGOs or other civil groups can perhaps work with the DENR to help activate and strengthen all the PAMBs. Most PAMBs do not meet regularly (quarterly General Assembly) and have little capability-building/strengthening

- A moratorium on designating new PAs under NIPAS in Bohol should be considered until such time that existing PAs are fully functional or have been properly reviewed

- Some PA's should be reviewed and assessed whether they may not be better managed under the local government.

C. Technical Working Groups on CRM

TWGs are multi-sectoral and multi-agency groups that serve as CRM "core groups" for the municipalities. They are usually enabled by an executive order or resolution from the LGUs. They play a very important role in getting the CRM cycle started and disseminating information about CRM. The chief executive of the town normally chairs the TWG. Meanwhile, certain LGU departments perform CRM-related functions (e.g. the MAO for extension services, the MPDC for planning, the Municipal Treasurer for ensuring that the budget is utilized for CRM purposes, the PNP for law enforcement, the SB Chairman of the Committee on Fisheries for legislation, the Aquaculture Technician (AT) for technical activities, and the FARMC Chairman). The formation of the TWG puts all these people together into one forum to discuss CRM-related issues, activities and CRM implementation strategies.

The CRM TWG should act as the main "think tank" on CRM and initiate planning for CRM in the municipality. Despite having similar functions with the FARMC, TWGs can still initiate CRM activities depending on their capabilities, and succeed in doing so. They can also serve as the core of potential leaders upon which to focus any capability-building activity.

D. People's/Women's/Farmers'/Fisherfolk Organizations

POs are the main initiators of community-level activities. They normally have a legal personality that allows them to apply for loans and other funded projects registered under the Securities and Exchange Commission (SEC) or the Department of Labor and Employment (DOLE). POs become the voice of the resource users at the *barangay* level and their political neutrality is very important. They should work together with the *barangay* officials and have a seat at the Municipal Development Council as they are ultimately responsible for *barangay*-initiated CRM activities and interventions like marine sanctuary management, enterprise development, mangrove management, participatory planning, etc.

E. Bohol Coastal Resource Management Task Force

Created in consonance with Presidential Executive Order 117 that encourages the establishment of an inter-agency task force for coastal environmental protection during the 1990s, this group is chaired by the PENRO, with the BEMO as co-chair. Composed of 26 representatives from national and local government agencies and NGOs, the BCRMTF coordinates and integrates the activities and initiatives of various organizations implementing CRM in the province. It also provides technical assistance through IEC and is the main planning body for IEC-related activities within Bohol.

In order to carry out a more effective CRM undertaking, the BCRMTF should possibly review its MOU and clarify its membership and the respective roles of the members. To keep abreast with recent developments in CRM in Bohol, it should meet more regularly, hand down a

clear direction, and prepare a work plan, with various committees being established to focus on the different needs of the member agencies and organizations.

F. Congressional Coastal Law Enforcement Councils

The multi-sectoral CLEC is the main coastal law enforcement arm in Bohol. As provided for under the Memorandum of Understanding dated June 6, 2000, the Provincial Government of Bohol shall ensure that each congressional law enforcement council is organized and strengthened. The creation of the three councils was institutionalized through Resolution No. 2001-052 of the *Sangguniang Panlalawigan*. Likewise, each coastal municipality shall ensure that it has one municipal action officer as member of the council (see Chapter 6.)

Participatory Coastal Resource Assessment Completed

Community mapping in Barangay Cambuhat, Buenavista. PCRA should involve all the local stakeholders and mapping is a great tool to involve everyone.

The first and most important phase in CRM is to conduct a PCRA, which results in the collection of baseline data and identification of the main issues and problems in *barangay* or municipality. PCRA is a good planning tool. With the issues and problems already identified, the role now of the CRM implementers is to set priorities for these issues and problems during the CRM planning process.

The PCRA is an activity conducted by the resource users and stakeholders (multi-sectoral) at regular intervals throughout the CRM project cycle. More importantly, it is an essential pre-requisite to any coastal-related implementation as it gives an idea of the current status of the coastal resources in the area. It uses a series of simple methodologies that allow the resource users themselves to do the assessment. It also sets the stage for planning for CRM activities and builds alliances between project implementers and the *barangay*.

Multi-year CRM Plan Developed and Adopted

To coordinate resources and ensure a smooth and clear CRM implementation, municipal LGUs should be encouraged to develop a strategic and comprehensive multi-year CRM plan.

The five-year municipal CRM Plan shall contain, at the minimum, the following:

1. Coastal environment profile
2. Management objectives

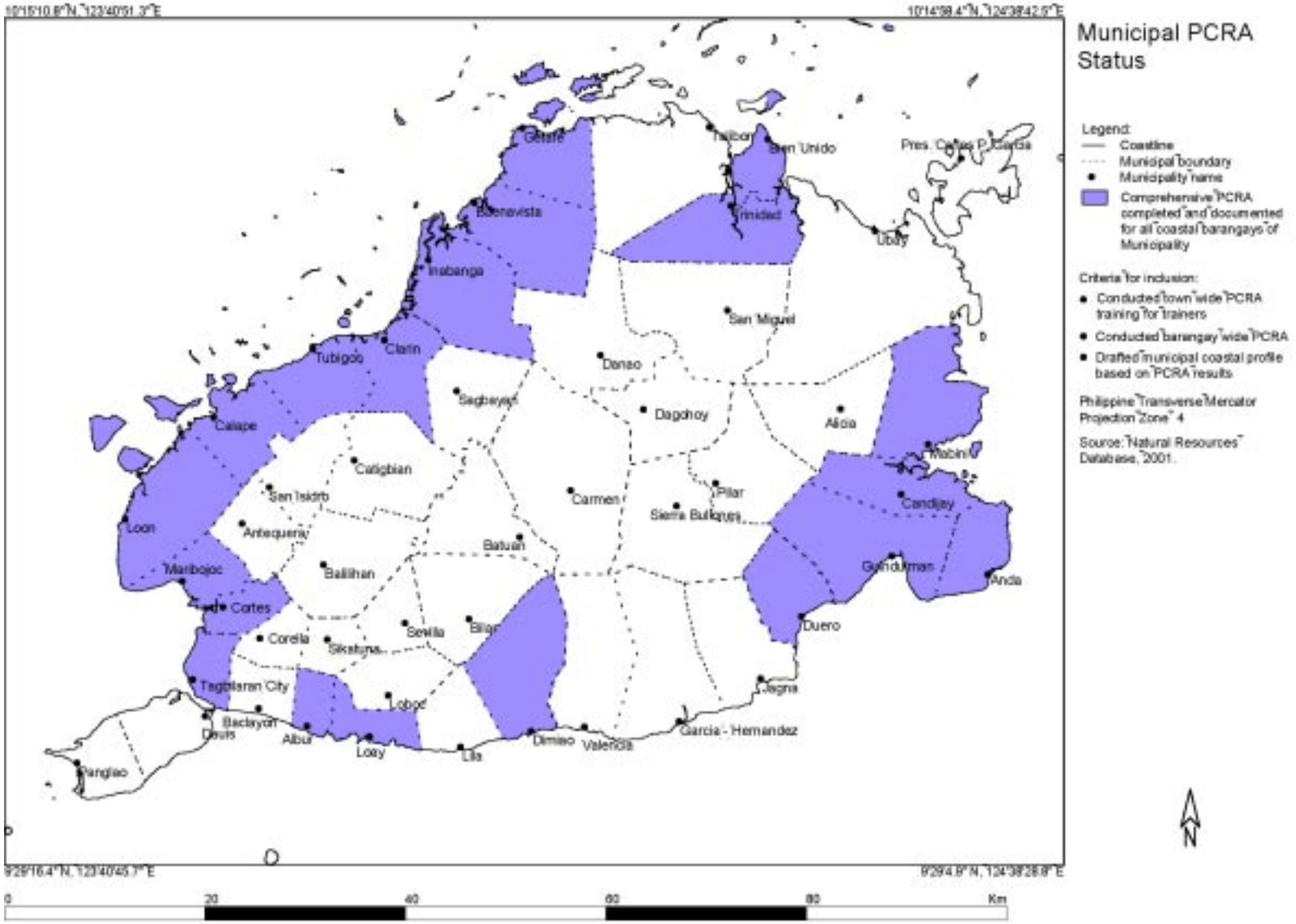


Figure 5.5. Map of coastal LGUs in Bohol with completed PCRA

Mabini CRM planning workshop with a variety of stakeholders tasked with planning and zoning the municipal waters of the town, with Leonarda Vallejos, head of the BEMO-CRM Section facilitating the activity.

3. Programs, strategies and activities
4. Time frame of implementation
5. Budgetary allocation
6. Responsible agencies
7. Implementing structures
8. Monitoring and evaluation (M & E) system
9. Copy of S.B. ordinance/resolution approving the plan

Things to Consider

- The Provincial Government, through the Provincial Development Council, Provincial Land Use Board and/or other entity, shall ensure that the five-year Municipal CRM Plans are consistent with the Provincial Physical Framework Plan — specifically, the Provincial CRM Framework Plan — and other development plans. These entities shall also ensure that other strategic plans such as, but not limited to, the Comprehensive Municipal Development Plan and Comprehensive Land Use Plan are integrated and consistent with the Provincial CRM Framework Plan.

- CRM Plans of each coastal municipality should likewise be integrated and consistent with the national and provincial medium-term development plans (see Annex 5.1.).

CRM BEST PRACTICES

Comprehensive Coastal Zoning for Municipal Waters

Each LGU will be encouraged, through its five-year Municipal CRM Plan, to prepare a comprehensive coastal zoning plan for its municipal waters. This will include delineation of zones and the development of appropriate policies that will be enforced within these zones. The plan will be fully integrated into any provincial development plans.

Municipal/City Legislation

Given that the municipal/city government is the main manager of the municipal waters, it is very important that there are sufficient, updated and well disseminated municipal/city legislations

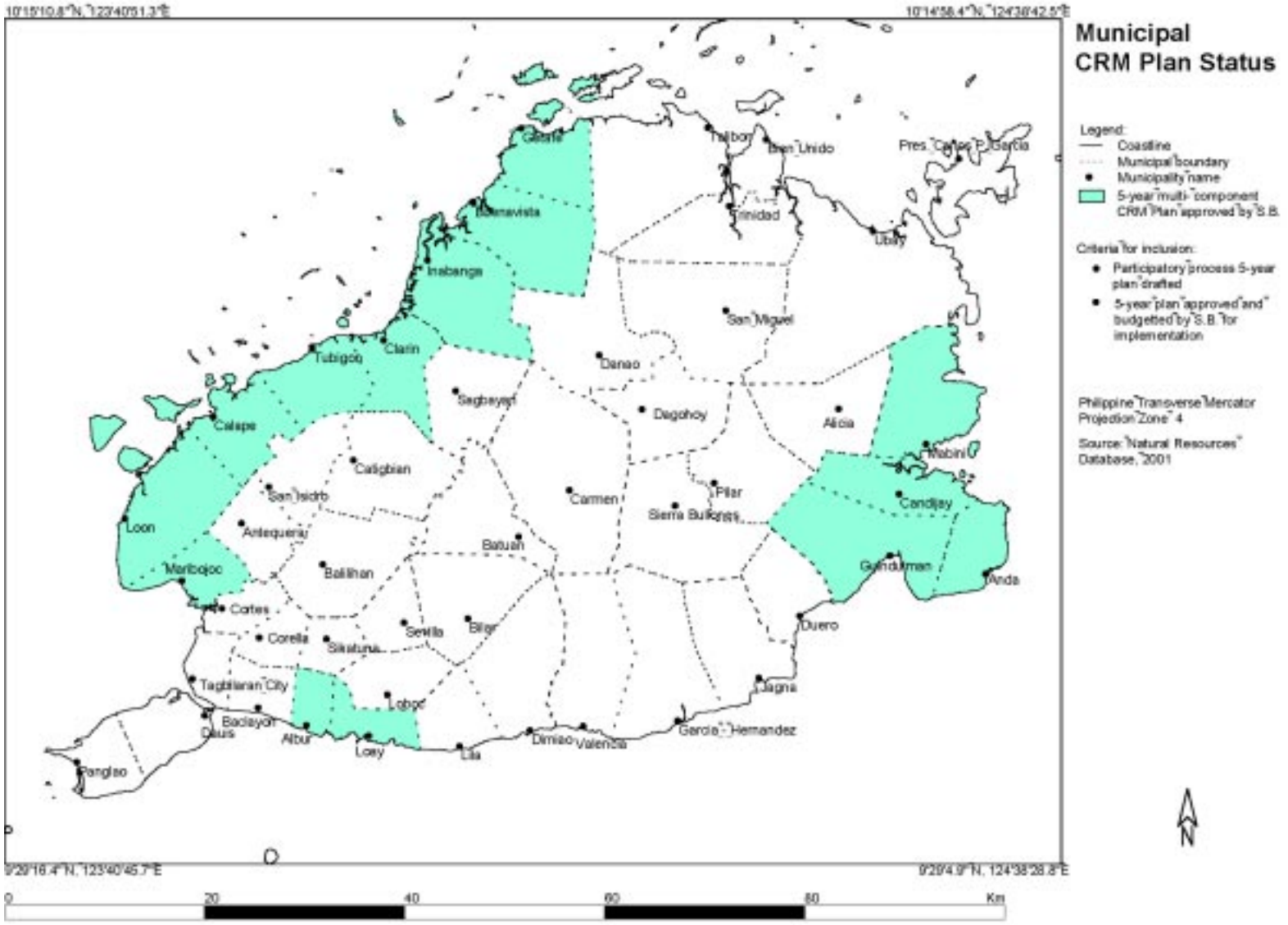


Figure 5.6. Map of coastal LGUs in Bohol with CRM Plans

Box 5.3. Summary of municipal/city legislations within the Province of Bohol

33% have banned the use of chemicals and other poisonous substances to catch fish
27% have ordinances related to river and estuary management
40% have declared some fisheries management regulations (such as marine protected areas, ban on fishing of certain commercially important species during their spawning seasons, ban on sale of gravid females, etc.)
90% have resolutions requesting for delineation of their municipal water
50% have ordinances related to waste management
20% have restricted the extraction of sand and gravel
40% have declared marine sanctuaries
25% have endorsed special bodies for CRM such as Technical Working Groups, etc.
33% have a clear incentive system for law enforcement

to abide to. A summary of municipal/city ordinances in Bohol, furnished by SB/SP Secretaries of 29 coastal MLGUs and one city, and consolidated and analysed by the SP Secretary (Box 5.3) provide an indication of the variation in and types of ordinances in the province.

Trends (as of end of 2000)

- The oldest fisheries-related ordinance in Bohol was legislated in 1956 in Loon. It called for the imposition of a license fee, to be paid to the LGU, for certain types of fishing gear.

- Since the 1950s, each town has drafted an verage of 11 ordinances relating to coastal resource management. Many of these are outdated and some are in conflict with the Fisheries Code of 1998.

- Only Tagbilaran City and four municipalities (Tubigon, Inabanga, Buenavista and Alburquerque) have consolidated their fisheries ordinances into one comprehensive ordinance/CRM Code.

- A few towns stand out as having good legislation in the province. These include Tubigon, Inabanga, Talibon, Calape and Loon.

- The towns of Clarin, Ubay, Bien Unido, Dauis, Mabini, Panglao and Garcia- Hernandez have only few ordinances relating to CRM.

Things to Consider

- CRM ordinances should be consolidated and analyzed, and the many gaps in local legislation filled in to ensure that legislation is up-to-date thereby making law enforcement a lot easier. Neighboring towns should also consider more inter-LGU agreements such as sharing of law enforcement costs and delineation of their water.

- Ordinances related to taxation and licensing should be developed along with incentives for the law enforcers. Currently, the LGU is paying a lot of money for the management of its municipal waters. The resource users should pay initially small amounts for the right to fish within the municipal waters, i.e. small fishers to pay minimal amount while

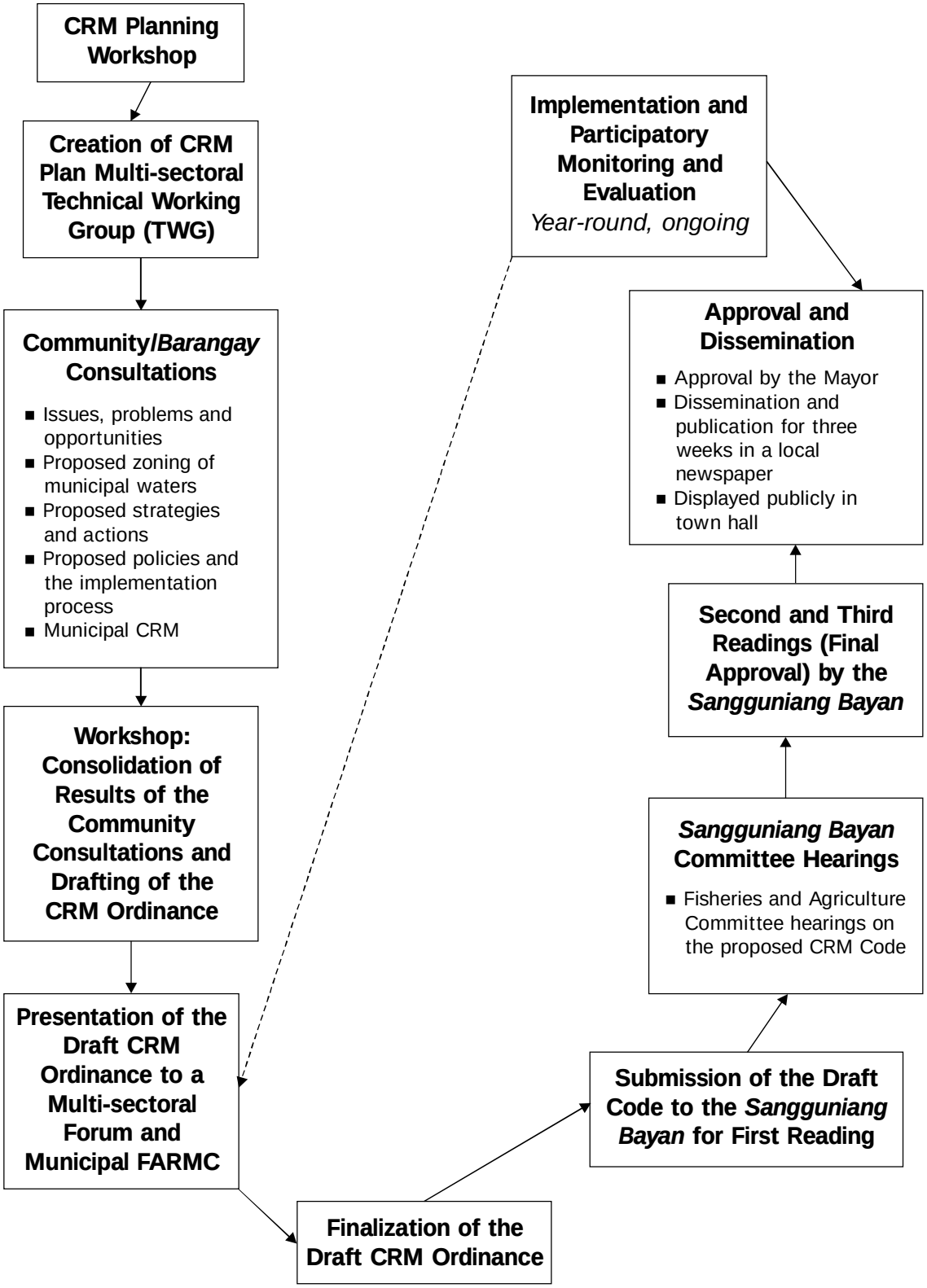


Figure 5.7. Proposed flow in the formulation of a Municipal CRM Code in Bohol

commercial fishers should pay much larger amount for the right to fish in the town (if they are allowed to fish from 10.1 km).

- M/CFARMCs, SB/SP Secretaries and fisheries council chairpersons should meet to discuss coastal legislation.

- The *Sangguniang Panlalawigan* and its Special Projects Unit in coordination with the BEMO should conduct a workshop on standardization of municipal ordinances.

- CRM ordinances and legislation should focus on institutionalizing preferential access of small fisherfolk to municipal waters. Big and expensive fishing gear, (if followed) which catch many fish should be made to pay higher revenues to the LGU for the right to fish in water. This will develop a more equitable fishery.

- LGUs should consider CRM codes which consolidate all previous ordinances and the fisheries code into one uniform code.

- A good example of inequitable fishing nets is the case of one fisher in Pamilacan who owns a fishing net worth over PhP70,000. It is over fifty fathoms in depth and over one km long. An average catch of 10–15 rays worth up to PhP10,000 per day is the normal. This is inequitable and LGUs should discourage one person from owning such a large net and if the net is allowed, it should be taxed very heavily as this is no longer subsistence fishing but commercial fishing.

Operational Coastal Law Enforcement Units

Each LGU should have at least one operational patrol boat to back up their enforcement of coastal laws as well as trained and deputized fish wardens (see Chapter 6.)

Enterprise Development and Coastal Tourism

Enterprise development is a real need at the community level. In several surveys conducted by then Divine Word College of Tagbilaran (DWC-T) Social Weather Station from 1998 to 2001, one of the main issues and problems voiced out by the Boholanos was the lack of alternative sources of income. This is compounded by the fact that the fisheries resources are already depleted and not equitably distributed, so the small fishers really do need alternative livelihood (land-based, sea-based, mariculture, etc.).

Enterprise development, if done correctly, can really have a huge impact on the day-to-day sustenance of the beneficiaries. It is envisioned to create economic incentives for coastal community residents and provide alternative or additional employment and income, thus increasing their stakes in managing their resources. It also generates additional private incomes and public revenues and encourages environmentally sustainable investments to the area. Ideally, it should be tied together with resource management and other developments in the *barangay*.

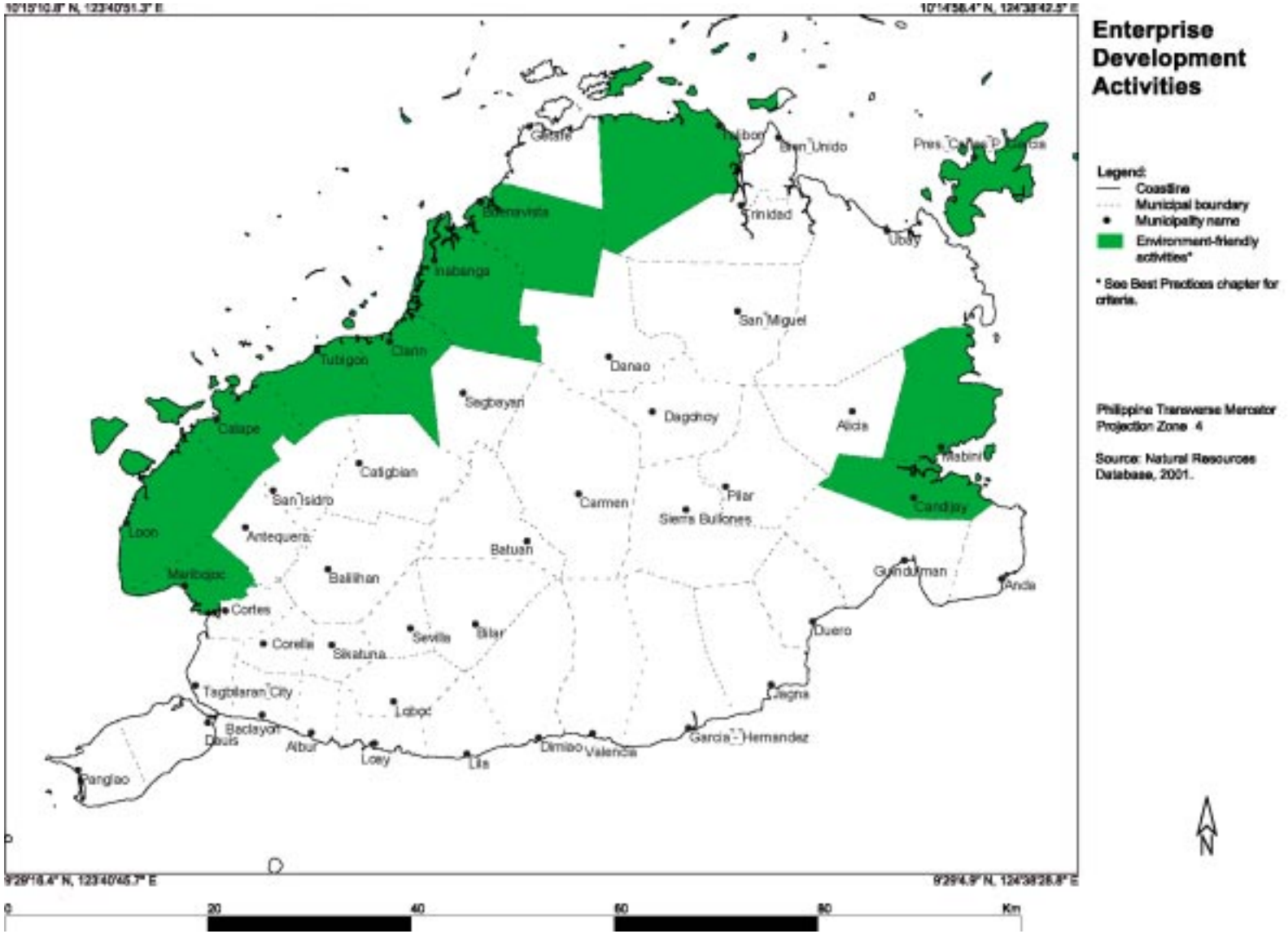


Figure 5.8. Map of environment-friendly enterprise development in coastal areas of Bohol (2000)

Potentials of Enterprise as a Coastal Management Tool

- Contributes to income diversification and lessens dependence on fishing
- Provides economic incentives for conservation activities
- Increases government revenues from the management of coastal waters and marine protected areas
- Shifts economic direction away from extractive trades through promotion of eco-friendly investments to the area
- Provides alternative employment to destructive or unsustainable livelihoods
- Increases household incomes while lessening fishing pressure

Criteria for Selecting Specific Enterprise Developments

- Environment-friendly or ecologically-sound (set limits, zoning, preferential access to fisherfolk)
- Substantial economic benefits to target beneficiaries and communities
- Appropriate and acceptable to communities
- Existing and accessible market
- Profitable
- Technologically feasible

Possible Enterprise Development Process

a. Identify and research on impact areas and beneficiaries
b. Select appropriate and feasible enterprise
c. Consult and involve stakeholders
d. Conduct technical training
e. Conduct production trials or product development
f. Plan feasibility and consult marketers
g. Source financing
h. Organize business unit
i. Start operation
j. Assist in production, marketing and financial management
k. Conduct business management skills training
l. Monitor business operation by beneficiaries
m. Assess/evaluate business operation
n. Recommend modifications to the business plan
o. Assist implementation of modifications

Environmental and economic frameworks, such as those illustrated below, can be great tools to help beneficiaries identify what is and is not feasible in their *barangay* and/or town.

Initially begin with a brainstorming on all the present enterprises in a community and then list other possible enterprises. Using the simple scoring matrix shown below, rate the impacts of existing livelihood practices (e.g. on a scale of 1-5), and evaluate the proposed livelihood. Then,

add up the scores in the right-hand column and you will get a rough idea of what is environmentally-friendly and what is not to guide you in selecting the appropriate enterprise in the area.

Matrix 5.1. Environmental feasibility indicators

Enterprise Or Livelihood Project (Product or Service)	Environmental Impacts								Score
	Corals	Mangroves	Seagrasses	Estuaries	Fisheries	Beaches	Water Quality	Land Quality	
Existing									
Potential									

The same can be done for assessing whether the enterprise is actually feasible or not.

Matrix 5.2. Economic feasibility indicators

Enterprise Or Livelihood Project (Product or Service)	Economic Considerations						Score
	Availability of materials	Presence of skills	Will create jobs for the coastal community members	Accessibility to and existence of long-term market	Stability of price and profitability by at least 10%	Community ownership	
Existing							
Potential							

Things to Consider

- The handing out of fishing gears (except in buy-back schemes in exchange for illegal fishing gears) is not an environment-friendly enterprise and thus should be discouraged as it will only deplete stocks further and create more problems in the management of the resources. Likewise, bank loans for this purpose should be discouraged (i.e. Land Bank of the Philippines, etc.).

- Conduct a series of and intensive scoping of any project with the beneficiaries using a framework similar to the one mentioned above.

- Counterparting of resources from the municipality, *barangay*, other agencies and stakeholders is strongly recommended as having the intervention lodged at the household level (and not the PO necessarily) effects greater success.

- There is really a need to invest substantial amount of money to have a successful enterprise project, however, there are many readily available sources. Enterprise development should be part-and-parcel of a holistic ICM program and not just livelihood alone.

- There is a need to offer continuous technical assistance throughout the project life span.

Case Study - International Coastal Clean-up

A great "tool" for securing public awareness in waste management, wherein a large number of people participate is the International Coastal Clean-up (ICC), held on the third week of September every year. In 1999 in Bohol, more than 40,000 people participated in the ICC. The waste collected is taken to proper dumping sites and/or recycled. Results of the main waste collected and volunteer profile are shown in Figures 5.9 and 5.10.

Coastal clean-up, Dauis Causeway

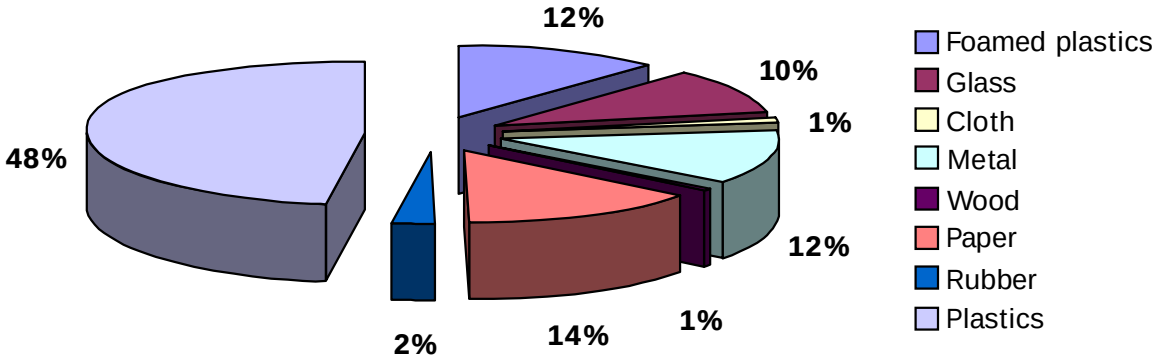


Figure 5.9. Marine debris composition (%) during the 1999 International Coastal Clean-up (ICC) in Bohol

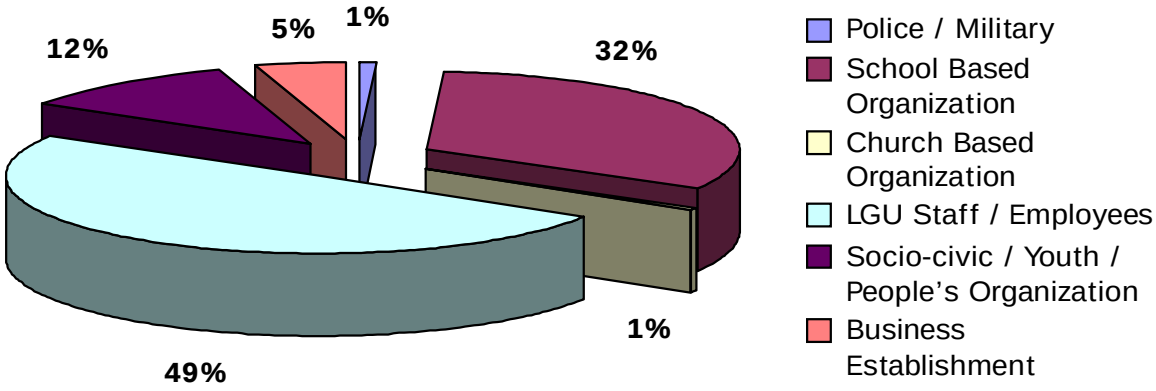


Figure 5.10. Volunteer composition (%) per sector during the 1999 International Coastal Clean-up (ICC) in Bohol)

Coastal Recreation and Tourism

Countries with coastal ecosystems, characterized by beaches for swimming and leisure, mangrove estuaries for fishing and boating, and clear water and coral reefs for diving, are increasing their share to the market as these attractions are developed for use as recreational points for local residents and foreign tourists.

The following guidelines are important in preventing or minimizing potential problems:

1. Coastal tourism development should be conceived within the framework of national, regional and local socio-economic development plans to ensure proper integration of environmental objectives in development strategies. In particular, coastal tourism development should be approached within a national strategy for coastal area development and management. Such strategy requires the identification of zones most suitable for tourism.

2. Zoning plans that take into account the natural geographic and socio-economic conditions of the area should cover coastal areas reserved for tourism development. To achieve optimal use of potential tourism resources, an inventory should first be conducted in the region of the proposed site(s) to include the natural and physical environment, man-made environment and socio-cultural environment. It is also important to know the existence of locally originated or temporary communicable diseases.

3. The carrying capacity of the area should be defined to determine the total population that the tourism area can sustain without overburdening infrastructure and causing degradation of the natural resources.

4. Clearing, where required, should be controlled to ensure minimal impact to the natural coastal ecosystem.

5. Means of access must be properly designed with due consideration to minimizing traffic congestion, noise, solid and liquid waste pollution, and other impacts on the surrounding areas.

6. The development of accommodation facilities should be concentrated in one area, leaving as much as possible the natural resource in an undisturbed state. The scale, size and type of infrastructure should be appropriate. Structures should not be constructed within 20 meters from the shoreline, which has been set aside as environmental protection zone (DAO No. 97-05).

7. Allowances must be made for adequate waste disposal measures. Where possible, waste disposal should use existing waste collection and disposal systems. Liquid waste should not be discharged onto beaches, coral reefs or other fragile areas.

8. Voluntary activities such as International Coastal Clean-up are great ways to involve a broad sector of society in activities such as this.

Things to Consider

- Extraction and use of sea sand should not be allowed and discouraged as it quickly degrades, thus a poor building material. Alternative sources for making building materials, e.g. hollow cement blocks, should be looked into. One adverse effect of too much sand extraction is the scouring of the shore that gives way to the collapse of any infrastructure directly adjacent to it.

- All types of beach sand extraction should not be allowed until such time an inventory of all mineral resources in the province has been conducted and an assessment of where sand can be sourced from has been established (i.e. identify offshore deposits which, if removed, will not threaten the beaches of Bohol).

Marine Protected Areas Functional

Signboards in local dialect are very important for disseminating information, especially about marine sanctuaries which are often misunderstood. Signboard in Tayong Occidental, Loay telling the rules of the sanctuary.

Locally established (community-based), marine protected areas (MPAs) or marine/fish sanctuaries are fast becoming the most popular CRM tool implemented by many coastal municipalities of Bohol. Established marine sanctuaries can be very effective in encouraging the community to actively participate in managing the resources in the area. Through time, it has been proven to increase fish abundance and size within the sanctuary while increasing fish catch and collection of other marine organisms in the adjacent fishing ground.

Marine sanctuaries can be established in any site where the community deems it suitable. It is very important that the community members themselves select the site and validate its suitability. Proper site selection, coupled with social and technical knowledge, spells success for marine sanctuaries. Actual implementation may take some time but if done properly and transparently, it would be a life-long commitment on the part of the community to protect and manage the resource that gives them considerable benefits.

A well-managed marine sanctuary is described to have either some or all of the following:

- It must be a "no take area" where all types of fishing activity are banned. Recreational activities are minimized within and around the area.

- The conduct of scientific research is encouraged. If the sanctuary is a good site for diving activities (i.e. there is steady increase in fish abundance and size within the area), these can be allowed for a small fee or other economic investments.

- Boundaries should be clearly delineated with buoys and concrete markers. Signboards written in the local dialect should be used to ensure that everyone is aware of the area and the rules of the sanctuary.

- A clear management committee to handle all aspects of the marine sanctuary should be organized and made functional.

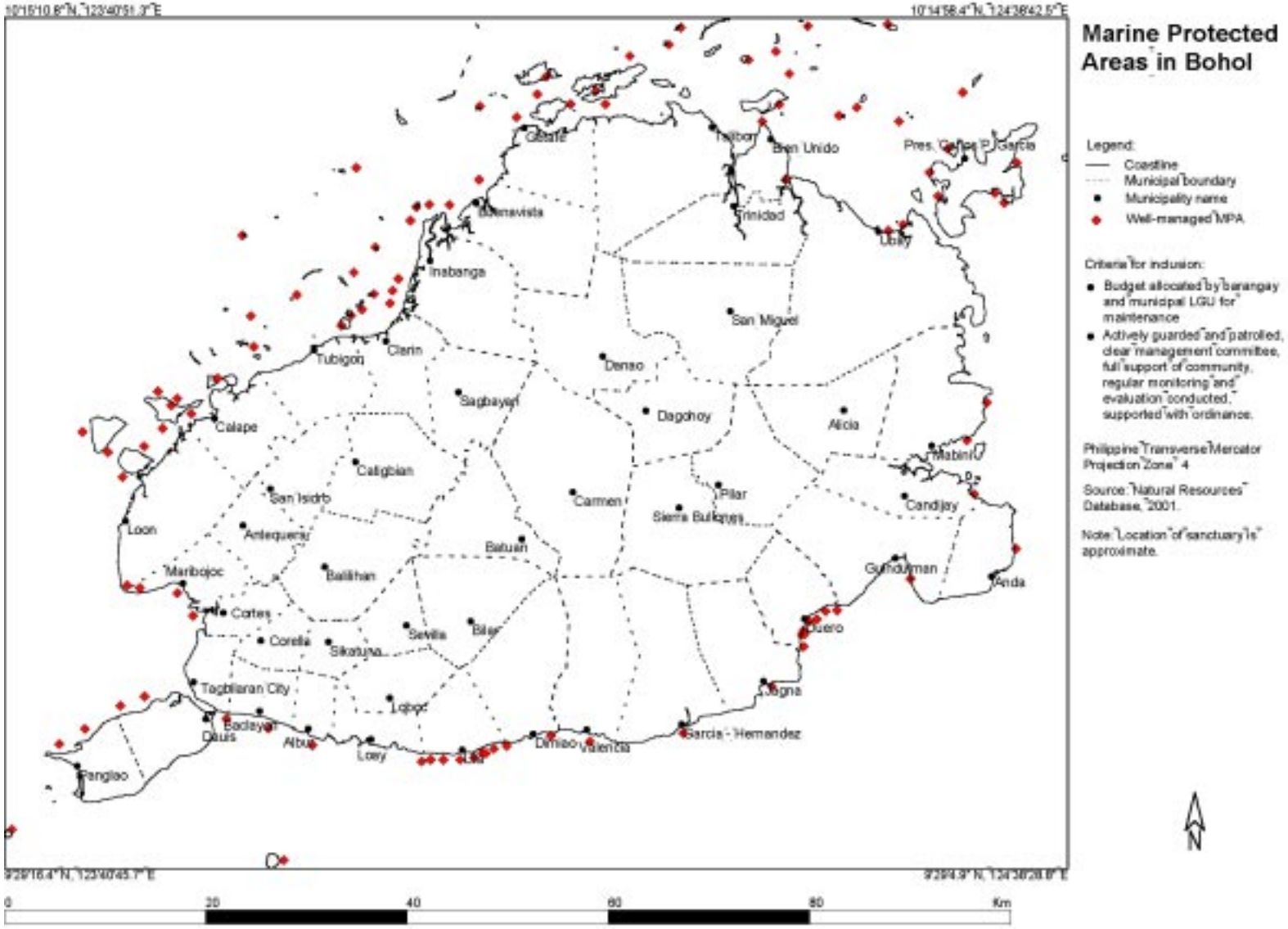


Figure 5.11. Map of established MPAs in Bohol

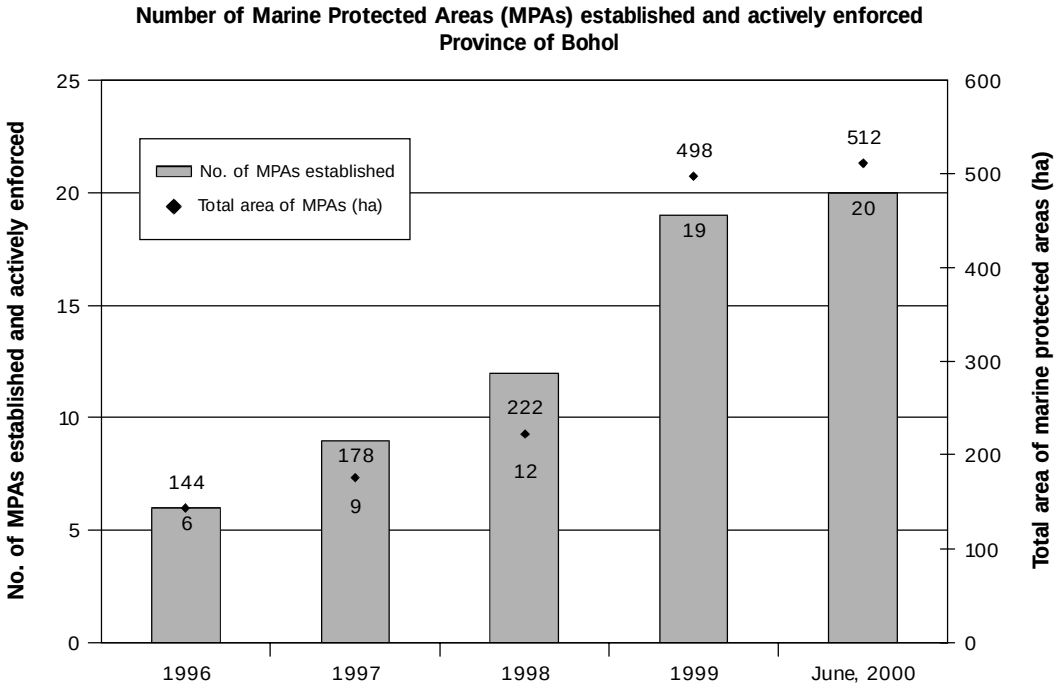


Figure 5.12. Established and actively enforced MPAs in Bohol

- Clear legislation regarding the marine sanctuary should be passed by the SB/SP in coordination with the M/CFARMC. This may cover site assessment, allowed and prohibited activities, etc.

- The area should be at least 10-15 hectares in size and include a buffer zone around it where the use of certain types of fishing gear shall be allowed only to the small fisherfolk involved in its establishment.

- A series of *barangay* consultations shall have been conducted and at least 70-80% of the community members shall have agreed to its establishment.

- The *barangay* and municipal LGUs should play equally important roles in its establishment, alongside the facilitation efforts of an NGO, NGA and/or BEMO as agreed upon in a co-management agreement.

- The assisting agencies should also be willing to continue their assistance (funding and/or technical) even after the MPA has already been established.

- The *barangay* and municipal LGUs should allocate a yearly budget for the establishment and maintenance of the sanctuary.

- The management committee should be guided by a 3-4 year marine sanctuary management plan.

- Diver's fee, for people interested in visiting the area, should be considered to help defray the maintenance and management costs of the marine sanctuary.

At present, there are a variety of marine sanctuaries in Bohol. These include seagrass sanctuaries, shell gardens and coral reefs. Many of these, however, have been neglected or abandoned. In a study of 14 randomly selected marine sanctuaries in Bohol, only three were found to be very well managed by the community (Pollnac and Crawford, 2000). Conversely, this means that out of about 50 declared marine sanctuaries in Bohol, only about 10 are probably functioning and well managed. Therefore, there is a need to focus resources on the re-establishment of these marine sanctuaries, this time properly following a guided process. It should be stressed out that establishment is yet the beginning of the process and more inputs will be required before any sanctuary will be successful.

Box 5.4. Case study of the Lomboy-Kahayag Fish Sanctuary, Pangangan Island, Calape, Bohol

Case Study: **The Success of Marine Sanctuaries in Bohol (Barangay Lomboy-Kahayag Fish Sanctuary, Pangangan Island, Calape, Bohol)**

A combination of dynamite fishing and natural calamities once devastated the coral reefs of Lomboy. From the 1960s to the 1980s, dynamite fishing and other destructive fishing were regular occurrences in the area with up to twenty blasts a day being considered a "normal occurrence" according to local residents.

At that time, the residents of Lomboy did not really complain as there still seemed to have enough resources for everyone, and the dynamiters would always hand out a share of their bounty to whomever from the community would ask. They innocently considered the situation as perfectly normal. Two hundred kilograms of fish was a fair catch from the traditional dynamite "bombs" made of soft drink bottles stuffed with fertilizer and a small "blasting cap" at the top.

It was only in the late 1980s that the local residents began to realize the effects of what destructive fishing had brought them. The catch from hook-and-line fishing had dropped from some 15 kg per day during the 1960s to close to 2-3 kg only per day in the late 1980s. Today, some of the fishers would even return from the sea with no catch at all — something unheard of in the past.

Understanding the fate of the sea and its resources, the people of Lomboy accepted the proposal to establish a marine protected area. The fish sanctuary is in an area known as 'awo', which is a fringing reef that surrounds a deeper coralline area that drops to 30-40 meters. According to the fisherfolk, the 'awo' is a traditional fish breeding site where, in the olden times, spawning aggregations would be seen in the middle of the area. Given this local knowledge, the site was immediately selected and the local communities of Kahayag and Lomboy agreed to work together to manage the area.

In March 1995, with the help of the local People's Organization (PO) (Lomboy Farmers, Fishers and Carpenters Association), the municipality of Calape and the village established the 8.6- hectare Lomboy-Kahayag Fish Sanctuary. The LGU, then under the guidance of Mayor Julius Caesar F. Herrera, now under incumbent Mayor Ernesto Herrera II, and the DENR-CEP helped facilitate the establishment of the sanctuary. The strong support of *Barangay* Captain Benjamin Cuadrasal and his *barangay* council as well as the local fisherfolk organization ensure that the sanctuary will continue to flourish for the coming generations.

Regular monitoring and evaluation of the marine sanctuary has been done every year since 1997. The fishes have started to return, a positive indication of the sustained management of the marine sanctuary by the community (see Figure 5.13).

Marine sanctuaries are one of the most effective ways known to protect coral reef habitat and increase fish production. Fish abundance and coral cover can rapidly improve as evidenced

by the Lombog-Kahayag Fish Sanctuary (Figure 5.13). Established in 1995, the sanctuary shows increased fish abundance especially in target fish that are prioritized by fisherfolk (Table 5.1). Biophysical data were collected through the efforts of the community underwater assessment team of Lomboy in coordination with the UP-MSI and with funding and coordination from the CRMP-BEMO. Some of the data go up and down from year to year due to sampling regime and other factors such as coral bleaching and other external influences. But as a whole, the results show a marked increase in fish and coral abundance within the marine sanctuary, an indication that the management in the area is doing well (guarding and patrolling being sufficient).

Despite initial negative perceptions of some community members towards the sanctuary, they and the *barangay* council have seen the value of the sanctuary and are now planning to expand the core zone to 20 hectares. Barangay Kahayag, however, later withdrew from the management of the fish sanctuary due to some issues relating to the continued fishing in the area of people from their village.

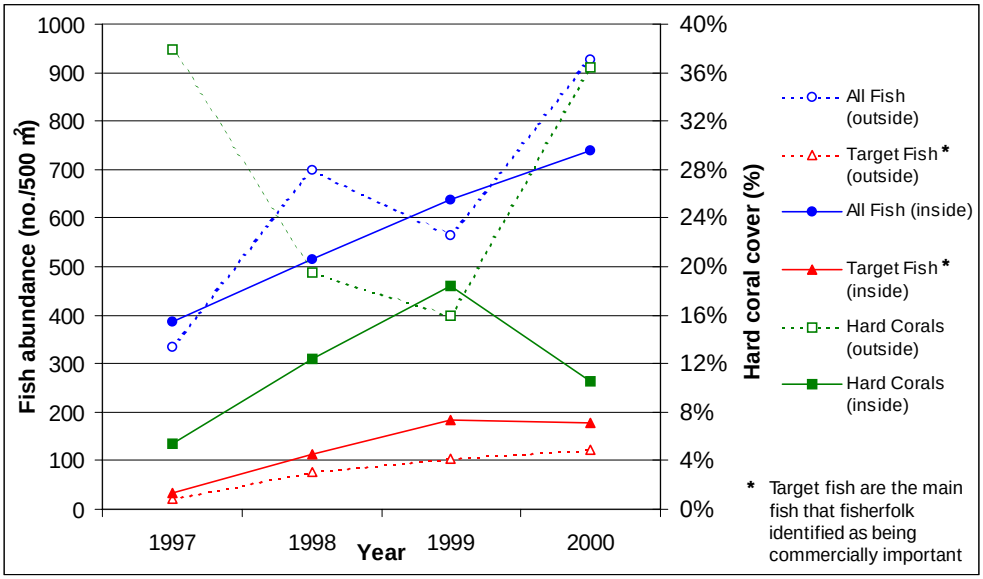


Figure 5.13. Fish abundance per 500 m² and % hard coral inside and outside the Lomboy- Kahayag Fish Sanctuary, Pangangan Island, Calape, Bohol (*Source*: UP-MSI)

It is also important for the community to establish baseline data or information on the sanctuary on which to base future monitoring and evaluation activities. A training course on this can be accessed from the BEMO and from a manual on the subject by Uychiaoco *et al*. 2001 at UP-MSI.

Things to Consider

- Marine sanctuaries should include the other ecosystems of the coastal environment such as deep sea, mudflat, seagrass, mangrove, etc. Priority areas for spawning of fishes should be identified and included, while networks of marine sanctuaries should be considered and planned.

Table 5.1. Fish abundance, coral cover and % change with respect to baseline of the Lomboy-Kahayag Fish Sanctuary, Pangangan Island, Calape, Bohol (*Source*: UP-MSI)

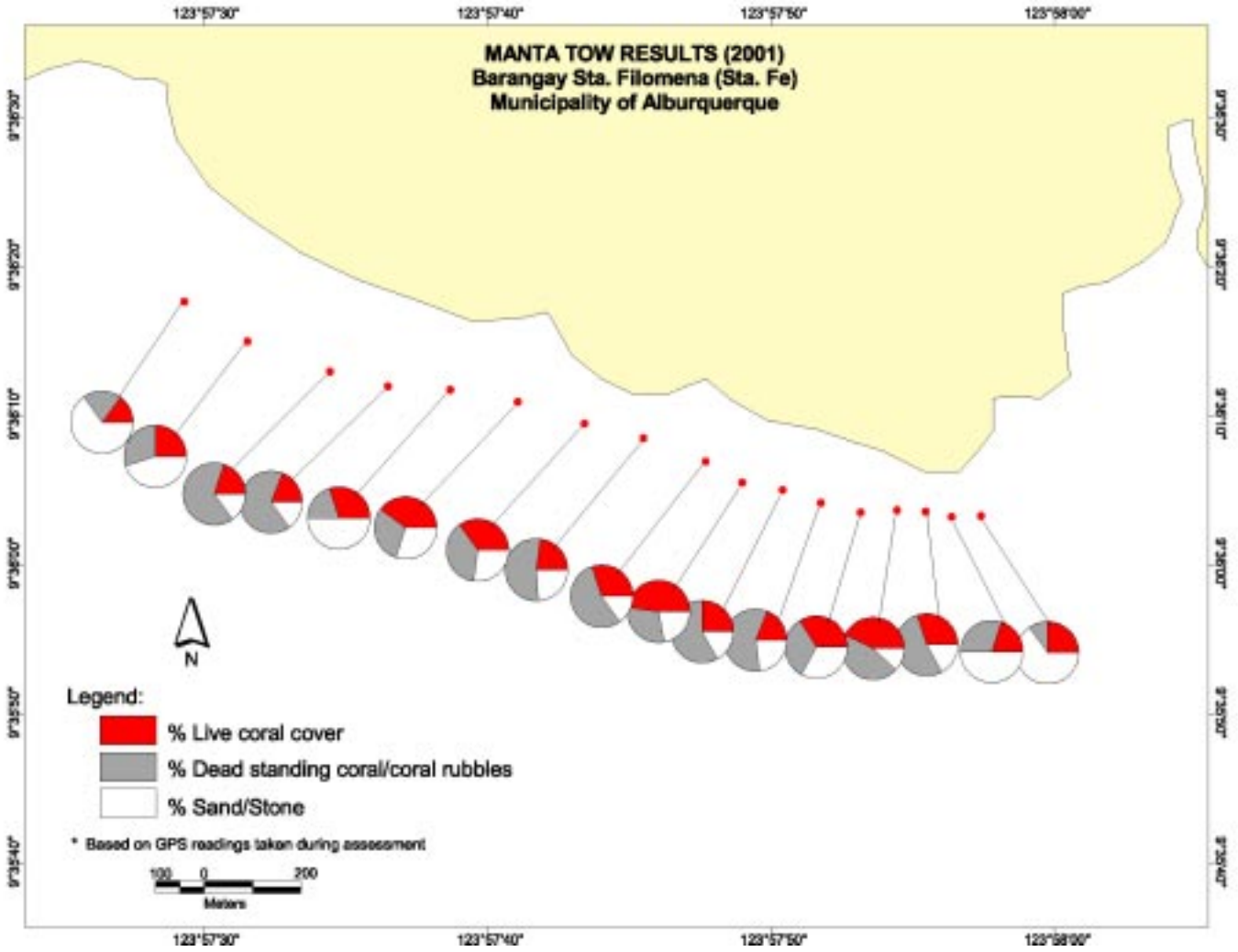
Indicator	Unit	1997	1998	1999	2000	2001
Outside sanctuary						
Hard coral cover	% cover	37.9%	19.6%	16.0%	36.5%	32.7%
All fish abundance	no./500 m^2	333	701	564	927	
Target fish abundance	no./500 m^2	22	76	105	122	
Hard coral cover	% change relative to baseline	0%	-48%	-58%	-4%	-14%
All fish abundance	% change relative to baseline	0%	110%	69%	178%	
Target fish abundance	Relative to baseline	0%	249%	385%	461%	
Inside sanctuary						
Hard coral cover	% cover	5.4%	12.4%	18.4%	10.5%	20.68%
All fish abundance	no./500 m^2	387	516	639	739	
Target fish abundance	no./500 m^2	34	113	184	178	
Hard coral cover	% change relative to baseline	0%	130%	240%	95%	283%
All fish abundance	% change relative to baseline	0%	33%	65%	91%	
Target fish abundance	% change relative to baseline	0%	227%	434%	417%	

- Section 81 of the Fisheries Code of 1998 (R.A. 8550) should be taken into consideration. It states that *"At least fifteen percent (15%), where applicable, of the total coastal areas in each municipality shall be identified, based on the best available scientific data and in consultation with the Department (of Agriculture), and automatically designated as fish sanctuaries by the LGUs in consultation with the concerned FARMCs."*

- Given that Bohol has only approximately 512 ha of marine sanctuaries which are successfully managed and that the total marine waters are approximately 6,427 km^2 (or 6,427,000 ha) (Geoplan, 2000), this means that, approximately only 0.01% of the total provincial water is covered. Therefore, 14.990% or 963,750 ha must be declared to reach 15% as suggested under Section 18 of R.A. 8550. Given this number and extent of marine sanctuary, it is fair to say that the fisheries would be "insured" against fishing pressure and other activities. It also means that we have a long way to go in establishing marine sanctuaries across the province.

CBFMAs for Mangrove Areas

Community-Based Forest Management is the national strategy adopted by the Philippine Government through Executive Order No. 263, signed by then President Fidel V. Ramos, to



Source: Results of the Manta Tow conducted along the Alburquerque coastline during the MPA Trainers' Training held August 22-24, 2001.

Note: Manta Tow is a broad reef-monitoring tool which can be used in the assessment of large areas of reef to select potential sites for marine sanctuaries. The fisherfolk should be the ones to conduct the manta tow and a minimum of inputs can enable them to do it successfully.

Figure 5.14. Results of the Manta Tow conducted at the coastline of Alburquerque, Bohol (2000)

J. Jarantilla-Paler

With their new CBFMA in Barangay Tangkigan, Mabini, the community may now sustainably manage their mangrove area and harvest planted nypa and utilize other non-timber products.

"ensure the sustainable development of the country's forest land resources and providing mechanisms for its implementation". The Community-Based Forest Management Program (CBFMP) is implemented by the Department of Environment and Natural Resources to address the problem of natural forest destruction through rehabilitation and management involving the occupants and resource users within and adjacent to the forest area.

The program sees the need to actively involve forest occupants and resource users, both in the upland and coastal areas, in protecting and managing their habitat and resources. It embraces into one all pro-people-oriented programs like the Integrated Social Forestry Program (ISFP), National Forestation Program (NFP) and the Social Reform Agenda (SRA), thereby integrating all the respective tenurial instruments like the Certificate of Stewardship Contract (CSC), Forest Land Management Agreement (FLMA) and Certificate of Ancestral Domain Claim and/or Certificate of Ancestral Land Claim into the Community-Based Forest Management Agreement (CBFMA).

The CBFMA is a production-sharing agreement entered into by and between any organized community and the DENR to protect, manage, develop and utilize a portion of the timberland area and the resources found therein. It is consistent with DAO No. 96-29 (Rules and Regulations for the Implementation of Executive Order No. 263, otherwise known as the Community-Based Forest Management Strategy), and seeks to devolve the management of mangrove and upland forest resources to the local resource users with support from the *barangay* and municipal LGUs. It also provides tenurial security to the organized community for 25 years and is renewable for another 25 years.

For coastal areas, any organized community in or adjacent to the mangrove forestland and has been socio-economically dependent on the area and its resources found therein through time, can enter into contract with the DENR. In applying for CBFMA, the applicant must:

1. be a Filipino citizen;
2. live in or adjacent to the mangrove forest he/she is applying to manage; and
3. be a member of a people's organization or be willing to form such an organization (a PO must have a minimum of 20 members). Prior to applying for CBFMA, the PO should have been registered with the Department of Labor and Employment, Cooperative Development Authority and the Securities and Exchange Commission.

Provided the three pre-conditions are met, the PO can start processing its application for CBFMA. The PO shall:

- identify the proposed area for CBFMA;
- request for legislative support through endorsement from the *barangay*, municipal and provincial LGUs;
- request the DENR to provide the accountable form to be signed by the PO President, *Barangay* Captain, Municipal Mayor, CENRO, PENRO and Governor; and
- develop a map of the proposed area.

The DENR Secretary delegates the issuance of the CBFMA to the Regional Executive Director (RED) for forestland areas of 5,000 to 15,000 ha and the PENRO for areas of 5,000 ha and below. Upon issuance of the CBFMA, the PO shall prepare a 25-year Community Resource Management Framework (CRMF) and Annual Work Plan (AWP). Provided that the CBFMA area has existing *Nypa* plantations, the PO shall also prepare a Resource Use Plan (RUP).

As legal steward of the CBFMA area, the PO is:

- given tenurial control over the area;
- allowed to use the area for a wide variety of livelihood activities and utilize minor and/or non-timber forest products such as *Nypa* fronds (for shingles production), 'pandan', vines, and other resources within the area in accordance with the approved CRMF;
- exempted from paying rent for the use of the area and forest charges on non-mangrove timber and non-timber products harvested from plantations;
- given preferential access to all possible technical and/or funding assistance from line agencies, NGOs, and other entities;
- entitled to receive all income and proceeds from the use of forest resources within the area;
- entitled to enter into agreements or contracts with private or government entities; and
- tasked to enhance unity and strengthen advocacy for the mangrove areas.

Things to Consider

- Continue the process for other possible CBFMA areas in the province.

- Encourage community-based livelihood and mangrove-friendly enterprises within CBFMA areas.

- For the facilitating agency to make follow-ups and continue technical assistance to established CBFMA areas.

- DENR should conduct a survey before planting and rehabilitation of the CBFMA area to determine its species suitability. Suitable sites have high survival rate of planted propagules. Spacing requirement or planting distance also has effects on survival. For example, closer spacing of propagules encourages apical growth as there is competition for sunlight and nutrients, which are needed in greater amounts especially at the early years of growth. With the present moratorium on the cutting of mangrove trees, including those that have been planted by the community, pruning is encouraged to be the only silvicultural treatment allowed at the moment.

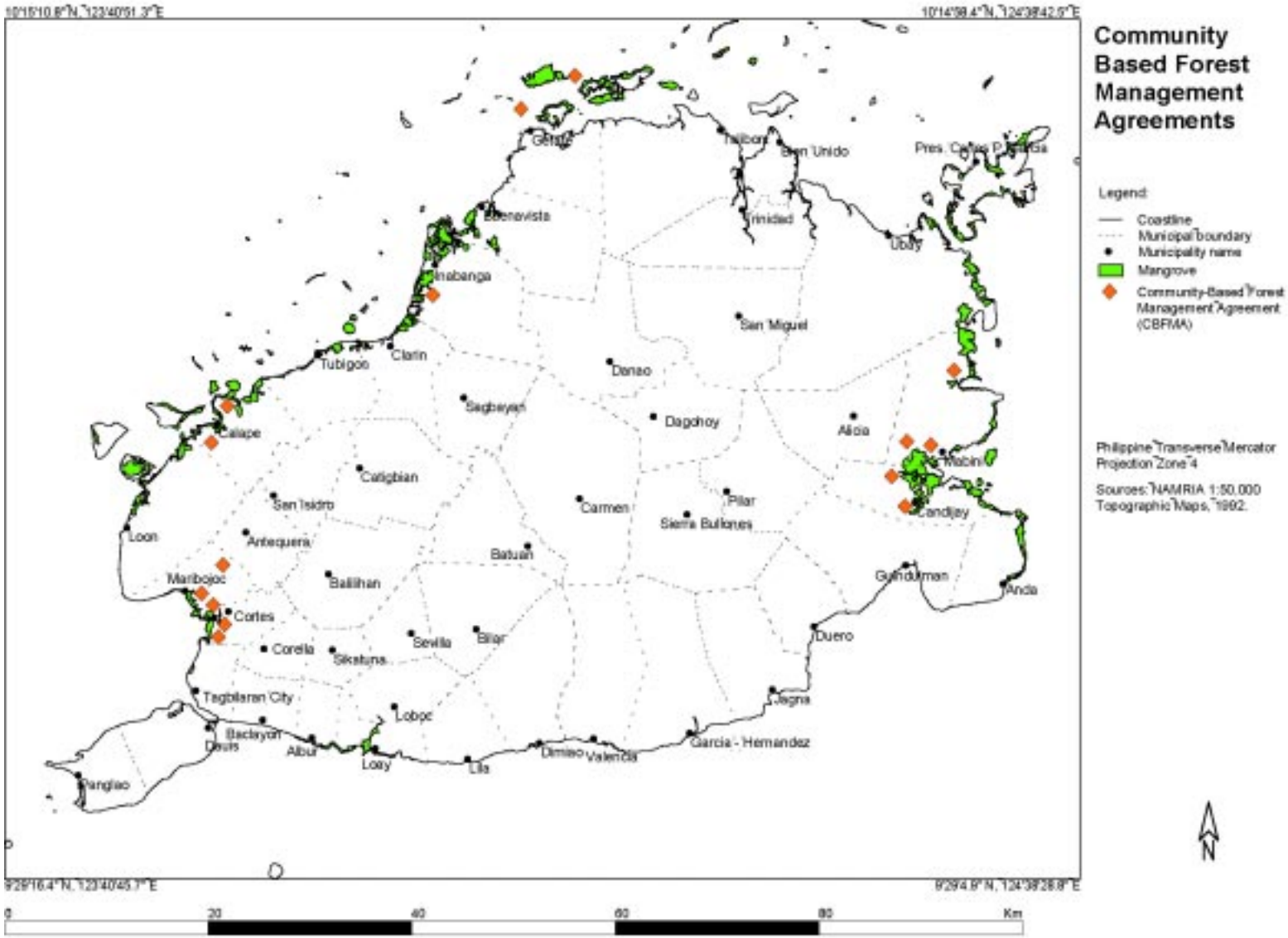


Figure 5.15. Map of CBFMA sites in Bohol

Table 5.2. People's Organizations awarded with CBFMA for mangroves in Bohol

	Name of People's Organization	Location	Area Covered (ha)	Assisting Agency/ Organization
1	San Isidro Mangrove Association (SIMO)	San Isidro, Mabini	17	DENR-CRMP
2	Kapunongan sa Pagpalambo sa Dagat sa Poblacion 2 (KASAPADAP)	Poblacion 2, Mabini	115	DENR-CRMP
3	Tangkigan Mangrove Association (TMA)	Tangkigan, Mabini	112	DENR-CRMP
4	Panadtaran Mangrove Association (PAMAS)	Panadtaran, Candijay	590	CENR-CRMP
5	Boyoan Mangrove Association (BOMA)	Boyoan, Candijay	163	DENR-CRMP
6	Nasingin Fishers and Mangrove Planters Association (NASFIMPA)	Nasingin, Getafe	420	DENR-CRMP
7	Cagawasan Mangrove Planters Association (CAMPA)	Cagawasan, Inabanga	160	DENR-CRMP
8	Macaas Fishers Association (MFA)	Macaas, Tubigon	53	DENR-CRMP
9	Abatan Lincod Mangrove Growers Organization (ALIMANGO)	Lincod, Maribojoc	105	DENR, BIDEF
10	De La Paz Environmental Association (DEA) and Upper De La Paz Bio-diversity Conservation Association (UBCA)	De la Paz, Cortes Upper De La Paz, Cortes	120	DENR, PROCESS
11	San Vicente Mangrove Association (SAVIMA)	San Vicente, Maribojoc	56.25	DENR, PROCESS
12	Kapunongan sa Mananagat sa San Isidro (KAMAS)	San Isidro, Calape	102	DENR, BIDEF
13	Tultugan Small Fishermen and Farmers Association (TSFFA)	Tultugan, Calape	47	DENR, BIDEF
14	Agahay Nypa Planters Association (AGNIPA)	Agahay, Maribojoc	50.36	DENR, BIDEF
	Total		**2,110.61**	

- Provided the mangrove area is not yet covered by CBFMA, consider applying first before doing any rehabilitation or enhancement planting.

Delineation of Municipal Waters

Delineation of municipal water boundaries is vital to establishing the jurisdiction of each municipality and city and is an important management strategy for LGUs to improve the condition of coastal resources. The Provincial Government will facilitate the finalization of the maps of

municipal water boundaries of each town. The NAMRIA (as mandated under DAO 17, S. 2001 of the DENR) will be requested to assist in resolving boundary conflicts and produce the maps. Each LGU will be encouraged to enact a local ordinance adopting the municipal water boundary coordinates as required under RA 8550. The LMP-Philippines has recently entered into a MOA with NAMRIA to assist in the delineation of municipal waters. It is, however, important to stress that LGUs should initiate the process with their neighboring municipalities, even if the NAMRIA has not yest visited.

Shoreline Management

The economic costs of coastal erosion can be enormous for both the government and private individuals. Coastal protection structures are expensive to build and typically do not last very long. The government cannot always respond to annual coastal flooding and erosion. It needs to be more pro-active in its approach to planning and management to reduce and prevent shore erosion and flooding. Humans trigger coastal erosion through unsustainable practices in the same way that they can help in preventing the occurrence of coastal erosion.

Improperly placed structures such as construction in foreshore areas, removal and degradation of the upland and coastal cover, and excessive sand and coral extraction contribute to the rate and degree of coastal erosion.

Things to Consider

- Regulation of sand mining to ensure the beach sand is capable of natural replenishment.
- Enforcement of bans on coral reef mining because reefs dissipate the energy of waves hitting the shore (providing natural coastal protection), and provide many other benefits.
- Preventing the degradation of mangrove areas that act as a buffer against wave action and other physical factors.
- Proper selection of certain sites for the construction of coastal protection works since some areas are more cost-effective than others.
- Allowing the natural cycle of sand flow.
- Coastal setback lines should be established to prevent the construction of buildings close to the shoreline. These may require the construction of revetments or other protection structures to prevent flooding, severe erosion, or building collapse. The law does not allow any structure within the 20-meter environmental protection zone (DAO 97-05).
- Setbacks are a cost-effective approach to erosion protection. They are also prudent, given that the sea level has risen at an average rate of 0.6 mm per year over the past century. They are also important for tourism purposes as they allow for open views along the shore (which tourists are often willing to pay for).

Coastal Infrastructure and Development

Under typical conditions of the tropical coastal zone, most coastal resources exhibit the ability to rapidly colonize suitable habitats near ports, harbors, and waterways. In order to maximize economic benefits and minimize costs and risks, planning of port, harbor, and waterway improvements should consider how modifications would affect the physical, biotic and socio-economic aspects of the infrastructure and surrounding areas.

Things to Consider

- Port improvements should be done in a properly designated place and designed in a manner that minimizes effects to water quality parameters (i.e., salinity, temperature, organic constituents, etc.).

- Volume and composition of waste should be estimated to identify appropriate waste disposal sites to minimize harmful impacts to human health and important biological resources.

- Dredging operations should consider the impacts on commercially important fish species and habitats (seagrass beds, coral reefs, mangroves, etc.).

- Dredge-spoil disposal on upland sites is usually preferable to disposal in nearshore or offshore areas.

- Ports, channels and harbors should maintain the natural equilibrium between sediment accretion and erosion.

- Ports and harbors should be placed in areas with the highest available flushing rates. Channels should be designed to minimize water circulation changes.

- Ports, channels and harbors should be properly situated to avoid any damage or destruction to the critical coastal resources. Establishing "boat highways" around coral reefs and extensive mangrove areas, and minimizing the size of channels and quantity of dredge-spoil can greatly decrease direct and indirect economic costs.

- Ports and harbors should incorporate facilities that allow for effective handling of sewage and industrial wastes.

- Dredging and offshore disposal operations should be timed so as not to coincide with critical periods of migration, spawning, or nursery activities of commercially important fish species, which may be affected by such activities.

Diving Sites Managed

There are quite a number of divers in Bohol, some visitors, while others are residents. Year round, divers come to Bohol, which has about 30 dive shops, many of whom come straight

Diving is one of the main tourist attractions of Bohol. They too are a key stakeholder to Bohol's coastal needs. Diver here shown in Cabilao Island, Loon.

from Cebu (Mactan Island) and head for Cabilao Island (Loon) and some of the islands in Getafe and Buenavista.

There are over 50 regular diving spots in Bohol, with the top dive spots being in Cabilao, Pamilacan and Balicasag Islands. Most of the dive shops are concentrated in Panglao, Dauis, Baclayon and Loon, however, a few are found in Guindulman, Maribojoc and Anda. These are owned by various corporations and managed by foreign and local divers. Some of the dive shops are proactive in coastal management and have placed mooring buoys and have a variety of other activities such as beach clean ups etc.

Divers provide first-hand information on the current status of the coral reefs in Bohol (loss of coral cover, fewer fishes, and capture of rare species of marine organisms). If the negative trend in the coral reefs of Bohol continues, the diving industry will eventually collapse. It is fair to say that about 70% of visitors to Panglao, Cabilao, etc. are divers, and if the diving sites will deteriorate further, most of the divers will not return.

Presently, some of the major threats to the diving industry include:

- anchoring on reef areas;
- careless diving by some groups (standing on corals, collecting marine organisms, fish feeding);
- lack of agreement and coordination with local fishers, LGU officials and divers on the management of dive areas;
- lack of zonation and basic policies/guidelines (from the LGU to dive shops to the divers, and vice versa) to guide the management of diving activities;
- spear fishing by unscrupulous divers interested in game fishing off the reefs; and
- indiscriminate illegal fishing in dive sites
- lack of studies and maximum carrying capacities for the dive spots

In the past, there have been several conflicts between divers and fishers in Bohol (e.g. capture of whaleshark by fishing boats in Panglao, dynamite fishing in favorite dive areas like Doljo Point in Panglao, destroying fish traps such as in Guindulman and cutting of fishing lines by divers, etc.). The latter, however, is scientifically proven to cause more harm than good and affects the livelihood and income of small fishers. Once a fishing net or trap is sent to the bottom of the sea, it does what is called "ghost fishing" which means that fishes and shells move into the net, get trapped and eventually starve to death. "Ghost fishing" will continue to catch many fishes everyday until such a time when the net/trap breaks up (usually a long time as these nets are made of strong nylon). It is important to stress to the divers that fishers who set up traps and nets on the reef

are those who do not use dynamite or other outlawed fishing types, and these nets provide the livelihood of the fishers (this cutting of nets will only cause more miscommunication in the long-term between divers and fishers).

The unabated capture of sharks and endangered species also poses a negative impact to the diving/tourism industry of the province (i.e. decreased revenues, loss of employment and income of the local people), particularly to favorite dive spots of Bohol. Sightings of sharks provides a major attraction to divers and observers, thus, increasing revenues from diving activities. Sharks are species that have very low fecundity rates and produce only several young every couple of years. Presently, their number in Bohol has reduced significantly, thus some conservation for these should be considered.

Cabilao Island in Loon used to be a haven, apparently being the migration route and feeding ground or possibly 'cleaning' ground, of scalloped and giant hammerhead sharks in the early 1990s. In 1998, a group of fishers from Siquijor on their way to Palawan were stranded due to a storm and decided to stay in Cabilao until the weather cleared up. Over the next 27 days, these stranded fishers laid their multiple long-line fishing gear (over 2 km in length) just to try and caught over 350 hammerhead sharks. The locals enjoyed the cheap supply of meat and their fins were dried and sold to Cebu at high price. On the first five days, almost 20 hammerheads were caught daily using dead 'tulingan' as bait. During the latter days of the stranded fishers in the island, only 1-2 sharks were caught per day (showing the rapid decline in population of the sharks). Meanwhile, the local council and local beach resorts lobbied to stop the shark capture, which they eventually did, although somewhat late. Since then, not a single hammerhead has been seen in the waters of Cabilao, meaning that possible diving revenues due to these sharks have disappeared and the hammerheads of Cabilao are now a thing of the past.

Better communication between dive shops and the community could have resolved this. The local fishers were not really willing to stop the catching of the sharks as they provide cheap protein, the locals maintain that they get no economic or other benefits from the local diving industry, so why should they help the divers? If they can begin to see some benefits from the diving, they have agreed that they will stop the capture of sharks, like this and the other sharks which until now are still regularlycaught.

Things to Consider

- A reef-and-fish monitoring team could be set up, with training on reef check with the divers. Every six months, divers could do assessments and look at long term biophysical trends in the reef areas.
- All divers and names of dive boat coming from other provinces should be registered in Bohol. This will help in monitoring the activities of the divers and in the occurrence of any emergency.
- Markers, such as entry points and buoys, should be put around the reef to guide inexperienced divers and provide other prospective activities for newly trained open-water divers (e.g. training on diving).

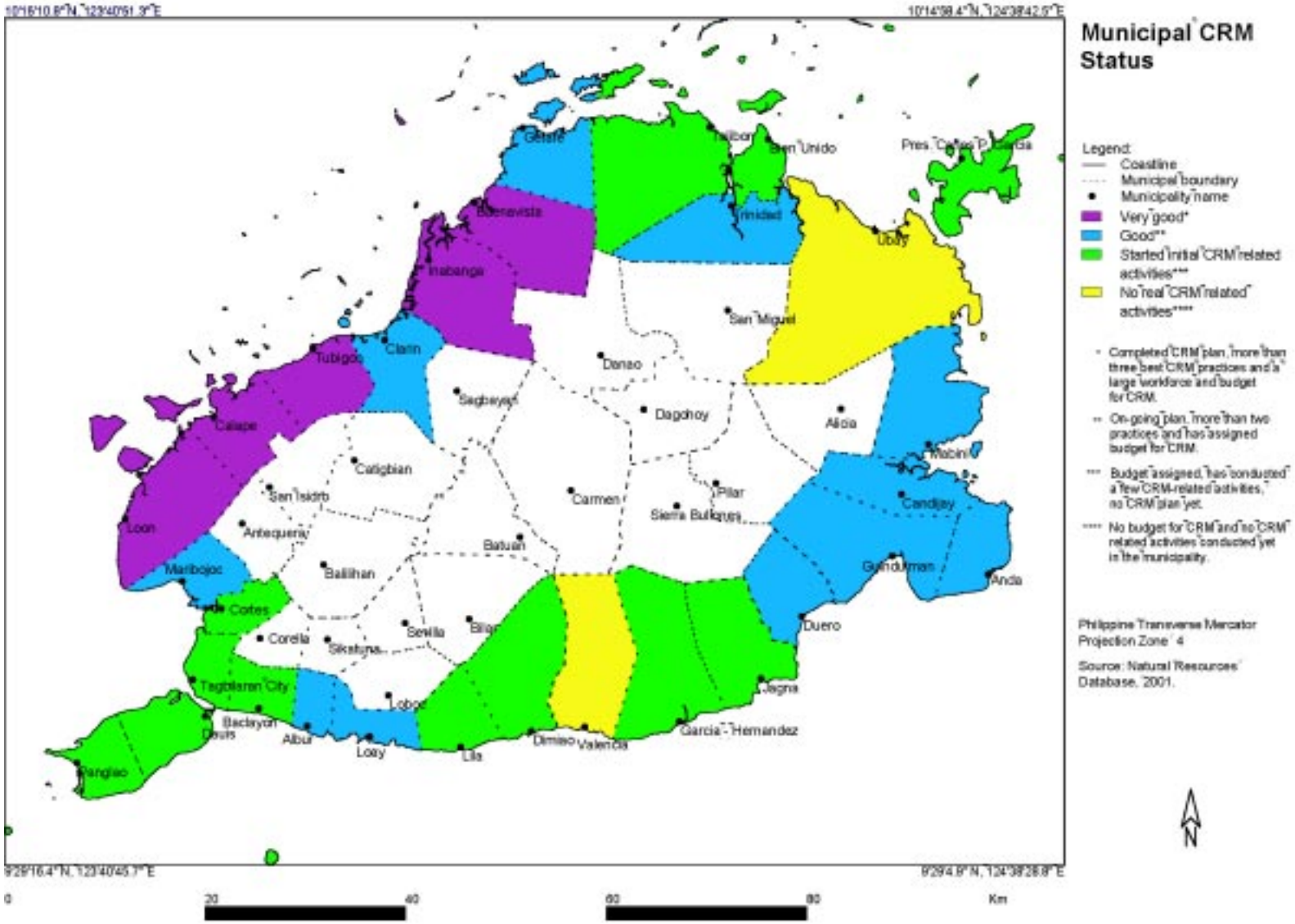


Figure 5.16. Map of municipal CRM status in Bohol as of December 2001

- Marine sanctuaries (especially those which are successful) could establish a diver's fee to help in the maintenance and monitoring (guarding and patrolling against illegal fishers or offenders) costs of the communities.

- A training on snorkeling and diving could be conducted for coastal LGU leaders involved in CRM (i.e. mayors, provincial staff). Only several officials in Bohol (e.g. SB members of Panglao, Mayor Cesar Tomas Lopez of Loon) can actually dive.

- IEC on coral reef management by dive shop owners and experienced divers to local communities and divers who come to visit.

- More integration of views and information of divers, as they are one of the stakeholders of the coastal ecosystem of Bohol, into coastal management activitie=s. They could considerably help in CRM in the province and have a huge stake in what happens to the reefs.

- A set of guidelines for diving in Bohol should be established by the dive shops and imposed on visiting divers. Newly certified divers should not be allowed in the best dive sites or their access regulated.

- High profile activities such as "celebrity dives" and dives for a cause can help bring added educational value, such as the one held in 1999 in Cabilao Island, Loon attended by celebrities from Manila including Jim Paredes, Redford White and Wowie de Guzman.

SUMMARY

Coastal LGUs of Bohol have made considerable progress in achieving CRM benchmarks and implementing CRM best practices. Most municipalities have initiated some form of CRM program (Figure 5.15). Selected municipalities have achieved the key CRM benchmarks associated with the 5-phase CRM process. Only a couple of municipalities have not initiated any CRM activities.

CRM plans and programs of coastal municipalities and cities may vary depending on the needs and priorities of the stakeholders. It is essential for any CRM program; however, to have a strategic direction, starting slowly and aiming for quality even at the initial stage of implementation. Then, building on this using the CRM project planning cycle, learning along the way, and expanding the scope of the project, with staff capability and community acceptance of CRM no longer an option but an essential part of everyday life.

The paradigm shift in the management of our various ecosystems, one that embraces sustainable management of the resources by actively involving the grass roots level, is a big leap from the traditional bureaucratic process. In the past, the decision and development of management strategies were just handed down from the top without really understanding the needs of those at the lowest level - the community. Now, issues and decision-making no longer start from generalities (issues are looked at the macro level), but through the actual manifestations of people directly affected or involved in the management of the coastal and marine resources.