BOHOL ISLAND: ITS COASTAL ENVIRONMENT PROFILE

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Enhancing and facilitating greater partnership between all coastal stakeholders in implementing coastal resource management in the Province of Bohol.

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UNDP - Global Environment Facility
Bohol Foreign Friendship Foundation, Inc.

2002

" The most exciting phrase to hear in science - the one that heralds new discoveries - is not 'Eureka!' ('I found it!') but rather 'Hmm … that's funny…'. "

- Isaac Asimov

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tables, figures, matrices and box items

Tables

Figures

Matrices

Box Items

acronyms and abbreviations

A & D	Alienable and Disposable
AFA	Area Focus Approach
AFMP	Agriculture and Fisheries Modernization Plan
AGNIPA	Agahay Nipa Planters Association
ALIMANGO	Abatan-Lincod Mangrove and Nipa Growers Association
AT	Aquaculture Technician
ATI	Agricultural Training Institute
AusAID	Australian Agency for International Development
AWP	Annual Work Plan
BANGON	Bohol Alliance of Non-Government Organizations
BCRMTF	Bohol Coastal Resource Management Task Force
BEMO	Bohol Environment Management Office
BFAR	Bureau of Fisheries and Aquatic Resources
BFI	Bol-anon Foundation, Inc.
BIDEF	Bohol Integrated Development Foundation, Inc.
BIPC	Bohol Investment Promotion Center
BMT	Bohol Marine Triangle
BTO	Bohol Tourism Office
BWRP	Bohol Watershed Reforestation Project
CADC	Certificate of Ancestral Domain Claim
CALC	Certificate of Ancestral Land Claim
CBCRM	Community-Based Coastal Resource Management
CBFMA	Community-Based Forest Management Agreement
CBFMP	Community-Based Forest Management Program
CBRMP	Community-Based Resource Management Project
CDA	Cooperative Development Authority
CENRO	Community Environment and Natural Resources Office/Officer
CEP	Coastal Environment Program
CIDA	Canadian International Development Assistance
CIS	Communal Irrigation System
CLEC	Coastal Law Enforcement Council
CLUP	Comprehensive Land Use Plan
cm	centimeter
CPG	Carlos P. Garcia
CPUE	catch per unit effort
CRM	coastal resource management
CRMF	Community Resource Management Framework
CRMP	Coastal Resource Management Project
CSC	Certificate of Stewardship Contract
CVRP-I	Central Visayas Regional Project - I
CVSCAFT	Central Visayas State College of Agriculture, Forestry and Technology
DA	Department of Agriculture
DAO	Department Administrative Order

DAR	Department of Agrarian Reform
DECS	Department of Education, Culture and Sports
DENR	Department of Environment and Natural Resources
DepEd	Department of Education
DILG	Department of Interior and Local Government
DOF	Department of Finance
DOJ	Department of Justice
DOLE	Department of Labor and Employment
DOST	Department of Science and Technology
DOT	Department of Tourism
DSWD	Department of Social Welfare and Development
DTI	Department of Trade and Industry
ECC	Environmental Compliance Certificate
EIA	Environmental Impact Assessment
ELAC	Environmental Legal Assistance Center
EMS	Environmental Management System
ESSC	Environmental Science for Social Change
FAD	fish aggregating device
FAO	Fisheries Administrative Order
FARMC	Fisheries and Aquatic Resources Management Council
FCB	First Consolidated Bank
FCBFI	First Consolidated Bank Foundation, Inc.
FLA	Fishpond Lease Agreement
FLMA	Forest Land Management Agreement
FPE	Foundation for Philippine Environment
FRMP	Fisheries Resource Management Project
FSP	Forestry Sector Project
FTC-P	Feed the Children - Philippines
g	gram
GIS	Geographic Information System
GOCC	Government Owned and Controlled Corporation
GOLD-ARD	Governance and Local Democracy - Associates in Rural Development
GPS	Geographic Positioning System
GT	gross ton
ha	hectare
HNU	Holy Name University
ICC	International Coastal Clean-up
ICM	integrated coastal management
ICRI	International Coral Reef Initiative
IEC	information, education and communication
IMA	International Marinelife Alliance
IPAP	Initial Protected Area Plan
IPOPCORM	Integrated Population and Coastal Resource Management
IRA	Internal Revenue Allocation
IRRDP	Inabanga Rural Rehabilitation and Development Project
ISFP	Integrated Social Forestry Program
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
kg	kilogram
KKK	*Kilusang Kabuhayan at Kaunlaran*
km	kilometer
km^2	square kilometer
kW	kilowatt

LC	Land Classification
LEAD	Livelihood Enhancement and Development
LGU	Local Government Unit
LHC	live hard coral
LMP	League of Municipalities of the Philippines
LOGODEF	Local Government Development Foundation
LOGOFIND	Local Government Financial Development
m	meter
m^2	square meter
m^3	cubic meter
MAFC	Municipal Agriculture and Fisheries Council
MAO	Municipal Agricultural Office/Officer
MARICOM	Maritime Command
MARINA	Maritime Industry Authority
MCD	Municipal Coastal Database
MFARMC	Municipal Fisheries and Aquatic Resources Management Council
MFO	Municipal Fisheries Ordinance
MLGOO	Municipal Local Government Operations Office/Officer
MLGU	Municipal Local Government Unit
mm	millimeter
MOA	Memorandum of Agreement
MOOE	Maintenance and Other Operating Expenses
MOU	Memorandum of Understanding
MPA	marine protected area
MPCI	Multi-Purpose Cooperative Incorporated
MPDC	Municipal Planning and Development Coordinator
MPDO	Municipal Planning and Development Office
MTPDP	Medium-Term Philippine Development Plan
MTWG	Municipal Technical Working Group
NAMRIA	National Mapping and Resource Information Authority
NAPOCOR	National Power Corporation
NEDA	National Economic Development Authority
NFP	National Forestation Program
NGA	national government agency
NGO	non-government organization
NIPAS	National Integrated Protected Areas System
NRDB	Natural Resources Database
NSO	National Statistics Office
OPA	Office of the Provincial Agriculturist
OPSWD	Office of the Provincial Social Welfare and Development
PA	protected area
PACAP	Philippine-Australia Community Assistance Program
PAMB	Protected Area Management Board
PASu	Protected Area Superintendent
PATH	Program in Appropriate Technology in Health Foundation Philippines, Inc.
PAWD	Protected Area and Wildlife Division
PAWS	Protected Area and Wildlife Services
PCRA	Participatory Coastal Resource Assessment
PCG	Philippine Coast Guard
PD	Presidential Decree
PENRO	Provincial Environment and Natural Resources Office/Officer
PFO	Provincial Fishery Office
PIA	Philippine Information Agency

PIO	Provincial Information Office
PLGU	Provincial Local Government Unit
PNP	Philippine National Police
PO	people's organization
PP	Presidential Proclamation
PPDC	Provincial Planning and Development Coordinator
PPDO	Provincial Planning and Development Office
PPFP	Provincial Physical Framework Plan
PROCESS	Participatory Research, Organizing of Communities and Education towards Struggle for Self-Reliance
PTA	Philippine Tourism Authority
PTWG	Provincial Technical Working Group
RA	Republic Act
RED	Regional Executive Director
RICH	Rehabilitation in Conservation Hotspots
RSNP	Rajah Sikatuna National Park
RUP	Resource Use Plan
SAC	Social Action Center
SAFDZ	Strategic Agriculture and Fisheries Development Zone
SB	*Sangguniang Bayan*
SEC	Securities and Exchange Commission
SP	*Sangguniang Panlungsod/Panlalawigan*
SRA	Social Reform Agenda
SSS	Social Security System
SU	Silliman University
SWS	Social Weather Station
TESDA	Technical Education and Skills Development Authority
TSEPRLI	Training Services Enhancement Project for Rural Life Improvement
TWG	Technical Working Group
UB - CDF	University of Bohol - Community Development Foundation
UNDP - GEF	United Nations Development Program - Global Environment Facility
UP - MSI	University of the Philippines - Marine Science Institute
USAID	United States Agency for International Development
VSO	Voluntary Service Overseas
WPWRP	Wahig-Pamacsalan Watershed Reforestation Project
WWF	World Wildlife Fund

glossary

Bag net. A mobile impounding drag net, locally called 'basnig'. This is a conical or cubical net operated with the aid of light on dark nights. A lifting motion effects the capture. Requires about 7 to 10 people.

Bottom set gill net. An entangling net which is locally called 'pamante-triple' or 'pamante-abay' or by the generic name for gill net, 'pukot'. This net is anchored, weighed down, or attached to the bottom so that it is not free to move with the water current.

Commercial fishing. Fishing for commercial purposes in waters more than 15 km from the shoreline with the use of fishing boats of more than 3 GT.

Drift gill net. An entangling net commonly called 'pamo'. It is also locally referred to as 'pamante', 'patuloy', 'pangtamban', or by the generic gill net name, 'pukot'. When used at night, with light, it is also referred to as 'pang-anduhaw'. This type of gill net is usually fixed to boats and is free to move with the wind or tide, and is used throughout the year.

Fish cage. Any method of culture of fish and aquatic resources in a fish enclosure which is either stationary or floating, made up of nettings or screens sewn or fastened together and installed in the water with opening or cover at the surface and held in place by wooden/bamboo post or various types of anchors and floats.

Fish corral. Locally known as 'bunsod', this is a guiding barrier constructed of bamboo and/or nets which are set by means of regularly spaced stakes or posts in tidal waters or along the natural paths of fish into a desired area. Trapped fish may be collected daily during the morning, especially during the months of May to December.

Fish pen. An artificial enclosure constructed within a body of water for the culture of fish and aquatic resources made up of bamboo and other poles arranged in an enclosure with either fine bamboo materials, screen, or nylon netting to prevent escape of fish.

Fish sanctuary. A place set aside or an established fishery reserve or fish refuge and sanctuary where it shall be unlawful for any person, corporation, and cooperative to conduct any fishing operation or disturb, take, catch, destroy, or kill any marine organism within the designated body of water.

Fish trap. Locally called 'panggal', is a set trap or enticing device made of bamboo or rattan which is a regular, usually rectangular, receptacle preventing escape of fish by means of trap doors or tricky passageways. Trapped fish may be collected at regular intervals, in terms of days or weeks.

Fishery. The business of catching, taking, raising, culturing, handling, marketing, and processing of fish and other aquatic products. The fishing grounds, the right to fish, or take such products therein.

Fishery reserve. A designated area or areas in municipal waters or Philippine waters either by ordinance or proclamation as fishery reservation for the exclusive use of the government or of the inhabitants thereof or for the culture of fish and other aquatic animals for educational, scientific, and conservation purposes or fishing rights reserved for exclusive use of the government.

Gill net. Variously sized entangling net in which capture of fish is by gilling effected by the actual meshes of the net. This is commonly referred to by locals as 'pukot', 'palaran', 'pamalo', 'panglambay', 'panglampornas', 'pangtamban', 'pukot-doble', 'pukot-triple', 'pukot-paapong' (with light).

Lift net. A mobile impounding net in which capture is effected by a vertical lifting motion of the gear. It is locally called baling usually used with petromax.

Long line. An extremely long line with a large series of baited hooks, either set or drifting, and requiring only periodic attention at more or less fixed time intervals. Generic local name is 'pasol' (for line) with hook numbers ranging from 2 to 1,000 and hook sizes ranging from #12 to #17, #100 to #120, #565 to #579. Filament size varies from nylon #8 to #150. Other local names are 'palangre', 'katay', 'pasol-pambariles', 'panubid', 'undak'.

Multiple hook and line. A collective name applied to all handlines with multiple hooks including set or drift long lines. Multiple handlines are composed of a single vertical line with a small series of barbed hooks attached to it by spreaders at regular intervals.

Municipal waters. Waters included between two lines drawn perpendicular to the general coastline from points where the boundary lines of the municipality or city touch the sea at low tide and a third line parallel with the general coastline and 15 km from it. It also includes streams, lakes, and tidal waters within the municipality, not being the subject of private ownership and not comprised within the national parks, public forests, timberlands, and forest reserves. However, where two municipalities are so situated on the opposite shores that there is less than 15 km of waters between them, the third line shall be equally distant from the opposite shores of the respective municipalities.

Scoop net. Also referred to as scoop seine which is basically a small purse seine employed as an accessory gear in hauling the catch direct from the large semicircular enclosure of deepwater fish corrals which may be devoid of a collecting pond or crib. It also refers to a fishing method wherein schools of fishes lured towards surface waters by light are scooped out of the water with a circular net. Locally called 'sudsud' (with petromax).

Single hook and line. Also called simple handline or drop line. A single vertical line carrying one or two barbed, baited hooks and worked simply by dropping into the water and waiting for a fish to bite. Generic local name is 'pasol' or 'subid'. Also called by various names, most often after the most dominant species in the catch, such as 'manubid-pamarilis', 'pambaka', 'pamirit', 'pangaraw', 'palutao' ('ulang'), 'pamalo', 'pamariles' (deep-sea fishing), 'pamirit', 'pangtangigue', 'pawin', 'subid', 'undak' (with light). Hook sizes range from #06-#20 to #566-#571 while filament size varies from nylon #8 to #190.

Spear gun. Locally called 'pana' or 'pamana', sometimes 'pana-suga'. It constitutes a hand instrument provided with pointed, barbed, or barbless blades at the straight tip which are not detachable from the handle or shaft. It can be thrown by hand although sometimes shot from a gun or bowlike device. It is used at night or dawn, with a light source. Fishers may come in groups of two or three with one spear gun each.

Squid trap. Similar to fish traps with screen as siding and specifically targets squids by using squid-attracting baits.

acknowledgments

The ***Bohol Island: Its Coastal Environment Profile*** contains a great deal of information compiled by national and local government agencies, non-government organizations, fisherfolk, people's organizations and other entities actively involved in coastal related activities.

The editors would like to acknowledge in particular the following agencies, organizations and institutions and their staff for the help they have extended in the completion of this profile:

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Philippine National Police - Provincial Command
Philippine National Police - 703rd Maritime Command
Philippine Coast Guard
Department of Interior and Local Government - Provincial Office
Department of Education
DENR - Provincial Environment and Natural Resources Office, Bohol
DENR - Community Environment and Natural Resources Office, Tagbilaran City
DENR - Community Environment and Natural Resources Office, Talibon
Bureau of Fisheries and Aquatic Resources - Provincial Office
Bohol Investment Promotion Center
Bohol Alliance of Non-Government Organizations
PROCESS-Bohol
Feed the Children - Philippines
Environmental Legal Assistance Center - Bohol
Holy Name University - Research Center
University of the Philippines - Marine Science Institute
League of Municipalities of the Philippines - Bohol Chapter
National Statistics Office
Bohol Tourism Office
LMP - Bohol Chapter

We would also like to thank all the coastal municipal LGUs of Bohol as represented by their Chief Executives, Municipal Planning and Development Coordinators, Municipal Agricultural Officers and the members of the *Sangguniang Bayan*; fisherfolk; *barangay* captains and all the people who have shared their thoughts and ideas which compose this profile.

In as much as we give due credit to all our resource persons. All photos courtesy of Mr. Stuart J. Green unless specified.

The editors have made efforts to ensure that the data included in this profile are up-to-date and validated, however, there may be some errors/inaccurate data for which the editors take full responsibility.

Daghan kaajong salamat!

Republic of the Philippines
PROVINCE OF BOHOL
City of Tagbilaran

OFFICE OF THE GOVERNOR

Message

Stretching 654 kilometers in coastline, the Province of Bohol is blessed with some of the most biologically diverse habitats in the world especially when we talk about coastal resources. From mangrove (with over 32 known species), coral reef, seagrass to deep-sea ecosystems. These ecosystems serve as the life-support system of all coastal and marine living forms and provide balance to nature. The many bounties found in these ecosystems constitute the major source of protein of the Boholanos and income of our fisherfolk which number to about 80,000 or so.

However, unabated human pressure has stressed our coastal and marine ecosystems and are now badly in need of management and protection that will sustain through time.

True to the vision of Bohol, we must ensure that our coastal and marine resources do not just become things of the past — which we see only in books — but a living memory for all generations to inherit and enjoy.

Bohol Island: Its Coastal Environment Profile aims to look at the coastal environment of Bohol in order to have a basis in planning our next activities or interventions relative to conserving, managing and protecting our coastal resources. It gives us a glimpse of the real picture of what is happening in the coastal areas of Bohol and its status at the moment.

I therefore encourage you all to use this profile as a guide to our CRM activities across the province and hope that it will help us all to coordinate and work together. With this, we are guaranteed greater success as we are one of the provinces in the country that has taken our mandate very seriously to ensure the sustainable development of our coastal ecosystem for a lifelong enjoyment of our coastal resources and the well being of our people.

ATTY. ERICO B. AUMENTADO
Governor

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Republic of the Philippines
PROVINCE OF BOHOL
City of Tagbilaran

OFFICE OF THE VICE-GOVERNOR

Message

It will always be Bohol's pride that we have finally come up with the ***Bohol Island: Its Coastal Environment Profile*** that will highlight the initiatives that the province have embarked on towards a comprehensive and sustainable development in our coastal resource.

I would like to give due credit to the people who had been the key players towards the realization of the coastal management initiative in Bohol, especially those who have been there since the inception of the program. The marine sanctuaries of Bohol have been a constant source of pride among our people, and as we strengthen our crusade towards its protection and proper management, I am enjoining all sectors in our community to work with us in working out and institutionalizing the different coastal resource management (CRM) plan that we have formulated. Only through a collective awareness of our responsibility towards our marine and coastal bounties that we begin to truly appreciate the benefits that it can bring to our people on a long-term basis.

The challenge of sustaining our environmental endeavors in the entire province is a growing concern that should not only inform us of the real need to exert greater effort to continue our initiatives. With the Bohol Environment Code which is the first local legislation codified in the entire Philippines, we, in the *Sangguniang Panlalawigan* of Bohol will continue confronting the greater challenge of maximizing the effectiveness of the legal mandates of the Code to give maximum protection to our environment especially the coastal and marine sectors.

I am optimistic that this ***Bohol Island: Its Coastal Environment Profile*** will be a step forward towards fulfilling our vision, as Boholanos, and as stewards of our one and only environment.

November 15, 2001
Tagbilaran City

ATTY. JULIUS CAESAR F. HERRERA
Vice-Governor
National President
Vice-Governors' League of the Philippines

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BOHOLANO FOREIGN FRIENDSHIP FOUNDATION, INC.

Message

The BOHOLANO FOREIGN FRIENDSHIP FOUNDATION INC., or the BFFFI, is a development institution in Bohol, a non-stock and non-profit organization, established in June 2000, consisting of foreign residents and Boholanos, envisioned to contribute to the over-all development of the island province. Founded by German philanthropist Hans Schoof, the BFFFI is a convergent forum of Boholanos and Foreign residents in Bohol to enhance Bohol's quality of life.

Its main areas of development are environment, livelihood, health, education, inter-cultural understanding and cooperation, arts and cultural heritage, eco-cultural tourism, promotion of rights and duties of foreign residents, and promotion of peace.

The birthing of the first international organization of Boholanos and foreign residents in the province marks the international community's commitments to the principles of universal brotherhood and cooperation, especially inspired by the Great International Malayan himself, Dr. Jose Rizal.

AIMS AND CONCERNS:

- To provide a venue for Boholanos and foreign residents in Bohol for positive interaction, cooperation and solidarity towards developing an international brotherhood/sisterhood for development;
- To promote the various potentials and assets of Bohol province nationally and internationally as having a strong development potentials in eco-cultural tourism and other areas of human and social development;
- To directly aid upgrading the less privileged sectors of Boholano society through partnerships in programs for livelihood, health and education;
- To contribute to the development of Boholano arts and cultural heritage through collaboration with Boholano artists and cultural institutions;
- To facilitate the development of Bohol as an Eco-Cultural Tourism Destination by helping provide international standards.
- To provide a professional forum for foreign residents to know and affirm their rights and duties as foreign residents in Bohol and in the Philippines; and
- To promote ways of living and working together in peace within the context of global understanding

PROGRAM SERVICES:

The various program areas of the BFFFI that will help realize these aims are:

PROMOTIONS AND ADVOCACY: *festivals, publications, websites, interactive CD roms, conferences*
PARTNERSHIPS IN PROGRAM DEVELOPMENT: *training, seminars, workshops, technological skill-share, project development assistance, collaboration in livelihood programs*
EVENTS ORGANIZING: *concerts, exhibits, tours, performances*
NETWORKING AND LINKAGES: *fora, memberships in international and national associations*

Sharing skills•Changing lives

VOLUNTARY SERVICE OVERSEAS (PHILIPPINES)

Message

VSO is an international development charity that works through volunteers. http://vso.org.uk
SPARK webpages: http://vso.org.uk/overseas/spark.htm

One of the programmes of VSO is SPARK (Sharing and Promotion of Awareness and Regional Knowledge).

SPARK is a five-year program which started in January 2000 that aims to promote community-based approaches to natural resource management and sustainable livelihoods in the Philippines, Indonesia, and Thailand. SPARK comprises an integrated package of complementary components to support existing organizations and communities in implementing community-based natural resource management (CBNRM) activities. These components include volunteer development workers (VDWs), small grants, conferences and workshops, research, study tours, secondments, scholarships, programme newsletter, and directory of CBNRM practitioners.

The implementation of the program in each country is informed by an advisory group comprising of four key proponents of CBNRM, two local employers of VSO volunteers and two VSO volunteers. SPARK also works closely with a hub organization in each country to ensure that the benefits gained during the five-year life span of the project will remain within the CBNRM network in each country.

SPARK hub organizations:

- Environmental Science for Social Change (ESSC), c/o Sylvia Miclat: essc@admu.edu.ph
- Thailand: Thai Development Support Committee (TDSC), c/o Khun Wipaphan Korkeatkachorn: tdscthai@asiaaccess.net.th
- Indonesia: The Indonesian Tropical Institute (LATIN), c/o Arif Aliadi: aaliadi@latin.or.id

UNITED NATIONS DEVELOPMENT PROGRAM -

GLOBAL ENVIRONMENT FACILITY

Bohol Marine Triangle

Message

The Global Environment Facility was established to forge international cooperation and finance actions to address four critical threats to the global environment: biodiversity loss, climate change, degradation of international waters, and ozone depletion. Related work to stem the pervasive problem of land degradation is also eligible for GEF funding.

Launched in 1991 as an experimental facility, GEF was restructured after the Earth Summit in Rio De Janeiro to serve the environmental interests of people in all parts of the world. The facility that emerged after restructuring was more strategic, effective, transparent, and participatory. In 1994, 34 nations pledged $2 billion in support of GEF's mission; In 1998, 36 nations pledged $2.75 billion to protect the global environment and promote sustainable development.

The GEF can succeed in its global environmental mission only as part of a worldwide movement toward sustainable development. GEF brings together 166 member governments, leading development institutions, the scientific community, and a wide spectrum of private sector and non-governmental organizations on behalf of a common global environmental agenda.

Biodiversity Conservation and management of the Bohol Islands Marine Triangle

Housed under the GEF Asia and Pacific Biodiversity window, a new project begun in 2001 in Bohol, under the GEF and UNDP. The project management office is under the Foundation for the Philippine Environment (FPE) and this is the first GEF funding in the Philippines ever given to an NGO for implementation. The project preparation began in 1998, but finally after three years it was released.

This project addresses the priorities of the Philippine National Biodiversity Action Plan (NBSAP), the Philippine Marine Policy, and the Philippine Agenda 21. It also complements past and existing Philippine coastal resource management projects, such as the Coastal Environmental Program in coordination with the National Integrated Protected Areas System, the Coastal Resource Management Project, and the Central Visayas Regional Project-I (CVRP-I) and II. The project focuses on managing the coastal resources of Panglao, Dauis and Baclayon which is a highway and resident area for globally significant marine resources, coral reefs and marine mammals.

The overall objective of the initiative is to ensure the protection of globally significant marine ecosystems and resources in the Bohol Islands Marine Triangle and manage the 'triangle' and the surrounding area on a sustainable and ecologically sound basis.

preface

History and Rationale of the Profile

In 1997, the Province of Bohol had the first Environment Summit in the Philippines. The summit called together all natural resource stakeholders of Bohol and solicited their comments and advices on how to get Bohol on track towards the direction of sustainable development in its true sense.

Through the work of many partners and using the workshop outputs of the various Technical Working Groups, the Bohol Environment Code was crafted. The Bohol Environment Code set out a natural resource agenda for the province and mandated the creation of the Bohol Environment Management Office to be the Province's arm in natural resource management. One of the mandates of the BEMO is to manage and focus on supplying up-to-date and accurate information for use in planning and implementation of relevant activities and programs for Bohol's environment sector.

Since 1999, the BEMO, under the Provincial Planning and Development Office, in coordination with the DENR-CRMP and other partners such as the VSO, BANGON, OPA, DENR (PENRO Bohol, CENROs Tagbilaran City and Talibon) and BFAR, has been working on developing an information management system for the Province. The system considers all sectors of the environment but which initially focused on information needs for coastal resource management to model the information requirements.

Why the need for information management at the provincial level?

Like any management decision, accurate, timely and up-to-date information is needed. CRM covers huge areas [coastal waters in Bohol's coastal municipalities are approximately two and a half times bigger than the land component to manage (Courtney and Traub, 1999)]. It also covers a wide variety of complex social issues that need to be resolved. Scientifically-based decisions in governance, with full participation of all resource users, is the key to a successful CRM.

Therefore, for the LGUs, FARMCs, planners and project initiators, there must be a simple, accessible and retrievable information set. This information set should be in a possibly visual format so that trends and situations can be easily assimilated. This can ensure all our CRM activities and projects can have reasonable and suitable targets. The information contained in this profile are meant to act as a one off "snapshot" of coastal resources and we hope that these will be used as baseline upon which to base our coastal management decisions.

A well-managed information database is essential. This information should benefit not only one office but should be shared among all resource users and decision makers. Hence, the development of this profile uses all the combined and current information of the Natural Resources Database (NRDB) of the BEMO and the Municipal Coastal Database (MCD) of the Coastal Resource Management Project. The information management system also acts as the home of the institutional memory of Bohol's CRM programs and activities. With this acting as basis, we can build greater exchange of information with newer, more specific and additional CRM information. Significantly, this means that the information collection phase should, as much as possible, be standardized and systematized so that the frontliners and planners can use the data to immediately see Bohol's "big picture".

The information management system of the Province was developed from two independent systems that, through the combined efforts of the BEMO and VSO, are compatible with each other and made available to all resource users. We hope that we will all use these and share our information with the database to ensure its evolution.

First, is the Municipal Coastal Database (MCD) which was designed and developed by the DENR-CRMP. This was designed to simplify and standardize the monitoring and evaluation of CRM at the Municipal LGU level for eventual widespread dissemination across the Philippines. This can be used by the LGU as a guide in the implementation of CRM programs as well as in reporting the progress made in managing its municipal waters. Moreover, the MCD can be used as a guide for outside institutions and other partners in evaluating their CRM interventions at the LGU level and to benchmark and compare the development of LGUs across a wider perspective, i.e., at the provincial level. The MCD for Bohol was developed in coordination with DENR-CRMP and BEMO-VSO and feeds directly into the Natural Resources Database (NRDB) of the BEMO.

Second, is the NRDB which was designed by VSO volunteer Richard Alexander in coordination with the BEMO. This will be the main information management tool of the Province for the future. This covers the sectors on watershed management, integrated solid waste management, coastal resources management, environmental management system and database management itself and other information relevant to planning and prioritization of activities for the Province.

All these information contained in the database are accessible to anyone interested through its website. Memorandum of Agreement has been made between some agencies and organizations such as the DENR-PENRO Bohol, PROCESS-Bohol and Bureau of Agricultural Statistics to allow information sharing between these agencies and eventually develop the NRDB as the center of Bohol's information pertaining to the environment.

Why write a Bohol coastal profile?

This profile is the first of the Bohol NRDB-MCD profiles and focuses on the coastal ecosystems of Bohol. Future profiles on watershed management, solid waste management, environmental management system, etc. may follow.

It is therefore important for us to know what information we have on these resources so that we can plan correctly and ensure that all of our limited resources go into the development of a better coastal resource management and its in the future. With a community-based and LGU led coastal resource management in the Province of Bohol, it is only then that we will be able to manage and secure the resources of Bohol for the future.

executive summary

OBJECTIVES OF THE PROFILE

This profile attempts to present the overall situation of Bohol on the status of its coastal resources, trends and current reality analysis in a simple, understandable and semi-map-based format. It also tries to illustrate and reinforce the often overlooked role of the Provincial Government and its Bohol Environment Management Office and other key offices. Moreover, it illustrates the huge potential of the BEMO to offer technical assistance, systematize and standardize CRM initiatives in the province, as well as being the "institutional memory conduit" of what key agencies and NGOs are doing in Bohol for natural resources management.

Specific Objectives

- To reinforce the huge role that information management in CRM plays, and publish the data included in the Natural Resources Database (NRDB) of the BEMO and the Municipal Coastal Database (MCD) of the CRMP.

- To encourage all agencies to use, validate and even suggest amendments to the data contained in this profile and share and build upon the NRDB in the BEMO for the benefit of all.

- To propose a common CRM framework (best practices) for Bohol and showcase some best model practices already incorporated in the CRM framework to ensure that all agencies involved in CRM can build upon these and not just learn the same lessons over and over again.

- To act as a working documentation for CRM implementation in the province and try and identify key trends and areas where future technical assistance projects could be directed for the help of funding agencies and other agencies interested in working in Bohol.

- To be the first of a series of sectoral studies of the BEMO and consolidate the learnings of the Coastal Resource Management Project and the CRM Section of the BEMO since the two began working together in Bohol offering technical assistance on CRM to LGUs and communities.

The information contained in this profile were collected from the NRDB of the BEMO, MCD, PCRAs of coastal towns, reports and documents of various primary sources specifically NGAs and NGOs working on CRM, and coastal MLGUs and communities of Bohol.

introduction

Chapter 1

"A journey of a thousand miles begins with the first step."

The coastal environment is like a magnet, attracting the interests of many people to the shoreline, mangroves, coral reefs, and fisheries that inhabit the nearshore waters. It has been said that "the coasts are the crossroads of human activity with the sea" (Weber, 1993). Indeed, the majority of Boholanos are directly dependent on the coastal resources for food and livelihood. Coastal communities are dependent on their daily catch of fish to meet their families' basic dietary needs. Coastal areas provide protection from storms and typhoons, recreation, main navigation routes for people and commodities, eco-tourism opportunities, and a medley of cultural, economic and ecological benefits. The development of the province and its people depends on maintaining the wealth and health of its coastal resources. Unfortunately, over the years we have trampled this coastal crossroad with our activities and as a result, we are quickly losing the fundamental basis for economic development, a sound environment and natural resource base.

Boholanos, together with their local government units, however, have recognized the urgent need to protect our coastal environment. Together, with committed partners from national government agencies, NGOs, and foreign funding agencies, we are making rapid progress in managing and protecting our coastal resources. This profile describes the current condition of our coastal environment and summarizes our progress in managing these vital resources. As such, it also serves as a benchmark for measuring our future progress.

PHYSICAL SETTING OF BOHOL

Bohol lies in the heart of the Central Visayas, geo-politically known as Region VII, along with the provinces of Cebu, Siquijor and Negros Oriental. Bohol lies on the periphery of the Camotes Sea along with the island provinces of Cebu on the northwest and Leyte and Southern Leyte on the northeastern and southeastern boundaries, respectively. It has 654 kilometers of coastline and 6,245 square kilometers of municipal waters covering the major islands and islets (CRMP, 2002). Encompassing a total land area of 411,726 hectares, it is the tenth largest province in the country (PPDO, 1993).

Bohol is composed of 48 municipalities with 15, 14 and 19 municipalities composing the first, second and third congressional districts, respectively. Thirty of these municipalities, or 62.5 percent, are situated along the coast. The rest are interior towns.

Based on land classification (LC), about 101,271 hectares of the total land area of Bohol is timberland, while 310,455 hectares is alienable and disposable (A & D) land. Communities of the interior towns are mostly engaged in agriculture as their primary source of income.

Dry season in Bohol occurs from January to May while the rest of the year is wet with occasional strong winds bouncing between the two monsoons, the 'amihan' and 'habagat' winds.

> *It is interesting to note that the total municipal waters of the 29 coastal municipalities and one city are two and a half times the size of their aggregate land area — a huge area to manage yet only very few local government units (LGUs) have begun to manage.*

SOCIO-ECONOMIC SETTING

People living in coastal areas depend on fishing as their primary source of income. Fishing provides food especially for the ordinary fisherman's family and a meager income to send his children to school and buy household necessities.

In most rural areas, family planning is not so much appreciated and the Bohol population is currently growing at the rate of 2.85% per annum (NSO, 2000). Most families think that the more children they have, the better hope there is for the family in the future. This may have been true in previous generations but is a dubious concept at the present time.

The population of the coastal municipalities grows faster than that of the interior municipalities (see Figure 1.4). Therefore, more and more people are turning to the sea for livelihood, especially at the present time where there are few other sources of income. During weekends, many of those from upland communities even go down into the coastal areas to glean and fish to supplement their protein needs.

With the meager income of the fisherfolk these days, people get caught in a vicious cycle of poverty. Small catch means no extra income for even the most basic of needs such as shelter and schooling for their children. As it is, the lack of quality resources creates a chain of impact, which means that their quality of life is dictated by the presence and quality of resources that they depend on.

OVERVIEW OF COASTAL AREA AND RESOURCE USE

Most coastal areas in the Philippines can be characterized by a de facto open access regime where coastal resource use is poorly managed and monitored. Without limits or restrictions on coastal resource use, there is little incentive to manage the coastal environment and anything and everything is hunted, extracted, or used for economic gain and sustenance. This regime is not

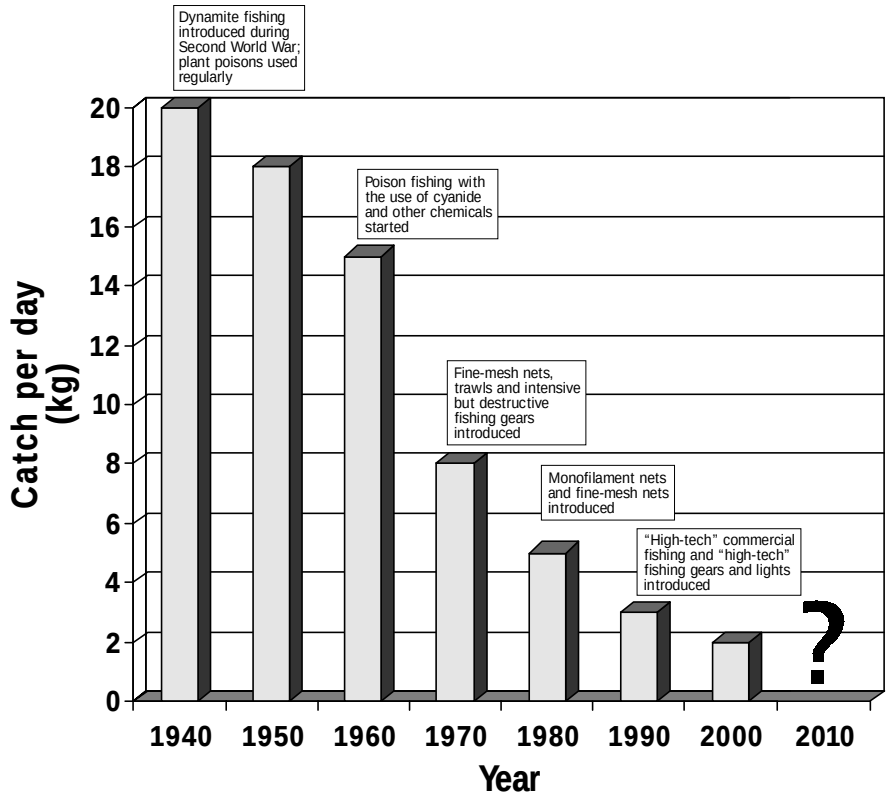
Boris and Irena Heberer

Pamilacan Island, Baclayon.

unique to the Philippines, where overexploitation of coastal resources and destruction of coastal shoreline and habitats are increasingly becoming the norm throughout the world.

Reduced fish catch, more and more mouths to feed, increased price of fishery products, and fewer fishers able to make a living from the sea is a common scenario around the province. The trend in fish catch in one town, Loon, illustrates the magnitude and reasons for the decline in the catch of marginal fishers (Figure 1.1). Bohol's coastal resources are severely degraded with a twenty-fold decrease in catch per unit effort (CPUE).

The majority of the Boholano fisherfolk are becoming more and more marginalized while a few commercial and illegal fishing financiers are still making a good living, albeit at the expense of 95% of the other fishers. A common joke in Talibon sums up all of it. In the older days, the sea was so abundant that families would just go down to the shore, and build a fire to boil water. Once the 'panakot' (vegetables and spices) were added to the pot of boiling water, the fisher would whistle and clap his hands, and the fish would jump into the pot. This may be a joke now but it illustrates just how abundant the fishery resources were in those days, however, nowadays, this is inconceivable.



Graph shows decreasing fish catch of marginal fishers in Loon as measured by catch per unit effort (kilograms caught per day) plotted against time. Proliferation of illegal fishing gears within municipal waters and subsequent decline in fish catch are common for the rest of Bohol. Data taken from the results of the participatory coastal resource assessment (PCRA) conducted town-wide in 1999 and from separate interviews with the fisherfolk to validate the information. Fish catch is standardized as the average catch of small-scale fisherfolk who use hook-and-line fishing gear and non-motorized (oar-driven) 'banca' or fishing boat, and fish for an average of 6-8 hours per day.

Figure 1.1. Declining fish catch of marginal fishers in the Municipality of Loon, Bohol

The open access regime has led to the destruction of critical coastal habitats and degradation of marine fisheries. Full-scale "liquidation" of coastal resources is taking place with little regard for the future. Corals are blown up, poisoned or smashed up to get expensive shells; mangroves cut down to give way to illegal fishpond development; and seagrass beds becoming saturated with pollutants and replaced by reclamation projects. The state ownership of all the natural resources and treasures of the country has led to their non-management or mismanagement.

A comparison of land-based and sea-based resources can provide a clearer picture of the effects of an open access regime. Let us take a look at two types of resources, a rice field and the sea (Box 1.1.) as a means to understand the difference in management regimes that are in place and the need for coastal resource management. For land-based resources, such as a rice field, the farmer would take all measures necessary to protect the resource not only for the current harvest, but to plan and implement measures to ensure future harvests. For sea-based resources, however, similar measures are rarely taken.

In order to change the current open access regime, coastal resources need to be viewed similarly to land-based resources, where "ownership" and responsibility is clearly defined and

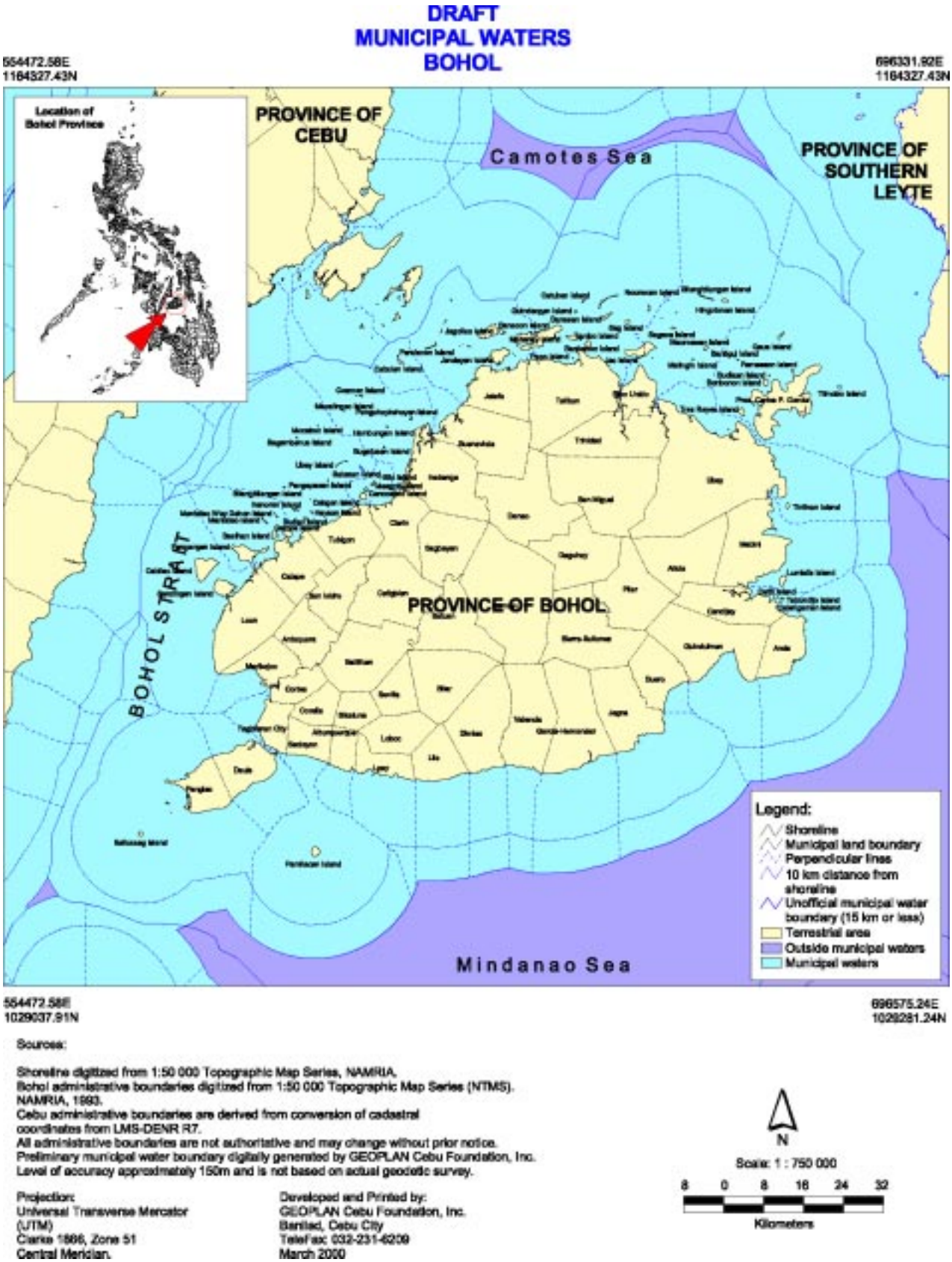


Figure 1.2. Map of draft municipal waters of Bohol

Table 1.1. Draft municipal coastline areas and lengths of Bohol[1]

Municipality	Area of Municipal Waters (Hectare)	Area of Municipal Waters (sq. km.)	Length of Shoreline (km.) *including* offshore islands[2]	Length of Shoreline (km.) *excluding* offshore islands
Alburquerque	3,203.20	32.03	5.88	5.88
Anda	48,722.73	487.23	21.19	21.19
Baclayon	44,924.74	449.25	11.13	6.78
Bien Unido	51,299.00	512.99	43.86	22.81
Buenavista	6,569.29	65.69	32.41	25.37
Calape	12,486.08	124.86	53.65	21.68
Candijay	1,529.73	15.30	32.82	28.68
Clarin	3,178.82	31.79	28.62	17.94
Cortes	122.24	1.22	7.30	5.97
Dauis	9,964.91	99.65	28.26	28.26
Dimiao	8,907.41	89.07	6.00	6.00
Duero	1,357.11	13.57	6.81	6.81
Garcia-Hernandez	19,891.07	198.91	16.44	16.44
Getafe	20,282.52	202.83	84.74	24.60
Guindulman	12,158.05	121.58	16.81	16.81
Inabanga	18,932.10	189.32	66.79	60.26
Jagna	28,855.95	288.56	13.55	13.55
Lila	12,543.90	125.44	8.67	8.67
Loay	10,754.12	107.54	13.58	12.97
Loon	37,707.94	377.08	60.94	34.42
Mabini	15,507.02	155.07	36.97	31.72
Maribojoc	3,692.48	36.92	17.26	16.54
Panglao	74,613.52	746.14	37.64	30.54
Pres. Carlos P. Garcia	57,470.18	574.70	79.62	64.39
Tagbilaran City	2,590.77	25.91	12.45	12.45
Talibon	52,466.33	524.66	98.92	33.53
Trinidad	42.64	0.43	98.92	1.95
Tubigon	38,176.30	381.76	1.95	14.97
Ubay	20,296.22	202.96	59.47	55.87
Valencia	6,259.64	62.60	6.58	6.58
Total	**624,506.01**	**6,245.06**	**1,009.23**	**653.65**

[1] Derived using Geographic Information System generated maps (draft).
[2] Including the perimeter of all offshore islands within the LGU coastal waters.

Reference : Coastal Resource Management Project - Geographic Information System, 2001

resource use is managed and sustainable. The Local Government Code of 1991, Philippine Fisheries Code of 1998, and other national laws established required regulatory regimes and management measures for coastal resource use. These laws mandate LGUs, together with coastal communities, to manage coastal resource use for sustainable development. The strict implementation of this national legal framework for coastal resource management will enable the recovery and rehabilitation of coastal resources to benefit all Boholanos.

Box 1.1. Comparative issues between two resources used for socio-economic benefits

Questions	Rice field	Sea
Are the boundaries of the area marked and clearly defined?	Yes	No
Do you plow, apply fertilizer and plant in the area?	Yes	Rarely (except for mangroves)
Do you vigilantly protect your resource?	Yes	Sometimes but normally not
Would you contemplate harvesting young/juveniles from the area?	No	Yes
Would you allow other people from other provinces, towns and villages to come and harvest your resource without asking permission and/or paying a certain fee?	No	Yes
Would you use chemicals, dynamite and other detrimental chemicals to harvest your resource?	No	Yes
Would you harvest all the resource without leaving juveniles/ seeds for next year?	No	Yes
Would you throw your rubbish and other wastes into your resource?	No	Yes
Would you allow industries and sewage to be poured directly into your resource with little monitoring?	No	Yes
Would you allow permanent structures to be built on your resource without your consent or legal permit?	No	Yes
Is it an open access resource?	No	Yes

A traditional subsistence fisherman repairing his small fishing net - Pamilacan Island, Baclayon

As population continually increases, the capacity of the coasts to regenerate and renew declines. Out of the total 1,109 *barangays* in Bohol, 304 are coastal *barangays* and 63 are island *barangays* (NRDB, 2001). Thus, it is fair to say that approximately 33% of Bohol's population is directly dependent on fishing and fisheries-related activities as major sources of income. Upland communities also consider Bohol's coastal resources as their number one source of cheap animal protein.

What is apparent in Bohol is that there are many people who depend on the coastal resources. Also, many are underemployed and leave fishing to look for other livelihood, which at present is hard to find. There are enough fish for the small fisherfolk of Bohol but it is not being equitably distributed. Certain malpractices are being carried out, creating a negative impact on

the coastal resources and their ability to regenerate and rejuvenate. These include illegal fishing, destruction of the coastal habitats, and catching of juvenile fishes [e.g. 'pirit-pirit', 'kuyug' (also called 'lap-ot' or 'tagum-tagum'), etc]. Catching these young fishes inhibit their further growth and their capacity to eventually breed, thereby affecting the income of the fishers in the long run.

Illegal fishing financiers, commercial fishers and other groups are taking the lion's share of the fishery resource and the income derived from it. For a true and holistic sustainable development in the province, there needs to be a bias towards increasing the fish catch of small fishers (numbering some 80,000), reducing investment in the fishery, and stopping the very wasteful overfishing and destructive illegal fishing activities and habitat destruction, the latter affecting the rejuvenating abilities of the resources. In all development theories, there is a direct correlation between the quality of both the natural resources and the life of the people in the coastal areas. In other words, poor quality of resources results in the poor quality of life of those dependent on them and vice versa.

HISTORICAL RESOURCE MANAGEMENT REGIMES

The management of coastal resources in Bohol has been practiced for centuries following cultural and religious traditions. According to the Spanish chronicles on Bohol, very few people lived initially in the coastal areas. A hunter/gatherer type of living took place. Every couple of months, Boholanos would come down from the mountains and fish intensively for several days, and then dry and salt their fish before carrying their harvest back into the upland areas. As time went on and as the threat of attacks from the various bandits from other parts of Mindanao decreased, the people moved down to the coastal areas.

At this time, village heads ruled over the coastal resources and practiced religious and cultural practices which protected the resources. Within each village, there were areas that were off limits to fishing and only during certain cultural and religious festivals were people allowed to harvest therein. These prohibited areas included offshore islands and places considered sacred to the inhabitants. The early folks revered and feared the greater being who provided them the very resource that gave them life. They believed that whenever they exploit their environment or harm the bigger species of fish, they would experience ill fate or simply catch nothing.

From a management point of view, this worked very well and ensured that areas with high biological diversity were maintained to replenish and regenerate the other fish and marine stocks in the area. With the conquest of the country by the Spaniards, the traditional rights over the resources were shifted as the Spanish Government became the owner of all natural resources of the country. This was re-enforced later by the Americans whose administration of the Philippines put all natural resources as the property of the state, thereby, in effect, starting the "open access" regime and taking away the rights of the local resource users to decide on how to manage their resources.

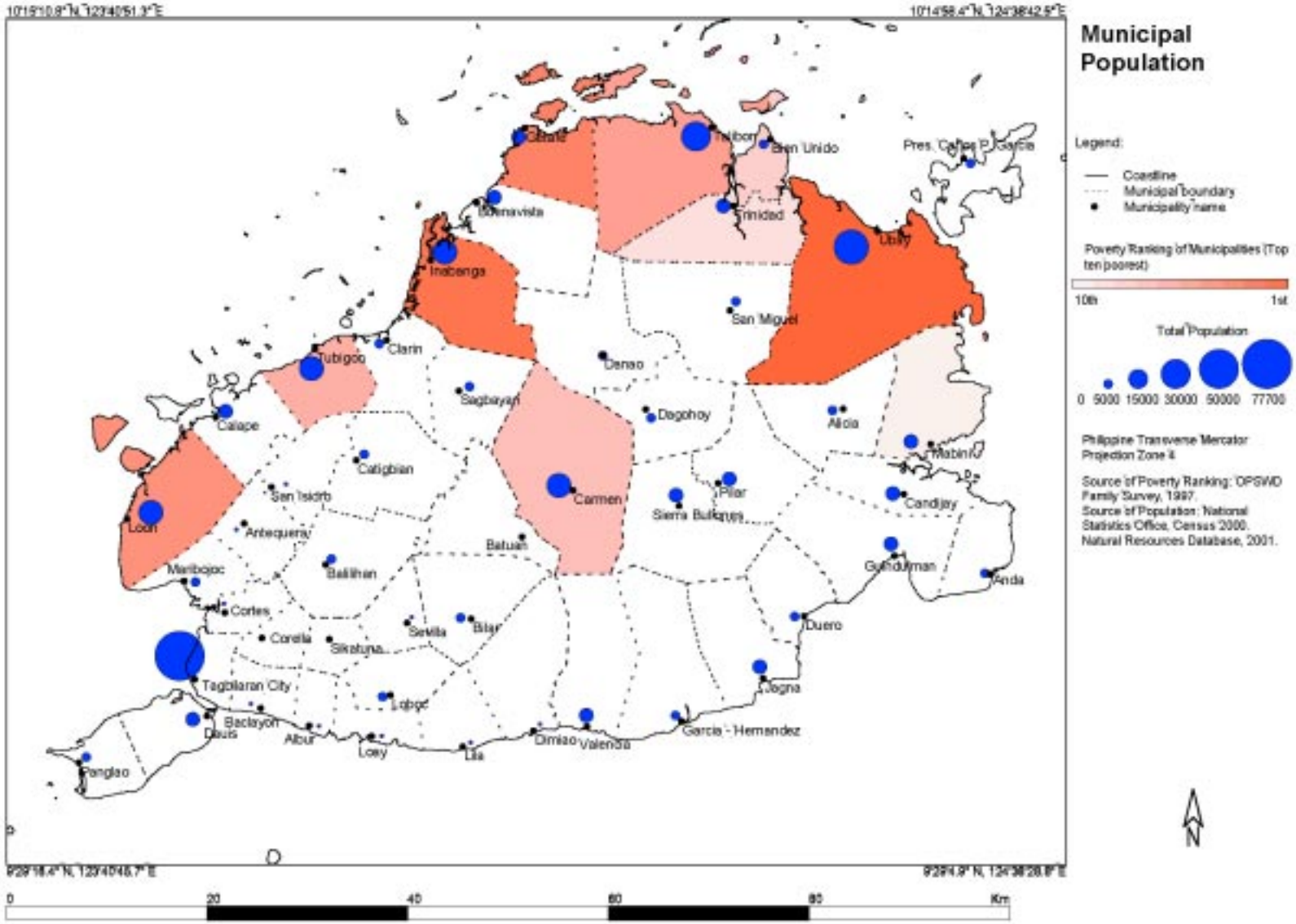


Figure 1.3. Map of municipal population of Bohol as of 2000

Some of these traditional rights areas remain until today but rarely are they properly protected. Few are left but those around the Danajon Bank in the northern part of Bohol still have traditional "protected areas" locally called 'sonas', which have no legal basis but are protected by the community. The 'sonas', like those in Bilangbilangan, Bien Unido, are off limits to fishing for most part of the year but fish may be harvested before the local fiesta. Nowadays, however, the area is bidded out one week before the annual village fiesta. The highest bidder is allowed to blast the area with dynamite and harvest all (some are sold fresh while some are naturally dried under the sun to produce the 'bulad', to be later sold at prices depending on the species of fish). Consequently, the corals in the area and other base habitats are now equally destroyed. This, perhaps, answers the query of the bidders why their subsequent catches up to the present are nothing like in the past.

There has also been a change in the point of view of the younger generations of fisherfolk compared to the ancestors of the coastal communities of Bohol. The older fishers see the fisheries resource as a source of livelihood and sustenance for the family and should be protected and enhanced to ensure sustenance for all. Younger generations, however, now see the resources as an inexhaustible commodity with a price tag — the more that they can take, the higher the gains. The concept is that if they don't take them someone else will. Understandably, some fishes and shellfishes command a higher price. For example, a live grouper would sometimes fetch up to 800 pesos per kilo. This has led to the paradigm shift in resource utilization in fishing communities from being traditional and sustenance, while caring for the resource, to seeing the resource merely as a cash commodity.

Ordinary fishermen get only a small share of the fishery resource in their area.

Another factor that compounds resource degradation is that coastal communities understandably focus only on living and surviving for the present, a short-term strategy of sustenance. As long as there is food on the table everyday, it doesn't matter to them how and in what way this was provided for. There is little focus on the long-term continuum of life, which is essential if the resources are to be maintained.

These changes in the perceptions of people have added up through the years to result in the resources being decimated across the province and removed at a rate faster than they can reproduce.

RECENT FISHERIES DEVELOPMENT EXPERIENCES

The fisheries models and laws advocated by the National Government have gone full circle in the last thirty years. In 1975, with the passage of Presidential Decree 704, the main focus of fisheries development in the country was on production of more fish, fishpond expansion, and increasing export volume for foreign currency earnings. This was termed as the "Blue Revolution" of the Philippines. It also encouraged the development of an efficient fleet of fishing boats and introduction of new fishing technologies to catch more and more fish.

During this time, thousands of hectares of mangroves were allocated for fishpond development and new efficient but destructive fishery technologies were introduced. Loans were given out for fishpond development, most of which were never used for fishpond development but for other activities. Soft loans under the *Biyayang Dagat* and the *Kilusang Kabuhayan at Kaunlaran* (KKK) programs rarely got paid back as the small fishers were encouraged to buy bigger boats and nets to harvest the "infinite" fishery resources in their areas. Meanwhile, the Bureau of Fisheries and Aquatic Resources (BFAR) introduced trawling and the use of seine nets with scaring devices in Ubay and Clarin. In the south of Bohol, they introduced and handed out for free some deep-set gill nets and trained fishers on how to use them, resulting to increasingly greater fish catch with little thought for the sustainability of such interventions.

In mid-1984, another fishery development program was launched in Bohol through the Central Visayas Regional Project - I (CVRP-I) with funding from the World Bank. During the first five years of implementation, the project concentrated on selected towns in northwest Bohol (Talibon, Bien Unido and Ubay). Later, the project was turned over to the Provincial Government to institutionalize the activities and replicate the approaches that were proven successful and applicable to the situation of Bohol. At this time, many other coastal towns were involved and availed of the assistance from the Provincial Government.

CVRP-I focused on the community-based or "bottom-up" approach, that is, to have a realistic and holistic view of resource management, the direct users should be involved in the management of the coastal habitat. One of CVRP's components was the establishment of artificial reefs as the main strategy in reviving or rehabilitating the lost or degraded natural reefs. However, sometime after the artificial reefs were installed, only the dynamite fishers were able to harvest to the disadvantage of the small fishers. Consequently, most of the people's organizations were discouraged by the situation. Moreover, the LGUs were also not able to sustain the benefits of the project because they did not incorporate any budget for CRM and were not so well involved in the project. Although the CVRP's operations lasted until 1992, there are some towns that still continue to embrace the CVRP concept of sustainable community-based resource management.

The enactment the Philippine Fisheries Code of 1998 represents the recognition of the national government that a paradigm shift was needed from production-oriented fisheries development to coastal resource management and conservation. Slowly, people are beginning to change with the ever more obvious realization that the sea is not infinite and that its resources

have to be managed, regulated and controlled. Small fisherfolk are now given preferential access to the municipal waters, particularly those with boats of less than three gross tons and passive fishing gears. Establishment of marine sanctuaries has been encouraged and the gears introduced previously are now declared active and their use outlawed. The legal basis for a sustainable and equitable fisheries allocation is now in place. Today, the management impetus for LGUs is to implement the mandates of the Fisheries Code of 1998 and integrate the suggestions of the local fisherfolk on how best to manage the fishery resource and their habitats.

THE NEED FOR COASTAL RESOURCE MANAGEMENT

Coastal resource management (CRM) is the identification of holistic and appropriate human interventions (a combination of social, technical and scientific strategies) through participative efforts to manage the use of coastal resources in a sustainable manner. CRM aims primarily to involve and consider the welfare of the affected communities along with other stakeholders in every stage of the undertaking, for a sustained coastal and marine environment and improved quality of life. CRM tries to focus its activities on the short-term needs of the communities vis-à-vis the long-term issues and resolve such needs and issues.

Coastal resource use issues in Bohol that can be addressed by CRM include:

- Continued treatment of the coastal resources as an open access resource, with only limited management and "ownership" being applied
- Continued over-fishing and destruction of the coastal resources
- Inequitable distribution of fishery benefits, with very limited individuals (financiers, illegal fishers and commercial fishers) getting the major share of the resource at the loss of the small-scale fishers (95% of the total number of fishers)
- Lack of information, education and communication (IEC) on and enforcement of coastal laws by multi-sector coastal law enforcement groups
- Lack of coordination, collaboration and common direction among the NGAs, NGOs, LGUs and coastal communities
- Many jurisdictional issues and gray areas still have to be resolved by and among NGAs, LGUs (provincial, municipal), NGOs and communities, with some not taking responsibility of their jurisdictional mandates amid lack of coordinated planning between these agencies
- Poor land and coastal resource uses as well as a lack of framework for decision making for LGUs to better manage the resources
- Pollution, runoff and siltation from upland areas due to poor and inappropriate human practices

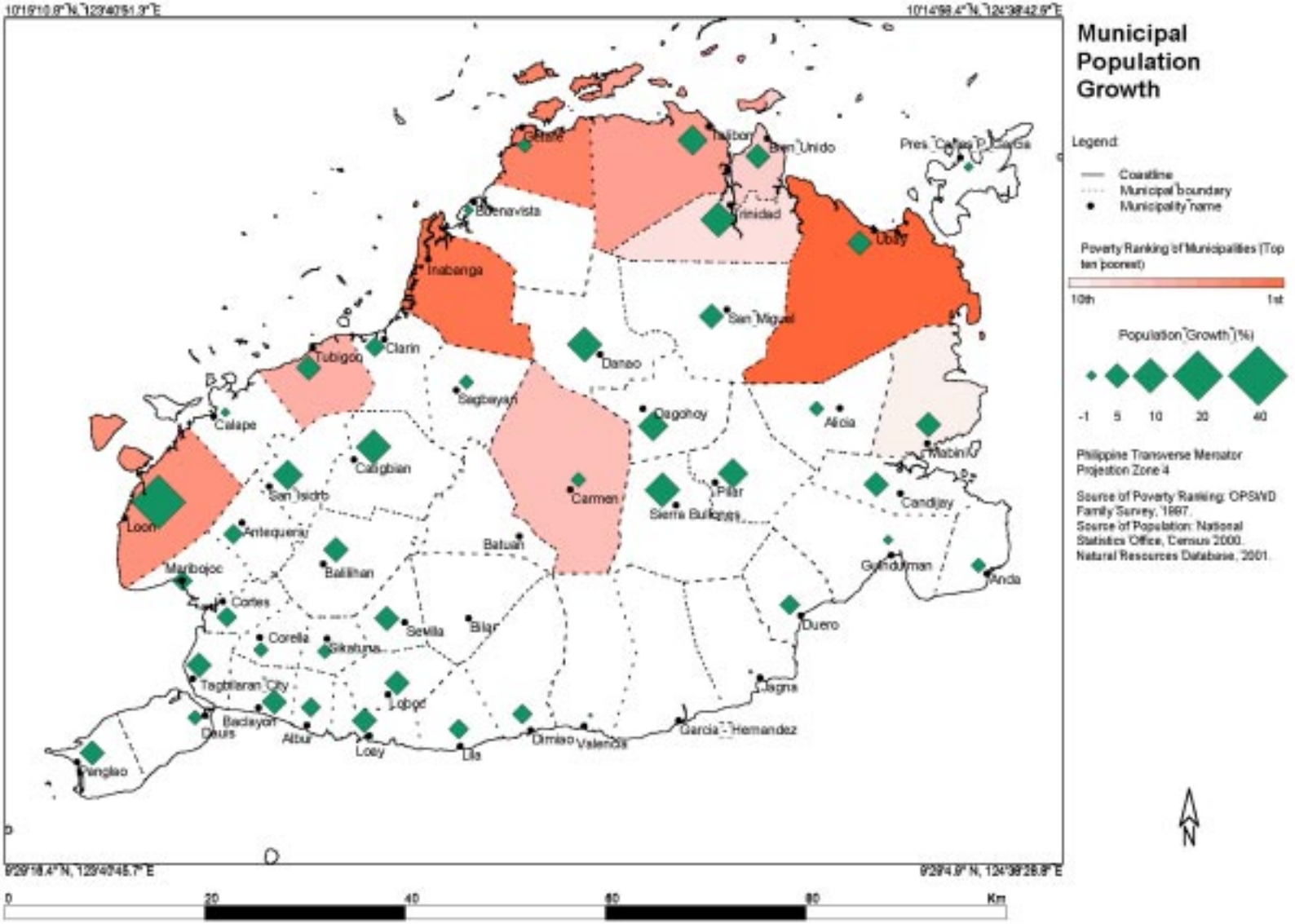


Figure 1.4. Map of municipal population growth of Bohol as of 2000

Traditional fishermen with hook and line and two "petromax" lights to attract fish - Clarin

- Lack of general awareness on coastal resource benefits and values, coastal resource management, coastal issues and laws among coastal communities, decision makers, judiciary, politicians and the general public

CRM is about looking at the resource as a whole, setting laws and direction based on best scientific knowledge with a small bit of educated guesswork, taking the wealth of coastal laws and having the LGU, in coordination with the communities, to actually implement these equitably for the good of the majority. If CRM is successfully implemented by strictly enforcing the law, it will benefit 95% of the coastal communities, on the whole the smaller fisherfolk. Certainly, a few will be affected — the 5% who are at present practicing unsustainable and illegal activities. The integration of all concerned sectors of the society for the "co-management" of the resources is a key concept of CRM.

CRM in Bohol has so far provided many lessons learned on how to rehabilitate and improve the quality of the coastal and marine ecosystems. Its institutionalization in the province and the positive changes it has provided continue to challenge all stakeholders to sustain it and inspires other provinces to do the same. There is, however, a need to amplify and replicate these experiences across the whole province, for which there is still a long way to go. CRM is essentially a never-ending cycle of planning, implementation, monitoring and evaluation of CRM related activities and continuing implementation based on the learnings from the previous project cycle.

Within Bohol, as laid down in the Local Government Code of 1991, it is the municipality which is the key "owner" or "manager" of all coastal resources and municipal waters which extend 15 km from the shoreline. CRM should therefore be considered as an essential and basic service of the municipality. By managing the development of the large coverage of coastal waters, the LGU can also steer its town towards prosperity through food security to improve and sustain the quality of life of coastal communities, and through other revenue-generating activities.

The LGUs must be in the forefront of the CRM planning process and should urge their partner agencies from the national government agencies (NGAs), non-government organizations (NGOs) and people's organizations (POs) to work together towards one direction. The communities and resource users must also be involved if true CRM governance is to be realized. If all these stakeholders are gathered together, CRM will be successful and the LGUs will reap the benefits of development.

CRM is not like planning for any physical structure, which, after a period of time, one sees the immediate and visual result. It is a gradual and consistent process that takes time before any tangible and intangible benefits are experienced by coastal communities. Thus, it is important for the LGUs and their development partners to really research into the socio-economic and bio-physical changes brought about by their projects. If successful, however, the CRM project can have a huge impact on the whole municipality (this is discussed further in Chapter 7).

No resource is inexhaustible. The increasing population trend in the province is indicative of both the fair amount of resources in Bohol and the possible decline in its critical habitats. The resources are not being distributed equally and equitably and are controlled by a few individuals who, on the whole, use illegal methods to catch the fish. Bohol's coastal resources are still largely in an open access situation and only when they are collectively considered as owned and managed by the stakeholders, with the LGU in the forefront of CRM, will they be secured.

CRM is a strategy to help the people come to terms with the burgeoning coastal issues and let them get involved themselves. It is also not only about managing the resources, but managing the people as well and how they utilize such resources.

The lead agency for CRM has to be the municipal LGU, and CRM should be considered as a basic form of governance and a basic service of the LGU. It should no longer be a "luxury" or optional activity.

At present, a large number of local and foreign funding agencies, NGAs and NGOs are working on various CRM activities in the province. There are many CRM related activities going on in the province. It is therefore important that these are wisely and strategically spread around Bohol. There should also be counterparting as these activities need to be institutionalized in the communities, villages or *barangays*, municipalities and the province to ensure their sustainability beyond the funding life span.

The framework is set and there are many models of good CRM practices in the province. It is time now to replicate them, amplify their impacts, and really institute a true pro-people development by ensuring the safeguards of CRM among the coastal communities of Bohol.

ecosystems and natural resources

Chapter 2

“Live off the interest, don’t mine the capital.”

Bohol is considered as one of the few provinces in the country that still has some of its diverse ecosystems left in reasonable condition. Its varied ecosystems are home to both migratory and endemic wildlife species. Bohol’s freshwater, beach, mangrove, coral reef, and open-water ecosystems are intricately tied culturally, economically and ecologically with the life of the Boholano people. This chapter provides a description of the ecosystems and natural resources of Bohol as a basis for understanding how to manage them.

Figure 2.1. The coasts are the natural crossroads between the sea and the land

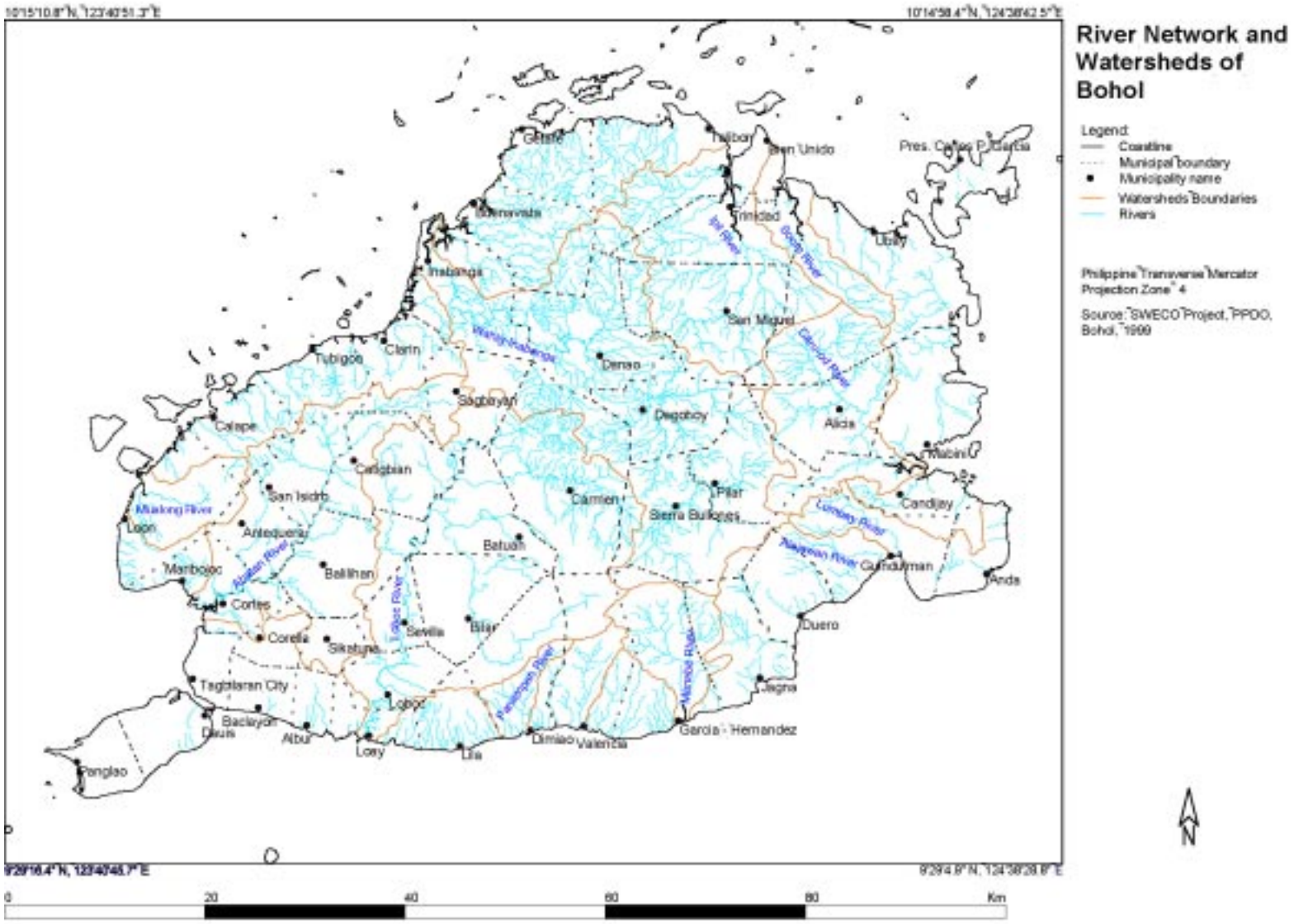


Figure 2.2. Map of river networks and watershed areas in Bohol

FRESHWATER ECOSYSTEM

There are eleven major rivers in Bohol fed by hundreds of tributaries emanating from the upland watersheds. The major river systems include the Wahig-Inabanga River (Inabanga), Ipil River (Trinidad), Soom River (Ubay), Caru-od River (Candijay), Lumbay River (Anda-Guindulman), Manaba River (Garcia Hernandez), Loboc River (Loay-Loboc), Panampan River (Dimiao), Abatan River (Cortes-Maribojoc), Moalong River (Loon) and Alejawan River (Duero).

Bohol has three major watersheds, all of which have been declared as protected areas under the National Integrated Protected Area System (NIPAS). These are the Wahig-Inabanga Watershed, Loboc Watershed and Duero Watershed. The Wahig-Inabanga Watershed covers two watershed projects of the DENR, namely, the Bohol Watershed Reforestation Project (BWRP) in Dagohoy and Wahig-Pamacsalan Watershed Reforestation Project (WPWRP) in Pilar.

The Wahig-Inabanga Watershed is the largest watershed covering 16 municipalities and 98 *barangays*, with a total area of 52,516 hectares. It has a daily discharge rate of about 1.5 million m³ during the rainy season, which gradually decreases to 600,000 m³ at the onset of the dry months (NRDB, 2000). During the rainy months, surface water easily flows out into the sea or overflows into the riverbanks. In 1994, the entire Wahig-Inabanga Watershed was proclaimed as a forest reserve by virtue of Presidential Proclamation No. 468.

Slash-and-burn ('kaingin') agriculture causes deforestation, which consequently triggers increased rate of surface water runoff and soil erosion - Ubay, Bohol

The second largest and first to be proclaimed (by Pres. Elpidio Quirino) as watershed forest reserve in Bohol (by virtue of Presidential Proclamation No. 450 dated December 23, 1953) is the Loboc Watershed. It has an area of 19,410 ha, part of which is a portion of the Rajah Sikatuna National Park (RSNP). Currently, the forest reserve is a project area of Bohol Alliance of Non-Government Organizations Foundation, Inc. (BANGON) which has received funding from the Australian Agency for International Development (AusAID), through the Philippine-Australia Community Assistance Program (PACAP), for its Loboc River Basin Development and Management Program - Area Focus Approach (Loboc-AFA). The foundation is developing an integrated management project in the entire watershed with its partner agencies.

Major and minor rivers and tributaries are vital to the coastal ecosystem because, through natural processes, discharge of large amount of organic matter and nutrients from the upland and lowland takes place.

Estuaries, which are that portion of the rivers affected by tidal exchange of seawater, are the main interface between the upland and coastal areas of Bohol. Estuaries have very high productivity and serve as spawning and/or feeding grounds of many species of fish, crustaceans, mollusks and migratory birds. However, they also carry the results of upland activities to the sea, which in most cases are destructive to the coastal areas, such as chemicals from use of pesticides and inorganic fertilizers in farmlands, liquid and solid wastes, and large volumes of sediment. Sediments from poor land use, deforestation and unsustainable farming practices are detrimental to the coastal resources, smothering seagrasses and corals and eventually choking them and blocking sunlight to the sea bottom, while pesticides and other chemicals quickly assimilate into the food chain and start causing negative impacts to the whole coastal ecosystem and human life.

The rivers and estuaries in Bohol have many uses. They commonly serve as harbors and navigation routes, areas for aquaculture development (e.g. Inabanga River), recreation and tourism (Loboc River), and fishing and sand quarrying areas. They also provide water for irrigation, domestic and industrial uses (e.g. Loboc Mini Hydro-Power Plant). They are the key interface between the sea and upland ecosystems. Thus, they should be conserved and managed to ensure that they continue to provide these social, economic and ecological services.

Management Strategies to Consider

- River bank stabilization through greenbelts or planting of ornamental plants and deep-rooted trees within the 20-meter environmental protection zone on both sides of the river and estuaries to minimize and/or prevent soil erosion

- Identification, by the MLGU and concerned communities, of a river or estuary for the "Adopt-A-River" Project under the Clean and Green Program of the DENR

- Community-Based Forest Management Agreement under the CBFM Program of the DENR to take over the management of swamps and mangrove areas, such as in Barangay Lincod, Maribojoc which now manages over 110 hectares of *Nypa* plantations along the Abatan River

- Enhancement and rehabilitation planting of site-specific mangrove species and 'nipa' to serve as buffer from strong winds and reduce water turbidity by binding and trapping sediments from upland activities flowing downstream

- Environment-friendly mariculture technologies that encourage local ownership and sustainable incomes as well as vigilance by the local community over rivers/estuaries

- Sustainable farming practices such as organic farming and reforestation of denuded areas

- Prevention of physical alterations, like construction of buildings and other infrastructure, that will affect the natural flow of the river

- Establishment and implementation of a clear zoning system to guide the LGU and resource users on what can and cannot be done in certain areas of the river/estuary

- Adoption of appropriate waste management practices

- Enforcement of laws against destructive fishing activities such as 'sudsud', fine-mesh nets, dynamite, and the use of chemicals and pesticides in large quantities to kill and catch fishes and crustaceans (e.g Nyhindrin, which is being commonly used)

MANGROVE ECOSYSTEM

Mangroves are woody, seed-bearing trees with specialized roots that thrive in brackish and/or waterlogged soil and exposed conditions. Mangroves surround most of Bohol and are most common around river systems, estuaries and in offshore islands.

Mangrove areas in the country, which sustain the life of our coastal ecosystem, have declined to about 123,000 ha in 1998 (DENR) from 450,000 ha in 1918 (Brown and Fisher) (Melana and Courtney, 1999). Large tracts of mangroves had been cut to pave the way for fishpond development and other various uses. Indiscriminate and illegal human use of mangrove ecosystems have serious consequences on the productivity of coastal resources (Table 2.1).

Some of the mangrove areas in Bohol are typical of riverine zones like this one in Cambuhat River, Buenavista, where the community have set up their own "tour".

With some 32 identified true species of mangrove (Yao, C.), Bohol has possibly one of the most biologically diverse mangrove ecosystems in the Philippines along with the one in Pagbilao, Quezon Province, Luzon. The largest and most biologically diverse mangrove area in Bohol is found in Cogtong Bay, which is bounded by Candijay and Mabini. It covers about 2,200 hectares.

Many people mistakenly look at mangroves as a muddy, smelly and fly-infested unproductive ecosystem. In fact, mangrove areas are one of the most productive and essential component of Bohol's ecosystems. One hectare of mangrove produces at least 600 kg of fish and shrimps per year. A healthy and biologically diverse mangrove ecosystem is economically estimated at US$ 500 to US$ 1,550 per hectare per year, the minimum valuation of a loss when mangroves are converted to other land uses (Dixon, 1989).

Table 2.1. Effects of indiscriminate human practices to the mangrove ecosystem

Exploitative Human Activities	Negative Implications	Effect on the Mangrove Ecosystem and Its Resources
Deforestation in the uplands	Increased soil erosion and surface water runoff	Increased siltation rate suffocates the specialized aerial roots of mangroves resulting to gradual death of juvenile tree
Rampant illegal cutting for firewood, either for domestic or economic purposes; as raw material for infrastructure development; for fishing device (e.g. fish cage, fish pen, fish corral)	Decreased mangrove cover and leaf litter	Loss of habitat (mangroves serve as breeding, spawning and rearing grounds for the complex cycle of marine vertebrates and invertebrates) and food for a variety of marine fauna (crustaceans, mollusks, fishes) and associated wildlife (migratory and endemic bird species, reptiles and insects)
Improper disposal of solid and liquid wastes from households, farmlands, and commercial and eco-tourism establishments	Increased rate in water pollution (from rivers, lakes and estuaries that drain to the seas)	Mangrove trees are attacked by pests (e.g. barnacles) that thrive on polluted seawaters
Fishpond development	Cutting of mangrove trees to give way to the development of dikes and canals	Fishpond dikes and canals limit the free flow of seawater and nutrients causing the death of associated flora and fauna and other mangroves in the surrounding areas
Reclamation	Cutting of mangrove trees to give way to infrastructure development	Loss of dominant and/or endemic species of mangroves

Mangroves act as spawning and nursery areas of many fishes, shrimps and mollusks. They provide large quantities of detritus through their fallen leaves, thereby, giving enough food and nourishment to various fauna. Wood from mangrove trees is characterized to have high calorific value (high heat content), which makes it ideal for firewood and charcoal making (one of the main reasons why mangroves are cut). Mangroves also act as natural buffer or protection against physical disturbances like strong winds and waves (that may be caused by storm or typhoon) and erosion. Their demise leads to increased damage to property and life.

People living within or adjacent to mangrove areas have a variety of uses for the different mangrove species (Table 2.2). There are also many traditional beliefs in the province regarding mangroves, which may have possibly helped maintain some of the areas.

Banacon Island in Getafe is known to be the biggest man-made mangrove forest in Southeast Asia with about 1,750 ha planted mostly with Rhizophora species, which suits the type of substrate in the area. The planting of mangroves in Banacon Island was initiated in the 1950s by one man, Mr. Eugenio "Nong Denciong" Paden, and his family.

Table 2.2. Common mangrove species in Bohol and their uses

Mangrove Species		Socio-Economic and Bio-Physical Uses
Scientific Name	**Common Name**	
Aegiceras corniculatum	Saging-saging	spawning grounds of fishes and shrimps
Aegiceras floridum	Tinduk-tindukan	spawning grounds of fishes and shrimps
Avicennia alba	Bungalon-puti	wood source of inferior firewood, used for small cabinet works; rice mortar; ointment from seeds used for relieving small pox ulceration; bark preparation used as astringent
Avicennia lanata	Piapi	wood source of inferior firewood, used for charcoal making and small cabinet works; ash from wood used for soap making
Avicennia marina	Bungalon	flowers source of pollen for bee colonies; rice mortar; ash from wood used for soap making; wood source of inferior firewood, used for small cabinet works; leaves used as fodder for animals
Avicennia officinalis	Api-api	wood source of inferior firewood, used for charcoal making and small cabinet woks; bark used as seasoning for raw fish; leaves used as fodder for farm animals
Bruguiera cylindrica	Pototan-lalaki	young fruit eaten as vegetable or preserved; wood used as firewood and for charcoal making
Bruguiera gymnorrhiza	Busain	wood used for house posts, flooring, furniture and cabinet manufacture, charcoal making, as pile, mine timber, firewood; bark source of tannin, used as seasoning for food; fruit substitute for betel nut; medicine for sore eyes
Bruguiera parviflora	Langarai	wood used for furniture and cabinet manufacture, flooring, charcoal making, as firewood, timber; bark used for seasoning
Bruguiera sexangula	Pototan	young leaves eaten as vegetable; roots used as incense; wood used as mine timber, pile, pole, firewood, for charcoal making, house posts, furniture and cabinet manufacture, flooring; bark source of tannin; fruit chewed as substitute for betel nut; lotion from fruits as medication for sore eyes
Camptostemon philippinensis	Gapas-gapas	wood used as construction and/or fencing material, firewood, for cabinet and charcoal making
Ceriops decandra	Malatangal	wood used as timber, firewood, for charcoal making, furniture and cabinet manufacture, house posts; decoction of bark to stop hemorrhage; bark source of dye and tannin
Ceriops tagal	Tangal	bark source of dye and tannin (for 'tuba' or local wine making); wood used as pile, pole, for firewood and charcoal making, house posts; bark yields plywood adhesive
Dolichandrone spathacea	Tui	wood used as firewood, construction material, for charcoal making

continued

Table 2.2. continued

Mangrove Species		Socio-Economic and Bio-Physical Uses
Scientific Name	**Common Name**	
Excoecaria agallocha	Buta-buta	resin from bark cures stomach cramp and various skin diseases; sap and wood preparation used as purgative, fish and arrow head poison, medication for toothache; wood used as incense, firewood
Heretiera littoralis	Dungon-late	wood used as timber
Lumnitzera littorea	Tabau	wood used as timber, pile, ship building material, for house posts, cabinet making, paving blocks; extract from decoction of leaves used to cure thrush
Lumnitzera racemosa	Kulasi	wood used as firewood, construction material, for charcoal making; extract from decoction of leaves used to cure thrush in infants
Nypa fruticans	Nipa	young leaves used for cigarette wrapping; fronds made into shingles for roofing; young seeds eaten raw or made into sweet meat; sap source of vinegar, sugar and 'tuba' (local wine)
Osbornia octodonta	Taualis	wood used as firewood, fencing material, for charcoal making
Pemphis acidula	Bantigi	wood used as fencing material, firewood
Rhizophora apiculata	Bakauan-lalaki	bark source of tannin; wood used as timber, fencing material, firewood, for charcoal and cabinet making, house posts
Rhizophora mucronata	Bakauan-babae	wood used for charcoal making, flooring, furniture and cabinet manufacture, as firewood, pile, pole, mine timber, post, tool handle; bark source of tannin; stilt roots used for small boat anchor
Rhizophora stylosa	Bakauan-bato/ Bakauan-bankau	wood used as firewood, construction and/or fencing material, tool handle, timber, pole, for charcoal making, furniture and cabinet manufacture
Scyphiphora hydrophyllaceae	Nilad	wood used as firewood, fencing material, tool handle
Sonneratia alba	Pagatpat	wood used for charcoal and cabinet making, as firewood, ship building material, post, pile for bridge and wharf construction/construction material; bark source of tannin; leaves used as fodder for goats and cattle; pneumatophores used as floats for fish nets, for manufacture of inner soles of shoes, substitute for cork; fruit eaten raw or cooked; fermented juice used to control hemorrhage
Sonneratia caseolaris	Pedada	wood used for charcoal and cabinet making, as firewood, ship building material, post, pile for bridge and wharf construction/construction material; bark source of tannin; leaves used as fodder for goats and cattle; pneumatophores used as floats for fish nets, for manufacture of inner soles of shoes, substitute for cork; fruit eaten raw or cooked; fermented juice used to control hemorrhage

continued

Table 2.2. continued

Mangrove Species		Socio-Economic and Bio-Physical Uses
Scientific Name	**Common Name**	
Sonneratia ovata	Pagatpat-babae	leaves used as fodder for farm animals; wood used for charcoal making, as ship building material, pile for bridge and wharf construction, timber, lumber
Xylocarpus granatum	Tabigi	wood used as timber, firewood, for charcoal making; oil used for illumination and hair; extract from decoction of bark used to treat cholera
Xylocarpus moluccensis	Piagau	highly priced wood, good for high grade furniture and cabinet manufacture; bark used as astringent and cure for diarrhea; decoction of roots used as alternative medicine

J. Jarantilla-Paler

Children in Panadtaran, Candijay make use of the resource in the area for making shingles out of 'nipa' (Nypa fruticans) fronds for domestic use. Mostly, people living near swamplands and mangrove areas produce 'nipa' shingles for additional income.

Possible Management Strategies to Consider

- Legally, mangroves are under the jurisdiction of the state, which gives the management responsibility to the DENR. To date, 2,110.61 hectares of mangrove forests have been distributed to deserving communities in Bohol for management (see Table 5.2. of Chapter 5) under the Community-Based Forest Management Program of the department. The program has led to community stewardship and ensures the rehabilitation and management of these areas. CBFMP is a very successful program and more communities should be encouraged to apply.

- Reforestation projects through DENR, DepEd (formerly DECS) and the like should be encouraged to manage these areas, but monitoring of their success after the planting is essential. Site assessment should be conducted with the help of the DENR prior to the planting to ensure site-specific and/or the right mangrove species, desired spacing (depending on the observation and suggestion of the community) and the right method of planting.

- Moratorium on the cutting of mangroves, e.g. for fishpond development, should be strictly imposed even in areas with FLAs. The law states that if the mangroves are not cut five years after the issuance of FLA, they may no longer be cut. Considering that FLAs are no longer released, in theory, no more mangroves should be cut.

- Encourage replanting of old abandoned fishponds and their management passed on to the community interested in managing the area.

- Encourage the establishment of multi-species mangrovetum/mangrove gardens around Bohol to ensure adequate supply of seeds and availability of all mangrove species found in Bohol. These can also act as mini-education centers showcasing mangroves, their products and aesthetic value, and the many services they provide.

- Encourage environment-friendly mangrove enterprise to the community managing the mangrove area to provide incentive for guarding and managing it.

- Implement the joint DA-BFAR and DENR General Memorandum Order No. 3, Series of 1991 and turn over idle, unproductive and abandoned fishponds (some of which are illegally utilized and occupied) to the communities for them to manage and rehabilitate the mangrove cover, and explore possible environment-friendly enterprise activities within these areas to sustain the re-planting.

BEACH ECOSYSTEM

Largely known for their recreation, tourism and aesthetic values, beaches are commonly the pride of many areas. A beautiful white beach often stands as evidence of healthy coral reef ecosystems offshore and attracts recreational activities. Bohol boasts of its white sandy beaches.

Beaches are commonly used for tourism development (e.g. hotels, restaurants, beach resorts, etc.), fish and boat landing, and as source of sand as a construction material, albeit being of very poor quality due to the salt content. Common crabs, fishes and birds abound in these areas, laying their eggs alongside turtles. Many environmental issues focus on the beach ecosystem, as it is the prime land for development and household settlement due to its aesthetic values.

A good example of a badly developed and managed beach is Alona Kew on Panglao Island where clusters of beach resorts have been built right into the beach. Coconuts that once lined the beach eventually fell due to gradual erosion of the sand caused ironically by the beach resorts. Despite the danger posed by the absence of a natural buffer, all the owners still continue to move their structures further and further into the coastal zone to “protect” their sand. Planning and implementation of setback zones could have prevented this.

All existing seawalls and structures built in this zone offer only a short-term solution to the rapidly depleting sand. These will eventually succumb to wave action and in fact cause major harm in the long-term by increasing erosion rates in the area. What used to be a picturesque Alona Beach, with its white sand and low-hanging coconut trees, is now replaced by a series of walls and improperly placed developments that look very unattractive. Likewise, many resorts even built their septic tanks into the beach without realizing the harm these would cause to the long-term quality of the coral reef and seagrass in the area.

It is interesting to note that worldwide, the most exclusive and expensive resorts are always well set back from the shoreline and have no structures in the coastal zone. Tourists appreciate this and the sands stay forever, thus ensuring a constant flow of guests and a steady revenue from tourism.

Possible Management Strategies to Consider

- LGUs should prevent construction of any structure (e.g. groins, piers, wharves, seawalls), which inhibits the sand from moving in any direction or disturbs the natural sand migration and increases erosion in the long run. Beaches have a long erosion and accretion cycle and a long-term study should be conducted before any structure is built in the area.

- All developments should be set back from the shoreline. In the Philippines, the environmental protection zone is set at 20 meters (in other countries, such as Sri Lanka, the setback is as much as 50-100 m). This will ensure that everyone has access to the beach and the natural beauty is maintained. Waste and septic tanks should be set back at least 200-250 m to minimize leaching to in the nearshore waters and coral reef ecosystems. Small-scale waste treatment plants could also be considered.

- Beach nourishment projects offer only short-term solutions to the problem and if the root cause of the problem (i.e. inadequate setbacks) is not resolved, then degradation of the beach ecosystem will continue.

- Ecological processes in the area should be protected. Sand dunes, seagrasses, coral reefs and mangroves all help generate and trap sand; their removal will result in further degradation. One two-kilogram parrotfish can produce up to 50 kg of sand per year; fish sanctuaries can in fact help the sand replenishment cycle (by allowing the corals to grow, and the fish to eat and convert them to sand).

- Better waste management should be practiced.

- Ensure public access to the beach. It is a natural beauty that, in the Philippine Constitution, is open for the enjoyment of everyone. Develop a suitable, simple, clear and consistent zoning plan and policies that allow access without damaging the area.

- All resort owners should agree on a set timeframe for removal of their structures back from the beach front, for example two years.

SEAGRASS ECOSYSTEM

Young fisherman diving in amongst Enhalus acroides seagrasses - Barangay Napo, Loon

Bohol has extensive seagrass beds with many of the Philippines' 14 species being represented. Seagrasses are the only true flowering plants that have managed to evolve into the coastal ecosystem, leaving their ancestors on land. They have extensive root systems, which bind sediment, flower regularly and disperse their seeds into the sea.

Large seagrass beds abound in Bohol. Near the pier in Tagbilaran City are very productive seagrass beds, which are being encroached upon by the port and a local hotel. They comprise a large area of Panglao Bay and abound in other towns.

Seagrass beds have very high productivity and are home to many mollusks, fishes, sea cucumber, urchins and the like. They are also the best gleaning grounds where many people can be seen at low tide collecting shellfishes for their dinner and other marine fauna for sale at the local markets. They are also home and favored food of the Philippine sea cow or 'dugong', although it has since disappeared in Bohol.

Seagrasses act as refuge as well as spawning and nursery grounds for many species, which spend part of their life cycle there until they are big enough to go to the coral reefs where they live as adults. They are sometimes gathered and used as fertilizer and raw material for furniture construction. These activities, however, should be discouraged as the seagrasses lose their potential as a productive ecosystem if removed. Often undervalued, seagrass beds are gradually giving way to construction and reclamation activities in Bohol at the expense of fishery production.

Possible Management Strategies to Consider

- Seagrass sanctuaries, such as those in U-og and Lawis, Inabanga, should be encouraged. They serve as a shell garden and ensure adequate supply of fish and shellfishes to the neighboring areas (the minimum size of a sanctuary could be 10-15 ha).

- In all developments, seagrasses should be considered as a productive ecosystem upon which many people depend. Before any development (e.g. reclamation) in the area, the benefits derived from a sustained healthy seagrass habitat should be integrated into the development plans. Also, the possible environmental and socio-economic impacts (aspects of biodiversity conservation, livelihood, etc.) should be considered.

- Illegal and destructive fishing methods such as 'sudsud', fine-mesh nets, 'baling', etc. should be minimized.

- Collection of juvenile fishes, like 'tagum-tagum', should be prohibited to allow them to grow into larger size, reproduce and ensure more catch for everyone.

- Closed seasons could be observed for certain species such as rabbitfishes, which spawn in seagrass areas at specific times of the year (3rd to 5th day of new moon).

OPEN-WATER ECOSYSTEM

The open-water ecosystem is relatively low in productivity when compared to other ecosystems and not so much is known in Bohol about this big ecosystem, which covers over 90% by volume of the province's coastal waters.

Pamilacan Island is one of Bohol's most famous islands surounded by deep water and has 12 species of marine mammals, turtles, rays and whalesharks parring by the island. These all appearing in the area due to the large volumes of food in the form of giant squids, shoaling pelagic fishes and huge volumes of plankton.

It is, however, the place where most fishing activities take place and where all the pelagic fishes of Bohol live. Bohol has many varieties of shoaling fish. Most pelagic fishes shoal in large numbers, a strategy biologically used to ensure their "safety". Commercial fishers, however, exploit this and literally harvest whole shoals of fish, thus preventing the spawning of the fishes in and around Bohol.

Giant squids, rays, 12 species of whales and dolphins, large pelagics, tunas, whale sharks, Spanish mackerels and scads all abound in Bohol's open sea, fed by the previously huge schools of fish which once came to Bohol on their yearly migration.

Just like the other ecosystems, this area is also under the onslaught of the commercial fishermen who use illegal fishing paraphernalia and fish within municipal waters. Fine-mesh nets, fish aggregating device (FAD), fish finders, power blocks, sonars and huge drift nets catch juvenile and gravid fish and basically scour everything in their path as long as it is in volume. The larger fishes are slowly being removed and as this happens the commercial fishers search for aggregations of smaller fishes.

Table 2.3. Some of the more common fish species of Bohol

Family Name	Local Name	English Name
Engraulidae	bolinao, boris, libud, tuakang	Anchovies
Lethrinidae	bagangan (young), bitilya, katambak, kirawan, madas, dugso, bakuktut, sapingan	Emperor breams
Exocoetidae	aliponghok (fingerling), antulihaw, bangsi, barongoy, bolador, eliu, laniu	Flying fish
Caesionidae	bilason, butlogan, dalagang bukid, sinao-an, sulid	Fusiliers, Bananafish
Belonidae	balo, bawo, dugso, doal, mangansing, batalay, sinao-an	Garfish, Needlefish
Mullidae	saramulyete, senok (young), tiao, timbungan	Goatfish
Serranidae	lapu-lapu, kugtong (large sized), suno, señorita, tingag, tiring, dolit, lilig, taleti-on, kobe, turnutulin, garopa	Groupers, Seabasses, Perchlets
Hemiramphidae	bamban, buging, kasusuwit, sasa, sausid, sawasid	Halfbeaks
Carangidae	damis, tawa-ay, baho-olo, salay-salay, barilason, pampano, talakitok, lagidlid (young), pagapa, makaagum, trakito, bitilya, badlon, mamsa, tabangka, tamarong	Jacks, Cavallas, Crevalles, Trevallies, Darts
Gerreidae	batuhan, batuhanan, bauhanon, malakapas	Mojarras, Silver biddies
Mugilidae	balanak, banak, gagapan, gapang, pili, gisao	Mullets
Siganidae	danggit, kitung, layap, samaral, tagbago	Rabbitfish, Spinefeet
Clupeidae	tamban, tunsoy, toy, haol-haol, helos, kabasi, mararapad, lupoy (fry), siliniasi (fry), mangsi	Sardines, Herrings, Sprats, Gizzard shads
Carangidae	galunggong, borot, burot-burot, matangbaka, hagumaa, gutlob	Scads
Leiognathidae	laway-laway, lulu-an (large sized), palangan (large sized), parutpot, palutpot, sapsap	Slipmouths, Ponyfish
Lutjanidae	aha-an, auman, lagan, mangagat, maya-maya, turnos	Snappers, Sea perches
Holocentridae	siga, baga-baga, ganting, suga-suga	Squirrelfish and Soldierfish
Acanthuridae	alibangbang, bagis, bakwak, bongkokan, indangan, kadlitan, kalmin-kalmin, labahita, mungit, pelason, saguranding, sunghan, tudlo-an	Surgeonfish, Tangs, Unicornfish
Nemipteridae	bisugo, lambado, lagaw, sagisi-on, bakay, silay	Threadfin breams, Spinecheeks
Scombridae	tulingan, barilis, bankulis, alumaan, tangigue, hasa-hasa, burao, kabalyas, tambakol, pirit, karao	Tunas and Mackerels
Labridae	bagondon, bugok, bungat, ipos-pos, labayan, lakhoy, lamon-lamon, lupit, maming	Wrasses

Year 2001 marks the third successive year that 'tulingan' (Family Scombridae) has not reached Bohol's shores clearly due to over-fishing. Those that make it close are never caught by the small fishers because they are swallowed up by the large nets of commercial fishers.

To make things even worse, every year, from August to September, the young 'tulingan' whose parents survive migrate around Bohol searching for feeding and nursery grounds. These 5-10 cm-long juveniles are all consistently vacuumed up by the commercial fishers, thus resulting in fewer and fewer adults caught every year. If allowed to grow, an average 'tulingan' can grow up

to 100-150 cm long, and will be a lot tastier and more expensive than 'pirit', which Bohol consumers still buy in huge volumes.

This once rich ecosystem is currently under severe stress and if not rehabilitated, it will become unproductive, unprofitable and useless.

Possible Management Strategies to Consider

- Delineate all municipal waters out to 15 km from the offshore islands of each coastal municipality as laid down in DAO 17, Series of 2001, of the DENR.
- Enforce commercial fishing laws and catch the commercial fishers who, in the first place, rarely fish outside of municipal waters.
- Coordinate the law enforcement efforts of LGUs with those of Bohol's Coastal Law Enforcement Councils of the three congressional districts.
- Ban the use of FADs in municipal waters. Each 'payaw' should be registered, its location noted, and taxed by the LGU. Perhaps, only fishing organizations should be allowed to establish these for exclusive use by municipal fishers using hook-and-line.
- Enforce the law on the capture and slaughter of manta rays (still openly sold in some places in Bohol), whales, whale sharks and dolphins as these can, in the future, be very profitable to local communities through the promotion of eco-tourism as evidenced by the Pamilacan Island dolphin and whale-watching activities.
- Enforce municipal boundaries and ban all fishing vessels registered as less than three (3) gross tons but still use active fishing gear (as defined by FAO 201 of the BFAR).
- Declare large open-sea sanctuaries. There is not one open-sea sanctuary in Bohol yet this ecosystem comprises over 90% by volume of the coastal waters of the island province.
- Map and identify the spawning/aggregation areas of Bohol and consider having closed seasons for these fishes during the spawning months.
- Consider setting minimum size limits for the sale of certain species based on predetermined biological factors, i.e. only mature individuals should be harvested.
- The Maritime Industry Authority (MARINA) and Philippine Coast Guard (PCG) could work together to validate some dubious boat sizes in Bohol (registered as 2.90 tons, yet have been re-built to about 5-10 gross tons and larger in size).

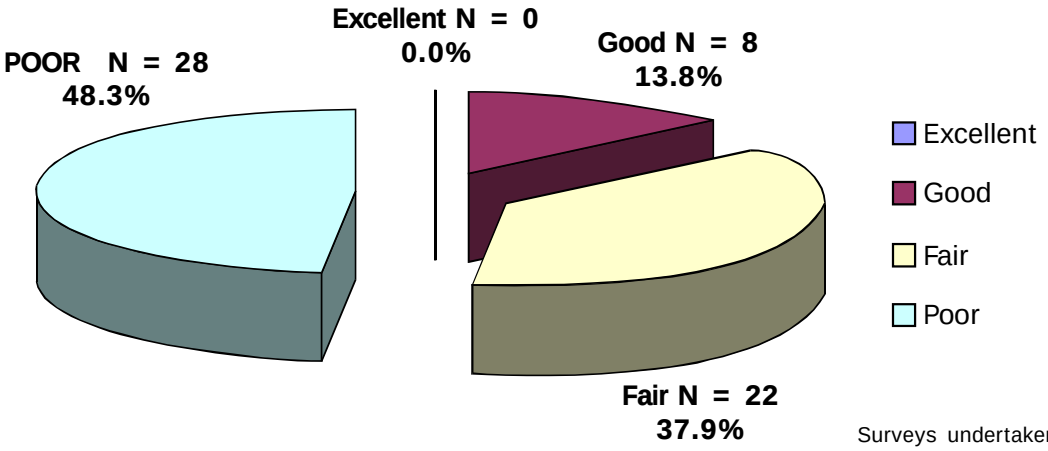
CORAL REEF ECOSYSTEM

Corals are often considered in Bohol as being 'bato', and thus are worthless "non-living" stones. They, however, are living animals that, if managed well, could produce for the Boholanos a bounty of resources forever. The coral reef ecosystem is in fact highly productive and biologically diverse, yet a fragile ecosystem. Worringly, in a recent survey at the LMP National Conference in Manila, 2001 only 4.2% of mayors in the Visayas region responded that a coral was an animal, whereas 41% identified them as a "rock" based on a multiple choice question.

Bohol is well known internationally as rich in corals and coral reefs especially in the islands of Panglao, Balicasag (Panglao) and Cabilao (Loon), as well as the Danajon Bank in Northern Bohol. Hundreds of tourists visit these sites yearly to dive into and snorkel the underwater "gardens".

In terms of biodiversity, coral reefs are known as the "rainforests" of the sea and serve as buffer against underwater currents. They provide food and refuge for thousands of marine flora and fauna. They have many uses at present, but current research suggests that some of the fauna and flora contained in coral reefs have great potential as cures for human aliments and other uses that are yet to be discovered. The precautionary principle in management should be strongly applied to them.

Since 1996, various teams from different agencies have conducted surveys on the status of the coral cover in Bohol. Earthwatch, WWF, Feed the Children-Philippines, BFAR, UP-MSI, CRMP, Reefcheck and the DENR have conducted research on some 58 sites. Only 8 sites or about 14 percent of the areas sampled are in good condition (with 50-75% live coral cover) and no site remains in pristine and/or excellent state. On the other hand, a glaring total of more than 86 percent are found to be in poor or fair condition (with 0-49% live coral cover). This means that, possibly, Bohol has already lost more than three quarters of its corals known to be the breeding grounds of diverse marine fauna.



Status of Bohol Coral Reefs at 8 Localities (58 Sites)
(About 86.2% of the reefs are now in poor and fair condition)

Figure 2.3. Status of coral reefs in Bohol

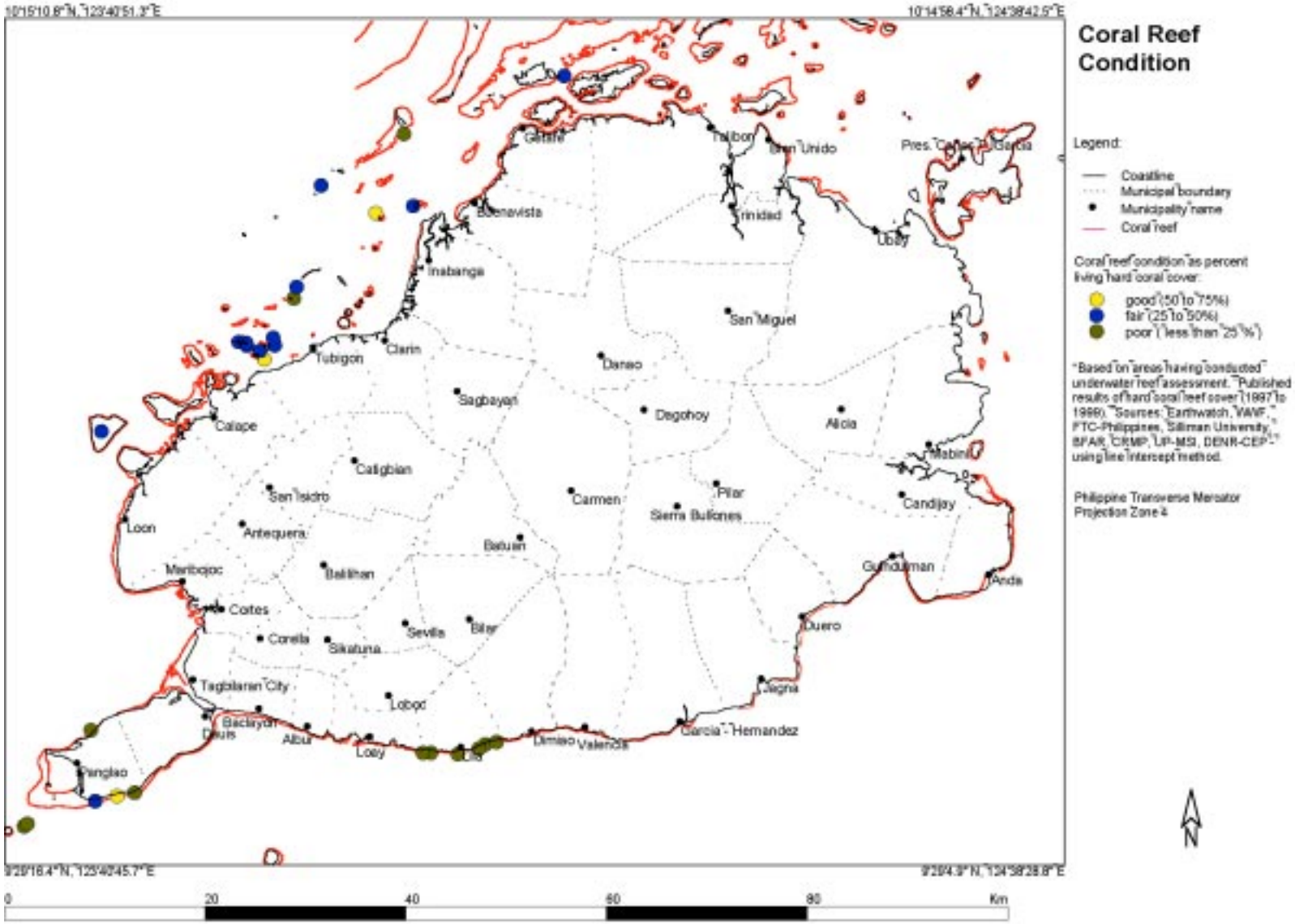


Figure 2.4. Map of assessed coral reefs in Bohol

The degradation of coral reefs can be attributed to siltation, anchorage, illegal fishing, storms, coral bleaching (due to temperature anomalies brought about by global warming) and construction of piers, houses and even churches in the past centuries (most of Bohol's ages-old churches are built of coral heads like the ones in Loon, Baclayon, Loboc, Dimiao, and Maribojoc). There had been reports about corals being used to bleach clothing and as personal souvenir items. Some are gathered and illegally exported for sale in other countries.

There is one real example of how some people regard corals. This certain family in Guindulman would yearly clean out, smash up and remove all the coral reefs in one area. They did this because the corals kept on ripping up their fishnets, thus a nuisance to their livelihood. Little did they know of the benefits of the corals and they never seemed to realize, until recently, that the corals are the houses and food of the fishes (no corals: no fish). That corals are useless is still a common belief around Bohol but as more information gets disseminated to the people, it is hoped that they will begin to see the benefits of leaving the corals intact.

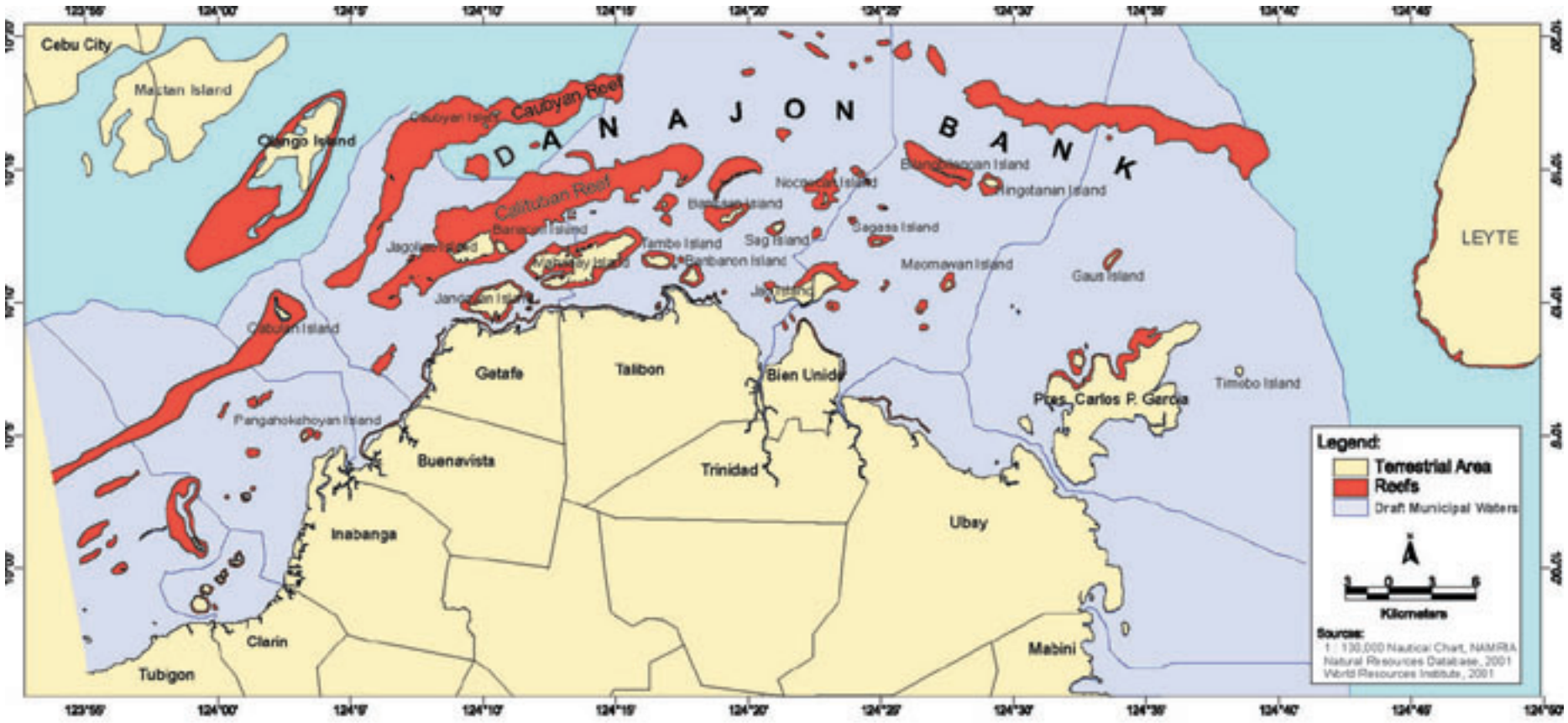
Healthy corals in excellent condition can produce 20,000 kg of fish per square kilometer per year, enough to provide 50 kg of fish per person per year or enough for 400 families (Mc Allister and Ansula, 1993). On the other hand, poor corals can only produce 2-5,000 kg per square kilometer per year or enough to feed only 30-50 families, per square kilometer.

Danajon Bank

The Provincial Government of Bohol through the efforts of Governor Erico B. Aumentado and the BEMO are currently focusing their efforts on managing and protecting this unique feature. The double barrier reef is one of only ten documented double barrier reefs in the world and the only one in South Asia.

The Danajon reef is an excellent example of how the northern coastal LGUs of Bohol from Clarin to President Carlos P. Garcia could work together and implement inter-provincial CRM to protect a unique national treasure.

The Danajon Bank is a double barrier reef that runs parallel to the northern coast of Bohol and is composed of the outer Caubyan and inner Calituban barrier reefs. It is bounded by four municipalities (Getafe, Bien-Unido, Talibon and Ubay) in the south and the Camotes Sea in the north. To the west, it runs all the way to the next province, Cebu, and to the east and northeast it reaches up to the provinces of Leyte and Southern Leyte. Danajon is one of the few documented double barrier reefs in the world and is a very rare geological formation. It has supplied food to Cebu and Bohol for centuries but is in a very poor condition with 90% of it having poor and damaged coral reefs (Stuart J. Green and LGU-Talibon, 1997).



Map of Danajon Double Barrier Reef, showing outer barrier (Caubyan) and inner Barrier (Calituban)

Figure 2.5. Map of Danajon Bank

Possible Management Strategies to Consider

- Information, education and communication (IEC) campaign throughout the province on the value of coral reefs and their benefits
- Establishment of 15-50-hectare community-based marine sanctuaries, such as those already established in Lomboy-Kahayag, Pangangan Island, Calape; Tayong Occidental, Loay; Cabacongan, and Cabilao Island, Loon.
- Development of integrated coastal management (ICM) plan and zoning plan by LGUs
- More research on and documentation of coral reef areas in Bohol
- Regular monitoring and evaluation of already established sanctuaries, documentation of the trends, and sharing of best practices with other LGUs
- Establishment of education centers and model sanctuaries of high quality in and around the province
- Establishment of buoys to stop anchor damage, adoption of voluntary code of ethics for dive shops, deployment of information guides, and better documentation of dive areas
- Establishment of diver's fee systems for communities and LGUs interested in allowing divers inside their sanctuaries to help cover management and operating (patrolling activities) costs and to put the community as the clear manager of these reefs.
- More regular surveying and training of local communities and local divers for "reef check" and other monitoring activities if interest is shown
- More regular bio-physical monitoring of previously established marine protected areas (MPAs) by the LGUs, NGAs and NGOs to evaluate the results of their CRM-related activities, and passing on of the information to the BEMO
- Minimizing, if not totally preventing, illegal and destructive fishing activities around coral reefs
- Minimizing the illegal extraction of corals for construction of houses, seawalls, piers and other infrastructure and the sale of marine ornamentals
- Reducing surface water runoff and soil erosion from the uplands that result to increased sedimentation and siltation, thereby literally choking the coral reefs
- Integration of information on the coral reef ecosystem into the curriculum of the DECS
- More awareness raising work that a coral is in fact a delicate annual, not a stone or plant

SUMMARY

Bohol's various ecosystems are interrelated and play different but equally important roles in the life cycles of the marine organisms in the area. If one ecosystem is degraded, it will surely affect the other ecosystems in the area. The coastal and marine habitats of Bohol experience most of the pressure from the lowland and upland communities that has led to increased stress caused to them and increasing losses in economic benefits. These ecosystems are actually in a pretty poor condition but can still be rehabilitated. Coastal habitats need to be managed and full economic, social and ecological benefits must be considered prior to other developments in the area. Marine sanctuaries are a great way to rehabilitate small areas of the sea, and involve the communities in their management.

Chapter 3

organizations concerned with crm in the province

There are many multi-sectoral organizations working on coastal resource management in Bohol. These groups have a variety of interventions including participatory CRM planning, habitat and fishery resource management, enterprise development, mangrove rehabilitation and management, strengthening and establishment of POs and others. Some development partners work together as collaborators while others work alone. The types of organizations represented here are national and local government agencies, non-government organizations, academic institutions and the concerned communities (e.g. coastal-based POs and multi-purpose cooperatives), all of which are working towards the realization of a sustained CRM in Bohol and have shown interest to be included in this profile.*

PROVINCIAL GOVERNMENT OFFICES

Bohol Environment Management Office (BEMO)

Mandated through the Bohol Environment Code of 1998, the BEMO is an offshoot of the Bohol Environment Summit of 1997 which was sponsored by the Provincial Government and the USAID-Governance and Local Democracy (USAID-GOLD) Project and a variety of stakeholders.

After the summit, a small budget was allocated for the BEMO, which has steadily increased. This office is now a separate division under the office of the Provincial Governor. The Local Government Code of 1991 encourages, although optional, the establishment of an environment and natural resources office for every province.

The vision of the BEMO is to become "a dynamic, responsive and informative organization based on the principles of collaboration and participation; committed to the management of the environment; and led by pro-active, motivated, self-reliant, innovative, responsible and technically equipped staff to effectively deliver services through technical assistance to all beneficiaries to achieve a sustainable ecological balance for the Province of Bohol."

* All information contained on the organization is based on information given to the authors by each agency during 2001, through a questionnaire from BEMO-CRMP.

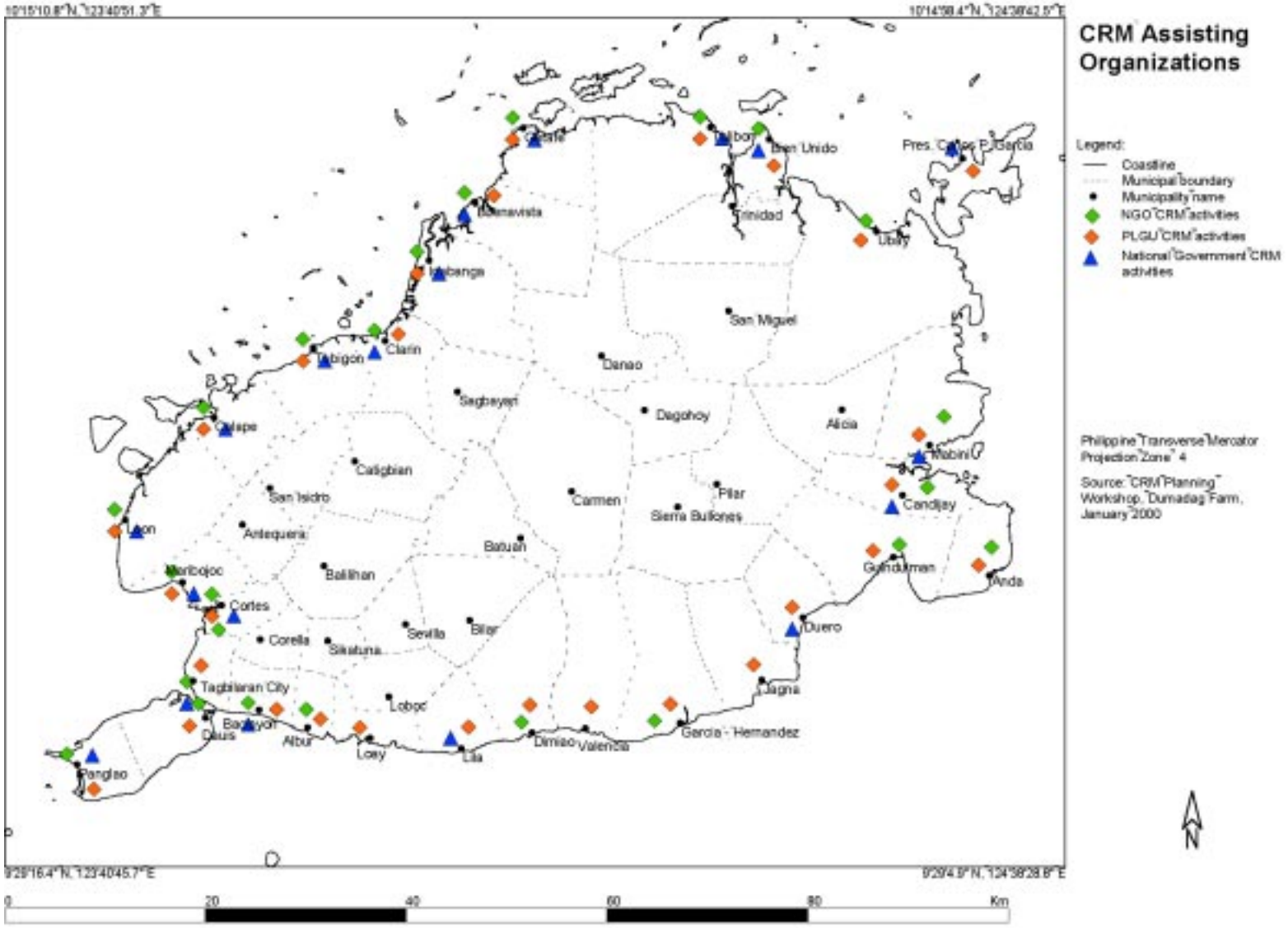


Figure 3.1. Government and private organizations working on CRM in Bohol

BEMO offers programs on CRM, watershed management, integrated solid waste management, air and water quality monitoring, participatory land use planning, natural resources database, and environment management systems. It also offers IEC and extension services.

BEMO is now mandated as the main coordinating, systematizing and standardizing office for natural resource management in the province and has a variety of partners, institutional linkages and funding organizations. Its CRM activities have been implemented in the CRMP Learning Areas and eight expansion municipalities, as well as province-wide, like the recently organized Bohol Coastal Law Enforcement Councils (CLEC). By the end of year 2000, BEMO was working in all coastal municipalities of Bohol advocating for better across-the-board resource management, integrating this with its other programs such as solid waste management and upland management.

In terms of technical assistance, the BEMO is the key office that can coordinate and collaborate CRM-related undertakings in Bohol. It is suggested that all agencies working on CRM in the province coordinate with the BEMO in order to harmonize all activities and create a greater impact on the coastal communities and fisherfolk. The BEMO is primed to be the "institutional memory" of the province for natural resource management programs, activities, successes, failures and, most importantly, learnings of these programs.

Bohol Tourism Office (BTO)

Set up by the administration of the recently elected Gov. Erico B. Aumentado, the Bohol Tourism Office will primarily implement the provincial tourism development program, avowedly a major cornerstone in the integrated development plan for Bohol. The Bohol Tourism Office also complements and supplements the over-all national tourism development plan as laid out by the Department of Tourism (DOT). It will also sustain the eco-cultural tourism focus as laid out in the vision of the Provincial Government, and carry on the initiatives of the tourism promotion section of the Bohol Investment Promotion Center.

Among the initial programs this office will undertake are the production of an adequate supply of tourism information and promotion materials, a more definitive tourist profiling system, and a province-wide series of "enculturation" training activities and seminar-workshops geared at ingraining in every Boholano with a culture of tourism to help deal with visitors in as warm and honest ways as possible.

Office of the Provincial Agriculturist (OPA)

The Office of the Provincial Agriculturist is mandated to implement environment-friendly enterprise projects in coastal communities. It works closely with the BFAR and DA and assists LGUs and communities in coastal livelihoods.

OPA's main functions are to formulate plans and programs geared toward sustainable fishery production, extend technical assistance on aquaculture and marine fisheries development,

establish nurseries and demostration farms, and enhance the capability of the fisherfolk for entrepreneurship. It has a staff of 12 persons who focus on enterprise development and mariculture. These staff were previously involved in the activities of the original provincial *Bantay Dagat* of Bohol.

The current projects of the OPA include oyster culture, mudcrab fattening, seaweed farming, and nursery establishment. Its enterprise activities are usually not tied to any other CRM practices and focus more on adopting an environment-friendly enterprise framework that encourages better resource management. OPA's current project sites are found in Panglao, Loon, Calape, Tubigon, Clarin, Buenavista, Getafe, Talibon, Ubay, Mabini and Candijay.

Bohol Investment Promotion Center (BIPC)

The Bohol Investment Promotion Center was created in 1997 under the Office of the Provincial Governor. Its main focus is to assist investors in setting up their projects and facilities in Bohol. BIPC provides a variety of services, such as providing information on investment opportunities, business procedures and government regulations; guiding the investor in completing the requirements of government regulatory agencies; and providing referrals to relevant government bodies, support organizations and service providers. The BIPC also focuses on the establishment of major public infrastructure projects in the province, as well as other programs and projects that will enhance Bohol's business environment.

With technical assistance from CRMP in CY 2000, the center collaborated with key CRM players in promoting enterprise development in the towns of Buenavista, Candijay, Duero and Panglao. The environment-friendly practices that it helped promote and enhance include loom weaving in Duero, seaweed farming in Panglao, mudcrab culture in Candijay, and eco-tourism promotion and development in Cambuhat, Buenavista. Recently, it added a livelihood and technology development assistance bureau to enhance its role in the upliftment of the quality of life of the Boholanos.

NATIONAL GOVERNMENT AGENCIES

Department of Education (DepEd)

DepEd, formerly DECS is a complex learning organization that develops, promotes, provides and ensures basic education that is responsive to the internal, external and emerging learning needs. The vision of the department is to commit itself to a culture of excellence in public service, believing that the most important resource of the country is its people, therefore making the task of educating the Filipino child its singular mission.

In coordination with a Manila-based NGO (International Marinelife Alliance), DepEd is conducting integration of coastal education into the curriculum of teachers in 22 coastal schools across Bohol. It has also initiated a variety of advocacy and education activities throughout the province. These include film showings, poster competitions, essay writing contests and field trips for school children. DepEd and BEMO are currently focusing on the institutionalization of the "I Love the Ocean" Movement in one pilot school in Tagbilaran City. This activity mobilizes and advocates for civil society participation in managing the ocean and its resources. It also conducts various voluntary activities around the province. Part of the commitment of DepEd to the environment is helping replant mangrove areas around Bohol, an example of which is the one fronting the Baclayon church.

Department of Environment and Natural Resources (DENR)

The DENR is mandated as the primary government agency responsible for the sustainable development of the country's natural resources and environment. It aims to be a dynamic force behind people's initiatives in the protection, preservation and management of the environment through strategic alliance and partnerships, participatory process, relevant policies and programs, and appropriate technology towards sustainable development.

DENR is the primary agency responsible for the management of Bohol's mangrove resources and has taken a paradigm shift from a profit-oriented approach to managing the natural resources to a pro-people approach, highlighted through its Community-Based Forest Management Program (CBFMP). In Bohol, communities of 14 sites, covering 2,110.61 hectares of mangrove areas have been awarded their Community-Based Forest Management Agreement (CBFMA). The CBFMA confers on its recipients the exclusive right to manage and protect the resources in their area.

Prior to the implementation of the CRMP, the DENR launched its Coastal Environment Program (CEP), which focuses on CRM in protected areas of Bohol (Calape, Mabini, Getafe, Talibon) with the Calape CEP site being the national winner for the Most Gender-Responsive Project in the country. The CEP sites in Talibon and Getafe have been phased out and turned over to their respective LGU. The CEP has also helped conduct gender sensitivity activities and community organizing, and establish livelihood and enterprise projects and marine protected areas. It has also initiated a series of contract reforestation projects in mangrove areas across the province. A minimum of two regular staff for each of the two CENROs in Tagbilaran City and Talibon are tasked to look after the activities of the CEP sites in their respective area of jurisdiction.

The DENR has also begun a newly funded project for mangrove management in the town of Pres. Carlos P. Garcia, particularly in six *barangays* (Poblacion, Bogo, Bonbonon, Campamanog, Lipata and Popoo). Called the Lapinig Island Mangrove Rehabilitation Sub-Project under the Forestry Sector Project (FSP) of the department and funded by the Japan Bank for International Cooperation (JBIC), the sub-project covers 250 hectares of open mudflats for plantation establishment and

300 hectares of secondary growth mangrove (sparse forest) for enrichment planting (DENR-7 Updated Appraisal Report of Lapinig Is. Mangrove Rehabilitation Sub-Project, June 2000).

DENR - Coastal Resource Management Project (DENR-CRMP)

The Coastal Resource Management Project has chosen Bohol as one of its pilot provinces in the country. Funded by the United States Agency for International Development (USAID), implemented by the DENR and managed by Tetra Tech Environmental Management, Inc. (Tetra Tech EMI), it focused on CRM implementation at the *barangay*, municipal and provincial levels, as well as having a policy component at the national level.

Initially, CRMP worked in seven municipalities on the western and northwestern coast of Bohol and then moved into the provincial level to work with the BEMO. Later, it expanded its activities in eight more coastal municipalities, with the BEMO as lead implementing agency. CRMP focused mostly on CRM extension and technical assistance.

The project ran for six years and focused on developing best CRM practices at the village level while offering technical assistance to interested LGUs on how to set up and manage a CRM program of their own. Successful LGUs were lauded for practicing CRM as a basic service of local government.

A large number of best practice "models" at the *barangay* and municipal levels were facilitated in association with the CRMP. These include mangrove management, environment-friendly enterprise, coastal and tourism product development, PCRAs, IEC-related activities, establishment of provincial trainers on CRM, CRM planning for coastal LGUs, community-based marine sanctuaries, coastal law enforcement, and policy development, among others.

Department of Finance - Community-Based Resource Management Project (DOF-CBRMP)

Supported by the World Bank and implemented through the Department of Finance, the CBRMP aims to reduce rural poverty and environmental degradation through support for locally generated and implemented natural resource management projects. It consists of a grant and loan facility for LGU-initiated community-based resource management projects, with the LGUs implementing the activities along with the DENR, BFAR and other appropriate development partners.

Funding ranges from 5-30 million pesos in a loan/grant/equity mix. Approximately 19 municipalities in Bohol have applied for funding. These include the coastal municipalities of Loon, Calape, Inabanga, Buenavista, Getafe, Bien Unido, Trinidad, Mabini, Duero, Jagna and Candijay and some upland municipalities.

The CBRMP works directly with municipalities. Collaboration with the Provincial Government, however, has been minimal despite the latter's mandate, current thrusts, strong programs and technical assistance.

The project has now finished its funding application in the province and DOF-World Bank funding window (LOGOFIND) is replacing it. Its technical assistance is handled by the Regional Offices of concerned national government agencies which work directly with MLGUs.

Agricultural Training Institute (ATI)

The ATI in Tagbilaran City is one of 41 extension and training centers of the Department of Agriculture (DA) around the country. It operationalizes the vision of the DA, that is the emergence of a dynamic and self-sustaining rural community of organized farmers cum fisher-entrepreneurs doing profitable business out of agriculture.

The institute implemented a "Training Services Enhancement Project for Rural Life Improvement" or TSEPRLI which established a model site, in coordination with the LGU, in Tangaran, Clarin which was expanded to Poblacion Norte, Bacani and Bonbon in the same municipality.

The project focused on community organizing, establishment of shell gardens/marine sanctuaries, mangrove area rehabilitation, CRM planning, and coastal law enforcement. Funded by the Japan International Cooperation Agency (JICA), it involved the hiring of two field staff and engaging the ATI for technical support in coordination with the LGU.

Department of Agriculture - Livelihood Enhancement and Development Project (DA- LEAD Project)

The DA has a variety of funding sources for the livelihood development of the fisherfolk through a soft loan for a variety of projects.

This project normally gives loans to small fisherfolk to spend money on purchasing fish aggregation device (FAD) or 'payaw', big boats and fishing nets, a very flawed strategy as it results in over-fishing and related problems. FADs involve mere harvesting of fish in great number to the disadvantage of the smaller fisherfolk. Barangay Manga in Tagbilaran City aptly illustrates this situation. Meanwhile, the loan recipients have not been able to pay their obligations.

In Barangay Napo, Loon, where a LEAD Project was implemented, the purchased FADs were not used for hook-and-line fishing. Instead, the small fishers were encouraged to set up a working agreement, which is illegal, with the commercial fishing boats of Tagbilaran City and Cebu. A few members of the community then began encouraging big ring net fishers to come into the municipal waters of Loon to harvest their fish. For this, they got a 33% share of the catch while at the same time agreeing to watch out for patrol boats. This again resulted in huge

catches, with some fishermen earning as much as PhP 40,000 per night from one harvest while the small fishers consistently catch nothing.

Investing more money in the coastal waters of Bohol and expecting financial returns for the fisherfolk no longer offer a bright prospect. The soft loans have not been paid back and the whole project has caused a lot of detriment to many small fisherfolk. The LEAD Project should seriously consider establishing guidelines for its credit program. Also, it should discourage the purchase of bigger boats and nets. Land-based activities and other livelihood undertakings would have been much better.

Bureau of Fisheries and Aquatic Resources (BFAR)

The BFAR, in cooperation with concerned national government agencies, has jurisdiction over the management, conservation, development, protection, utilization and disposition of all fisheries and aquatic resources of the country, except those within municipal waters. In municipal waters, however, it may coordinate with and assist the LGUs, FARMCs and other concerned agencies in the development, conservation, protection, utilization and management of fisheries and aquatic resources as laid down in RA 8550, the Fisheries Code of 1998. It is also the main national government agency responsible for the management of inland fisheries.

BFAR's vision is "a modernized fisheries that is technologically advanced and globally competitive". Its transformation is guided by sound management practices of resource sustainability, the principle of social justice and strong private sector." It has three over-riding mandates, one on global competitiveness, one on food security and the other on support services.

BFAR works in most municipalities of Bohol in a variety of capacities. It issues licenses to commercial fishing boats for fishing activities beyond the 15-km radius, and handles the highly controversial Fishpond Lease Agreements (FLAs).

The BFAR has research stations based in Clarin, Calape and Ubay that focus on the development of aquaculture technologies and other development-based activities. In coordination with the LGUs, it has established marine sanctuaries and FARMCs, assisted in law enforcement and fish warden deputization activities, and conducted hydro-biological surveys and related activities.

The BFAR has a very comprehensive livelihood program for the fisherfolk. These include the culture of grouper, milkfish and 'tilapia' in fish cages; seaweed and oyster culture; seaweed nurseries; hog raising; fish culture in ponds; distribution of fishing gears; etc. It also conducts training on fiberglass boat making in coordination with the Regional Fisheries Training Center.

The regional office of the BFAR has several extension units, namely, the newly created CRM Section, the Regional Fisheries Training Center, and the hydro-biological underwater

assessment team. The latter, upon request, can conduct underwater assessments and video documentation of the status of the underwater ecosystems of the municipalities.

NON-GOVERNMENT ORGANIZATIONS

Feed the Children - Philippines (FTC-P)

FTC-Philippines has been working in Bohol since 1989 and since then it has gone through a series of development paradigm shifts in its project implementation. FTC envisions "a brighter tomorrow for children where their basic human needs are met and their rights protected." FTC is the only NGO in the province with an integrated development program for children. It focuses on three programs, namely, Integrated Child and Family Development Program, Biodiversity Resource Management for Sustainable Development Program, and Micro Finance or Community Banking Program. All these are implemented through an integrated approach.

FTC officially began its Community-Based Coastal Resource Management (CBCRM) Program in 1998. It now works with fishing communities in Tagbilaran City, Panglao, Garcia Hernandez, Calape and Tubigon, and has a core staff of five. Through an interagency and participatory approach, it endeavors to improve the health and overall development of children by promoting sustainable coastal resource management for the whole family. FTC's main premise is to make sure that the resources of the family are looked after. If the parents can have a sustained catch, the children will get better access to protein, education and health.

FTC conducts community organizing, habitat management (sanctuaries and mangroves), information retrieval and research, CRM planning, coastal law enforcement, enterprise development, and other activities as required by the communities it works with. All these are incorporated into their programs on governance for CRM, alternative livelihood, IEC, organization and strengthening of fisherfolk associations, and marine rehabilitation and protection.

More recently, the CBCRM program is integrating reproductive health into its CRM package with help coming from the Path Foundation Philippines, Inc. It is also documenting through video film its lessons in Tubigon to share and amplify its experiences with and across the town and province, while highlighting the role of community leaders and government officials in making CRM a success.

Foundation for Philippine Environment (FPE)

FPE was created due to the realization that something must be done to the country's fast declining resources. In 1992, the FPE received an endowment fund of about US$ 22 million through a debt-for-equity swap. The interest of this amount has been used for biodiversity-related and social development projects to support communities and NGOs in the Philippines. Through this

Governor Erico B. Aumentado officially opens the Bohol Marine Triangle joint LGU workshop, with the mayors of Dauis, Baclayon and Panglao shown in background.

funding, the FPE supports several NGOs in Bohol, such as PROCESS Foundation, Inc. in its Abatan Watershed Project. It also began work on the Bohol Marine Triangle (BMT) Project, which was developed through a participatory approach over a long period of time with the Silliman University, CRMP, Sulu Fund and other participating agencies as development partners. The BMT Project aims to protect the globally significant resources of the marine highway enclosed by the Bohol Marine Triangle southwest of the province. The project builds on a substantial foundation of past and current initiatives related to biodiversity conservation.

The United Nations Development Program - Global Environment Facility (UNDP-GEF) has released substantial funding for the BMT, and the FPE is the first NGO to gain access to this type of funding in the Philippines. The project now works closely with the BANGON Foundation, Inc. and other NGOs to ensure its success.

The BMT Project is guided by a CRM planning cycle in three municipalities (Baclayon, Dauis and Panglao) and two smaller islands (Balicasag and Pamilacan), all of which cover over 1,120 km². The BMT Project aims to enable the communities of 12 pilot *barangays* to conserve the biodiversity in the marine triangle through a more effective, equitable and sustainable planning, implementation, monitoring and enforcement of conservation efforts. Extensive coral reef habitats in good condition still abound within the BMT, with over 50% live hard coral cover and rich marine resources that attract diving enthusiasts to the place.

Environmental Legal Assistance Center (ELAC)

Formally created in 1997 as an offshoot of ELAC-Palawan, which was established in the early 1990s, ELAC-Bohol offers legal assistance and capability building expertise in environmental law.

With a staff of five, it conducts paralegal education and training, training of local law enforcers, environmental law awareness seminars, and meta-legal actions. It also offers assistance for policy formulation and development/environment-related law, including representation before any judicial, quasi-judicial and administrative bodies.

ELAC has worked in many coastal towns and *barangays* of Bohol, particularly in Loon, Dauis, Baclayon, Panglao and Tagbilaran City. It successfully helped impede the proposed reclamation project at the Tagbilaran bay, which was considered unnecessary because of the severely degraded coastal environment of the city.

It has recently launched its own CB-CRM project in two pilot *barangays* of Mabini, Bohol and these are great hopes for its success in the future.

Haribon Foundation - Project Seahorse

Haribon Foundation is a Manila-based NGO which in Bohol works in partnership with the Canadian-based Project Seahorse, which has been conducting research in Bohol since 1994. The project is composed of a team of biologists and social workers committed to conserving and managing seahorses and their relatives and habitats while respecting human needs. They envision a world where populations of seahorses and their relatives are secured in a well-managed marine ecosystem.

Haribon's activities include community organizing, marine protected area establishment and management, research on biological and socio-economic aspects of coastal communities, environmentally sustainable livelihood, CRM planning at the *barangay* level, and IEC.

They are focused in pilot *barangays* in the municipalities of Getafe, Talibon, Ubay, Pres. Carlos P. Garcia, Buenavista and Tubigon, as well as within the Danajon Bank. With ten full-time staff and local assistants working in Bohol, Haribon was contracted from 1997 to 2000 by the USAID-funded DENR-CRMP to handle the community-based CRM activities in northwest Bohol.

First Consolidated Bank Foundation, Inc. (FCBFI)

FCBFI was registered in Bohol in 1989. It envisions itself as "a viable and self-reliant development institution committed to the upliftment of poverty groups through holistic and sustainable development approaches." It is the corporate arm of the First Consolidated Bank (FCB) based in Bohol. Its main thrusts are micro-finance intermediation program, social development technical assistance and training, and offering affordable printing services.

The foundation is implementing a CBCRM enterprise in one village in Buenavista and another in Candijay as part of a package of assistance from the DENR-CRMP, and lately through the Path Foundation and Canadian International Development Assistance (CIDA). This forms part of its Social Development Program on resource management, business development, and market development and enhancement. The foundation also has a new DENR-funded project on mangrove rehabilitation and social development in the municipality of Pres. Carlos P. Garcia (formerly Pitogo).

FCBFI has one officer and six community organizers-technical assistants who implement CBCRM-related activities and promote enterprise development as a catalyst for resource management.

Local Government Development Foundation (LOGODEF)

For many years, this Manila-based NGO has been helping develop the capability of Bohol LGUs (and various other provinces) to implement their mandate as laid down in the Local Government Code of 1991. It is piloting LGU capability-building programs and, recently, developing information resource centers for local governments.

LOGODEF was involved in the computerization of important government documents and transactions including taxation, and in the development of environment codes in Bohol. In Tubigon, it helped the LGU develop an excellent model for implementing sustainable mariculture and enterprise programs towards complementing CRM in the community. This project is implemented in coordination with the Konrad-Adenauer Stiftung, an NGO based in the Philippines with funding from the European Union.

Participatory Research, Organization of Communities and Education towards Struggle for Self-Reliance - Bohol (PROCESS-Bohol)

PROCESS began its operation in Bohol in 1985 and has had a wide experience in a variety of social development projects. It was the first NGO to focus on fisheries development in the province. It is currently implementing its Fisheries Development Program and other coastal resource management-related projects with the goal of building gender-sensitive peoples' organizations for the protection, preservation, conservation, rehabilitation and development of aqua-marine resources through community-based coastal resource management (CBCRM).

The focus areas include community organizing, participatory research, CRM planning, habitat management, fisheries management, enterprise development, community-based sustainable tourism, and a variety of other activities. This NGO is also the designated Bohol coordinator for the Integrated Population and Coastal Resource Management (IPOPCORM) in collaboration with Path Foundation.

PROCESS offers an integrated CBCRM package and has organized a province-wide federation of fisherfolk associations. The CRM activities of PROCESS have been implemented in the municipalities of Loon, Calape, Tubigon, Buenavista, Getafe, Talibon, Maribojoc, Cortes, Tagbilaran City, Dauis, Panglao, Baclayon, Alburquerque, Loay, Lila, Dimiao, Duero, Guindulman, Anda, Candijay and Mabini. The NGO recently signed a Memorandum of Understanding (MOU) with the Provincial Government to jointly implement CRM across the province and share and coordinate resources.

Presently, PROCESS has 15 coastal-based staff who assist 25 fisherfolk organizations within the aforementioned municipalities and work closely with all the stakeholders in the project sites.

Program in Appropriate Technology in Health Foundation Philippines, Inc. (PATH)

path Foundation Philippines, Inc.

Path Foundation is a private, non-profit, non-stock corporation registered with the Securities and Exchange Commission (SEC) in 1992. Its mission is to improve reproductive health and environmentally sustainable development in underserved areas of the Philippines. It achieves this by involving and supporting client groups and target communities to adapt and apply appropriate technologies to address local problems and priorities.

Path's main focus in Bohol is its Integrated Population and Coastal Resource Management (IPOPCORM) Initiative, a project designed to link population and environment and address reproductive health, environmental degradation and food security issues in coastal zones, and implemented by PROCESS-Bohol. Other implementing NGOs include FTC-Philippines and FCBFI. Private pharmacies are also involved particularly in the social marketing of reproductive health products.

Community-based activities of Path are carried out in Mabini, Candijay and Tubigon, the latter through FTC. These areas have high marine biodiversity, high population growth and young population age structure.

Bohol Integrated Development Foundation, Inc. (BIDEF)

An offshoot of a church-based organization, BIDEF was formed in 1988. It has been practicing CBCRM for several years now. Its CRM program started off in the north of Bohol, particularly in Talibon and Bien Unido, and picked up from where the CVRP-I left off. Initially, it was funded by FPE and then by the British Embassy. Presently, it has quite a number of donors.

BIDEF offers various CRM components, such as enterprise development, environmental education, and fisherfolk and cooperative formation. At present, it is developing its own province-wide federation of people's organizations.

Project sites include Calape and Loon and two *barangays* in Maribojoc, where it works with the Abatan-Lincod Mangrove and Nipa Growers Association (ALIMANGO) and Agahay Nipa Planters Association (AGNIPA) in Nypa trading and cooperative development. BIDEF has also helped secure CBFMAs in Maribojoc and Calape.

Presently, the foundation has three full-time staff working on CRM. It has several other staff working on other social development projects in the province.

Bol-anon Foundation, Inc. (BFI)

Bol-anon Foundation, Inc. was registered in 1989 and has been working in Bohol in a variety of capacities including CRM. It has a wide range of experience in mangrove management and appropriate technologies, such as solar desalination, zero waste management, solar cooking, biogas utilization, and mangrove nursery development.

BFI's CRM focus involves waste management, municipal environment management, and related activities. It currently has a staff of two working on coastal projects and who have worked in the coastal communities of Getafe and Dimiao.

Bohol Alliance of Non-Government Organizations Foundation, Inc. (BANGON)

BANGON was institutionalized in 1991 by some of the aforementioned NGOs after they saw the need to work together under an alliance. It has 16 member NGOs, 14 of which are still active. Pursuing its vision, strategic plan and development agenda, BANGON ensures unity and alliance among its partner agencies. Its members get involved in steering forward its direction through a board of trustees whose membership is drawn from among the member NGOs.

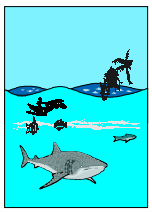
BANGON seeks to coordinate the efforts of its members and has had many learnings and successes through the Loboc River Basin Development and Management Program - Area Focus Approach, which is funded through PACAP-AusAID. Currently, it hopes to build on this experience and develop a CRM program. It now has a CRM framework, direction and plans to help encourage its members to work together for a successful CRM.

The member NGOs plan to share, learn from each other's experiences, and hope to have access to funding for CBCRM collaboration among themselves. BANGON's main strategy aims at capacitating its members to implement better practices through collaboration, not through competition between and among its member NGOs. It currently has two staff focusing on CRM. This number is expected to be increased as funds will be available. BANGON's NGOs seem to be the most experienced and professional CBCRM implementers in Bohol.

BANGON is now the lead implementor of the BMT Project in 19 *barangays* of Panglao, Dauis and Baclayon.

Coastal Conservation and Education Foundation, Inc. (CCEFI)

The Coastal Conservation and Education Foundation, Inc. (formerly Sulu Fund) was established in 1998 by a dedicated group of individuals with a desire to address critical marine conservation needs of the Philippines. Protection and management of the marine environment is



the central focus of CCEFI. It strives to help conserve and manage coral reef ecosystems and other coastal ecosystems and resources while promoting sustainable uses for the benefit of people throughout time. It promotes leadership for improved coastal resource management through education, information exchange and learning by implementing field programs in partnership with local resource stakeholders.

In the province of Bohol, the CCEFI has been conducting coral reef surveys on selected marine sanctuaries off southwest of the island in year 1984, 1992 and 1999. The change in coral reef quality as a result of management efforts, humans impacts and environmental factors, was collected and collated. This information was used to draw recommendations for improved management in the surveyed sites and the larger area.

Continuing on to support conservation efforts in Bohol, the CCEFI assisted the Foundation for the Philippine Environment (FPE) in the design of the Bohol Marine Triangle Project 2000. CCEFI will continue to assist FPE with project management and provide guidance in field implementation based on the combined experience of the CCEFI and Coastal Resource Management Project.

PEOPLE'S ORGANIZATIONS

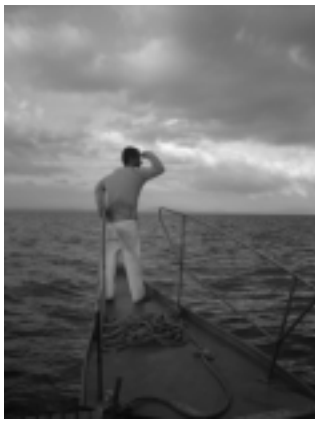
Fisherfolk Associations and Federations

There are quite a number of active and inactive fisherfolk associations and federations within Bohol. These have been organized by both government agencies and NGOs, and are too numerous to mention in this profile. MAKAMASA-Bohol, a provincial federation of subsistence fisherfolk organizations in Bohol, however, seems to be the oldest and most mature. Organized by and can be contacted through PROCESS, this federation was actively involved in the drafting of the Fisheries Code of 1998 and in lobbying for its enactment.

MAKAMASA-Bohol is very strong in its crusade against all forms of illegal fishing, particularly the encroachment of commercial fishers on the municipal waters.

Pamilacan Island Dolphin and Whale Watching Organization (PIDWWO)

Pamilacan Island Dolphin and Whale Watching Organization, organized in 1998 with the help of KKP-WWF, has over 100 members now. The organization is tasked to run and manage the whale and dolphin watching tourism activities in Pamilacan Island. It also focuses on other livelihood activities and resource management, since a ban on capture of whalesharks and manta rays was enforced by the BFAR.



Spotter looking for dolphins

ACADEMIC INSTITUTIONS

Holy Name University (HNU)

Formerly Divine Word College of Tagbilaran (DWC-T), this sectarian institution has a training pool and regularly offers technical consultancy and facilitation skills to the various LGUs of Bohol, particularly on socio-economic issues through its research arm, the Social Weather Station (SWS). Occasionally, it gets involved in marine-related activities most especially advocacy for a clean marine environment.

University of the Philippines - Marine Science Institute (UP-MSI)

Based in the campus of the University of the Philippines in Diliman, the Marine Science Institute has been working in Bohol for some time. UPMSI was designated the "National Center of Excellence in the Marine Sciences" by Presidential Proclamation No.518 in 1994.

The UP-MSI once collected data on Bohol coral reefs in the late 1970s as part of a nationwide survey of coral reef resources. The UP-MSI then returned in 1997, conducting community-based MPA monitoring and evaluation trainings. It has good time series data analyses for the Lomboy-Kahayag Fish Sanctuary in Pangangan Island, Calape and the Cabacongan marine sanctuary in Cabilao Island, Loon.

The regular monitoring and evaluation of these sanctuaries has been made possible through small grants from UP Center for Integrative and Development Studies, the UNDP-GEF-Small Grants Programme and DENR/USAID CRMP and partnerships with BIDEF and VSO as well as assistance from the University of San Carlos, BFAR, DENR and the BEMO.

The institute has conducted a trainer's training on reef assessment for local NGO's and Government Agencies agencies. It is also conducting a long-term time analysis of water surface temperatures in Bohol while looking at the impact of surface temperatures nation-wide and its relation to coral bleaching.

It is also now considering working in Bohol with Dr. Edgardo Gomez who has won a Pew award to work in selected marine protected areas transplanting giant clams and coral reefs.

Silliman University (SU)

Based in Dumaguete City, Silliman University has been working in Bohol since the early 1980s through the Marine Conservation and Development Program in the islands of Pamilacan (Baclayon) and Balicasag (Panglao), where

its efforts resulted in the establishment of two of the first community-based marine sanctuaries in the Philippines.

Since then, SU through its Marine Laboratory has conducted underwater assessments and socio-economic surveys in Bohol, particularly for the Central Visayas Regional Project - I (CVRP-I) of the World Bank, later with the DENR-CRMP, and lately in Balicasag Island (Panglao) with the Philippine Tourism Authority (PTA). It has also rescued giant clams in Balicasag and Pamilacan, Pangangan Island, Calape throughout its Giant Clam Project. It is presently involved with the Bohol Triangle Biodiversity Conservation Project providing technical assistance in biodiversity assessment and database development. These activities produced a variety of long-term data on Bohol and its coastal resources.

Central Visayas State College of Agriculture, Forestry and Technology (CVSCAFT)

The CVSCAFT is a system of colleges based in Tagbilaran City and four municipalities, with the interior town of Bilar being the seat of the main campus. The campuses in Calape, Clarin and Candijay offer CRM-related courses and subjects. The whole system also offers various professional training courses and has a huge untapped potential to collaborate with the various agencies and communities that work on CRM in Bohol.

As part of the curriculum for the newly developed Bachelor of Science in Environmental Resource Management, major in Coastal Resources Management (BSERM-CRM), each student conducts research or thesis on CRM on their last year, for which he may work with LGUs and other appropriate agencies. As a result, the teachers will accumulate a wealth of information about CRM.

University of Bohol - Community Development Foundation (UB-CDF)

Newly established, this foundation has a big potential in helping with the CRM activities in Bohol, especially as regards education and research aspects. It could assist in validating results of various CRM and related activities and guiding students in their research or thesis, and tapping a pool of qualified teachers and staff to work on CRM in Bohol.

VOLUNTEER AGENCIES

There are several CRM-focused international agencies working in Bohol and some of these have technically capable staff who can facilitate the transfer of skills to LGUs and NGOs. Among these agencies are the German Development Service, which has assigned marine biologists in certain NGOs and a development planner in the Provincial Planning and Development Office (PPDO); and the Voluntary Service Overseas (VSO), a British volunteer organization which has deployed several volunteers in specialized job areas. Recently, the VSO has moved towards working with government institutions and offices in various fields. There is also the Peace Corps

of the United States of America, which has fielded volunteers including teachers, marine biologists, planners and water resource management specialists across Bohol for many years now.

FUNDING AGENCIES/FINANCING INSTITUTIONS

There have been a number of loans made available by development banks to small fisherfolk organizations, which have continued since the 1970s. The *Biyayang Dagat*, *Kilusang Kabuhayan at Kaunlaran* (KKK) and other pro-people projects had, on the whole, been "dole out" projects, and were dismal failures. As cited earlier, investing in bigger nets and boats will not help the majority of the fisherfolk nor anyone else in the fishery sector. The problem with the small fisherfolk is no longer catching more fish as the maximum limits have already been reached. It is a matter of enhancing and leaving enough of the resource and making sure that everyone, not just a selected few, has access to it.

There is no more need for soft loans and other unsustainable technologies to increase fish catch. What is most important is equitable distribution and nurturing of the resource.

SECTARIAN GROUPS

Social Action Center (SAC)

The Diocese of Tagbilaran, through the efforts of Msgr. Leopoldo S. Tumulak, has been very vocal in its advocacy for coastal awareness. The Bishop has been helping the fishers of the city's Manga District advance their advocacy on anti-illegal fishing, especially against a commercial fishing group that uses active gears (i.e. ring nets).

The Social Action Center of the Diocese also serves as the provincial coordinator for the "I Love the Ocean" Movement which, at the moment, is a little inactive. There is a plan to institutionalize the ILOM in the province with the Tagbilaran City Science High School as pilot school.

TRENDS AND RECOMMENDATIONS

- There is a bias for the northern and western parts of Bohol as regards funding for CRM, and very few agencies are implementing or facilitating CRM in the southern and eastern municipalities. Some LGUs, however, are doing very well, such as Dimiao, without the need for external inputs. If the LGUs are really committed, they will be able to implement CRM on their own. Some extra staff and resources, however, may be needed, and this could be possible through an NGO or a funded project.

- There is more room for collaboration and counterparting of resources and activities between and among the various agencies, institutions and NGOs in all aspects of CRM. More agencies and organizations may consider establishing MOUs with the Provincial

Government and MLGUs. These agreements will define the individual roles of participating partners and fit these into the CRM plan of the LGU.

- If possible, the agencies (including funding agencies) could consider adopting a common framework for CRM in Bohol (Chapter 5). The NGOs, especially, should really focus on developing their own specialized CRM niche and not on competing with each other. Thus, one NGO may strengthen its capability for CRM research, while others may specialize in CRM planning, enterprise development, MPA establishment, law enforcement, children's needs, bay management, community planning, etc. This situation will produce a new group of CRM specialists who can work together by sharing their various expertise. At present, most NGOs are generalists as regards CRM-related activities. Furthermore, there may be need for a code of ethics for all NGOs working in Bohol.

- Only one NGO (Path Foundation Philippines, Inc.) is focusing on population education and health, a very necessary move in CRM as these concerns have huge impacts on the resource users and their quality of life. Path will, however, be working with several NGOs in Bohol to try and institutionalize their thrust.

- No school in Bohol offers a marine science course, although there are at least three that focus on fishery education. One of the universities or colleges in the province could perhaps consider setting up a marine science department or college to produce a local breed of future CRM practitioners and advocates with a scientific focus.

- Bank loans for livelihood projects involving fishing gears and vessels as well as new fish capture technologies should not be encouraged as these just add more pressure on the coastal resources and are not profitable either. In CRM, small and simple technologies are much better and cheaper to maintain. As emphasized in the Fisheries Code of 1998, it is important for the small fisherfolk to have preferential access to the remaining resources to sustain their livelihoods.

- There are many other NGOs and foundations not mentioned here that work on CRM in Bohol, however, very little is known about their areas of focus (i.e. what they do, how they work or the lessons they have in CRM). It would be good to try and look for ways to involve them in the CRM initiatives of the province to ensure greater complementation of activities.

- Information about CRM activities and learnings are still not being fed into a centralized information management system as each agency works separately. All the agencies should consider using the common and systematized information collection system of the Natural Resources Database (NRDB) of the BEMO. This will enable all agencies to use and validate the data, and build upon this information. Such a system will provide a more comprehensive picture of Bohol's coastal ecosystems.

- NGOs currently spend about 15 million pesos per year while government agencies, including the Provincial Government, spend about 13 million pesos per year on CRM-related activities. The World Bank- DOF spends about 40 million pesos per year for the Community-Based Resource Management Project (CBRMP) on coastal activities. This, however, is done through loans made available to the LGUs which will ultimately be responsible for the payments. Meanwhile, the academic sector spends about 2 million

pesos per year for CRM. As a whole, there is more than enough funding to implement good CRM across the province (over 70 million pesos per year).

- NGOs have a total of over 40 trained staff who are directly involved in CRM activities throughout the province, while NGAs and the Provincial Government have over 35. With less funding, the academe and other agencies have more or less 15 staff working province-wide. All in all, there are about 90 people who are directly involved in CRM implementation in Bohol; more than enough manpower to achieve CRM province-wide.

SUMMARY

There are various NGAs, NGOs, academic institutions and other entities working on CRM in Bohol. However, there is still a need for a greater convergence within and among sectors, with a lead agency for each sector being essential (i.e. BANGON for NGOs, Provincial Government for government agencies, etc.). Research work, and a link between academic institutions and other agencies and their work on CRM, is presently weak in Bohol.

Funding institutions should also as a matter of protocol pass through the provincial government and try and align their programs as priorities with those of the provincial government. They should also consider spreading their resources around the province more evenly, rather than focusing on speciific areas only and the provincial government is always open to counterparting of human and/or financial resources.

legal and jurisdictional framework

Chapter 4*

OVERVIEW

Coastal resource management in the Philippines is guided by national laws that define the governance system and management measures that must be implemented by national government agencies and local government units. This national legal framework, which is composed of the Local Government Code, the National Integrated Protected Areas System and the Philippine Fisheries Code provides numerous opportunities for local innovation and initiative and encourage active participation of coastal stakeholders in developing and implementing CRM. Coastal resource management is a dynamic process that improves as it evolves in the *barangay*, municipal, provincial, national or international levels. Many external factors, such as population growth and globalization may also influence the development of local CRM plans and programs.

Under the Local Government Code of 1991, the traditional "top-down" approach has given way to a more "bottom-up" approach. Recent developments witness the increasing role of the LGUs in implementing national programs and enforcing national policies, in the process developing further their capabilities in local governance. This policy shift has opened a variety of opportunities and completely re-modeled natural resource management thrusts. Thus, a much more progressive approach towards resolving CRM issues and problems has been set in place.

This chapter focuses on the legal and jurisdictional mandates of the *barangay*, municipal and provincial government units. It also presents the role of some of the national government agencies that implement CRM-related programs, the coastal protected areas in Bohol and their implications, and a case study report about fishponds in Bohol, where there is clearly a jurisdictional problem.

LGU MANDATES FOR CRM

Municipalities and cities are mandated under national laws as the local government unit primarily responsible for managing coastal resources and municipal waters. Responsibility for CRM general falls under the office of the Municipal Agricultural Office (Figure 4.1), however other municipal offices, in particular, the Municipal Planning and Development Office, are involved

* Note: Portions of this chapter were taken from the Philippine Coastal Management Guidebook Series No. 2 - Legal and Jurisdictional Framework for Coastal Management

Table 4.1. Key national policies and laws on fishery and coastal resources management

Law (Date)	Area of concern
RA 6975 (1990) – Department of Interior and Local Government Act	Created a maritime police unit within the PNP, vested with authority to perform all police functions "over Philippine territorial waters and rivers, coastal areas from the shoreline to one mile inland to include ports and harbors and small islands of two miles in length or diameter with less than 1,000 population"
RA 7160 (1991) – Local Government Code of 1991	Contained provision for pollution control by local authorities subject to supervision, control, and review by the DENR
RA (1992) – National Integrated Protected Areas System	An act providing for the establishment and management of national integrated protected areas system, defining its scope and coverage, and for other purposes. It establishes protected areas in the coastal and marine ecosystems to be managed, conserved and protected with involvement of multi-sector groups and representatives.
RA 8550 (1998) - The Fisheries Code	An Act for the development, management, and conservation of the fisheries and aquatic resources, integrating all laws pertinent thereto, and for other purposes. The code recognizes the principles of ensuring sustainability of fisheries resource utilization with ecological limits and of social justice by providing preferential treatment for municipal fisherfolk and their organizations. The code also aims at providing a sound policy and institutional framework for fisheries resource management as well as long-term sustainable development in the sector.
Fisheries Administrative Order No. 197, Series of 2000	Established rules and regulations governing the lease of public lands for fishpond development. Pursuant to RA 8550, qualified fisherfolk cooperatives/ associations and small and medium enterprises are given primary consideration to apply for FLA covering public lands released for fishpond purposes by the DENR to the BFAR. However, existing FLA holders are given priority to extend for another 25 years.
DAO 17, Series of 2001	Established guidelines for delineating/delimiting municipal waters. Defines the geographic extent of coastal municipalities or cities in order to have a legal basis in implementing law enforcement and overall management of the municipal waters.

in planning, budgeting, and monitoring and evaluating municipal CRM plans and programs. The roles and responsibilities of various municipal offices and local resource management organizations is shown in Box 4.1. It has been well documented, however, that a critical factor in the success of CRM at the local government level can be attributed to the level of commitment and unified support of the Mayor and *Sangguniang Bayan*.

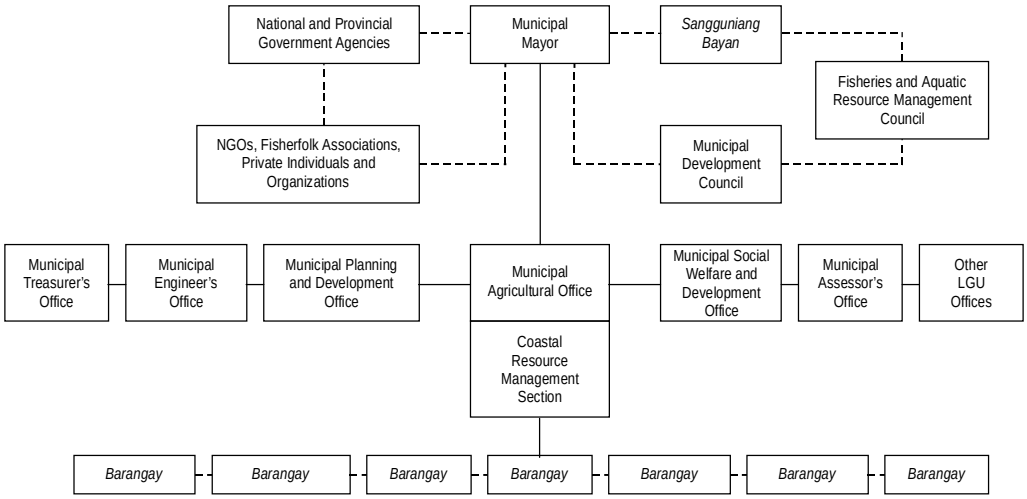


Figure 4.1. Municipal coastal resource management implementing structure

Box 4.1. Roles and responsibilities of the various offices and agencies involved in coastal resource management at the municipal level

Municipal Mayor

- Provides overall administrative supervision and control of the office and its staff
- Prepares budgetary recommendations for specific activities
- Establishes network between and among the LGUs, NGAs, NGOs, fisherfolk associations and other groups for CRM initiatives

Sangguniang Bayan *(SB)*

- Approves CRM-related resolutions and ordinances
- Approves and appropriates funds for CRM programs and projects
- Conducts ocular inspection of the programs and projects to monitor their progress

Municipal Planning and Development Office (MPDO)

- Assists in the planning, implementation and monitoring of CRM programs
- Inspects and monitors the progress of the CRM plan implementation
- Conducts yearly review of CRM activities and recommends for changes or amendments to the CRM plan

Philippine National Police, in coordination with the deputized fishwardens

- Performs the lead role in enforcing fishery laws and prosecuting the offenders

Municipal Fishery and Aquatic Resources Management Council (MFARMC)

- Assists the CRM Section in program planning, monitoring and evaluation
- Recommends proposed programs and projects as well as legislative agenda to the SB Committee on Fisheries

Municipal Agricultural Office (MAO)

- Oversees the proper implementation of the CRM programs and projects
- Prepares work plan and financial review on a yearly basis
- Facilitates linkage of local CRM initiatives to NGAs and NGOs

CRM Section of the ENRO (optional as laid out in R. A. 7160)

- Enforces CRM policies and implements CRM programs and projects
- Prepares progress reports and submits them to concerned persons and offices
- Acts as main coordinating office for CRM activities
- Facilitates communication between and among the LGU, concerned agencies and fisherfolk associations to ensure feedback

Barangay LGU

The village is the smallest political unit in the Philippines. With 367 coastal *barangay*s in Bohol, they are very important. The role of the *barangay*:

Legislation
- Enforce pollution control law and environmental laws

Enforcement
- Prosecute any violation of the provisions of applicable fishery laws (*Barangay* Captain)
- Enforce laws and regulations relating to pollution control and protection of the environment

Other Services
- Provide services and facilities related to general hygiene and sanitation, beautification and solid waste collection

Municipal LGU

In Bohol, there are 29 coastal MLGUs and they should be the main coordinator of CRM related activities. The role of the municipal LGUs:

Planning
- Adopt a comprehensive land use plan
- Reclassify land
- Enact integrated zoning ordinances in consonance with approved comprehensive land use plan
- Conduct cadastral, special and isolated surveys
- Develop Agriculture and Fisheries Modernization Plans (AFMPs)
- Consolidate with land use and zoning ordinances

Protection/Conservation
- Recommend to DA-BFAR the inclusion of certain parts of municipal waters as fishery reserves
- Establish fishery refuge and sanctuaries in consultation with FARMCs
- Establish closed season in consultation with FARMCs
- Undertake reclassification of lands
- Protect the environment and impose appropriate penalties for the following acts which endanger the environment:
  - dynamite fishing and other forms of destructive fishing
  - illegal logging and smuggling of logs
  - smuggling of natural resources products and endangered species of flora and fauna
  - slash-and-burn farming
  - other activities which result in pollution, acceleration of eutrophication of rivers and lakes or of ecological imbalance
- Provide for the establishment, maintenance, protection and conservation of:
  - communal forests and watersheds
  - tree parks
  - greenbelts
  - mangroves
- Implement other similar forest development projects subject to DENR guidelines

Legislation
- Approve ordinances which shall ensure the efficient and effective delivery of the basic services and facilities as provided for under Sec. 17 of the Local Government Code
- Adopt measures and safeguards against pollution and for the preservation of the natural ecosystem in the province

- Enact appropriate ordinances in consultation with the FARMC and in accordance with the National Fisheries Policy
- Enact a basic Municipal Fisheries Ordinance (MFO) delineating the boundaries of the municipal waters
- Provide the rules and regulations on licensing and permits and other fisheries activities
- Modify or amend existing municipal fisheries ordinances to conform with the Fisheries Code
- Enact ordinance to authorize or permit small and medium commercial fishing vessels to operate within the 10.1 to 15 km area from the shoreline in municipal waters as defined, provided that all the following are met:
  - No commercial fishing in municipal waters with depth less than 7 fathoms as certified by the appropriate agency;
  - Fishing activities utilizing methods and gears that are determined to be consistent with national policies set by the DA;
  - Prior consultation, through public hearing, with the MFARMC has been conducted;
  - Applicant vessel as well as the ship owner, employer, captain and crew have been certified by the appropriate agency as not having violated the Fisheries Code, environmental laws and related laws

Regulatory

- Issue auxiliary invoices for the transport of fish and fishery products except those caught in violation of the provisions of the Fisheries Code or are declared as health hazards
- Make available to the Provincial Fishery Office (PFO) the monthly summary of auxiliary invoices
- Design a color coding system for municipal waters, such color code system to include identifiable markings to be carried by the municipal fishing boats
- Authorize or permit small and medium commercial fishing vessels to operate within the 10.1 to 15 km area from the shoreline in municipal waters as defined, provided that all the following are met:
  - No commercial fishing in municipal waters with depth less than 7 fathoms as certified by the appropriate agency;
  - Fishing activities utilizing methods and gears that are determined to be consistent with national policies set by the DA;
  - Prior consultation, through public hearing, with the MFARMC has been conducted;
  - Applicant vessel as well as the ship owner, employer, captain and crew have been certified by the appropriate agency as not having violated the Fisheries Code, environmental laws and related laws
- Establish the boundaries of the allowable areas for commercial fishing
- Seek the assistance of the DA-BFAR and/or the NAMRIA in establishing the boundaries and isobath depth of waters
- Maintain a registry of municipal fishers, who are fishing or who may desire to fish in municipal waters, provided, that the FARMC shall submit to the LGU the list of priorities for its consideration
- Formulate the necessary mechanisms for inclusion or exclusion procedures; FARMC may recommend such mechanisms
- Maintain a registry of municipal fishing vessels by type of gear and other boat particulars with the assistance of the FARMC
- Grant use of demarcated fishery areas to engage in fish capture, mariculture and/or fish farming
- Grant priority to resident municipal fishers and their organizations/cooperatives in the exploitation of municipal and demarcated fishery areas
- Grant demarcated fishery rights to fishery organizations/cooperatives for mariculture operation in specific areas identified by the DA
- Grant new concessions, licenses, permits, leases and similar privileges for the establishment or operation of fish pens, fish cages, fish traps and other structures for the culture of fish and other fishery products within established zones only to municipal fishers and their organizations in consultation with FARMCs
- Issue permits for the operation of pearl farms
- Determine defined migration path of migratory fish species such as river mouths and estuaries in consultation with FARMCs

- Implement solid waste disposal system or environmental management system and services or facilities related to general hygiene and sanitation

Enforcement

- Enforce rules and regulations relating to agriculture and aquaculture
- Provide agricultural extension and on-site research services and facilities which include the: (Municipal Mayor)
  - organization of farmers and fishers cooperatives and other organizations
  - transfer of appropriate technology
- Enforce all fishery laws, rules and regulations as well as valid fishery ordinances enacted by the municipal council

Extension/Technical Assistance

- Provide extension and on-site research services and facilities related to agriculture and fishery activities which include:
  - dispersal of livestock, poultry, fingerlings and other seeding materials for aquaculture
  - water and soil resource utilization and conservation projects
  - enforcement of fishery laws in municipal waters including the conservation of mangroves
- Provide support to municipal fishers through appropriate technology and research, credit, production and marketing assistance and other services
- Prepare the Strategic Agriculture and Fisheries Development Zone (SAFDZ)

Intergovernmental Relations

- Formulate with other LGUs having jurisdiction over municipalities bordering bays, lakes and gulfs a unified MFO for an integrated resource management

Relations with POs and NGOs

- Enact appropriate ordinances in consultation with the FARMC and in accordance with the National Fisheries Policy
- Determine, in consultation with the FARMCs, the license fees of fisheries activities in municipal waters
- Consult FARMCs in the enactment of municipal fisheries ordinance
- Conduct public hearing in consultation with FARMCs to present the following:
  - map showing the area of municipal waters where small and medium commercial fishing vessels may be allowed to operate
  - type of fishing vessels and gear that may be allowed in such waters
  - draft MFO permitting/allowing such commercial fishing operations

Sangguniang Bayan

Protection/Conservation

- Ensure conservation of mangroves

Regulatory

- Regulate activities relative to the use of land, buildings and structures within the municipality

Enforcement

- Enforce all laws and ordinances relating to pollution control and protection of the environment

City LGU

Tagbilaran City is Bohol's only coastal city. As a fast developing city, its concerns should also focus on food security and CRM. With its very own Environment planning and management office, it should have great success in the future. The role of the city:

Planning

- Adopt a comprehensive land use plan
- Reclassify land
- Enact integrated zoning ordinances in consonance with approved comprehensive land use plan
- Conduct cadastral, special and isolated surveys
- Develop AFMPs
- Consolidate with land use and zoning ordinances

Protection/Conservation

- Recommend to DA-BFAR the inclusion of certain parts of municipal waters as fishery reserves
- Establish fishery refuge and sanctuaries in consultation with FARMCs
- Establish closed season in consultation with FARMCs
- Protect the environment and impose appropriate penalties for the following acts which endanger the environment:
  - dynamite fishing and other forms of destructive fishing
  - illegal logging and smuggling of logs
  - smuggling of natural resources products and endangered species of flora and fauna
  - slash-and-burn farming
  - other activities which result in pollution, acceleration of eutrophication of rivers and lakes or of ecological imbalance
- Provide for the establishment, maintenance, protection and conservation of:
  - communal forests and watersheds
  - tree parks
  - greenbelts
  - mangroves
- Implement other similar forest development projects subject to DENR guidelines

Legislation

- Approve ordinances which shall ensure the efficient and effective delivery of the basic services and facilities as provided for under Sec. 17 of the Local Government Code
- Adopt measures and safeguards against pollution and for the preservation of the natural ecosystem in the province
- Enact appropriate ordinances in consultation with the FARMC and in accordance with the National Fisheries Policy
- Enact a basic Municipal Fisheries Ordinance (MFO) delineating the boundaries of the municipal waters
- Provide the rules and regulations on licensing and permits and other fisheries activities
- Modify or amend existing municipal fisheries ordinances to conform with the Fisheries Code
- Enact ordinance to authorize or permit small and medium commercial fishing vessels to operate within the 10.1 to 15 km area from the shoreline in municipal waters as defined, provided that all the following are met:
  - No commercial fishing in municipal waters with depth less than 7 fathoms as certified by the appropriate agency;
  - Fishing activities utilizing methods and gears that are determined to be consistent with national policies set by the DA;
  - Prior consultation, through public hearing, with the CFARMC has been conducted;
  - Applicant vessel as well as the ship owner, employer, captain and crew have been certified by the appropriate agency as not having violated the Fisheries Code, environmental laws and related laws

Regulatory

- Issue auxiliary invoices for the transport of fish and fishery products except those caught in violation of the provisions of the Fisheries Code or are declared as health hazards
- Make available to the Provincial Fishery Office (PFO) the monthly summary of auxiliary invoices
- Design a color coding system for municipal waters, such color code system to include identifiable markings to be carried by the municipal fishing boats

- Enact ordinance to authorize or permit small and medium commercial fishing vessels to operate within the 10.1 to 15 km area from the shoreline in municipal waters as defined, provided that all the following are met:
  - ❑ No commercial fishing in municipal waters with depth less than 7 fathoms as certified by the appropriate agency;
  - ❑ Fishing activities utilizing methods and gears that are determined to be consistent with national policies set by the DA;
  - ❑ Prior consultation, through public hearing, with the CFARMC has been conducted;
  - ❑ Applicant vessel as well as the ship owner, employer, captain and crew have been certified by the appropriate agency as not having violated the Fisheries Code, environmental laws and related laws
- Establish the boundaries of the allowable areas for commercial fishing
- Seek the assistance of the DA-BFAR and/or the NAMRIA in establishing the boundaries and isobath depth of waters
- Maintain a registry of municipal fishers, who are fishing or who may desire to fish in municipal waters, provided, that the FARMC shall submit to the LGU the list of priorities for its consideration
- Formulate the necessary mechanisms for inclusion or exclusion procedures; FARMC may recommend such mechanisms
- Maintain a registry of municipal fishing vessels by type of gear and other boat particulars with the assistance of the FARMC
- Grant use of demarcated fishery areas to engage in fish capture, mariculture and/or fish farming
- Grant priority to resident municipal fishers and their organizations/cooperatives in the exploitation of municipal and demarcated fishery areas
- Grant demarcated fishery rights to fishery organizations/cooperatives for mariculture operation in specific areas identified by the DA
- Grant new concessions, licenses, permits, leases and similar privileges for the establishment or operation of fish pens, fish cages, fish traps and other structures for the culture of fish and other fishery products within established zones only to municipal fishers and their organizations in consultation with FARMCs
- Issue permits for the operation of pearl farms
- Determine defined migration path of migratory fish species such as river mouths and estuaries in consultation with FARMCs
- Implement solid waste disposal system or environmental management system and services or facilities related to general hygiene and sanitation

Enforcement

- Provide agricultural extension and on-site research services and facilities which include the: (City Mayor)
  - ❑ organization of farmers and fishers cooperatives and other organizations
  - ❑ transfer of appropriate technology
- Enforce all fishery laws, rules and regulations as well as valid fishery ordinances enacted by the city council
- Enforce forestry laws in community-based forestry areas
- Enforce small-scale mining laws, subject to policies of the DENR
- Verify and adjudicate conflicts on guano collection
- Verify and adjudicate conflicts on sand, gravel and other quarry resources

Extension/Technical Assistance

- Provide extension and on-site research services and facilities related to agriculture and fishery activities which include:
  - ❑ dispersal of livestock, poultry, fingerlings and other seeding materials for aquaculture
  - ❑ water and soil resource utilization and conservation projects
  - ❑ enforcement of fishery laws in municipal waters including the conservation of mangroves

- Provide support to municipal fishers through appropriate technology and research, credit, production and marketing assistance and other services
- Prepare the Strategic Agriculture and Fisheries Development Zone (SAFDZ)

Intergovernmental Relations

- Formulate with other LGUs having jurisdiction over municipalities bordering bays, lakes and gulfs a unified MFO for an integrated resource management

Relations with POs and NGOs

- Enact appropriate ordinances in consultation with the FARMC and in accordance with the National Fisheries Policy
- Determine, in consultation with the FARMCs, the license fees of fisheries activities in municipal waters
- Consult FARMCs in the enactment of municipal fisheries ordinance
- Conduct public hearing in consultation with FARMCs to present the following:
  - map showing the area of municipal waters where small and medium commercial fishing vessels may be allowed to operate
  - type of fishing vessels and gear that may be allowed in such waters
  - draft MFO permitting/allowing such commercial fishing operations

Sangguniang Panlungsod

Protection/Conservation

- Ensure conservation of mangroves

Enforcement

- Enforce all laws and ordinances relating to pollution control and protection of the environment

Provincial LGU

Governor Erico B. Aumentado conducting an ocular inspection of fishing boats and mangroves in Baclayon.

The Provincial Government of Bohol has a huge mandate in environmental management and through its Bohol Environment Management Office, it is hoped it will be successful. Here are the roles of the Provincial LGU with respect to CRM.

Planning

- Review AFMPs

Protection/Conservation

- Undertake reclassification of lands

Legislation

- Approve ordinances which shall ensure the efficient and effective delivery of the basic services and facilities as provided for under Sec. 17 of the Local Government Code
- Adopt measures and safeguards against pollution and for the preservation of the natural ecosystem in the province
- Review ordinances enacted by the municipal/city government

Regulatory

- Issue permit and collect fees for guano collection
- Issue permit to extract sand, gravel and other quarry resources

Enforcement

- Provide agricultural extension and on-site research services and facilities which include the: (Governor)
  - ❑ organization of farmers and fishers cooperatives and other collective organizations
  - ❑ transfer of appropriate technology
- Prescribe a criminal penalty therefore in accordance with the provisions of the Fisheries Code
- Enforce forestry laws in community-based forestry areas
- Enforce small-scale mining laws, subject to policies of the DENR
- Verify and adjudicate conflicts on guano collection
- Verify and adjudicate conflicts on sand, gravel and other quarry resources

Power of Taxation and Revenue Generation

- Impose taxes on sand, gravel and other quarry resources which include those located in littoral and coastal areas

Extension/Technical Assistance

- Provide agricultural extension and on-site services and facilities which include the:
  - ❑ organization of farmers and fishers cooperatives and other organizations
  - ❑ transfer of appropriate technology
- Integrate the operations for the agricultural extension services
- Undertake an annual evaluation of all municipal extension programs

Sangguniang Panlalawigan

Protection/Conservation

- Adopt measures and safeguards against pollution and for the preservation of the natural ecosystem in the province

Enforcement

- Enforce all laws and ordinances relating to pollution control and protection of the environment
- Protect the environment and impose appropriate penalties for the following acts which endanger the environment:
  - ❑ dynamite fishing and other forms of destructive fishing
  - ❑ illegal logging and smuggling of logs
  - ❑ smuggling of natural resources products and of endangered species of flora and fauna
  - ❑ slash-and-burn farming
  - ❑ other activities which result in pollution, acceleration of eutrophication of rivers and lakes or of ecological balance

All Levels

Power of Taxation and Revenue Generation

- 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
- Formulate special levies on real property and the procedure for allocating the proceeds
- Receive share from the internal revenue allocation (IRA)
- Receive share of proceeds from government agencies or government owned and controlled corporations (GOCCs)
- Create special funds or special accounts in the general fund

Intergovernmental Relations

- Group together, consolidate or coordinate efforts, services and resources for commonly beneficial purposes
- Group together and coordinate with each other to achieve the objectives of integrated fishery resource management

- Share with the National Government the responsibility in the management and maintenance of ecological balance within the territorial jurisdiction

Relations with POs and NGOs

- Promote the establishment and operation of POs and NGOs
- Enter into joint ventures and such other cooperative arrangements with POs and NGOs
- Develop local enterprises
- Provide assistance, financial or otherwise, to POs and NGOs

Province of Bohol, Their Actual Mandates

Box 4.2. Vision, mission and goal of the province of Bohol

Vision

Bohol is a prime eco-cultural tourist destination and a strong agro-industrial province with an empowered and self-reliant people who are God-loving, law-abiding, proud of their cultural heritage, and committed to the growth and protection of the environment.

Mission

To continuously transform its social, economic, political and cultural life through effective collaboration of people from various sectors of the province to achieve and sustain its vision.

Goals

1. To establish the importance and contribution of Bohol to the nation's socio-cultural and political growth and economic competitive edge;
2. To establish sustainable eco-cultural tourism and agro-industrial sites in the province to encourage investments and employment;
3. To ensure sustainable growth in revenues from major industries that adhere to a sustainable framework for developing, utilizing and managing the environment and natural resources of the province;
4. To enrich and continuously develop the dynamic and creative Boholano culture in all municipalities and in the capital city of Bohol; and
5. To develop a well-informed citizenry in healthy communities, aware and proud of its competencies that will enable them to be much more productive, enterprising and participative in attaining the vision and goals of Bohol

Box 4.3. Key provisions of the Bohol Environment Code (Provincial Ordinance No. 98-01, otherwise known as the Bohol Environment Code)

Article Number	Title
I	Title of the Ordinance
II	Authority and Purpose
III	Forest Resources
IV	Mineral Resources
V	Water Resources
VI	Integrated Solid Waste Management
VII	Coastal Resources
VIII	Air and Noise Pollution Management
IX	Ecotourism
X	Environmental Impact Assessment
XI	Land Use Planning
XII	Organization
XIII	Penalities and Miscellaneous Provisions
XIV	*Sustainable Agriculture Development Framework (newly initiated to be included in the IRR as decided by TWGs on environment)*

Box 4.4. Mandate and functions of the BEMO as provided under Provincial Ordinance No. 98-01

Section 111. **Creation of the Bohol Environment Management Office (BEMO).** For the purpose of implementing the provisions of this Code and pursuant to Sections 463 and 484, RA 7160, the coastal, mineral, forestry, and water resources management, solid and liquid waste management, air and noise pollution control, environmental impact assessment, and ecotourism functions of the various offices and departments under the Office of the Provincial Governor, including applicable appropriations, records, equipment, property, and such personnel as may be necessary, are hereby merged into a single office to be known as the Bohol Environment Management Office, referred to in this Code as the BEMO.

Section 112. **Jurisdiction of the BEMO.** The BEMO shall have jurisdiction and authority over all environment and natural resources in the province, subject to the provisions of RA 7160 and all other applicable national laws, rules and regulations.

Pursuant to Section 16, RA 7160 and in ensuring that the provisions of the 1997 Bohol Covenant for Sustainable Development and the proceedings of the Bohol Environment Summit of 1997 are pursued, it shall share responsibility with the municipal governments, the Department of Environment and Natural Resources and other cognizant national government agencies for the effective protection, development, management, rehabilitation, and conservation of environment and natural resources in the province, the regulation and supervision of the operation of licensees, lessees and permittees for the taking or use of natural resources; the implementation of local government-driven coastal, forest, mineral, ecotourism, and water resources management, including waste management and the control of air and noise pollution; and enforcement of environment and natural resources laws, rules and regulations; and perform the functions prescribed in Section 484, RA 7160.

Specifically, the BEMO shall undertake the following:

a. **Organizational Development.** Assist municipal governments and *barangay* councils, including environmental organizations through the provision of technical assistance such as, but not limited to, development of environmental management organizational capability, participatory formulation of environmental programs, mobilization of local and external pool of environmental specialists, and guidance in the formulation and implementation of environmental laws.

b. **Program Development.** Develop a multi-year environment management framework plan for the promotion of local government-driven community-based and livelihood-oriented initiatives, particularly in tree enterprises, watershed management, ecotourism, coastal resources management, solid waste management, and participatory land use planning.

c. **Linkaging.** Establish an operational internal and external linkages and networking system that will maintain and expand local government-driven environmental initiatives.

d. **Showcasing.** Develop and implement environmental programs through the promotion of best-as-of-the-moment methods, processes, and approaches by establishing showcases within the province for LGUs to adopt in their respective jurisdictions.

e. **Fund sourcing.** Establish linkages with national and international institutions for purposes of fund sourcing, network building, research, and information/data bank generation.

f. **Policy Advocacy.** Organize a network of lobby/advocacy groups by maintaining provincial network of environmental organizations.

g. **Management Review.** facilitate and coordinate the holding of Provincial Environment Summits to be held in June and July of each year where a cross section of the *Boholano* community will resolve issues with regard to natural resource utilization and management.

h. **One-Stop-Shop.** Install a one-stop-shop and quick response desk that will be manned by an interdisciplinary, interagency and multisectoral team whose task will be to facilitate calls for fact-finding missions, monitoring and investigation of controversial issues in the province.

i. **LGU Clustering.** Encourage municipalities to group themselves into clusters to address common concerns, such as law enforcement in municipal waters, protection of river systems, watershed management, and pollution control, as stipulated in Section 3(f), RA 7160.

j. **IRR.** Recommend to the Governor implementing rules and regulations (IRR) for the Bohol Environment Code.

k. Perform such other acts that are necessary to carry out its functions.

LEGAL DECLARATIONS

Protected Areas in the Coastal Ecosystem

Because of its diverse ecosystem, Bohol has many national protected areas declared through either a Presidential Decree (PD) or Presidential Proclamation (PP). National protected areas located within the coastal ecosystem of Bohol are declared by virtue of PP 2151 and/or PP 2152.

PP 2151 establishes a certain area into the initial component of the National Integrated Protected Areas System (NIPAS) under the category of strict nature reserve and classifies such as wilderness area. As defined under Section 2 (Declaration of Policy) of Department Administrative Order (DAO) No. 25, Series of 1992 — the Implementing Rules and Regulations (IRR) of Republic Act 7586, otherwise known as the NIPAS Act of 1992 — a strict nature reserve is *"an area possessing some outstanding ecosystem, features and/or species of flora and fauna of national scientific importance maintained to protect nature and maintain processes in an undisturbed state in order to have ecologically representative examples of the natural environment available for scientific study, environmental monitoring, education, and for the maintenance of genetic resources in a dynamic and evolutionary state."*

PP 2152 establishes an area under the category of protected landscape/seascape and classifies such area as mangrove swamp forest reserve. Protected landscapes/seascapes are *"areas of national significance which are characterized by the harmonious interaction of man and land while providing opportunities for public enjoyment through recreation and tourism within the normal lifestyle and economic activity of these areas."*

Both categories of protected areas take into consideration the various habitats in the area (mangroves, mudflats, seagrass beds and coral reefs), ensuring protection and management of such bio-physical resources.

All protected areas established as initial components of the NIPAS are still subject to the decision of the Congress to become regular components of the system.

Table 4.2. Coastal protected areas in Bohol under NIPAS

Name of Protected Area	Coverage
Pres. Proclamation No. 2151	
Calape Group of Islands Strict Nature Reserve	Poom Point, Basihan Islet
Candijay Group of Islands Strict Nature Reserve	Catiil, Colanggoman and Tabangdio Islands
Candijay-Mabini Strict Nature Reserve	Lumislis Island
Clarin Group of Islands Strict Nature Reserve	Cabgan, Cancostino, Tabaon, Maagpit and Silo-siloan Islands
Getafe Group of Islands Strict Nature Reserve	Nasingin and Banacon Islands
Inabanga Group of Islands Strict Nature Reserve	Bugatusan, Pangahoy-kahoyan and Hambongan Islands
Pres. Carlos P. Garcia Group of Islands Strict Nature Reserve	Pamasaun and Budlaan Islands
Talibon Group of Islands Strict Nature Reserve	Tambu, Banbanon, Bansaan and Sag Islands
Tubigon Group of Islands Strict Nature Reserve	Budlaan Island, Hayaan and Inanuran Islets
Ubay Strict Nature Reserve	Tintinan Island
Presidential Proclamation No. 2152	
Alburquerque-Loay-Loboc Protected Landscape/ Seascape	Albur, Loay, Loboc
Loon Group of Islands Protected Landscape/ Seascape	Cabilao and Sandingan Islands
Pangangan Island Protected Landscape/Seascape	Pangangan Island (Calape)
Pres. Carlos P. Garcia Protected Landscape/ Seascape	Bonoon Island
Tubigon Protected Landscape/Seascape	Batasan Island
Ubay Protected Landscape/Seascape	Lapinig Chico Island

The aforementioned PAs have their respective Initial Protected Area Plan (IPAP) prepared with the involvement of communities within and adjacent to the boundaries of the protected area and endorsed by members of the Protected Area Management Board (PAMB) for the approval of the DENR Secretary. The IPAP includes, aside from the socio-economic, bio-physical and geographical attributes of the protected area, the proposed management zones. The protected area can have one or more management zones (i.e. strict protection, sustainable use, restoration, habitat management, multiple use, buffer, cultural, recreational and special use zones). Every proposed zone has its own management objectives and strategies to address the key habitat management issues. It is important to note that all PAs should have a buffer zone "to provide a social fence that prevents encroachment into the protected area by outsiders," which "should be treated as an integral part of the protected area in management planning" (Section 10 (f), DAO 25, S. 1992).

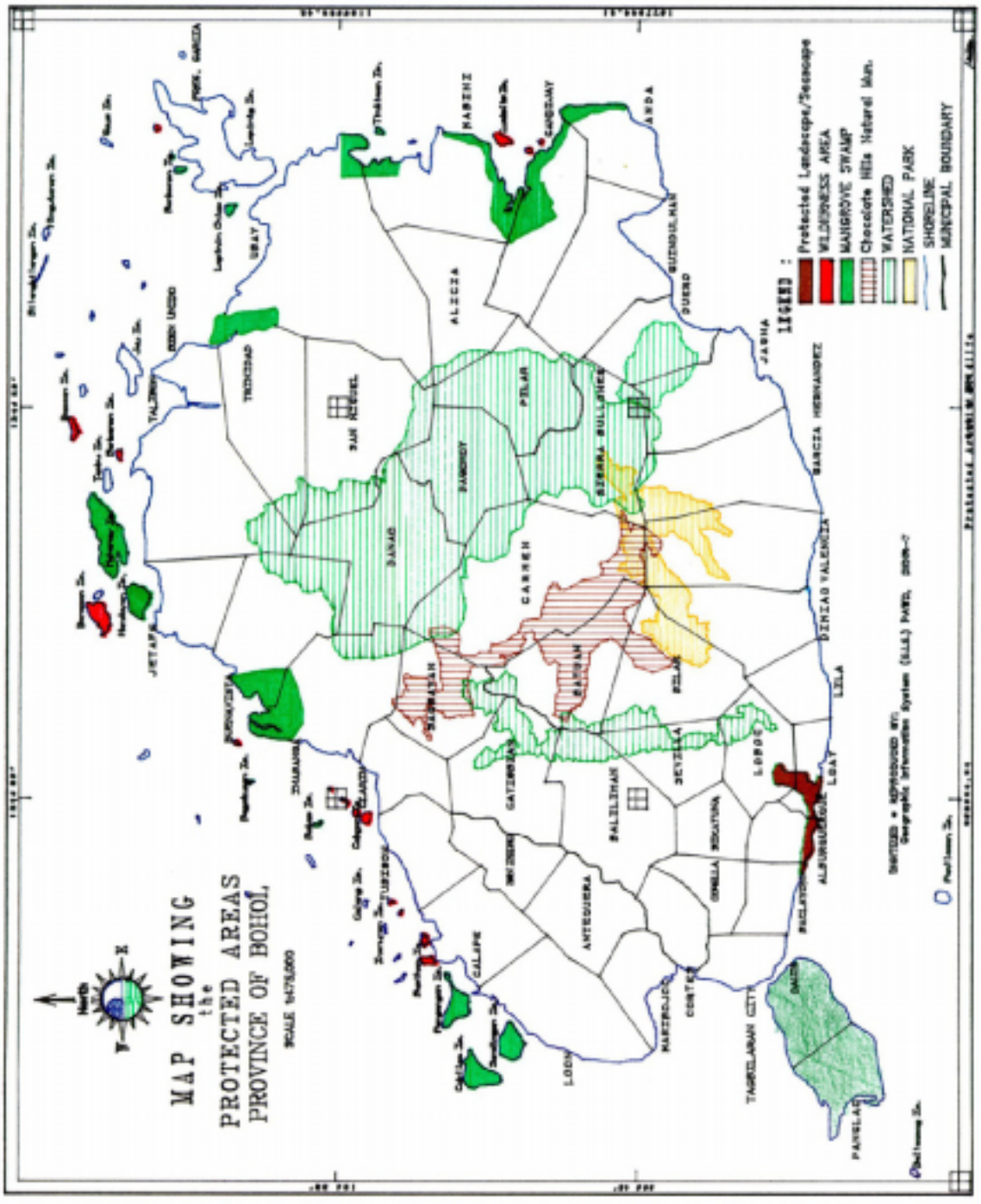


Figure 4.2. Map of protected areas in Bohol under NIPAS

Strict nature reserves or wilderness areas were declared prior to the upsurge of human settlement in these areas. However, all the protected areas in Bohol are currently being occupied regardless of the existing legal declarations. Although IPAPs for the coastal PAs in Bohol have already been submitted, not even one has been approved yet.

Issues and Concerns

Presently, a lot of management issues still crop up in these areas. Encroachment activities within the boundaries of the protected areas in Bohol are very much apparent, e.g. mangrove cutting, sand extraction and other illegal activities.

- All protected areas in Bohol, not to mention throughout the country, are faced with the issue of tenurial security. Titling of lands within protected areas, after these have been legally declared by the state, is pending. However, prior rights are respected by the state.

- The continued exploitation of the resources within the bounds of the protected areas threaten the sustainability of the resources.

- Traditional human practices (e.g. cutting of mangroves for everyday use) are limited by the declarations supporting the protected areas, which in turn aggravate environmental degradation as some people would resort to encroachment and other illegal activities.

- Despite being declared many years ago, the proposed management zones in each protected area are not yet approved. Proposed zones, such as strict protection and habitat management zones, are still subjected to human exploitation.

- Some of the PAMBs are not fully functional, need capability-building activities and must work with the LGUs concerned and share in planning activities and revenue generation.

- There is a need for more involvement of the local and municipal LGUs, NGOs and other agencies to help get the PAMBs up and moving, and implement their mandates.

Fishponds

Bohol is identified as one of the provinces once rich in primary or old growth mangrove forests. Now, a great bulk of the existing mangrove cover is secondary growth, i.e. replanted.

With the advent of the "Blue Revolution" whose main thrust was to increase fishery production for export, huge areas of mangroves were surveyed and proposed for fishpond development. Under this program, the national government encouraged any interested investor to apply for a Fishpond Lease Agreement (FLA). Field technicians from the BFAR provided information and technical assistance on new improved technologies on brackishwater fishpond development including post-harvest and fish handling. Initially, the fishpond owners experienced high production and large profits. However, due to their intensive nature (coupled with various

Abandoned fishpond - San Isidro, Calape, showing original mangrove tree stumps

other issues), the fishponds slowly became more unproductive (Soils will slowly degrade until they are useless, five to ten years from the fishpond establishment).

Almost every coastal town in Bohol has at least one existing fishpond. Currently, not all of the fishponds are productive or operational. Based on the records of the Regional Office of the BFAR, the total area granted for fishpond development is 2,909.97 ha, with only 1,672.36 ha developed and 430.63 ha undeveloped. These data, however, are still subject for verification as BFAR is conducting an ongoing inventory of fishpond areas in Bohol (pers comm. Cres Pahamutang, Provincial Fishery Officer).

The joint DA-BFAR and DENR General Memorandum Order No. 3, Series of 1991, tries to respond to the problem of idle, unproductive, abandoned and/or illegal fishpond areas by reverting them into their original classification of timberland. Fishpond areas with FLAs that are found to be violating this policy will be reverted to the administration of the DENR. All applications for FLA within timberlands, which have not been released for fishpond development by DENR, shall automatically be returned without being acted upon.

On the other hand, the DA-DAR Administrative Order No. 18, Series of 1991, prescribes the guidelines in the redistribution of cancelled and/or expired FLAs to agrarian reform beneficiaries. Cancelled FLAs can only be transferred to the administration of the Department of Agrarian Reform (DAR) if the fishpond is within alienable and disposable (A & D) land.

Fishponds cannot be sold or have ownership changed by law, this signboard in Cortez tells a different story, however.

In Bohol, however, not even one idle, unproductive, abandoned or illegal fishpond has been reverted to the category of timberland. Neither has one FLA been cancelled. This situation has concerned the LGUs and FARMCs of Calape, Loon, Anda, Candijay and Mabini, which have all applied for reversion. According to the law, FLAs are not transferable to new entities once the fishpond areas have been abandoned yet the practice of changing the names of FLA holders continues.

As an initial step in the reversion process, a Technical Working Group (TWG) was created, the membership of which was composed of the DENR, DA-BFAR, BEMO, Mangrove Management Component of the CRMP, Environmental Legal Assistance Center (ELAC) and Environmental Science for Social Change (ESSC). Several meetings were conducted to identify focus issues vis-à-vis the mandate of the TWG to implement the DA-BFAR-DENR memorandum order.

The TWG, after being fed with relevant data and information by BFAR and DENR, chose Boyoan, Candijay and U-og, Inabanga as pilot sites for the implementation of the joint memorandum order. These areas were chosen based on certain criteria, to wit: 1) should have been abandoned for more than five years; 2) unproductive; 3) at least 20% remaining mangrove cover; and 4) initial efforts made by the community against fishpond development.

The BFAR, as chairman of the group, have continued some activities but is waiting for the special orders from the regional offices of the DENR and BFAR before further action can be taken.

It is important to know that for every hectare of illegal, abandoned or disused fishpond means a loss of about 600-700 kg of fishes, crustaceans and mollusks every year. For example, if there are about 1,000 ha of fishponds in Bohol left unproductive, there is a loss of about 600,000 kg of fishery products per year excluding other economic losses associated with this. Each year of inaction therefore means another year of 600,000 kg being lost for Bohol's coastal production.

Issues and Concerns

- Overlapping policies of the DA-BFAR and the DENR
- The implementation of joint DA-BFAR and DENR General Memorandum Order No. 3, Series of 1991, is currently an extremely difficult activity that takes considerable time and resources to accomplish because it is not a priority of either the two agencies.
- The role of the LGU and FARMC is not properly defined. Despite the FARMC and LGU resolutions of Calape, Loon, Anda, Candijay and Mabini, no action has been taken as regards illegal or abandoned fishponds.
- The provincial BFAR is aware of some illegally constructed and illegally occupied fishponds. However, exact figures could not be established as inventory on fishpond development in the province is not part of their workplan for the year 2001. BFAR-Bohol intends to include this activity as part of the major targets for 2002. On the other hand, fishpond inventory needs adequate funding in order to come up with a truly comprehensive and complete data.

Recommendations

- Operationalize the joint General Memorandum Order No. 3, S. 1991, of the DA-BFAR and DENR and re-activate the TWG established in Bohol.

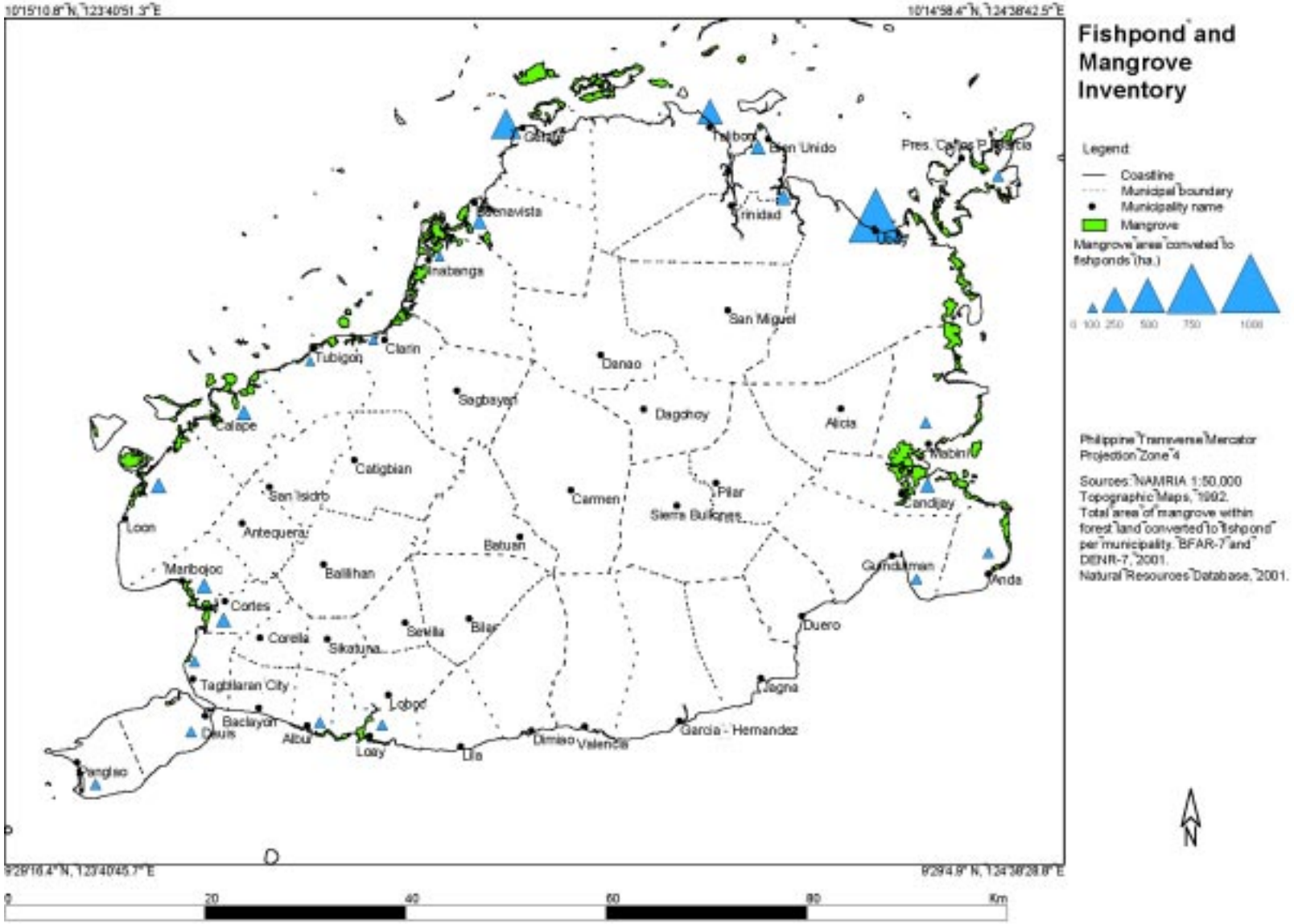


Figure 4.3. Map of fishpond and mangrove inventory in classified lands (A & D and Forest Lands) in the Province of Bohol

- It should be made clear that abandoned fishponds are ecologically and economically useless, thus these need to be reverted to the category of timberland for the benefit and management of interested communities, and, possibly, in association with the CBFM Program of the DENR.

- Clear up problems on policy jurisdiction and define jurisdictional mandates.

- The inventory and assessment of the remaining mangrove cover in Bohol should be undertaken as soon as possible.

- LGUs should be encouraged to initiate and strongly support the activities for fishpond reversion, in coordination with the MFARMCs.

- There is a need to compare maps, and standardize data collection techniques and mapping system, perhaps with the use of GPS, as the base maps of the DENR, BFAR and province are all different.

SUMMARY

The implementation of a holistic coastal resource management in the province needs a sustained collaboration among all concerned sectors of the society. The respective mandates of each administrative level should not become instruments of undivided efforts but should form the basis for setting out a common direction for a sustained CRM implementation in Bohol.

The MLGU is mandated to take the lead in the implementation of CRM in the municipality. However, it needs to work with the province, *barangay* and other agencies to ensure a holistic CRM.

There are still some policy and agency overlaps that have to be worked out in the future, perhaps with the piloting of fishpond reversion in Bohol and amplifying the learnings up to the national level for nation-wide replication.

Sometimes, PAMBs and other protected areas should be considered by NGOs, LGUs and other agencies as good opportunities for capability-building, and strengthening and more joint collaborations would be good to see.

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.

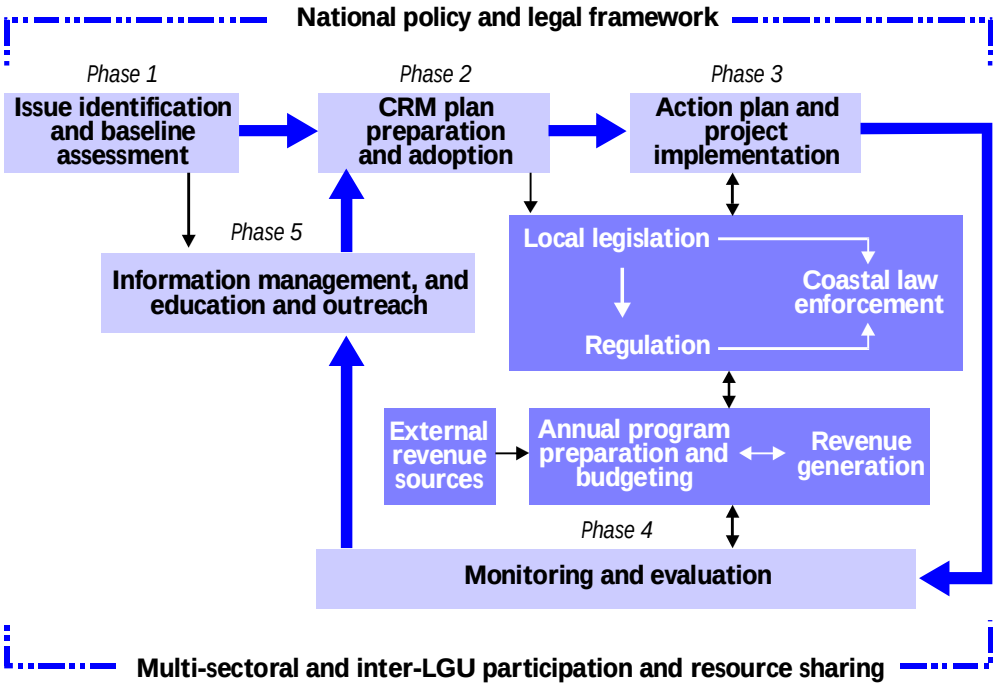


Figure 5.1. Five-phase CRM planning process adapted for Philippine local government

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.

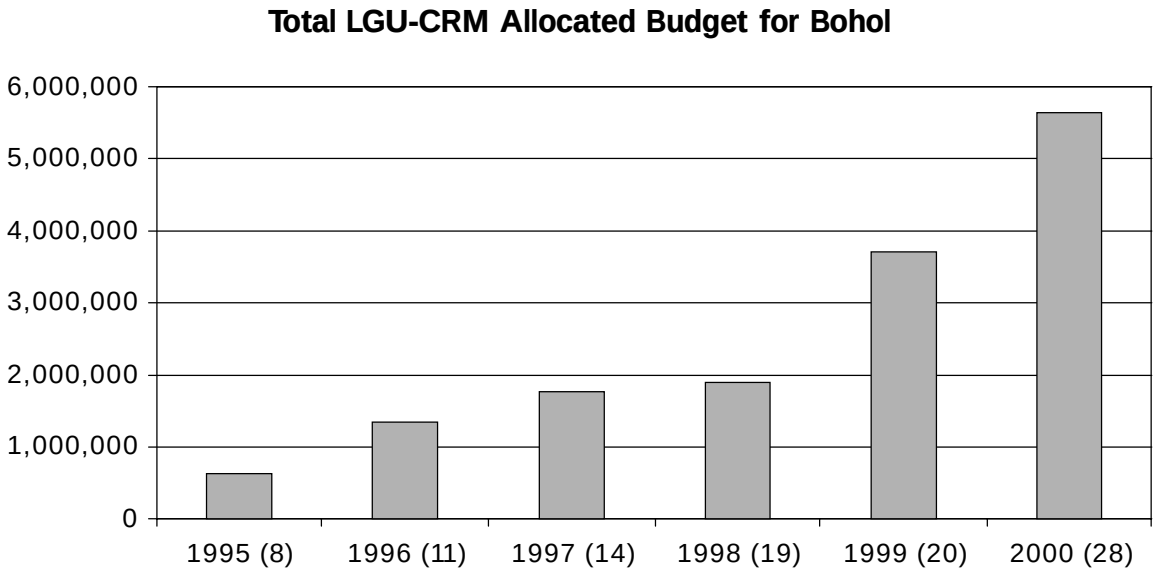
The annual CRM budget needed for a typical municipality in the Philippines has been estimated at approximately 1.36 million pesos. This annual management cost is what is required to sustain a potential annual revenue of 15.2 million pesos (economic average benefit from coastal resources in an average 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.

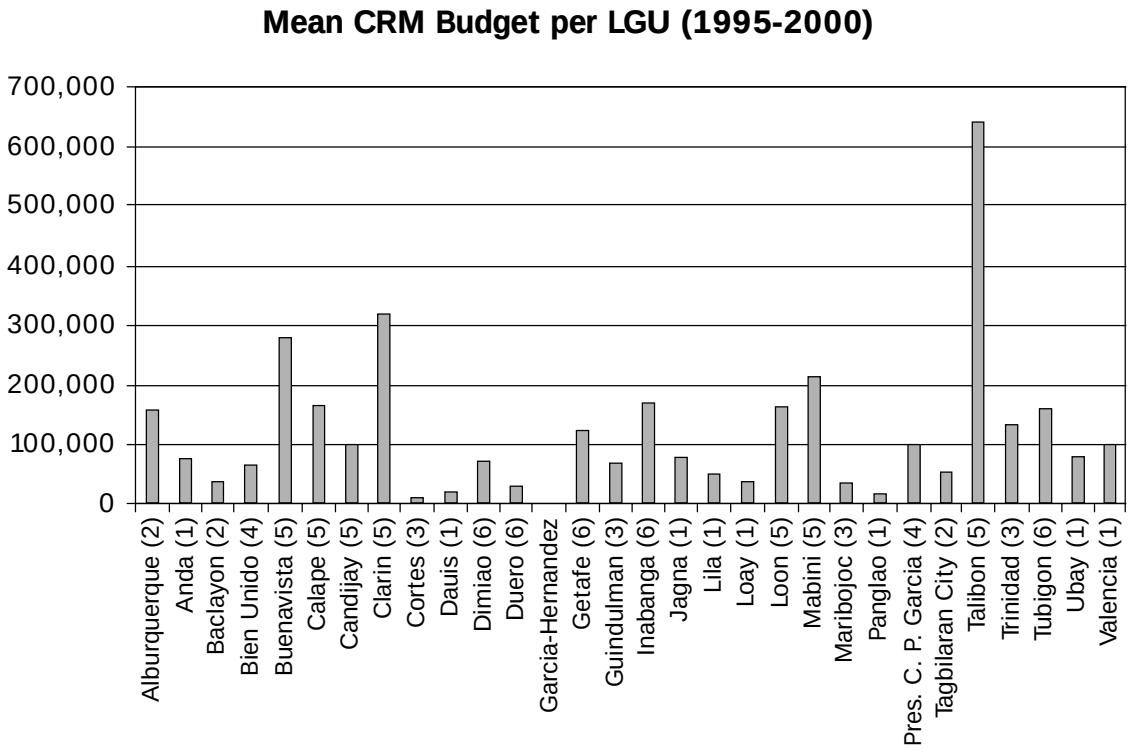
A. Municipal/City Fisheries and Aquatic Resource Management Councils

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.

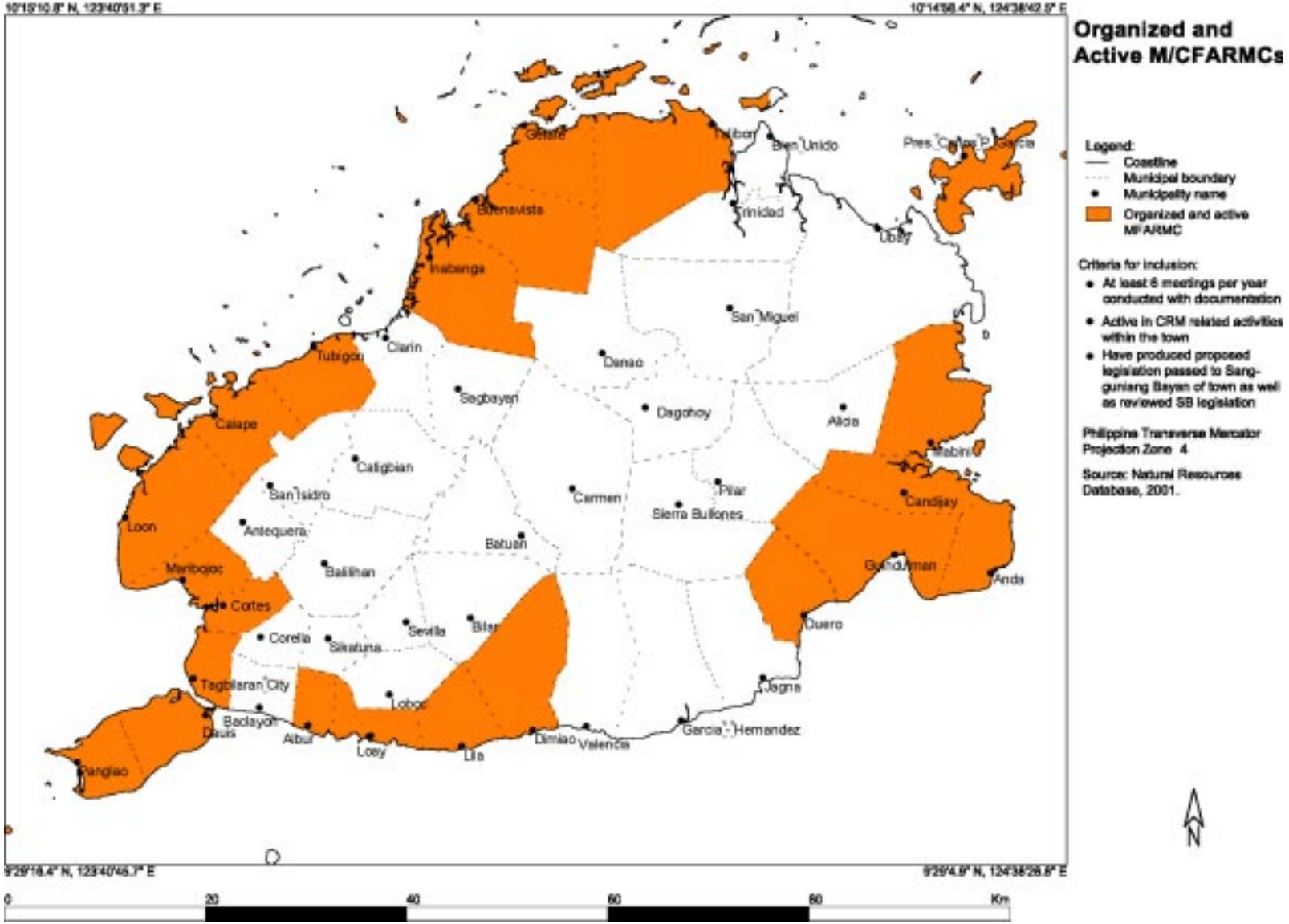


Figure 5.4. Map of organized and active M/CFARMCs in Bohol

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

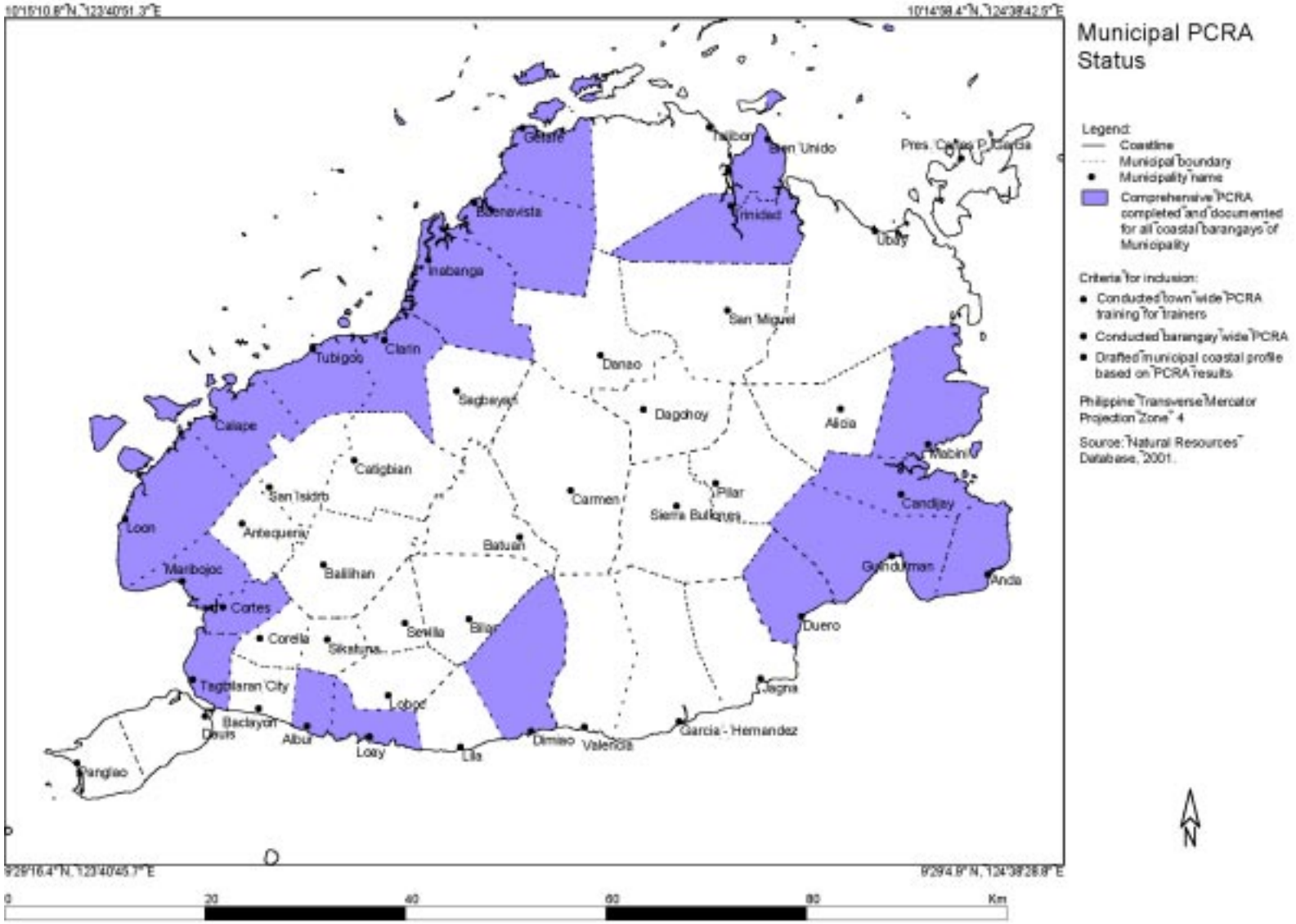


Figure 5.5. Map of coastal LGUs in Bohol with completed PCRA

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

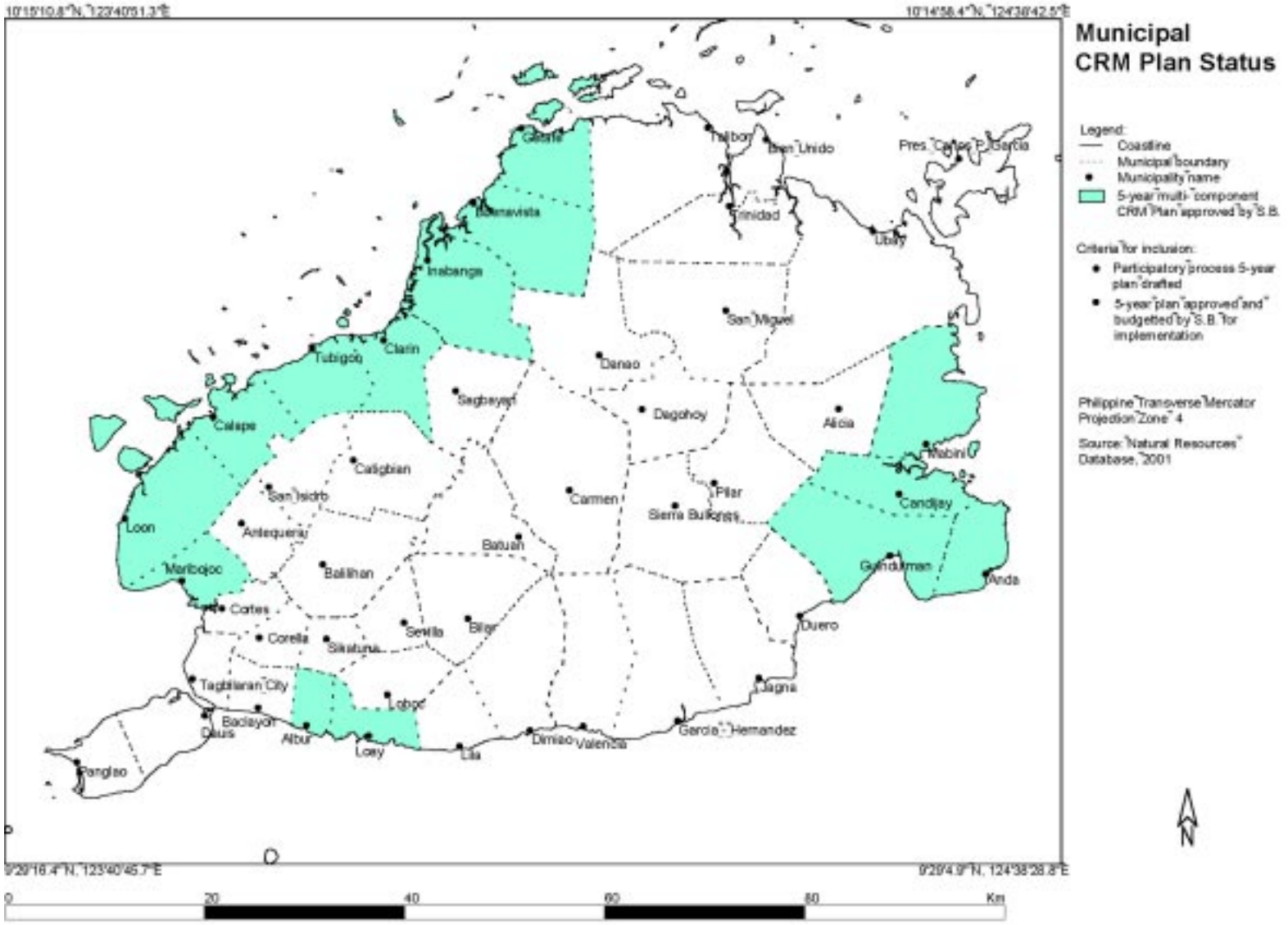


Figure 5.6. Map of coastal LGUs in Bohol with CRM Plans

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

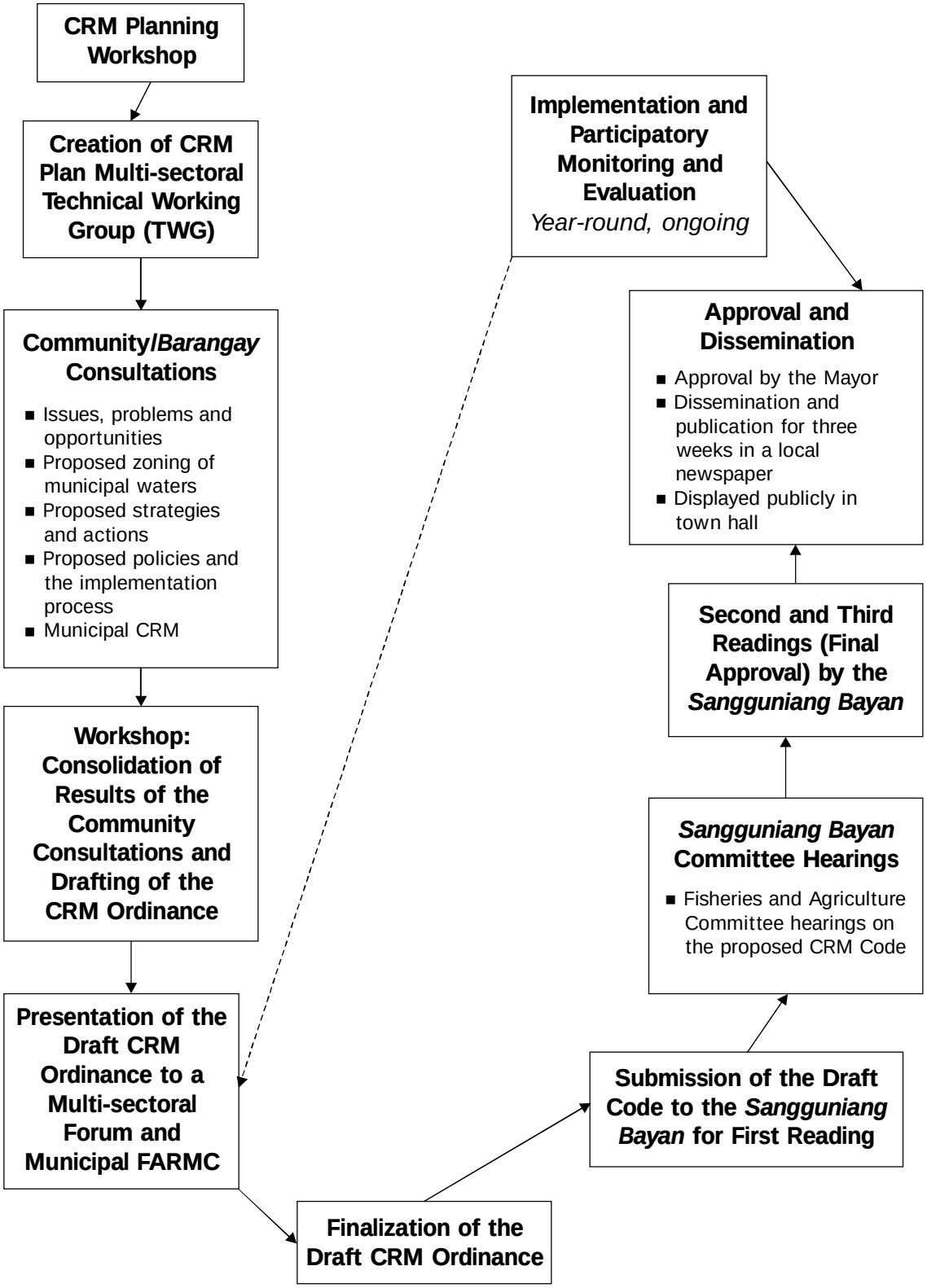


Figure 5.7. Proposed flow in the formulation of a Municipal CRM Code in Bohol

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*.

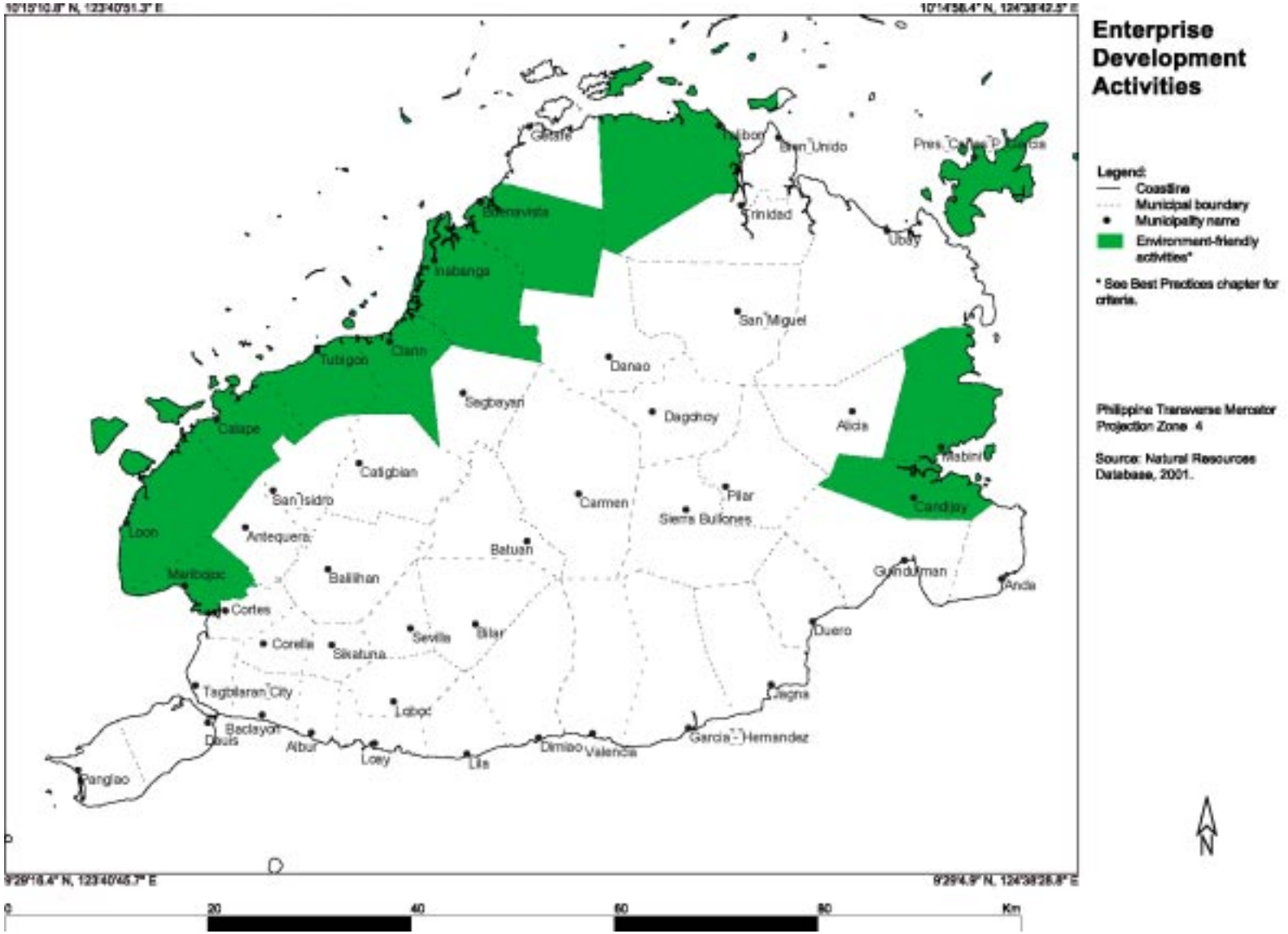


Figure 5.8. Map of environment-friendly enterprise development in coastal areas of Bohol (2000)

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

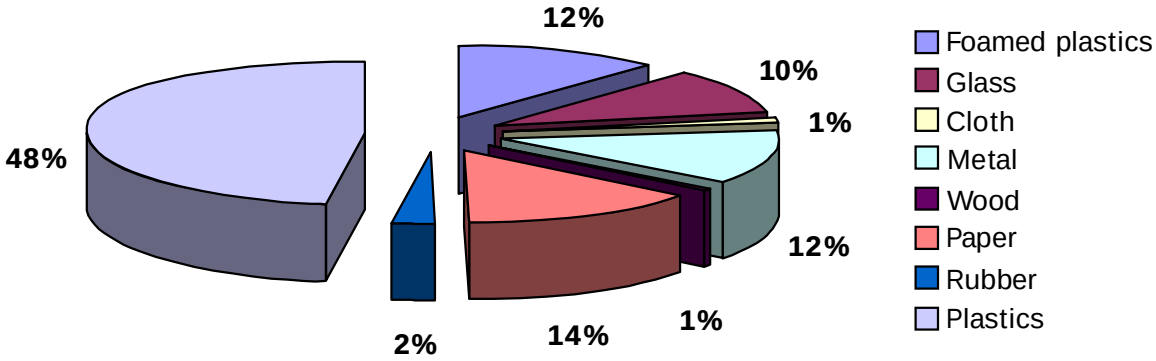


Figure 5.9. Marine debris composition (%) during the 1999 International Coastal Clean-up (ICC) in Bohol

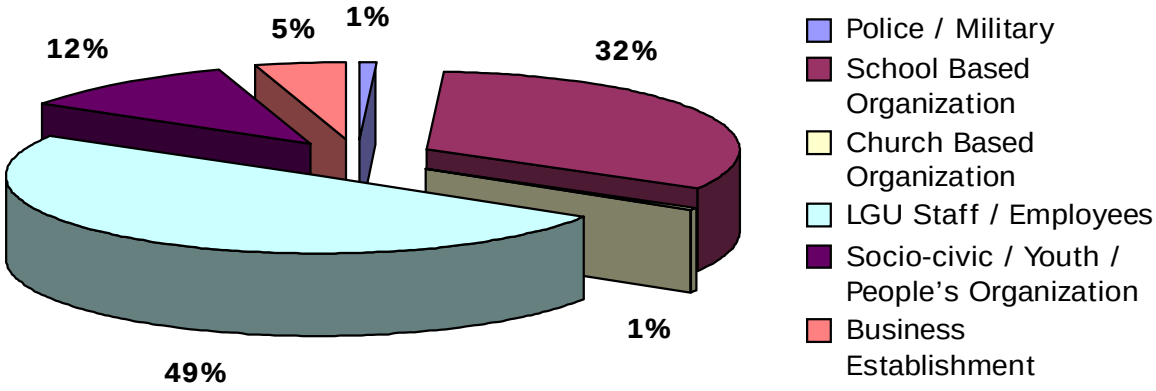


Figure 5.10. Volunteer composition (%) per sector during the 1999 International Coastal Clean-up (ICC) in Bohol)

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.

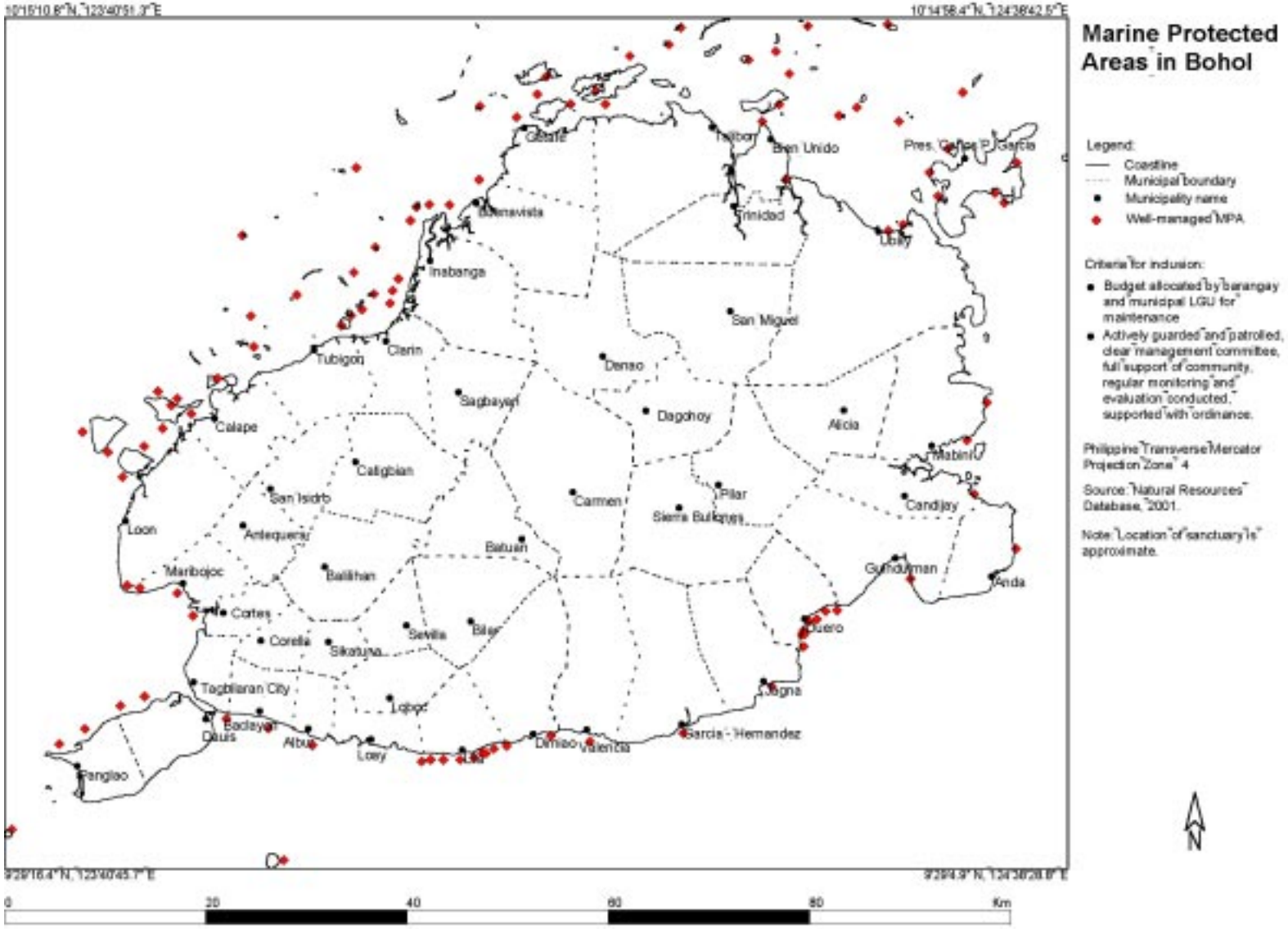


Figure 5.11. Map of established MPAs in Bohol

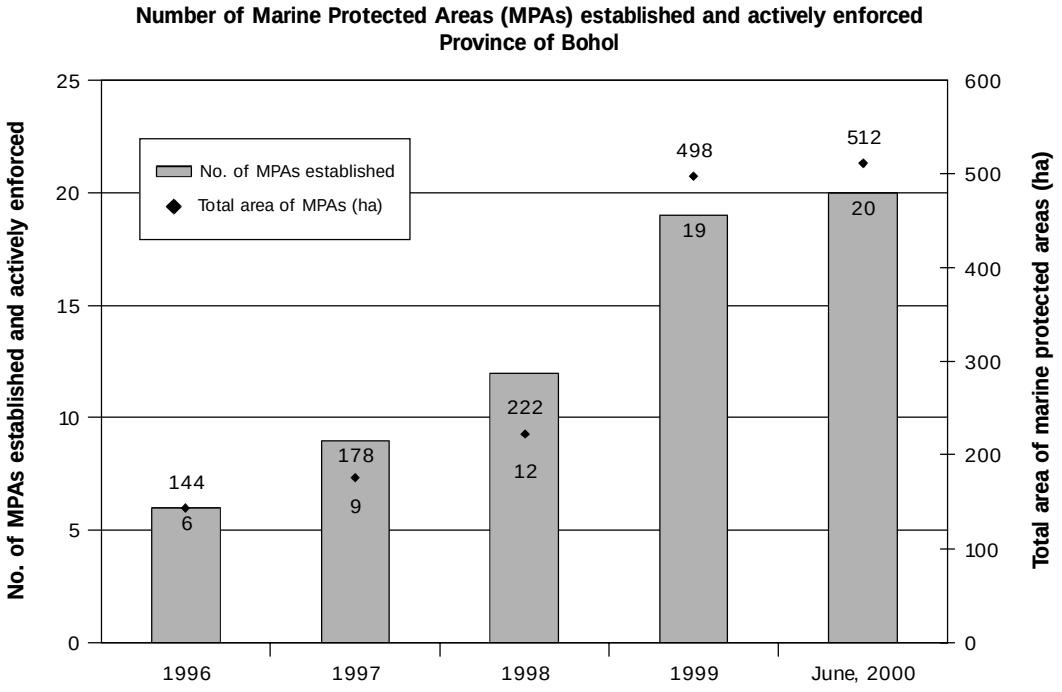


Figure 5.12. Established and actively enforced MPAs in Bohol

- 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.

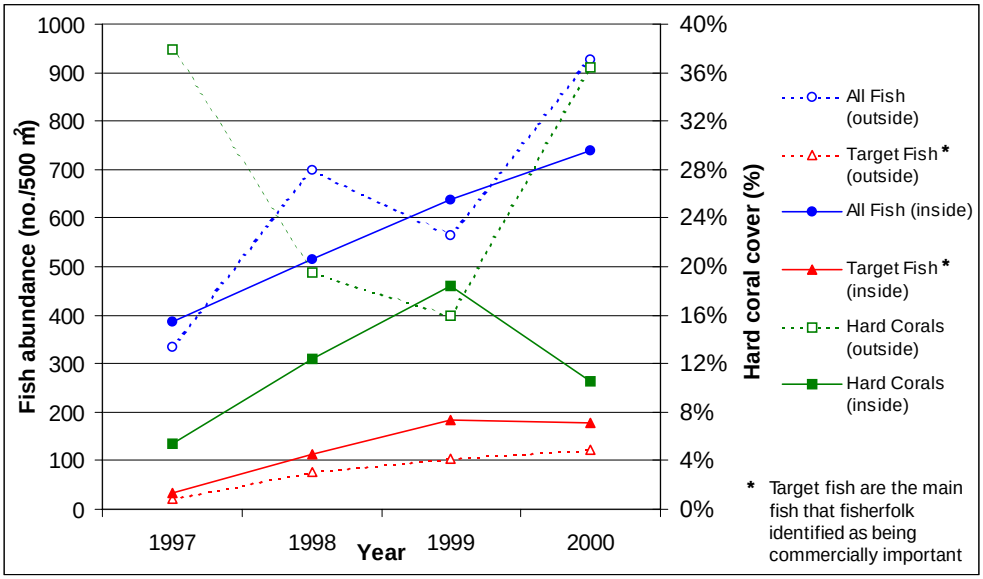


Figure 5.13. Fish abundance per 500 m² and % hard coral inside and outside the Lomboy- Kahayag Fish Sanctuary, Pangangan Island, Calape, Bohol (*Source*: UP-MSI)

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)

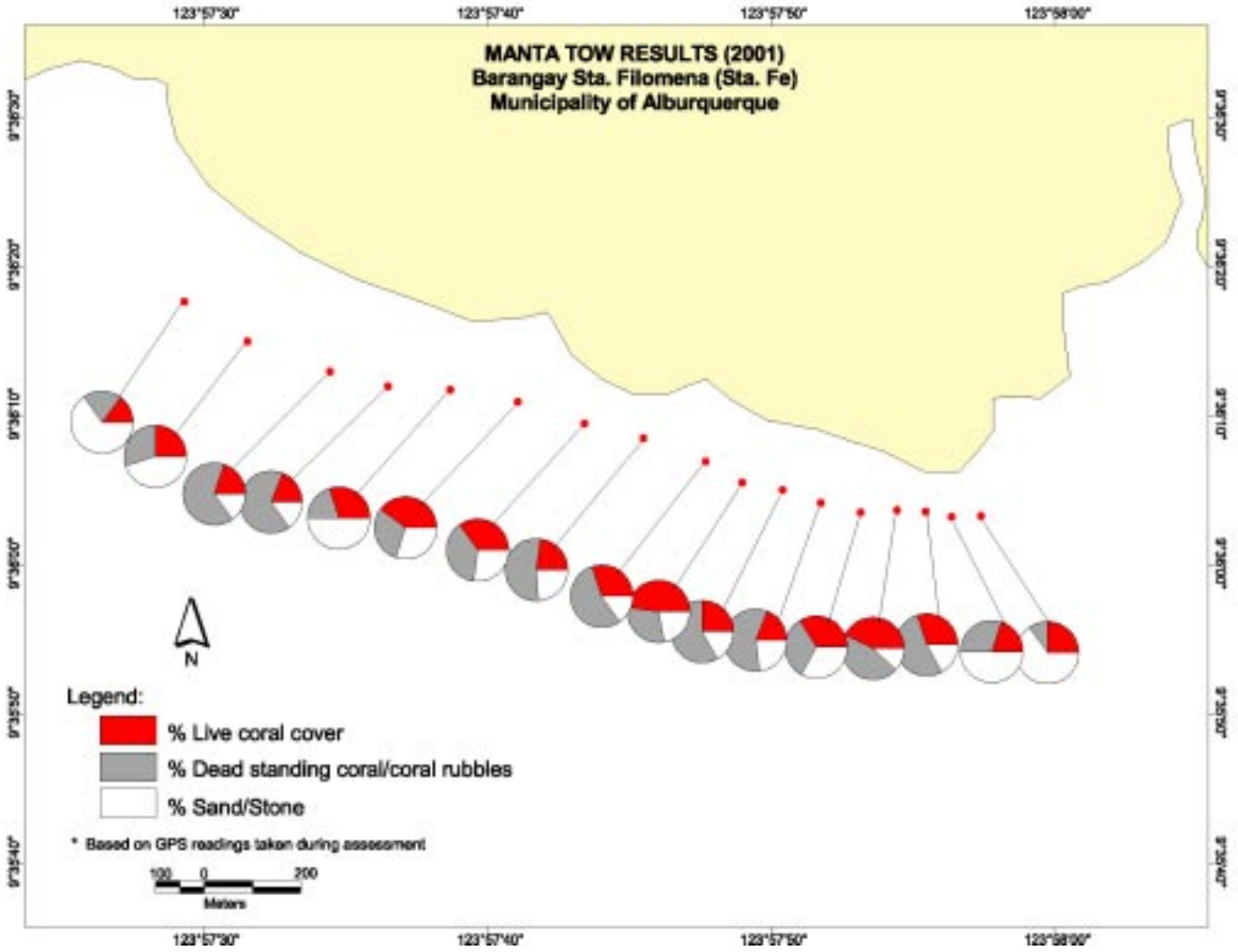
Indicator	Unit	1997	1998	1999	2000	2001
Outside sanctuary						
Hard coral cover	% cover	37.9%	19.6%	16.0%	36.5%	32.7%
All fish abundance	no./500 m^2	333	701	564	927	
Target fish abundance	no./500 m^2	22	76	105	122	
Hard coral cover	% change relative to baseline	0%	-48%	-58%	-4%	-14%
All fish abundance	% 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.

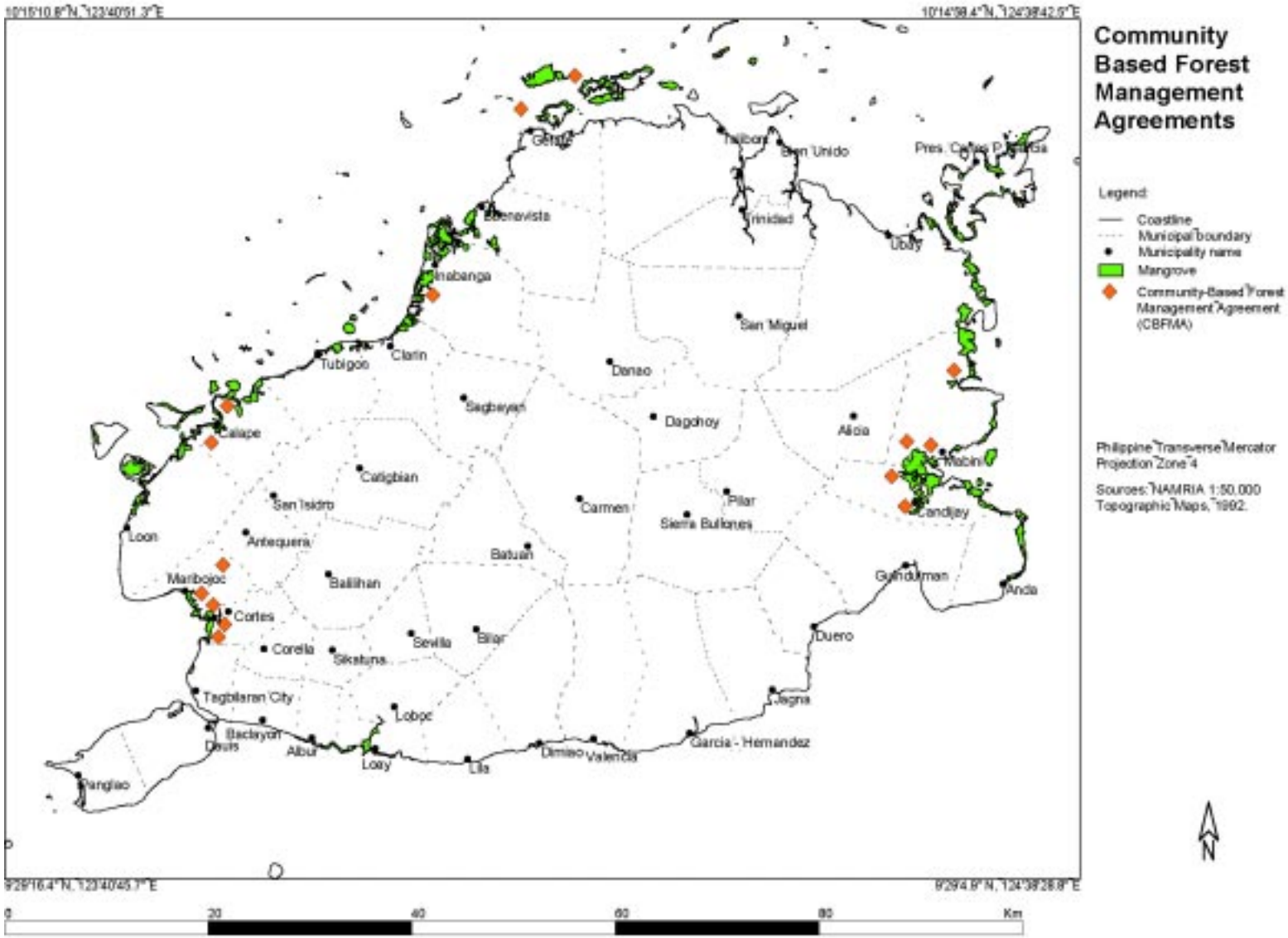


Figure 5.15. Map of CBFMA sites in Bohol

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).

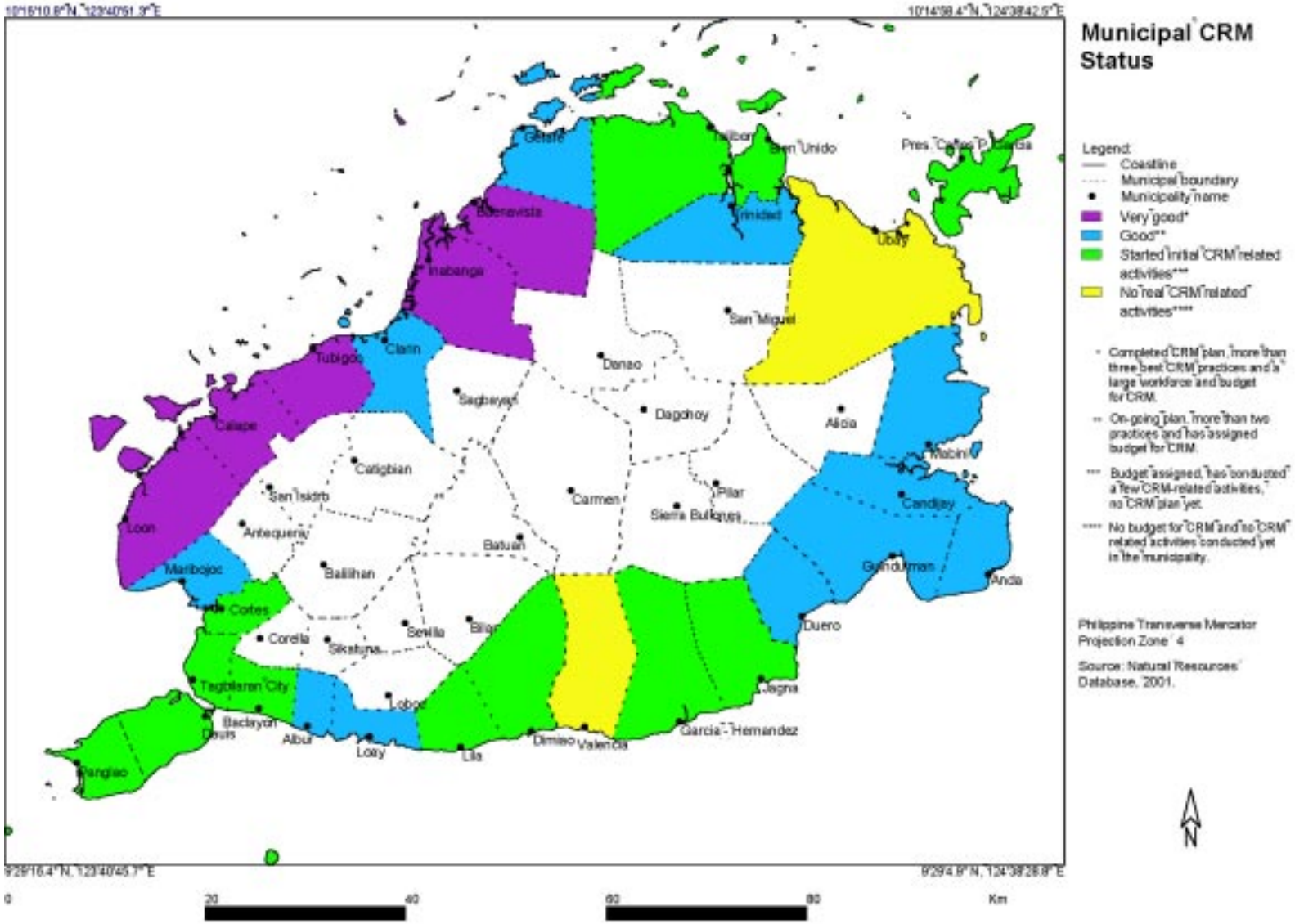


Figure 5.16. Map of municipal CRM status in Bohol as of December 2001

- 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.

coastal law enforcement

Chapter 6

During the Bohol Environment Summit held in 1997, the key issue in Bohol's coastal resources sector was the lack of effective coastal law enforcement. Time and time again, the problems of coastal law enforcement resurface all around Bohol. This has led to a cat-and-mouse game between law enforcers and illegal fishers, with the latter just moving around the province and the law enforcers not quite able to catch up with them. This situation can be attributed to non-coordination of all concerned parties and lack of an integrated approach to resolve coastal law enforcement. Meanwhile, law enforcement also needs to be strengthened by all municipal LGUs.

The main agency concerned with the management of law enforcement activities within municipal waters is the municipal LGU. There are other agencies or involved entities in law enforcement such as the PCG, BFAR, DENR, PNP, and PNP-Maritime Group and fish wardens. The LGU, however, has to take the lead in coordinating and collaborating with these groups, with the local PNP as lead law enforcement agency.

Illegal fishing has had an enormous negative impact on Bohol's coastal environments. It can be cited as the main reason for the reduction in fish catch, and the destruction of coral reefs, seagrasses and other habitats. The introduction of dynamite during the Second World War marked the beginning of illegal fishing. Since then, new and "more innovative" fishing gears have been introduced, which are just as destructive to the various habitats as the fish stock.

EFFECTS AND IMPACTS OF ILLEGAL FISHING

- Destruction of huge areas of coral reefs, seagrass beds and mangrove forests (illegal cutting).
- Loss of income of the 80,000 small scale fisherfolk of Bohol.
- Loss of coastal habitats, which are the feeding and spawning grounds of fishes, causing further stress to the ecosystem and making it more susceptible to other external threats (e.g. sedimentation).
- Serious health problems experienced by those practicing hookah diving, using dynamite, cyanide, etc. (diving mortalities, poisoning, paralysis, dismemberment).

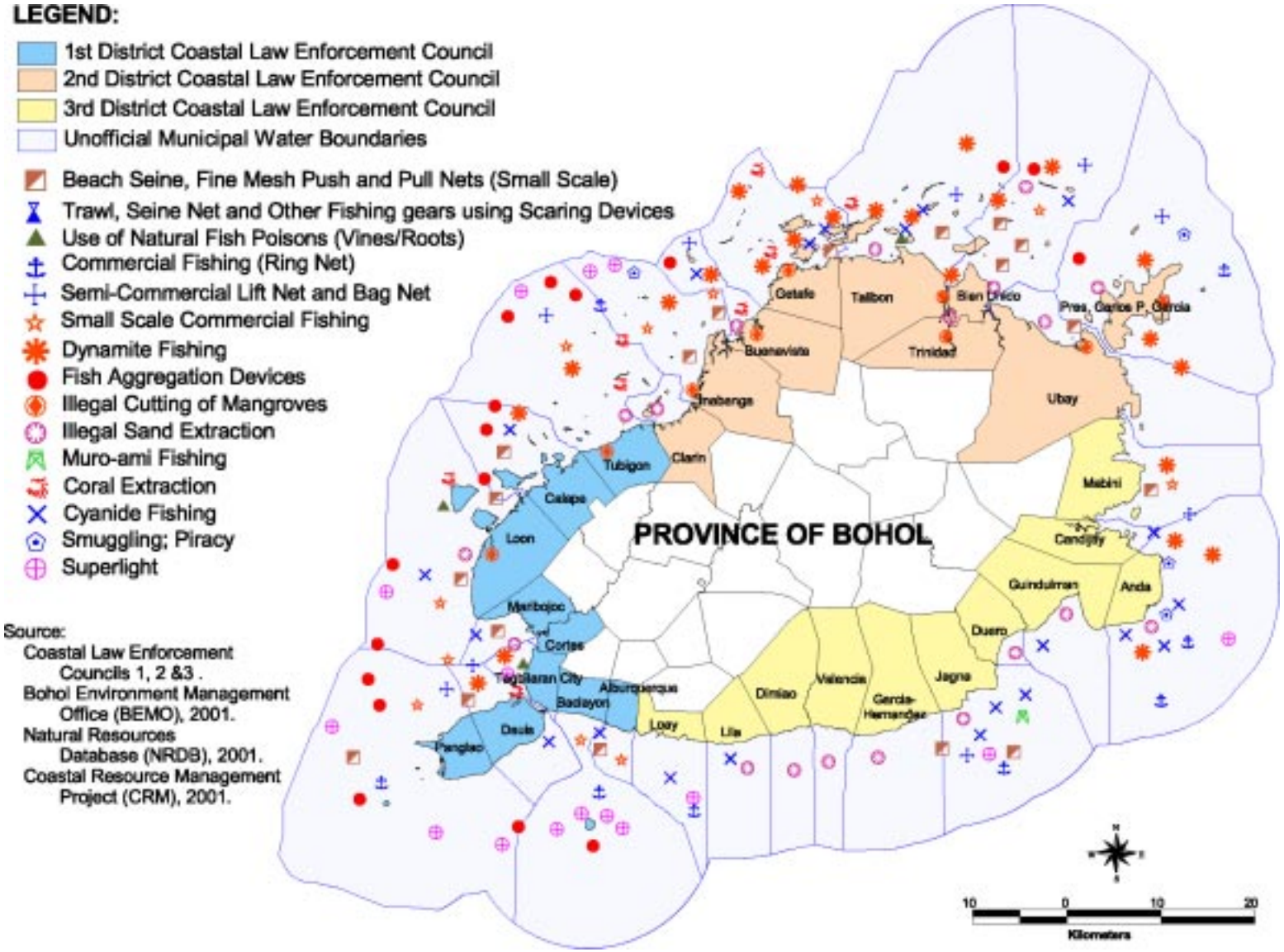


Figure 6.1. Map of illegal fishing used in Bohol

- Loss of food security for Boholanos and poverty of communities.
- Increased fish prices and reduced availability of marine products, and near extinction or disappearance of certain marine organisms and fishes.
- Increased use of illegal fishing gears due to lack of enforcement.
- Increased income (though temporary) for only very few individuals (e.g. illegal fishing financiers) and very little income for people who are directly involved in illegal fishing (some are children aged 10-15 years).
- Gambling, drug abuse, and other illegal activities due to "instant wealth".
- Increased smuggling of guns and illegal commodities in association with illegal fishing activities

Illegal fishing activities follow a vicious cycle where illegal intrusion of commercial fishing into municipal waters depletes fish stocks that could otherwise have been caught by municipal fishers. Municipal fishers in turn resort to illegal fishing, such as dynamite and use of fine mesh nets, to catch what's left behind by the commercial fishers. Without effective and consistent coastal law enforcement, typically law-abiding citizens are drawn into the illegal cycle, because of the need to catch food.

Most fish species have a juvenile stage and are unable to reproduce until they have reached a certain age and/or size. Fishes have a variety of reproductive strategies. Some are multiple spawners, producing eggs monthly starting from a quite young age at certain times of the year (e.g. rabbitfishes, locally known as 'danggit'). Others spawn only once a year, are quite large, and form spawning aggregations (e.g. groupers), however, they are slow growing and can spawn only when quite old, up to ten years old.

With most fishes (relatively more than 60%) being displayed and sold in the markets of Bohol still at their juvenile stage (1-2 years as opposed to a life span of 4-6 years needed for reproduction to take place), it is not surprising that fish stocks in Bohol have decreased considerably in recent years. Reproductive capacity (fecundity) is also related to fish size, with the bigger fishes producing more eggs than small fishes. A 12.2-kg red snapper, for example, can produce 240 times more eggs than a 1.2-kg one (Bohnsack, 1990). Fishes in Bohol are a lot smaller nowadays than before, which in turn means they can only produce a lot smaller number of eggs.

Most of the aforementioned changes can be attributed to the increase in fishing effort through the use of new and more innovative fishing gears and the introduction of illegal fishing activities.

To give a clear picture of how serious the illegal fishing problems in Bohol is, the Provincial Government, in coordination with the Department of Interior and Local Government (DILG), conducted a survey on illegal fishing through a series of *barangay* consultations in April 2000.

Following are the consolidated results from the 182 questionnaires distributed to the coastal *barangays* covering 21 out of the 30 coastal LGUs.

Box 6.1. Percentage of *barangays* using outlawed fishing gears and doing illegal fishing-related activities in 21 coastal LGUs of Bohol

Outlawed fishing gear/activity	% of barangays which responded yes
Use of naturally occurring chemicals, such as root vines, etc.	50%
Manually pulled fine-mesh nets	50%
Fine-mesh nets pulled by motorized boats	44%
Trawls	40%
Use of cyanide and pesticides	48%
Use of dynamite	55%
Entry of commercial fishing boats into municipal waters	43%
Shiners or superlights	36%
Use of scaring device, throwing of rocks, and swimming to scare the fish into the net	43%
Gathering and breaking up of corals	7%
Illegal extraction of endangered marine faunal species (fishes, shells)	4%

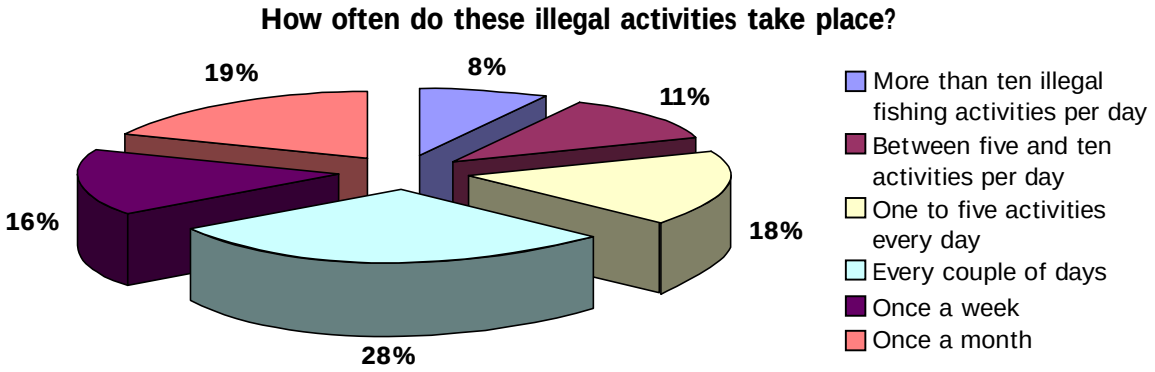


Figure 6.2. Occurrences of illegal fishing activities in 21 coastal LGUs of Bohol

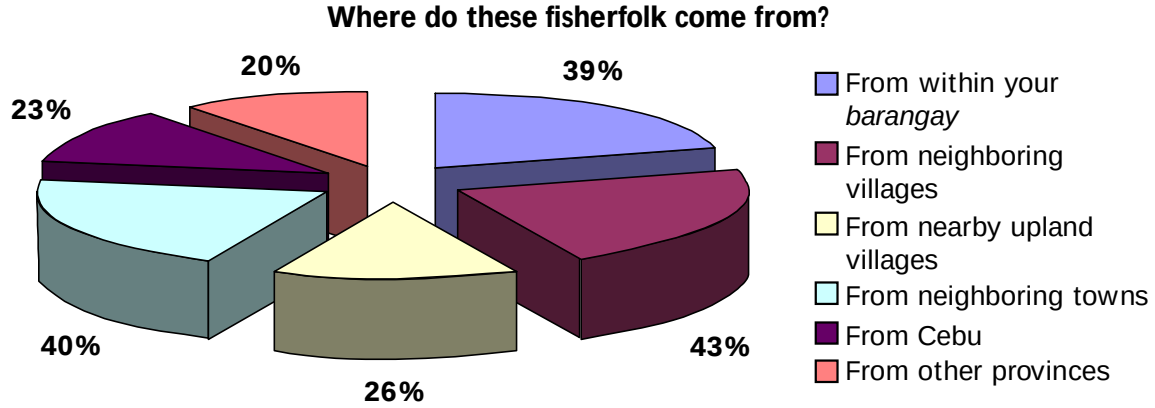


Figure 6.3. Origin of illegal fishers in Bohol

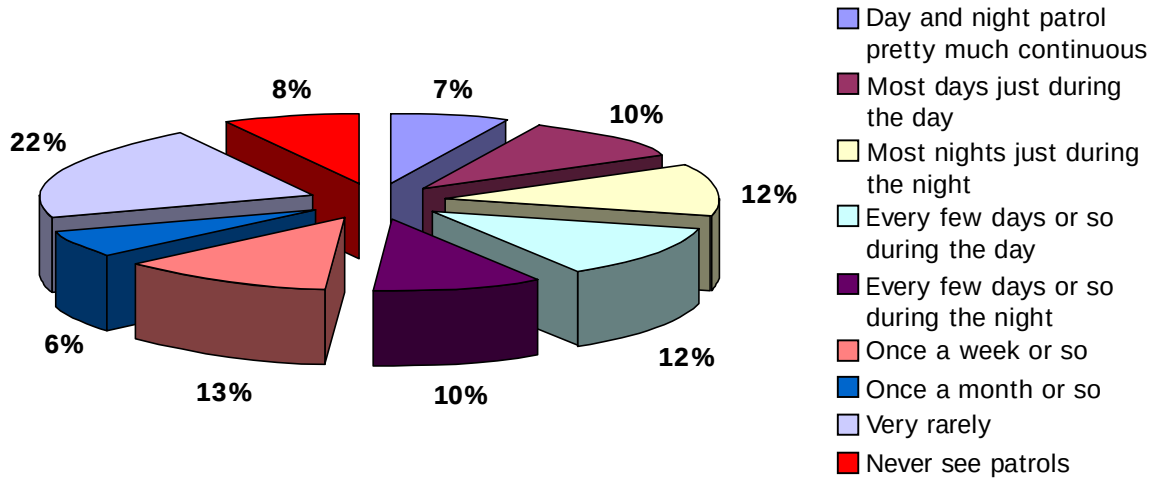


Figure 6.4. Occurrences of law enforcement activities in 21 coastal LGUs of Bohol

TYPES OF ILLEGAL FISHING and FISHING GEARS USED IN BOHOL

Confiscated fishing gears on display in Buenavista during the first "Saulog sa Dagat 2000" (Festival of the Sea), the Bohol celebration in support of the annual Month of the Ocean in May

The following sections describe some of the many types of illegal fishing gears and methods present in Bohol as well as their impacts on the coastal ecosystem.

Dynamite Fishing

Dynamite seems to be the oldest known and documented illegal fishing gear in the Philippines. It was introduced during the Second World War and was apparently used by the Japanese Imperial Army. Hand grenades and other explosives were thrown into the reefs to catch fish for food. After the war, the practice continued with the remaining explosives left behind. These explosives eventually ran out and were gradually replaced with the use of fertilizers and blasting caps. For the bombs, forms of nitrates are being used (i.e. calcium, sodium, potassium and ammonium). These are legally sold to farmers and seem to be freely accessible in the country. Mango growers and the mining industry can purchase these nitrates legally under the premise of use for their activities, however, large amounts are used in illegal trade for the manufacture of dynamite. One kilogram of ammonium nitrate can make 8 to10 dynamite cocktails. Ammonium nitrate costs less than 40 pesos per kilogram (Guidote, undated).

To make the dynamite, the nitrates (in powder form) are mixed with gasoline or methyl alcohol and the mixture is then poured into a container that varies in size from a glass bottle to

Parts of a blasting cap and home-made explosive used in illegal fishing in the Philippines.

small, medium or even gallon drums. The bottle is then filled to the brim with fertilizer, covered with a blasting cap/ detonator and sealed with melted candle wax. Blasting caps may only be sold to licensed blast foremen of quarries, mines or construction companies. Despite the regulations and the fact that there are only eight licensed explosives manufacturers in the Philippines, blasting caps and nitrates proliferate in the market and are delivered to Bohol from Cebu.

Talisay City in Cebu Province is renowned for supplying cheap, safe (i.e. they don't often blow up early while in the hands of the fishers) and effective bombs. Its *barangays*, especially Tangke, have a thriving full-blown backyard industry based on this illegal trade. Barangay Tangke was named so because of same unused ammunitions and explosives left by the Japanese and US armies during the Second World War. The local residents of the *barangay* got to experiment with the explosives left in the area. Now, Talisay City is considered as the leading supplier of blasting caps and dynamite sticks all over the Philippines (Guidote, 2001).

About 10 pesos is spent to produce a bomb. Its materials and ingredients include an empty soda bottle, a small amount of gasoline, candle wax and blasting cap (bought at a price of 4-5 pesos). The bomb is then sold for up to 40 pesos and guarantees a minimum catch of 10-20 kg of fish. Not bad for a few minutes of work. Although an illegal trade, dynamite manufacturing has been considered as one of the main backyard industries of Talisay City. With the LGU's difficulty to provide alternatives, it has been hidden away for many years.

There are many areas associated with dynamite and cyanide use in the province's top ten hotspots (mostly islands), and have strong links with Cebu, more particularly with Talisay City. It also seems that most areas have a key supplier of dynamite and cyanide and that this is tied with the purchase of fish and regular delivery of the chemicals to the area from the suppliers in Cebu. The Cebu suppliers arrive in Bohol two to three times weekly. They ply their illegal trade by placing the dynamite and cyanide inside sacks of rice and animal feed. The sacks are provided with double compartments for the blasting caps and the nitrates. Even the boats have secret compartments carved into the hull to hide the deadly trade. The suppliers sometimes sell their products through *barangay* officials, and return to Cebu loaded with fish and the fruits of their trade, which they in turn sell to Cebu City.

Jojo dela Victoria

Reams of blasting caps and their bottles shown here after an arrest in Cebu.

Dynamites come in a variety of sizes and shapes (e.g. small liquor bottles to liter-size beverage and lemonade bottles). They literally blow the reef apart, killing and maiming any organism within the radius of the large explosion. Some bombs are called sinkers. The addition of sand and rocks to the bottle make them heavier. Therefore, they sink deeper into the water column before exploding. Others are called floaters and are used especially for catching anchovies and small shoaling fishes near water surface.

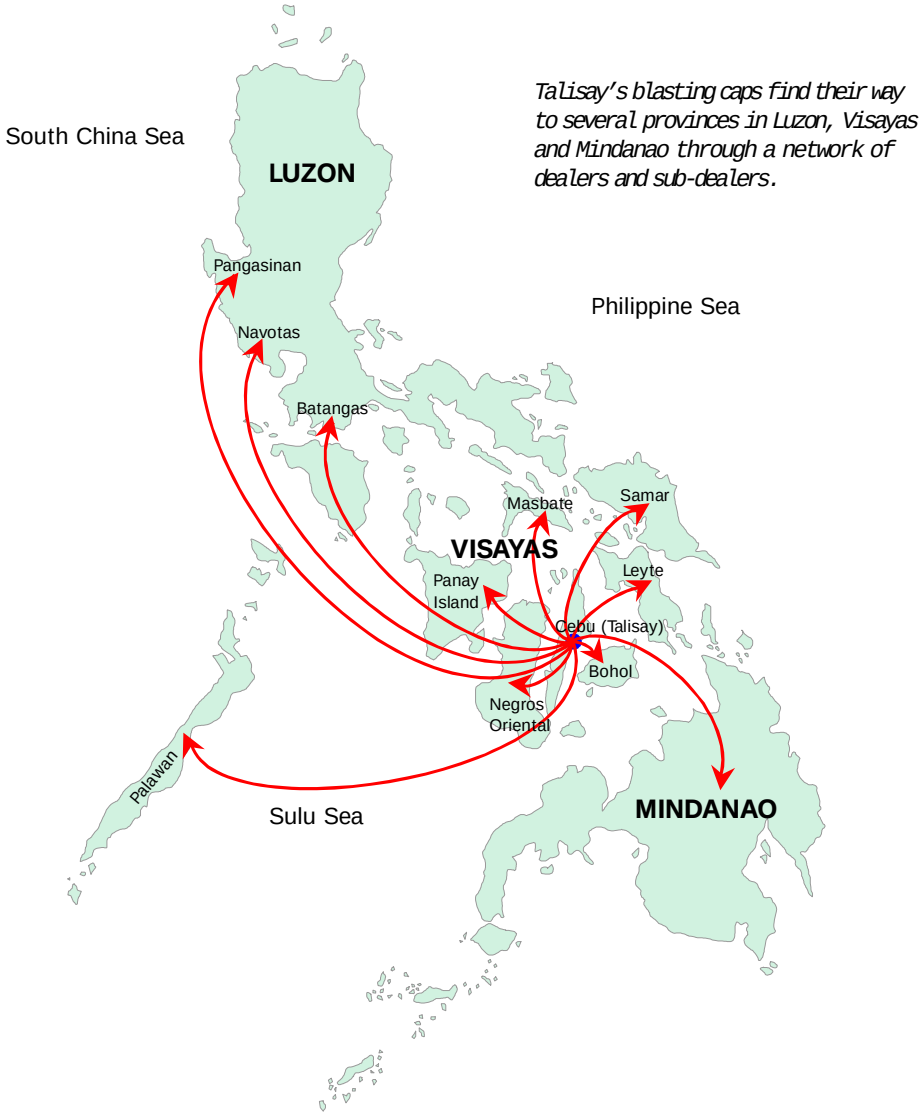
Dynamite fishing is also synonymous with the use of compressors that enable the fishers to dive deeper to collect the fish. The dynamiters take their pick of the wounded fishes from the broken coral fragments. Many other fishes and organisms are affected by the shock wave, which is transmitted through the water column (water is a very good conductor of energy). Once a fish's bladder receives a shock, it tends to rupture and the fish is no longer able to keep its balance in the water, remains paralyzed, and slowly sinks to the bottom of the sea where they die slowly if not picked up by the divers.

Scared by the dynamite users, who have been known to pick up their dynamite bombs and throw them at local law enforcers, the local fisherfolk just watch in despair as the dynamites continue to explode in the seas. Once the dynamite fishers leave, the local fisherfolk get whatever is left as there always are "leftovers" from this type of fishing. Meanwhile, it will take some 50-100 years for the destroyed reefs to recover, if it is ever able to colonize again, thus becoming albeit ecologically and economically useless for all who fish and glean in the area.

Fish caught by dynamite are easy to recognize by their fractured body parts, red eyes due to ruptured capillaries, and ruptured and bloodied intestines and gills. Internal anatomical manifestations include ruptured air bladder and blood vessels and broken vertebral column. Any market vendor knows that a fish has been caught by dynamite. Certain species are commonly associated with dynamite fishing, e.g. rabbitfishes, striped mackerels ('alumahan'), fusiliers ('dalagang bukid'), anchovies and related species.

Dynamite fishing is a noisy activity and poses great hazard to anybody directly and indirectly involved in it. The identified illegal fishing hotspots in Bohol, which are mostly island communities are characterized by human-induced mortalities and disabilities. Most, if not all, of these hotspots have armless, legless — generally termed by the local residents as 'pungkol' — and/or blind residents. Dynamite users are hard to catch though because they can easily throw away their paraphernalia, head to shore and run into the village to hide. The law states that anyone will be

penalized if he is caught in actual possession of dynamite with other paraphernalia, or in the act of throwing dynamite into the sea. On the whole, the incidence of dynamite fishing is declining in the province but, in most cases, it is merely being replaced with more toxic and deadly cyanide.



There are eleven dynamite and cyanide fishing hotspots identified, in no particular order, in the Province of Bohol. These include the following:

1. Tintinan Island, Ubay (possibly the worst area in Bohol)
2. Mantatao Island and Barangay Talisay, Calape
3. President Carlos P. Garcia Island, especially Barangay Balod
4. Cabul-an Island, Buenavista
5. Barangay Doljo, Panglao Island
6. Cuaming and Hambongan Islands, Inabanga
7. Calituban, Noknokan and Guindacpan Islands, Talibon
8. Nasingin, Pandanon and Banacon Islands, Getafe

9. Bilangbilangan and Hingutanan Islands, Bien Unido
10. Bagong-banwa and Mocaboc Islands, Tubigon
11. Barangay Cogtong, Candijay

Cyanide Fishing

The secret trade of sodium cyanide, locally termed 'kuskos' or 'hilo', is almost impossible to trace. This deadly substance is a broad-spectrum poison (literally a nerve poison) used in the mining, electroplating and agriculture industries. Its use began in the Philippines in the late 1950s when the country began to explore the market for aquarium fishes. Spurred initially by the huge demand for aquarium fishes in the world market in the 1970s and onwards, its use has been encouraged by the huge demand for live food fish such as groupers and bumphead wrasses especially for the local, Hong Kong and Singapore markets.

Cyanide seems to be the number one replacement for dynamite but figures on its use in Bohol could not be established. In contrast to dynamite, cyanide produces no noise and can easily be dumped and thrown away if patrollers and law enforcers come close.

The effects of cyanide end up in a deadly food chain, especially for humans who are the highest form of consumers in the food chain. Cyanide builds up in the tissues of fishes and will not degrade. When ingested, the chemical is stored in the fatty and nerve centers of the human body and once it reaches a certain level, the person may die. Cyanide can also kill corals and other marine organisms that get in contact with it. Several studies show that sometimes corals can recover, but once subjected to second dose of cyanide, they will die. Once the corals die, they need to be biologically eroded and broken up. This takes at least 30-40 years depending on the species of coral and other features of the area.

Some estimates calculate that hundreds of thousands of kilograms of cyanide are sprayed on the reefs around the Philippines. There is only one cyanide test lab in BFAR-Region 7 (Cebu City), to which suspected samples can be sent for analysis. The laboratory technique used, however, is expensive and does not consistently produce accurate results, as the results depend on how the cyanide was used in the first place.

Cyanide is oftentimes used by those who use spear guns or gather aquarium fishes. It is squirted into holes and crevices to stun expensive fishes which are then collected by hand. If to be sold at the local market, the stunned fishes are speared ("double kill") to make them appear as though they were caught by spear gun.

The cyanide trade is very well protected and supplies emanate from Cebu Province, particularly Argao where there is one big supplier. With 40-50 pesos, enough chemical can be bought to last for about a week of fishing. A kilo of cyanide is retailed at about 250 pesos. This quantity is then sliced up and dealt very similarly to illegal drugs. The chemical can be mixed with

water inside baby feeding bottles or with fish bait. There is even a small store on one island in Bohol that openly sells cyanide and dynamite "over the counter".

Cyanide fishing is lucrative as it targets the more expensive fishes. A kilogram of live grouper can fetch up to 600-800 pesos for rarer species, while each aquarium fish is sold at an average of 10 pesos up to 50 pesos. With this, many fishers are encouraged to turn to cyanide fishing to eke out a living. In a country where the fishermen are among the poorest, the "jackpot" they get from cyanide fishing is enough to make them unsympathetic to such "abstract concepts" as sustainable fishery and environmental protection and conservation (Pratt, 1997). The cyanide fishing hotspots of Bohol are strongly correlated with dynamite fishing.

Other chemicals, some as destructive as those commonly used in illegal fishing in Bohol, include Nyhindrin (a pesticide used in ricefields), and poisonous plant extracts like 'lagtang' and 'tubli' which are also used as pesticides for crops. Eating fish caught using these toxic chemicals poses extreme danger to human health as well as to corals and other marine animals.

Fine-Mesh Net

The by-catch from one pull of a small beach seine shows the amount of disturbance to and destruction of marine habitats and organisms (San Isidro, Talibon, Bohol).

Fine-mesh nets, such as beach seine or 'baling', double net (two layers of nets that result in a fine-mesh net), tri-ply (three layers of nets that result in an extra fine-mesh net), small beach seine or 'sahid', and other net types, are also destructive and illegal as defined by law.

These nets are commonly used in all coastal municipalities of Bohol, coupled with 'muro-ami' type of fishing methods that involve the use of scaring devices, throwing of stones and rocks, and striking the water surface with oars or large sticks to scare the fish into the net. These nets are dragged to scrape the seabed. In so doing, they pull up or break the corals, sponges, seagrasses and other habitats of fishes and catch other marine organisms including juvenile fishes.

The fisherfolk claim that fine-mesh nets are only used to support their daily dietary needs. They, however, catch juvenile fish and destroy their habitat, thus, in the long term, leaving less and less fish to catch. Juveniles of other marine organisms like crabs, squid and other mollusks are also caught. This deters spawning and the production of more and bigger fish.

'Kurantay', a type of fine-mesh net, has been modified and made a lot larger to resemble the 'liba-liba' (large seine net with scaring device). The smaller version of 'liba-liba' is called the 'hulbot-hulbot' while the larger one, which is mechanized and of commercial size, is called 'de-siper' and 'de-ring'. These modified fishing gears destroy the bottom substrates and scare fishes into the huge nets that can cost up to 50,000 pesos each. They are commonly used in the northern and eastern parts of Bohol, from Getafe to Candijay, and in the deeper seas of Loon and Tubigon. Commercial fishers from Cebu, some from Bogo, also move around Bohol with this type of net to catch fish. The community does not complain much because these fishers also buy fish from the local sellers.

Like all the other fishing gears discussed earlier, fine-mesh nets are illegal. The Fisheries Code of 1998 defines them as "active" fishing gears (also laid down in FAO 201).

Baby Trawl

Illegal fishing gears piled outside the municipal hall of Talibon, after a strong law enforcement drive of the LGU under then Mayor Juanario Item.

Locally known as 'palakaya', the baby trawl was introduced in Bohol by BFAR in the 1970s to increase the fish catch of small fishers. Since then, it has evolved into an even larger version which is known in Ubay as the 'lupad-lupad'. Baby trawls literally plow through the bottom substrate.

Fishers who use baby trawls are noticeable through the two plywood boards positioned at the rear of the boat. These otter boards drag the trawl in a straight line. Fishing boats with baby trawls are hard to catch as they are equipped with at least 16-hp engines. Once they see a patrol boat coming, the illegal fishers just cut their nets and flee. The boats can easily attain speed of up to 20 knots.

Baby trawls can be recognized through their noisy engines and constant movement at night. They catch shrimp, crabs and high-valued fishes. They tend to move everywhere and anywhere. The marine sanctuary in Macaas, Tubigon was not spared. They destroyed the buoys, signboards and other paraphernalia as they "plowed through" the sanctuary. Several families involved in baby trawl fishing are based in Tinangnan, Tubigon and Jao Island, Talibon. Due to increased law enforcement efforts in some areas of Bohol, most have moved to other towns where the fishing ground is large and coastal law enforcement is weak.

Commercial Fishing

Commercial fishing is banned from the shoreline and offshore islands of Bohol out to 15 km of the coastal waters. Only small- and medium-scale commercial fishing vessels with 3-150 gross tons may enter the 10.1-km to 15-km allowable area within the municipal waters provided that the LGU has delineated the municipal waters and the FARMC and the LGU passed an ordinance to this effect. At present, no LGU in the entire province has finalized the delineation of its municipal waters.

With the majority of fishes on municipal waters caught by about 1,000 commercial fishing operators in Bohol, the fish catch of about 80,000 subsistence fishers has been greatly affected. This means that only a few individuals, particularly the well-connected and influential are benefiting and making profit from Bohol's fisheries. The small subsistence fishers are left with literally nothing in their nets, and just 'asin' (salt) for their food.

Purse sieners from Negros and Cebu were the main problem during the early 1990's in Bohol, but as time has gone, these have been replaced by the local ring netters.

Ring Net

The main type of fishing gear used by commercial fishers in Bohol is the ring net, locally called 'likom'. Ring nets harvest from 50 to 100 'banyera' (one 'banyera' is equivalent to 40 kg of fish) per haul. They usually to haul fish two to three times per night depending on the time of the year. The boats are well equipped with fish finders, sonars, power blocks, radios, cell phones and Geographic Positioning System (GPS), and are thus aware of whether or not they are fishing within permitted areas. The ring net operators, mostly coming from Siquijor, Camiguin and Negros, have moved to Bohol apparently because of the abundant fisheries and made huge amounts of money at the expense of Bohol's small-scale fishers. They also seem to have lawyers and some media personalities their payroll who readily look for loopholes in law enforcement to secure their clients' income. It is interesting to note that legal offices have sprouted near the causeway in Tagbilaran City where abodes of big-time fishers are also located.

Commercial fishing has literally decimated Bohol's small and large pelagic fish species. It is common to see four to five big boats harvesting within 2-3 km from the shoreline almost every night in most southern towns of Bohol. With the advent of fish finders and sonars, the boats can even go 'scanning' on moonlit nights and catch fishes, something that was impossible to do in the past because fishes tend to scatter during moonlit nights. The complete range of communication facilities enables the commercial fishers to detect the presence of patrol boats. They even have a string of informants around Bohol to keep them aware of any patrol operation or provide inside information relating to the activities of the law enforcers. They provide these cohorts free radio equipment and accessories and get regular updates of where patrols are taking place. There is even one commercial fishing "dispatcher boat" which follows the CLEC-1 boat every time it patrols.

Small-scale commercial fishers continue to encroach the municipal waters to the detriment of the small fisherfolk, here shown Barangay Napo, Loon.

There was even one case of a small fisherman who was shot by a commercial fisher because he refused to remove his net and allow the commercial boat to harvest a group or 'apong' of fish. The small fisher had all the rights over the resources, but he was bullied and shot for refusing to succumb to an encroacher (pers. comm. Natalio Lajera).

It is therefore very necessary that the law enforcers must be better equipped and prepared if they are going to win the war against illegal fishers. Commercial fishing is apparently used as a front by some fish dispatchers and unscrupulous owners in the trafficking of illegal drugs. Meanwhile, the smaller fishing boats that use ring nets on municipal waters (most of which are dubiously registered as weighing below three gross tons) are also illegal. The net is also as an active fishing gear, thus not allowed on municipal waters as per Fisheries Administrative Order (FAO) No. 201.

Light Boat

Commercial fishing boats equipped with "superlights" to attract fish well within the 15 km from the coast of Panglao (photo taken from Balicasag Island, Panglao)

Commercial fishers encourage the use of light boats or large boats with attached dynamo which carry huge lights (up to 2,500 kW) in a variety of colors. More recently, halogen lights are submerged in order to attract and catch more fish.

In Bohol, there are about 200 light boats with strong lights or "shiners" which are by law not allowed within municipal waters. These are mostly financed by private individuals, including some influential people.

Fish Aggregation Devices ('Payaw')

These payaws are a great atttracting device for fish who are lured by the shade and slower currents. They are however a great temptation too for commercial fishers, here shown in Pamilacan Island, Baclayon.

Commercial fishers have also launched hundreds of illegal Fish Aggregating Devices (locally known as 'payaw'). This has encouraged many non-fishers to set up their own 'payaw' and purchase light boats. FADs are now becoming a nuisance to commercial vessels plying the Tagbilaran–Cebu route as they are anchored everywhere. Reportedly, the Philippine Coast Guard (PCG) hired divers to cut the 'payaw' which almost caused some accidents to boats navigating through the Maribojoc Bay (pers. comm. Lt. Lopez).

Like lightboats, 'payaws' have a variety of influential owners. Teachers, several politicians, municipal employees, even Cebuanos and Ilongos not even from Bohol own their FADs in Bohol waters.

It must be stressed that he who dropped a 'payaw', does not own part of the sea. By law, one should have permission from the LGU and pay a fee for the use of a FAD. In fact, there is a moratorium from the BFAR disallowing the use of FADs and artificial reefs on municipal waters because of their detrimental effects on fisheries. There are more or less 1,000 'payaw' installed within the waters of Bohol, with majority of them found in Buenavista, Inabanga, Tubigon, Loon, Maribojoc, Dauis, Panglao and Baclayon.

Once a light boat or 'payaw' has aggregated fish, the message is passed on through handheld radio, and more recently through the highly popular text messaging via cell phones. Lights are flashed on and off at sea to attract the attention of other commercial fishing boats. The latter immediately come close to "scan" the area and estimate the size of fish, how deep the net should be set, and whether there is enough fish to make a harvest worthwhile. Dispatchers of different commercial fishing boats also roam around at night trying to find good fish aggregations. Once the fish is hauled in, the owner of the 'payaw' or the light boat then gets one-third share of the catch after expenses have been taken away. This amounts to 20-30,000 pesos for one night's work.

Meanwhile, local hook-and-line fishers just watch in despair and if lucky they are given a handful of fish as the boats leave. Local fishers have been known to cut nets in the water because of their anger over losing all the fish to the net of a commercial fisher.

The fishing boats also catch large numbers of dolphins, whales and, more recently, whale sharks. In Baclayon in late 1999, over 70 dolphins were caught in a ring net. Most of them drowned while a few were taken home for their intestines, a good ingredient for 'dugo-dugo' (cooked intestines with blood of the marine animal), a local delicacy. Whale sharks are still occasionally caught and secretly sold through the southern ports of Bohol and delivered to Cebu. Cagayan de Oro in Mindanao is also a port of call for these whale sharks.

The fisherfolk of southern and western Bohol are tired of waging a silent war against commercial fishing. In March of 2001, some 200 small-scale fishers marched from the CPG Avenue to the PNP Maritime Group Sub-station at the K of C Drive in Tagbilaran City. Their tempers flaring, they voiced out that they have been stripped of their livelihood and are left with nothing to catch. Some commercial fishing operators even hire underaged boat helpers. These fish workers rarely receive any benefits (e.g. SSS) and most do not even have a legal fish worker's license from their 'amo' (boat owner or "boss"). Some of the boats also carry inadequate safety equipment such as life vests. In 2001, there was even one commercial fisher from Loon who was lost at sea, his disappearance discovered only when the boat docked in Loon, and his body was never recovered.

Fishes caught within the waters of Bohol do not always get landed in Bohol since most are traded to dispatchers at sea who ship the catch to other provinces, like Cebu and Negros. Meanwhile, the limited supply of fish to Bohol has resulted in high price, and the consumers can do nothing but pay high to taste their own fish. Meanwhile, Cebu and other provinces buy fish from Bohol at a price lower than its price when sold in Bohol. One person in Loon who lives in Cebu, buys fish in the latter and brings it over to Bohol on a weekly basis because it is 20 pesos cheaper in the city. When the local politicians asked the fish sellers where the cheap fish come from, the latter said that it is from Bohol (pers. comm. Atty. Barbarona).

FADs normally aggregate spawning ('bidhan') or fecund fishes, or those at their spawning run. What could grow into large sizes are caught before they are able to spawn. The unscrupulous fishers have in their minds the volume of fish they could harvest regardless of size and season. They catch juveniles which have not and never will be able to spawn, thereby, depleting fish stocks and drastically affecting food security. Certain species have begun to disappear. The once strong stocks of 'tulingan' (tuna), which were seen yearly in Bohol from March to June, are now rarely seen.

Regular harvests of shoaling individuals are also being done especially in the months of March to May. Aggravating the situation, during August-September when these fishes have spawned their young, they are caught and sold in huge volumes. Catching these juveniles or 'pirit-pirit' means that fewer adults will return and spawn a new generation. It is obvious that commercial fishing operators just want to catch anything and everything as long as it is in volume.

The fisheries condition in Bohol is very serious, fishes continue to disappear (such as tunas in recent years), fish prices will continue to increase, and Bohol will no longer be able to

supply fish as the main source of animal protein. It is also essential that big-time fishers should be the first to be apprehended by the law enforcers, as they are the main illegal fishing problem in Bohol far ahead of the damage done by other illegal fishers. With their exit, the small fishers will be able to stop their small-scale illegal fishing activities and return to catching enough fish legally to live off. There are about 80,000 small fishers in Bohol, and they get only a very small share of the fish stock. In contrast, commercial fishers, who comprise less than 1% of the total fishers in the province, get most of the fishery resource and revenues.

On the other hand, the commercial fishers claim that their collapse would cause fish prices to increase and would threaten fish supply. This is not true at all, because all they have to do is move out of the municipal waters into the deep sea areas off Bohol and stop competing with the small fishers. Fish supply will increase if the fish stocks are allowed to recover. By putting a stop to commercial fishers' monopoly on fish sales, the small fishers will become the main suppliers of the local markets in Bohol. Fish price will eventually drop and the small fishers will have a much more secured income, thereby, ensuring a better and more sustainable fish supply in the long run. Bohol will also be able to have a greater access to its fishery resources, and the supply of fish to Cebu and Negros will decrease.

Within the waters of Bohol, there are a number of identified areas where illegal commercial fishing still exists, to wit:

1. Tagbilaran City
2. Dauis
3. Panglao
4. Baclayon
5. Loay
6. Mabini
7. Maribojoc
8. Loon
9. Tubigon
10. Clarin
11. Inabanga
12. Pres. Carlos P. Garcia (formerly Pitogo)
13. Buenavista
14. Getafe
15. Ubay

COASTAL LAW ENFORCEMENT SITUATION IN BOHOL

The Local Government Code of 1991 mandates that the municipal LGU is the main agency tasked with the management of the municipal waters. This responsibility is reinforced by the Fisheries Code of 1998.

Some LGUs have had astonishing impacts on illegal fishing within Bohol. The consistent law enforcers of the province have contributed to the decrease in the frequency of illegal fishing

Participants of the Trainers' Training on Boarding Procedures conducting patrolling and inspection of one of the commercial fishing vessels in Tagbilaran City with the BEMO, PCG, CRMP, PNP-Maritime Group, PNP Provincial Command and CLEAR7 staff.

in some areas, although a few have managed to raise people's awareness of the real economic benefits that a municipality can have with heightened law enforcement. Put simply, better coastal law enforcement can ensure more fishes, thus, more socio-economic revenues for the municipality and all its stakeholders, as well as sustainable fish supply in the local market.

Strict imposition of penalties, through fines, can cover the costs of law enforcement. Active coastal law enforcement also ensures that other illegal activities (e.g. illegal trade in lumber, drug trafficking, gambling, etc.) get caught red-handed, and navigation of seaborne vessels made safer. The experiences of those directly involved in coastal law enforcement prove that this activity should get a very high priority.

Some politicians who have fully understood the importance of strict coastal law enforcement in municipalities have won the hearts of the people, especially the ordinary fisherfolk. The LGU of Inabanga, a northern municipality, is an excellent example of how a local chief executive, serious on implementing coastal law enforcement, waged a serious campaign against illegal fishing and greatly minimized it during her terms as local chief executive. Mayor Josephine Socorro Jumamoy is one of the first local executive in Bohol to take a stand on law enforcement. It was not a very easy job for her at the start, but Mayor Jumamoy took the risk of losing the trust of her townspeople. Fortunately, many of her constituents were happy that the LGU, legislators and law enforcers dared the illegal fishers to stop their unscrupulous activities. Other LGUs worthy of mention are Tubigon, Calape, Clarin, Talibon and Candijay whose chief executives are making sure that their coastal law enforcement programs are very consistent and well implemented.

Relative to its mandate as regards the management of the municipal waters, the LGU, through its *Sangguniang Bayan*, is responsible for drafting and passing adequate policies and ordinances. The PNP and the PCG are two national agencies that are mandated to enforce coastal, including fishery, laws in coordination with the concerned coastal MLGUs and other deputized law enforcers.

The *barangay* has no legal jurisdiction over the municipal waters but it can formulate laws, either through resolution or ordinance for the SB to consider, in relation to some activities they want to undertake in coordination with the Municipal FARMC. The *barangay*, however, has jurisdiction over activities that affect the coastal waters within the *barangay*, e.g. solid waste management (see Chapter 4).

Although there is no such thing as provincial waters, the Provincial Government of Bohol plays a big role in facilitating and catalyzing province-wide initiatives in relation to coastal law enforcement. In this regard, it has taken the lead through its pro-development stand.

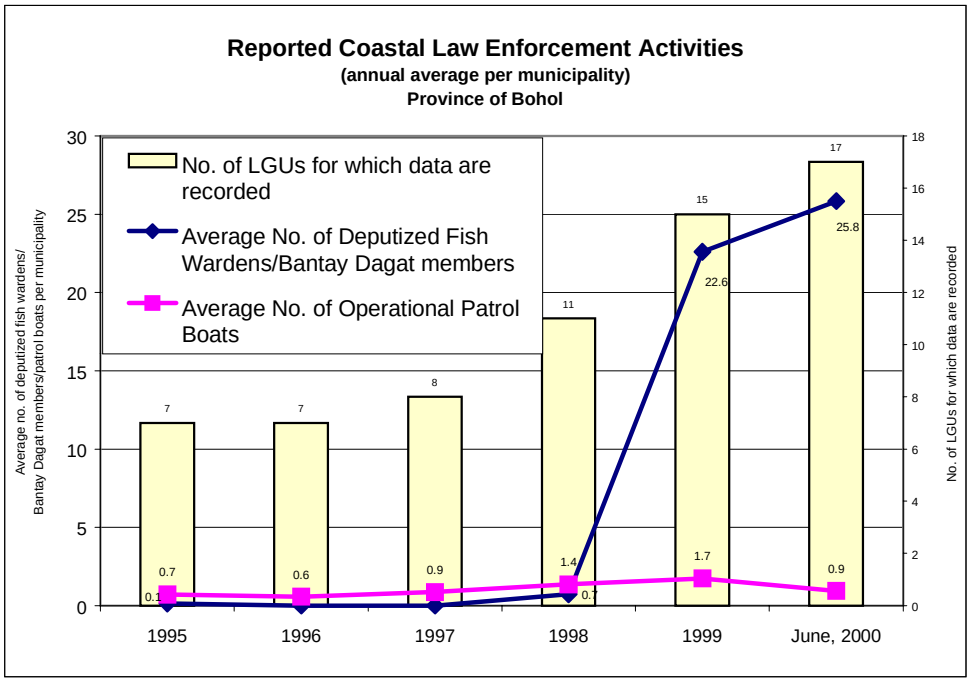


Figure 6.5. Graph showing reported coastal law enforcement activities in Bohol

Bohol Coastal Law Enforcement Summit

Inspired by the success of the Bohol Environment Summit held in 1997, the Provincial Government decided to mount a follow-up activity to focus on local coastal law enforcement issues.

For years, coastal law enforcement in Bohol has been like a cat-and-mouse game wherein illegal fishers evade the coastal law enforcers by transferring from one town to another. Triggered by a suggestion from then Vice Governor Edgardo Chatto, the BEMO facilitated the holding of the Bohol Coastal Law Enforcement Summit in May to June 2000. The activity was supported by the Office of the Provincial Governor, DENR-CRMP, and BCRMTF.

The gathering of all fishery stakeholders in the province served to highlight the celebration of May as Month of the Ocean. The ten-day summit centered on the problem of coastal law

Culmination of the Bohol Coastal Law Enforcement Summit (June 2000), highlighted by the signing of the MOUs on the creation of the Coastal Law Enforcement Council (CLEC) in the three congressional districts of the province.

enforcement in Bohol. Workshops were conducted and facilitated by the BCRMTF and participated in by the mayors and vice mayors of all coastal LGUs, chairpersons of SB/SP Committees on Fisheries and Environment, SB/SP secretaries, municipal/city fish wardens, FARMC heads, members of the judiciary, provincial prosecutors, and the private sector including commercial fishers and representatives of civil society.

The members of each sectoral group were asked to share their thoughts on the current reality on coastal law enforcement in Bohol and share their own experiences. A priority list of issues and activities on law enforcement was drawn up (see Box 6.2.). An action plan was then formulated upon which the Provincial Government could focus its resources. During the workshops, it was agreed that a multi-sectoral and inter-LGU approach to law enforcement is needed for Bohol. This should be supported with sufficient logistics (personnel and materials) and equipment to realize a concerted response towards an effective coastal law enforcement for Bohol.

Box 6.2. Outputs of the series of sectoral workshops held during the two-week-long Bohol Coastal Law Enforcement Summit 2000

EXECUTIVES OF PROVINCIAL GOVERNMENT AND NATIONAL LINE AGENCIES AND *SANGGUNIANG PANLALAWIGAN*	
Priority Issues	**Strategic Directions**
▪ Absence of a provincial coordinating body for local coastal law enforcement ▪ Undelineated municipal waters ▪ Limited logistics and financial resources ▪ Lack of incentives for witnesses in the prosecution of violators ▪ Lack of alternative livelihood	▪ Create coastal law enforcement council in every district ▪ Delineate municipal waters ▪ Source/appropriate funds ▪ Conduct IEC

continued

Box 6.2 continued

RTC AND MTC JUDGES, PROSECUTORS, LAW ENFORCERS AND THE MEDIA	
Priority Issues	**Strategic Directions**
▪ Lack of coordination among the five pillars of the justice system ▪ No financial support from some municipal LGUs ▪ Political intervention ▪ Unholy alliance between law enforcers and illegal fishers ▪ Undelineated municipal waters	▪ Institutionalize a network of line agencies ▪ Appropriate sufficient funds for coastal law enforcement ▪ Strictly implement the law ▪ Strengthen IEC on coastal law enforcement

NGOS AND ACADEME	
Priority Issues	**Strategic Directions**
▪ Ordinances not harmonized nor standardized ▪ Lack of political will ▪ Lack of logistical support ▪ Lack of IEC ▪ Unholy alliance between some law enforcers and illegal fishers ▪ No municipal judge	▪ Standardize fishery ordinances ▪ Create and strengthen coastal law enforcement councils and task forces ▪ Provide support mechanism ▪ Conduct IEC, advocacy and networking ▪ Enhance existing management and judicial systems ▪ Conduct monitoring and evaluation

MUNICIPAL MAYORS, MPDCs, MAOs AND SB REPRESENTATIVES (1st, 2nd and 3rd Congressional Districts of Bohol)	
Priority Issues	**Strategic Directions**
▪ Lack of logistics and financial support ▪ Lack of IEC ▪ Ordinances not harmonized nor standardized ▪ Undelineated municipal waters ▪ Illegal fishing still rampant	▪ Allocate budget for CRM ▪ Conduct information education and communication (IEC) ▪ Create District Coastal Law Enforcement Council ▪ Provide alternative livelihood ▪ Delineate municipal waters ▪ Sustain efforts in coastal law enforcement

VICE MAYORS AND *SANGGUNIANG BAYAN* SECRETARIES (1st, 2nd and 3rd Congressional Districts of Bohol)	
Priority Issues	**Strategic Directions**
▪ Financial constraints ▪ Lack of political will ▪ Inter-LGU conflicts on ordinances ▪ Inactive fisherfolk ▪ Absence of coastal zoning, undelineated municipal waters	▪ Allocate budget for CRM ▪ Create coastal law enforcement board in every municipality ▪ Harmonize fishery laws and ordinances ▪ Solicit technical assistance from concerned agencies

continued

Box 6.2 continued

PO LEADERS AND MFARMC CHAIRMEN	
Priority Issues	**Strategic Directions**
▪ Continued illegal fishing activities ▪ Lack of logistical support ▪ Lack of alternative livelihood ▪ Lack of political will ▪ Undelineated municipal waters ▪ No municipal judge	▪ Create and strengthen Coastal Law Enforcement Councils ▪ Provide/solicit financial support ▪ Conduct IEC ▪ Conduct monitoring and evaluation ▪ Conduct advocacy and networking activities ▪ Lobby for the assignment of municipal judges

PHILIPPINE NATIONAL POLICE, *BANTAY DAGAT* AND FISH WARDENS	
Priority Issues	**Strategic Directions**
▪ Lack of manpower and dedicated law enforcers to sustain a 24-hour operation ▪ Lack of facilities and equipment ▪ Alternative livelihood for illegal fishers not sufficient ▪ Continued illegal fishing operation	▪ Establish a composite seaborne patrol team ▪ Appropriate sufficient funds for coastal law enforcement ▪ Allocate funds for alternative livelihood projects ▪ Strictly implement fishery laws and ordinances ▪ Strengthen IEC activities

BUSINESS SECTOR: FISH VENDORS AND COMMERCIAL FISHERS	
Priority Issues	**Strategic Directions**
▪ Intrusion of commercial fishers from other provinces ▪ Regulations limiting the use of marine resources ▪ No regular monitoring of public markets for fish caught by dynamite fishers ▪ Undelineated municipal waters	▪ Strengthen coastal law enforcement ▪ Improve licensing/permit system ▪ Strengthen Municipal FARMCs ▪ Conduct IEC

Congressional Coastal Law Enforcement Councils

Heads and representatives of local and provincial LGUs and national agencies witness the signing of the MOU on the creation of Congressional Coastal Law Enforcement Councils (June 6, 2000).

On the last day of the Bohol Coastal Law Enforcement Summit, a Memorandum of Understanding was signed by and between heads of concerned agencies and the local chief executives of all coastal towns of Bohol. The MOU stresses Bohol's commitment to create a congressional coastal law enforcement council in each of the three districts. Each council will serve as the main planning and coordinating body for all activities related to coastal law enforcement within the district and will be fully represented by all coastal M/CLGUs of each district.

The Roles of the Three CLECs

Laid out in the MOU are the roles and responsibilities of all agencies concerned with coastal law enforcement in the Province of Bohol. The MOU ensures that each agency will commit its resources and time for the coordinated undertaking. It also consolidates the mandates of the collaborating agencies in order to harmonize their roles in the Council.

Each of the three CLECs shall:

- identify a base of operations (i.e. office) for the district;
- organize a composite coastal law enforcement team including advisers;
- produce a district-wide coastal law enforcement communication and operations plan;
- procure budgetary allocations and logistics for district-wide activities;
- determine the share of each MCLGU from the fines resulting from the law enforcement activities of the council and/or explore other innovative methods of fund raising;
- acquire patrol boats through interagency/counterpart funds;
- coordinate with coastal LGUs that share common boundaries to ensure uniform policies and activities;
- provide the Provincial Government regular updates on the councils' activities;
- advise LGUs through their respective mayors and MCFARMCs on the suggested standardization of policies and proposed policy changes;
- prepare a training and capability-building program for its members; and
- convene in a general assembly each year to assess and evaluate accomplishments and plans, and explore areas for closer collaboration between districts.

Composition of the Three CLECS

Each CLEC is composed of all CRM partners present during the Summit and who were elected in October and November 2000. To date, the three councils are doing exceedingly well and are becoming the main coastal law enforcement leaders in the districts. The current chairmen of the three CLECs are Mayor Gabino Redulla (LGU-Maribojoc), Vice Mayor Apolonio Aparece (LGU-Buenavista) and Vice Mayor Felix Casingcasing (LGU-Duero) for the first, second and third districts, respectively.

The following shall compose each of the three CLECs of Bohol and will be duly elected in a forum of all LGUs of the district:

- One FARMC Chairman
- One fishwarden representative
- The Provincial Director of the PNP or his representative
- The Provincial Prosecutor or his representative
- One representative from the DENR
- One representative from the BFAR
- Representative of all the coastal Municipal Mayors and City Mayor
- Representative of all the coastal Municipal Vice Mayors and City Vice Mayor
- Representative from the *Sangguniang Bayan/Sangguniang Panlungsod*, preferably the Chairperson of the Committee on Fisheries and Agriculture

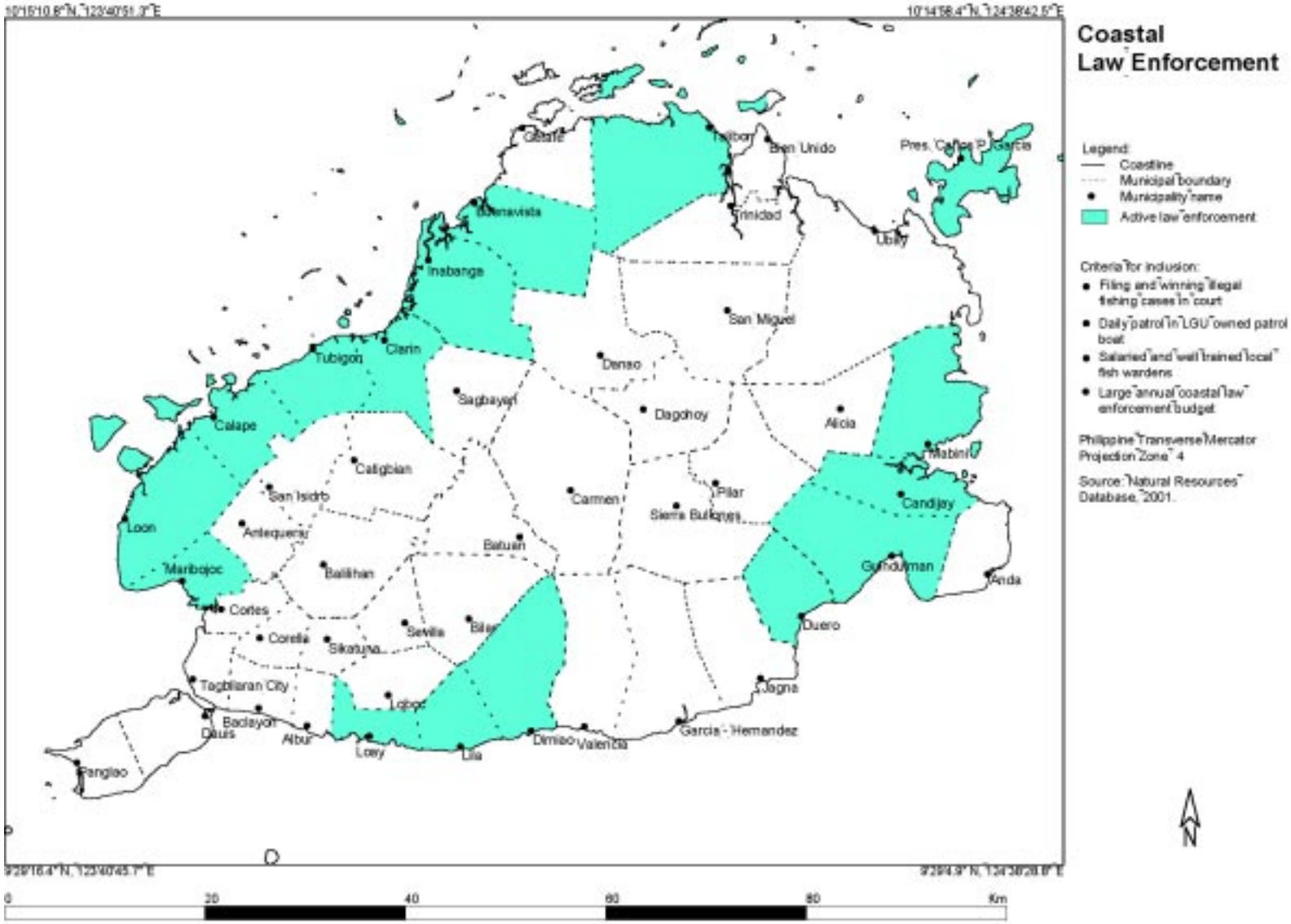


Figure 6.6. Map of LGUs in Bohol practicing strong coastal law enforcement as of 2001

- Representative from the Philippine Coast Guard
- Representative from the PNP-703rd Maritime Group
- One representative from the civil society
- One representative from the Bohol Environment Management Office
- One representative from the *Sangguniang Panlalawigan* (SP)

The advisers of each CLEC include the:

- representative (congressman) of the district to the House of Representatives,
- Provincial Director of the DILG or his/her representative,
- representative from ELAC,
- representative from the Judiciary,
- representative from the Provincial Prosecutor's Office,
- representative from CRMP (coterminus with project),
- representative from PIA,
- representative from PIO and other media, and
- other representatives deemed necessary by the council.

The councils meet regularly. A one-year plan, which includes IEC, serves as a guide in their activities.

After their blessing and launching, the three CLEC patrol boats started off for environmental awareness campaign, dubbed as "Duaw Sangyaw", in identified illegal fishing hotspots of Bohol during the whole month of May 2001 to celebrate the Month of the Ocean.

To strengthen the operations of the CLECs and address the problem on lack of equipments, the Provincial Government purchased three patrol boats with complete equipment and allocated funds for maintenance and operating costs. Each patrol boat is manned by one boat operator, one maintenance crew and the members of the composite law enforcement team of the district.

THE COASTAL LAW ENFORCEMENT ALLIANCE IN REGION 7 (CLEAR7) AND THE BOHOL COASTAL LAW ENFORCEMENT COUNCILS

Established through a Memorandum of Agreement signed in June 2000 by the DENR, DA-BFAR, DILG, PNP, PCG, NBI, ELAC, IMA, Philippine National Association of Fishwardens, LMP-Bohol Chapter and CRMP, CLEAR7 was developed to pilot and package an integrated coastal law enforcement strategy in the Central Visayas Region. Most CLEAR7 signatories are the regional offices-counterpart of the CLEC signatories.

Participants and instructors to the Coastal Law Enforcement Trainors' Training conducted by CLEAR7 for the CLECs.

At the onset, CLEAR7 through a support from the DENR-CRMP-USAID and the United States Coast Guard International Training Division (USCG-ITD) trained key enforcers from the provinces of Cebu and Bohol on the rudiments of Joint Boarding Exercises. Some of the trainees from Bohol consequently became members of the CLEAR7 pool of trainors that were mobilized to conduct a trainors training for the CLECs. The CLECs has now an independent pool of trainors coming from the PNP Bohol Provincial Office, 703rd PNP-Maritime Group, the Coast Guard Station in Bohol and ELAC.

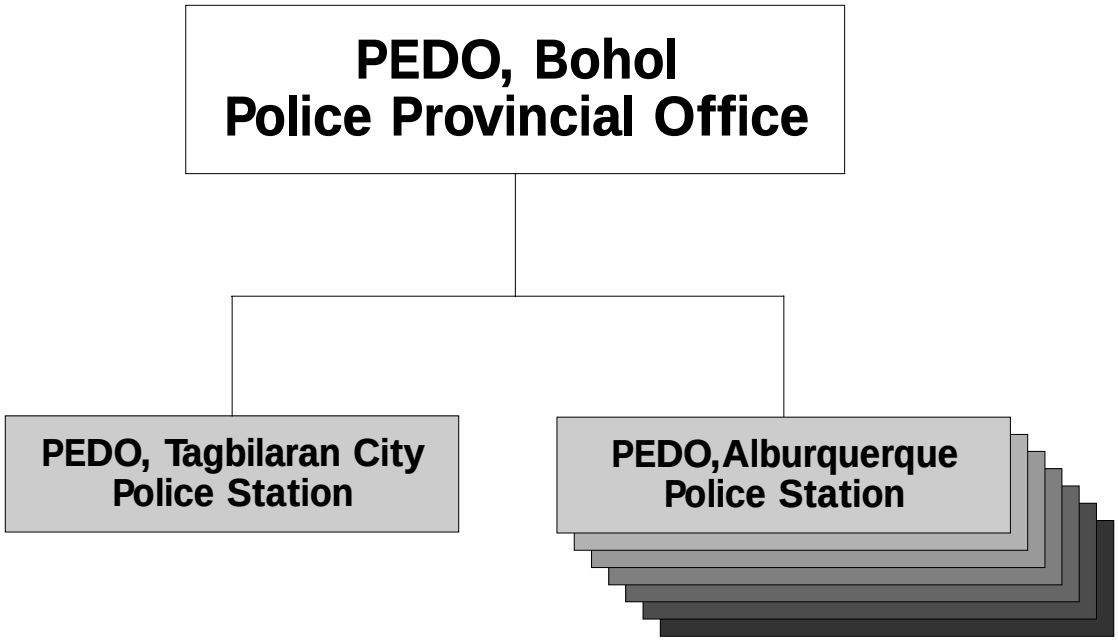
Another product of the CLEAR7-CLEC partnership is the initial drafting and eventual implementation of PNP Letter of Instruction 10 series of 2001 (LOI10/01) entitled "Perfect Environment" which provides for the creation of the Police Environment Desk. Although a project of the PNP Regional Office, CLEAR7 and Police officers coming from the CLECs participated actively in reviewing the draft of the LOI.

CLEAR7 being supported by the USAID through the DENR-CRMP and the CLEC through the BEMO-CRMP work closely in areas of training, planning and coordinating coastal law enforcement activities (Guidebook 8, page 135). Owing to the centralized character of law enforcement agencies, this tandem proves to be an ideal environment for a provincial coastal law enforcement activity to prosper.

The Police Environment Desks in Bohol

One of the most recent developments in the Central Visayas Region is the creation of the police environment desk in all police stations. In Bohol, all 48 police stations have been required to create such as desk and appoint their respective Police Environment Desk Officers or PEDO (Figure 6.7).

Police environment desk is the PNP Regional Office's response to the growing clamor for a more active and sustained police involvement in environmental protection. Current situation in environmental policing is characterized by fragmented approaches and problematic strategies as there are many agencies tasked to enforce the same laws resulting to none of them doing the job. Under the program, the PEDO is mandated to take on the lead role in environmental law enforcement especially in areas where the government agency, whether national or local, directly responsible is physically absent.



* PEDO's are preferably station's investigator or Police Community Relations Police Commissioned Officers/PNCOs

Figure 6.7. Communication flow/hierarchy of the PEDO in Bohol

It is a given fact that government agencies with environmental law enforcement functions have very limited reach to monitor, accept reports, and more importantly to act quickly on violations. The DA-BFAR and DENR monitoring, control and surveillance officers are virtually absent in remote localities of Bohol so much so that violations on fishery and forestry laws remain unabated.

Police stations are present in all localities of Bohol however most of their personnel are ill-equipped of the technical intricacies related to environmental law enforcement which are mostly governed under special laws that only lead agencies understand. But with proper information, training and logistical support from these agencies, the police can be their immediate extensions. The PEDO serves are the direct and accountable extension officer of such agencies as DENR, DA-BFAR and all other law enforcement agencies. It is hoped that full maturity of the Police Environment Desk will make every policeman capable of taking cognizance of environmental law the violations, assume jurisdiction quickly and dispose of the case more efficiently (Figure 6.8).

The Bohol Coastal Law Enforcement Councils and the PEDOs

Consistent with the creation of the Congressional District Coastal Law Enforcement Councils the PEDO of all police stations in coastal towns of Bohol automatically becomes the action officers to the CLECs.

The primary activity of PEDOs is the enforcement of coastal laws. This means that PEDOs are required to obtain all necessary information and skills relative to effective enforcement of

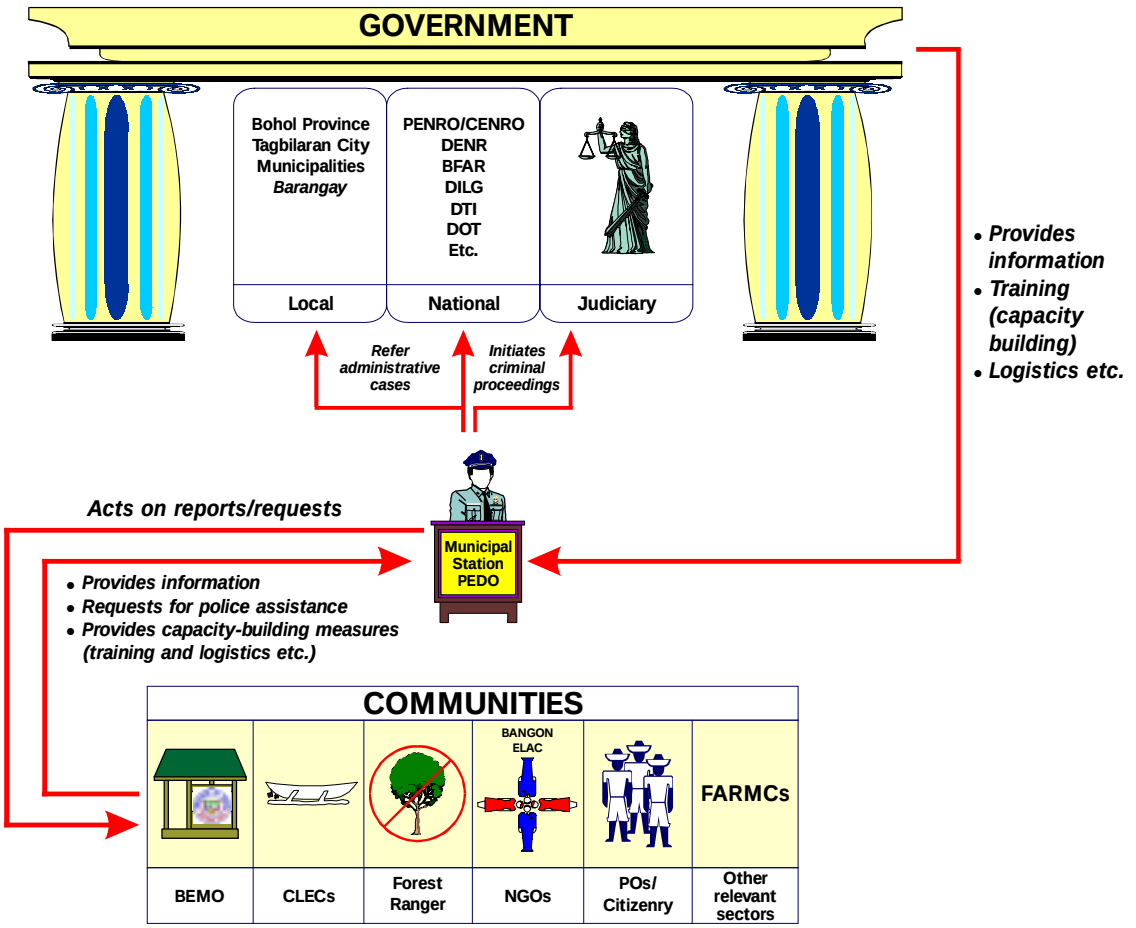


Figure 6.8. Flow of environmental law enforcement in the Police Environment Desk

maritime and fishery laws such as basic fish and gear examination, seaborne patrolling, proper boarding and search procedures, navigation and seamanship, evidence handling and case presentations.

Initially, the BEMO with the PNP Bohol Provincial Office sponsored a Boarding and Para-legal training for some of the PEDOs of Bohol in Tagbilaran City.

SUMMARY

Coastal law enforcement is definitely not a new concept. Although there exists a continuing battle against illegal fishers, Bohol is one of the very few provinces that have taken a bold step in its pursuit to sustain its fisheries sector. The Bohol Coastal Law Enforcement Summit succeeded in highlighting the fact that illegal fishing is a problem for everyone to face and resolve, and that a multi-sectoral, multi-strategy approach is needed to resolve it, with IEC and land-based and sea-based patrols.

Chapter 7

information management: the key to successful implementation

Updated and quality information is a critical component in coastal resource management, and forms the basis of any planning or decision-making process. It is therefore essential that relevant and good, if not the best, quality information and data are available to coastal LGUs.

The CRM process begins with the collection of information and an assessment of the current status of and issues on the coastal environment. From this base line, certain objectives and priorities may be identified before formulating an action plan. The process is repeated after the first cycle of plan implementation has been assessed or evaluated.

At the community level, this process may involve a participatory coastal resource assessment, coastal resource management planning, organizing and implementing marine patrols, and establishing marine sanctuaries. At the provincial level, this may include identifying the status of the municipalities, and the CRM priorities and plans. Monitoring and evaluation are done in both levels.

STANDARDIZATION

With so many organizations involved in coastal resource management, a standard approach for information and data management is required. This will enable a common basis for comparison of information and reduce repetition of effort. Obviously, this requires cooperation and sharing of resources and information between and among the various CRM practitioners in the province.

Municipal Coastal Database

Governor Erico B. Aumentado attending workshop training for all coastal LGUs of Bohol on how to use the MCD. Shown with CRMP training head, CRMP Chief of Party and Bohol Provincial Coordinator.

The Municipal Coastal Database (MCD) was developed by the USAID-funded DENR-CRMP. It was designed to help simplify and standardize information management at the municipal level for CRM activities. The MCD enables coastal municipalities and cities to manage data and information on all aspects of CRM including budgeting, institutional development, local legislation, regulatory measures, and biophysical data. The MCD aims to provide municipal LGUs with a framework for assessing their performance and for planning. It also provides a holistic view of the CRM status of all coastal municipalities.

The Provincial Government has adopted the MCD and is currently facilitating the collection and validation of data from every coastal municipality. The LGUs are given free access to all the information that is based at the BEMO.

Natural Resources Database

The Provincial Government through the Voluntary Service Overseas (VSO) and the BEMO has developed the Natural Resources Database (NRDB), a major component of the natural resources center. Its primary objective is to provide centralized information for environmental management in Bohol. This database will be used for setting CRM priorities, planning, implementation and monitoring of the programs facilitated by or undertaken with the BEMO. Like the MCD, it shall be made available and accessible to all development partners in the province and, in the future, to interested parties from other provinces.

The NRDB consists of three components, namely, the Municipal Coastal Database, Upland and Watershed Resources Inventory, and Solid Waste Management Status. Profiles of the status of these components will be published periodically. In addition, data from the province's Environment Management Systems will be incorporated.

The Provincial Government has already signed MOAs with provincial offices, NGAs and NGOs for the coordinated establishment and management of the MCD and NRDB. These agreements involve the following:

- Preparation of digital base maps with the Environmental Science for Social Change (ESSC);
- Agriculture profiling for food security with the Office of the Provincial Agriculturist (OPA); and
- Identification of details on land classification and protected areas with the DENR.

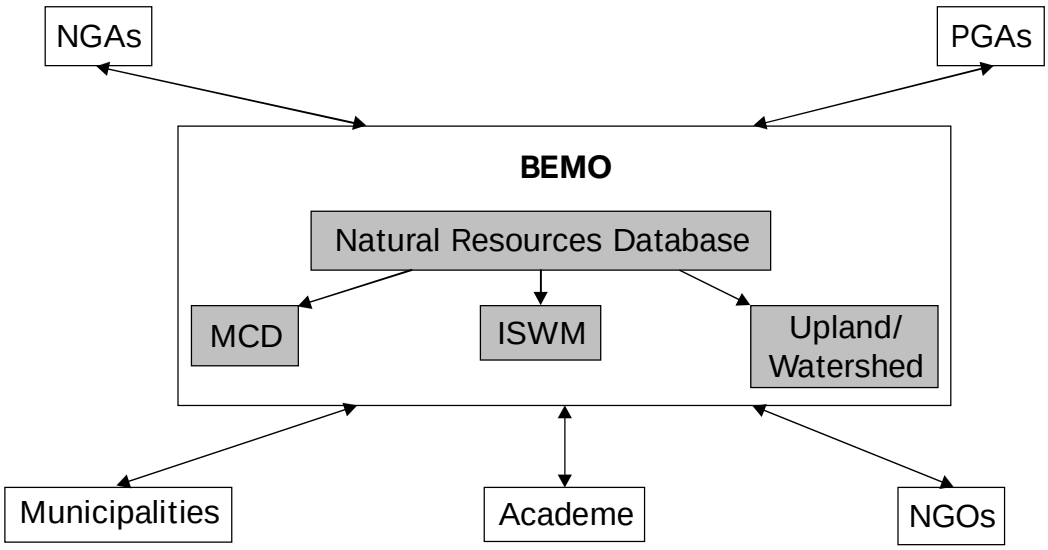


Figure 7.1. Provincial information flow

Recommendations

- All LGUs and NGOs should be encouraged to use the NRDB for various developmental purposes.
- Data collection methodologies should be standardized and systematized.
- As laid down in the Bohol Environment Code of 1998, NGAs should provide the NRDB all available pertinent information.
- New projects and funding institutions should consider working with the BEMO and developing further their information management systems.
- All new projects and activities in the province should be encouraged to utilize, validate, and update the NRDB.
- All LGUs should use the MCD and submit hard/file copy of their updated data by January of each year for incorporation into the provincial MCD.

Box 7.1. Features of the Provincial Natural Resources Information Center of Bohol

Part of the role of the Bohol Environment Management Office (BEMO), which is a leading advocate of environmental education and assists and coordinates with other organizations in environmental management, is the development and maintenance of the Natural Resources Center as a venue for information and equipment relating to all programs of the BEMO.

The resource center is primed up to address the following issues and problems:

1. Lack of environmental consciousness at all levels of society
2. Dearth of IEC materials and facilities
3. Absence of a clear direction for IEC in the province

continued

Box 7.1 continued

4. Lack of environmental advocacy group
5. Lack of concerted effort to promote CRM-based IEC
6. Poor extension/outreach activities
7. Lack of dissemination of best practices

Given the above issues and problems, there is a need to put up a Bohol Natural Resources Center to cater to the demands of the various clientele groups in terms of research and extension.

The objectives of the center are as follows:

1. To develop a centralized environmental IEC center
2. To establish linkages with the people and media
3. To develop standardized environmental IEC materials for the province
5. To establish an IEC database
6. To acquire equipment for IEC activities
7. To provide technical assistance
8. To develop a pool of trainers and/or directory of provincial resource persons
10. To develop a provincial IEC core group

The following facilities shall be established to meet the center's objectives:

1. Social Marketing Unit
   - To reach all requesting and priority *barangays* within two years
2. Quick Response Desk
   - To disseminate information through various media channels
3. Database
   - To produce updated information and profiles for various clientele groups
4. Mini-library
   - To provide information materials for research, extension and other purposes
5. Exhibit Area
   - To provide pertinent information through multimedia presentations
6. Training Unit
   - To serve as depository for all training kits, briefing materials and related support tools including directories of trainers and technical experts
7. IEC Core Group
   - To set IEC directions, develop an IEC system, and provide outreach/extension services
8. Project Documentation and Publication Unit
   - To document best practices and develop them into appropriate packages

CRM CERTIFICATION SYSTEM

At the provincial level, part of its monitoring and evaluation of CRM activities within every coastal municipality is the implementation of the CRM Certification System. The CRM Certification System establishes benchmarks for effective CRM at the municipal and city levels. Coastal municipalities and cities must conduct annual monitoring and evaluation of their CRM plans and programs for evaluation and validation by organized multi-sectoral and multi-institutional groups at provincial and regional levels. Once a coastal municipality is "CRM-certified", more prospective development partners will invest in their area. Furthermore, national government agencies have committed to prioritize "CRM-certified" municipalities for investment.

To implement the certification system, the Provincial Government, through a MOA, has established a multi-sectoral Provincial CRM Certification Technical Working Group (PCRMC TWG), composed of:

- one representative from the BEMO (which acts as the main secretariat);
- the Provincial Director of the DILG;
- the Provincial Environment and Natural Resources Officer of the DENR; (chairperson)
- the Provincial Fishery Officer of the BFAR;
- the Chairperson of the Sub-committee on CRM or representative from the Special Projects Unit of the *Sangguniang Panlalawigan* (SP);
- one representative from the League of Municipalities of the Philippines-Bohol Chapter;
- one representative of each of the three Coastal Law Enforcement Councils (CLECs);
- the Executive Director of the Bohol Alliance of Non-Government Organizations (BANGON);
- one representative from the BIPC;
- the Provincial Agriculturist of the OPA; and
- one representative from the Coastal Resource Management Project (CRMP) (coterminus with project).

Figure 7.2. CRM Certification System

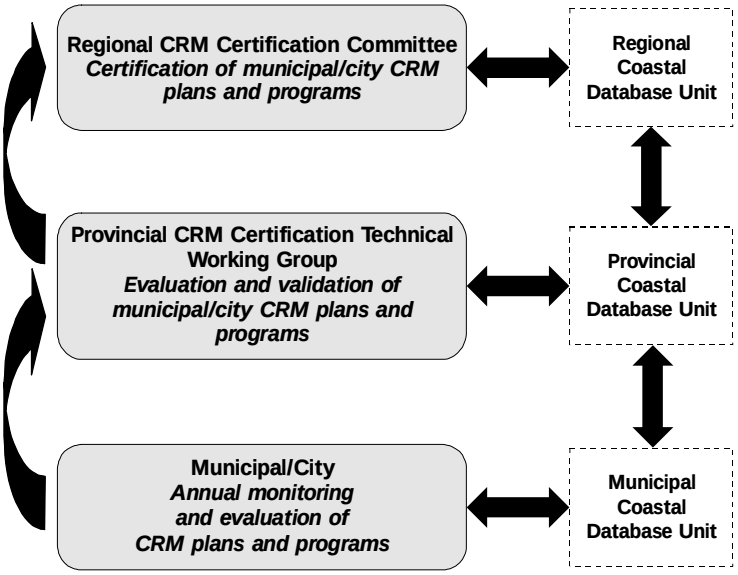


Figure 7.3. Flow of CRM Monitoring and Evaluation

The PCRMC TWG is tasked with the evaluation and validation of monitoring and evaluation reports submitted by each municipality. After evaluation and validation, the PCRMC TWG endorses the municipality's certification application to the Regional CRMC Committee.

Mayor Jumamoy proudly shows off the Certificate for CRM Certification of LGU-Inabanga. With her is Gov. Erico B. Aumentado, Frank Donovan (USAID), Dr. Catherine Courtney (CRMP Chief of Party), Marius Corpus (DILG Undersecretary), Gov. Rodolfo del Rosario (LPP President), Vice Gov. Julius Ceasar F. Herrera, Gerardo Cuadrasal (VGO), Stuart J. Green (CRMP Provincial Coordinator), Anecita Gulayan (CRMP Technical Assistant) and Nunila Pinat (BEMO Deputy Head).

The PCRMC TWG will also provide assistance and training in participatory monitoring and evaluation to coastal LGUs interested in applying for CRM certification. Coastal municipalities interested in CRM-certification must follow the "Guidelines for Monitoring and Evaluation of CRM Plans and Programs for CRM Certification" which describes the process and benchmarks for CRM certification. As of publication, Inabanga was the first LGU to be certified in the whole of Region VII.

Box 7.2. CRM Benchmarks for Local Government Units

Beginning CRM Level One (I) - Indicators Framework

- Budget allocated for CRM
- Municipal FARMC formed and active
- Multi-year CRM Plan drafted (5 years)
- Appropriate CRM best practices planned and initiated (at least 2-3)

Intermediate CRM Level Two (II) – Indicators Framework

- MFARMC strong and active
- Multi-year CRM Plan finalized and adopted
- Municipal ordinance supports plan/CRM code
- At least two CRM best practices implemented
- Coastal law enforcement effective
- Financial and human resources assigned permanently to CRM activities

Advanced CRM Level Three (III) – Indicators Framework

- Sustained long-term implementation of CRM with monitoring, measured results and positive returns
- Bio-physical improvement in resources measured (i.e. increase in coral cover or fish abundance)
- Socio-economic benefits accrued to coastal residents (i.e. actual increase in livelihood within the communities)
- Illegal activities totally minimized
- Annual budget based on results of monitoring and Municipal Coastal Database

CRM PLAN INTEGRATION with CLUP and ANNUAL INVESTMENT PLAN

One component of CRM implementation, as outlined in the Bohol Environment Code of 1998, is the implementation of municipal coastal zoning alongside the preparation of a ten-year Comprehensive Land Use Plan (CLUP). The Coastal Zoning Plan should be prepared under a CRM planning process. The CLUP should be integrated in the Coastal Zoning Plan.

LGUs should also include the coastal zone when preparing annual investment plans. In coastal municipalities, a large proportion of the population is dependent on the coastal resources and, thus, investment should ensure effective management of the resources therein.

The following framework presents the integration of the Municipal and Provincial CRM Plans into the National Medium-Term Program Development Plan.

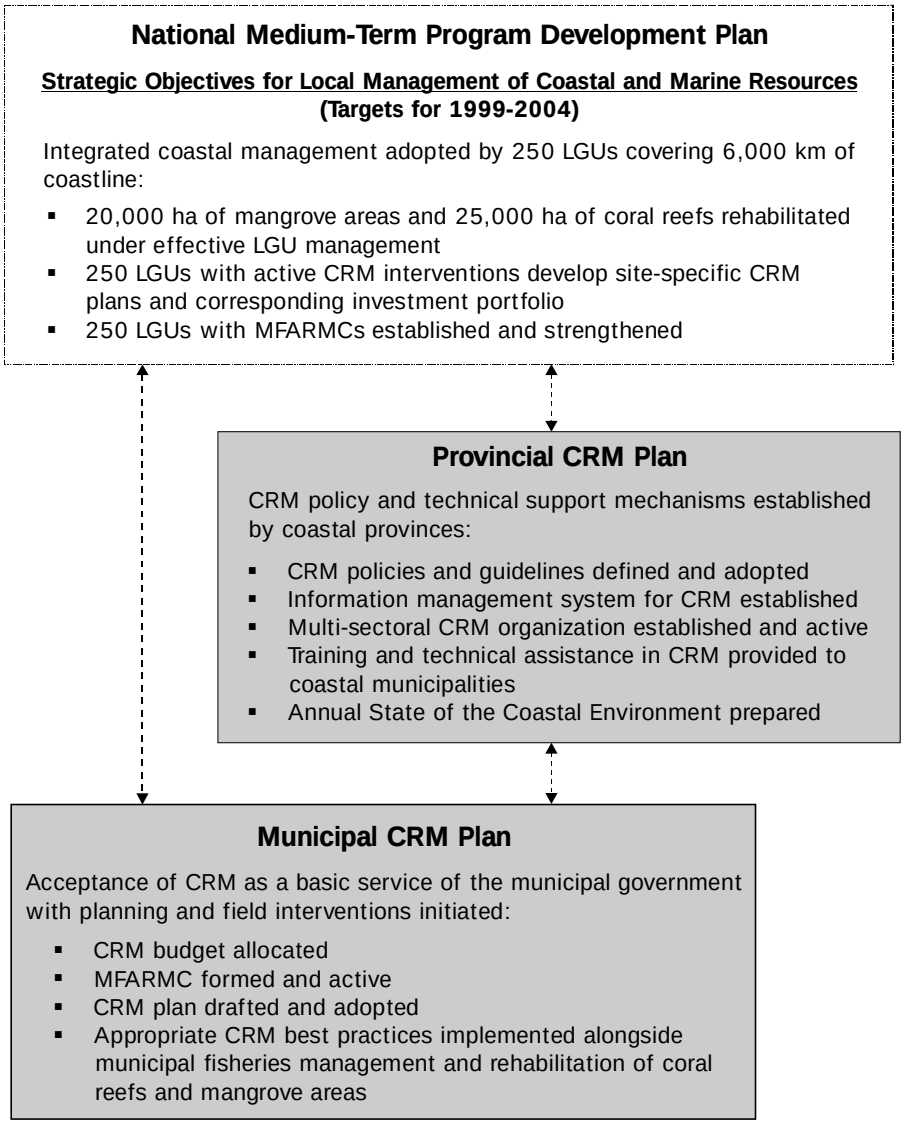


Figure 7.4. Framework of CRM Plan integration

Provincial Physical Framework Plan

The Provincial Physical Framework Plan (PPFP) is a document that translates the development policies, goals and objectives of the province into a land use plan. It indicates the manner in which land resources of the province shall be used during a 20-year period so that people can benefit from continuous land protection and utilization.

Currently being re-written, the PPFP incorporates a component on CRM based on national and regional objectives, as well as the commitments of the Provincial Government through the Bohol Environment Code of 1998.

SUMMARY

In order to facilitate good CRM, an information management system must be in place. The NRDB, which is based at the BEMO, should be considered as the "mother" of databases in the province, and all agencies are encouraged to use, validate and add information to the NRDB.

Annex 4.1. Draft Implementing Rules and Regulation (IRR) for the Coastal Resources Sector, as stipulated under the Bohol Environment Code of 1998.

Section 52. Delineation of Municipal Waters

52.1 The Provincial Government, in coordination with the Department of Environment and Natural Resources (DENR), Bureau of Fisheries and Aquatic Resources (BFAR) and concerned local government units (LGUs) shall facilitate the delineation of municipal waters using guidelines established by the National Mapping and Resource Information Authority (NAMRIA).

52.2 The Coastal Resource Management Framework is anchored on the following principles:

52.2a The Provincial Government recognizes that coastal municipalities and cities are the primary planning and management units for coastal resource management.

52.2b The Provincial Government adheres to the Philippine Fisheries Code of 1998 (R.A. 8550) which identifies coastal resource management as a strategy for achieving food security and sustainable livelihood from coastal resources.

52.2c The Provincial Government also affirms the provisions of Chapter I, Section 4 (58) of R.A. 8550 defining municipal waters as under the jurisdiction of municipalities or cities and should be reserved for the livelihood and benefit of the local fisherfolk and communities.

52.2d Pursuant to the Local Government Code of 1991 (RA 7160), the Provincial Government shall provide assistance to concerned municipalities and cities in implementing coastal resource management as a basic service.

52.2e The Provincial Government shall ensure effective interagency and inter-LGU collaboration for the implementation of programs and initiatives consistent with the provincial framework/plan on the rehabilitation, sustainable management and protection of Bohol's coastal and fishery resources.

52.3 The Provincial Coastal Resources Management Framework. - The Provincial CRM Framework shall serve as guide for municipalities and cities in implementing programs and projects on the conservation, rehabilitation, protection and sustainable management of coastal and fishery resources. It shall consist of the following minimum components:

52.3a Resource Rehabilitation and Conservation

52.3a.1 The Provincial Government shall provide assistance to municipalities and cities in developing

continued

Annex 4.1 continued

comprehensive and strategic multi-year municipality/city CRM plans that should be consistent with the CRM Framework of the Province. The latter should be consistent with the municipal and city development plans, comprehensive land-use plans and other plans that have been developed by the LGUs and adopted through ordinances.

52.3a.2 The Provincial Government, in coordination with concerned national government agencies (NGAs), shall ensure the sustainable management of the coastal and fishery resources through the implementation of CRM best practices such as, but not limited to, CRM plan adoption, fisheries and coastal management ordinance implementation, marine protected area establishment, and mangrove rehabilitation and protection.

52.3b Livelihood and Enterprise Development

The Provincial Government, in coordination with national government agencies (NGAs), nongovernment organizations (NGOs) and the private sector shall promote environment-friendly livelihood and enterprise development activities in coastal areas. It shall extend assistance to the municipalities and cities in, but not limited to, development and promotion of value-added products, fund sourcing, market linkaging/networking and formulation of appropriate guidelines.

52.3c Investment Promotion and Revenue Generation

The Provincial Government shall encourage the municipalities and cities to develop mechanisms for local revenue generation and allocate annual budget for CRM implementation. It shall also facilitate an investment promotion program from local, national and international fund sources to augment financial requirement for CRM implementation at the provincial, municipal or city level.

52.3d Legal, Institutional and Fiscal Arrangements

The Provincial Government shall formulate a provincial CRM Plan consistent with the Provincial CRM Framework. It shall encourage all coastal municipalities and cities to formally establish CRM Offices with staff and legislate necessary CRM and fisheries management-related ordinances that are consistent with existing national and local laws.

52.3e Research and Extension (R & E) and Information Management

52.3e.1 The Provincial Government shall implement research activities such as, but not limited to, Participatory Coastal Resource Assessment (PCRA), hydro-biological studies, coastal databanking, mapping/geographical information system (GIS), and monitoring and evaluation (M & E). It shall maintain an information management system, ensure access to research data and information for development planning and management, and provide municipalities and cities copies of reports of research, studies and related educational or scientific activities undertaken by the Provincial Government.

continued

Annex 4.1 continued

52.3e.2 The Provincial Government, in coordination with academic institutions, nongovernment organizations (NGOs), business establishments, private sector, media and other sectors, shall undertake community organizing, information, education and communication (IEC) activities and other extension strategies to support the CRM initiatives of municipalities and cities.

52.3e.3 The Provincial Government shall prepare an annual report on the status of the coastal and fishery resources of Bohol based on reports submitted by the municipalities and cities. It shall also encourage all agencies and institutions conducting R & E within Bohol to submit reports of their activities to the Provincial Government and concerned LGUs.

52.3f Shoreline Development

The Provincial Government, in coordination with concerned national government agencies (NGAs) and local government units, shall ensure the proper utilization and conservation of the shoreline provided that activities such as, but not limited to, land conversion and reversion, reclamation, coastal area land-use, pollution control and mitigation, port and harbor development, setbacks, settlements, erosion control, sand and gravel extraction, and fishpond lease agreements (FLAs) should be discouraged and allowed only in exceptional cases where no other alternative is available, provided that, existing national and local laws must be fully complied with at all times.

52.3g Coastal Law Enforcement

The Provincial Government, in coordination with concerned agencies and local government units, shall ensure effective coastal law enforcement. It shall continue to coordinate activities such as, but not limited to, delineation of municipal waters and operation and strengthening coastal law enforcers.

Section 53. Conservation of Biological Diversity and Preservation of Heritage Items

53.1 The Provincial Government, in coordination with the DENR and other national government agencies (NGAs), nongovernment organizations (NGOs), people's organizations (POs) and other concerned agencies, shall ensure that activities that negatively affect the present and future status of the biological diversity in the municipal coastal waters of Bohol shall not be conducted or initiated.

53.2 In coordination with concerned LGUs and agencies, the Provincial Government shall identify and recommend for declaration certain coastal areas as heritage sites based on, but not limited to, the following considerations: social, cultural or historical significance; biodiversity and ecological importance; and uniqueness and rarity. It shall also undertake measures to preserve these sites.

53.3 The Provincial Government shall establish and maintain an updated database and inventory of the declared heritage sites. It shall also conduct information, education and communication activities to encourage the people to participate in the preservation, protection and management of such sites.

continued

Annex 4.1 continued

Section 54. Community Participation and Integration of National Government Agencies (NGAs)

54.1 The Provincial Government shall encourage the municipalities, cities and concerned agencies or sectors to ensure active community participation in activities such as, but not limited to: conduct of resource and ecological profiling; project development and implementation; enforcement of coastal, fishery and environmental laws; protection and management of coastal habitats; and livelihood enterprise endeavors.

54.2 The Provincial Government shall ensure the participation of all sectors regardless of age, race, gender, culture, religion or other affiliations.

54.3 The Provincial Government shall provide assistance to the Provincial CRM Task Force created under Executive Order No. 117.

Section 55. Coastal Zoning and Management Guidelines

55.1 ***Zoning of Coastal Area.*** - The coastal area and municipal waters shall be divided into the following zones: protected zone, rehabilitation or conservation zone, sustainable use zone, and recreation and ecotourism zone. Trade and navigational zone may also be included.

55.1a ***Protection Zone.*** - In this zone, fishing is not allowed. Human activities and access to the area may also be restricted. Sanctuary establishment and mangrove management shall be undertaken whenever applicable.

55.1b ***Rehabilitation or Conservation Zone.*** - In this zone, human activities or access may be allowed but with limitations.

55.1c ***Sustainable Use Zone.*** - In this zone, most human activities are allowed but only those that are non-destructive and legal.

55.1d ***Recreation and Ecotourism Zone.*** - In this zone, areas for recreation, ecotourism and other related activities shall be identified.

55.1e ***Trade and Navigation Zone.*** - This zone shall be managed based on guidelines set by, and in consultation with, the Philippine Coast Guard (PCG), Philippine National Police (PNP) Maritime Group and other concerned agencies.

55.1f The municipalities and cities may formulate appropriate guidelines and designate areas for, but not limited to mariculture and other special uses.

55.2 In zoning the coastal area and municipal waters, the following shall be considered:

55.2a The coastal zone, which starts from the outermost limit of the municipal waters up to one kilometer landward from the coastline

55.2b Existing habitats in the area such as corals, mangroves, seagrasses, estuaries and rivers

55.2c Traditional area for fish corral, fry gathering, mariculture, navigation and other current uses

continued

Annex 4.1 continued

55.2d Potential use of the area such as, but not limited to, sanctuary and protected area establishment, mangrove management, sustainable mariculture, and coastal tourism

55.2e Simplicity, enforceability and manageability, i.e., the number of major management zones may be limited to 5 to 6

55.2f The ineffective or inappropriate use of the area shall be corrected.

55.3 ***Creation of a Coastal Zoning and Management Committee.*** - The Provincial Government shall assist the municipality or city and its FARMC in creating a multisectoral committee tasked to formulate a municipal/city CRM plan.

55.3 ***Public Consultation.*** - The Provincial Government shall encourage the Coastal Zoning and Management Committee of the municipality or city to conduct public consultations prior to the finalization and implementation of the Municipal/City Coastal Zoning and Management Plan.

55.4 ***Mapping and Demarkation of Coastal Zones.*** - The Provincial Government shall assist the municipalities and cities to conduct actual survey and demarkation of the proposed coastal zones.

55.5 ***Comprehensive and Strategic Five-Year CRM Plan***

55.6a The Provincial Government, through the Provincial Development Council, Provincial Land Use Board or any other appropriate entity, shall ensure that the Comprehensive and Strategic Five-Year CRM Plan of the municipality or city is consistent with the Provincial CRM Framework and any other development plans that are consistent with the latter. Through the same entities, it shall also ensure that other strategic plans, such as but not limited to Comprehensive Municipal Development Plan and Comprehensive Municipal Land Use Plan, are integrated and consistent with the Provincial CRM Framework/Plan and general direction.

55.6b The Provincial Government shall also encourage the municipality or city to include the Comprehensive and Strategic Five-Year CRM Plan in its Annual Investment Plan.

55.6c The Provincial Government shall assist the municipalities and cities in conducting participatory coastal resource assessment (PCRA).

55.6d The Comprehensive and Strategic Five-Year CRM Plan shall contain, at the minimum, the following:

- ***55.6d.1*** coastal environment profile
- ***55.6d.2*** management objectives
- ***55.6d.3*** programs, strategies and activities
- ***55.6d.4*** time frame of implementation
- ***55.6d.5*** budgetary allocation
- ***55.6d.6*** responsible agencies
- ***55.6d.7*** implementing structures
- ***55.6d.8*** monitoring and evaluation (M & E) system

continued

Annex 4.1 continued

55.7 ***Coastal Zone Management and Monitoring.*** - The Provincial Government shall encourage the Coastal Zoning and Management Committee to conduct periodic assessment of the status of the implementation of the plan.

SECTION 56. ENVIRONMENTAL IMPACT ASSESSMENT.

56.1 Environmentally critical projects (ECP) and those located in environmentally critical areas (ECA), as defined under Department Administrative Order (DAO) 96-37 and P.D. 1586, shall undergo the Environmental Impact Statement System.

56.2 The Provincial Government shall assist the Multipartite Monitoring Team, as defined under DAO 96 – 37 and P. D. 1586, to ensure that all conditions set in the Environmental Clearance Certificate (ECC) are complied with.

SECTION 57. PROVISION OF TENURIAL SECURITY AND MANAGEMENT RIGHTS

57.1 The Provincial Government, through the technical support of the appropriate national government agencies (NGAs), shall provide a province-wide uniform system of permitting, licensing, granting of rights and privileges and all other tenurial instruments governing access and use of natural resources. Along this line, it shall establish a database and information system to ensure monitoring and reporting to national government agencies (NGAs), local government units (LGUs) and other pertinent parties.

57.2 Any application for tenurial security and management rights shall be qualified based on, but not limited to, the following criteria:

57.2a Impeccable track record or no record of fishery environment law related violation

57.2b Management capability

57.3 The Coastal Resource Management Section (CRMS) of the BEMO shall maintain a registry of grantees of tenurial security and management right for determining priorities, limit or monitor their activities and/or other related purposes.

57.3a Actual registered residents of the municipality or city concerned who have customary management use rights, and traditional resource users, especially marginal and/or subsistence fisherfolk and/or their duly registered organization/ cooperative shall have priority to tenurial security and management rights within the area.

57.3b Where there are two or more people's organizations (POs)/cooperatives applying for the same area, both shall be equitably accommodated if possible; otherwise, Section 57.2 of this IRR (Implementing Rules and Regulations) applies.

57.3c Where there are individuals and people's organizations (POs) applying for the same area, the latter shall be given preference.

57.4 On claims relating to mangrove areas, the Community-Based Forest Management Program of the DENR or other tenurial programs shall be followed.

continued

Annex 4.1 continued

57.5 On recommendation of the FARMC and based on best available scientific information, tenurial rights may be limited, revoked or cancelled by the concerned LGU following an established administrative due process.

Section 59. Promotion of Conducive Policy and Complementary Provincial Government-wide Fishery Ordinance. - There is hereby created a Coastal Resources Policy Coordination Committee (CRPCC).

59.1 ***Composition.*** - The Committee shall be composed of the Governor as Chairman; Vice Governor as Co-Chairman; and Head of the BEMO, Chairpersons of the *Sangguniang Panlalawigan* Committees on Agriculture and Environment, and Subcommittee on Coastal Resources, and Provincial Agriculture Officer, as members. The regular members hereof may allow their representatives to attend meetings to continue the ongoing activities of the Committee.

59.2 ***Functions.*** - The Committee shall have the following functions:

59.2a Review and systematize the ordinances pertaining, but not limited to, coastal zoning and standardization of fishing boat-licensing system;

59.2b Identify legislative gaps;

59.2c Reconcile the conflicting provisions of existing ordinances;

59.2d Attain rational complementation of ordinances among municipalities and cities and between the provincial and municipal/city ordinances; and

59.2e Closely coordinate with the District Coastal Law Enforcement Council, as defined under Sec. 63.6 of this IRR, and the *Sanggunians* and stakeholders for this purpose.

59.2f Receive regular updates and copies of new national-level legislation such as, but not limited to, Executive Orders, Department Administrative Orders and Fishery Administrative Orders; and recommend, whenever necessary and within the powers of the Provincial Government, any legislative action for the province-wide implementation of the same.

59.2 The Committee shall be assisted by a secretariat composed of personnel from the BEMO Natural Resources Management Division. The Secretariat may also mobilize personnel from the Provincial Agriculture Office or other offices to augment its staff.

59.3 The Committee shall meet at least twice a year, or as often as necessary. It shall submit a draft Provincial Government-wide complementary fishery ordinance to the *Sangguniang Panlalawigan* for enactment within one year from the approval of these implementing rules.

Section 60. Public Beaches

60.1 The Provincial Government, in coordination with the DENR, shall encourage all coastal municipalities and cities to identify local areas having potential for development into public beaches and make an inventory of the same. All coastal municipalities and cities shall identify areas for development into public beaches and submit a list of the same to the DENR for verification and for proper survey/delineation and mapping.

continued

Annex 4.1 continued

60.2 The Provincial Government shall encourage the *Sangguniang Bayan* and *Sangguniang Panlungsod* to pass ordinances identifying and declaring certain areas in their respective municipalities and cities for public beach development.

60.3 The Provincial Government shall encourage the municipalities and cities to post conspicuous signs in every declared public beach for public information.

Section 61. Gathering, Extraction and/or Removal of Beach Sand and Corals

61.1 If expressly allowed by national law, administrative order or implementing guidelines:

61.1a Pebbles, sand and gravel, boulders, and other beach resources within the territorial jurisdiction of the Provincial Government may be gathered, extracted and/or removed in specific areas only through a permit issued by the Office of the Governor pursuant to Section 23 of this Code.

61.1b Permit to exploit the aforestated resources shall be issued only to qualified persons in accordance with Section 43, RA 7942 and Section 23 of this Code.

61.1c Under no circumstances may hard or soft, precious, semi-precious or ordinary corals be mined or removed from the sea.

61.1d Permit to exploit the said resources shall be exclusively issued to cover only those resources that do not make up any marine habitat identified by the LGU in consultation with the Mines and Geo-sciences Bureau (MGB).

61.1e The Monitoring and Evaluation Office established under Section 24 of this Code shall ensure compliance by permittees and/or licensees with pertinent mining laws, rules and regulations as well as provincial ordinances. In order to achieve this end, the Monitoring and Evaluation Office shall:

61.1e.1 coordinate with the concerned municipal and city mayors and *barangay* captains;

61.1e.2 conduct regular monitoring and ocular inspections in areas where exploitation is conducted;

61.1e.3 initiate appropriate actions, in coordination with the Provincial Attorney's Office, against persons who violate mining laws, rules and regulations and provincial ordinances;

61.1e.4 render monthly reports on the results of its monitoring and ocular inspection, duly certified by the concerned *barangay* captains, to the Office of the Governor through the BEMO; and

61.1e.5 assist the Provincial Government, municipal and city local government units, and *barangays* in strengthening their monitoring and evaluation capability.

continued

Annex 4.1 continued

Section 62. Coastal Resources Management Fund

62.1 The Provincial Government, through the *Sangguniang Panlungsod*, shall pass an ordinance establishing a separate budget item from the Internal Revenue Allotment (IRA) to be called a CRM Fund.

62.2 The coastal municipalities and cities shall avail of the CRM fund through an established counterparting scheme.

62.3 The coastal municipalities and cities shall avail of the CRM Fund either in the form of financial or technical assistance depending on certain criteria that will be set by the Provincial Government.

Section 63. Fishery and Aquatic Resources Management Councils (FARMCs). - The Provincial Government affirms the provisions of Chapter III, Article II, Sections 73, 74 and 77 in regard to the organization and functions of municipal, city and integrated FARMCs. Innovations, however, shall be adopted to organize a provincial federation of FARMCs.

63.1 ***Organization of a Provincial Federation of Fishery and Aquatic Resources Management Councils (FARMCs).*** - The provincial federation of FARMCs shall be formed by the Provincial Government in coordination with the municipalities and cities concerned through the Bohol Environment Management Office (BEMO) and with the assistance of the Bureau of Fisheries and Aquatic Resources (BFAR) and other concerned national government agencies (NGAs) and nongovernment organizations (NGOs) as provided for by R.A. 8550. Prior to organizing the federation, however, the Provincial Government through the BEMO shall ensure that a FARMC is already organized in every coastal municipality/city.

63.2 ***Functions of the Provincial Federation of Fisheries and Aquatic Resources Management Councils.*** - The provincial federation of FARMCs shall be an independent body and shall have the following functions:

63.2a assist in the preparation of the Provincial CRM Framework and Plan;

63.2b recommend to the *Sangguniang Panlalawigan* through its Sub-Committee on Coastal Resource Management the enactment of appropriate provincial ordinances;

63.2c coordinate with the *Sangguniang Panlalawigan* on matters related to planning and implementation of province-wide coastal resource management programs such as, but not limited to, integrated or district-wide law enforcement activities and harmonization of inter-LGU ordinances and policies;

63.2d coordinate with the BEMO in the conduct of monitoring and evaluation of the implementation of municipal/city FARMC action plan.

63.2e perform such other functions that may be assigned by the *Sangguniang Panlalawigan* such as, but not limited to, the other functions provided under Section 9, Letters f to l of the Fisheries Administrative Order No. 196, series of 2000.

continued

Annex 4.1 continued

63.3 Composition and Regulations of the Provincial Federation of FARMCs

63.3a The regular members of the federation shall be composed of the chairpersons of all Municipal/City/Integrated FARMCs of Bohol, without jeopardizing the provision of Section 10 of the Fisheries Administrative Order No. 196, series of 2000.

63.3b The provincial federation of FARMCs shall adopt rules and regulations governing the holding of meetings, qualification and admission of members, election of officers, and other proceedings in accordance with the provisions of R.A. 8550.

63.4 Coastal Law Enforcement. - To ensure effective implementation of law enforcement in the Provincial Government, and in aid of legislation and/or issuance of Executive Orders, the following is hereby adopted:

63.4a Creation of District Coastal Law Enforcement Management Council for each Congressional District, with the following functions:

63.4a.1 Operationalize and manage the coastal law enforcement activities within the district;

63.4a.2 Conduct research, analyze and recommend solutions to problems on law enforcement;

63.4a.3 Prepare law enforcement monthly/quarterly action plan; and

63.4a.4 Monitor and evaluate the progress of law enforcement activities of each district.

63.4b The District Coastal Law Enforcement Management Council shall be composed of representatives of the following:

63.4b.1 Mayors
63.4b.2 Vice Mayors
63.4b.3 *Sangguniang Panlalawigan*
63.4b.4 FARMCs
63.4b.5 Fish Wardens
63.4b.6 Provincial Prosecutor
63.4b.7 Provincial office of the Department of Interior and Local Government (DILG)
63.4b.8 Philippine National Police Provincial Command
63.4b.9 Philippine National Police Maritime Group
63.4b.10 Philippine Coast Guard
63.4b.11 Business sector
63.4b.12 Civil society

63.4c The Council of Advisers for the District Coastal Law Enforcement Councils shall be composed of the following or their representatives:

63.4c.1 Provincial Governor
63.4c.2 Provincial Vice Governor

continued

Annex 4.1 continued

63.4c.3 Chairman of the Committee on Agriculture and Fisheries of the *Sangguniang Panlalawigan*

63.4c.4 Duly elected representative of the District in the House of Representatives

63.4c.5 Provincial chief of BFAR

63.4c.6 Provincial chief of DENR

63.4c.7 Provincial chief of DILG

63.4c.8 Head of BEMO

63.4c.9 Executive director of the Environmental Legal Assistance Center

63.4c.10 One representative of the Judiciary

63.4d The District Coastal Law Enforcement Management Council shall adopt rules and regulations necessary to carry out effectively the law enforcement functions within each district.

Section 66. Prohibited and Punishable Acts

66.1 The Provincial Government shall encourage municipalities and cities, through their respective *Sangguniang Bayan* or *Sangguniang Panlungsod*, to enact ordinances defining the penalties and/or sanctions for acts in violation of existing fishery laws, such as, but not limited to, the following:

66.1a Prohibited gathering, taking, removing, possessing, purchasing, selling or exporting, in any state or form, the following:

66.1a.1 ordinary, semi-precious and precious corals identified under Fishery Administrative Orders (FAOs)

66.1a.2 rare, threatened or endangered species identified under Fishery Administrative Orders (FAOs)

66.1a.3 manta rays (*Manta birostris*), locally known as *sanga*

66.1a.4 whale shark (*Rhincodun typus*), locally known as *balilan*

66.1a.5 full-grown mother *bangus* (milkfish, *Chanos chanos*) or *awa*

66.1b Regulated gathering, taking, removing, possessing or selling of seahorses (*Hippocampus* sp.) and starfishes, locally known as *kurus-kurus,* in any state or form.

66.1c Regulated gathering, taking, removing, possessing or selling of sexually mature, larvae, roe (*bihud* in the local dialect), fry, young or any vulnerable stages of species identified under Fishery Administrative Orders (FAOs)

66.1d Gathering, taking, removing, possessing, purchasing, selling or exporting, in limited quantity and in any state or form, the species mentioned in Sec. 66.1a, Sec. 66.1b and Sec. 66.1c of this IRR for scientific or research purposes only after appropriate permits shall have been acquired from concerned agencies and in coordination with concerned municipalities or cities.

66.1e Disposing, dumping or throwing directly or indirectly to the aquatic environment any substance or fuel that harms living and non-living aquatic resources, poses a potential or real hazard to human health, and hinders aquatic activities such as fishing and navigation within the jurisdiction of the Provincial Government.

continued

Annex 4.1 continued

66.2 Sec. 56 of this IRR shall govern the construction of tourist facilities directly on the water's edge and within coastal zones as defined under Sec. 55.2a of this IRR.

66.3 The conversion of wetlands and extraction of freshwater in coastal areas shall be subject to pertinent Fishery Administrative Orders (FAOs) and other applicable national laws.

66.4 For purposes of this section, the following terms are hereby defined:

66.4a *Liba-liba/Hulbot-hulbot* - refers to a fishing gear consisting of a conical net with a pair of wings, the ends of which are connected to ropes with buri leaf strips, plastic strips or any similar materials to serve as scaring/herding device with hauling ropes passing through a metallic ring attached to a stone weight (*lingote*) when hauled into a fishing boat.

66.4b *Baby trawl or Palakaya* - a fishing gear operated by a fishing boat of less than three (3) gross tons. It is similar to a beach seine consisting of a pocket net or cod end, wing net, rope and buoy. A flapper is attached to the pocket net to prevent the escape of entrapped fish. It is operated by being towed, trailed and trawled in the seabed to capture fish or other aquatic products.

66.4c *Beach seine* - locally known as *baling*, it is a type of drag net made of polyethylene, kuralon or nylon setting with a bag or bunt flanked at both sides by two (2) long wings. The head rope, which is provided with floats, is attached to the upper line of the net. The footrope is provided with stones, clay or lead sinkers. Bridle lines are extended to the wing ends to which wooden brails are attached. A pair of long towing ropes, usually polyethylene, is tied to the brails and pulled by fishermen from the shoreline.

66.4d *Fishing with the use of explosives* - refers to the use of dynamite and other kinds of explosive or chemical compound that contain combustible elements or ingredients that, upon ignition or friction, concussion, percussion or detonation of all parts of the compound, can kill, stupefy, disable or render unconscious any fish or fishery/aquatic product. It also refers to the use of any device or substances that cause explosion capable of producing the said harmful effects on fish or other fishery/aquatic products.

66.4e *Fishing with the use of obnoxious/poisonous substances* - refers to the use of any substances, plant extracts or juice thereof, whether raw or in processed form, harmful or harmless to human beings but can kill, stupefy, disable or render unconscious any fish or other fishery/aquatic products.

66.4f *Super light* - also called magic light, this is a type of light using halogen or metal bolide bulb that may be set above the sea surface or submerged in the water. It consists of a ballast, regulator, electric cable and socket. The source of energy comes from a generator, battery or dynamo coupled with the main engine.

66.4g *Air compressor* - a motor-driven device that supplies oil-filtered air to a diver through a long hose the tip of which the latter directly inserts into his mouth from time to time. Although not illegal per se, as it is used in spearfishing or collecting deep-sea species of shells, it becomes illegal when used as accessory to dynamite

continued

Annex 4.1 continued

	fishing particularly when collecting the dead fish from the seabed. The device is also used when catching live fish using chemicals to temporarily render unconscious the fish for easy collection. The use of air compressors in high pressure depths can cause caisson disease or the bends, a serious and sometimes fatal condition characterized by cramping pain and paralysis as bubbles of gas form in the blood due to very rapid return to normal atmospheric pressure after a period in a compressed atmosphere.

Annex 5.1. National and Provincial Medium-Term Program Development Plans (1999-2004)

A. The National Medium-Term Program Development Plan of the Philippines
Strategic Objectives for Local Management of Coastal and Marine Resources
(1999-2004)

1. Integrated coastal management (ICM) adopted by 250 LGUs, covering 6,000 km of coastline for the improved management of municipal waters

   - 2,000 hectares of mangrove and 25,000 hectares of coral reef rehabilitated under effective LGU management
   - 250 LGUs with active CRM interventions develop site-specific CRM plans and corresponding investment portfolio
   - 250 LGUs with MFARMC established and strengthened

B. The Provincial Medium-Term Program Development Plan (draft)
Strategic Objectives for Local Management of Coastal and Marine Resources
(1999-2004)

1. Beginning level integrated coastal management adopted by 25 LGUs, covering 500 km of coastline for the improved management of municipal waters

The Province of Bohol shall target over 80% (25) of its coastal municipalities to adopt Coastal Resource Management (CRM)/Integrated Coastal Management (ICM) Frameworks and initiate and begin implementation of their CRM plans with corresponding investment portfolio. To be able to validate these results, these towns will have to undergo a participatory monitoring and evaluation process and apply for regional certification as explained in Section 5 of this framework.

2. Intermediate level integrated coastal management adopted by 10 LGUs, covering some 150 km of coastline for strong improvement of management within municipal waters

The Province of Bohol shall target technical assistance to 10 municipalities (also included in above-mentioned targets), covering 150 km of coastline to ensure that they will be practicing ICM at an intermediate certification level as laid down in Section 5 of this framework.

1. Municipal management organizations strengthened as the multi-sectoral groups and main implementing and monitoring arms of ICM at the town levels

The Province of Bohol shall also organize and strengthen MFARMCs until at least 80% are active as defined in the results in the framework (25 out of 30 MFARMCs).

continued

Annex 5.1continued

2. Management of the precious mangrove habitats of Bohol

The Province of Bohol shall also facilitate additional 1,000 hectares of mangrove to be under effective management through the issuance of CBFMA.

3. Management of the precious coral reef habitats of Bohol

The Province of Bohol shall also ensure that at least 1,000 hectares of coral reef will be under effective management (marine sanctuaries, coastal zoning, etc. by the year 2005).

1. Management of precious seagrass habitats of Bohol

Encourage the establishment of seagrass sanctuaries, enforce laws on illegal fishing and deter land reclamation and construction in this fragile ecosystem.

1. Collaboration and coordination of resources

The Provincial Government will develop MOAs and/or collaborative agreements with at least 10 external (outside Bohol) and internal (within Bohol) agencies, which will include counterparts from the municipal governments and strategically planned ICM projects in and around the province. These programs and projects will use the provincial information system to prioritize the LGUs and natural resources, which are most in need of ICM, as well as ensuring a province-wide implementation and assistance program.

2. Collaborative monitoring and evaluation and planning

The Provincial Government, in coordination with NGAs, NGOs and coastal MLGUs, will ensure that they will all begin to use common frameworks and collaborate fully in the implementation of ICM in the province through the CRM framework laid down in this plan. On a yearly basis, all NGAs, NGOs and coastal MLGUs (through CRM plans) shall be encouraged to jointly monitor and plan their CRM initiatives. This should lead to more sharing of resources, collaboration and coordination with the goal of better ICM implementation at the *barangay*, municipal and provincial levels.

References

Alexander, R.D. 2001. Natural Resources Database (Version 1.15 Beta) 2001. Bohol Environment Management Office, Bohol and Voluntary Service Overseas, Manila, Philippines.

AusAid (Australian Agency for International Development). 1995. Technical Assistance for Physical Planning. Manila, Philippines.

BEMO (Bohol Environment Management Office) and CRMP (Coastal Resource Management Project). 1998. Proceedings: Workshop on Coastal Resource Management. Cebu City, Philippines.

BEMO (Bohol Environment Management Office). 1999. Proceedings: Meeting of the Technical Working Group for Fishpond Reversion. Province of Bohol, Philippines.

BFAR. 1991. Republic Act 8550 (The Philippine Fisheries Code of 1991). Manila, Philippines.

Bohnsack, J.A. 1990. The Potential of Marine Fishery Reserves for Reef Fish Management in the U.S. Sounthern Atlantic. NOAA Technical Memorandum NMFS-SEFC-261, Miami. 40 p.

Clark, J.R. 1995. Coastal Zone Management Handbook. Lewis Publishers, USA.

Courtney, C. and K.P. Traub. 1999. Local Government Management of Coastal Resources: Defining the Outer Limits of Municipal Waters in the Philippines. Tambuli (Volume 5). Pp. 14-18.

CENRO Tagbilaran City. 2000. List of Protected Areas. PAWS Unit, CENRO Tagbilaran City, Bohol.

CENRO Talibon. 2000. List of Protected Areas. PAWS Unit, CENRO Talibon, Bohol.

CRMP. 1998. Mangrove Component Strategy. Mangrove Management Component, Coastal Resource Management Project, Cebu City, Philippines.

CRMP. 2000. Municipal Coastal Database 2000. Coastal Resource Management Project, Cebu City and Provincial Government, Bohol, Philippines.

DENR. 1992. NIPAS Act of 1992: Implementing Rules and Regulations (DAO No. 25, Series of 1992). Manila, Philippines.

DENR-CENRO Tagbilaran City. 1998. Initial Protected Area Plan of Clarin Group of Islands Strict Nature Reserve. Tagbilaran City, Bohol, Philippines.

DENR-CENRO Tagbilaran City. 1998. Initial Protected Area Plan of Tubigon Group of Islands Protected Landscape/Seascape. Tagbilaran City, Bohol, Philippines.

DENR-Region 7. June 2000. Lapinig Island Mangrove Rehabilitation Sub-Project (Region 7) Updated Appraisal Report. Nipponkoei Co., Ltd. in Association with Orient Integrated Development Consultants, Inc. and Philkoei International, Inc.

DENR (Department of Environment and Natural Resources), DA-BFAR (Bureau of Fisheries and Aquatic Resources of the Department of Agriculture), and DILG (Department of Interior and Local Government). 2001. Philippine Coastal Management Guidebook Nos. 1-8. Coastal Resource Management Project of the Department of Environment and Natural Resources, Cebu City, Philippines.

Dixon, J.A. 1989. Valuation of Mangroves. Tropical Coastal Area Management. 4(3): 1-6.

DOT (Department of Tourism). 1997. Bohol Eco-tourism Development Framework. Office of Product Research and Development. Bohol, Philippines.

Green, S.J. 1997. Danajon Bank Resource Inventory Sponsored and Conducted for LGU-Talibon.

Green, S.J., R.P. Monreal, A.T. White and T.G. Bayer. 2000. Coastal Environment Profile of Northwestern Bohol, Philippines. Coastal Resource Management Project, Cebu City, Philippines, 113 p.

IMA (International Marinelife Alliance - Philippines). 1996. Community Profiles and Site Assessment Surveys of Olango Island, Cebu and Selected Barangays in Bohol. Pasig City, Philippines.

IMA (International Marinelife Alliance). 2000. International Coastal Clean-up Data Card Summary - Region 7.

Lanuza, R.L. 1992. Soil Survey of Bansaan Island. In R.L. Baggayan (ed.) Ecosystem Research Digest 2(2): 46-53.

Lavina, G.M. and E.M. Rio. 1976. An Assessment Study on the Fishes Along the Southern Coasts of Negros Oriental and Bohol Provinces. Silliman Journal 23: 304-318.

McAllister, D.E. and Ansula, A. 1993. Save Our Coral Reefs, A Coral Reef Care Manual. Ocean Voice International. ISBN 0-9695176-1-0.

Melana, E.E. and H.I. Gonzales. Field Guide to the Identification of Some Mangrove Plant Species in the Philippines. Ecosystems Research and Development Service, DENR-Region 7, Cebu City, Philippines.

MTDP. 1997. Medium-Term Development Plan (1998-2003). Bohol, Philippines.

NEDA (National Economic Development Authority). 1997. Bohol Second District Development Master Plan (1997-2000). NEDA-Region 7, Philippines.

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

NSO (National Statistics Office). 2000. Population Census for the Province of Bohol. NSO, Philippines.

Office of the Governor. 1998. Governor's Report. 1997-1998. Bohol, Philippines.

PAWD. 2000. Map of Initial Protected Areas of Bohol. Protected Area and Wildlife Service, DENR-Region 7, Cebu City, Philippines.

Pichon, M. 1977. Physiography, Morphology and Ecology of the Double Barrier Reef of Northern Bohol. *In* Proceedings, Third International Coral Reef Symposium. Rosentiel School of Marine and Atmospheric Science, University of Miami, Miami, Florida, U.S.A. Pp. 261-267.

Pichon, M. 1977. Recent Studies on the Reef Coral of the Philippine Islands and Their Zoogeography. In Proceedings: Third International Coral Reef Symposium. Rosentiel School of Marine and Atmospheric Science, University of Miami, Miami, Florida, 33149, U.S.A. pp. 149-154.

Pollnac, R.B. and B. Crawford. 2000. Discovering Factors that Influence the Success of Community-Based Marine Protected Areas in the Visayas, Philippines. PCAMRD and Coastal Resources Center, University of Rhode Island.

Pollnac, R.B. and J.J. Poggie. 1999. Fish Aggregating Devices in Developing Countries: Problems and Perspectives. International Center for Marine Resource Development (ICMRD) and the Anthropology Program at the University of Rhode Island with Support Funds from the USAID. 160 p.

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

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

PPDO (Provincial Planning and Development Office). 1997. Medium-Term Development Plan (1998-2003). Bohol, Philippines.

PPDO (Provincial Planning and Development Office). 1998. Proceedings: Municipal Development Council Participatory Planning and Budgeting Workshop. Loon, Bohol, Philippines.

SUML (Silliman University Marine Laboratory). 1997. Profile of the Bohol Learning Area. Dumaguete City, Philippines.

SUML (Silliman University Marine Laboratory). 1999. Survey of Coastal Areas and Residents as Part of the Bohol Marine Triangle Project. Duamguete City, Philippines.

Uychiaoco, A.J., H.O. Arceo, S.J. Green and F.I. Castrence, Jr. 1997. Monitoring the Effects of Marine Sanctuaries in Lomboy, Calape and Cangmating, Sibulan.

Valle, I.S., M.C.B. Cristobal, A.T. White and E.T. Deguit. 2000. Coastal Environmental Profile of the Malalag Bay Area, Davao del Sur, Philippines. Coastal Resource Management Project, Cebu City Philippines. 127 p.

Walters, J.S., J. Managos, S. Siar and A.T. White. 1998. Participatory Coastal Resource Assessment: A Handbook for Community Workers and Coastal Resource Managers. Coastal Resource Management Project and Silliman University, Cebu City, Philippines. 113 p.

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

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Higugma-a ang kadagatan

- *Hununga ang ilegal ug makadaut nga panagat*
- *Panalipdi ug dumala-a sa malungtarong pamaagi ang kagasangan, kabakhawan, kalusayan ug uban pang mga puluy-anan sa mga isda*
- *Kunhuri ang pagpanagat aron mo-tunhay ang kapanguhaan niini*
- *Ipatuman ang pagdili sa pagsulod sa mga komersyal nga panagat sa kadagatan sa lungsod* (municipal waters)

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