MANUAL ON COMMUNITY-BASED MANGROVE REHABILITATION

MANGROVE MANUAL SERIES NO. 1

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ZSL Mission

To achieve and promote the worldwide conservation of animals and their habitats

Community-based mangrove restoration is an increasingly popular conservation intervention with enormous potential benefits to both people and biodiversity. However, succeeding at restoring a mangrove forest can be extremely challenging. This manual, which represents the culmination of many years research and field experience, provides practical recommendations on how to greatly increase the probability of success of a mangrove restoration project. It is written in an accessible style that will be useful to all practitioners. This could not have come at a more important time with 20% of mangrove habitat lost since the 1980s and threatening processes rapidly increasing in coastal habitat. With the information in this impressive manual it is now time to rapidly scale up mangrove restoration initiatives in countries across the globe.

When visiting the Community-based Mangrove Rehabilitation Project of the Zoological Society of London I was fortunate enough to join one of the community groups in the planting process. It was educational, fun and inspirational to work as a team restoring nature. I was told by the team that the destruction of mangroves had resulted in the loss of fish nurseries and therefore a major decline in fish, which is an essential source of food for their families. Restoring the mangroves brings back the nurseries and therefore the fisheries as well as a broad range of other species. They also explained that mangrove forests save lives and livelihoods as they provide coastal protection during major storms. They greatly valued mangrove forests and were committed to restoring and protecting them into the future. This manual will empower similar communities around the world to successfully restore one of their most valuable assets.

Professor Jonathan Baillie
Director of Conservation Programmes

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LIVING CONSERVATION

Photo David Curnick/ZSL

Contents


SUUR
0
100
100
100
100
50
50;40;40
100;100
100;100
100
100
100
100
50
50;40;40
1
YK
CM
100
100
100
50
50;40;40
50
50
100
100
100
100
50
50;40;40
75
75;60;60
100

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Community groups

Barangay Pedada Fisherfolk Association
Bugtongbato Fisherfolk Association
Buntod Katibyugan ka mga Mangingisda kag Kababaenhan
Katilingban sang Magagmay nga Mangingisda sa Dolores
Naisud Mangrove and Aquatic Organization
New Balaring Mangrove Association

Government bodies

Ajuy, Iloilo Local Government Unit
British Foreign and Commonwealth Office
Bureau of Fisheries and Aquatic Resources
Department Environment and Natural Resources
Department of Labour and Employment
Department of Tourism
Guimaras Environment and Natural Resources Office
Ibajay, Aklan Local Government Unit
Iloilo City Local Government Unit
Iloilo Provincial Local Government Unit
Ivisan, Capiz Local Government Unit
Leganes, Iloilo Local Government Unit
National Commission on Indigenous Peoples
Nueva Valencia, Guimaras Local Government Unit
Office of the Provincial Agriculturist – Aklan
Office of the Provincial Agriculturist – Capiz
Office of the Provincial Agriculturist – Iloilo
Panay, Capiz Local Government Unit
Philippine Coast Guard
Philippine Embassy – London
Philippine National Police

NGOs

Capiz Medical Society
Haribon Foundation
Iloilo Code of Non-Governmental Organisations
Iloilo Fish Producers Association

Philbikers
Philippine Association of Chemical Engineers
Philippine Business for Social Progress
Project Seahorse Foundation for Marine Conservation
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Nabitasan National High School
Naisud National High School
Northern Iloilo Polytechnic State College – Ajuy Campus
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Pawa National High School
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List of Tables, Figures, Boxes and Appendices

Tables

Figures

Boxes

Appendices

Acronyms and Abbreviations

ADB	Asian Development Bank
ASU	Aklan State University
AWP	Annual Work Plan
BIDEF	Bohol Integrated Development Foundation
BDTC	Barangay Dolores Tourism Council
BFA	Bugtongbato Fisherfolk Association
BFAR	Bureau of Fisheries and Aquatic Resources
BFARMC	Barangay Fisheries and Aquatic Resources Management Council
BLGU	Barangay Local Government Unit
BPFA	Barangay Pedada Fisherfolk Association
CAO	City Agriculture Office/Officer
CBFMA	Community-Based Forest Management Agreement
CBL	Constitution and By-Laws
CENRO	City Environment and Natural Resources Office/Officer
CLET	Coastal Law Enforcement Team
CMRP	Community-based Mangrove Rehabilitation Project in the Philippines
CNO	Certificate of Non-Overlap
CRM	Coastal Resource Management
CRMF	Community Resources Management Framework
DA	Department of Agriculture
DAO	Department Administrative Order
DBP	Development Bank of the Philippines
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DOLE	Department of Labor and Employment
DOT	Department of Tourism
DSWD	Department of Social Welfare and Development
ECC	Environmental Compliance Certificate
ECP	Environmentally Critical Project
EENP	Environmental Education Network of the Philippines
EIS	Environmental Impact Statement
ELE	Environmental Law Enforcement
EMB	Environment Management Bureau
FAO	Fisheries Administrative Order
FCU	Filamer Christian University
FLA	Fishpond Lease Agreement
FLMA	Forest Land Management Agreement
FMS	Forest Management Section
FRMD	Fisheries Resources Management Division
IEC	Information, Education and Communication
IGP	Income Generating Project
IRR	Implementing Rules and Regulations
JAO	Joint Administrative Order
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency

KACUSA	Katunggan sa Culajao Salbaron Association
KAMAMADO	Katilingban sang Magagmay nga Mangingisda sa Dolores
KASAMA	Kalibo Save the Mangrove Association
KII	Katunggan it Ibajay
KRA	Key Result Area
LCE	Local Chief Executive
LGA	Line Government Agency
LGC	Local Government Code
LGU	Local Government Unit
LMS	Land Management Section
LRA	Local Research Assistant
MAO	Municipal Agriculture Office/Officer
MCI	Mangrove Convergence Initiative
MCS	Mangrove Community Structure
MENRO	Municipal Environment and Natural Resources Office/ Officer
MEO	Municipal Engineering Office/Officer
MFARMC	Municipal Fisheries and Aquatic Resources Management Council
MGB	Magandang Gabi Bayan
MLGU	Municipal Local Government Unit
MNR	Ministry of Natural Resources
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPDO	Municipal Planning and Development Office/Officer
MRF	Material Recovery Facility
NAMAO	Naisud Mangrove and Aquatic Organization
NCIP	National Commission on Indigenous People
NewBAMA	New Balaring Mangrove Association
NFA	National Food Authority
NGO	Non-Government Organization
NIPAS	National Integrated Protected Areas System
NIPSC	Northern Iloilo Polytechnic State College
OIC	Officer-In-Charge
O&M	Operation and Management
PAMB	Protected Area Management Board
PBSP	Philippine Business for Social Progress
PD	Presidential Decree
PENRO	Provincial Environment and Natural Resources Office/ Officer
PICHE	Philippine Association of Chemical Engineers
PLEFMC	Punta Lusaran Ermita Fisherfolk Multi-purpose Cooperative
PO	People's Organization
PSFMC	Project Seahorse Foundation for Marine Conservation
PTFCF	Philippine Tropical Forest Conservation Foundation
RA	Republic Act
RD	Regional Director
SAVIMA	San Vicente Mangrove Association

SEAFDEC AQD	Southeast Asian Fisheries Development Center – Aquaculture Department
SEC	Securities and Exchange Commission
SB	Sangguniang Bayan
SUMACORE	Sustainable Management of Coastal Resources
TINMAR	Taklong Island National Marine Reserve
TK	Tanggol Kalikasan
TWG	Technical Working Group
UNDP	United Nations Development Program
UNDP-GEF-SGP	United Nations Development Program – Global EnvironmentFacility – Small Grants Program
UP MSI	University of the Philippines – Marine Science Institute
UPV	University of the Philippines in the Visayas
UP Aquasoc	University of the Philippines – Aquaculture Society
WIMAPHIL	Women in Maritime Philippines
WVCST	West Visayas College of Science and Technology

Executive Summary

The Community-based Mangrove Rehabilitation Project of the Zoological Society of London ran from 2008 to 2012 with the aim of increasing coastal protection, food resources and livelihood income of coastal communities in Panay and Guimaras by rehabilitating abandoned government-leased fishponds to mangroves, re-establishing legally mandated coastal greenbelts, and securing tenure on coastal land through Community-based Forest Management Agreements (CBFMAs). During the course of the CMRP, close to 100,000 mangroves were planted, with the rehabilitation of 107.8 hectares (56.3 ha fishponds and 51.5 ha greenbelt) of mangrove forest underway. More than 4,000 people have been actively engaged in the planting, with many receiving intensive training. Six peoples' organizations were established or strengthened, with one of these being awarded a CBFMA and five more onstream. These four years have provided many important lessons in mangrove rehabilitation, for both nursery and growout phases.

The following strategies should be considered the **20 Golden Rules** of mangrove rehabilitation:

1. **Assisted regeneration** of mangroves through active planting of seedlings and wildings is required in areas of extensive historic deforestation with highly dependent communities vulnerable to typhoons with low food security.
2. **Target rehabilitation areas** should be in an intertidal location exposed during neap low tide (instead of spring low tide, the current practice), and reached by seawater during neap high tide. The middle and upper intertidal zones are therefore the most favorable.
3. **Small, backyard nurseries** enable communities to produce sufficient numbers of healthy mangrove seedlings such as *Avicennia marina*, for planting.
4. **Wildings** make an excellent source of plants for rehabilitation, but should be harvested sustainably so as not to affect natural recruitment.
5. **Seafront planting** is more successful using adapted seafront species, particularly *Sonneratia alba*, and by using taller, nursery reared saplings of at least 0.5-1 m height.
6. ***Rhizophora* (bakhaw) propagules** generally do not grow well in seafront zones and therefore cannot be relied upon for mangrove rehabilitation in greenbelts.
7. **Fixed quadrat monitoring** is the simplest, most efficient and robust form of monitoring for large scale rehabilitation initiatives.
8. **Active fishponds** should maintain or achieve a ratio of 4 ha mangroves: 1 ha pond area for ecological sustainability.
9. **Inner abandoned fishponds** more easily revert to mangrove forests than exposed seafronts, but they have more complex tenurial issues.
10. **Protective structures**, including breakwaters and barriers, may be required in highly eroded areas with strong wave action to protect young mangrove plants.

11. **Fences and signage** can help protect young mangrove plants from boat traffic, fishing and gleaning activities, and domestic and wild animals.
12. **Local government and community support** is required from the outset for successful implementation of community-based mangrove rehabilitation projects.
13. **Partnerships** with local government, schools and technical support and specialist groups enhance the scale and scope of mangrove rehabilitation.
14. **Engagement, mobilization and training** empower local communities in mangrove rehabilitation projects.
15. **'No Pay' Planting** should be promoted, where communities appreciate and recognize the importance of their mangrove resources to their livelihoods and their contribution of labor is the basis for ownership.
16. **Counterpart funding** should be mobilized from communities and partner organizations, to maximize resources and underpin the collaborative approach to rehabilitation projects.
17. **Tenurial instruments**, such as the CBFMA, can be used to sustain community initiatives in the long term.
18. **Livelihoods** should only be established if they are economically, ecologically and culturally sustainable.
19. **Restoration of protective and productive greenbelts** should be seen a means of securing better livelihoods for coastal communities through increased resilience against natural disasters and higher fisheries productivity.
20. **Mangrove ecoparks** protect mangroves, provide a means of income and pride to local communities, and are a powerful educational and awareness raising tool.

Introduction

Mangroves are intertidal shrubs and trees found in the tropics and subtropics. They grow at or above mean sea level or MSL (Fig. 1) which is tidally inundated not more than 30% of the time (Kjerfve, 1990). That is, the middle to upper intertidal zone, and not the lower levels with mudflats and sometimes seagrass beds. This means that the currently popular practice of planting more in the latter habitats and the lower intertidal zone is ecologically misguided.

TABLE 1. Mangrove species and families in the Philippines

Family	Species
Acanthaceae	1. *Acanthus ebracteatus* 2. *A. ilicifolius* 3. *A. volubilis*
Avicenniaceae	4. *Avicennia alba* 5. *A. officinalis* 6. *A. marina* 7. *A. rumphiana*
Bombacaceae	8. *Camptostemon philippinensis*
Combretaceae	9. *Lumnitzera littorea* 10. *L. racemosa* 11. *L. rosea*[a]
Euphorbiaceae	12. *Excoecaria agallocha*
Lythraceae	13. *Pemphis acidula*
Meliaceae	14. *Xylocarpus granatum* 15. *X. moluccensis*
Myrsinaceae	16. *Aegiceras corniculatum* 17. *A. floridum*
Myrtaceae	18. *Osbornia octodonta*
Palmae	19. *Nypa fruticans*
Rhizophoraceae	20. *Bruguiera cylindrica* 21. *B. gymnorrhiza* 22. *B. parviflora* 23. *B. sexangula* 24. *Ceriops decandra* 25. *C. tagal* 26. *Kandelia obovata* 27. *Rhizophora apiculata* 28. *R. lamarckii*[a] 29. *R. mucronata* 30. *R. stylosa*
Rubiaceae	31. *Scyphiphora hydrophyllacea*
Sonneratiaceae	32. *Sonneratia alba* 33. *S. caseolaris* 34. *S. gulngai*[a] 35. *S. ovata*

Sources: Brown & Fischer, 1920; Arroyo, 1979; Fernando & Pancho, 1980; Tomlinson, 1986; Spalding et al., 1997; Yao, 1999
[a] Hybrids

A. MANGROVE ZONATION AND SPECIES SELECTION

Globally, there are some 50-60 species of mangroves belonging to 16 families, more than 50 of them in the Indo-Pacific (Polidoro et al, 2010; Spalding et al, 2010) and ~35 species in the Philippines alone (Table 1; Primavera et al, 2004). Mangrove species distribution is influenced by tidal elevation and flooding regime, salinity pattern, substrate and other factors. Species may be distributed both vertically according to low, mid, and high tidal level, and horizontally from downstream, intermediate and upstream (Fig. 2). Low elevation species are *Avicennia marina, A. alba* and *Sonneratia alba* coastally and *Rhizophora mucronata, Sonneratia caseolaris, Xylocarpus granatum* and *Nypa fruticans* in intermediate to upstream brackishwater areas. High elevation species are *Bruguiera gymnorrhiza* and *Lumnitzera racemosa* in

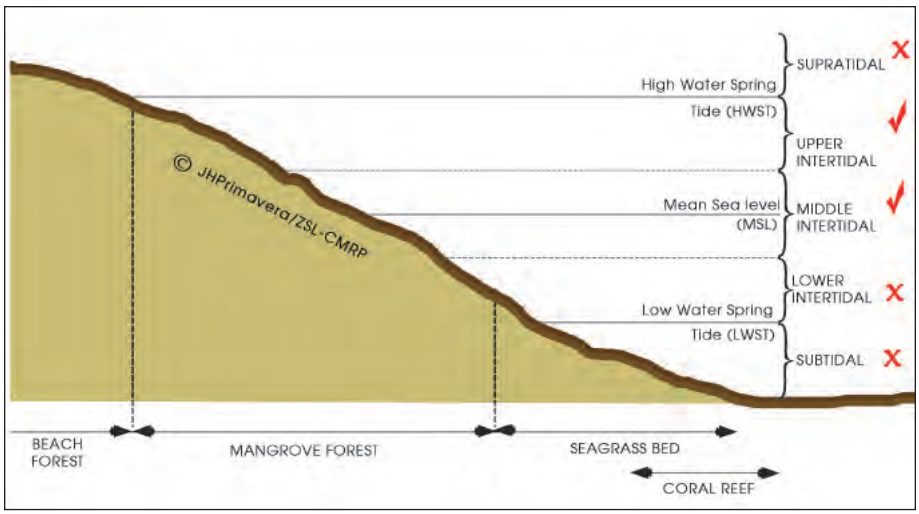


FIG. 1. Location of mangroves in relation to other coastal habitats, and tidal elevation suitable (✓) for planting (mid- to upper intertidal). Lower intertidal and subtidal sites (✗) experience high mortality.

coastal, high salinity areas and *A. officinalis, B. cylindrica, Ceriops tagal* and *Heritiera littoralis* in estuarine sites. Environmental factors of hydrology, salinity, substrate, rainfall and freshwater supply also affect mangrove growth.

Therefore species selection for any mangrove restoration project will depend primarily on the species match for the physical characteristics of a given site (Table 2), and secondarily on the objectives for rehabilitation. The 5-year old *Sonneratia alba* plantation along the sandy Dumangas, Iloilo beach front illustrates a perfect site-species matching (Fig. 3). In 2007, unwed couples first planted *A. marina* and *S. alba* seedlings (provided by a Pew fellowship grant) as requirement for free wedding rites. All the *A. marina* and later batches of

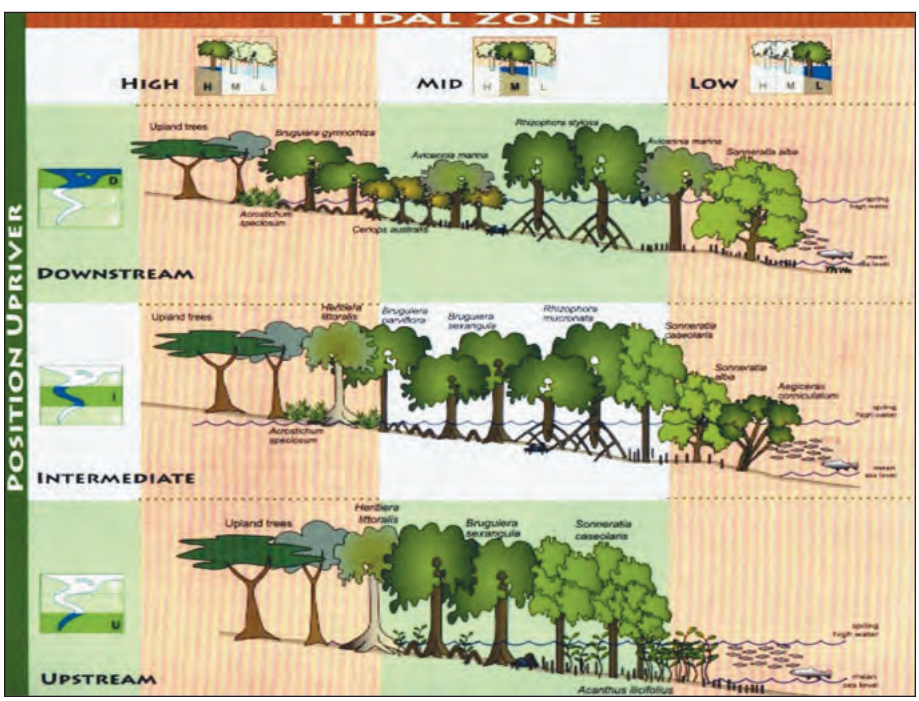


FIG. 2. Tidal zone (high, mid and low) and estuarine zone (up-, mid- and downstream) location of mangroves (Duke, 2006).

TABLE 2. Site characteristics of common mangrove species with local names

	Intertidal zone (position) [a]	Estuarine position [a]	Salinity	Substrate	Remarks
Avicennia marina (bungalon/apiapi)	Lower	Downstream	Wide range	Varied	Front liner
Avicennia alba (bungalon/apiapi)	Lower	Mid- to downstream	Full salinity	Sandy-muddy	Front liner
Sonneratia alba (pagatpat)	Lower	Downstream	Full salinity	Sandy-muddy	Front liner
Rhizophora stylosa (bakhaw bato)	Lower	Downstream	Full salinity	Sandy	Behind *A. marina-S. alba* zone, other sheltered sites
Rhizophora apiculata (bakhaw lalaki)	Lower	Downstream	Full to brackish	Sandy to muddy	Behind *A. marina-S. alba* zone, along riverbanks, other sheltered sites, e.g., lagoons
Rhizophora mucronata (bakhaw babae)	Lower to middle	Mid- to downstream	Brackish	Muddy	Along tidal creeks and rivers
Bruguiera cylindrica	Middle to upper	Midstream	Brackish	Muddy	Often found along tidal creeks
Ceriops decandra	Middle	Midstream	Brackish	Muddy	Colonizer, invades grassland
A. rumphiana	Middle	Midstream to upstream	Brackish	Muddy	Often landward
A. officinalis	Middle	Midstream to upstream	Brackish	Muddy	Often landward
Xylocarpus granatum, X. moluccensis	Middle to upper	Midstream	Brackish	Muddy	Dioecious, leaves turn brown, orange, red then fall
Heritiera littoralis	Upper	Midstream to upstream	Brackish to fresh	Muddy-clay	Landward, rarely near the sea

[a] Refer to Fig. 2.

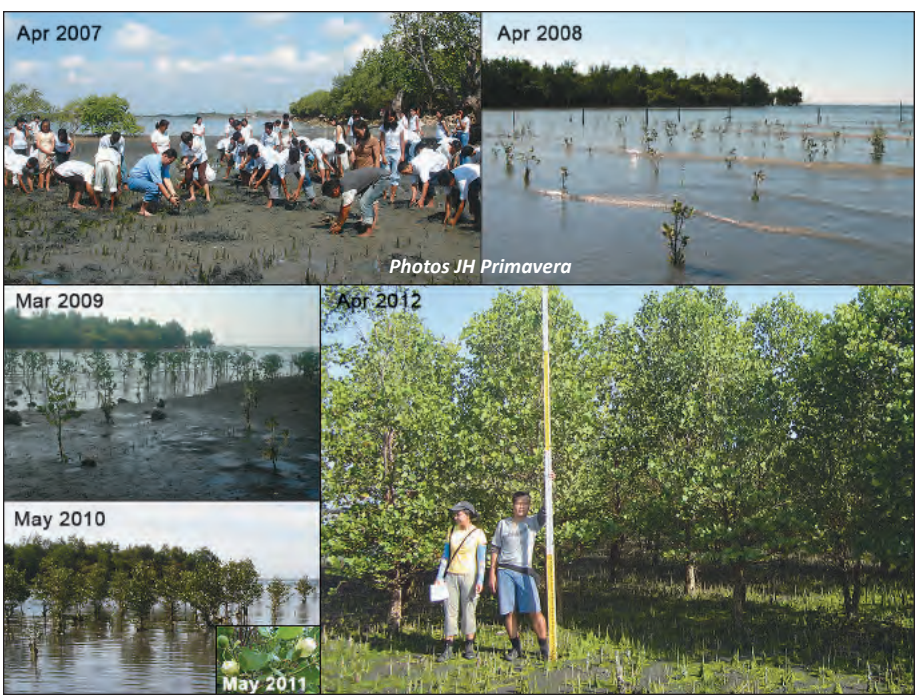


FIG. 3. Reproducing *Sonneratia alba* plantations along the Ermita, Dumangas, Iloilo seafront. In contrast, *Avicennia marina* and *Rhizophora* all died <1 yr after planting.

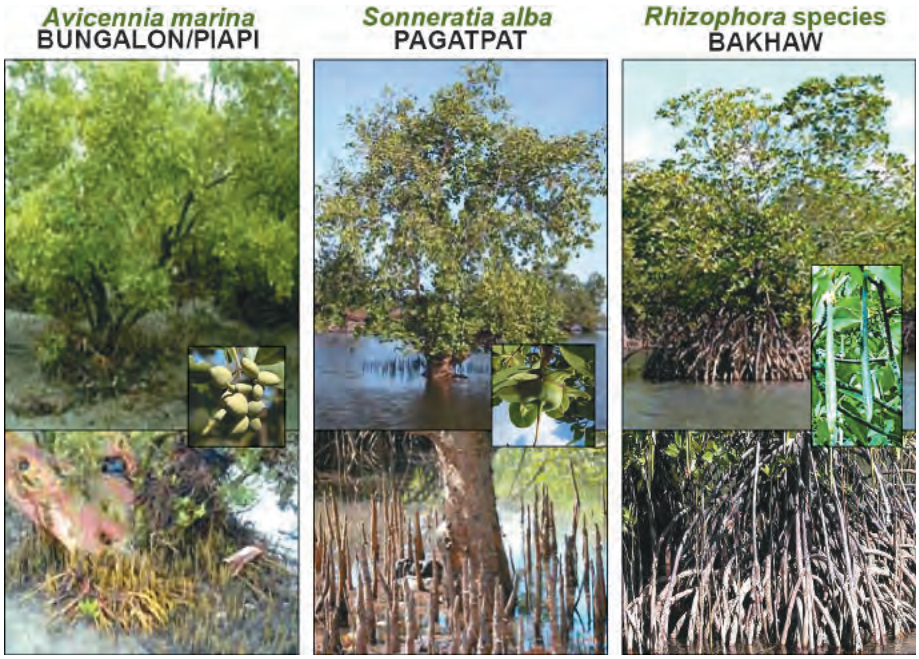


FIG. 4. Common mangrove colonizers are identified by their fruits and roots – pencil pneumatophores for *Avicennia marina*, cone-like pneumatophores for *Sonneratia alba*, and prop/stilt roots for *Rhizophora* spp.

Rhizophora spp. died due to infestations of filamentous algae and barnacles. Only pagatpat *S. alba* survived and bore flowers and fruits after 4 yr.

Fringing mangroves in the Philippines and the rest of Southeast Asia are naturally lined by a band of *A. marina* and/or *S. alba* frontliners with *Rhizophora stylosa* and *R. apiculata* (Fig. 4) immediately behind. Not many other species

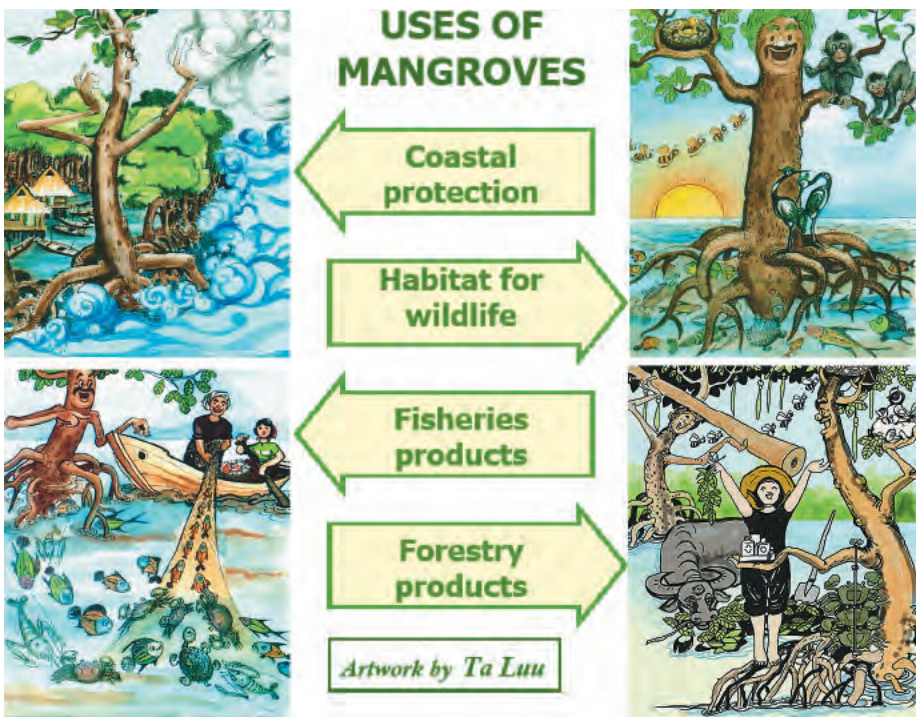


FIG. 5. The importance of mangroves is beautifully illustrated by Vietnamese artist Ta Luu.

BOX 1. Mangrove Ecosystem Services (Millennium Ecosystem Assessment, 2005)

Regulating: Protection of beaches and coastlines from storm surges, waves and floods, Reduction of beach and soil erosion; Stabilization of land by trapping sediments; Water quality maintenance; Water regulation (groundwater recharge and discharge, flood and flow control); Climate regulation (maintenance of air quality, temperature, precipitation);

Provisioning: Subsistence and commercial fisheries; Aquaculture (small-scale, traditional); Hunting; Honey; Fuelwood; Building materials; Traditional medicines

Cultural: Tourism and recreation; Spiritual and cultural

Supporting: Storage and recycling of nutrients; Pollution control and detoxification; Nursery habitats

are able to withstand the extreme conditions of exposure and wave action. A wider species diversity can be found in the middle to landward sections of mangrove forests with a range of substrates, salinities and tidal variation, and where biodiversity concerns can be addressed.

B. MANGROVE FUNCTIONS AND VALUATION

TABLE 3. Valuation of mangrove services[a]

Service	Examples of value (US$/ha/yr)[b]
Raw materials and food	484-585
Coastal protection	8,966-10,821
Erosion control	3,679
Maintenance of fisheries	708-987
Carbon sequestration	30-50
TOTAL	14,166-16,142

[a] Barbier et al, 2012
[b] No estimates available for a) water purification, and b) tourism, recreation , education and research.

Mangrove systems have contributed significantly to the well-being of coastal communities through a wide array of ecosystem services (Fig. 5) which have been classified into regulating, provisioning, cultural and supporting (Box 1). The total value of such services ranges from US$14,000 to $16,000/ha/yr, with the biggest contribution from coastal protection (Table 3).

C. MANGROVE STATUS

Mangroves are found in some 120 countries covering 14-15 million ha, of which a third is in Southeast Asia (Giri et al 2010, Spalding et al 2010). Mangrove decline from 18 million ha in the early to mid-1990s (Spalding et al 1997) shows a drastic mangrove decrease worldwide within the last few decades. Estimated to cover 400,000-500,000 ha (Brown and Fischer, 1918) at the turn of the century, Philippine mangroves have declined to 256,000-263,000 ha (Giri et al 2010, Long and Giri 2011, Spalding et al 2010) due to overexploitation by coastal dwellers, and conversion to agriculture, salt ponds, industry and settlements. Among these factors, aquaculture remains the major cause – around half of the 279,000 ha of mangroves lost from 1951 to 1988 were developed into culture ponds (Primavera, 1997). Although the country appears to have significant mangrove areas remaining, some provinces like Iloilo have up to 95% of total mangrove area converted to ponds (E. Hortillosa, unpub. thesis, 2008).

To minimize the impacts of pond construction on mangrove ecosystems and their associated fisheries, Saenger et al (1983) recommended that "...the amount of mangrove forest converted into ponds should not exceed one ha of ponds for four ha of natural mangrove kept untouched." This means that no more than 20% of a discrete mangrove area should be converted to ponds. The present 256,000 ha of remaining mangroves (Long and Giri 2011) and 232,000 ha of fish/shrimp culture ponds in the Philippines (Primavera, 2000) give a 1:1 pond-to-mangrove ratio, which is way below the ideal 4:1 ratio. Therefore there is an urgent need to increase the country's mangrove area by rehabilitating degraded sites, i.e., abandoned ponds and former fringing mangroves, while protecting remaining forests.

D. MANGROVE REHABILITATION: SEAFRONT VS ABANDONED PONDS

This manual uses the term **rehabilitation** which seeks to reestablish most key ecological processes, rather than **restoration** which is more challenging as it aims to bring back the original condition (Box 2). Mangrove reforestation programs focus mostly on the narrow coastal band from the lower intertidal down to the subtidal zone that includes tidal flats and seagrass habitats because they are open access public lands that pose little ownership conflicts. But these sites are located below the MSL (Fig. 1) and therefore are not optimal for mangroves, hence the generally low longterm survival rates of 10-20% (Primavera and Esteban, 2008; Samson and Rollon, 2008) of many coastal programs. *Rhizophora* are the favored planting species, however, in these *Avicennia/Sonneratia*-dominated sites, for the big-sized propagules of the genus are easy to plant and may not need to go through a nursery (Fig. 6). This is best described as planting by convenience rather than ecology (Primavera 2005, Primavera and Esteban, 2008). Such species are far more ecologically

FIG. 6. Bakhaw *Rhizophora* spp. are planted in ecologically incorrect sites – a) along the beach with high mortality, b) on seagrass beds or d) among roots of *Avicennia marina*. c) Propagules are set in substrate to check if mature (inset).

BOX 2. Definitions (after Field, 1998)

Rehabilitation aims to re-establish most, but not all, key processes and functions

Restoration aims to re-establish former biodiversity and all key ecological processes and functions, i.e., to bring an ecosystem back into, as nearly as possible, its original condition; considered a special case of rehabilitation

Natural regeneration (NR) restores or rehabilitates ecosystems through ecological succession (e.g., natural recruits)

Assisted natural regeneration (ANR) also rehabilitates ecosystems through direct transplanting of wildings, or planting of nursery-conditioned recruits or seedlings

Afforestation is planting in non-forest habitats (e.g., tidal flats)

Reforestation is rehabilitation or restoration of former forest

appropriate in abandoned ponds, and especially along muddy tidal creeks and rivers dominated by *R. mucronata*, *R. apiculata* and other species that can tolerate brackishwater salinity levels. Moreover, loss of the mangrove fringe has sometimes exposed the site to wave action that erodes the margin not only horizontally but also vertically, resulting in lower soil elevation as experienced in Bigke, Leganes (Fig. 7). Such low-lying areas with prolonged flooding are no longer optimal for mangroves (Primavera and Esteban, 2008).

Rather than problematic seafronts, rehabilitation projects should focus on the middle to upper intertidal sites of former mangrove forests now occupied by abandoned ponds (Primavera et al, 2012). Reverting hundreds to thousands of hectares of such ponds holds better promise for increasing mangrove area as they are ecologically the best sites for mangrove growth (Fig. 8). Provided natural hydrology is restored and propagule sources are present, such derelict

FIG. 7. Loss of fringing mangroves along the coastline has led to severe erosion of substrate both horizontally and vertically in a, b, d) Bigke, Leganes, Iloilo, and c) Naisud, Ibajay, Aklan.

FIG. 8. Timeline of 9-ha abandoned pond in Nabitasan, Leganes, Iloilo reverted to mangrove, from initial transplanting of *Avicennia marina* wildings in 2009, to full cover. First flowering was observed in 2011. Left photos show pond facing west and right photos facing east.

ponds will return to their mangrove state naturally in 15-20 yr (Fig. 9) or 3-5 yr by Assisted Natural Regeneration (ANR) or planting (Fig. 8). Various laws (e.g., DENR Admin. Order 15 of 1990, DA-DENR Memo. Order 3 of 1991, and Rep. Act 8550) mandate the cancellation of leases of abandoned, underutilized and undeveloped ponds (AUU), and reversion to the Forestry Bureau of the Department of Environment (DENR) for mangrove rehabilitation. Few of such ponds have been reverted so far (Ferrer et al, 2011), because of problems and the generally poor level of law enforcement in the country. Moreover, many ponds with cancelled leases are declared open and available to new applicants, rather than reverted to the Forestry Bureau.

To facilitate implementation of laws that mandate the reversion of AUU ponds to mangroves, the respective national government agencies, DA-BFAR and DENR are crafting a joint order (or separate orders) that provide the implementing rules and regulations. Nevertheless, so long as millions of low-income Filipinos living along the coastline have no means of relocating to safer ground (for protection from storms which are bound to increase in frequency and severity with Climate Change), the need for seafront planting remains.

E. THE FLA SYSTEM AND AQUACULTURE PONDS

Brackishwater culture ponds may be classified according to tenure and operational status. Tenurial status may be public (covered by a Fishpond Lease Agreement or FLA with the government) or private (with a title). Other ponds may be covered by a tax declaration (issued by the local government), or undocumented. Regardless of tenurial status, the ponds may either be operational, non-operational (= abandoned) or converted to other uses (e.g., saltbeds, housing projects).

The release of mangroves for pond construction was mainly through the FLA system which granted a maximum area of 25-100 ha to individuals, and 250-500 ha to corporations for a fee of PhP50/ha/yr. Pond construction peaked at 5,000 ha/yr in the 1950s-70s with US$23.6 million in loans from external development agencies for pond development and operation (Primavera, 1995) through such conduits as the Development Bank of the Philippines (DBP). Although the FLAs did not confer ownership, they were endorsed by the the BFAR and accepted as collateral for loans. Records of the DBP show a total of PhP124.6 million released 1947-79 for 3,412 loans covering 48,432 ha of public land as collateral (Yap, unpub. report). By such mechanism have wide mangrove areas been lost from the public domain – through transfer from the Forestry Bureau temporarily to the Fisheries Bureau and permanently to development banks (through foreclosed loans), and eventually private ownership.

A survey covering operational ponds in 385 FLA sites in four regions to assess the effectiveness of the FLA system (Yap, unpub. report) showed that a) almost half were operated by persons other than the leaseholders, b) up to a third were partially developed, and c) the fully developed ponds had either deteriorated over time or had big compartment sizes with no pumps and aerators. The low yearly rent (PhP50 =US$25, 1960s) to lease public land (mangroves) meant to encourage pond development instead became an incentive to claim large areas and a disincentive to productivity because it could easily be paid (from sales of timber from felled mangrove trees). The increase to PhP1000/ha/yr ($20/ha/yr) first proposed in 1991, finally passed into law (Republic Act 8550) only after 7 years due to lobbying of the pond industry. Yet pond operators refused to comply, challenging R.A. 8850 in court and it would take another 7 years for the court to dismiss the complaint and uphold the law. Nevertheless, present fee collections are very low (Yap, unpub. report).

FIG. 9. Concrete gates are the only evidence that these sites in a, c) Calatagan, Batangas, b) Barotac Nuevo, Iloilo, and d) Tangalan, Aklan were once culture ponds. Natural regeneration back to mangroves takes 15-20 yr.

A more recent survey evaluated disused (=abandoned) ponds in 62 FLA areas (representing 84% of total cancelled FLAs in 4 provinces in Western Visayas (Ferrer et al, 2011). Due to many problems in the processes of lease cancellation and reversion in jurisdiction to DENR, a lower number of leases was cancelled than the actual abandoned areas. Of the abandoned ponds surveyed, only 23% were suitable for reforestation because the others were located in lower intertidal or foreshore areas. Moreover, some fishpond leases were obtained for use as collateral to obtain bank loans for pond development, with no intention to develop the ponds nor pay back the loans. For areas suited to mangrove reversion, the benefits of such far outweigh the costs (at 15% discount rate, the Net Present Value of Benefit ranges between US$18,544.18 and $18,783.78 while NPV of cost is only $5,924).

F. COMMUNITY-BASED MANGROVE REHABILITATION PROJECT

To move forward the process of FLA cancellation and biophysical reversion of AUU fishponds to mangroves, the Community-based Mangrove Rehabilitation Project of the Zoological Society of London (ZSL-CMRP) organized a series of conferences – a) September 2007 Workshop on Pond-Mangrove Rehabilitation in Iloilo City, b) August 2008 Mangrove Seminar-Workshop in Tangalan, Aklan, c) December 2008 Workshop on Mangrove/Pond Governance in Iloilo City, d) 2010 Seminar-Workshop on Fishpond Lease Agreement Cancellation and Reversion to Mangrove Forest in Iloilo City, and e) 2012 National Mangrove Conference in Iloilo City, the last two in collaboration with the German Technical Cooperation or GTZ, later the Deutsche Gesellschaft für Internationale Zusammenarbeit or GIZ.

The CMRP was established as a 4-year BLF-funded project to support coastal communities to rehabilitate abandoned government-leased fishponds and re-establish the legally mandated greenbelt areas with the goal of increasing coastal protection, food resources and livelihood income through the sustainable management of mangrove forests. Community-based projects are those that take place in community settings with the involvement of local stakeholders from design to implementation. Such projects recognize the contributions made by formally structured community partners to project success. Communities are organized to bring people together to take collective responsibility in sustaining and managing their environment and resources. Organized communities ensure local participation of men and women act-

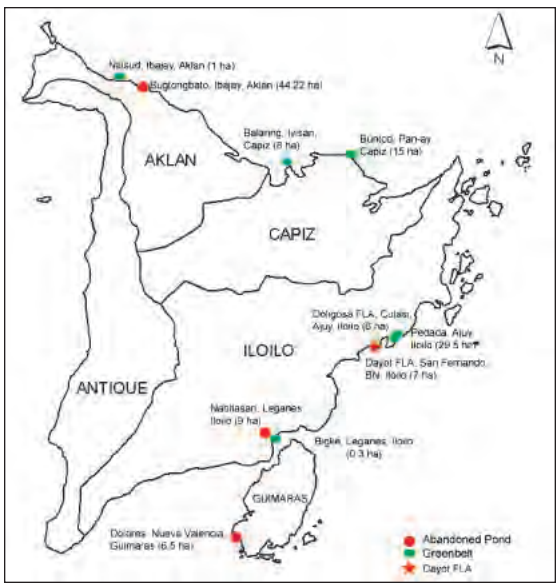


FIG. 10. CMRP sites for mangrove rehabilitation in Panay and Guimaras, central Philippines: seafront greenbelts (green squares), and abandoned ponds (red circles).

TABLE 4. CMRP mangrove sites in Panay and Guimaras

Site	People's Organization	Biophysical Intervention (area)	Sociopolitical Model[a]
Bgy. Ermita, Dumangas, Iloilo	None (Pew Fellows Project)	Seafront planting (1 ha)	
Bgy. Nabitasan, Leganes, Iloilo	None (Municipal LGU, Leganes, Iloilo)	Pond reversion (9.5 ha)	Abandoned Fish Pond with Protection through Municipal LGU
Bgy. Pedada, Ajuy, Iloilo	Bgy. PedadaFisherfolk Association (BPFA)	Seafront planting (29.5 ha); 110 m breakwater and Ecopark	Greenbelt with Exptal Breakwater Protection, and Protection through CBFMA
Bgy. Culasi, Ajuy, Iloilo	None (Doligosa FLA Pond)	Seaward pond (6.5 ha); converted to greenbelt	Protection by Individual Operator through FLA Amendment
Bgy. Nanding Lopez, Dumangas, Iloilo	None (Jastillano FLA Pond)	Pond (10 ha)	Experimental and Enrichment Planting
Bgy. Dolores, NV, Guimaras	Katilingban sang Magagmay nga Mangingisdasa Dolores (KAMAMADO)	Pond (6.4 ha)	Previously Cancelled FLA-Abandoned Fish Pond with Protection through CBFMA
Bgy. Naisud, Ibajay, Aklan	Naisud Mangrove and Aquatic Organization (NAMAO)	Abandoned pond and natural forest (44.2 ha); ecopark opened in 2010	Pond FLA Cancellation-Enrichment and Forest Protection through Municipal LGU
Bgy. Bugtongbato, Ibajay, Aklan	Bugtongbato Fisherfolk Association (BFA)		
Bgy. Buntod, Panay, Capiz	Buntod Katibyugan ka mga Mangingisda kag Kababainhan	Seafront planting (15 ha)	Greenbelt and Protection through CBFMA
Bgy. Balaring, Ivisan, Capiz	New Balaring Mangrove Association (NewBAMA)	Seafront planting (15 ha)	Greenbelt and Protection through CBFMA

[a] After S. Lucero, unpub. report

ing together. Such communities are strong and can form alliances with other groups for advocacy work. They can sustain organizational integrity and deliver successful projects that last beyond the interventions of non-governmental organisations. Community organizing is a means of socially preparing people to take more control over their lives and secure a better livelihood and future.

To achieve its goals, the CMRP has developed six models in its various sites (Fig. 10) which combine the biophysical interventions and sociopolitical strategies based mainly on tenure, e.g., CBFMA, FLA Cancellation or Amendment (Table 4). The latter are described in Part V (Organizing Communities) of the Manual. Applying the six models above, the Project has organized the rearing of 57,600 mangrove seedlings of various species in community nurseries and the planting of 98,500 seedlings/saplings in ~20 ha of seafront sites and abandoned ponds by ~4,100 PO and NGO members, students, teachers and other volunteers since 2009. It has also facilitated the construction of a 110-meter

FIG. 11. Coverage of CMRP activities by national and regional newspapers has raised the profile of mangroves in the country.

breakwater and two mangrove ecoparks and has increased the profile of mangroves through coverage by national and regional broadsheets (Fig. 11) and other media.

The CMRP is now ready to share its substantial learnings, particularly in light of the important role of mangroves in Climate Change mitigation and adaptation, and the ongoing DENR and BFAR projects in mangrove rehabilitation. This manual is therefore addressed both to experienced and first-time planters among local communities/fisherfolk/POs, officials/employees of local government units and national government agencies, e.g., BFAR, DENR; academe (students and faculty of elementary, high school and college levels); civic and other organizations (Fig. 12).

FIG. 12. Government fisheries agency staff join ZSL in planting mangroves to celebrate Fish Conservation Week. No Pay Planting by stakeholders is a major paradigm shift promoted by the CMRP.

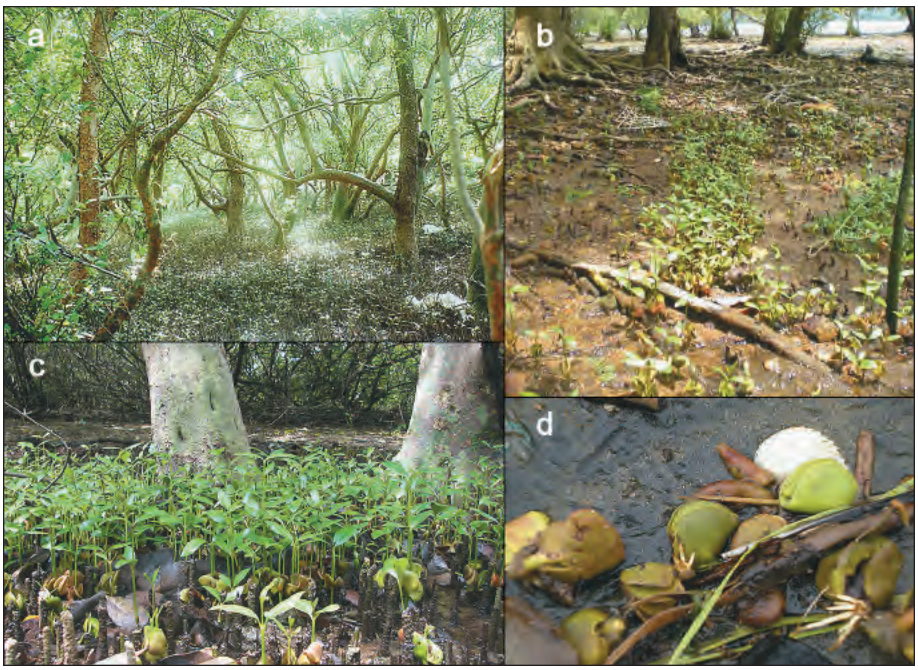


FIG. 13. *Avicennia marina* seedling banks a, c) created by dense pneumatophores that slow down tidal flow and trap propagules; b, d) fewer wildings can withstand wave action along the beach strand.

II. Biophysical and Socioeconomic Considerations

Colonizing mangrove species whether viviparous (*A. marina*, *R. apiculata*) or seed-bearing/ oviparous (*S. alba*) face difficult recruitment in fringing, overwash and riverine mangroves because tidal or river flow will wash out the propagules. Only in landward sites reached by weakened flood tides 1-2x monthly do fallen seeds or propagules have the chance to settle, germinate and/or grow. Otherwise, trapping mechanisms whether natural (dense pneumatophores

BOX 3. Mangrove seedling banks: Natural and artificial barriers

Nature produces an excess of mangrove materials for the next generation with seedling counts of 2,000-91,000/ha (Primavera et al, 2009) and 45,600-343,000/ha (Primavera et al, 2007). These numbers are for rooted recruits, those for seeds and propagules on trees, or newly fallen, are even higher. Abundance of mangrove recruits over time is subject to the vicissitudes of nature, such that the severe El Nino of 2010 produced a very lean harvest of wildings later in the year (as reported by PO members in Capiz and Iloilo). Similarly, seedling patterns in space are affected by seed morphology, e.g., the small and light seeds of *S. alba*. For the small seeds to settle, the incoming flood tide needs to pass through extensive tidal creeks or across wide stretches of abandoned ponds so water movement can slow down. In contrast, the heavier seeds of *A. marina* settle early and easily at the beach strand (Figs. 13, 37).

Settlement of propagules is facilitated by physical trapping among pneumatophores and other roots and along the dikes of abandoned ponds (Fig. 27), thereby forming "sapling banks" (Ellison, 2000). Otherwise, fruits and propagules of colonizing species which fall on frequently inundated sites are normally carried away by the ebbing tide. Once roots and leaves emerge, the seedling needs stability and protection from wave action (to grow into a sapling) – again provided by pneumatophores, pond dikes, and the like.

FIG. 14. The gates, dikes and bottom of abandoned ponds also slow down tidal flow and trap mangrove recruits that form seedling banks of *Sonneratia alba*.

or pencil roots: Fig. 13) or artificial (dikes of abandoned ponds: Fig. 14) are needed to retain recruits in numbers even exceeding 300,000/ha (Primavera et al, 2007). Such mangroves have been called "sapling banks" (Ellison, 2000: Box 3).

Thus the CMRP has learned to utilize these excess wild seedlings or wildings (Figs. 13, 14), which would otherwise die due to overcrowding and competition. Wildings (also spelled wildlings) if large enough may be directly planted in degraded forests nearby (with minimum transport stress). Smaller ones need conditioning in the nursery to reach 30-50 cm height. The use of wildings saves time in the nursery, i.e., 6 mo-1 yr representing the period otherwise spent from germination/rooting to grow to a height of 30-50 cm. However, over-exploitation of wildings must be avoided, and sufficient numbers left to allow for natural recruitment.

TABLE 5. Comparison of Natural Regeneration (NR) vs Assisted Natural Regeneration (ANR)

	Natural Regeneration	Planting or ANR
Duration to reproduction	15-20 yr	min. 4 yr
Seedling source	natural recruits	directly planted propagules or wildings (recruits), or nursery seedlings
Species diversity	natural species composition (few to many, depending on location)	few species (if lower to middle intertidal)
Site suitability	seafront – recruits will flow out with tide abandoned pond – recruits retained by dikes, other stuctures	suitable for both seafront and abandoned ponds

BOX 4. All about tides

In a single tidal cycle, the sea level rises on the flood tide and falls on the ebb tide. There is no flow in the period between flood and ebb, called slack, when the lowest point (low tide) and the highest point (high tide) of sea level are attained. The Philippines has mainly semidiurnal, or two – major and minor – tides in a day. (Other places have diurnal tides, or a single tidal cycle over a 24-hr period.) Tidal elevation depends on the lunar phase such that spring tides (when tidal range, or difference between high and low tide, is greatest) occur during the New Moon and Full Moon, and neap tides (range least) during First Quarter and Last Quarter. Spring and neap tides occur around every two weeks.

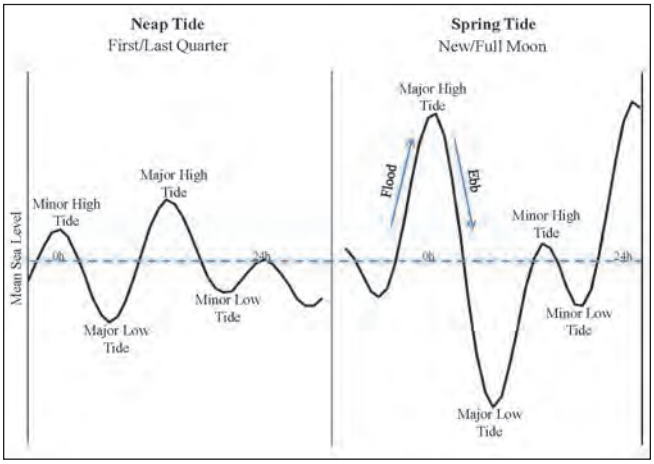


FIG. 15. The Philippines has semidiurnal tides – with a major and minor tide – over a 24-hr cycle. Tidal fluctuation is greater (max. 2.2 m) during spring tides during the New or Full Moon compared to neap tides during First or Last Quarter. Height of tide (y-axis) and time in hr (x-axis) are approximations.

Nursery-reared plants are sturdier, and therefore preferred for outplanting, over propagules. But the direct planting of propagules, preferably of *Rhizophora* spp., can be considered in exceptional cases, e.g., planting of wide areas located in inner parts of abandoned ponds with little wave action. Such direct planting should be timed during the reproductive season when the propagules are available.

The coastline and communities in the CMRP sites in Panay, where over 80% of the mangrove forests have been lost, are increasingly vulnerable to typhoons and storm surges, and food security is a major concern. In such circumstances, more rapid intervention and recovery is required, hence our recommendation for Assisted Natural Regeneration (ANR) through the active planting of wildlings and nursery seedlings rather than Natural Regeneration (NR). The latter, also called Ecological Mangrove Restoration (Lewis et al, 2006; Lewis, 2009) will take 15-20 yr for abandoned ponds to regain full forest canopy (Fig. 9) (Primavera and Esteban, 2008), assuming that there are nearby sources of wild propagules (Table 5). This is much longer than only 3-5 yr required for planting in CMRP ponds (Fig. 8). Moreover, NR is possible along the seafront only if barriers and fences are constructed to provide protection from wave action, boat traffic and gleaners (see IIB, Outplanting) so that natural recruits can settle and grow, unlike relatively sheltered abandoned ponds which do not need protective structures.

A. BIOPHYSICAL

1) The Philippines has semidiurnal tides, meaning it has 2 tidal cycles over a 24-hr period each with a Major and Minor Tide (Box 4, Fig. 15) with maximum tidal range of ~2 m. Characteristics of tides are: a) Neap Tide/Spring Tide and lunar phase, b) semidiurnal pattern, c) High Tide/Low Tide points, and d) Flood Tide (inflow) and Ebb Tide (outflow). Exposed areas for planting

BOX 5. Criteria for mangrove rehabilitation sites – biophysical (nursery and outplanting of seafront, abandoned ponds) and socioeconomic (LGU, PO and partners) – as applied to Lipata, Carlos P. Garcia, Bohol (2012).

a) Nursery		
Flooded during spring tide (upper intertidal)	YES	
Protected from wave action	YES	
Substrate firm	YES	
Substrate flat	YES	
Well-drained location	YES	
Presence of trees for shade	YES	
First 5 criteria should be YES		
b) Outplanting: seafront		
Exposed during neap tide (low tide)		NO
Protected from wave action	YES	
Substrate firm (foot does not sink above the ankle)	YES	
Remaining mangroves	YES	
First 3 criteria should be YES		
c) Outplanting: outer abandoned pond		
Exposed during neap tide (low tide)	YES	
Protected from wave action	YES	
Substrate firm (foot does not sink above the ankle)		NO
Remaining mangroves	YES	
First 3 criteria should be YES		
d) Outplanting: inner abandoned pond		
Not waterlogged	YES	
Substrate firm (foot does not sink above the ankle)	YES	
e) Socio: LGU (interviews)		
Open minded	YES	
Collaborative	YES	
Easy to work with	YES	
Willing to provide counterpart funds	YES	
Willing to have their staff trained	YES	
Shares common vision with the project	YES	
5/6 criteria should be YES		
f) Socio: PO		
Present on site	YES	
Registered	YES	
With constitution and by-laws (CBL)	YES	
With structure	YES	
Complete set of officers	YES	
g) Socio: No PO present		
Community willing to form PO		
h) Socio: Partners (e.g., BFAR, DENR, Schools)		
Willing to provide technical / other support and guidance		

sites should be identified during neap tide, rather than the spring tide (Fig. 15). Areas exposed during neap tide will remain above water even during spring tide, a prerequisite for mangrove survival, as mangroves cannot stand flooding more than 30% of the time. Neap tide selection is a major paradigm shift from the past protocol of selecting exposed sites during spring tide –

FIG. 16. ZSL and Leganes LGU representatives discuss findings during CMRP site selection in Nabitasan, Leganes in 2009.

which turn out to be flooded when the neap tides follow, resulting in mortality of seedlings (as experienced in the CMRP Basyaw Cove, Guimaras site).

2) The above guidelines have been simplified into a short checklist of criteria for selection of outplanting sites in Box 5, which also gives criteria for nurseries and evaluation questions for LGU buy-in and PO commitment.

3) Any natural or artificial beach structures that may affect tidal flow should be considered. For example, a concrete seawall in Balaring, Ivisan, Capiz caused a backwash of incoming waves affecting planted mangrove seedlings planted and resulting in high mortalities.

B. SOCIO-ECONOMIC-POLITICAL

1) Buy-in and commitment of Local Government Units (LGUs) – the LGU, having jurisdiction over mangrove management including conservation as well as implementation of community based projects, must be open minded, collaborative, easy to work with, willing to provide counterpart funds, open to having their staff trained, and share a common vision with the project (Fig. 16). Mangrove planting projects, especially along the seafront, should follow the approved municipal or city Comprehensive Land Use Plan (CLUP) where specific zones are delineated for mangrove greenbelts (protection), boats and other navigation, mariculture, and the like.

2) Presence of POs – as major stakeholder for community-based projects, POs provide the formal structure for decision-making and sustainability. The presence of POs is a minimum requirement of the DENR for securing Community-Based Forest Management Agreement (CBFMA) (Box 5). In sites with no POs, the community must be able and willing to form one.

3) Access to technical support or specialist groups such as the Department of Environment and Natural Resources (DENR), Bureau of Fisheries and Aquatic Resources (BFAR) and academic institutions e.g. University of the Philippines Visayas (UPV). Such groups can converge and discuss common problems and develop appropriate strategies to facilitate pond cancellation and reversion to mangroves, recommend project sites, and intervene in major concerns. The support group can also conduct tripartite site inspection for an amended FLA (Box 6).

BOX 6. CBFMA requirements of DENR

The Community Based Forest Management Agreement (CBFMA) is a renewable, 25-year tenurial instrument awarded to People's Organization (POs) by the DENR, giving them rights and responsibilities over the area inclusive of utilization, protection and management. The POs are required to comply the following:

- Application letter to DENR
- Endorsement from the Barangay LGU, MLGU, PLGU
- Authorization Letter for PO President to sign document and transact business with DENR
- Certificate of Registration either from DOLE or SEC
- Constitution and By-Laws (CBL)
- List of Members (indicating gender) with names of spouses
- Approved Map of the applied CBFM area
- CENRO and PENRO Endorsements
- Certification of non-overlapping of area from the National Commission on Indigenous People (NCIP)

BOX 7. Composition, roles and significant contributions of the Mangrove Convergence Initiative (MCI)

In September 2007 the Workshop on Mangrove Pond Reversion was conducted which is a consultative dialogue among major stakeholders who shared information and valuable feedback on issues such as potential areas for mangrove rehabilitation taking into consideration the ideal 4:1 mangrove-pond ratio, as well as the discussion on more undocumented/illegal ponds.

During that workshop, a resolution was passed on the need for officials of the regional offices of BFAR and DENR to meet periodically and discuss common concerns on mangrove reversion and develop strategies to facilitate reversion. The following meetings that followed eventually led to MCI formation.

MCI composition and respective roles

- DA-BFAR – in charge of managing fisheries and aquatic resources
- DENR – agency responsible for protecting and preserving coastal and marine resources and for facilitating CBFMA for the organized community groups.
- LGUs - have jurisdiction over aspects of mangrove management including conservation, as well as the implementation of community-based forestry projects, subject to the supervision, control and review of DENR.
- Other line agencies e.g. DILG and NCIP

Significant Contributions of MCI:

- Provided the necessary information on abandoned, underutilized and undeveloped (AUUs) fishponds and areas with government projects e.g. BFAR-FRMP and the DENR-contract growing sites
- Set criteria for selecting the sites of the ZSL mangrove project in 4 provinces of Iloilo, Aklan, Capiz and Guimaras
- Dialogued with the bank in the case of the mortgaged Gaona FLA to condone loan and explore the possibility of partnership for a mangrove project
- Fast tracked the reversion of Ongkiko cancelled FLA in Naisud, Ibajay, Aklan back to mangroves by engaging BFAR and DENR to take action
- Intervened with the approval of KAMAMADO's CBFMA application by following up status through written letters and telephone calls with the DENR Secretary
- Facilitated approval of A. Doligosa FLA amendment
- Advocated for implementation of DENR-DA-DILG JAO I (Series of 2008)
- Updated partners on new policy issuances from DENR and BFAR (Fig. 47)
- Collaborated on activities such as Fish Conservation Week, International Year of the Forest (Fig. 48)
- Facilitated counterpart funding for National Mangrove Conference, Fishpond Lease Agreement Workshop and other national activities.

III. Nursery

Nurseries can provide mangrove seedlings of the required species in the required numbers and sizes at a given time. Otherwise, planting will be highly dependent on the availability of propagules, seeds or wildings. Nurseries are essential for large-scale reforestation – they meet the need for seedlings of different heights, e.g., taller plants for sites with deeper water or faster sedimentation. Additionally, nurseries provide temporary storage for excess seeds and propagules produced in the fruiting season which otherwise would be lost (Box 3; Figs. 13, 14).

FIG. 17. Large-scale mangrove nurseries in a) Guimaras, and b, c) Southern Leyte.

Small seeds are not suitable for direct planting as they are easily washed away by currents; they need a nursery phase. Genera like *Avicennia* and *Rhizophora* have viviparous seeds (i.e., they are already young plants while still on the parent tree), which readily take root upon falling to the ground, unlike non-viviparous *Sonneratia* whose seeds need a substrate for germination and whose wildings are relatively rare. Survival along the seafront is higher for nursery-raised seedlings (vs propagules) because their woody stems and developed roots and bigger sizes can better withstand barnacle infestation and wave action. In contrast, these biophysical stressors are absent from the inner portions of abandoned ponds, so the latter can be directly planted with propagules.

Nurseries may be *large-scale* or *commercial* (seedlings primarily for sale: Fig. 17) or *small-scale, backyard* (for local planting: Fig. 18) nurseries. The latter are generally temporary for projects of short duration, and when the reforestation area is small, and can be located under mature mangrove trees (for

FIG. 18. Small-scale CMRP nurseries (shaded by mature trees) are readily accessible because of their backyard location, as in Ajuy, Iloilo.

TABLE 6. CMRP Nursery Status (2009-2011)

Nursery	Species	Total Bagged	Planters
BugtongBato-Naisud, Ibajay, Aklan	Bungalon (*A. marina*)		BFA, NAMAO, Naisud Youth, Ibajay East Schools, ASU Environmental students, Naisud National HS, BFAR, Ibajay LGU, DENR, ZSL
	Pagatpat (*S. alba*)		
	Bakhaw (*Rhizophora* spp.)		
	Others/mixed spp	7,667	
	Total (plants/ planters)	*7,667*	*1,294*
Basyaw Cove, Dolores, Nva. Valencia, Guimaras	Bungalon (*A. marina*)		KAMAMADO, Magagmay nga Mangingisda sa Dolores, National HS, BFAR, Nva. Valencia LGU, GMA Born to be Wild Crew, ZSL
	Pagatpat (*S. alba*)		
	Bakhaw (*Rhizophora* spp.)	15,027	
	Others/mixed spp		
	Total (plants/ planters)	*15,027*	*282*
Balaring, Ivisan, Capiz	Bungalon (*A. marina*)	6,590	NewBAMA, Basiao National HS, Filamer Christian University, Balaring BLGU, Ivisan LGU, Ivisan National HS, ZSL
	Pagatpat (*S. alba*)	1,956	
	Bakhaw (*Rhizophora* spp.)	-	
	Others/mixed spp	-	
	Total (plants/ planters)	*8,546*	*591*
Buntod, Panay, Capiz	Bungalon (*A. marina*)	991	Buntod Katibyugan, BFAR, Buntod BLGU, Panay LGU
	Pagatpat (*S. alba*)	20	
	Bakhaw (*Rhizophora* spp.)	-	
	Others/mixed spp	-	
	Total (plants/ planters)	*1,011*	*37*
Ermita, Dumangas, Iloilo	Bungalon (*A. marina*)	-	ZSL, hired laborers
	Pagatpat (*S. alba*)	500	
	Bakhaw (*Rhizophora* spp.)	-	
	Others/mixed spp	-	
	Total (plants/ planters)	*500*	*7*
JastillanoFLA, Dumangas, Iloilo	Bungalon (*A. marina*)	1,960	ZSL, hired laborers
	Pagatpat (*S. alba*)	-	
	Bakhaw (*Rhizophora* spp.)	-	
	Others/mixed spp	-	
	Total (plants/ planters)	*1,960*	*9*
Nabitasan, Leganes, Iloilo	Bungalon (*A. marina*)	9,624	Nabitasan National HS, Rotaract Club Jaro Chapter, UCCP, BFAR, Leganes LGU, ZSL
	Pagatpat (*S. alba*)	-	
	Bakhaw (*Rhizophora* spp.)	-	
	Others/mixed spp	-	
	Total (plants/ planters)	*9,624*	*569*
Pedada, Ajuy, Iloilo	Bungalon (*A. marina*)	7,098	BPFA, Pedada BLGU, Ajuy National HS, Luca National HS, Ajuy LGU, ZSL
	Pagatpat (*S. alba*)	3,491	
	Bakhaw (*Rhizophora* spp.)	-	
	Others/mixed spp	-	
	Total (plants/ planters)	*10,589*	*257*
GRAND TOTAL		***57,643***	***3,037***

FIG. 19. Site selection is important because even rock-fence barriers (top) cannot protect nurseries from strong waves during typhoons (bottom).

shade). They have the advantages of regular maintenance and monitoring. In contrast, commercial nurseries which produce tens to hundreds of thousands of seedlings may be bigger, more complex with permanent structures. Guidelines for large-scale nurseries can be found in Clarke and Johns (2002), Hachinohe et al (1997), Siddiqi et al (1993), Sinohin et al (1996), and Taniguchi et al (1999).

Around 15 mangrove nurseries have been established in Panay; most of these nurseries plant only bakhaw (*Rhizophora* spp). On the other hand, ZSL-CMRP has assisted the establishment of nurseries in five of its project and partner sites (Table 6), with bungalon (*A. marina*), pagatpat (*S. alba*) and bakhaw (*Rhizophora* spp.) as the main species. The CMRP has focused its nursery work on producing *A. marina* and *S. alba* for coastal greenbelts, based on their dominance as frontliners in fringing mangroves. CMRP nurseries are backyard, small-scale and located in a protected portion of the shoreline shaded by large trees (Fig. 18). Seedlings of *Bruguiera, Heritiera littoralis*, etc. are also reared in multi-species nurseries for estuarine sites and abandoned ponds. An example is the CMRP multi-species nursery established in the Katunggan It Ibajay Ecopark, Ibajay, Aklan which has 27 of the ~35 true mangrove species in the Philippines. Where species diversity is high, a multispecies nursery is recommended, with focus on the pioneer or colonizing species *A. marina, S. alba, R. mucronata* and *R. apiculata* (Fig. 4).

The present BFAR Mangrove Aquasilviculture Project aims to plant one million mangroves in 3,300 ha all over the country within three years (2011-2013). Coastal communities are encouraged to establish nurseries as these can be a good source of income. Organizations or cooperatives (section V: Organizing Communities) may set up a centralized nursery or encourage members to have backyard nurseries. The nursery experience of the CMRP partner communities has given them a head start in exploiting this unanticipated livelihood opportunity.

The following steps in the establishment and operation of a mangrove nursery are based on CMRP experiences in Panay and Guimaras sites.

A. SITE SELECTION

In selecting a nursery site, the following factors should be considered:

1) natural tidal flow/inundation during spring tide to minimize labor for watering plants

2) protection from waves during extreme storm events – nurseries set up during the non-typhoon season may be destroyed when storms come (Fig. 19)
3) relatively flat, with firm substrate and well-drained (not waterlogged)
4) under the shade of mangrove/other trees – but should avoid insects (e.g., larvae from *talisay* leaves falling on mangrove seedlings)
5) proximity to the planting site (for backyard nurseries, to reduce transport costs)
6) preferably close to a freshwater supply
7) preferably close to seed/propagule sources

CMRP nurseries cover no more than 5-20 sq m, whereas large-scale commercial nurseries may extend to hundreds of square meters. Large-scale nurseries generally include the following sections (see Hachinohe et al, 1997 and Sinohin et al, 1996):

1) preparation area – for mixing soil and placing in bags
2) production area – seedbeds for seedlings, canals for tidal inflow and drainage
3) office-storage area – for materials, equipment; not needed for backyard hatcheries
4) fence – for protection from stray animals and incoming debris
5) shade (for younger seedlings) - provided by old nets, coconut fronds and nearby trees

The above are all combined in the same space for backyard hatcheries.

B. PREPARATION FOR FIELD COLLECTION

Prior to the fieldwork:

1) Consult the commercial calendars (with tide levels coded in red or blue color) to select a suitable date and time. For its Panay and Guimaras partner sites, the CMRP developed a tidal calendar clearly showing the tide level at any given time of any date of the month (Fig. 20). The ideal tide level for mangrove activity is 0.4 m or lower. Although tide dependent, bagging should ideally be conducted either early in the morning (6:00–9:00 a.m.) or late in the afternoon (3:00–5:00 p.m.) to avoid the hot sun.

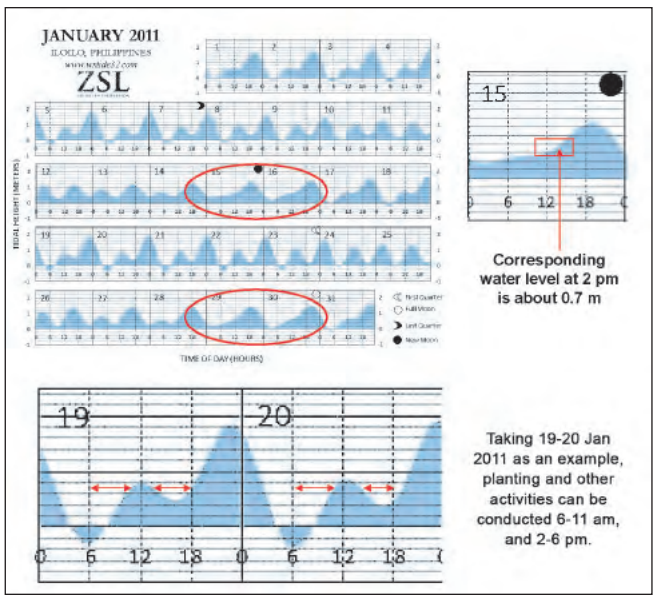


FIG. 20. A tidal calendar that shows the time and height of tides (for Iloilo Station, January 2011) is a must in planning mangrove activities.

FIG. 21. Requirements for mangrove planting activity: cap, long-sleeved shirt, long pants and booties/ thick socks for wear, and digging blades.

2) Collectors (volunteers/PO members) should prepare the following: sunblock, appropriate clothes (long sleeve shirts, hats), rubber shoes/booties (Fig. 21).

3) Prepare logistics (transportation, snacks, certificates for volunteers) and materials, e.g., seedling polybags – 8 x 12" (20 x 30.5 cm) for wildings, smaller size of 4 x 6" (10 x 15 cm) for seeds – shovels or digging blades (*tagad*). For volunteers: Time should be allocated for photo documentation and snacks, and in the case of volunteers, awarding of certificates of appreciation.

On the day of field work:

4) Give a brief orientation to the volunteers about nurseries, e.g. their importance, site requirements, and divide them into groups of seed/wilding collectors, baggers and haulers.

5) For better supervision, a ratio of one supervisor or facilitator (ZSL/project staff): 15-20 participants is recommended (Fig. 22). More than this will mean some volunteers may be unsupervised and apply wrong practices, e.g., throwing – instead of carefully carrying – the bagged seedlings, thereby causing higher mortality.

6) The above become part of the regular onsite activities after initial bagging, for PO members.

FIG. 22. Mangrove outplanting: a) briefing volunteers, b) marking rows of 1-1.5 m distance for staking and making holes, c-f) removing seedling from polybag, placing inside hole, levelling soil surface, and tying seedling to stake.

FIG. 23. Seeds and wildings of different mangrove species: a) tabao *Lumnitzera littorea,* b) lipata *Excoecaria agallocha*, c) gapas-gapas *Camptostemon philippinensis* (beside *Xylocarpus* fruit), and d) dungon *Heritiera littoralis*.

C. COLLECTION AND BAGGING OF WILDINGS

1) Wildings (also spelled wildlings) are often observed near mother trees, retained by mangrove roots (the earlier mentioned "seedling bank"), and dikes of abandoned ponds, or caught on the beach strand (Figs. 13, 14, 23). The latter are short-lived because of wave exposure, in contrast to those trapped by roots or along the dikes of ponds, which remain undisturbed and grow to one meter or more. We sourced the relatively rare pagatpat *S. alba* wildings by first looking at the species distribution based on the literature, both published and gray (e.g., Hortillosa, unpub. thesis) then validating through satellite images, then groundtruthing (Box 7, Fig. 24).

2) Collect wildings not more than 40 cm, preferably 10-30 cm tall (with at least 6 leaves), because smaller plants are less sturdy while bigger plants have longer roots that are more prone to damage.

3) Use a shovel or digging blade (Fig. 21) to carefully remove the plant with soil still attached to the roots to ensure they are surrounded by a ball of

BOX 8. Searching for *Sonneratia alba* seedlings (Figs. 14, 24)

Stands of **pagatpat** *S. alba* dominate stretches of the eastern Panay coastline and the species has proven superior even to *Avicennia marina* for rehabilitation of sandy fringes (Fig. 3). But **pagatpat** germination trials have been few, and the rareness of wildings is widely known. Hence we developed the following protocols for wild recruits:

a) search both published and gray literature (including unpublished theses) for reports of *S. alba* distribution
b) retrieve satellite images, and identify on the maps mature stands and younger growth of *S. alba*, especially in abandoned ponds
c) locate and ground-truth the satmap sites (abandoned ponds and tidal creeks) for presence of **pagatpat** recruits

This approach has been applied to bagging of wildings in Zarraga, Iloilo (abandoned ponds) and Panay, Capiz (tidal creeks), and complements the germination procedures described in Box 8.

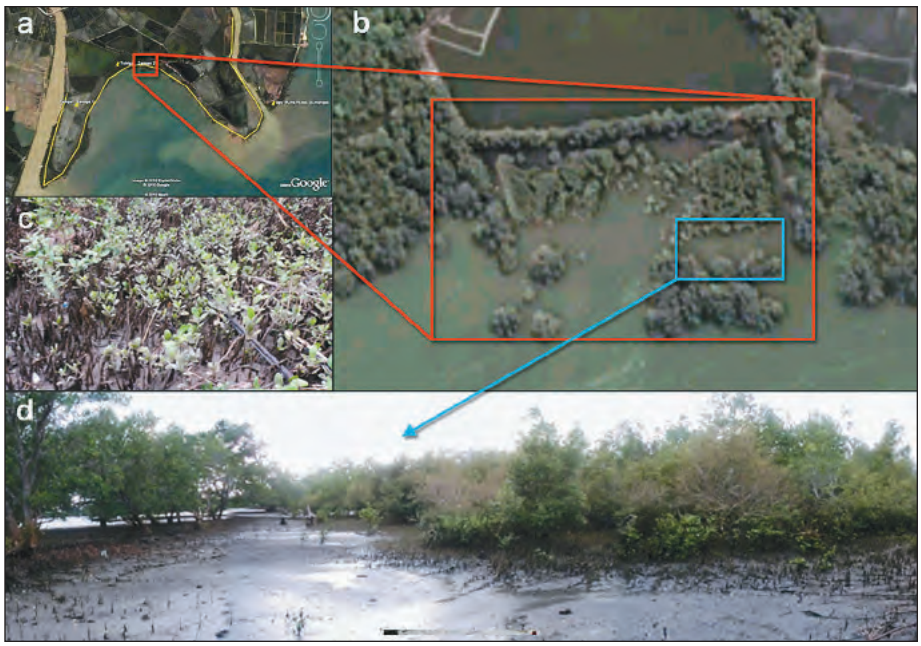


FIG. 24. Locating *Sonneratia alba* in abandoned ponds: a) reviewing satellite images (Google) of areas with abandoned ponds, b) identifying mangrove growth, d) ground-truthing, and c) locating wildings.

earth (Fig. 25). Bare-root transplants of *C. tagal* wildings showed significantly lower survival compared to transplants whose roots were earthballed (Bagalihog, 2000).

4) Wildings removed from a sandy substrate may show higher mortality compared to more compact mud because sand particles tend to fall, exposing the root hairs to air.

5) Smaller wildings (10-20 cm long) need to be conditioned in the nursery (3-4 mo up to 1 yr) until they reach a minimum 30 cm and the stems are sufficiently hardened, while bigger wildings (20-30 cm long) may be transplanted directly to the rehabilitation site after removal, provided enough soil remains with the roots to prevent dehydration and damage.

D. COLLECTION AND PLANTING OF SEEDS/PROPAGULES

FIG. 25. Wildings are earthballed (carefully removed with soil) to prevent root damage, then transferred to polybags by PO members.

1) Collection should be done during peak of the fruiting season, usually in June-August after the April-May flowering. Collect fruits or propagules from parent trees manually, taking care that the flowers and young fruits are not harmed. Newly fallen fruits may also be collected from the

TABLE 7. Mangrove propagule/seed collection time (Panay Is.) and maturity indicators

Species	Seeds or Propagules	Indicators of maturity[a]	Collection time[b]
Avicennia spp. (api-api)	Propagules	Seed coat changes from green to light yellow; seed coat becomes wrinkly and oftentimes opens	May/June-September
A. marina (bungalon)	Propagules	Seed coat changes from green to light yellow; seed coat becomes wrinkly and oftentimes opens	May-September
Bruguiera spp. (busain)	Propagules	No ring-like mark; green propagule turns brownish/bronze and drops without the pericarp or cap	Year round
Bruguiera spp. (pototan lalake)	Propagules	Tip of hypocotyl changes from green to brown	Year round
C. tagal (tangal)	Propagules	Presence of ring-like mark (abscission layer) below pericarp or cap (up to 1cm wide)	Year round
Rhizophora apiculata (bakawan lalake)	Propagules	Presence of ring-like mark (abscission layer) below pericarp or cap (up to 1cm wide)	Year round
R. mucronata (bakawan babae)	Propagules	Presence of ring-like mark (abscission layer) below pericarp or cap (up to 1cm wide)	Year round
R. stylosa (bakawan bato)	Propagules	Presence of ring-like mark (abscission layer) below pericarp or cap (up to 1cm wide)	Year round
Sonneratia alba (pagatpat)	Seeds	Fruits turn shiny or yellowish and soft	Year round
Xylocarpus granatum (tabigi)	Seeds	Fruits change from light brown to dark brown	April-August

[a]from Field, 1996, [b]from Primavera et al, 2004

FIG. 26. Nursery innovations: a, b, e) recycled plastic and aluminum containers, c, d) coconut husk as substrate (photos Eric Buduan/ PTFCF), and f) plastic sheet to prevent primary roots from penetrating the soil.

FIG. 27. Nursery of *Sonneratia alba*: a) collection of fruits, b) crushing to separate seeds, c, f, g) sowing and germination, d, h) nursery rearing in abandoned ponds, and e) 6-mo old plantation (photos Eric Buduan/PTFCF).

ground (Fig. 23), provided they have no insect and other damage. *Avicennia* propagules may be collected by placing nets under or in front of mother trees, or at the high tide line to trap incoming seeds (Fig. 13).

2) When collecting fruits, check the color and texture for maturity, e.g., dark green-reddish hypocotyls of *Rhizophora* and cracked skin of *Sonneratia* and *Xylocarpus* fruits (Table 7). Exclude fruits with insect damage, e.g., the pinhead sized holes of the beetle larvae, disease and malformed shapes.

3) When purchasing *Rhizophora* propagules in the hundreds or more, it is advisable to give only 30-50% down payment, and first check for viability by planting the propagules in mud. Propagules that grow roots (Fig. 6) are viable and the balance can be paid.

4) To avoid potential negative impacts on the local gene pool or possible transfer of diseases and pests, propagules should not be transported between islands

BOX 9. Protocols for growing pagatpat *Sonneratia alba* (Fig. 27)

Avicennia marina and *Sonneratia alba* are the two major colonizers of fringing coastlines but wildings are much rarer in nature for the latter, and nursery techniques relatively undeveloped (perhaps related to its small, non-viviparous seeds) compared to the first. The following protocols for **pagatpat** rehabilitation jointly developed by the P.O. *Kapunungan sa Gagmay'ng Mangingisda sa Concepcion* and the Philippine Tropical Forest Conservation Foundation or PTFCF (Buduan and Ballon, 2012) will greatly contribute to mangrove rehabilitation in the country and in Southeast Asia.

Collected ripe fruits are macerated to release the seeds which are then soaked in water to separate viable seeds (they sink) from nonviable floaters. These seeds are sown on a thin layer of mud lined below with canvas, germinate after 3-5 days, are removed and broadcast on a suitable substrate, e.g., abandoned ponds, at ~50 seedlings/sq m. After 4 mo, the seedlings are mudballed (removed with intact root system held in place by mud) for transplanting nearby or for transport to other rehabilitation sites.

(e.g., Panay and Luzon), and collection of propagules and wildings should be regulated (by the DENR), to ensure some remain for natural succession of younger plants and to colonize bare areas especially in degraded forests.

5) Seeds and propagules can be stored in a shady, cool and dry place and should be planted within 1 week to 1 month, depending on the species, e.g., 10-20 days for *A. marina* and *A. corniculatum* and one month for *Rhizophora* during which they remain viable (Table 7).

6) After seed collection, the seeds are sowed and germinated, maintained through watering, fertilization and pest protection, and hardening prior to transport and outplanting. Larger seeds of *Avicennia* may be germinated directly in individual containers, e.g., poly bags or recycled plastic and aluminum containers (Fig. 26) whereas the very small seeds of *Sonneratia* are best germinated on a seedbed prior to transfer to separate bags. Large propagules of *Rhizophora, Bruguiera* and other Rhizophoraceae may be planted directly in individual polybags commensurate to their size. For details such as depth of sowing, size of seedbed, etc. consult Sinohin et al (1996), Hachinohe et al (1997), Taniguchi et al (1999) and other manuals.

7) Nursery and growout techniques for *S. alba* have been developed in Zamboanga Sibugay (Buduan and Ballon, 2012). Steps in fruit collection, seed germination, bagging of seedlings and outplanting are described in Box 8 and Fig. 27.

E. MAINTENANCE

1) After wildings are bagged and seeds germinated, the nursery needs to be visited at least 2-3 times weekly (by a caretaker or PO member) to check that the plants remain upright (Fig. 28) and are healthy, and to ensure regular watering (by the tide, etc.), and protection from pests and stray animals. Seawater also kills insect larvae that infest *Sonneratia* and *Avicennia* seedlings.

2) Healthy plants have green leaves and are pest-free. Yellowing of leaves in the first month may be due to stress, but if discoloration persists, and leaf wilting and/or powdery material appears on the surface, the plant may be diseased. Such attacks may be caused by beetle *Coccotrypes* (formerly *Poecilips*) *fallax* larvae which bore into *Rhizophora* propagules (Fig. 29). To avoid this, propagules are sun-dried or air-dried for 1-2 weeks prior to planting in polybags to reduce moisture content,

FIG. 28. Regular nursery check-up is important to prevent: a) dying *Avicennia marina* (not reached by tidal water), b) fallen *Rhizophora*, and c) overgrown *Sonneratia alba* with roots reaching the ground through the plastic bag.

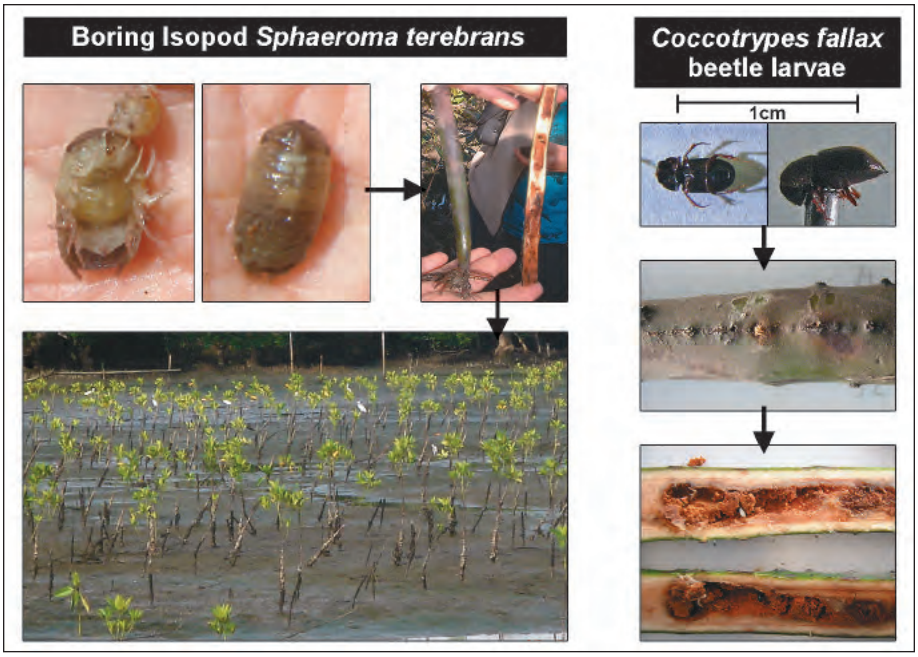


FIG. 29. Pests of *Rhizophora* propagules include the boring isopod *Sphaeroma terebrans* (Culajao, Roxas City plantation), and beetle *Coccotrypes fallax* larvae (Basyaw Cove, Nueva Valencia, Guimaras nursery).

harden the covering and discourage penetration of beetle larvae.

3) Remove diseased plants and bury them.

4) If nursery rearing is longer than 6 mo (e.g., to produce 1-m tall plants), polybags should be separated from the bottom of the nursery with a plastic sheet lining (e.g. recycled plastics, tarpaulins: Fig. 26) to prevent roots from reaching the ground. Otherwise, the roots could be damaged during transfer for outplanting.

5) If seedlings are stunted due to small bags, transfer to bigger bags without damaging the roots.

F. SEEDLING SELECTION AND TRANSPORT

1) Regularly segregate seedlings by species and size for easy transport and hauling of required sizes for planting and/or sale).

FIG. 30. Transport of mangrove seedlings is mainly a) by modified sack+bamboo carrier (or crate), or b) by raft and c) in open pick-up trucks for long distances.

2) Transport may be needed if planting site is far, although it is best to plant wildings onsite. Prepare crates or modified seedling carriers, e.g., sack material attached to bamboo poles (Fig. 30).

3) Buyers from commercial nurseries are responsible for the transportation of mangrove seedlings.

G. NURSERY COSTS

Over 4 yr, the CMRP has organized the bagging of almost 50,000 seeds and wildings by ~3,000 volunteers (students, civil society), PO members or hired laborers (in the case of abandoned ponds with no nearby community: Table 8). Costs (including materials, transport and labor) for bagging one wilding are high at PhP13-20 each for volunteers, but are lower if labor is provided by PO or community members. The higher costs and slow rate of work (max. of 20/day for volunteers vs. 70/day for PO members) are primarily due to the nonfamiliarity of students, professionals and the like with the muddy mangrove environment. On the other hand, engaging volunteers is an educational tool which makes them mangrove stakeholders. Together with community members, their contribution of labor provides the basis for ownership which commits them to manage, protect and see the plants through maturity – a longterm approach more sustainable than the business transaction of paying per piece of mangrove planted.

TABLE 8. Costs to establish nursery (wildings) and maintenance using volunteers and caretaker (CMRP experience)

Item	Quantity	Unit cost (PhP)	Total cost (PhP)[a]
A. Bagging of wildings for nursery (plants)[b, c]			
Plastic bags (4"x 4"x10")	300-500 pcs	2	525-875
Sacks	5 pcs	10.00	50
Bamboo poles	10 pcs	20	200
Spade[d]	2 pcs	500	1,000
Digging blade[d]	2 pcs	500	1,000
First Aid Kit[d]	1 unit	500	500
Snacks (volunteers)	30 pax	25	750
Transportation (vehicle hire)	2 jeepneys	1000	2,000
Start up bagging costs per activity			6,025 - 6,375
Ongoing bagging costs per activity			
Start up bagging costs per plant		12.8-20.0	
Ongoing bagging costs per plant		12.8-20.0	
Cost of bagging 5,000 plants[e]			64,000-100,000
B. Nursery maintenance (3 mo)			
Nursery shed	1	5,000	5,000
Caretaker (for sites with no PO/ organized community)	1 for 3 mo	1,000/mo	3,000
Total costs: bagging + nursery			72,300-108,300
Total bagging + nursery cost per seedling		14.5-21.7	

[a] Total costs lower if community provides labor for bagging, caretaker and maintenance (transportation costs minimal).
[b] 1 bagging activity = 30 volunteer-planters @ 10-17 wildings = 300-500 wildings
[c] Optional: certificates for volunteers @P10
[d] One off capital costs (spade, digging blade, First Aid kit, nursery shed)
[e] Seedling requirement, assume:
4,500 seedlings/ha (at 1.5 m-intervals)
+ 900 replacement (20% mortality)
5,000 seedlings total required

IV. Outplanting

A. PHYSICAL INTERVENTIONS

FIG. 31. Tidal elevation is a major factor in mangrove survival. A few centimeters too low (enclosed by yellow line) leads to seedling mortality in Silay, Negros Occ.

Mangroves have very specific hydrological and substrate requirements. For example, the only difference between a surviving band of mangrove trees and saplings planted along the seafront and an adjacent plot of dead stumps in Silay, Negros Occidental is elevation lower by only ~5 cm (Fig. 31). Correct elevation is marked by surviving trees in background. Potential rehabilitation sites may therefore require interventions to optimize future mangrove growth and survival. In some cases, local hydrology will have changed so dramatically that even areas that historically were mangrove forests cannot automatically be assumed to be suitable for rehabilitation. Where intensive ponds have been excavated (to maximize depth for intensive pond culture), substrate levels will need to be restored, along with the natural hydrology, to allow survival and growth of natural or planted mangrove recruits.

The CMRP used the following approaches based on a philosophy of sourcing local materials that are relatively low cost and could be implemented by the POs working with LGU engineers (where necessary). Collaborations with academia helped provide technical input on the type and location, with local knowledge giving important guidance on the water and weather conditions that might influence the effectiveness of such interventions. These interventions are:

1) barriers (Fig. 32) – made of bamboo, rocks and other locally available materials. Barriers are placed in front of the plantation to reduce the energy of oncoming waves giving some protection while young seedlings become established; of secondary benefit is the increase in sediment elevation behind the structure

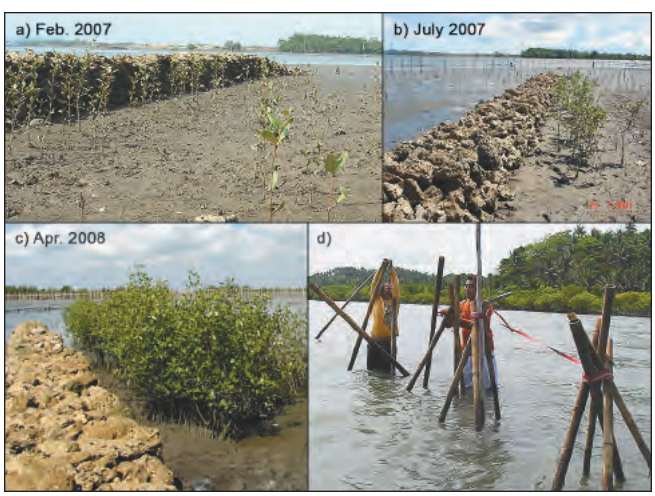


FIG. 32. Barriers made of a, b, c) rocks in Ermita, Dumangas, Iloilo (2007-2008), and d) bamboo in Balaring, Ivisan, Capiz (experimental) support mangrove growth by reducing wave energy and trapping sediment.

2) breakwater – to reduce longterm

BOX 10. Natural Regeneration enhanced by barriers

The construction of a breakwater in Pedada, Ajuy, Iloilo and bamboo fence in Balaring, Ivisan, Capiz illustrates the enhancement by artificial structures of propagule/seed settlement and growth. Since mid-2010, around 70 *A. marina-S. alba* wildings (now 30-45 cm high) have sprouted on a 9 x 70 m accreting sand bar behind the Ajuy breakwater, and ~500 *A. marina* seedlings one-m tall have likewise colonized the fenced-off 500 sq m area in Ivisan. Both sites show a recruitment rate of ~1,000 wildings/ha which is remarkable for the seaward edge of fringing mangroves.

Pedada accreting area (behind breakwater constructed Feb/Mar 2010)
= 9 m x 70 m = 630 sq m area
= 71 wildings (38 *S. alba* + 33 *A. marina*)
= 71÷ 630 = 0.113 wilding/sq m x 10,000 sq m/ha
= 1,130 wildings/ha

Balaring fenced-off area (starting July 2010)
= 0.5 ha = 5,000 sq m
= 500 *A. marina* recruits, estimated no. (1 m high)
= 500 ÷ 5,000 sq m = 0.1 wildings/sq m x 10,000 sq m/ha
= 1,000 recruits/ha

shoreline erosion which had removed more than 1 meter of sediment at some points along the Pedada, Ajuy coastline, two breakwaters made of locally sourced rocks (Box 7) – measuring 0.9 m high by 1–2 m wide by 70 m and 110 m long with a break to allow for boat traffic (Fig. 33). It was constructed in 2010 after some preliminary planting trials demonstrated that the extensive erosion and high wave action in the area meant that no other alternative was possible to re-establish the site as viable for mangrove reforestation. Since the installation of the barrier, the substrate level has increased by 10-50 cm (Fig. 34). An accreting band behind the breakwater 9 m wide has stabilized 2 yr after construction (Fig. 33) and supports growth of both planted and wild recruits (Box 9). A similar accre-

FIG. 33. Two lengths of breakwater, 0.9 m high by 1-2 m wide by 70 m and 110 m long, have consolidated sediment and provided both substrate and protection to planted and natural mangrove recruits in Pedada, Ajuy, Iloilo.

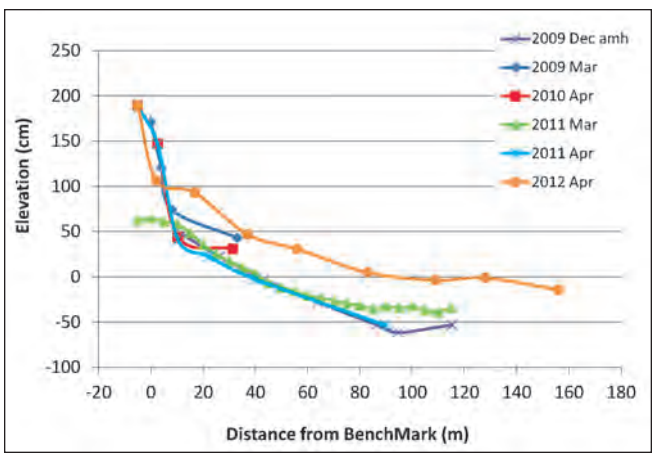


FIG. 34. Beach profile of Pedada, Ajuy, Iloilo shows sediment level increasing behind the breakwater by up to 50 cm, 2010-2012.

FIG. 35. Protecting mangrove plantations: a) bamboo fence for b) gleaners and d) stray animals, e.g., goats; c) markers tied to nylon straps along the plantation boundaries to e) keep out boat traffic during high tide.

tion behind a breakwater in Sg. Haji Dorani, Malaysia stabilized after 18 mo, allowing the establishment of *A. marina* recruits (Tamin et al, 2011). However, the remaining muddy area in Pedada will need a few more years to completely stabilize. Airdried (141 days) samples from this area had 44.5% moisture content, compared to 30.5% moisture for the sandy accretion. Moreover, organic carbon and organic matter were higher, and silt lower in mud compared to sand (1.5%, 0.88% and 13.6% vs 0.74% 0.43% and 20.6%, respectively).

3) restored tidal and freshwater flows – dikes were built to hold water required for growing fish and shrimp in ponds. The flows of both tidal and freshwater creeks that have been subsequently altered need to be restored (by breaking the dikes at strategic points) to allow mangrove growth. The best points for breaking the dikes should be identified in consultation with engineering experts, either within the LGU or academia. Ponds long abandoned whose dikes have been breached over time are characterized by mangrove recolonization (Figs. 14, 24).

B. SITE SELECTION

Site selection is critical for seafront planting because the area available for mangroves along the beach is mostly lower intertidal. In contrast, abandoned ponds are generally suitable for mangrove reversion, as they are located in former mangrove areas in the middle to upper intertidal, provided pond excavation has been minimal (e.g., extensive culture ponds).

1) During neap tide, go to the potential seafront site, delineate and mark with stakes the boundaries of the suitable area (exposed during neap tide, and/or aligned with the edge of the pneumatophores or the peat layer, if present).

FIG. 36. In enrichment planting, wildings are transplanted directly to fill the gaps in nearby degraded forests.

Use a Global Positioning System (GPS) to take readings if available, otherwise note the points followed in the area, based on permanent local landmarks or features. Areas with many fishing boats should allow for designated navigational lanes (5-10 m wide) to facilitate traffic. Fencing the planting area can help reduce boat damage and clearly identify the area to community members (Fig 35).

2) For seafront sites, note remarkable features such as creeks, waterlogged portions which may drown the seedlings, and in the case of ponds, dikes, gates and other structures which may affect water flow. Also identify and record naturally occurring mangrove species and mother trees (as potential sources of fruits, wildings), and relatively protected areas that can serve as onsite nurseries.

3) For abandoned ponds, draw a map of the area including mangrove trees and wildings, topography (mounds, excavations, waterlogged parts, dikes, gates), hydrology (seawater/freshwater channels, tidal levels) and other features. Any level portion may be planted excluding waterlogged areas and high dikes. Note that pond sections facing the open sea will have the same problems, e.g., strong wave action and algal growth, as the seafront and therefore will be more challenging to rehabilitate.

C. PLANTING STRATEGY

1) *What*

Select species of mangroves naturally found in the area. A general description of elevation, salinity, substrate and other site characteristics of the common mangrove species planted is provided in the Introduction and Table 2. The pagatpat plantation in Ermita, Dumangas, Iloilo (Fig. 3) is a classic example of site-species matching. Planted mainly to both *A. marina* and *S. alba* in 2007, with *Rhizophora* spp. added to the 2009-2012 planting batches, only *S. alba* survived. *Rhizophora* spp. were vulnerable to wave action and barnacles while *A. marina* succumbed to thick algal growth.

Nearby wildings may also be directly planted in abandoned ponds, and for enrichment planting of inner seafront sites (Fig. 36) protected from wave action. Planting materials can be sourced from nurseries. Mangrove sizes for planting will depend on location and substrate:

- bigger sizes (minimum 50 cm to 1-1.5 m for *A. marina, S. alba, R. apiculata, R. mucronata, R. stylosa*) – for seafront planting, also very muddy portions of ponds

- smaller sizes (minimum 30 cm *A. marina, S. alba* to 40-60 cm *R. apiculata, R. mucronata, R. stylosa*) – inner abandoned ponds (no wave action)

2) *When*

Schedule planting during the season of least wave action, e.g., northwest monsoon or *amihan* for southern Panay, and southwest monsoon or *habagat* for northern Panay. Consult a tidal calendar for daytime low tides (Fig. 20). Because of the relatively lower elevation, seafront planting will require spring water low tides, while inner abandoned ponds can be planted during either spring or neap low tides. Allocate 2-4 hours for the whole activity from hauling of seedlings to cleanup. If the tide allows, plant in the early morning or later in the afternoon when temperatures are not too high.

3) *How* (density and pattern)

- Inner sites along the seafront and in abandoned ponds with little wave action can be planted at 1.5-2 m intervals.
- Seaward sites exposed to frequent wave action and debris brought by the incoming tide need to be planted at closer intervals of 0.5-1 m (Fig. 37) and/or in clusters of 2-3 seedlings each. Some studies have reported cluster planting to be more effective than planting single mangroves, in terms of survival and growth (Elster, 2000; Huxham et al, 2010). However, preliminary CMRP trials show that survival in seafront sites subjected to strong wave action is uniformly low for single or cluster planting.
- Offset the planting of seedlings in consecutive rows so that the columns appear in zigzag pattern, avoiding uniformly empty rows between rows of plants.

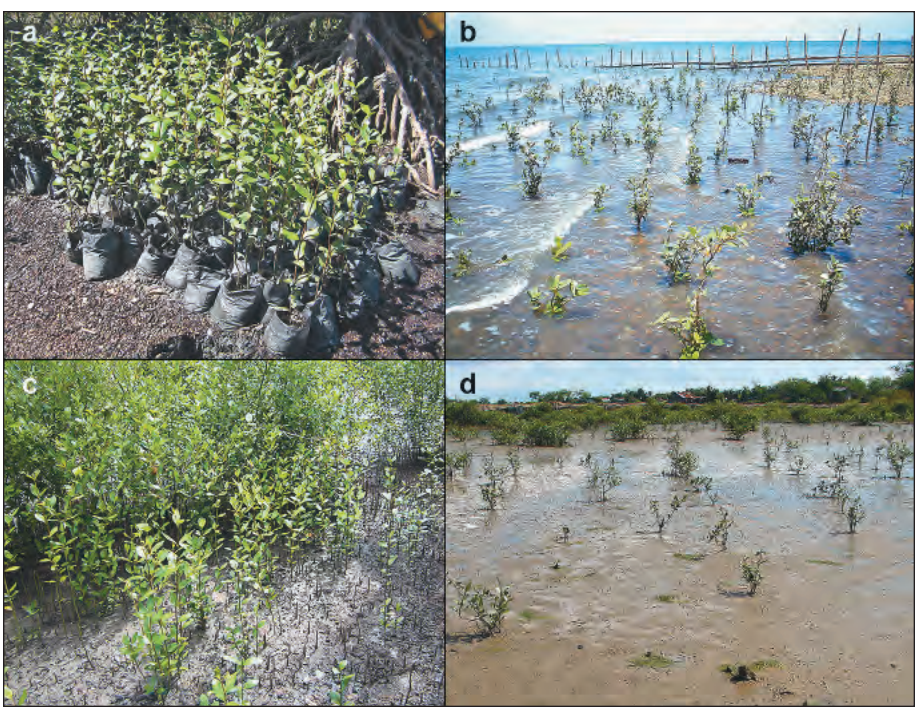


FIG. 37. Mangroves may be sourced from a) nurseries or c) wildings, and planted b) closely spaced together along the seafront, or d) wider apart in inner abandoned ponds.

- For the 1st batch in a given site, do trial planting of a few rows, then observe for the next few months. Plant additional rows only if the seedlings/saplings show good growth and survival.
- Whether seafront sites or abandoned ponds, plant starting from the beach or landward portion moving in a seaward direction (*pa-abante*). This is a major change from the past practice of planting from the seaward boundary in a landward direction (*pa-atras*).
- Depending on the number of planters, 2-5 rows may planted on a given day during the 2-4 hr planting window allowed by the tides.

D. OUTPLANTING PROTOCOLS

Fisherfolk and other community members with experience in mangrove planting need minimum supervision. But students, members of civil society and other volunteers need the guidance of more knowledgeable facilitators (at a ratio of 1 facilitator: 15-20 volunteers) (Fig. 22).

1) Before the activity proper, planters/volunteers should be given introductory lectures, including topics on proper field wear, species to be planted and planting methods (see below).

2) Wear a hat, long-sleeved shirt, long pants or knee-length short pants, booties or old rubber shoes (for the mud and water), apply sunblock, insect repellent and bring plenty of drinking water.

3) Prepare the following materials (in numbers proportional to area/no. of planters:

- seedlings (from nursery or wildings for direct planting)
- shovel, digging blades and trowels
- meter stick
- nylon rope, with knots tied at predetermined spacing (e.g., 10 or 20 m)
- bamboo stakes, 1 m long
- pre-cut strings/plastic straws, ~20 cm long
- large plastic bags, preferably recycled
- pen/pencil and notebook
- camera
- seedling carriers - plastic crates or improvised sacks with sides attached along the length of two bamboo poles
- Global Positioning System (GPS) device, if available

4) Plan the travel such that arrival in the planting site is at least 1 hr before the tide becomes low enough so planting can start. This one hour is needed for briefing (review of various steps from seedling transfer to actual planting to clean-up), hauling and other preparatory activities.

5) Divide the planters into smaller groups for the specific tasks of hauling of seedlings, marking the lines, digging holes, etc.

6) Planting steps (Fig. 22)

- Using a meter stick, steel tape or measuring tape, mark parallel rows with distances of 1 m for seafront sites, or 1.5-2 m for abandoned ponds. For enrichment planting of sparse mangrove sites, plant seedlings in open/vacant

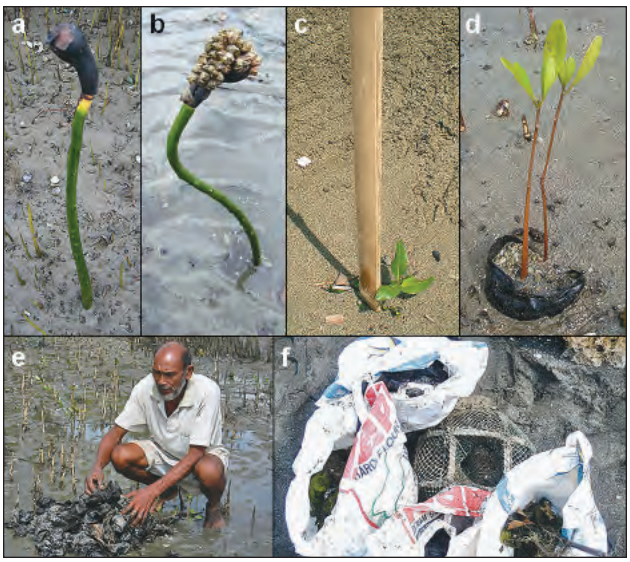


FIG. 38. Planting tips include removing a, b) the caps of *Rhizophora* propagules, and d) plastic bags, and e, f) collecting them for disposal elsewhere; and c) avoiding highly sedimented sites.

spaces at least 2 sq m wide.

• Within the same row, mark out 1, 1.5 or 2 m distances with bamboo stakes. Alternatively, seafront planting may use clusters of 2-3 instead of single seedlings. Plants in consecutive rows should be offset by 0.5-0.75 m to create a zigzag pattern for the columns.

• Next to the stakes, dig holes ~30 cm (= 1 foot) deep using a trowel, shovel or digging blade (*tagad*).

- Haul or transfer the bagged seedlings from the vehicle, or wildings newly-collected nearby, to the planting site.
- For bagged seedlings, remove the plant carefully from the bag to keep the soil attached, then place inside the hole. The top of the plant soil should be the same level as the ground. For cluster planting, place 2-3 seedlings in a single hole (although this is still experimental).
- For *Rhizophora* propagules, make sure to remove their caps (Fig. 38).
- For direct planting, place the wilding together with the attached soil inside the hole.
- Fill in with soil any remaining spaces in the hole.
- For seafronts and on muddy substrates, place a bamboo stake securely beside the plant and tie it just loose enough (to avoid breakage) at mid-stem to the stake for support, e.g., during strong wave action. Where plants are to be monitored and need tagging, attach gina cloth tag (see item G, 1c).
- Collect discarded polybags and other garbage inside the large (recycled) plastic bags for appropriate disposal when you reach home. Do not leave trash in the planting sites (Fig. 38).

E. PROBLEMS

Planting is only the first step towards restoring mangroves. During the first 1-2 yr, the plants are vulnerable to various man-made and natural stressors. Therefore monitoring (of growth and survival) and maintenance (by removing algae, other pests) are two major activities in mangrove rehabilitation,

BOX 11. Mangrove Threats

A. Biological
filamentous algae
oysters
barnacles
insect larvae
boring isopods
crabs
wild animals (monkeys)

B. Physical
wave action
flooding
sedimentation

C. Anthropogenic
gleaners
fishing gears, boats
garbage/debris, oil spills
domestic animals (eg, goats)

FIG. 39. Regular maintenance by removal of a) fishing nets, and b) algae using scissors, and c) placing inside bags for disposal outside the plantation.

aside from bagging wildings and planting proper, for PO members and volunteers.

1) *Physical*

Wave action, flooding and burial in the substrate can damage young seedlings. This is a particular problem where inundation and sedimentation rates are high, as in the lower intertidal to subtidal flats. For example, seedlings in Dumangas, Iloilo planted in the lower intertidal zone died within 3 mo, mainly from inundation as evidenced by rotting stems.

2) *Biological*

a) Infestation of filamentous algae (Fig. 39) peaks in the summer and disappears with the rains; it is also frequently observed near fishponds which regularly drain effluents (containing excess feeds and fertilizers) to the sea. Heavy growth of filamentous algae (*Enteromorpha, Cladophora* and *Oscillatoria*) can choke and break seedlings – wet weight was 0.33 kg algae per seedling compared to aboveground biomass of 0.29 kg per seedling (Baconguis et al., 1995). The *Cladophora-Oscillatoria* algal mat covering a single 1.5-yr old *S. alba* sapling 1.6 m tall in Ermita, Dumangas had a dry weight of 43.9 g.

b) Boring isopods identified as *Sphaeroma terebrans* attacked *Rhizophora* saplings in Culajao, Roxas City (Fig. 29); the crustaceans showed no apparent negative effects on mature *A. marina* trees. Originally from India and taxonomically closer to terrestrial woodlice (than the isopods parasitic on fish), the widely distributed *S. terebrans* (http://www.sms.si.edu/irlSpec/Sphaeroma_terebrans.htm) is on the evolutionary path from free-living creature to woodboring scavenger to full-fledged plant parasite (G. Bristow, Univ. of Bergen, pers. comm.).

c) Barnacle infestation varies with mangrove age (declining in older >2 yr-old seedlings) and species (rough bark of *A. corniculatum* preferred to smooth, flaky stems of *K. candel)* (Maxwell and Li, 2006). The adhesive cement of barnacles may be deleterious to plant growth and survival. *Avicennia* and

FIG. 40. Barnacles are harmless to *Sonneratia alba* which a, d) regularly sheds its bark, but need to be removed from b) *Avicennia marina* c) by means of long-nosed pliers.

Sonneratia appear to tolerate barnacle infestation better than *Rhizophora*, perhaps related to their seafront dominance where barnacle incidence is higher and to the flaking bark of *S. alba* (Fig. 40).

d) Oysters may physically weigh down the plants, but do not seem to affect survival of *Avicennia* and *Sonneratia*.

e) Insects:

- Larvae of the tussock moth *Euproctis* sp. attack *Rhizophora* leaves. Scolytid beetle *Coccotrypes (Poecilips) fallax* larvae infest *Rhizophora* seedlings and propagules; indicators are the presence of holes and/or powdery material (called "frass") on the surface.
- Tide-watching Mangrove Moth *Aucha velans* larvae attack natural *A. marina* stands (but not nearby *Rhizopora* and *Sonneratia* trees), eating leaves and shoots whose branches eventually die; but new buds allow the trees to recover (P. Sage, unpub.)
- Ambrosia beetle *Platypus* sp. adults bore holes through *A. marina* bark, make tunnels where they lay eggs, and cause defoliation

3) *Anthropogenic* (Fig. 35)

Fishing gears, boat traffic, and gleaning (for shellfish and crabs) have negative impacts on mangrove plantations. Sites close to populated centers have problems with garbage and debris (fishing nets, plastic bags, etc.), and domestic animals (e.g., pigs, goats, cattle). In plantations near primary forests, wild animals such as boars and monkeys feed on newly planted *Rhizophora*.

F. PROTECTION AND MAINTENANCE

Regular patrolling should be undertaken by the community (or LGU or school group), for seafront plantations. On the other hand, it is best that a caretaker

(hired by the LGU or NGO) maintains plantations inside abandoned ponds with no organized communities, particularly while tenurial negotiations are ongoing.

1) Planting is recommended in the rainy season to avoid algal blooms during the summer months. Otherwise, algae should be regularly removed using a pair of scissors. Collected algae should be placed in bags for disposal elsewhere (Fig. 39). In the CMRP Nabitasan, Leganes site, removal of algae is done from a boat when the tide is at least 0.5 m so the floating algae are easily collected.

2) The most effective way to remove barnacles is with long-nosed pliers (Fig. 40) – do not use your bare hands as the shells have sharp edges! *Rhizophora* plantations are particularly prone to barnacle infestation, so a proactive solution is to avoid planting bakhaw along the seafront (where they do not belong). Otherwise, avoid monoculture plantations that are vulnerable to pests by interplanting with *A. marina* and/or *S. alba*. Because it regularly sheds its bark (Fig. 40), pagatpat *S. alba* is unaffected by barnacles and oysters.

3) Relatively taller seedlings should be planted in seafront sites with high sediment load and in deeper water, so the higher leaves remain exposed and are less prone to gathering sediment and flooding, allowing the plants to survive.

4) For protection from wave action, install barriers made of rocks or closely spaced bamboo poles (Fig. 32). Such barriers also help to trap sediment and increase the substrate level, further enhancing plant growth. In places where erosion is a major problem, a breakwater can be constructed, e.g., in Pedada, Ajuy (Fig. 33, Box 10).

FIG. 41. Political will is important – for example, the hut (and caretaker) provided by the Leganes, Iloilo municipal government has facilitated cross visits by LGU oficials, NGOs and other groups.

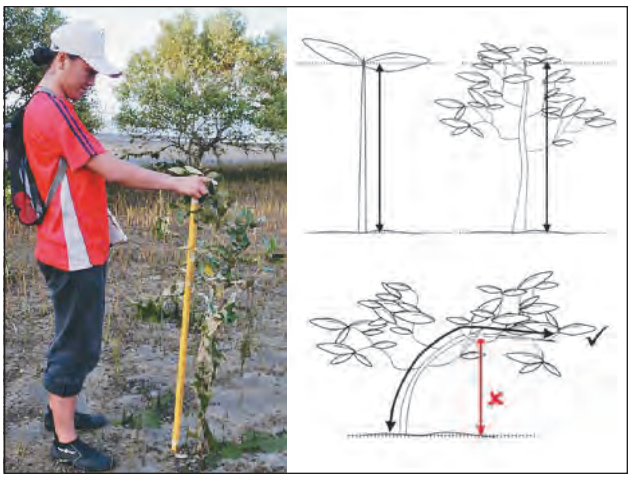


FIG. 42. Plant height is the basic parameter for growth, and is measured from the base to the tip of the stem (top, right). Plants bent (by algae and other factors) must first be straightened before measuring (bottom, right).

5) Alternatively, relatively sheltered portions of the plantation with a gentle slope have recruits washed up by the tide. The Balaring, Capiz P.O. NewBAMA installed a bamboo fence in July 2010 to keep out gleaners and other passersby from their plantation. After one year, the protected area has been colonized by ~500 *A. marina* wildings, now measuring ~1 m high, in an area of 0.5 ha (or a recruitment rate of 1,000 wildings/ha: Box 10).

6) For protection from boat traffic during high tide when plants cannot be seen, NewBAMA installed floating markers made of packaging strap material attached to bamboo poles staked around the perimeter of the plantation (Fig. 35). To protect the seedlings and keep out shellfish gleaners, stray animals and also large debris (washed out during typhoons), install bamboo and other low-budget fences (Fig. 35). Fences should be temporary, lasting 3 yr, or until saplings become tall and sturdy enough to withstand boats and animals. Signs describing the project and warning outsiders to keep out also provide effective protection.

7) If the mangrove site is far from road access, a rest house with toilet facilities and other amenities, will provide planters rest from sun and shade. Such is the hut constructed by the Leganes, Iloilo LGU (Fig. 41), which also displays the municipal ordinance that protects the mangroves and other mangrove laws (Table 11).

8) Visit the plantation regularly to repair fences and remove debris (plastics, fish nets), filamentous algae, barnacles and sediment from leaves and stems. Gather algae, debris and trash in old plastic bags and dispose of away from the plantation (Fig. 38). Do not throw these back into the water/planting site. Dead plants should be replaced with nursery-sourced seedlings or wilding transplants, especially in the 1st year.

G. MONITORING

Often overlooked in mangrove rehabilitation programmes, regular monitoring (Fig. 42) is fundamental in determining whether objectives of reforestation have been achieved. In many cases, the mere numbers of propagules or seedlings planted are considered indicators of success (especially given the propensity for photo 'ops' meaning opportunities). Yet subsequent investigation demonstrates that very few plants have survived because either the site or species selection has been inappropriate. Allocating time and resources into monitoring is a key component of a successful mangrove rehabilitation program.

FIG. 43. Fixed quadrats or plots are useful in keeping track of growth and survival because plants are tagged individually.

Monitoring is important at two levels:

For NGOs, government agencies and researchers involved in mangrove reforestation: to assess plant growth and survival and give regular feedback to the LGU, community, school/civic groups and other stakeholders. It is also key to developing successful and replicable approaches to reforestation.

For communities: to track recovery of their mangrove forest, and also to identify and troubleshoot problems early.

Scientific monitoring

Established monitoring methods have been based on measuring 10-20% of plants at varying frequency – monthly (months 1-3), then quarterly (months 4-12), biannually (months 12-48), and annually (>48 months). The CMRP planted around 90,000 mangroves involving nearly 4,000 people from communities and civic society. With only one field biologist on staff, it quickly became apparent that traditional monitoring approaches were not viable and it was very difficult to track plants consistently over time. In addition, the enthusiastic engagement of communities meant that active replacement planting was carried out with no records, compromising calculations of survival rates.

As a result, we moved to established fixed-point quadrats as the preferred way to monitor mangrove survival and growth, especially when dealing with large-scale rehabilitation projects. This provides a defined area for regular scientific monitoring which is recognized by participating communities.

1) How to set up a fixed quadrat (Fig. 43)

Step A - Plant an area at least 100 m^2 with mangrove seedlings and make a note of the date. (Note that mangroves planted in batches over a one-month period can be counted as a single batch.)

Step B - Measure a 100 m^2 plot within your planted area which may be square (10 m x 10 m) or rectangular (20 m x 5 m) depending on the planted area. If the area has varying substrate, elevation, etc., set up more than one quadrat in these micro-sites.

Step C - Permanently mark the plot by inserting bamboo or wooden poles buried ~1 m deep in each of the four corners. This will then give a permanent reference area for monitoring. If available, take a GPS reference point of the quadrat, or use permanent local landmarks or features to reference the plot.

Step D - Through briefings with the community, ensure that no undocumented or *ad hoc* replacement planting is undertaken within the quadrat as this will distort the results.

2) Monitoring survival and growth rates

Individual plants are tagged to facilitate data gathering, in particular growth rate measurements. Tagging materials should withstand alternate periods of getting wet by the tide and drying under the sun, and retain their colors at least over the 2-3 yr of intensive monitoring. Bright colors such as red and orange are preferred because they stand out against the greenery. Tag materials should also be available and cheap as they are continually replaced due to wear and tear. We recommend using gena cloth (tag remains intact for at least 1 yr, but marks and color lost over time) with each given a unique reference code (Fig. 44). When attaching the tags, ensure you leave enough space to allow for future growth to enable the calculation of exact growth rates for each plant. Other materials that we tested are Crystal silk, colored wires (may constrict the seedlings), and plastic folder material (gets brittle and breaks).

Monitor survival and growth rates monthly for the first quarter, every 3 months for the first two years and then every six months between years 2 and

FIG. 44. Among different materials tested by CMRP, the best is gena cloth (a, b, c) in terms of visibility, availability and price (though it has a short lifespan). Other materials tested are not satisfactory – d) crystal silk, e) plastic folder and wire, and f) laminated paper and wire.

4. Monitoring beyond 4 years is optional, though an annual inspection can be useful. It is important that all data are recorded on a data monitoring/ recording sheet (Appendix 1).

The materials you will need are a meter stick and/or measuring tape, counter, pencil/pen, and monitoring sheet.

Survival

Step A Count the total number of plants within your quadrat on the day it is established. This initial number will serve as the baseline for your future analyses.

Step B Return to the site, make a note of the date, calculate how many days it has been since your last visit.

Step C Count all of the surviving plants within your quadrat.

Step D Calculate the survival rate of all plants.

$$\frac{\text{No. of survivors}}{\text{Initial no.}} \times 100 = \text{survival rate (\%)}$$

Step E Repeat steps B-D every time you monitor your quadrat.

Survival rates of 70-80% after 1-2 yr, and 60-75% after 3 yr (Fig. 45) may be expected, if the preceding guidelines on site selection, planting, maintenance and protection are followed.

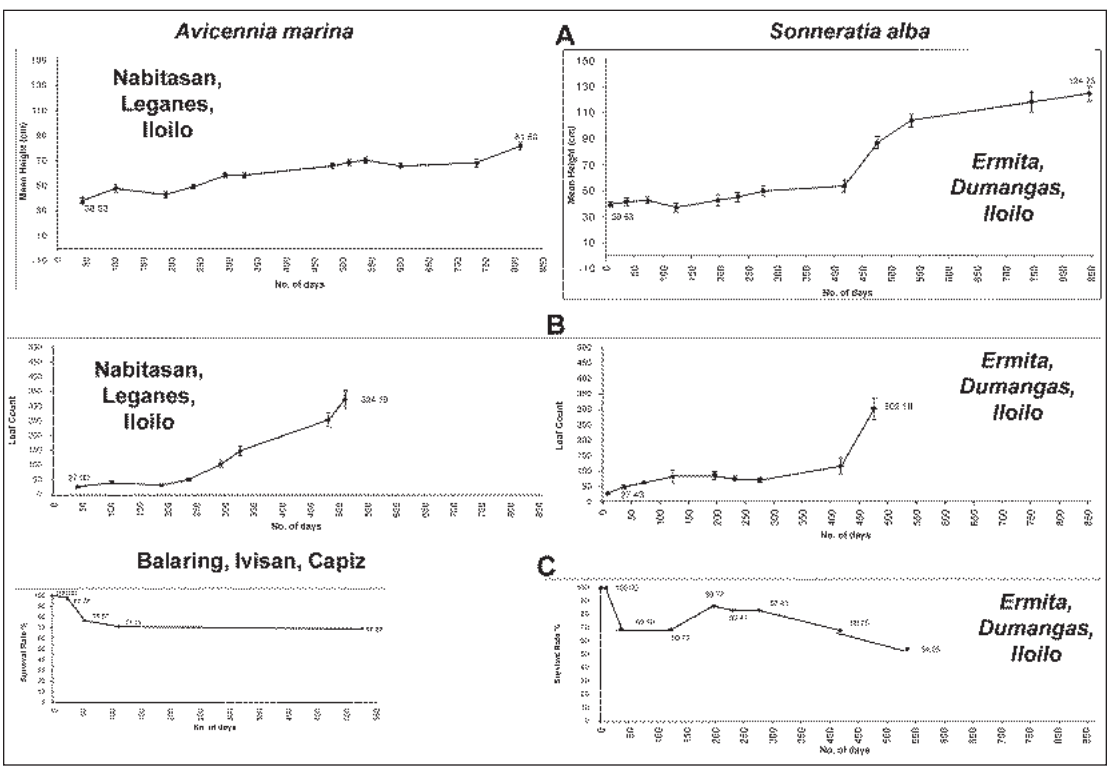


FIG. 45. Growth and survival: (A) height, (B) no. of leaves, and (C) survival rate of *Avicennia marina* (Leganes, Iloilo and Ivisan, Capiz) and *Sonneratia alba* (Dumangas, Iloilo). The latter (C, right) declined to 70% on Day 50 because leafless plants were considered dead; it increased to 85% by Day 200 when the leaves had reappeared.

Growth

Step A Select at least 30 plants at random (meaning do not choose a particular size or characteristic, e.g., tallest, smallest) within your quadrat and measure their height on the day the quadrat is established. This initial height (H_1) will act as the baseline for your future analyses. Using your meter stick and/or measuring tape, measure the height from ground level to the highest bud (not the tip of leaves) of the tallest branch; straighten out plants that are bent (by the weight of algae) before measuring to ensure the tip of the stem is measured (Fig. 42). For plants with dead branches, measure up to the living portion.

Step B Return to the site, make a note of the date, calculate how many days it has been since your last visit.

Step C Select another 30 plants at random (they do not have to be the same plants as in step A) within your quadrat and measure their height (H_2) as described in Step 1.

Step D Calculate the growth rate as follows:

$$\frac{H_2 - H_1}{H_1} \times 100 = \text{growth rate (\%)}$$

Step E Repeat steps B-D every time you monitor your quadrat.

Fig. 45 shows growth in terms of height and no. of leaves of *A. marina* and *S. alba* in three CMRP sites.

3) Optional measurements

Number of leaves (for additional growth parameters): individual counts up to 30 leaves, otherwise note as >30.

FIG. 46. The number of nodes and internodal distance are also indicators of growth in *Rhizophora* and related genera (Rhizophoraceae).

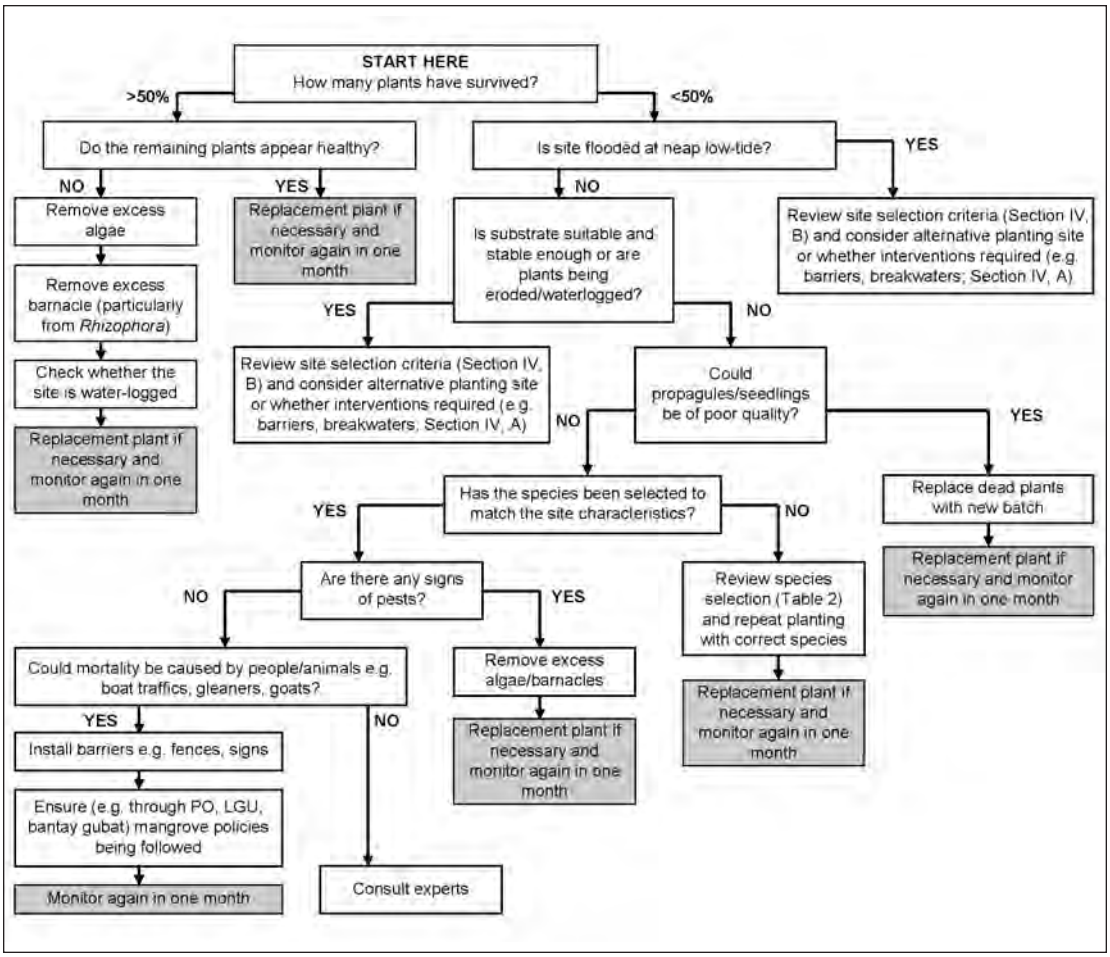
Number of nodes and nodal distance may also be recorded for *Rhizophora* and *Ceriops* species (Fig. 46).

Number of pneumatophores may also be recorded for *Avicennia* and *Sonneratia* species (Morrisey et al, 2003).

Document first flowering and fruiting events: Early reproduction is a characteristic of mangrove colonizers. In the Iloilo CMRP sites, we documented first flowering at 3 yr for *A. marina* (Fig. 8) and 4 yr for *S. alba* (Fig. 3).

Aside from floral succession and mangrove survival, the success of rehabilitation can also be evaluated through faunal recruitment (return of fish, crustaceans and mollusks), environmental factors, sustainable exploitation, and

BOX 12. Community Decision Tree



ecosystem functioning including links with other habitats (Kaly and Jones, 1998; Bosire et al, 2008; Crona and Ronnback, 2005, 2007; Walton et al, 2006, 2007).

Soil (porewater) salinity and pH may be measured using a refractometer and pH meter, respectively, for correlation with growth and survival.

Community monitoring

The fixed quadrat monitoring approach is within the technical capability and resources of some trained local monitoring teams, though interpretation of results can be challenging. The primary objective of communities involved in mangrove rehabilitation projects is to conduct the most resource effective approaches to start gaining the resource benefits from recovered mangrove forests. In this case, therefore, communities need to focus on monitoring survival, identifying problems early and knowing how to solve them. The CMRP has therefore developed a simple decision tree as a troubleshooting tool which should be translated into the local dialect (Box 11).

H. OUTPLANTING COSTS

Mangrove rehabilitation costs $100-500++/ha in the Philippines and $225-216,000/ha elsewhere (Primavera and Esteban, 2008). Compared to past programs in the country, outplanting costs for CMRP sites are higher at $2,000-3,000/ha (PhP92,500-128,500/ha), of which 80-85% represent expenses for nursery-sourced plants (reared from wildings or seedlings). These planting materials cost PhP14-22 each from the nursery (Table 8) in contrast to only PhP0.75-3.00 per seedling (bakhaw propagules; Primavera and Esteban, 2008) for the early projects which generally give low survival of ~10-20%. The use of nursery plants in CMRP sites gives higher mangrove survival of up to 70-80% in Years 1-2 (ZSL-CMRP BLF Terminal Report, 2012).

Table 10 gives the summary of outplanted mangroves in CMRP sites – 98,500 seedlings/saplings in ~20 ha of seafront sites and abandoned ponds by ~4,100 volunteer planters. The labor component for nursery and outplanting provided

TABLE 9. Costs of outplanting and 1-yr maintenance of CMRP mangrove plantation using volunteers and caretaker

Item	Quantity	Frequency	Unit cost (PhP)	Total cost (PhP)[a]
A. Outplanting activity [b, c]				
Cost of nursery plants (including replacement)	5,000		14.5-21.7	72,500-108,500
Transportation (30 volunteers/planters)	2 vehicles	5 trips	1,000	10,000
Spade, digging blades	5 sets		500	2,500
Bamboo stakes, other supplies	5 sets		500	2,500
First Aid kit	1 set		500	500
Snacks (30 volunteers)	30 pax	5 trips	30/pax	4,500
Total outplanting costs per ha[d]				92,500-128,500
Total outplanting costs per plant				18.5-25.7
B. Plantation maintenance (1 yr) [e, f]				
Caretaker (no P.O./community)	1	12	1,000	12,000
Transportation (15 volunteers)	1	6 trips	1,000	6,000
Snacks (15 volunteers)	15 pax	6 trips	30/pax	2,700
Garbage bags, scissors, pliers, other supplies	2 sets		1,000/set	2,000
Total maintenance costs per ha (1 yr)[g]				22,700
Total planting + 1-yr maintenance costs per ha				115,200-151,200

[a] Total costs are lower if the community provides labor (transportation becomes minimal), and higher if protective fence is added

[b] Per activity (2-3 hr period) = 1,000 seedlings planted by 30 volunteers, therefore 4,500 seedlings require 5 trips

[c] Assume nursery is nearby, therefore no transport costs

[d] Optional costs: certificates for volunteers @ PhP10

[e] Assume caretaker for security (no P.O./community)

[f] Assume clean-up, other maintenance by volunteers in Months 1, 2, 3, 6, 9, 12

[g] Optional: bamboo fence @ ~PhP50,000 (materials only, labor provided by community)

TABLE 10. Summary of CMRP outplanting (2009–2011)

Site	Species	Total no. planted	Area covered (ha)	Planters
Seafront Planting				
Balaring, Ivisan, Capiz	Bungalon *(A. marina)*	3,230	2.5	Buntod Katibyugan, NewBAMA members/ officers, Ivisan National HighSchool, Balaring Elem. School, MLGU-Ivisan, BFAR-PFO Capiz
	Pagatpat *(S. alba)*	1,262		
	Bakhaw (*Rhizophora* spp.)	640		
	Others/mixed spp	1,500		
	Total	*6,632*		*674*
Buntod, Panay, Capiz	Bungalon *(A. marina)*	12,674	3	Buntod Katibyugan, community members, Pawa National High School, MLGU-Pan-ay
	Pagatpat *(S. alba)*	-		
	Bakhaw (*Rhizophora* spp.)	8,783		
	Others/mixed spp	-		
	Total	*21,457*		*619*
Bigke, Leganes, Iloilo (Site dropped)	Bungalon *(A. marina)*	-	0.3	BLGU-Community
	Pagatpat *(S. alba)*	-		
	Bakhaw (*Rhizophora* spp.)	-		
	Others/mixed spp	195		
	Total	*195*		*30*
Ermita, Dumangas, Iloilo	Bungalon *(A. marina)*	210	1	PICHE members (Univ. San Agustin, UP Visayas, Central Phil.University, St. Therese College, John B. Lacson Colleges), PhilBikers, WIMA Philstudents, UCCP-Pag-ulikid students
	Pagatpat *(S. alba)*	396		
	Bakhaw (*Rhizophora* spp.)	-		
	Others/mixed spp	376		
	Total	*982*		*438*
Pedada, Ajuy, Iloilo	Bungalon *(A. marina)*	19,190	2	BPFA officers/members, Knights of Columbus, Ajuy-NIPSC students, MLGU-Ajuy, BLGU-Pedada, ANHS students, CPU-JMAP, private citizens, senior citizens, youth
	Pagatpat *(S. alba)*	871		
	Bakhaw (*Rhizophora* spp.)	320		
	Others/mixed spp	-		
	Total	*20,381*		*993*
TOTAL		***49,642***	***8.3***	***2,754***
Ponds Planting				
Naisud, Ibajay, Aklan* (Site dropped for planting)	Bungalon *(A. marina)*	320	1	BFA officers, NAMAO officers, Naisud High School Students, MLGU-Ibajay, Naisud Youth, ASU Students, East Ibajay Students, MFARMC-Ibajay, BLGU
	Pagatpat *(S. alba)*	-		
	Bakhaw (*Rhizophora* spp.)	-		
	Others/mixed spp	847		
	Total	*1,167*		*341*
Basyaw Cove, Dolores, Nva. Valencia, Guimaras	Bungalon *(A. marina)*	800	3	KAMAMADO officers and members, BLGU/MLGU-Nva. Valencia, GMA7 Crew
	Pagatpat *(S. alba)*	-		
	Bakhaw (*Rhizophora* spp.)	8,140		
	Others/mixed spp	-		
	Total	*8,940*		*314*
Nabitasan, Leganes, Iloilo	Bungalon *(A. marina)*	10,069	3.5	Nabitasan National HS, BLGU-Nabitasan, MLGU-DA Leganes, Leganes National HS, RCJC, JPIA, WIMAPhil, GoldenZ, WVCST, PICHE, UCCP
	Pagatpat *(S. alba)*	50		
	Bakhaw (*Rhizophora* spp.)	10,400		
	Others/mixed spp	-		
	Total	*20,519*		*513*
JastillanoFLA, Dumangas, Iloilo	Bungalon *(A. marina)*	5,750	3.5	Locals, ZSL staff, and NIPSC students
	Pagatpat *(S. alba)*	300		
	Bakhaw (*Rhizophora* spp.)	10,300		
	Others/mixed spp	-		
	Total	*16,350*		*85*
DoligosaFLA, Ajuy, Iloilo	Bungalon *(A. marina)*	1,945	1	NIPSC students, Sto. Rosario BLGU, ZSL staff
	Pagatpat *(S. alba)*	-		
	Bakhaw (*Rhizophora* spp.)	-		
	Others/mixed spp	-		
	Total	*1,945*		*123*
TOTAL		***48,921***	***12***	***1,376***
GRAND TOTAL (Seafront & Ponds)		**98,563**	**20.3**	**4,130**

by PO members, students, NGO and other sectors is minimal because of its voluntary nature, in contrast to PhP3,500-10,200/ha (for paid labor) for plantation establishment and maintenance in earlier projects. No Pay (volunteer) Planting is based on the premise that labor contributed by the community provides the basis for ownership, thereby obligating them to care for the plants to maturity and validating their role as *de facto* managers of mangrove resources.

TABLE 11. Philippine laws on mangrove conservation and rehabilitation (Primavera et al, 2004)

P.D. 705 (1975)	Revised Forestry Code: Mangrove strips in islands providing protection from high winds, typhoons shall not be alienated
BFD A.O. 2 (1979)	Minimum 25% of total mangrove forest of any given area to be declared completely protected as Mangrove Wilderness Areas
P.P. 2151 & 2152 (1981)	Declaration of 4,326 ha of mangroves as wilderness areas and 74,767 ha as forest reserves
MNR A.O. 42 (1986)	Expansion of mangrove belt in storm surge, typhoon areas: 100 m along shorelines, 50 m along riverbanks
P.D. 1067	3 to 20 m of riverbanks, seashore for public use: recreation, navigation, floatage, fishing and salvage; building of structures not allowed
DENR A.O. 76 (1987)	Establishment of buffer zone: 50 m fronting seas, oceans, and 20 m along riverbanks; FLA ponds required to plant 50-m mangrove strip
DENR A.O. 123 (1990)	Award of 25-yr Community Forestry Management Agreement for small scale utilization of mangroves, establishment of *Rhizophora* and *Nypa* plantations, aquasilviculture
DENR A.O. 15 (1990)	Policies on communal forests, plantations, tenure through Mangrove Stewardship Contracts; revert abandoned ponds to forest; ban cutting of trees in FLA areas; prohibit further conversion of thickly vegetated areas
DENR Memo Cir. 7 (1991)	Prohibits mangrove cutting in FLA area if ≥10% canopy cover and/or capable of natural regeneration
DENR A.O. 3 (1991)	Policies and guidelines for Mangrove Stewardship Agreement
DA-DENR Gen. M.O. 3 (1991)	Mangrove areas released to BFAR but not utilized or abandoned 5 years from release to be reverted to forest land category
R.A. 7160 (1991)	Local Government Code: devolved management/implementation of community forestry projects, communal forests <500 ha, enforcement of community-based laws
R.A. 7161 (1991)	Internal Revenue Code: Ban on cutting of all mangrove species
DENR A.O. 6 (1992)	Reversion to forest land category portions of mangroves in Bohol declared Alienable or Disposable for ponds
DENR A.O. 23 (1993)	Combined 3-yr Mangrove Reforestation Contract and 25-yr Forest Land Management Agreement into new 25-yr FLMA for families (1-10 ha) and communities (10-1,000 ha)
DENR A.O. 30 (1994)	Community-Based Mangrove Forest Management; NGO assistance
R.A. 8550 (1998)	Prohibits mangrove conversion to fishponds; reforestation of riverbanks, seashore etc, fronting fishponds; DENR, DILG with LGUs to determine abandoned, underdeveloped or under-utilised ponds for rversion to mangroves.
DA-DENR-DILG A.O. 1 (2008)	Interagency TWG to identify FLAs abandoned for 5 yrs from lease date; prepare guidelines for mangrove reversion of AUU FLA areas

Abbreviations: A.O. = Administrative Order; DENR = Department of Environment and Natural Resources; MNR = Ministry of Natural Resources, P.D. = Presidential Decree; P.P. = Presidential Proclamation; R.A. = Republic Act

Organizing Communities

A. BASIC CONCEPTS

Community organizing is defined as a process by which a community identifies its needs and objectives, develops the confidence to take action, and in so doing, extends and develops cooperative and collaborative attitudes and practices in the community (Ross and Lappin, 1967).

Why is there a need to organize coastal communities?

- Increase the coastal communities awareness of the condition of their environment and resources.
- Develop a sense of ownership in communities, and help them take collective responsibility for managing and protecting the resources.
- Provide opportunities for local participation of men and women in decision-making using the participatory process of problem identification, planning, implementation and monitoring.
- Strengthen the community's capacity to access funds for sustainable socio-economic projects.
- Enable the community to form alliances for advocacy, information, resources and technologies sharing.
- Build and sustain organizational structures for coastal resource management.
- Provide the necessary social preparation.

The ultimate aim of community organizing is to empower the community so that they are able to manage and protect their coastal environment on their own. The process of organizing communities is best facilitated by an effective Community Organizer (CO) (Box 13).

BOX 13. The Community Organizer

The Community Organizer

COs work to develop the capacity of local leaders, to facilitate coalition building and to assist in development campaigns. They seek to build groups that adhere to the principles of democratic governance. COs must be open, accessible to community members and concerned with the general welfare of the community. The COs must have:

- A clear grasp of the different theories of development
- Familiarity with the concept and processes of community organizing
- Good social and community relationship skills
- An ability to work with other teams of professionals involved in the management of marine and coastal resources.

The CO approach should adhere to the general principles of a standard and traditional CO. Moreover, they must be able to adapt according to the focus of the project for it to be effective e.g. CO for land distribution, CO for Coastal Resource Management (CRM), or in this case, CO for mangrove communities.

B. ORGANIZING COMMUNITIES IN MANGROVE AREAS

In 2008, the Zoological Society of London (ZSL) Community-based Mangrove Rehabilitation Project (CMRP) was established to protect and restore the mangrove forests of Panay, western Visayas. The project team worked with six different communities, first engaging with the Bugtongbato and Naisud communities in Ibajay, Aklan. This was followed by the communities in Dolores, Nueva Valencia in Guimaras and Pedada, Ajuy, Iloilo. The project also engaged the communities in Balaring, Ivisan and Buntod, Panay all in the province of Capiz. Due to the community-based nature of this project, Community Organizers (COs) were a core part of the project team in order to strengthen existing People's Organizations (POs) (i.e. Bugtongbato, Dolores, Pedada, Buntod) and to form new POs in areas where there was none (i.e. Naisud and Balaring). This manual outlines the experiences of the project team of working with these communities, to help inform similar projects.

FIG. 47. DENR and BFAR participants to the Mangrove Convergence Initiative meeting on new policy issuances, 10 March 2010.

C. FORMATION OF A SUPPORT GROUP

FIG. 48. Exhibit opening, International Year of the Forest Celebration with mayors of Iloilo City and Leganes, BFAR 6 Director, DENR 6 RTD for Research and Development and ZSL Project Manager, Iloilo City, 19 Sept. 2011.

The CMRP project formed the Mangrove Convergence Initiative (MCI) composed of key agencies and institutions (DENR, BFAR and academe) working on mangroves in the region. MCI's formation was identified by the LGUs, Line Government agencies and NGOs in the 10-12 September 2007 workshop as a need to meet and discuss common concerns on pond cancellation and mangrove reversion. Resolution #2 - *A Resolution Calling for the Formation of a Regional Mangrove Convergence Initiative (MCI) and for Pro-Active Efforts by Key Government Agencies* was passed by the participants of the workshop to support this clamor.

D. ORGANIZING STEPS

The COs used an issue-based approach for organizing mangrove communities. There is no written framework in organizing communities for mangroves

hence, the ZSL CMRP adopted the steps that evolved from its own experience and shared in this manual. The five major steps in organizing mangrove communities are as follows:

1. **Forge agreements with partner LGUs, LGAs and academe** – in order to seal the partnership, define partners' roles and accountability to include understanding the duration and scope of the project. The partners must develop and sign legal agreements in the form of a Memorandum of Agreement (MOA) (Fig 49). This is the first activity during the first year of the project (Appendix 2). Below are the steps in forging agreements.

FIG. 49. MOA signing between municipal LGU of Ibajay, Barangay LGUs of Bugtongbato and Naisud and ZSL CMRP, Ibajay, Aklan, 12 Jan. 2009.

2. **Get to know the community** – This is the step where the CO enters the area and immerses in the community to become familiar with the site, ascertain the political scenario through an analysis of forces that interplay within the area, and identify potential leaders. The criteria used to identify leaders are as follows:

- Well respected by members of community, and has relatively wide influence;
- Aware of community issues and concerns;
- Desirous of change and is willing to work for change;
- Believes in the participation of many people in resolving issues;
- Belongs to the targeted sector for organizing e.g. marginal fishers, shell gleaners, etc.;
- Finds time to perform the tasks of the core group; and
- Communicates effectively and listens to community members.

The potential leaders are formed into a core group to partner with the CO until an organization is formed. Issue identification is done at this stage. The CO must be able to sense how accepting the community is of the project by way of paying courtesy calls to the village officials, conducting house-to-house visits and/ or conducting formal and informal dialogues and consultations. The communities are trained by the COs to serve as Local Research Assistants (LRAs) and are tasked to examine their own problems, set their own goals, and analyze their economic situation (Fig 50). LRAs gather information using participatory techniques (Box 14) and household surveys (Appendix 3) to establish community profile reflective of the real situation of their area (Appendix 4). The profile serves as baseline data, a guide for project intervention, and the basis for measuring impact at the end of the project (see below).

FIG. 50. Local Research Assistants conduct Focus Group Discussion with fishers and women in Barangay Bugtongbato, Ibajay, Aklan, 26 Nov. 2008.

All the activities in the second step are done in the first year of CO work.

BOX 14. Training Design on Local Research Assistants (LRA)

Activity/Topic	Time allotment
Arrival and registration of participants - Opening Prayer - Singing of the National Anthem - Welcome message - Introduction of participants - Expectations check/levelling off - Objectives of the training - Training schedule orientation - What is inside the kit?	1 Hour 30 minutes
Lecture - The Mangrove Community- Based Rehabilitation Project - PRA Methods and Tools - Data needs : secondary data, FGDs and household survey questionnaires - Approaching communities, conducting FGDs and interviews	5 hours 15 minutes
Hands-on/ Field Visit	6 hours
Sharing of outputs, difficulties and lessons learned and research planning	2 hours
Closing	15 minutes

Analysis of the increase in income was conducted to see how it changed after the implementation of livelihood projects (e.g. working as ecopark caretaker) in the site. Socio-economic data were collected at the start of the project to determine the baseline income of the members. After one cycle, the survey was again conducted to determine their economic situation as shown in the example below.

Josephine Gelito, a Katunggan It Ibajay ecopark caretaker, had a 33% increase in income representing her monthly share from ecopark revenues.

	Income 2008	Income 2011	Change in Income	Percent
Josephine Gelito	PhP 3,001.00	PhP 4,000.00	PhP 999.00	33.29%

3. **Form or strengthen POs** – The communities have to be organized to apply for CBFMA and to manage the mangroves for a minimum of 25 years. This step is necessary in building long-term engagement, support, and responsibility from communities towards mangrove rehabilitation. For existing POs, they need to be strengthened (in two ZSL sites, formation of the PO was necessary while strengthening was needed in the other four). Below are the steps comparing PO formation versus strengthening.

PO Formation	PO strengthening
Identification of Leaders Core Group Formation Conduct of Meetings Mobilization PO Formation (Vision Mission Goal setting, Election of officers, Constitution-By-Laws formulation) PO registration Capacity Building (ongoing) Accreditation	Organizational Diagnosis PO re-organization (Vision Mission Goal, Constitution-By-Laws, election of officers) Update PO Membership Registration/ Submit report to Registering Agency Financial Audit of POs with existing income generating projects Capacity Building (ongoing) Accreditation

At the start of CMRP project, ZSL identified the indicators (Box 15) of a functional PO. This served as reference in conducting Organizational Diagnosis (OD) using a set of tools (Box 16). The OD result is used in identifying appropriate interventions to build strong and functional POs. Some of the organizational strengthening activities implemented were revisiting Vision, Mission and Goal, formulating Constitution and By-Laws (CBL) (Box 17), defining organizational structure and election of officers, and registering to either the Securities and Exchange Commission (SEC) or the Department of Labor and Employment (DOLE) where the following requirements are complied:

a. SEC Registration Requirements for Non-Stock Corporations/ Organizations/Associations

1. Name Verification Slip
2. Articles of Incorporation
3. Written Undertaking to change corporate name
4. Resolution of the Board of Directors that the Corporation will comply with SEC Requirements for non-stock Corporations
5. List of members certified by the Secretary and undertaking to submit list of additional members to the Securities and Exchange Commission (SEC)

BOX 15. ZSL indicators of a functional PO

Activity	Objectively verifiable indicators	Means of verification
Milestone 1: Six POs formed and active		
Organizing/strengthening of fishers/mangrove users	POs organized/ strengthened; Organizational Diagnosis conducted	Minutes of meeting; diagnosis report; attendance sheets
Training on leadership, organizational management	All PO officers trained; monthly meetings conducted	Attendance sheet; documentation/report; minutes of meetings
Formalization of organizational structure through meetings	6 written/approved Constitution and By- laws; set of officers elected per PO; PO registration	CBL document; registration and accreditation papers
Participation of members in forum/ seminars on mangrove	At least 50% of active members have attended seminars and forums	Attendance sheet, certificate of participation
Membership recruitment	At least 20 members per PO	Application for membership, payment of dues, list of members
Study tour	5-10 members participated/PO in at least 1 study tour	Attendance sheets; tickets; certificate of participation; pictures
Writeshop on proposal development for development projects	At least 1 proposal developed/ approved per PO	Certificate of award for funding, proposals
Milestone 2: PO have catalogued and mapped resources		
Mapping of resources with the DENR and LGU	1 CBFMA map produced per site	CBFMA maps
Milestone 3: CBFMA awarded to POs		
Orientation on CBFMA	1 seminar on CBFMA conducted per PO	Attendance sheet; documentation/report
Preparation of documents for CBFMA application	Workshop/meeting conducted; letter of intent submitted to DENR; LGU endorsements	Documentation; compiled CBFMA papers; CBFMA awarded
Milestone 4: CRMF and AWPs developed, endorsed by DENR		
Training workshop/formulation on the theoretical and practical aspects of Community Resource Management Framework and AWPs	6 CRMF and AWPs developed/ submitted to DENR	DENR affirmation of the documents
Milestone 5: Sustainable livelihood activities are developed/agreed by POs		
Training on enterprise planning and development	Module on enterprise planning and development	Attendance sheets; documentation report
PO meeting	At least 1 livelihood/PO implemented	Pictures; PO records
Milestone 6: POs/government provided with training in livelihood		
Skills training of POs and government officials	At least 1 skills training/identified livelihood	Attendance sheets; documentation report
Preparation of training modules	Training module developed/ livelihood	Training design
Milestone 7: Sustainable livelihood activities implemented		
Preparation and submission of business plans and Implementation	Business plans developed	Business plan

BOX 16.
PO Organizational Diagnosis (OD) Tool

Item	CMRP indicators of success	Present status	Gaps	Recommend-ations
Organizational formation	POs organized/strengthened			
Organizational structure	Set of officers elected; organizational structure in place/ complete; clear/defined roles and responsibilities			
CBL	Written and approved CBL; understood by the majority of members			
Registration	Registration with any registering body			
Accreditation at the local level	SB resolution of accreditation			
Membership to local groups/ councils	Member in at least 1 Local Special Body / group / council			
VMG	Formulated VMG			
Conduct of meetings	Monthly meetings conducted; knowledge and skill in facilitating meetings			
Organizational policies	Policies developed and approved by the GA; organizational policies implemented			
Conflict management	Knowledge and skill in resolving organizational conflict			
Trainings attended/ participated	At least 50% of active members have attended seminars and forum; all officers trained on leadership and organizational management; training on laws and rights; training on mangrove ecology; training on national policies re FLAs, greenbelts, and sustainable CRM			
Projects/ programs managed	Knowledge and skill in program management; Training in livelihood; PO managing programs/projects			
Membership	At least 20 members/ PO; membership expansion			
Linkage established	Linkage established with DENR, BFAR or the LGU			
Negotiations done/conducted	Knowledge and skills in doing negotiations			
Organizational funds	Payment of regular dues/fees; CBU system in place			
CBFMA	Orientation on CBMFA done; CBFMA papers submitted and CBFMA approved			
Level of organizational formation	Barangay based; primary or federation			

6. List of contributors and amount contributed certified by the Treasurer
7. For Foundation, notarized Certificate of Bank Deposit amounting to at least P1,000,000.00 as initial capital contribution, and Modus Operandi or Mode of Operation executed under oath setting forth the mode of its operation, source of its funds, the proposed application of said funds, and the prospective beneficiaries of grants or endowments
8. Registration Data Sheet

b. List of DOLE Registration Requirements

BOX 17. Guide to CBL formulation

A. Craft the Vision, Mission and Goal of the Organization
B. Formulate the Constitution and By-Laws of the Organization using the following outline

Preamble

Article I. Name and address of the organization
- What is the name of the organization?
- What is the official address of the organization?

Article II. Organizational structure
- What are the positions in your organization?
- Draw the organizational structure from the highest decision making body to the committee level (if there is any)

Article III. Membership
- What are your criteria for membership, i.e. who can become members of the organization?
- Describe the process of becoming a member.
- Is their limit as to number of members?
- What is the form of membership? HH or individual?
- What are the characteristics of a member in good standing/a good member?

Article IV. Rights and responsibilities of members
- What are the rights of a member?
- What are the responsibilities of a member?

Article V. Officers and their responsibilities
- Who are the officers of the organization? (from highest to lowest)
- List down the responsibilities of each officer

Article VI. Committees and their responsibilities
- What are the committees in your organization?
- List down the responsibilities of each committee

Article VII. Meetings
- When is your regular meeting?
- Where is the meeting held?
- What time is the meeting?
- When can you declare a quorum?
- How often is your general assembly?
- When is it held?

Article VIII. Election and terms of office
- What is the term of office of the officers? Board of Directors? Committee?
- When is election held?
- Describe the process of conducting the election

Article IX. Membership expulsion and suspension
- When do you expel/suspend a member from the organization? What are the grounds for expulsion/suspension?

Article X. Effectivity
- When does this constitution and by-laws take effect?

All documents for DOLE Registration shall be certified under oath by the Secretary or Treasurer as the case may be and attested to by the PO President.

1. Names of the association's officers and their respective addresses
2. Minutes of the organizational meeting/s
3. List of members who participated in the organizational meeting/s
4. Annual financial reports, if the applicant association has been in existence for one year or more. Financial report is not required if applicant association has been in existence for less than one year or has not collected any amount
5. Constitution and By-laws accompanied by the names and signatures of ratifying members
6. Minutes of adoption or ratification of the constitution and by-laws and date/s when ratification was made
7. Minutes of adoption or ratification is not required if it is done simultaneously with the organizational meeting and the same is reflected in the minutes of the organizational meeting

POs updated their membership and sought accreditation at the municipal and provincial levels prior to CBFMA endorsement. The requirements for accreditation are:

MLGU accreditation	PLGU accreditation
1. PO letter requesting MLGU accreditation 2. Barangay Endorsement 3. PO Authorization Letter-authorizing the PO Leader to sign and transact with Sangguniang Bayan (SB) in behalf of the organization. 4. Completed Application Form for Accreditation 5. PO Profile • List of Officers • List of Members and Spouses • CBL 6. Photocopy of PO's Certificate of Registration to any registering agency	1. PO letter requesting PLGU accreditation 2. Municipal Endorsement 3. PO Authorization Letter-authorizing the PO Leader to sign and transact with SP in behalf of the organization 4. Completed Application Form for PLGU Accreditation 5. PO Profile • List of Officers • List of Members and Spouses • CBL 6. Photocopy of PO's Certificate of Registration to any registering agency

In some cases the Provincial LGUs only affirmed Municipal LGUs accreditation. POs with existing funds may require an external audit to ensure that financial records are in order. The forming and strengthening of POs are implemented at the later part of Year 1 until Year 2.

4. **Build capability of POs** – Capacity building includes activities that improve effectiveness of the organizations in Years 2-3. These activities include three broad approaches to enhance the ability of POs in achieving its mission.

   a. Conduct trainings and seminars. Three types of training are provided to the POs: 1) training aimed at enhancing awareness; 2) training for increasing capacity in running and managing the organization; and 3) training to increase knowledge and skills in managing and protecting the mangroves.

- Cross visit and study tours – One effective means of enhancing POs awareness is to take them to other areas with advanced mangrove projects where PO to PO learning is demonstrated through direct interaction. Choose sites that demonstrate the best management practices even if they are at more distant locations. The value for such cross visits are the learnings gathered by the POs from the trip that they can bring home to start up their own mangrove project and the togetherness during the trip increased group cohesiveness (Fig 51).

FIG. 51. Lakbay Aral of ZSL PO and LGU partners to Bakhaw Park, Kalibo, Aklan, 18 May 2009

BOX 18. Training Design on Basic Leadership

Activity	Time allotment
Registration of participants and Opening Activities • Morning praise • Singing of the National Anthem • Introduction of participants • Expectations check/levelling off • Training objectives • Training schedule	1 hour
Lecture • What are values? Kinds of values. Factors that affect values • Maslow's hierarchy of needs • Man and Dignity • Definition of a leader; leadership, important things to consider in a leader, qualities of a good leader • Roles of a leader, characteristics of an effective leader, authentic leadership in the Philippines • Motivation (principles, process of motivating people) • Jack Welch 7 Rules for Leaders • Leadership styles • Leadership skills	8 hours
Role play/ Group Dynamics • Demonstrating values • Johari window • Differentiating a "Boss" from a "Leader" • Building a Tower	3 hours and 30 minutes
Break time (snacks and lunch)	3 hours (2 hours/ day @1 hr during lunch and 15 min/ snack
Evaluation/ Closing	30 minutes

BOX 19. Training Design on Leadership Skills

Activity	Time Allotment
Registration of participants and Opening Activities • Morning praise • Singing of the National Anthem • Introduction of participants • Expectations check/levelling off • Training objectives • Training schedule	1 hour 30 minutes
Lecture • Facilitating meetings • Agenda setting • Taking minutes of meetings • The 2-way communication process • Barriers to communication • Dos and Don'ts of effective communication • Conditions which hinder effective communication • Skills to increase clarity of communication • Effective listening skills • Stages of problem solving • Decision making procedure • Teamwork and cooperation	6 hours 30 minutes
Group dynamics/ role play • Facilitating meetings • Rumour Mongering • Laying off • Broken squares	4 hours and 30 minutes
Break time	3 hours (2 hours/ day @1 hr during lunch and 15 min/ snack
Evaluation/ Closing	30 minutes

FIG. 52. Leaders of Bgy. Pedada Fisherfolk Association in team building exercise during Leadership Training, Pedada, Ajuy, 25 July 2009.

• Leadership training – PO leaders are trained to equip them with the skills to improve working relationship between members and outside groups, develop the PO, and improve organizational culture. Leadership training have four levels: (1) Basic Leadership training, where functions and roles of a leader, leadership principles, and qualities of an effective leader are illustrated and discussed (Box 18), (2) Leadership Skills training, where facilitating meetings, taking minutes, making decisions, and solving problems are demonstrated through role playing (Box 19) (Fig 52), (3) Empowering Dispute Resolution Management (EDRMP) which is an advanced skills training for leaders that focuses on managing organizational conflict and conducting principled negotiation (Box 20), and (4) Financial Management training with emphasis on simple bookkeeping (Box 21) and financial systems installation.

BOX 20. Training Design on Empowering Dispute Resolution and Management

Activity	Time Allotment
Registration of participants and Opening Activities • Morning praise • Singing of the National Anthem • Introduction of participants • Expectations check/levelling off • Training objectives • Training schedule	1 hour
Lecture <u>Nature and Dynamics of Conflicts</u> • Session 1: Group Sharing on Common Types of Conflicts and Approaches to their Resolution • Session 2: Conflicts Defined, Circle of Conflict (CC), and Sources of Power • Session 3: CC – Conflict Resolution (CR) Continuum Framework <u>Effective Communication and Conflict Management</u> • Session 4: Key Effective Communication Skills (Active Listening and Probing, and Paraphrasing) • Session 5: Positional Bargaining vs. Principles Negotiation <u>Consensual Approaches to Conflict Resolution</u> • Session 6: Arbitration vs. Mediation • Session 7: Mediation	10 hours and 30 minutes
Laboratories • Session 8: Laboratory on Principled Negotiation • Session 9: Laboratory on Mediation	8 hours
Break time	3 hours (2 hours/ day @1 hr during lunch and 15 min/ snack
Evaluation/ Closing	30 minutes

BOX 21: Training design on Simple Bookkeeping

Activity	Time allotment
Registration of participants and Opening Activities • Morning praise • Singing of the National Anthem • Introduction of participants • Training objectives • Training schedule	1 hour
Review and assessment of existing financial practices	1 hour
Formulation of financial policies • Who are the signatories during withdrawal? • Who approves cash advances? • What are allowable items for cash advances? • Are there forms available for cash advances? • When are cash advances liquidated? How many days after the activity? • Who approves liquidations? • What are the penalties for not submitting liquidations on specified time? • How much petty cash should be maintained? Who maintains petty cash? • How much expense can be paid by the petty cash? • During official travel, what are the allowable rates for meals and transportation? • Who submits financial reports?	3 hours
Actual financial installation	2 hours and 15 minutes
Break time (snacks and lunch)	15 minutes
Evaluation/ Closing	30 minutes

- Technical hands-on training – POs underwent technical training to equip them with the basic knowledge on the uses and importance of mangroves, identification of species, nursery establishment, outplanting, and care and maintenance (Box 22) (Fig 53). In the sites, Local Monitoring Teams (LMTs) are organized and trained (Box 23) to assist the project's Marine Biologist. The LMTs later monitored the sites themselves, interpreted and used the data in making decisions related to mangrove rehabilitation (Fig 54). Work of the LMT is voluntary in nature.

  Some PO members are trained and deputized by the DENR as mangrove forest guards (Bantay Gubat or BG) (Box 24) to protect the mangrove areas and enforce laws related to mangroves and environmental laws (Fig 55). The PO/ BLGU selects among the qualified and willing leaders who will be trained. The POs comply with the list of requirements to qualify as deputized BGs, to wit:
  - Letter of endorsement from the organization head/ employer or Barangay Clearance signed by the Barangay Captain

BOX 22: Training Design on Mangrove Ecology and Taxonomy

Activity	Time Allotment
Registration of participants and Opening Activities • Morning praise • Singing of the National Anthem • Introduction of participants • Expectations check/levelling off • Training objectives • Training schedule	1 hour
Lecture <u>Mangrove Biology/ Ecology</u> • Understanding the Coastal and Marine Ecosystems • Discussion on Mangrove biology/ecology - Environmental factors, coping mechanisms, - Different mangrove species (leaves, fruits, flowers, roots) - Mangrove community - Uses of mangroves - Mangrove species (Philippines vs. Asia) • Institutional Factors/problems affecting mangroves • Causes of loss of mangrove forests <u>Mangrove Nursery</u> • Discussion on mangrove nursery establishment • Technology of mangrove nursery establishment - Planting - Propagule/ seedling collection - Monitoring - Care and maintenance • Recommendations for greenbelt establishment	8 hours
Practical Exercises • Identification of different mangrove species (leaves, fruits, flowers, roots) • Bagging of wildings at the nursery site	3 hours and 30 minutes
Break time	3 hours (2 hours/ day @1 hr during lunch and 15 min/ snack
Evaluation/ Closing	30 minutes

BOX 23. Local Monitoring Team hands-on training

Local monitoring teams (LMTs) were established in each site to regularly check the planted mangroves for its growth, survival, and significant changes. The monitoring team is composed of at least four members.

Steps in the establishment of the local monitoring teams:

1. Identify PO members who will compose the LMT (PO leaders or ZSL staff identify/ pinpoint members)
2. Orient LMT members with the data to be gathered: height of plant, number of leaves, total count inside the monitoring quadrats, and remarks/notes
3. Explain to LMT members the importance of each parameter to be recorded. The height and number of leaves are used for growth monitoring while total count represents survival. Remarks and notes are useful as supplementary information.
   a. Height. Height of planted seedlings is taken from ground level up to the highest node of the plant. For seedlings that are branched, look for the tallest branch for height measurement; for seedlings that have dead upper portion or branches, measure only the living portion of the plant; for cluster/tagged planting, measure only the tagged seedling.
   b. Number of leaves. Count the total number of green leaves only
   c. Remarks/notes. Write observations such as broken stems of plants, accumulation of barnacles, and/or presence of algae, plastic, debris on plants which can affect the growth and survival of planted seedlings. Observations gathered during monitoring sessions will serve as basis of activities to be conducted like clean-ups or replacement plantings.
4. Familiarize the LMT members to the data sheets (monitoring templates) to be used and all information to be recorded.
5. Conduct an on-site trial session. Show the location of plants to be monitored or the quadrats established. Remind LMT members of the details mentioned above before they monitor.
6. Gather all data sheets. Show LMT members how the data are processed and presented.

FIG. 53. Hands-on training on Mangrove Ecology and Taxonomy for members of New Balaring Mangrove Association (NewBAMA) in Balaring, Ivisan, Capiz, 4 June 2009.

FIG. 54. Marine Biologist of ZSL trains a Local Monitoring Team member in counting leaves and measuring height for growth and survival of 18 mo-old *Avicennia marina* in the greenbelt area of Balaring, Ivisan, Capiz, 13 Nov. 2010.

- Bio-data with ID picture
- Certificate of Good Moral Character from the Barangay Chairman, Parish Priest or Minister where the applicant resides
- Police Clearance (2 X 2 ID required)

FIG. 55. Role playing during Bantay Gubat training for PO leaders of NewBAMA, Buntod Katibyugan, BPFA and LGU Leganes staff in Pedada, Ajuy, 19 Aug. 2011.

- Sworn Statement that the applicant is willing to perform the functions of DENRO without compensation
- ID Picture – 1.5 X 1.5
- Medical Certificate

As soon as the list of requirements is compiled the chronological steps below in deputation are followed:

BOX 24. Training design for mangrove community forest guards

Topic/Activities	Time allotment
Opening Program Expectation Settings House rules Pre-test	1 hour
Module 1: DENR Mission, Vision, Thrusts and Mandates, Philippine Situation on ENR and Environmental Challenges	1 hour
Climate Change	2 hours
Module 2: Department Administrative Order (DAO) No. 2008–22: Revised Guidelines on the Deputation of Environment and Natural Resources Officers (ENROs) • Performance Evaluation of DENROs/SDENROs • Revocation/Termination of the Deputation Order • Renewal of Deputation Orders for DENROs/SDENROs	3 hours
Module 3: Environment and Natural Resources (ENR) Law Enforcement Constitutional Mandate • Philippine Environmental Laws and Jurisprudence • Forestry sector • Environmental sector • Protected areas, wildlife and coastal zone management • Lands sector • Mines sector	8 hours
Module 4: Paralegal Procedures • Conducting Surveillance • Preparation of the Investigation • Workshop: Writing an Investigation Report • Preparation and Filing of Cases in Court • Simulation exercises	4 hours
Post Test	30 minutes
Break time	3 hours (1 hour/ day during lunch)
Synthesis Post Course Closing Program	1 hour 30 minutes

1. Request LCE/CENRO authorized Representative to sign a Sworn Statement (stating that the applicant is willing to perform the functions of DENRO without compensation)
2. Submit papers/documents to CENRO for checking/validation
3. CENRO endorses the papers to PENRO
4. PENRO endorses the papers to RED
5. RED gets clearance from DENR Secretary to deputize BG and verifies if the applicant has undergone training through reports submitted by the DENR Regional office that conducted the training
6. RED signs paper of deputation and issues ID

The POs and LGU partners are given a training on Sustainable Coastal Resource Management (SCRM) to prepare them for the eventual development of the CRM Plan (Box 25). The CRM plan is the venue where the POs' agenda on mangroves are mainstreamed in the LGU agenda and has a good chance of being implemented and budgeted in the succeeding years (Fig 56).

b. Mobilize and engage communities. Mobilization is the act of assembling the community together to prepare for a specific collective action or movement with available logistical support. When communities are engaged and have been successful in mobilization, the activity becomes empowering for the people.

BOX 25. Training Design on Sustainable Coastal Resource Management

Activity	Time Allotment
Registration of participants and Opening Activities • Morning praise • Singing of the National Anthem • Introduction of participants • Expectations check/levelling off • Training objectives • Training schedule	1 hour 30 minutes
Lecture • Coastal and Marine Ecosystems • CRM Related Laws and Policies: FAOs, AOs, EOs, RA 8550, PD 705, EOs on Mangroves • Organizing Communities • Information, Education and Communication • CRM Plan • Coastal Zoning • Fisheries/Habitat Management • Shoreline Management • Coastal Tourism • Livelihoods and Enterprise Development • Legal Arrangement and Institutional Development • Health and Sanitation in the Coastal Areas	12 hours
Workshops • PO organizing experience • Planning per site on the conduct of CRM Planning • Coastal zoning	2 hours and 30 minutes
Field Visit, Discussion and sharing	4 hours
Break time	3 hours (1 hour/ day during lunch)
Evaluation/ Closing	1 hour

FIG. 56. Fisherfolk leaders, municipal and barangay officials, Philippine Coast Guard, DENR and BFAR representatives discuss coastal zoning during the CRM planning workshop of Ivisan, Capiz, April 2011.

Community mobilization work includes planting and maintaining mangroves, establishing and maintaining nurseries, formulating policies, reporting to LGU and the registering agency e.g. DOLE requires submission of a yearly accomplishment report, sourcing funds internally or externally, participating in seminars and forum, and conducting advocacy and education campaigns. Consensus to do on-site planting and maintenance activities are organized by the COs with the communities where dates, time, number of participating planters (from the POs and volunteer groups), logistic and materials/ equipment needed are discussed, agreed and prepared. When participation is needed for training and seminars, identification of attendees is decided by group consensus with the PO decision strictly followed even in the presence of political intervention that attempts to bend it. Steps in identifying PO participants:

- Include in PO meeting agenda the invitation for training/ seminar
- Assess who among the officers and members is appropriate to attend the activity based on capacity and availability
- Calculate the travel and food expenses to be incurred
- Request a cash advance from the PO

Require the participant to report back to the organization the highlights ofactivities attended.

Advocacy- and education-related activities conducted by ZSL-CMRP included interactive painting and drawing contest for children. ZSL-CMRP also celebrated major events in partnership with the BFAR, DENR and LGU e.g. fiesta celebrations, Fish Conservation Week where simultaneous planting was done in October 2009 and International Year of the Forest in September 2011 where films were

FIG. 57. Students of Nva. Valencia National High School watch educational films on mangroves, forests and climate change in the covered gym as part of the IYOF celebration, Nva. Valencia, Guimaras, 19 Sept. 2011.

FIG. 58. PO members of Buntod Katibyugan and staff of LGU Panay install billboard of the mangrove project in Buntod, Panay, Capiz, 16 April 2011.

FIG. 59. Grade school pupils from Ibajay record observations during study visit to *Katunggan It Ibajay* Eco-park for the Science Month celebration, 29 Sept. 2010.

shown to students (Fig 57) in addition to activity launching in a mall in Iloilo City. Communities tagged the trees at the eco-park and set up signage at strategic places e.g. billboards and tarpaulins bearing project information (Fig 58). POs major advocacy and education work included facilitating cross visits of other POs, LGUs, students (Fig 59) and teachers, NGOs, tour operators and foreigners in ZSL-CMRP sites, particularly in Ibajay. POs mobilized internal resources by collecting monthly dues and membership fees.

c. Implement livelihood enhancement projects. POs implement income-generating projects using mangrove as the base resource to augment income. Such activities must be legal, environmentally sensitive, and socially and economically appropriate for the communities. The ZSL-CMRP PO livelihoods experiences include managing an eco-park (Fig 60) and the milkfish cage culture (Fig 61). The former was implemented in two economic cycles (1 cycle = 1 year operation) while the latter was implemented in one cycle (1 cycle = 1 culture period).

FIG. 60. Ibajay Mayor and ZSL scientist with LGU and DENR representatives during the *Katunggan It Ibajay* Eco-park launching, Bugtongbato, Ibajay, Aklan, 19 Jan. 2010.

The process of developing income-generating projects includes project identification (see below), proposal packaging, preparing (Box 26) and formulating business plans (Appendix 5), capacity building (Box 27), actual implementation and monitoring, and evaluating project outcomes.

Project identification process:

1. Conduct inventory of existing livelihoods in the area
2. Scan environment for locally available materials

BOX 26. Steps in Preparing a Business Plan for a Community-based Mangrove Ecotourism Park

After the feasibility study for an ecotourism business (e.g. mangrove ecoparks) is done, the community then decides whether to pursue the business and invest their time and finances. If so, the preparation of a business plan is next.

A business plan outlines the course of action for the business to follow, describes the goals and strategies of the business, and presents situation and resources to strategize how to market the business. Once the business starts, the plan will be used to convey the business' operations and goals to community members.

Steps in preparing a business plan.

1. Make an executive summary, highlighting the business
2. Create a marketing plan to include product description, competition analysis (identification of major competitors for target market; comparison of business' strengths and weaknesses versus theirs), business location, market area, target clients (expected market size, number of clients, etc), promotional measures (activities used to sell the product to overcome competition challenges).
3. Compose an operations plan, detailing the daily functioning of the business to include production process, fixed capital, repair and maintenance plan with labor and cost.
4. Construct an organization and management plan, explaining the overview of the business structure with identified persons in key positions and descriptions of their backgrounds especially relevant to the proposed business and the pre-operating expenses.
5. Develop a financial plan with capital requirements, and projected financial data and a profit and loss statement of the business.
6. Form monitoring and evaluation criteria to monitor success and method of monitoring the business.
7. Include other additional information that reinforces the business plan conclusions.

3. List initially identified livelihood enhancement projects based on PO skill and available resources
4. Assess environmental impact of livelihood enhancement projects
5. Conduct pair-wise ranking to come up with the a short list of priority projects
6. Calculate start-up project cost
7. Develop plan to include fund sourcing (e.g. contribution from members, proposal making, assistance from the LGU, etc).

To measure whether an income generating project is viable and can significantly effect increase in household income it has to be implemented in at least three economic cycles.

FIG. 61. KAMAMADO PO members selectively harvest milkfish from cages, Basyaw Cove, Dolores, Nva. Valencia, Guimaras, 3 Aug. 2011.

The KII ecopark is on its 2.5 years of operation since launching in January 2010 and an initial assessment on the effect of income to 39 households in Bugtongbato and Naisud who are directly involved in managing the ecopark was conducted. The study showed a 17-20% increase in income (Box

BOX 27. PO Capacity-Building in Operating KII

(KII is managed by two People's Organizations from the two adjoining Barangays of Bugtongbato and Naisud, Ibajay, Aklan). Below are the Capacity-Building Activities/ Training that the PO leaders attended.

1. Project Management Orientations
2. Conduct of Mangrove Ecology Training (MET)
3. Visit Other Areas thru "Lakbay Aral"
4. Facilitate Registration
5. Process Accreditation with LGU
6. Apply CBFMA with DENR
7. Leadership Training
8. Creation of Project Management Committee (PMC)
9. Regular Monthly Meeting of PMC and POs
10. Financial On-the-Job Coaching (OJC)
11. Conduct of Interpretative Tour Guiding
12. Script Practice
13. Creation of Maintenance Committee
14. Suggestions/Visit of Tourism Experts
15. Facilitate Bureau of Internal Revenue (BIR) Registration
16. Attendance to METB Meetings
17. Training for "Bantay Gubat"
18. Assistance of Business Manager from LGU
19. Financial and Visitors Updating

28) from both sites. The data used for monitoring this change in income are the visitor's arrival (Box 29) and income generated from entrance fees (Box 30).

Household income increased for Bugtongbato Fisherfolk Association (BFA) from P8,855.00 (2009) to P10,600.00 (2011). Naisud Mangrove Aquatic Organization (NAMAO) members income of P6,061.00 (2009) increased to P7,076.00 (2011) (Box 28).

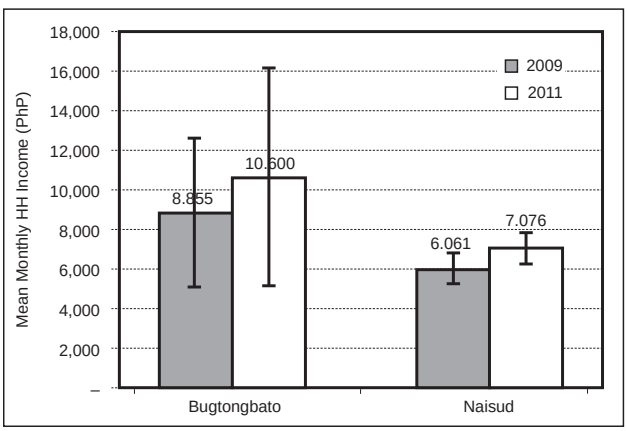
Visitors numbers peak in September each year as students visit KII to celebrate Science Month. Ninety eight percent (98%) of all visitors to KII were domestic tourists with a quarter visiting for educational purposes (Box 29).

The trend in ecopark income is increasing every year starting in 2010 indicating the potential of KII as an alternative tour destination (Box 30).

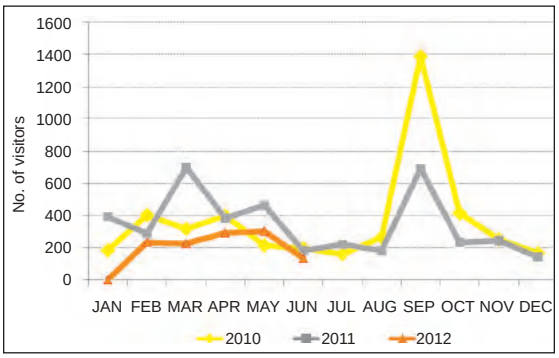
Resource-based projects must satisfy a certain set of requirements and consider its effects on the environment to be ecologically sound as in the case of the KAMAMADO milkfish cage culture project (Box 31).

5. Secure tenure and sustain community initiatives. Mangroves need long-term management, hence, a tenurial instrument for a minimum of 25 years has to be in place to sustain community activities. Mangrove areas are classified as public lands, therefore, these are open access and vulnerable to human abuse. The tenurial instrument awarded by

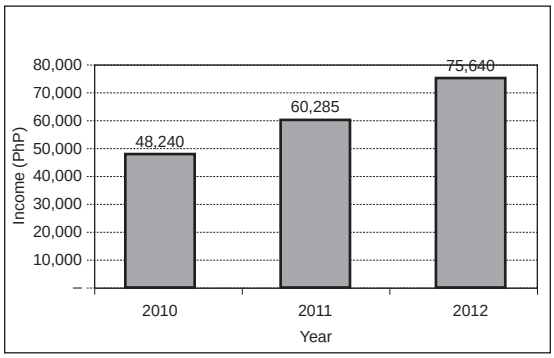
BOX 28. Graph showing change in income of POs directly involved in managing the KII ecopark, Ibajay, Aklan.



BOX 29. Data on visitors arrival in KII ecopark, Ibajay, Aklan from 2010-2012.



BOX 30. Trends in KII ecopark income from 2010-2012, Ibajay, Aklan.



DENR to communities in the mangrove areas is the CBFMA. The CBFMA grants the community authority to manage a public land. This gives them a sense of ownership to protect, manage and sustainably utilize the area. At the end of the mangrove project, the communities have invested long term-stewardship on their local environment. Thus, the CBFMA complements the years of POs' existence while allowing mangroves to full maturity. It is by sustaining mangroves that food security, coastal erosion protection, and other benefits are assured for communities. This organizing step is implemented from Year 2-4.

a. Award CBFMA to POs. The process of awarding CBFMA to the POs followed an arduous path.(Box 32). The POs formulated the 25 years Community Resource Management Framework (CRMF) (Box 33, Appendix 6) and the Annual Work Plan (AWP) (Appendix 7). The CBFMA timeline established during the ZSL- CMRP was more or less 3 years on average (Box 34). ZSL's linkage with the DENR - the agency responsible for awarding the CBFMA - should be intensified for the former to provide the necessary mentoring to the POs until the yearly review of CRMF and AWP are institutionalized at their level. In processing the CBFMA, ZSL modified some of the DENR formats to suit the POs situation and give them ownership within the process.

b. Mainstream mangrove agenda with the LGU. A mechanism to mainstream the PO mangrove agenda is to find its way into the LGU development plan like the 3-5 years short to medium-term Coastal and Resource Management (CRM) Plan (Box 35). The CRM Plan (Appendix 8) guides the LGU in identifying the appropriate interventions based on community situation from data gathered (Fig 62), prioritizing project implementation corresponding to the limited budget allocation, passing policies regulating the use of fisheries and coastal/ marine resources including mangroves and guiding key stakeholders for conducting capacity building needs. LGUs legislated and adopted during the 4th year of the ZSL-CMRP five CRM plans. A multi-stakeholder participation was ensured during CRM Planning with the BFAR, DENR, academe, Philippine National Police (PNP), Philippine Coast Guard (PCG), NGOs (e.g. Iloilo Code of NGOs, John B. Lacson Foundation), Fisheries and Aquatic Resource Management Council (FARMC) members, LGUs (village and

BOX 31: Milkfish cage culture case summary (First Run)

The implementation of KAMAMADO's milkfish (bangus) cage culture project aimed to augment income of members through rearing of milkfish in Basyaw Cove. Funds amounting to PhP150,000.00 came from the municipal government of Nva. Valencia. The full amount was granted to KAMAMADO in November 2010. Training of 10 members was conducted 25 February 2011 at SEAFDEC-Igang Marine Station. Construction of the cage facility took place thereafter. KAMAMADO members stocked 3,120 fingerlings (sourced from Igang) in a 5x5x3 m cage on 16 March 2011.

Heavy mortality occurred two weeks after stocking. Samples were analyzed at the Fish Health Section of SEAFDEC in Tigbauan, Iloilo. The mortality was due to the presence of parasites (protozoan) on the gills of weakened fish. These microorganisms proliferate in areas with slow water current. Traces of mud were present on the external part of the body. The recommendations were frequent changing of nets, 50ppm formalin bath for 30 minutes with strong aeration, ascorbic acid (Vitamin C) supplementation mixed in feed with squid oil, cod liver oil or egg white, OTC (Oxytetracycline) antibiotic 50-mg per kilo of feed mixed and given for 5-7 days, reduce feeding ration from 8 kilos to 5 kilos per day, transfer cage to alternative site with sufficient water current and away from ponds where excessive runoff of mud occurs during rainy season. Due to high mortality, 516 pieces of bangus fingerlings were replaced by the supplier on 2 May 2011.

The culture period was 157 days or 5 months and 7 days. Weight at harvest was 250-300 grams per piece (3-4 pieces:1 kilo). Three batches of harvest were done with a total of 663 kilos. The fish were sold locally for PhP120.00 per kilo.

Financial analysis

Sales (633 kilos x PhP 120.00/ kilo)	75, 960.00
Less: Operating expenses (fingerlings, feeds, maintenance, Transportation, supplies, materials, etc)	77,259.00
Net income (loss)	(1,299.00)
Return on Investment (ROI)	-1.68%

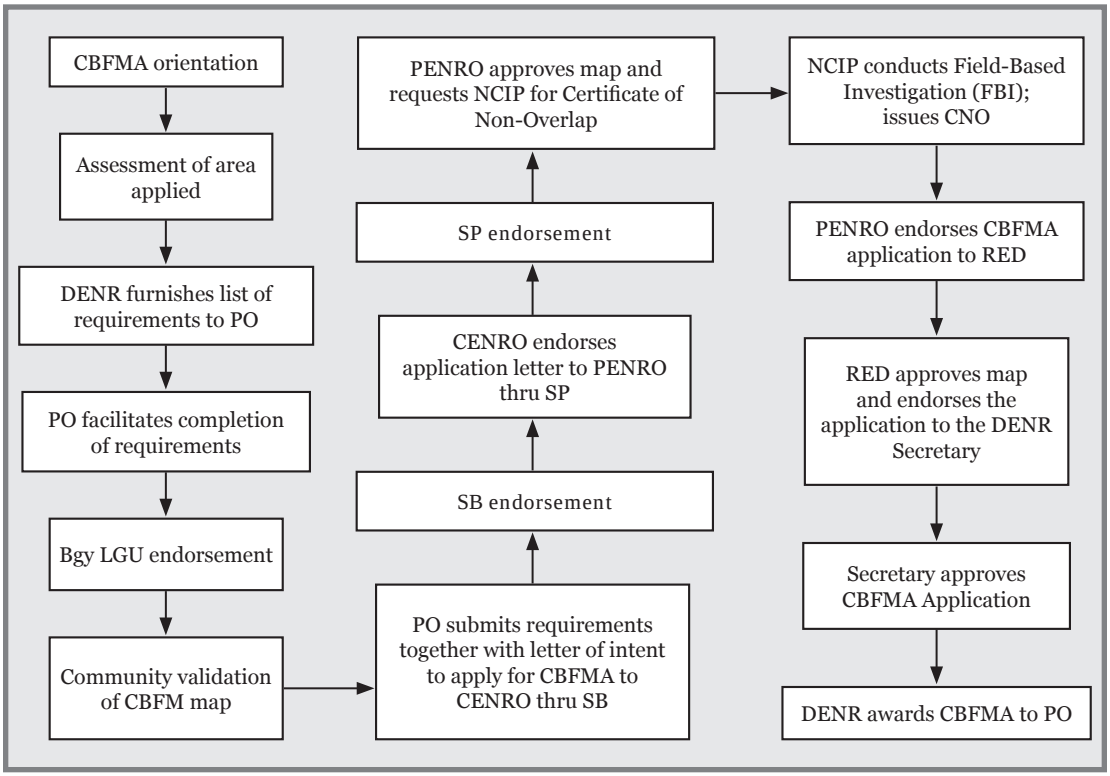
Problems Encountered and Observed

- Heavy mortality was experienced two weeks after stocking due to the lesions from stressed fish stocks.
- High feed conversion ratio (average 2.56:1) and slow growth (average 1.49 grams/day) of the fish (meaning most of the feeds consumed by the fish are not efficiently converted to biomass) caused by slow water current in shallow areas. It was recommended to transfer the cage to a deeper area with moderate water current. This was not followed by KAMAMADO.
- Poor site selection since the cage was placed inside the cove with 3.5-meter depth and slow water current rate. This was contrary to the recommendation of Dr. Gil Jacinto of UP-MSI to place the cage in deeper and clearer water.
- Sludge clung to the net (deployed prior to stocking) instead of algae thus contributing to low DO.
- Fish were trapped in between the double netting (supposed to prevent escape of fingerlings).
- Mortalities were replaced by fingerlings that were smaller in size making feed calculation difficult.
- No written policy on collection of sales from members who were allowed to sell the fish harvested and incentive/ sharing of harvest.
- Members were allotted PhP 12,000.00 as incentive even if losses were experienced.
- KAMAMADO intends to set up the next run without listening to the suggestion of ZSL of relocating cages near the cove's mouth where area is deeper/ faster current flow.
- Engagement with SEAFDEC did not materialize.

Lessons Learned

- Suspend the second cropping cycle and look for alternative sites (mouth of the cove) with at least 6-meters depth and moderate water current.
- Start the production at the onset of the Northeast Monsoon *(amihan)*.
- If KAMAMADO plans to push through with a second run in the same site, corrective measures should be applied as follows:
  1. Cost cutting of food allowance given to member caretakers
  2. Review feeding scheme
  3. Change of net every week should be mandatory
  4. Use single net instead of double net
  5. Caretakers must be vigilant re unusual movement of fish – immediately report observations to the management
  6. Members who have not undergone training should render duty with a trained partner
  7. Marketing should be wholesale even if price is lower; at present P24,000.00 of total sales from the MF harvest in August remains uncollected
  8. The site for the next run will be the same site as the last experimental run
  9. Payment of fingerlings should be done 15 days after stocking to cover stocking mortalities
  10. Reduce number of stocks/bag during transport and delivery
  11. Get Average Body Weight (ABW) of fish stock at start of culture as basis for calculating feeding rate
  12. Incentives should be based on net income
  13. The same set of beneficiaries will run the second culture trial since they have experience and to recover losses from the first run

BOX 32. Flow chart in processing CBFMA application based on ZSL-CMRP experience



BOX 33. CRMF Outline

The Community Resource Management Framework (CRMF) was developed by the PO members and other stakeholders with the supervision of the DENR. The CRMF workshop was done in three days with the following outline:

Part I. Introduction

A. Basic Information
- Name and address of the People's Organization (PO)
- Head of the PO
- Registration (name of agency, registration number and date)
- Total number of members
- Approved CBFMA (number and date of issuance, area covered, location, management)

B. Background
- B.1 BPFA as an organization
- B.2 CRMF and the Workshop Process

Part II. Present situation

1. *The Community*
2. The CBFMA area
   a. Location.
   b. Present land uses & approximate vegetative cover status
   c. Known important resources on the area
      c.1 timber resources
      c.2 non-timber resources
3. Community challenges
   a. Known or perceived constraint to CBFM implementation.
   b. Assistance Required from DENR and/or other Agencies.

Part III. Community Strategic Resources Management Plan

1. Vision, Mission
2. Goals and Objectives
   a. Organizational and physical goals
   b. Organizational and physical objectives
3. The Community's Envisioned Forest Land Use and Resource Use
4. Joint Community & DENR Assessment of Resources Usage/Extraction
5. The Community's Indicative Forest Management Strategies
6. The Community's Proposed Environmental & Socio-economic Impact Indicators
   a. Environmental
   b. Socio-economic
7. The Community's Proposed Financing Strategy and Accessible Resources/Funds
8. The Community's Proposed Marketing Strategies

BOX 34. Example of CBFMA timeline based on the ZSL-CMRP experience

Step	Documents required	Number of days	Responsible person/s
1. CBFMA orientation		1	DENR CENRO
2. Mapping/ assessment of applied area	Map of applied CBFM area, cadastral map, LC map	75 days	DENR CENRO
3. Secure list of CBFMA requirements from DENR	List of requirements for CBFM application	1	PO leaders/ CO
4. PO comply with CBFMA requirements	CBL Registration/ Accreditation certificate List of officers and members with their partners Letter of intent	75 days	PO leaders/ CO
5. BLGU endorses application to SB	Compiled requirements and BLGU resolution endorsing CBFM application	7days	BLGU/PO leaders
6. Community validation	Draft CBFM map	5 days	PO leaders, DENR CENRO
7. Submission of CBFMA application to CENRO thru SB; SB accreditation and endorsement	Compiled requirements and BLGU resolution endorsing CBFM application, draft CBFM map, BLGU endorsement	45 days	SB, CO, PO leaders
8. Submission of CBFMA application to the SP; SP accreditation and endorsement	MLGU and CENRO endorsement, compiled requirements and BLGU resolution endorsing CBFM application, draft CBFM map	60 days	SP, CO, PO leaders
9. PENRO approval of map	Draft CBFM map validated by community	60 days	DENR PENRO
10. PENRO request for/ CNO from NCIP	MLGU and CENRO endorsement, compiled requirements and BLGU resolution endorsing CBFM application, approved CBFM map	120 days	NCIP, CO
11. PENRO submits CBFMA application to RED	SP, MLGU and CENRO endorsement, compiled requirements and BLGU resolution endorsing CBFM application, approved CBFM map, NCIP CNO	7 days	PENRO
12. RED approval/ endorsement to DENR secretary	PENRO, SP, MLGU and CENRO endorsement, compiled requirements and BLGU resolution endorsing CBFM application, approved CBFM map, NCIP CNO	30 days	RED
13. DENR secretary approval	RED, PENRO, SP, MLGU and CENRO endorsement, compiled requirements and BLGU resolution endorsing CBFM application, approved CBFM map, NCIP CNO	90 days	DENR secretary
14. Awarding of CBFMA	Certificate of award	1 day	RED
Total days		577 days	

BOX 35. Steps in CRM Plan formulation

1. Map coastal resources, uses, issues and problems
2. Collect secondary data
3. Train local researchers and collect socio-economic data
4. Train local MENRO/MAO on MCS
5. Conduct MCS
6. Assess corals, fishes, sea grass beds
7. Assess Coastal Law Enforcement Team and its operation
8. Assess management of MPAs
9. Consolidate and compile socio-economic data
10. Conduct CRM planning workshop
11. Draft CRM plan (presented during village consultations by cluster)
12. Finalize/ submit to SB for adoption/ legislation
13. Implement CRM plan

FIG. 62. Community resource mapping in preparation for the comprehensive CRM Plan, Balaring, Ivisan, 6 April 2011.

municipal) and the coastal communities represented. The local legislative council members were present during the planning.

Policies in the ZSL sites are in the form of Municipal Fisheries Ordinance (MFO) or Municipal Fisheries Code (MFC). After the CRM Planning, revising the existing policies was observed as a necessity for complementing and giving strength to the programs and projects identified in the plan and ensuring for a sustainable utilization of the coastal and marine resources. Developing the MFC, in the case of Ivisan, started with the coastal communities' consultation until it was passed by the local legislative council (Box 36). The MFC highlighted zoning the coastal and marine areas and defin-

BOX 36. Steps in Policy Formulation

a. Barangay Level

1. Consult community on issues that need to be addressed by policies
2. Review existing policies, resolutions and ordinances
3. Identify policy gaps
4. Prioritize policies that will have greater impact on the issues faced by the community
5. Formulate policies through workshop
6. Present the draft policies during Barangay Council session
7. BC to conduct public hearing thru general assembly
8. Final reading of the policies by the Barangay Council during the session
9. Endorse policies to the Sangguniang Bayan members for adoption
10. Post approved policies in strategic places
11. Enforcement

b. Municipal Level

1. Conduct of community consultation to identify issues
2. Participatory review of existing policies e.g. review of Municipal Fishery Ordinance, Municipal Revenue/Tax Code, other related laws/policies
3. Identify policy gaps
4. Formulate policies thru a workshop
5. Read title of policy during SB session
6. Conduct public hearing
7. Final reading of policies by the Sangguniang Bayan during session
8. Approval of an ordinance or resolution
9. Popularize policies through community feed backing, posting in conspicuous places and publication in a local newspaper
10. Enforcement

BOX 37. Outline of the Municipal Fisheries Code of Ivisan

List of Acronyms

Chapter 1: Background Information
- A. Vision, Mission and Objectives
- B. The CRM Planning Process
- C. Site profile

Chapter 2: Development Problems, Issues, and Concerns

Chapter 3: Management and Operations Plan
- A. Coastal Zoning
  - Zone 1. Mariculture Zone
  - Zone 2. Protection Zone
  - Zone 3. Sustainable Eco-tourism Zone
  - Zone 4. Multiple-Use Zone
  - Zone 5. Fishpond Zone
  - Zone 6. Stationary Fishing Gear Zone
- C. Fisheries Management
- D. Habitat Conservation and Protection
- E. Shoreline Management
- F. Coastal Tourism
- G. Enterprise and Livelihood
- H. Waste Management
- I. Legal Arrangement and Institutional Development

Appendices

ing the activities allowed and not allowed in the zones (Box 37, Appendix 9). In Pedada, village policies were passed to protect the birds and wildlife that exist in the area, to enhance communities' roles and responsibilities by requiring residents to plant mangrove prior to issuance of village licenses, to regulate the harvest of fish and shellfish in mangroves and to conduct intensive study on the areas potential before mangrove planting (Appendix 10). These policies were submitted to the LGU of Ajuy for adoption (Fig 63). The LGU of Leganes passed the first mangrove ordinance to protect coastal areas from continuing erosion (Appendix 11). In Ibajay, Municipal Ordinance #92 Series of 2009 (Appendix 12) declared the 44.22 hectares of mangroves in Bugtongbato and Naisud as Eco-park after conducting Barangay consultations (Fig 64).

c. Maintain partnerships and linkage with LGUs and schools. Maintaining the partnerships forged with LGUs and schools at the start of the project was a challenge. During the 4th year of the ZSL-CMRP, a mechanism was devised to ensure that LGUs and schools continue mentoring and assisting the POs after the project's life. The LGUs in the last year were given more responsibilities in engaging the communities for project sustainability. The Municipal Agriculture Officer (MAO) or the Municipal Environment and Natural Resources Officer (MENRO) representing the partner LGUs were present during the strategic planning

FIG. 63. Policy development workshop with BFAR, DENR, NIPSC and LGU partners, Ajuy, Iloilo, 27 January 2011

FIG. 64. Barangay Consultation to declare the 44.22 hectares mangroves in Bugtongbato and Naisud as eco-park, Bugtongbato, Ibajay, Aklan, 4 May 2009.

session designed for the POs. The LGU partners were generous in terms of budgeting and providing financial counterpart as a result of the partnership arrangements and strong linkages (Box 38). Likewise, hierarchies of LGU governance and phasing were considered in partnering with them to maximize contribution as in the case of Ibajay (http://coastalcura.ca/peopleinplaces2011.html).

The engagement with the schools was equally fulfilling in terms of planting and maintaining mangroves, establishing nurseries, campaigning and raising awareness and in conducting participatory research with communities (Box 39). To maintain long-term partnerships, a new formal agreement complementing obligations and roles between the POs and the schools needs to be executed. The ZSL-CMRP engagement with the Northern Iloilo Polytechnic State College– Ajuy campus (Fig 65) was used as an example in making further partnership agreements with other schools. The schools are excellent grounds for advocacy since the young students have the enthusiasm and the drive to perform community extension work (Fig 66). Exposing the school teachers in various seminars and forum increased their involvement in helping these communities e.g. presence of school teachers during project orientations, film showings, planting and bagging activities; participation of Nabitasan National High School (NNHS) principal in the PO-NGO workshop of CMRP; and, presentation of a NIPSC professor with ZSL CO to the Philippine Association of Marine Scientist (PAMS) on their schools experience working with ZSL. NIPSC is now slowly embracing their role in helping mangrove communities. The advocacy within the NIPSC campuses has started with written news items (Fig 67) and awards for teachers on their exemplary extension work done in the ZSL-CMRP sites.

BOX 38. Summary of LGU counterparts to CMRP.

Year	Amount of LGUs, LGAs and NGO Counterparts (PhP)	Activity/ Items Covered
2009	141,428.00	Venue; plastic bags, labour, refreshments, and transportation for planting; boat fare to/from Cebu City, per diems and other incidental expenses for Bohol Study Tour; food/hotel accommodation for Panay Study Tour
2010	2,017,700.00	Construction of footwalk in KII, counterpart for trainings, launching of KII, METB Meetings, planting activities, cost of seedlings, truck used to transport students, snacks for outplanting activities
2011	1,635,400.00	Food for participants in CRM Planning Workshop, boat rental in conduct of PCRA among coastal and island barangays, establishment of nursery, rest house, signage, salary of 2 caretakers, cost of material counterpart for bamboo for barriers to protect newly planted mangrove seedlings, cost of material counterpart in signages, construction of eco-park facilities and road rehabilitation for Pedada, Ajuy
2012	575,000.00	Food and accommodation for participants to the National Mangrove Conference
Total	4,369,528.00	

BOX 39. Schools contribution to the CMRP targets

Year	Total Planted	Species Planted	Planted by Students	Percentage of Students' Contribution	Number of Student Participants
Outplanting					
2009	13,121	AM, RA, RM, SA	1,483	11%	129
2010	33,340	AM, RM, SA	9,018	27%	584
2011	39,585	Mixed, RM, RA, AM, SA	8,727	22%	362
Total	86,046		19,228	22%	1,075
Nursery/ Bagging					
2009	12,538	Mixed, RM, RA, AM, SA, NF	2,416	19%	204
2010	21,452	Mixed, RM, RA, AM, SA	5,045	24%	1,077
2011	9,800	Mixed, RM, RA, AM, SA	4,679	48%	495
Total	43,790		12,140	28%	1,776

AM - *Avicennia marina* RM - *Rhizophora mucronata* NF - *Nypa fruticans*
RA - *Rhizophora apiculata* SA - *Sonneratia alba*

d. Promote non-pay planting. In the past mangrove rehabilitation projects contracted out and paid communities with money for establishing nurseries and outplanting. Three of the five ZSL-CMRP sites were either previously engaged (Balaring, Ivisan) or currently engaged (Buntod, Panay and Pedada, Ajuy) with this kind of arrangement. Contracting is initially coursed through the BLGU, then through the PO (Buntod Katibyugan) and lastly through the MLGU. In Balaring, engaging the communities to outplant and establish nurseries proved to be very difficult because of their previous experience: People were lured with money and promises of income-generating projects which in the end turned out to benefit only a few and thus disappointed the many. Moreover plant survival was very poor. It was a major challenge for the CO to start issue-based organizing and to promote no payment scheme for the mangrove activities. Continuing education, raising level of awareness

FIG. 65. Culmination activity of NIPSC students and MOA signing, Ajuy, Iloilo, 24 Feb. 2011.

FIG. 66. NIPSC students outplanting in Bgy. Pedada, Ajuy, Iloilo, 25 Sept. 2010.

FIG. 67. NIPSC newsletter *The Projection*

FIG. 68 (far right). BPFA members during the strategic planning workshop in Bgy. Pedada, Ajuy, Iloilo, 8 March 2012.

and mobilizing communities resulted to a paradigm shift wherein communities recognize the importance of mangrove to their livelihoods. In Pedada and Buntod, the CO had to initiate a dialogue with the LGU and the PO leaders to tone down the payment scheme as come-on for people to plant.

e. ***Formulate PO strategic plan.*** The ZSL-CMRP conducted a strategic planning session for the POs (Fig 68) to prepare them for the eventual exit of CMRP from the sites (Box 40). The plan included enhancing the cohesiveness and capacity of the POs giving equal opportunities to both men and women, and recognizing their peculiar contribution to mangrove management and monitoring (http://genderaquafish.org/), coordinating closely with the DENR in reviewing and formulating AWPs and CRMFs, sourcing funds for alternative livelihoods project support,

BOX 40. PO strategic planning guide

Day	Activity	Time Allocation
Day 01	Opening Activities Prayer National Anthem Introduction of Participants Expectation Checking Rationale and Objectives of the Activity	1 Hour 30 Minutes
	Inputs What is Strategic Planning? Components of a Strategic Plan	1 Hour 30 Minutes
	Workshop 1 Define Scope, Targets and Threats Map Behavior Change Pathways	4 hours
Day 02	Workshop 2 Benefits and Barriers Formulation of Strategic Actions	8 hours
Day 03	Workshop 3 Review of Vision, Mission and Goals Enhancement of Organizational Governance	4 hours
	Membership Protocol	2 hours
	Closing	1 hour 30 minutes

BOX 41. PO capacity building matrix

CMRP Indicators	Sites					
	Naisud	Bugtong-bato	Balaring	Buntod	Pedada	Dolores
Leadership training						
Basic	✓	✓	✓	✓	✓	✓
Skills (facilitating meetings, communication, decision-making, problem solving)	✓	✓	✓	✓	✓	✓
Conflict mgt/ principled negotiation	✓	✓	✓	✓	✓	✓
Organizational structure						
Elected set of officers/ complete structure	✓	✓	✓	✓	✓	✓
Clear/defined roles/ responsibilities	✓	✓	✓	✓	✓	✓
Constitution and by-laws						
Written and approved	✓	✓	✓	✓	✓	✓
Understood by members	✓	✓	✓	✓	✓	✓
Registration						
With DOLE	✓	✓	✓	✓	✓	✓
With SEC						✓
LGU accreditation	✓	✓	✓	✓	✓	✓
Membership to Local Special Bodies (LSB)/ Council (at least 1)	✓	✓	✓	✓	✓	✓
Vision Mission Goal (VMG) set	✓	✓	✓	✓	✓	✓
Conduct of regular meetings	✓	✓	✓	✓	✓	✓
Organizational policies/ systems/ developed/ installed/ manualized/ approved by GA - manualized	✓	✓	✓	✓	✓	✓
Technical trainings (with at least 50% of active members participating)						
Mangrove ecology	✓	✓	✓	✓	✓	✓
Mangrove laws	✓	✓	✓	✓	✓	✓
FLA policies	✓	✓	✓	✓	✓	✓
Greenbelts policies	✓	✓	✓	✓	✓	✓
Sustainable CRM	✓	✓	✓	✓	✓	✓
Membership (at least 20/ PO)	✓	✓	✓	✓	✓	✓
PO managing programs / projects	✓	✓	✗	✓	✓	✓
Linkages established	✓	✓	✓	✓	✓	✓
Organizational funds						
Membership dues paid	✓	✓	✓	✓	✓	✓
CBU system in place/ monthly dues paid	✓	✓	✗	✓	✓	✓

developing direct linkages between POs and institutions and LGUs among others. In summary, the PO strategic plan is the document that will give them direction over the next 5-10 years. The first part of the strategic planning process is revisiting the organizational Vision, Mission and Goals, as well as governance and policies.

At the beginning of the project, a capacity building matrix was developed by ZSL CMRP to determine POs progress over the years. Essentially the matrix shows the set of activities needed to enhance the POs functionality as an organization (Box 41).

VI. Conclusions

The four years of CMRP have provided many important lessons for both nursery and growout phases in mangrove rehabilitation, and the socioeconomic aspects as well. First, nurseries are necessary to provide the required size/age, quantities and mangrove species within a suitable planting season. For communities, small-scale backyard nurseries have the advantages of low cost and conveniently simple operations. Another major contribution was identifying the value and use of abundant wildings trapped among pneumatophores (pencil) and other roots or along dikes of derelict ponds, forming veritable seedling banks where Nature's excess wildings (bank interest) are withdrawn, so to speak. Another component of this interest is the time saved equivalent to the age of the wilding (6 mo-1.5 yr) when collected.

Given the paradigm of 4 mangrove:1 pond ratio for ecological health, the ZSL-CMRP has shown that such a goal can be achieved faster by targetting abandoned ponds rather than the open access but ecologically difficult seafront. To revert abandoned ponds back to mangroves, the ZSL-CMRP recommends planting using wildings, as it shortens the period to only 3-5 yr for full canopy

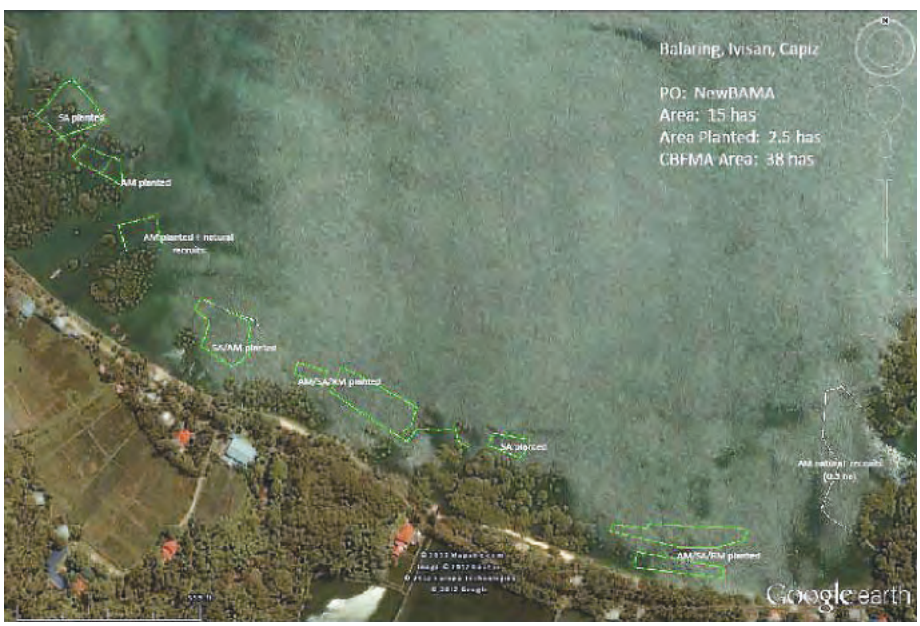


FIG. 69. Community-based rehabilitation of mangrove greenbelt in Balaring, Ivisan, Capiz.

to be restored compared to 15-20 yr with Natural Regeneration. Nevertheless, poor communities have no means to relocate to higher ground, therefore coastal protection is a must. In such cases, selection of mangrove sites along the seafront should be conducted during neap tide and planting should start from the beach in a seaward direction, instead of the standard spring tide survey and planting from the outermost margin, which characterize most mangrove planting activities. Other innovations for seafront rehabilitation include the use of taller, nursery saplings, and the construction of protective barriers (for wave action, erosion) and stationary fences or floating markers (to keep out stray animals, gleaners and fishing boats during high tide). A successful application of the protocols described above can help communities restore their coastal greenbelts, as seen in the satellite image of plantations connected end-to-end in the CMRP Balaring, Ivisan, Capiz site (Fig. 69).

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Glossary

abscission layer
zone of cells at the bases of fruits, flowers, and leaves whose breakdown causes separation of the structure from the stem

algae
aquatic plants without roots, stem or leaves but which contain chlorophyll

barnacle
marine crustacean with an external shell, permanently attached to rocks, boats and other surfaces

barrier
structure that prevents movement, such as the flow of water

breakwater
barrier built into the sea to reduce wave action and protect the shoreline

fringing mangroves
bands of mangroves along shorelines and islands, covered by daily tides

gleaners
pickers or gatherers of shells and other marine products in mudflats and sandflats exposed during low tide

greenbelt
belt of natural or planted forests or parks that lines a shoreline or river-bank, or encircles a community

hydrology
movement and other properties of water bodies, especially as influenced by tides

hypocotyl
portion of the stem of a plant embryo below the seed leaves or cotyledons

lower intertidal zone
coastal zone mostly submerged, only exposed during the lowest tides

Mean Sea Level (MSL)
the sea level halfway between the mean high tide and the mean low tide

middle intertidal zone
coastal zone regularly submerged by all high tides and exposed during all low tides

nodal distance
distance between two consecutive nodes

node
point on a stem where a leaf or leaves are attached

overwash mangroves
mangroves on small islands that are frequently washed by the tides

oviparous
plant that produces fruits (fertilized eggs) which germinate and develop after separation from the parent plant

peat layer
layer of soil rich in organic matter, mainly decaying plant material, saturated in water

pericarp
wall of the ripened fruit

pH
measure of the acidity/ alkalinity of a substance based on the concentration of hydrogen ions (H+). The pH of pure water is 7 and is referred to as neutral. A solution of pH less than 7 is said to be acid whereas a solution of pH above 7 is said to be alkaline.

pneumatophores
aerial roots, often pencil- or cone-shaped, with many pores and intercellular spaces for gas exchange; arising from cable or lateral roots

propagule
seed or seedling capable of producing a new plant, usually applied to Rhizophora and related genera

quadrat
a small square or rectangular area selected for intensive sampling to assess the entire population in the area

recruits
young plants (seedlings or wildings) that are added to the population each year

rehabilitation
aims to re-establish most, but not all, key processes and functions

restoration
aims to re-establish former biodiversity and all key ecological processes and functions, i.e., to bring an ecosystem back into, as nearly as possible, its original condition

salinity
measure of the total quantity of dissolved minerals and chlorides in water or soil expressed in parts per thousand (ppt); the saltness of water

saplings
a young tree, over one meter high, with trunk or stem more than 4 cm diameter

seedling
young plant grown from seed, less than one meter high

semidiurnal
occurring twice a day, with two high and two low waters each lunar day

upper intertidal zone
mostly dry coastal zone, covered by the highest tide but not the lowest high tides

viviparous
plant whose seeds germinate within the fruit and form plantlets while still attached to the parent plant

wildings (also spelled wildling)
young plant growing uncultivated in the wild

Appendix 1: Monitoring Sheet

MONITORING GROWTH

Species: _____ Site: _____ Date: _____

Plant No.	Height (cm)	No. of Leaves	No. of Nodes*	Nodal Distance (cm)*	Remarks
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

*Only for *Rhizophora* species

Appendix 2: Sample MOA with LGU

MEMORANDUM OF AGREEMENT

KNOW ALL PERSONS BY THESE PRESENTS:

This Agreement made and entered into by and between:

The **Community-Based Mangrove Rehabilitation Project in the Philippines (CRMP)** of the **Zoological Society of London,** a non-governmental organization with official address at Muzon San Luis Bldg., 132 Quezon St., Iloilo City and represented by its Project Manager, **Dr. Jurgenne H. Primavera,** herein referred to as **ZSL Mangrove Project**;

and

The **MUNICIPALITY OF LEGANES, ILOILO,** a duly constituted LOCAL GOVERNMENT UNIT with official address at Poblacion Leganes, Iloilo and represented by its Municipal Mayor, the **Hon. Adolfo Jaen,** herein referred to as the **Leganes LGU;**

WITNESSETH:

WHEREAS, the ZSL Mangrove Project aims to conserve wildlife populations and ecosystems, specifically by restoring mangrove ecology while allowing local communities to benefit from these resources in a sustainable fashion;

WHEREAS, Sec. 16 of Republic Act 8550 (Philippine Fisheries Code of 1998) states that the municipal government shall be responsible for the management, conservation, development, protection, and utilization of fishing/aquatic resources within municipal waters under their jurisdiction;

WHEREAS, the ZSL Mangrove Project and the Leganes LGU will jointly embark on a mangrove project for Barangay Bigke, covering an area of .36 ha with coordinates

N	10	°	45	′	53.3	E	122	°	36	′	3.9
N	10	°	45	′	53.3	E	122	°	36	′	3.6
N	10	°	45	′	54.1	E	122	°	36	′	4.3
N	10	°	45	′	54.2	E	122	°	36	′	4.2
N	10	°	45	′	54.3	E	122	°	36	′	4.5
N	10	°	45	′	54.2	E	122	°	36	′	4.4
N	10	°	45	′	54.0	E	122	°	36	′	4.7
N	10	°	45	′	53.9	E	122	°	36	′	5.5
N	10	°	45	′	54.0	E	122	°	36	′	5.4

and Barangay Nabitasan, covering an area of 9.0798 ha with coordinate

N	10	°	46	′	51.7	E	122	°	37	′	28.5
N	10	°	46	′	45.8	E	122	°	37	′	25.9
N	10	°	46	′	45.1	E	122	°	37	′	26.5
N	10	°	46	′	44.8	E	122	°	37	′	27.5
N	10	°	46	′	55.2	E	122	°	37	′	32.7
N	10	°	46	′	52.7	E	122	°	37	′	34.9
N	10	°	46	′	52.3	E	122	°	37	′	35.6
N	10	°	46	′	51.7	E	122	°	37	′	37.7
N	10	°	46	′	54.0	E	122	°	37	′	40.5

N	10	°	46	′	52.5	E	122	°	37	′	41.6
N	10	°	46	′	51.1	E	122	°	37	′	42.7
N	10	°	46	′	50.1	E	122	°	37	′	42.0
N	10	°	46	′	48.5	E	122	°	37	′	42.8
N	10	°	46	′	48.0	E	122	°	37	′	42.3
N	10	°	46	′	48.0	E	122	°	37	′	41.7
N	10	°	46	′	46.9	E	122	°	37	′	35.4

from date of signing to June 2012, aimed at rehabilitating abandoned government-leased fishponds to healthy mangrove forest, restoring the legally mandated greenbelt, and increasing coastal protection, food resources and livelihood income through the sustainable management of mangroves;

NOW THEREFORE, for and in consideration of the foregoing premises and consideration, the parties hereto agree as follows:

A. Title

This agreement shall be known as "Memorandum of Agreement between the ZSL Mangrove Project and the Local Government Unit of Leganes on the Implementation of the Mangrove Community-Based Rehabilitation Project".

B. Obligations

B.1 ZSL Mangrove Project

1. Support greenbelt establishment, reversion of abandoned ponds to mangroves;
2. Provide technical assistance, training, advisory services and related assistance in the implementation of said Mangrove Project;
3. Provide financial support in the rehabilitation and maintenance of said mangrove greenbelt and reverted ponds (to include materials for planting and nursery, monitoring, materials for the construction and installation of signage, and snacks during out-planting) for the duration of the project until June 2012;
4. Undertake regular biophysical monitoring of project sites, regularly evaluate and determine the status of project implementation;
5. Document shellfish gleaning, boat traffic and other socioeconomic uses of Bigke and Nabitasan mangroves;
6. Assist LGU in the conduct of the information and educational campaign on the importance of mangrove rehabilitation to residents of Barangays Bigke and Nabitasan, in partnership with the DENR;

B.2. Municipal Local Government Unit (Leganes)

1. Enforce the provisions of RA 7160 (Local Government Code) on environment and natural resources protection within their area of jurisdiction;
2. Clarify and rationalize tenurial status of the Leganes mangroves following the Local Government Code and the guidelines of DENR and BFAR;
3. Take the lead in the information dissemination of the project and campaign for the rehabilitation and protection of mangroves;
4. Actively participate in the interagency group that will formulate the Plan of Action and implement the project;
5. Provide support (human, material and financial counterparts) in the conduct of project activities;

6. Pass the necessary legislation in support of the project;
7. Provide technical assistance and monitoring in the conduct of site-based activities related to the project;

B.3 Barangay Local Government Unit (Bigke and Nabitasan)

1. Take the lead in maintaining, protecting and monitoring the rehabilitated mangroves
2. Actively participate in project implementation activities such as trainings, education campaign, planting, research, biophysical monitoring, etc.
3. Provide support (human, material and financial counterparts) in the conduct of project activities;
4. Pass the necessary legislation in support of the project;
5. Provide assistance in the organizational development of the barangay group that will manage the mangroves.

C. Effectivity and Period of the Agreement

This Agreement shall take effect on the date of signing by all Parties hereto and shall continue to exist until June 2012 from said date unless earlier terminated by the parties.

D. Limitations

Any changes or deviations requiring additional services or omissions in work covered by this Agreement shall be coordinated and mutually agreed upon by the Parties and may be attached as Addendum to this MOA to be signed by all parties and attached to the original document.

In witness hereof, the parties through their duly authorized representatives have hereunto affixed their signature this _____ day of _____, 2009 in _____.

For Leganes LGU	**For ZSL MANGROVE PROJECT**
HON. ADOLFO JAEN Municipal Mayor, Leganes	**JURGENNE H. PRIMAVERA, Ph.D.** Project Manager, CMRP
For Bgy. Bigke	**For Bgy. Nabitasan**
HON. NARCISO SARMIENTO Punong Barangay	**HON. LEOPOLDO JUELE SR.** Punong Barangay

Signed in the presence of

VIRGIE GUINTIVANO Officer-in-charge, MAO	**JOSEPHINE P. SAVARIS** Socio-economist, CMRP

REPUBLIC OF THE PHILIPPINES) S.S.

CITY OF **ILOILO**

X_____X

BEFORE ME, Notary Public for the Province/City/Municipality of _____, Philippines, this _____ day of _____ 2009 at _____ personally came and appeared the following:

	Parties	CTC Number	Date and Place of Issue
1)	Hon. Aoldofo Jaen		
2)	Jurgenne H. Primavera		
3)	Narciso Sarmiento		
4)	Leopoldo Juele Sr.		
5)	Josephine P. Savaris		
6)	Virgie Guintivano		

Known to me as the persons who executed this Memorandum of Agreement and acknowledged that the same is the product of their free and voluntary deed.

WITNESS MY HAND AND SEAL on the date and place first above written.

_____

NOTARY PUBLIC

PTR No. _____

Until _____

Doc No. _____ ;

Page No. _____ ;

Book No. _____ ;

Series of _____ .

Appendix 3. Household Survey Tool

SOCIO-ECONOMIC SURVEY

The Community-Based Mangrove Forest Rehabilitation and Management Project
Zoological Society of London

Date : _____
Municipality: _____
Barangay : _____

1. Full Name: _____
2. Age: _____
3. Sex: ( ) Male ( ) Female
4. Address: _____

   4.1 How long have you been residing in this barangay?
   _____
   4.2 How many times have you changed residence in the last 10 years?
   _____
   4.3 What were your reason(s) for these changes in residence? _____
   _____
   4.4 Where was your last residence before moving here? _____
   4.5 Do you have any plans to change residence in the next five (5) years? ( ) yes ( ) no
   4.5.1 If yes, why? _____
   _
   Where do you plan to reside? _____

5. Civil Status: ( ) Single ( ) Married ( ) Widow ( ) Separated
6. Highest Educational Attainment:

   ( ) College Graduate ( ) With College Units ( ) Vocational Graduate
   ( ) High School Graduate ( ) Elementary Graduate
   ( ) High School Level ( ) Elementary Level
   ( ) Others, please specify _____

7. Religious Affiliation:

   ( ) Roman Catholic ( ) Protestant ( ) Aglipay ( ) Seventh Day Adventist
   ( ) Others _____

8. To which ethnic group do you belong?

   ( ) Tagalog ( ) Cebuano ( ) Boholano ( ) Ilonggo ( ) Waray
   ( ) Others _____

9. What languages/dialects do you speak? _____
10. What is your main source of income?

    ( ) fishing ( ) farming ( ) animal husbandry
    ( ) business (specify) _____
    ( ) if no source of income, what is your source of living? _____
    ( ) others, specify _____

(Note: Please answer 10.a.1 to 10.a.7 if you are a full time or a part-time fisherman)

a.1 How many years have you been fishing? _____
a.2 How many months do you go fishing in a year? _____
a.3 How many days do you go fishing in a month? _____
a.4 How many times do you go fishing in a day? _____
a.5 From whom or where did you learn fishing? _____
a.6 What fishing gear or equipment do you own?
( ) Fishing boat ( ) Fish net ( ) Cooler ( ) others specify _____
a.7 What do you do with the fish and other marine plants and creatures you have caught or harvested?
( ) Sell to fish vendors or traders ( ) Home consumption
( ) Sell directly to consumers ( ) Process for home consumption
( ) Process for selling ( ) Others, specify _____

(Note: Please answer 10.b.1 to 10.b.7 for source of income taken from the mangroves)

b.1 How many years have you been harvesting resources from the mangrove? _____
b.2 How many months in a year do you do this? _____
b.3 How many days in a month do you do this? _____
b.4 How many times in a day do you do this? _____
b.5 From whom or where did you this activity? _____
b.6 What equipment do you own in doing this kind of activity?
( ) Fishing boat ( ) Fish net ( ) others _____
b.7 What do you do with the fish, shells, crustaceans and other mangrove resources that you have caught or harvested?
( ) Sell to fish vendors or traders ( ) Home consumption
( ) Sell directly to consumers ( ) Process for home consumption
( ) Process for selling ( ) Others, specify _____

11. What are your other sources of income?

( ) Farming ( ) Vending ( ) Running a sari-sari store
( ) Livestock raising ( ) Fish production/aquaculture ( ) Cooking
( ) Remittance from other family member ( ) Fish processing
( ) Dressmaking/tailoring ( ) Copra making ( ) Rental of properties
( ) Carpentry ( ) Others, please specify _____

12. What is your household total monthly income? _____

13. What other socio-economic skills do you know?

( ) Farming ( ) Vending ( ) Running a sari-sari store
( ) Carpentry ( ) Cooking ( ) Dressmaking/tailoring
( ) Copra making ( ) Livestock-raising
( ) Others, please specify _____

14. Do you have any savings? ( ) yes ( ) no

15. Household Members:

15.1 Tell me about the people who are now living in your household. (Include respondent)

Name	Position in the family	Sex	Age	Civil Status	Educational Level	Occupation	Estimated monthly income contributed to the family

15.2 Tell me about your family members who live outside the household but still consider your house their home.

Name	Position in the family	Sex	Age	Civil Status	Educational Level	Occupation	Estimated monthly income contributed to the family

16. House Ownership. Is your house ( ) owned? ( ) rented? (how much?)_____
( ) not owned? (specify) _____

17. If owned, how did you acquire it? ( ) inherited ( ) bought ( ) built

18. Type of dwelling:
( ) light materials (nipa/cogon/bamboo) ( ) mixed materials (combination of
( ) permanent (concrete/cement) wood/bamboo with GI roof/cement)
( ) others (specify) _____

19. Home lot ownership. Is your lot ( ) owned? ( ) rented? (how much?)_____
( ) not owned? (specify) _____

20. Do you have the following appliances/facilities in your house? Please check if you have.
( ) radio ( ) television ( ) Audio cassette player ( ) gas stove ( ) bed
( ) sewing machine ( ) sala set ( ) video camera ( ) refrigerator
( ) Typewriter ( ) others (specify) _____

21. Lighting facility:
( ) with electricity ( ) without electricity

If without electricity specify type of lighting facility
( ) kerosene lamp ( ) petromax/gas-operated ( ) generator-operated
( ) others (specify) _____

22. Toilet facility:
( ) with toilet facility ( ) without toilet facility

If with toilet facility, specify type
( ) Antipolo type ( ) water-sealed ( ) Others, please specify _____

If without toilet, specify where waste is disposed _____

23. What are your sources of potable water?
( ) artesian well ( ) spring ( ) deep well ( ) water service facility
( ) rain water ( ) bottled water ( ) Others, please specify _____

24. How do you dispose of your garbage?
( ) Throw in the family or community pit ( ) Burn
( ) Collected by the garbage collector ( ) Recycled
( ) Others, please specify _____

25. Property ownership

25.1 Farm Land ( ) yes ( ) no

If yes, type of ownership ( ) owned, how big? _____
( ) not owned, but leased, how much a year? _____
( ) tenant, what is the sharing system? _____

25.2 Fishing gear

( ) motorized boat (specify number)_____
( ) banca (specify number) _____
( ) nets (specify types of nets) _____
( ) other fishing gears (specify) _____

25.3 Animals owned

( ) carabao, how many_____ ( ) cattle, how many _____
( ) chickens, how many _____ ( ) horses, how many_____
( ) ducks, how many _____ ( ) pigs, how many _____
( ) goats, how many _____

26. Credit facility

26.1 If you need to borrow money, where do you usually go?

( ) relatives ( ) suki ( ) neighbors/friends ( ) pawnshop
( ) credit coop ( ) loan sharks ("5/6") ( ) banks ( ) bombay
( ) others (specify) _____

26.2 How is repayment done?

( ) specified period of time, with interest rate (specify rate) _____
( ) specified period of time, without interest rate
( ) no specific period of time
( ) other arrangements (specify) _____

27. What economic activities are primarily done by specific member(s) of your family? Please check.

Nature of Activities	Mother/Wife	Father/Husband	Daughter(s)	Son(s)
Fishing				
• fish capture				
• processing/drying offish				
• mendingnets & other gears				
• preparing gears for fishing				
• gleaning				
• mariculture				
• others, specify				
Farming				
• feeding				
• marketing/selling				
• others, specify				
Other income-generating activities				
• small-scale business				
• handicrafts				
• marine-based IGP				
• others, specify				

28. What percentage of your income is derived from fishing?

( ) 76% - 100% ( ) 50% - 75% ( ) 25% - 50% ( ) less than 25%

29. Health data

29.1. Source of drinking water

( ) piped water ( ) stream/spring ( ) dug open well
( ) water pump ( ) river

29.2. During the past year, what illness/diseases were experienced by the family?

Type of illnesses/diseases	Who in the family?

30. Membership in Organization.

Household Member	Name of Organization	Position	Type of Organization
Husband	1.		
	2.		
Wife	1.		
	2.		
Daughter(s)			
1.			
Son(s)			
1.			

31. Is there any organization/group, NGO or government agency in your barangay with environmental programs? ( ) yes ( ) no

31.1. If yes, what is/are these? Please indicate environmental programs and services for each.

32. What are the problems and issues faced by your family? How do you think these problems may be solved?

Problems	Proposed solutions

33. What are the problems and issues faced by your community? How do you think these problems may be solved?

Problems	Proposed solutions

34. How do you perceive the situation in your mangrove areas now?

35. How do you envision your mangrove area five years from now?

36. Have you noticed any public announcements posted in your barangay or barangay hall?
( ) yes ( ) no

37. Have you noticed any of the barangay or local governmentofficials or any other government or nongovernment agencies making announcements in the community?
( ) yes ( ) no

38. Have you received information on the following areas or topic? If yes, from where?

INFORMATION RECEIVED	Yes	No	SOURCES OF INFORMATION			
			NGO/PO	GO	Private	Others
Fishing laws, policies and procedures						
Credit						
Environment conservation						
Livestock raising						
Fisheries resource management						
Farming						
Leadershipang management						
Fishing technology						
Fishprocessing						
Aquaculture						
Marketing						
Project development & management						
Information, education and communication						
Enterprise development and management						
Others, please specify						

39. Can you identify fisheries and concerns related to mangrove which you consider as important?

_____

_____

_____

40. Have you observed any change in your coastal environment and mangrove resources in the past five (5) years?
( ) yes ( ) no
a. If yes, kindly specify effects of the changes to the community.

_____

_____

41. Are you aware of local beliefs, myths, and folklore about the environment?
( ) yes ( ) no

42. Are you aware of any assistance your community has received from government for the protection, rehabilitation and management of coastal resources and mangrove management?

GOVERNMENT ASSISTANCE	Yes	No
Law enforcement		
Technical assistance		
Legal assistance		
Material and financial assistance		
Rehabilitation		
Environmental management		
Referrals		
Others, please specify		

43. What are the types of illegal and destructive activities have you observed and who are involved?

Type of illegal activities	People involved	Remarks

44. Does your municipality have any ordinance to stop illegal fishing?

( ) Yes ( ) No ( ) Don't know

45. Does your municipality have any ordinance to stop illegal activities in the mangroves?

( ) Yes ( ) No ( ) Don't know

46. If yes, does your municipality enforce the ordinance?

( ) Yes ( ) No ( ) Don't know

47. How effective is the enforcement?

( ) Very effective ( ) Effective ( ) Not effective ( ) Don't know

48. What do you suggest to be done to stop illegal activities?

_____

_____

_____

49. Have you attended training in the following areas?

TRAINING PROGRAMS ATTENDED	Yes	No
Fisheries laws, policies and procedures		
Credit		
Environment conservation		
Livestock raising		
Fisheries resource management		
Farming		
Leadership and management		
Fishing technology		
Fish Processing		
Aquaculture		
Marketing		
Project development and management		
Information, education and communication		
Enterprise development and management		
Others, please specify		

50. Please check from the list below your most important training needs.

TRAINING NEEDS	Yes	No
Fisheries laws, policies and procedures		
Credit		
Environment conservation		
Livestock raising		
Fisheries resource management		
Farming		
Leadership and management		
Fishing technology		
Fish Processing		
Aquaculture		
Marketing		
Project development and management		
Information, education and communication		
Enterprise development and management		
Others, please specify		

Income and Expense Information per month

A. Monthly expenses

Expense item	Estimated expense (P)
Education	
Health	
Food	
Clothing	
Miscellaneous (vices, entertainment, vacation, travel, etc)	
Electricity	
Water	
House repair and maintenance	
Others	
Total expenses	

B. Total income per month

Source of Income	Total income (P)
Main source	
Secondary source	
Other sources	
Total income	

C. Income-Expenses

Income	
Less: Expenses	
Balance	

Appendix 4. Bio-Physical and Socio-Economic Profile of Barangay Dolores

BIO-PHYSICAL AND SOCIO-ECONOMIC PROFILE OF BARANGAY DOLORES, NUEVA VALENCIA, GUIMARAS

INTRODUCTION

This socio-economic profile was produced by the Zoological Society of London (ZSL) in partnership with Katilingban sang Magagmay nga Mangingisda sa Dolores (KAMAMADO) and the LGU of Dolores and Nueva Valencia, Guimaras. It was prepared with the following objectives:

a] To consolidate social, economic, biophysical and other relevant information on the mangroves and fisheries in Dolores into a profile that can provide baseline information;

b] To serve as basis for decision-making and stakeholder planning in line with the overall coastal resource management goal of the Municipality of Nueva Valencia, Guimaras; and

c. To use such baseline information as basis for measuring project impact at the end of the project term.

Methodology

Five (5) local research assistants (LRAs) were trained in Participatory Rural Appraisal (PRA). The PRA training included topics on principles, methods and tools. Lectures and field practicum were the methods used in the training. A research plan was done at the end of the session that included schedules for data gathering, list of households to be sampled (20% of the total households for the HH survey), participants for the Focus Group Discussion (FGD) and LRA assignments. Data gathering was conducted for 5 days after which a barangay assembly was conducted to validate data gathered.

FIGURE 1. Map of Nueva Valencia, Guimaras

ZSL and the Community-based Mangrove Rehabilitation Project

The Zoological Society of London is an international scientific, conservation and educational charity founded in 1826. ZSL runs ZSL London Zoo and ZSL Whipsnade Zoo. A registered charity (No. 208728), ZSL is dedicated to achieving and promoting the worldwide conservation of animals and their habitats in the context of communities. ZSL's conservation work aims to build capacity and influence policy, to bring direct and sustainable conservation benefits to wild animals and their habitats,

with activities typically undertaken by forming partnerships with local organizations and government departments.

ZSL has been working in the Philippines for over 10 years. The experience and knowledge gained from working in Philippine coastal communities helped identify the biodiversity problem in the Philippines.

In 2008, ZSL embarked on the Community-based Mangrove Rehabilitation Project (CMRP), a 4-year project which will bring expert technical knowledge and experience in mangrove reforestation; rehabilitation of abandoned shrimp ponds; planting mangrove forests for maximum biodiversity and fisheries gain; coastal protection and stabilization; establishing ecological, physiochemical and socio-economic monitoring programs to demonstrate mangrove productivity; establishing protected areas/reserves for mangrove conservation and awareness raising. ZSL will also provide experience in developing sustainable livelihoods appropriate to the coastal (mangrove) environment that are economically and ecologically viable.

The CMRP has the following specific goals:

- to secure tenure on coastal land through Community-based Forest Management Agreement (CBFMA);
- to rehabilitate 50 hectares of abandoned, unutilized and underutilized government-leased fishponds and 30 hectares of degraded nipa stands to healthy mangrove habitat to provide communities with ecosystem goods and services including increased food resources;
- to support coastal communities to supplement their livelihoods utilising rehabilitated mangrove habitats;
- to re-establish the legally mandated mangrove 'greenbelt' along the coast to decrease vulnerability of communities to coastal erosion and storm surges.

CHAPTER 1
GENERAL DESCRIPTION OF THE AREA

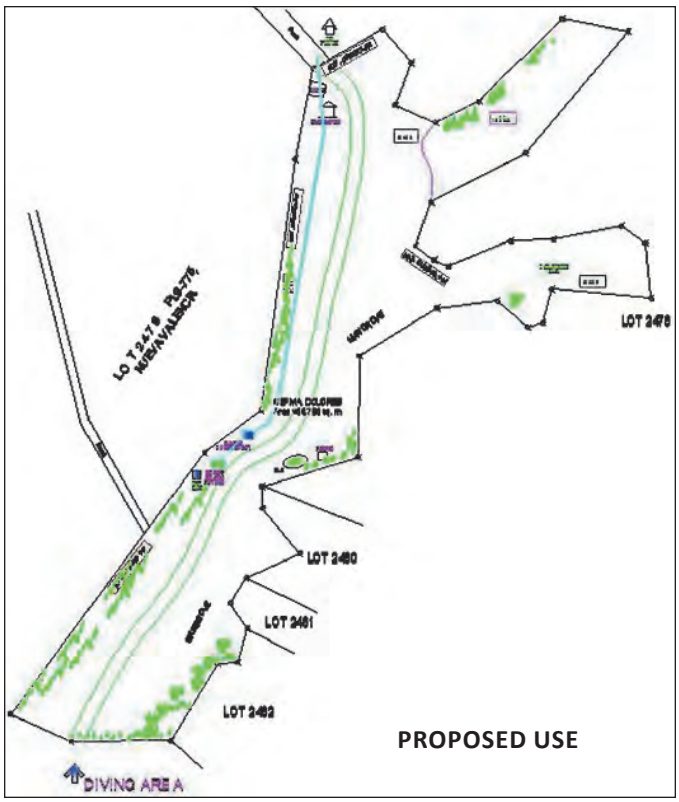
Municipality of Nueva Valencia

The Municipality of Nueva Valencia is one of five (5) municipalities that comprise the island province of Guimaras. It is located southeast of Panay Island and northwest of Negros Occidental. Iloilo Strait separates Guimaras from Panay with a distance of approximately eleven (11) kilometers. The Municipality of Nueva Valencia is bounded on the north by the Municipality of Sibunag, on the south and East by Iloilo Strait, and on the west by Guimaras Strait.

Nueva Valencia is a 3rd class municipality with a total land area of 13,712 hectares. It has 22 barangays, of which 14 are coastal, 2 island and 6 inland. Total population was registered at 35,026 (NSO data, 2007). Like the Province of Guimaras, the local economy of Nueva Valencia is primarily based on agriculture and fishery which contribute 68% to the total local economy. The Municipality of Nueva Valencia has a total mangrove cover of 147.72 hectares and is considered as the 2nd largest mangrove area in the province of Guimaras (CEP data, 2004). Fisheries production in the municipality was 2, 313.02 metric tons in 2008 (OMAS Nueva Valencia data, 2008).

Barangay of Dolores

Barangay Dolores is one of the 14 coastal barangays of Nueva Valencia and has a total land area of 421.76 hectares. It is bounded on the south by Barangay Tando and on the northwest by Barangay Pandaraonan. As of 2009, the population of Dolores was 2055 and the total number of HH was 438. Average HH size was 4.69. Fishing is considered the main source of income by at least 60% of the HHs in Dolores.



The CMRP site which is Basyaw Cove is in Barangay Dolores (encircled in the map of Nueva Valencia). Basyaw Cove is river like in nature with sea water coming in from the sea. The site is approximately 7.48 kilometers away from the municipality of Nueva Valencia.

Basyaw Cove's 6.4 hectares is presently planted with thin vegetation, mostly Rhizophora species. The cove is now used as entrance and exit points as well as docking area for boats of fishers residing in the area. A portion is now being used for talaba culture. The area was once a Fishpond Lease Agreement (FLA) pond. However the FLA was cancelled by BFAR in 2002 due to non development of area and non payment of dues.

CHAPTER 2
SOCIO-ECONOMIC PROFILE OF MAJOR STAKEHOLDERS

A. Population

Age. Majority (32%) of stakeholders in Dolores belong to age group 41-50 years old. Youngest is 26, the oldest is 78 and average age is 48 years.

Civil status. Majority of the stakeholders are married (85%), 11% are widowed, 3% single and 1% separated.

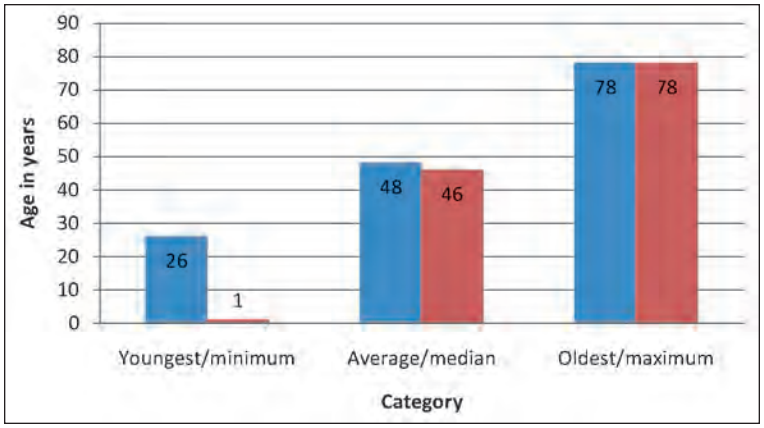


FIGURE 3. Comparison of stakeholder's age vs residency in Barangay Dolores, Nueva Valencia, Guimaras.

Religion. Majority of the residents in Dolores are either Aglipay (48%) or Roman Catholic (43%). A few are Protestants (9%).

Ethnic group and language spoken. Ninety seven per cent are Ilonggo. The remaining 3% are either Waray, Tagalog or Coyonen. Majority speaks Hiligaynon (48%). Some speak Hiligaynon in combination with another language (28.7%) or with 2 other languages

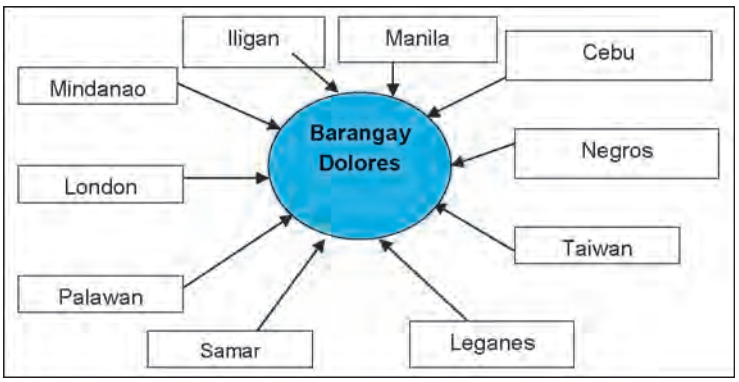


FIGURE 4. In-migration pattern in Dolores, Nueva Valencia, Guimaras

TABLE 1. Reasons for in-migration in Dolores, Nueva Valencia

Sex	Number	Reasons for in-migration
Male	9	Marriage
Female	17	Marriage

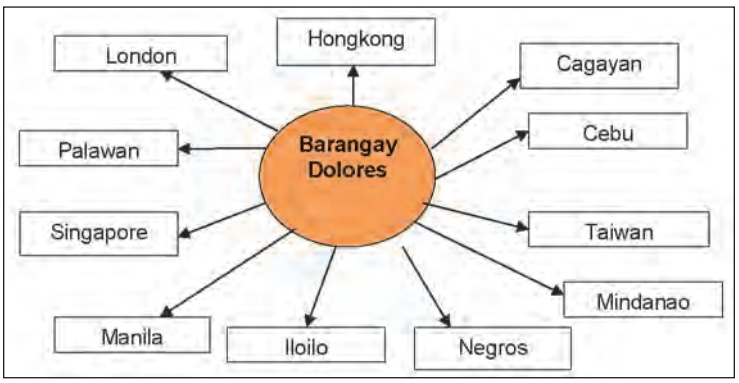


FIGURE 5. Out-migration pattern in Dolores, Nueva Valencia

TABLE 2. Reasons for out-migration in Dolores, Nueva Valencia

Sex	Number	Reasons for out-migration
Male	31	Look for job, marriage
Female	39	Look for job, marriage

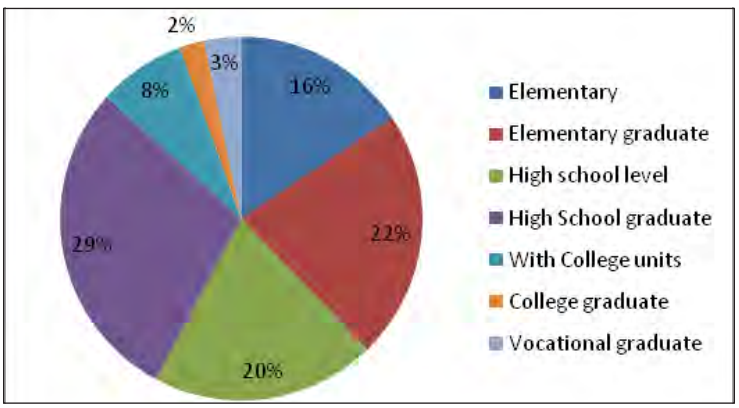


FIGURE 6. Out-migration pattern in Dolores, Nueva Valencia

(22%). Other languages spoken are Coyonen, Waray, Karay-a, Tagalog, Cebuano. Only 1% of the respondents said they speak Aklanon only.

Residency in the barangay. Majority (78.9%) have resided in the barangay since birth. Eighteen per cent have transferred once while only 2% transferred residence twice. Longest year of residence outside Dolores is 3 years. Place of last residence outside of Dolores of the majority that transferred are the neighboring barangays of Tando and Pandaraonan (35%).

The average age (48 years) is more or less the same as the number of years of residence (46 years) in Dolores.

The reasons for the change in residence are marriage (73%), death of partner, property (i.e. lots) owned at home or to accompany a family member.

All the respondents stated they do not have intentions to transfer residence in the next 5 years.

Migration pattern. Out-migration is higher than in-migration because of marriage and limited work opportunities in Dolores. Many in-migrants were observed in 2009. Peak of out-migration was in 2000 when residents looked for work abroad/ outside of Dolores.

B. Education

Highest Educational Attainment. Majority of the residents of Barangay Dolores have reached either the elementary or high school level

TABLE 3. Stakeholder's Main Source of Income in Dolores, Nueva Valencia, Guimaras (n=90)

Main source of income	Percentage
Farming	1.1
Support from other family members	1.1
Business	7.8
Employment (crew, checker, seaman)	6.7
Fishing	62.2
Fishing in combination with other livelihoods (farming, animal husbandry, carpentry, charcoal making, boat construction)	12.2
Poultry raising	1.1
Others (vending, manicurista, carpentry, laundry, dressmaking)	7.8

TABLE 4. Stakeholder's other sources of income in Dolores, Nueva Valencia, Guimaras (n=90)

Main source of income	Percentage
Farming (alone or in combination with other livelihoods e.g. livestock raising, copra making, carpentry, vending, business and remittance from family members)	15.6
Support from other members of the family	6.7
Business	3.3
Fishing	1.1
Poultry raising (alone or in combination with remittance from family members)	2.2
Livestock raising	8.9
Carpentry	22.2
Others (vending, laundry, dressmaking, driving, labourer, copra making, charcoal making, shell gleaning)	31.1
No answer	8.9

TABLE 5. Community perception of the economic status of HH in Dolores, Nueva Valencia, Guimaras

Category		
Poor	**Average**	**Better off**
• No work • Plenty of children • Cannot eat 3 meals a day • Do not own land	• Can eat 3 meals a day • Able to send children to school • Not pressured earning for income	• Has people working for him • Owns a house • Manages his own business • Owns car/ with driver • Can buy any food the family likes
HH number/ percentage per category		
54	321	75
12%	71%	17%

Total HHs categorized = 450

education only. Very few were able to start or graduate from college.

C. Dwelling and facilities

1. Type of dwelling. Majority (44.4%) of the houses in Barangay Dolores are made of light materials, i.e., a combination of nipa, cogon and bamboo. Only 16.7% of the houses are made of concrete. The rest of the houses are a combination of light and concrete materials (38.9%).

2. Lighting facility. Sixty seven per cent (67%) of the houses in Dolores have electricity. The rest of the households (37%) use kerosene lamp, petromax/gas operated or a combination of both for lighting.

D. Income and income sources

1. Income level. In Dolores, maximum monthly income is P22,000.00, minimum is P500.00 and average monthly income is P4,555.00.

2. Main source of income. Majority (62.2%) of residents are engaged in fishing as the main source of income. Others combine fishing with other livelihoods, run their own business, are employed or perform professional skills, (e.g. carpentry, dressmaking). Average income from main sources is P2,000.00/ month.

3. Other sources of income. Majority (31.1%) of HHs engage in other forms of livelihood for supplementary income. Carpentry is also a skill possessed by some (22.2%) HHs in Dolores. HHs

TABLE 6. Average HH expenses/ month in Dolores, Nueva Valencia, Guimaras

Item	Amount (P)	Percentage
Education	400.00	10.7
Health	500.00	13.4
Food	2,250.00	60.2
Clothing	200.00	5.3
Miscellaneous	200.00	5.3
Electricity	80.00	2.1
Water	0.00	0
House repair	100.00	2.7
Others	7.00	.2
Total	3,737.00	~100.0

TABLE 7. Sources of credit (n=90) in Dolores, Nueva Valencia, Guimaras.

Credit facility	Percentage
Banks	11.1
Credit cooperatives	10
Relatives and friends	47.8
Usurers	5.6
Lending institutions	3.3
Combination of 2-3 credit facilities	13.3
Suki	5.6
None	3.3

with farm lands engage in farming in combination with other livelihoods (15.6%). Average income from other sources is P1,000.00/ month.

E. Economics

Economic status. FGD participants determined the economic status of all the HHs using the wealth ranking tool. HH categories were defined as poor, average/ middle income and better off. A set of criteria was listed per category.

Majority of the HHs in Dolores are average income earners (71%). Twelve per cent and 17% are considered poor and better off, respectively.

Expenses. Majority of HH expenses is for food (60.2%). Secondary expenses are on health (13.4%) and education (10.7%). Minimal expenses are spent on clothing (5.3%), miscellaneous (5.3%), electricity (2.1%) and house repair (2.7%). No amount is spent on water since majority of the HH use deep well as water source.

Savings and credit. Majority of residents (76%) do not have savings, as income can barely cover the daily home expenses. Only 17% of HHs said they have savings.

Majority (47.8%) of the households in Dolores borrow money from relatives and friends. A few (5.6%) resort to borrowing money from usurers. Others (13.3%) borrow from a combination of 2-3 credit facilities. A few (3.3%) do not borrow money.

Among the HHs that borrow money, for 48% no specific repayment period is set, 33% have specific time and interest rate set, 16% have specific time with no interest rate charged while the remaining 2.3% have no time nor interest rate set.

Only 29 HHs (32%) reported that interest rates were charged from their borrowed money. The interest rates charged is 14%-20% for 6 months (44.8%), 20% in 1-2 months (24.1%), 5%-25% in a year (13.8%), 20% daily (3.4%), 2% per month (6.9%) and 5% weekly for 2 years (6.9%).

Properties

1. **House ownership and acquisition.** Ninety eight per cent of residents owned their houses. Of this number, majority (93%) built their own houses, 6% inherited parents' houses while only 1% bought existing houses.
2. **Home lot ownership.** Sixty six per cent (66%) of the residents owned the lots where the houses are built while 34% do not.

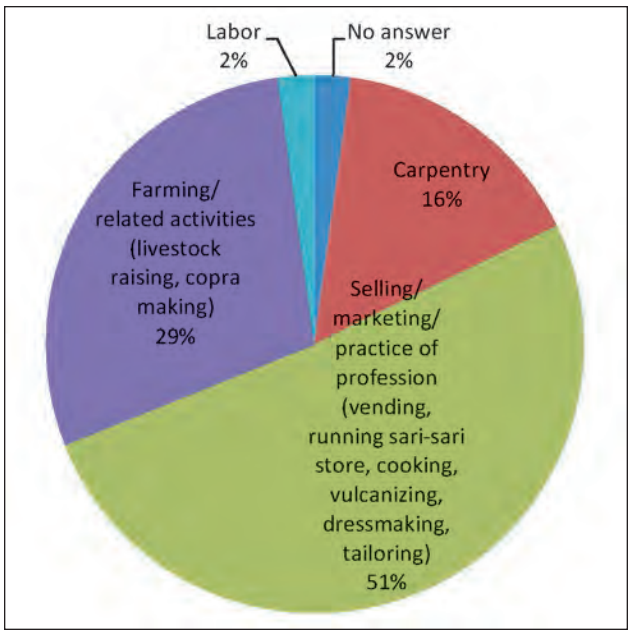


FIGURE 7. Socio-economic skills of households in Dolores, Nueva Valencia, Guimaras.

TABLE 8. Daily food consumption pattern in Dolores, Nueva Valencia, Guimaras

Breakfast	Lunch	Dinner
Rice, fish, bread, banana, eggs	Rice, fish/ shells, vegetables, meat	Rice, fish/ shells, shrimp paste (ginamos), dried fish, salt

3. **Farm land ownership.** Only 16% of the HHs own a parcel of farm land. Among the HHs with farm land, 72% own the land, 21% lease the land while 7% are tenants. Average size of farm land owned is 4 hectares.

Socio-economic skills. Majority of the skills of the respondents are selling or related to professional practice (51%). Some skills are farming and related activities such as livestock and copra making (29%). Sixteen percent are skilled carpenters while only 2% are labourers.

F. Health and Sanitation

1. **Toilet facility.** Ninety two per cent (92%) of the HHs have toilets. Among the HHs with toilets, 81% have water sealed toilet types, 8% antipolo and 4% open pit types. Majority of the HHs without toilet facilities use their father's toilets (43%); the rest of the HHs uses the forest for human waste disposal (28.6%), neighbors toilet (14.2%) or communal toilet facility (14.2%).

2. **Source of potable water.** Majority (93.3%) of the residents have deep well as water source. The rest of the HHs get water from artesian wells (2.2%), barangay water system (2.2%), spring (1.1%) or a combination of spring and deep well (1.1%).

3. **Garbage disposal.** Mode of garbage disposal of the majority (64%) of HHs is burning. The rest of the HH throw garbage in the pit and burn (20%) or throw in the family/community pit to decompose (16%).

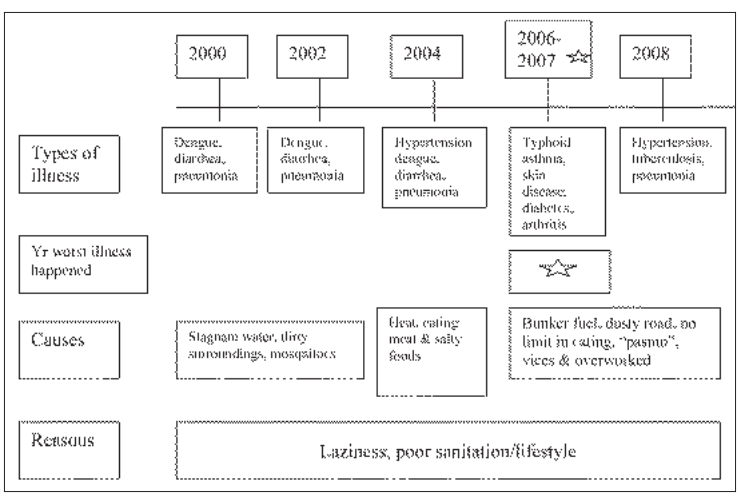


FIGURE 8. Trend line of illness in Dolores, Nueva Valencia, Guimaras

4. **Nutrition.** The percentage of malnourished children in the last 3 years as per Barangay Health Worker record is 2%. There was no recorded child born below 2 kilograms in the last 3 years. The daily food consumption pattern of HHs is shown in Table 8.

Fish and shells are part of the HH daily food items as these are abundant in the area and

are not bought. Vegetable consumption is at most 4x per week sourced from backyard gardens or bought from the market. Meat is eaten once a week and generally bought in the capital town of Alibhon or at times during celebrations/ festivities where meat is served (slaughtered pigs or cows raised at home).

5. **Trend line of illness.** There was no reported epidemic in the last 3 years. Illnesses commonly experienced are typhoid, diarrhea, skin related diseases and respiratory illness (pneumonia, asthma). Dengue was reported to have occurred in 2000-2004 because of stagnant water and dirty surroundings. Hypertension and diabetes were also reported in recent years.

CHAPTER 3
MANGROVES AND PHYSICOCHEMICAL PARAMETERS

A survey of the biophysical characteristics of Basyaw Cove was conducted in February 2010.

A. Water and soil quality

Three sampling stations were set up for the physico-chemical parameters in Basyaw. The average water salinity was 36.2 ppt, pH was neutral (7.0) and temperature averaged 27.9 °C.

B. Mangroves

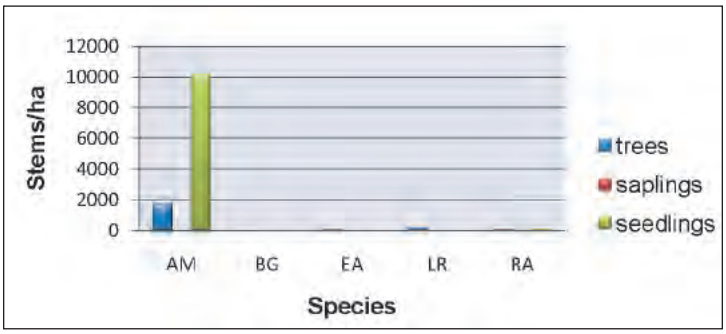
Mangrove patches, mostly Avicennia and Rhizophora species totalling 4.5 hectares are found in Dolores specifically inside Basyaw Cove. During the biophysical survey conducted, mangroves found in the cove comprised 10 species of true mangroves belonging to 4 families and 6 genera -- Family Avicenniaceae represented by Avicennia marina (AM) and A. officinalis (AO), Family Combretaceae represented by Lumnitzera racemosa (LR) and L. littorea, Family Rhizophoraceae composed of Bruguiera cylindrical (BC), Ceriops decandra, Rhizophora apiculata (RA), R. mucronata and R. stylosa, and Family Sonneratiaceae represented by Sonneratia alba.

Soil in Basyaw Cove had average soil pH of 6.87, salinity of 39.67 ppt and temperature of 28.20 °C. Benthic fauna found were mostly shells. Organic matter content of the soil was 19.68%.

TABLE 9. Physico-chemical data in Basyaw Cove, Nueva Valencia

Dolores, Nueva Valencia, Guimaras				
Date of sampling : 10 Feb 09				
Replicate	**pH**	**Salinity (ppt)**	**Temperature (°C)**	**Benthic fauna**
A. Water				
1	7.00	36.5	27.7	
2	7.00	36.0	28.0	
3	7.00	36.0	27.9	
Mean	7.00	36.2	27.9	
B. Soil				
1	6.87	40.00	28.00	shells
2	6.87	39.00	28.50	shells
3	6.87	40.00	28.10	shells
Mean	6.87	39.67	28.20	
% Organic Matter (Walkley and Black Method): 19.68%				

FIGURE 9. Mangrove Species in Basyaw Cove, Nueva Valencia



C. Mangrove-based livelihood

Basyaw Cove is home to native birds, snakes and monitor lizard. Shells, fishes and shrimps are likewise abundant in the cove where many fishers depend for livelihood.

An estimated 62% of the residents in Dolores have been harvesting traditionally from the mangroves. The average number of years of harvesting from the mangroves is 7.5. In a year, 5 months are spent and in a month, 5 days are spent in harvesting mangrove resources. One hour per day is spent in harvesting from the mangroves. Forty seven per cent of mangrove harvesters learned the skill from family members while 33% learned it on their own. Almost 60% of the harvest from mangroves are sold to consumers and consumed at home.

In order to rehabilitate Basyaw Cove, mangrove replanting was done by KAMAMADO in 2004 and 2005 by planting 20,000 bakhaw propagules in a 2-hectare area. However, due to oil spill, Typhoon Frank and tagimtim (barnacle) infestation, most of the planted bakhaw died thus requiring an immediate rehabilitation of the cove.

Mangrove species commonly found in Basyaw Cove

Scientific name	Common name
Avicennia marina	apiapi, bungalon
Avicennia officinalis	apiapi, bungalon
Lumnitzera littorea	tabao, libato
Lumnitzera racemosa	tabao, culasi
Bruguiera cylindrica	pototan
Bruguiera gymnorrhiza	pototan
Ceriops decandra	baras-baras, lapis-lapis
Rhizophora apiculata	bakhaw lalaki
Rhizophora mucronata	bakhaw babae
Rhizophora stylosa	bakhaw bato
Aegiceras floridum	sagingsaging
Pemphis acidula	bantigi
Sonneratia alba	pagatpat

TABLE 10. Mode of selling mangrove products in Dolores, Nueva Valencia, Guimaras (n=56)

Mode of selling	Percentage
Sell directly to consumers	8.9
Process for selling	3.6
Home consumption	10.7
Sell to vendors or traders and home consumption	1.8
Sell to consumers and home consumption	58.9
Sell to fish vendors or trader, sell directly to costumers and home consumption	16.0

CHAPTER 4
STATUS OF FISHERIES

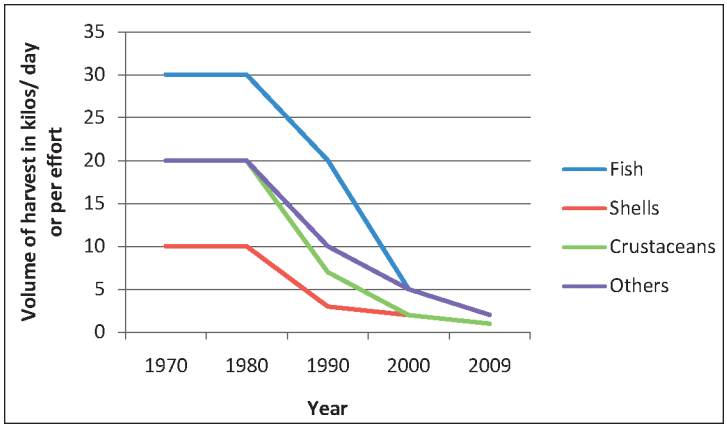


FIGURE 10. Trends in Harvest of Fishery Resources in Barangay Dolores, Nueva Valencia, Guimaras

The total coastline length of Barangay Dolores is estimated at 4.5 kilometers and fishing is considered the main source of livelihood of 441 fisherfolk as of 2008 registry.

The average number of years spent in fishing is 20. Fishers in Dolores spend 9 months in fishing in a year while 16 days are spent in fishing in a month. On the average only 1 hour per day is spent fishing. Gear commonly use in fishing are nets. Catch of

the majority of fishers is sold directly to consumers or consumed at home. Average HH monthly income of fishers is P4505.

In the recently concluded PRA data survey by the community, decreasing trend in the harvest of fish, shells, crustaceans and other marine organisms (e.g. sea urchin, squid and octopus) was observed for the period 1970-2009. The number of HHs that depend on the resource for livelihood has doubled in 39 years time, i.e., 150 in 1970 to 304 in 2009.

Most of the methods used in fishing (traditional hook and line, nets, traps, fish corral, diving/spear fishing) have not changed.

Many residents believe that the introduction of illegal fishing methods (spraying powder of derris root to stupefy fishes, dynamite fishing) in recent years and the increasing number of families that depend on the fishery resource for livelihood have contributed to its decline.

The 2006 Oil Spill which damaged the habitat of marine organisms was also considered one of the main factors for poor harvest. Despite this scenario, the species of fish and shellfish that are found in Dolores have not changed nor were there reports of species that have disappeared (Table 11).

Fishers consider declining fish catch the number 1 problem (confirmed in the FGD output, issue and problem matrix). Other problems include fishing inside the Coral Garden, indiscriminate cutting of mangroves and destruction of coral reefs and sea grass beds by extraction and use of destructive fishing methods (Table 12).

TABLE 11. Species Most Commonly Caught in Barangay Dolores.

Fish	Bullet tuna, lagaw, goatfish, samara, tambilawan, maya-maya, lison, mangagat, mullet, kintob, turingan, ngisi-ngisi, pak-an, eto, indangan, parrot fish
Shells	Sikad-sikad, sobra-sbra, litob, ponaw, pasyak, baka-baka, clams, toway, manok-manok, bagongon, koring-koring, soliot, capiz-capiz, botlog
Crustaceans	Lobster, shrimp, blue crab, mud crab, dawat, kaway, alikomo, kalampay
Others	tirik, squid, tayong, octupos, cuttlefish, tabogok, tamala, puffer fish, karatongan

TABLE 12. Fisher's Problems and Issues matrix.

Problem	Rank	Causes	Recommendations
Decreasing fish catch	1	Increase in population/ fishers, oil spill, illegal fishing methods (poison, compressor)	• Require all HH to attend family planning information campaign sessions • Enforce law on banning of compressor/illegal fishing
Disappearing mangrove forest	3	Conversion to fishponds, indiscriminate cutting, used as firewood/charcoal	• Reforestation/planting • DENR must strictly enforce with the cooperation of the community laws against indiscriminate cutting
Fishing inside the Coral Garden	2	Absence of policy as basis for apprehension	Pass policy/law for no fishing inside the Coral Garden
Disappearing sea grasses and corals	4	Use of beach seine, illegal coral extraction	Community must be vigilant in patrol operations/protection

Fishing is the livelihood of 62% of residents in Dolores. Among these fishing HHs, 52% learned fishing skills from family members (i.e., father, grandfather, elders). Some learned fishing on their own (39%). Others learned how to fish from friends, relatives, neighbours and people from other places (9%).

The fishing HHs interviewed stated that income derived is 50-75% (35.6%), 25-50% (25.6%), less than 25% (23.3%) and 76-100% (11.1%). Four per cent have no answer.

Current Management Practices

The LGU of Nueva Valencia created the Fisheries and Aquatic Resource Management Section under the Office of the Municipal Agricultural Services (OMAS) to provide the following services:

1. **Regulatory, Fishery Law Enforcement, Permits/ Licensing**

   Services provided under this section are operations of the Bantay Dagat, issuance of permits (business and permit to operate) and licenses, registration of fisherfolk and fish workers, registration of fishing vessels (3 gross tons and below) and recommending issuance of auxiliary invoices.

   Data in 2009 showed a dramatic increase in number of apprehensions made, number of fisherfolk apprehended and the amount of penalty paid. The increase indicates fisherfolk's aggressiveness in implementing fishery laws. In 2009 total penalty collected amounted to P1, 050, 500.00 for 30 apprehensions of 65 fishing boats and 252 crew members'.

   In 2009, the total number of registered boat operators was 252, total number of registered fishing boats was 270 while total number of fishing gears registered was 204. The amount paid for licenses and Mayor's permit amounted to P211, 945.00. An increase in fishing boat registration was observed from 2007 to 2009 which is 206 and 270 boats, respectively registered in those years.

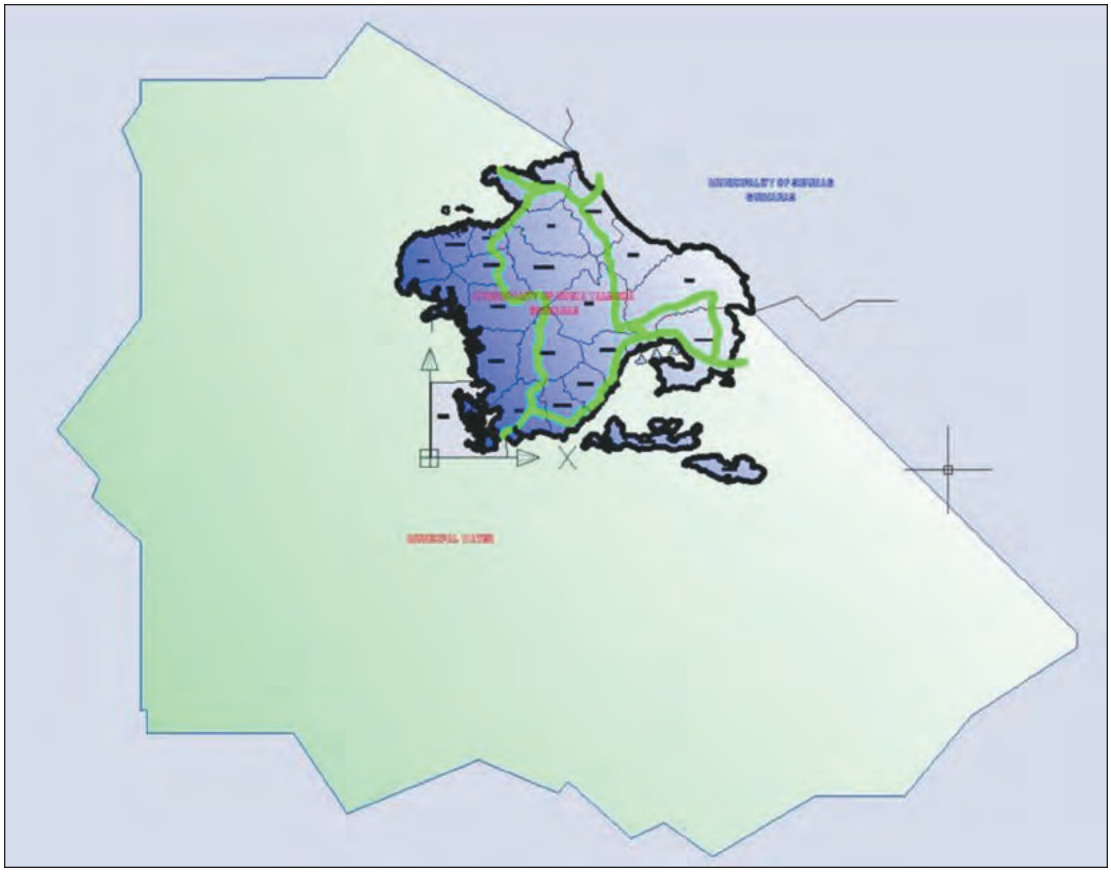


FIG. 11. Map of Nueva Valencia showing area of Municipal Waters

Gears and business registration declined from 327 in 2007 to 196 in 2008 because of decreased fish catches so the fisherfolk could not afford renewal of gear registration that year. Fees were adjusted and approved in June 2009 upon the recommendation of the MFARMC hence an increase in gear registration (of 204) was already observed in 2009.

Fisherfolk registration likewise increased from 5,189 in 2007, 5,283 in 2008 to 6,177 in 2009 indicating an increase in the number of people dependent on fishing for livelihood.

2. Aquaculture and Coastal Development

Profiling of fishponds, fish pens and cages including special projects is conducted under this section.

Four fishpond operators with total pond area of 32.8 hectares were recorded in Nueva Valencia. There are 4 fish cage, 1 fish pen and 1 oyster farm operators occupying an area of 4,910 square meters. A successful bangus cage culture was recorded in Barangay Igang where harvest during first cycle was 10 tons and during the 2nd cycle was 12 tons.

Seaweed culture which was introduced to beneficiaries in Barangay Dolores and Panobolon Island was not successful for a variety of reasons hence production was stopped and reprogrammed to start in the coming months.

3. Institutional and Livelihood Development

This section is responsible for facilitating consultations, dialogues, trainings and seminars, activities of FARMCs and organization of fisherfolk.

Municipal FARMCs conducted regular monthly meetings from which 5 resolutions and 4 municipal ordinances were legislated. Among the municipal ordinances passed were Municipal Ordinance #6 series 2005 or the Municipal Fishery Ordinance of Nueva Valencia, Municipal Ordinance #5 series of 2009 establishing operation and maintenance of Igang Bay Marine Sanctuary.

Twenty fisherfolk associations were recognized by OMAS as of December 2009. Sixteen trainings related to coastal resources management were facilitated by OMAS in 2008-2009.

CHAPTER 5
COMMUNITY AWARENESS

1. **Presence and names of organizations.** Eighty seven percent of HHs are aware of organizations/ NGOs present in the community while 7.8% are not aware. The rest of the HHs had no answer. KAMAMADO, BFARMC, SEAK, TSKI and BDTC were some of the organizations mentioned. Some agencies of the government, e.g., BFAR, DOH, DENR, PEC, DEpEd, DA were mentioned as organizations mainly because of their projects in the community. Projects mentioned were related to conservation, e.g., CRM, mangrove rehabilitation, Coral Garden (47.4); health and sanitation, e.g., water supply, Clean and Green Program (28.2%); tourism (14.1%); trainings and seminars (7.7%) and livelihoods, e.g., SEAK and TSKI loans (2.5%).
2. **Family problems and suggested solutions.** Majority (67.8%) of family problems are financial in nature. Other problems are unemployment (1.1%), poor fish catch (4.4%) to mention a few. Suggested solutions to family problems are introduction/ implementation of livelihood projects (34.4%), hard work (24.4%) and assistance from the government (7.8%), among many others.
3. **Community problems and suggested solutions.** The top 3 community problems are inefficient/ inadequate infrastructure facilities (28.9%), presence of illegal activities (21.1%) and lack of livelihood (14.4%).

TABLE 13. Community problems in Dolores, Nueva Valencia, Guimaras (n=90)

Community problems	Percentage
Lack of livelihoods/ financial problem	14.4
Inadequate information on mangrove conservation	1.1
Poor infrastructure (lack of road maintenance, inadequate electricity/ streetlights, damaged canal, no market, water shortage)	28.9
Illegal activities (illegal/ dynamite fishing, cutting of mangroves, gambling, use of compressor)	21.1
Theft/ community trouble	6.7
Decreasing fish catch	1.1
Family conflict/ lack of unity	3.3
Dirty environment/ environmental hazard	2.2
None	1.1
No answer	20.0
Total	~100.0

TABLE 14. Solutions to community problems in Dolores, Nueva Valencia, Guimaras (n=90)

Suggested solutions	Percentage
Livelihoods/ projects implementation	14.4
Mangrove rehabilitation	2.2
Parental guidance	3.3
Cooperation among community members	4.4
Allocate budget (for streetlights/ water system repair, road maintenance)	11.1
Enforce policies	24.4
LGU support	12.2
Information dissemination	1.1
Water conservation	1.1
None	2.2
No answer	23.3
Total	~100.0

Majority of the HHs consider policy enforcement (24.4%) as an important solution to community problems. Livelihoods/ income generating projects implementation are likewise considered by the 14.4% of HHs to solve unemployment problems of the community. Others recommend allocation of budget for repair and maintenance of infrastructure facilities e.g. street lights, water system and road (11.1%) and want LGU support extended to the community (12.2%).

4. Public announcements. Majority (91.1%) of the respondents stated they noticed public announcements posted in the Barangay hall. Government officials were responsible for making the announcements (88.9%).

5. Information received and its sources. Information received by the majority of stakeholders consist of fishing laws, policies and procedures, credit, environment, livestock raising, fisheries resource management, farming, fishing technology and IEC. Information on leadership and management, fish processing, aquaculture, marketing, project development and management and enterprise development and management are received by a few. Government organizations (GO) provide most of the information.

6. Fisheries/ mangrove related concerns. Majority of the stakeholders concern is the absence of a municipal ordinance to protect the mangroves (27.8%) and the continuous destruction of the mangroves (23.3%). People's lack of information and knowledge (18.9%) and the limited assistance provided by various groups (12.2%) is also a major concern among some people. Other concerns are the lack of interest of people to plant (5.5%) and the presence of destructive and illegal fishing practices (5.5%). The remaining 6.7% do not have any concern at all.

7. Observed changes in coastal environment and mangroves in the last 5 years and its effects. Majority (78.9%) has observed changes in the coastal areas and mangroves in the last 5

TABLE 15. Types of information received and sources in Dolores, Nueva Valencia, Guimaras.

Type of information	Yes	No	No answer	Major sources of information
	Percentage			
Fishing laws, policies and procedures	65.6	3.3	31.1	NGO, PO
Credit	50.0	14.4	35.6	Private persons
Environment	61.1	4.4	34.4	GO
Livestock raising	53.3	14.4	32.2	GO
Fisheries resource management	53.3	5.6	41.1	GO
Farming	31.1	27.8	41.1	GO
Leadership and management	13.3	35.6	51.1	GO
Fishing technology	40.0	30.0	30.0	GO
Fish processing	11.1	37.8	51.1	GO
Aquaculture	11.1	38.9	50.0	GO
Marketing	11.1	36.7	52.2	GO, private persons
Project development and management	17.8	32.2	50.0	GO
Information, education and communication	40.0	23.3	36.7	GO
Enterprise development and management	4.4	41.1	54.4	GO

years. Some (21.1%) has not observed changes.

Some of the observed negative effects of the majority are decreased in fish catch (74.6%) and mangrove destruction due to red tide, illegal fishing and water pollution (7%). On a positive note, some (12.7%) observed that resources were rehabilitated in the last 5 years. The rest of the respondents did not answer the question (5.6%).

Many events happened in Basyaw Cove in the last 5 years. Big mangroves were cut down because of private interests to convert the area into fish pond. But the residents persisted in driving away these persons who devastated the area. The FLA cancellation in 2002 encouraged for the newly organized fisherfolk to rehabilitate the area. Planting of mangroves started in 2004, however, the Oil Spill incident in 2006 again

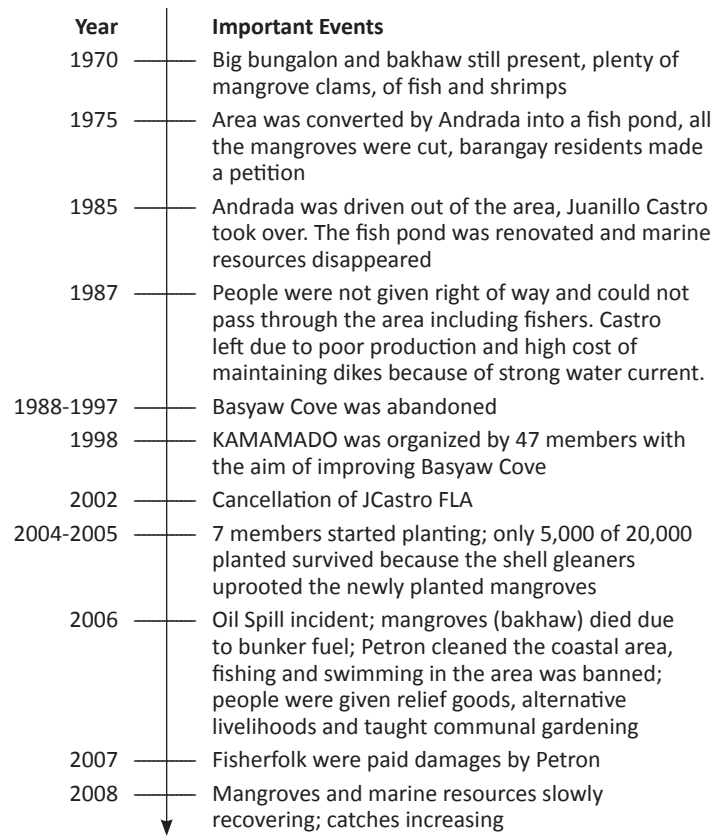


FIGURE 13: Timeline of Basyaw Cove, Dolores, Nueva Valencia, Guimaras

destroyed the newly planted mangroves. The area to date is slowly recuperating with the fisherfolk more determined to rehabilitate the area. Gradually increases in fish, shrimp and shell catches have been observed.

8. Community perceptions of mangrove situation

a. **At present.** Majority (37.8%) of HHs perceive that mangroves are destroyed by illegal activities and water pollution, occupies a wide area where Rhizophora sp. are already tall and productive (15.5%), area is big but not fully developed and planted (16.7%), or still being developed with continuous planting (11.1%). Nineteen percent of HHs do not know about mangroves or have no answer to the question.

b. **Five years from now.** Many (42.2%) fishers envision that proper protection and continuous planting will be assure them of bountiful harvest of fish, shells and shrimps. Others (26.7%) visualize a fully developed/ thick forest with variety of mangroves species planted in Basyaw Cove. On a negative note however, 12.2% of HHs see that plenty of marine resources will disappear if illegal fishing/ water pollution will continue. The rest 18.9% of HHs don't know or have no answer.

9. Vulnerability to storms and calamities. Residents feel that the worst calamity happened during the 2006 Oil Spill incident since this caused severe damage to the corals, seagrass beds and mangroves and resulted in decreased income of fishers due to poor fish catches and worse, a ban on fishing.

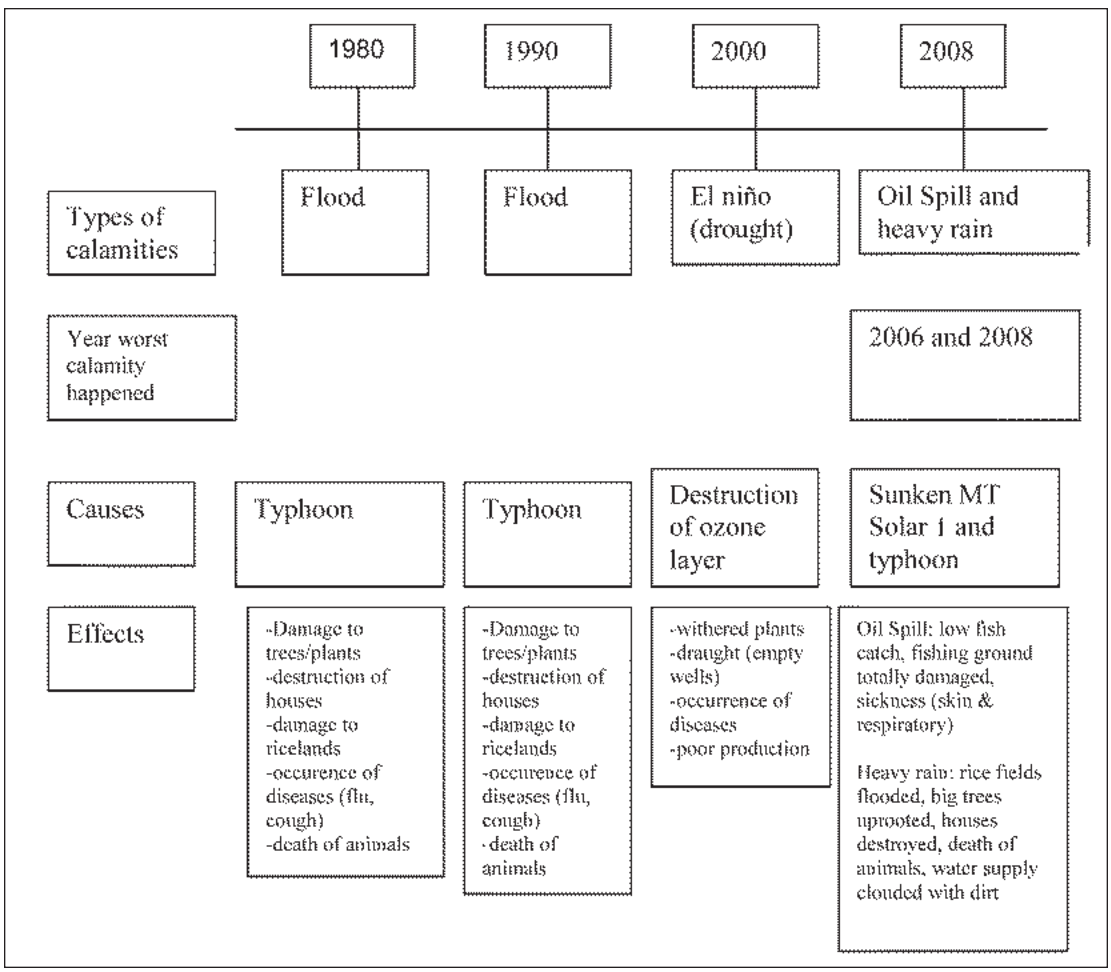


FIGURE 14. Trend line of community's vulnerability to storms and calamities

10. Beliefs, myths and folklore on environment. Majority (51.2%) are not aware of existing beliefs, myths and folklore on environment in their communities while the rest are.

11. Assistance received. Majority received material and financial assistance on law enforcement, rehabilitation and environmental management. Some have received technical support and referrals.

12. Illegal activities

a. Types. Majority of illegal activities identified are those related to illegal fishing (60%), while some (11%) identified illegal activities related to the persons and community (e.g. drugs, gambling, theft, drunkenness). Mangroves are still being destroyed by a few (8%). It is worthy to note that a sizeable number (19%) have no knowledge of illegal activities in the area.

TABLE 16. Type of assistance received

Type of assistance received	Yes	No
	Percentage	
Assistance on law enforcement	76.7	23.4
Technical assistance	60.0	40.0
Legal assistance	44.4	55.5
Material and financial	72.2	27.8
Rehabilitation assistance	73.3	26.6
Environmental management assistance	73.3	26.7
Referral assistance	51.1	48.9

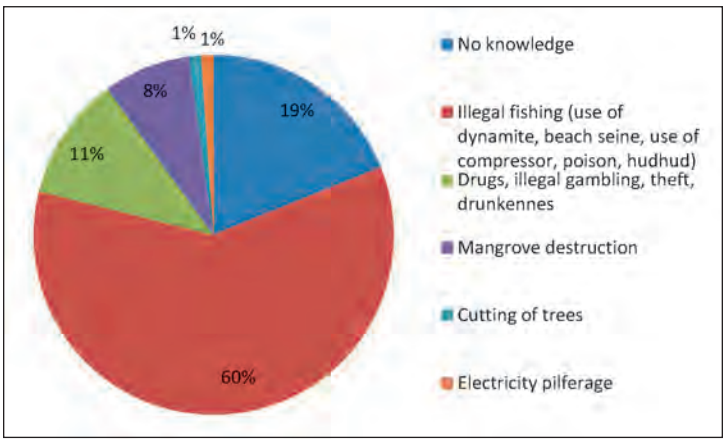


FIGURE 15. Types of illegal activities observed in Barangay Dolores.

b. People involved. Majority of the people involved in illegal activities are from the Barangay (23.3%) and fishermen (23.3%). Students/ minors (11.1%) are likewise considered to be involved in illegal activities such as drugs, theft and fraternity activities. Many outsiders (20%) are believed to be involved in illegal activities among others.

c. Suggested actions. Majority (51.1%) suggests to fully enforce laws to get rid of illegal activities. The rest suggest that the government provide work, stop illegal practices, not to sell alcoholic drinks, do night watch, encourage people to cooperate and officials should take action. A higher percentage have no answer to the question.

13. Policies

a. Presence

a.1 Ordinance to stop illegal fishing. Majority (92.2%) are aware that Nueva Valencia has passed an ordinance to stop illegal fishing; the rest (7.8%) are not aware.

a.2 Ordinance to stop illegal activities in the mangroves. Majority (86.7%) of the community are aware of the municipal ordinance to stop illegal activities in the mangroves, 11.1% do not know while the remaining 2.2% said that the municipality have no such ordinance.

b. Enforcement. Majority (70%) stated that ordinances are enforced while 10% said they are not. Twenty percent stated they do not know if the ordinances are enforced.

c. Effectiveness. Fifty per cent of the respondents observe enforcement to be effective, however 28.9% observe enforcement is not effective. Twenty percent do not know if enforcement is ef-

fective and only 1.1% found enforcement to be very effective.

B. Institutional linkage and support. The Venn diagram below shows that the Barangay Council and DA-BFAR are the institutions that provided the most assistance to KAMAMADO. The DOT has the smallest and farthest circle from Barangay Dolores since the agency was blamed for narrowing the passageway in the heritage site.

DA-BFAR/ Bgy.Council - Provided much assistance to KAMAMADO
DSWD - Provided capital to residents
DENR - Helped in their small way
Tourism (DOT) - Passageway was narrowed
Municipal LGU - Extended support to the programs
LGU Province - Level of assistance between DA-BFAR and DENR

C. Women's participation and access to mangrove resources. Despite the many domestic roles that women perform, they still have time to earn income for the family. Women perform domestic functions 18 hours a day (Table 11).

Women take active roles in community activities mainly by participating in meetings. The participation of women in fishing activities focus on actual fishing activity (alone or with the husband) i.e. fishing with the use of nets, fishing at night, shell gleaning and husking coconuts. These activities earn women: P200.00, P1,150.00, P100.00 and P200.00 respec-

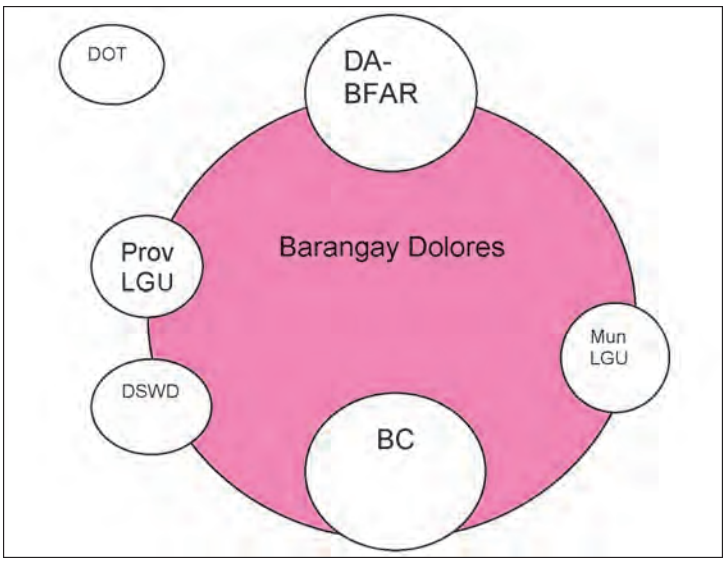


FIGURE 16. Institutional linkage and support to KAMAMADO

TABLE 17. 24-hour clock activity of women in Dolores, Nueva Valencia, Guimaras

Time		Activity
4am	-	wake up, water the plants
5am	-	cook food for breakfast, fetch water
6am	-	eat breakfast, tender the animals, feed the chicken, feed the children
7am	-	clean the house, take a bath
8-9am	-	wash clothes, feed the pigs, buy rice and viand
10am	-	cook food for lunch
11am	-	put animals in shelter
12nn	-	eat lunch, wash plates, rest a little
1-2pm	-	listen to radio, watch TV, sew clothes, sell snack foods, glean shells if low tide, fold dry clothes, gather firewood, make mats, cross stitch
3-4	-	clean the house, gather coconut fronds, get materials for charcoal, make thatch nipa, weeding the plants, tender animals, fetch wáter, wáter the plants, relax a little, gardening, vend fish, feed the chickens, get washed clothes
4-6pm	-	get animals, look for food for supper, feed the pigs, cook food
6-7pm	-	eat supper, watch TV, help children with assignments, make mats, rest
7-8pm	-	wash plates, bathe children, check animals, pray, prepare materials for selling snack food, collect fish fry, send children to sleep
8-10pm	-	watch TV
10pm-1am	-	watch/ check children while asleep
10pm-4am	-	sleep

tively. Activities which give women access to mangroves is shell gleaning 3 times a week at 3-4 hours per gleaning activity.

Trainings

a. **Attended.** Majority (31%-52%) of the respondents did not answer the question about trainings were attended. Thirty one to fourty six percent have not attended any training. A few (20%-31%) have attended trainings on fishing laws and policies, credit, environment, livestock raising, fisheries resource management and fishing technology. Trainings not attended (11% and lower) were on leadership, fish processing, aquaculture, marketing, project development, IEC and enterprise development and management.

b. **Needs.** Majority expressed the need for training except those on leadership and management, aquaculture, marketing and enterprise development and management.

TABLE 18. Trainings attended of stakeholders in Dolores, Nueva Valencia, Guimaras

Type of training	Yes	No	No answer
	Percentage		
Fishing laws, policies and procedures	31.1	31.1	37.8
Credit	31.1	37.8	31.1
Environment	28.9	35.6	35.6
Livestock raising	27.8	31.1	41.1
Fisheries resource management	22.2	34.4	43.3
Farming	22.2	34.4	43.3
Leadership and management	5.6	44.4	50.0
Fishing technology	27.8	38.9	33.3
Fish processing	5.6	43.3	51.1
Aquaculture	1.1	46.7	52.2
Marketing	5.6	43.3	51.1
Project development and management	11.1	38.9	50.0
Information, education and communication	11.1	40.0	48.9
Enterprise development and management	2.2	45.6	52.2

TABLE 19. Training needs of stakeholders in Dolores, Nueva Valencia, Guimaras

Type of training	Yes	No	No answer
	Percentage		
Fishing laws, policies and procedures	52.2	13.3	34.4
Credit	30.0	27.8	42.2
Environment	48.9	11.1	40.0
Livestock raising	64.4	10.0	25.6
Fisheries resource management	43.3	13.3	43.3
Farming	34.4	20.0	45.6
Leadership and management	14.4	31.1	54.4
Fishing technology	47.8	20.0	32.2
Fish processing	32.2	24.4	43.3
Aquaculture	10.0	37.8	52.2
Marketing	20.0	25.6	54.4
Project development and management	25.6	22.2	52.2
Information, education and communication	42.2	18.9	38.9
Enterprise development and management	12.2	30.0	57.8

Appendix 5. Katunggan it Ibajay Ecopark Business Plan

KATUNGGAN IT IBAJAY ECOPARK

Business Plan 2012 - 2017

Barangays Naisud-Bugtongbato, Ibajay, Aklan, Philippines

CONTENTS

I. EXECUTIVE SUMMARY

Katunggan it Ibajay (KII) Ecopark has been a recognized destination for ecotourism experience. Domestic and international visitors are drawn to KII Ecopark by a combination of diverse natural attractions and high quality ecotourism products. Two years from its launch in January 2010, a review of the implementation of the ***Katunggan it Ibajay Ecopark Business Plan*** and extensive consultation with key stakeholders indicated a clear need to update the Plan and continue efforts to date in growing KII Ecopark's ecotourism industry by providing a consistent direction for planning, development, management and marketing.

The *Katunggan it Ibajay Ecopark Business Plan 2012-2017* presents an updated vision, mission and key objectives of the ecopark, reflecting development in the ecotourism industry and experience gained since the launching in 2010. An updated set of Action Plans linked to each Key Objective provide the specific projects and activities that will underpin successful implementation of the *Katunggan it Ibajay Ecopark Business Plan 2012-2017.*

While substantial achievements have been made in the ecopark, there is a clear role for an updated Katunggan it Ibajay Ecopark Business Plan to lead industry, local government unit, the community and other stakeholders in the ongoing development of the ecotourism industry.

A variety of issues emerged from consultation with stakeholders involved in reviewing the Katunggan it Ibajay Ecopark Business Plan. Issues identified included the importance of continuing to develop partnerships and communication between the ecotourism industry, government agencies, academic institutions and other stakeholders, the need to regularly update ecotourism related research and the need to provide practical advice on how to achieve best practice / minimal impact operations.

The *Katunggan it Ibajay Ecopark Business Plan 2012-2017* Action Plans include specific actions that reflect the current needs of industry, government and the community and that are aimed at protecting and strengthening KII's competitive position in the local and national ecotourism markets.

Vision

Katunggan it Ibajay Ecopark will be a notable ecotourism destination with local government, community and private agency partnerships to promote mangrove conservation and helping people around the globe experience nature interacting with culture.

Objectives

The implementation of this Plan will be strategic, consistent with management plans and give initial priority to the following key areas:

- continuously provide visitors with an enjoyable and informative guided tour;
- improving the capacity of community members in running the ecopark as to guest relations and hospitality management;
- improving the business operating environment for community members and tourism operators accessing the ecopark;
- establishing a market presence that assures short-term and long-term profitability, growth and success;
- developing an evaluation scheme to gauge satisfaction of visitors;
- supporting tourism growth and development and overall economy of Ibajay and the rest of the country;
- contributing positively to our communities and our environment;
- developing a better understanding of the nature of the domestic and international ecotourism markets; and,
- ensuring the growth projections for ecotourism in *Katunggan it Ibajay* Ecopark are appropriately considered in the planning and management of the protected area.

II. MARKETING PLAN

Description of the Product

Presently, the *Katunggan it Ibajay Ecopark* provides guided ecotourism tours along a wooden footwalk. Visitors are hosted in a reception center and offered a guided tour by trained local site guides who are able to share information about the ecology and morphology of mangroves, mythologies and history of the place and traditional cultural activities along the tour.

Katunggan it Ibajay Ecopark boasts of 27 mangrove species with centuries-old *Avicennia rumphiana* trees (locally known as **apiapi** or **bungalon**). The biggest of this group is a 20 m tall tree with 8 m circumference at the end of a 1-kilometer tour.

Equally captivating is *Xylocarpus moluccensis* (**piag-ao**) whose leaves turn a brilliant yellow, orange and red and falls (in late January). The forest has birds and other wildlife such as mud lobsters, called the engineers of the mangroves because they continually build mounds creating a canal

system where water flows during high tide. When one steps down the boardwalk during low tide, fiddler crabs, mudskippers and other fauna are observed in abundance.

Local folk believe the forest is enchanted, and protected by spirits. In the mid 1980's, villagers and officials used 'People Power' to stop fishpond operators from cutting trees to make ponds. The "discovery" of this patch mangrove by SEAFDEC Aquaculture Department researchers in 1996 was followed by studies over the next 10 years, as documented in the 2004 Handbook of Philippine Mangroves. Construction of the footwalk started in 2008 with funds from a Pew Fellowship grant (of scientist J.H. Primavera, who also initiated the research). The following year marked the passage of Municipal Ordinance 92 proclaiming 44 hectares as an Ecopark, and completion of the footwalk and reception center by the local government in collaboration with the Community-Based Mangrove Rehabilitation Project of the Zoological Society of London. On 19 January 2010, Katunggan it Ibajay Ecopark was inaugurated by Ibajay Mayor Ma. Lourdes M. Miraflores.

At present, the following facilities are available in the ecopark: a) reception center; b) 1040- meter foot walk built on concrete post and bamboo flooring; c) four (4) rest areas built in strategic locations along the ecopark for visitors to relax during the trip; and, d) an eco-san toilet (an environment friendly facility) within the heart of the mangroves for visitors' personal comfort necessities. A bigger multipurpose center will be built which can accommodate bigger number of guests, serve as area for orientation and area for refreshment.

The Mangrove Ecotourism Board (METB) of the local government of Ibajay will assist in the development of structures and implementation of the project in the ecopark. Partners such as the Zoological Society of London and Aklan State University – Ibajay Campus will provide the technical inputs on of the ecotourism business and provide skills development to community members, respectively.

Comparison of the Product with its Competitors

Competitor	Product	Limitations
1. Jawili Falls, Tangalan	swimming, picnic, lodging accommodation, pictorial	limited to rainy season
2.Marine Sanctuary, Tangalan	diving/ snorkeling	limited to certified divers
3.Tangalan beach resorts	swimming, picnic, function halls, accommodation	areas are remote
4. Bakhawan Ecopark, Kalibo	Footwalk, function hall, charcoal bricketting, picnic areas, swimming, fishing	7 mangrove species only planted/ man-made), no tour guides
5. Isla Kapispisan, New Washington	300 m footwalk, *Rhizophora* plantation, CHED recognized for community extension	mono species
6. Pagatpat, Buruanga	function hall, 100 m footwalk	privately owned
7. Hurom-Hurom, Nabas	swimming, picnic, cottages	limited units
8. Katunggan it Ibajay	entrance hall, mangrove diversity (natural), centuries-old mangroves, 1km footwalk, boat ride, mud lobster mounds, fiddler crabs, birds, info material, tour guides, accessibility	

Location

The town of Ibajay situated in the Province of Aklan, is located 40 kilometers west of Kalibo and 50 kilometers east of the world famous Boracay (a 45-minute ride from Ibajay). It is classified as a 3rd class municipality and has a total land area of 18,190 hectares. Composed of 35 Barangays, it has a total population of 42,742 (NSO August 2008 data) with calculated growth rate of 1.04%. The total number of household is 8,548 with an average household size of 5. It is accessible by land transport from Kalibo or Iloilo City and also available by air from major hubs – Manila, Cebu, Davao.

Target Market

While it is important to encourage as many visitors to *Katunggan it Ibajay Ecopark* as possible, it is equally important to establish the holding capacity of the ecopark in relation to the ecological impact of visitors – to develop a maximum number who may stay in the ecopark at any given time. As an educational, and potentially a research area, *Katunggan it Ibajay Ecopark* will focus on a number of target visitors:

a. Domestic Tourists
Neighboring communities, local government units, line agencies

This group was not initially identified as the financial target group, as entrance fees for domestic tourists is currently, and will continue to be, lower than international tourists. However, after two years of operation, the group contributed 80% of the visitors and collected fees in the ecopark. Neighboring and even host communities have easier access to the ecopark and are of equal value as increased local awareness of conservation issues are directly connected to future sustainability and protection of the project.

b. Study Tourists
Students, teachers, scientists, researchers, conservation NGOs

This target group has fees much lower than domestic tourists; however, this group is equally important so as to encourage more interests and opportunities to students and researchers who may gain field experience in data collection. Since this target group is the future generation of potential professionals and decision makers in the conservation field, it is vital to enable them to have sufficient understanding of the environment they may later help to protect.

c. International Tourists
Non resident international public

This target group was initially identified as the financial target group because of the large number of tourists visiting the neighboring Boracay Island and fees are relatively higher for this group. However, after 2 years of operation, the group contributed a meager 1.5% of the total visitors annually. It is still believed that with the advent of a bigger multipurpose hall, the ecopark could potentially host a large number of international tourists.

TABLE 1. Tourist arrival in Katunggan it Ibajay Ecopark

Dates	Domestic tourists	Study tourists	International tourists	Fees generated
Jan 2010 – Dec 2010	3,889	389	65	approx. P48,000
Jan 2011 – Dec 2011	2,991	1,066	58	approx. P60,000

Tour Fees

Based on the amended Municipal Ordinance 092 Series 2011, entrance fees to the ecopark will be as follows:

a. Domestic tourists – PhP20.00
b. International tourists – PhP100.00
c. Students – PhP15.00

Tour packages are also offered covering transportation, entrance fees, site guide fees, meals, snacks and lunch. Table 2 details the packages designed to meet the needs of various tourists.

TABLE 2. Pricing for Tour Packages

Particulars	Group Cost	Number of visitors							
		1	2	3	4	5	6-10	11-15	16-20
Multicab		100	100	100	100	100	100	100	100
Boat fare		50	50	50	50	50	50	50	50
Van		300	300	300	300	300	300	300	300
Entrance fee		20	20	20	20	20	20	20	20
Site Guide	100	100	50	33.33	25	20	16.67	18.18	12.50
Welcome drinks		50	50	50	50	50	50	50	50
Lunch		160	160	160	160	160	160	160	160
Snacks		30	30	30	30	30	30	30	30
Actual Cost		810	760	743.33	735	730	726.67	728.18	722.50
Mark-up		243	228	222.99	220.50	219	218	218.45	216.75
Actual Rate		1,053	988	966.32	955.50	949	944.67	946.63	939.25
Published Rate		1,100	1,000	980	970	970	960	960	950

Rates can vary depending on the services (e.g., need to serve snacks or lunch) that will be included in the tour.

In computing for the tour package, a 30% mark-up was added to serve as buffer for maintenance and facility upgrade.

The computation of the actual cost and published rates has allowance for the fluctuating prices of goods and services.

To ensure a satisfying experience, group tours are encouraged to reserve bookings 1 week before scheduled tour.

Sales Forecast

The entrance fees will be the same unless amended by the METB.

Promotional Strategies

Several promotional measures will be employed for Katunggan it Ibajay Ecopark through which the tour will be marketed:

1. Inclusion of *Katunggan it Ibajay Ecopark* in accredited tour operators
   A familiarization tour will be organized to members of accredited local and national tour operators to include KII Ecopark in the itinerary of the tours they are selling.
   Development of website and Facebook™ page
   A full page from the website of Ibajay will be used to promote *Katunggan it Ibajay Ecopark*, allowing the visitors to view the wonderful sights of the ecopark, services offered, tour packages and booking/ reservation information. The Administrative Office and/or Municipal Tourism Office (MTO) will maintain/open an internet website from 8AM to 5PM daily.
   A Facebook™ page will be made for the ecopark in the frequently visited networking site to fea-

ture the services offered in the ecopark, corresponding rates, directions to get to the place and booking information.

3. Advertisement in radio, television and print media
   For two years of since its launching, local radio/ television stations and publications served as vehicle for advertising of the ecopark. For the next five years, brochures containing information about *Katunggan it Ibajay Ecopark* will be circulated during local festivals, provincial and national tourism events. News articles or write-ups promoting the ecopark will be published regularly.

4. Invitations to LGUs and academic institutions
   Local government units within the region and in other regions interested in mangrove conservation and rehabilitation will be invited for study tours in the ecopark.
   Primary, secondary and tertiary schools will also be invited for educational field trips and potential research studies.

5. Development and selling of souvenir items
   Shirts, caps, mugs, wallets and other novelty items with logo/ advocacy statements will be produced and sold to massively disseminate mangrove awareness among the target groups.

III. PRODUCTION PLAN

Fixed Capital

a. 1015-m footwalk made of bamboo
b. Entrance hall
c. 3 Rest areas
d. 1 Tree house
e. Eco-san toilet

Repair and Maintenance

Minimal expenses for repair and maintenance will be incurred since the materials for the footwalk are pliable and are not easily broken. Portions of the footwalk that are weak require replacement and repair. Materials for repairs are easily available in the locality.

Planned Capacity

The entrance hall will be utilized for souvenir area, mini-store and can accommodate 10-15 persons during orientations at the start of the tour.

A tour guide will be assigned a maximum of 10 persons to enter the ecopark at one time. The next batch will come 20 minutes after or at a 100-meter distance from the first batch. The ecopark can accommodate a maximum of 200 visitors per day.

IV. MANAGEMENT PLAN

Form of Business

Katunggan it Ibajay Ecopark is a mangrove ecotourism project of the Local Government Unit of Ibajay to support the rehabilitation and livelihood activities of Peoples Organizations in Barangays Bugtongbato and Naisud.

The existing organization is under the supervision of the Municipality of Ibajay through the Barangay Councils of Bugtongbato and Naisud. The Technical Working Group (TWG) of Katunggan it Ibajay was created in 2009 and later evolved into the Mangrove Ecotourism Board (METB). The METB has four committees: 1) Protection Committee; 2) Monitoring and Evaluation Committee; 3) Training and Management Committee; and, 4) Livelihoods Committee.

The METB reports to the Office of the Mayor and provides overall management and policy support to *Katunggan it Ibajay Ecopark*. Specifically, the Board ensures that the goals and objectives of the

enterprise as well as its management and operations are consistent with the goals of the ecopark. Figure 1 presents the existing organizational structure of the project.

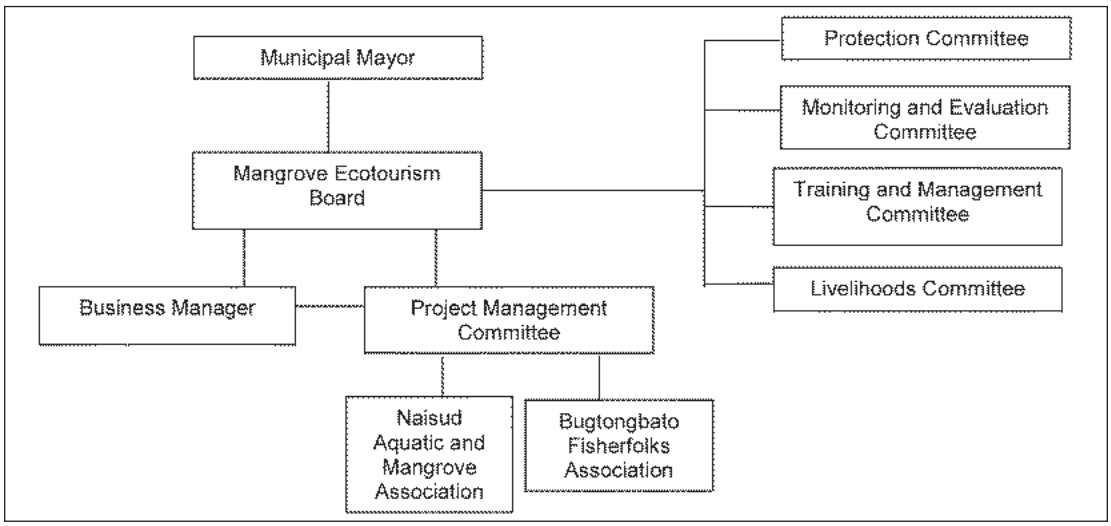


FIG. 1. The organizational structure of Katunggan it Ibajay Ecopark

Roles and Responsibilities

a. The Mangrove Ecotourism Board (METB) shall:
- Formulate policies and guidelines on the management, protection and utilization of mangroves;
- Monitor and evaluate the ecopark
- Supervise the Peoples' Organization in ecopark management
- Approves the annual workplan of the Project Management Committee (PMC); and
- Provide the over-all direction and coordination of activities in the mangroves of Bugtongbato and Naisud.

b. The committees within the METB shall:
- Protection Committee – formulate policy enforcement plan, coordinate with law enforcement groups/bodies and recommends policies;
- Monitoring and Evaluation Committee – assess projects viability, conduct regular observations of the biophysical and socio-economic results and changes brought about by the operation of the ecopark;
- Training and Management Committee – plan rehabilitation and reforestation activities, monitor health and growth of mangroves; and
- Livelihoods Committee – install systems in the ecopark, identify and access funds, coordinate with the PMC regarding construction of infrastructure facilities, promote and markets the ecopark.

c. The Project Management Committee (composed of representatives from BFA and NAMAO) directly manages and operates the ecopark, implements the annual workplan, keeps records of activities including logbooks of visitors and reports to the METB the status of the project, finances and policy enforcement.

The PMC have the following staff:
- Caretaker – entertains guests during arrival, coordinates activities, dispatch of tour guides and equipments, registers guests, receives and process payments, handles cash and cash-related transactions
- Tour Guides – guides and interprets the tour to visitors within the ecopark

Staff wages and benefits

Labor for repair and maintenance of facilities is not a problem since most members of the organizations have experiences in construction. Labor cost will be calculated depending on the need for repairs and availability of funds.

Members of NAMAO and BFA were selected and trained to work as caretaker and tour guides in the ecopark. Since the ecopark is in its initial stage, a 20% revenue share will be given to the caretaker and a 10% revenue share to the tour guides (which will be divided among tour guides depending on number of duty days).

Capacity building and trainings for staff

The Local Government of Ibajay and other support organizations and institutions (such as Zoological Society of London and ASU Ibajay) will be tapped to provide community members proper trainings and materials to run the ecopark.

Interpretative Tour Guide Training – for equipping members to serve as tour guides to visitors

Tourist Service Skills Training – for members to be trained in food handling, menu preparation, food service and housekeeping service

Financial Installation – for handling finances of the ecopark

V. FINANCIAL PLAN

Profit and Loss Statement

	Jan – Dec 2012	Jan – Dec 2013	Jan – Dec 2014	Total
REVENUE				
Gross sales (entrance fees)	63,072.00	75,686.40	90,823.68	229,582.08
Gross sales (tour packages)	122,803.20	147,363.84	176,836.61	447,003.65
Donations	9,270.00	11,124.00	13,348.80	33,742.80
Sales of souvenir shirts	18,000.00	21,600.00	25,920.00	65,520.00
Sales of souvenir items	3,000.00	3,600.00	4,320.00	10,920.00
TOTAL REVENUE	***216,145.20***	***259,374.24***	***311,249.09***	***786,768.53***
OPERATING EXPENSE				
Caretaker's share	39,029.04	46,834.85	56,201.82	142,065.71
Tour guides' share	19,514.52	23,417.42	28,100.91	71,032.85
Tour package cost	76,744.00	92,092.80	110,511.36	279,348.16
Electricity bill	3,600.00	3,960.00	4,356.00	11,916.00
Water bill	1,200.00	1,320.00	1,452.00	3,972.00
Supplies	3,600.00	3,960.00	4,356.00	11,916.00
Travel expenses	3,000.00	3,600.00	4,320.00	10,920.00
Maintenance of facilities	19,514.52	23,417.42	28,100.91	71,032.85
Miscellaneous expenses	24,000.00	28,800.00	34,560.00	87,360.00
BFA share	975.73	1,170.87	1,405.05	3,551.64
NAMAO share	975.73	1,170.87	1,405.05	3,551.64
Promotions and advertising	6,000.00	6,300.00	6,615.00	18,915.00
TOTAL EXPENSE	***198,153.53***	***236,044.24***	***281,384.09***	***715,581.86***
NET INCOME (LOSS)	**17,991.67**	**23,330.00**	**29,865.00**	**71,186.67**

KATUNGGAN IT IBAJAY ECOPARK GUIDELINES

Brgy. Bugtongbato, Ibajay, Aklan, Philippines

The KII Eco-Park is managed by the Bugtongbato Fisherfolk Association (BFA) and Naisud Mangrove and Aquatic Organization (NAMAO). It opens Monday—Sunday from 8:00 AM to 5:00 PM. PLEASE OBSERVE THE FOLLOWING RULES AND REGULATIONS INSIDE THE ECO-PARK

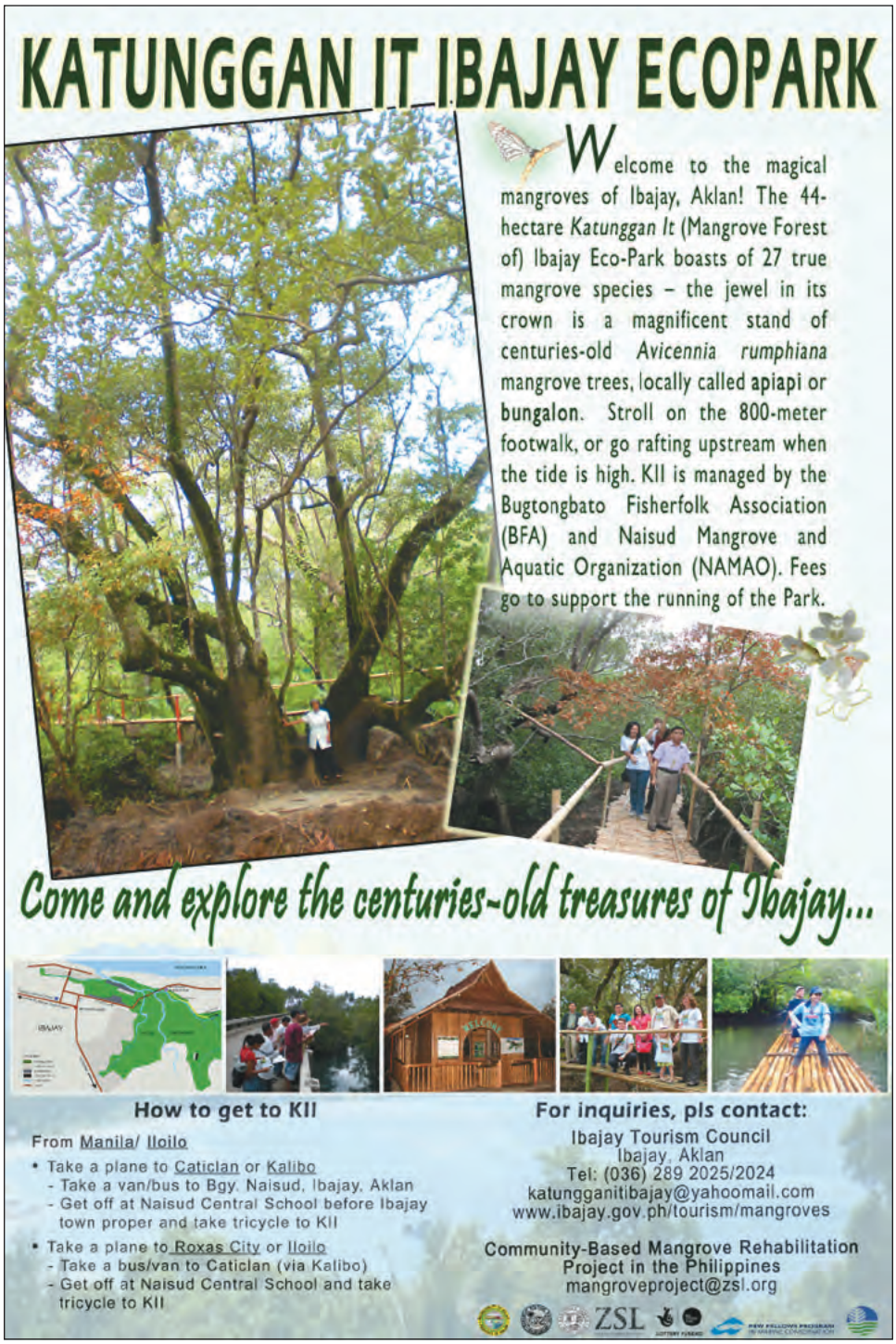
1. Entrance and other fees are found below.
2. Children below 7 years old should be accompanied by adults.
3. Carrying Capacity: A maximum of 10 persons per batch will be allowed to enter at one time, the next batch will come 20 minutes after or at a 100-meter distance from the first batch. The KII can accommodate a maximum of 200 visitors per day.
4. Leave bags at the Information Center, bring only valuables, camera and water.
5. Use the comfort room before entering the ecopark (as the walkway is more than 1 kilometer long).
6. Snacks, beverages and publications are available for sale at the entrance.
7. Garbage should be disposed of in designated places at the entrance and footwalk.
8. No alcoholic drinks are allowed inside the ecopark.
9. No firearms, deadly weapons, sharp objects are allowed inside the ecopark.
10. Collection of mangrove and other plants (seedlings, branches, etc.) and animals is strictly prohibited.
11. Vandalism and loitering are strictly prohibited.
12. For inquiries and reservations, contact: Josephine Gelito: 0949-4710761. Large groups should reserve 3 days in advance

FEES AND CHARGES:

1. Entrance fee — PhP20.00 for local tourists and PhP100.00 for foreign tourists (donations are welcome).
2. Tour guides are available — PhP100.00 per batch of 10 persons
3. Tree house and rest area rental — PhP100.00 per 4 hours and PhP50.00 per hour in excess
4. Boat rental — PhP30.00 per head for a one-way trip
5. *Mangrove Field Guide* rental — PhP20.00 per day
6. *Mangrove Handbook* rental — PhP30.00 per day

KATUNGGAN IT IBAJAY ECOPARK BROCHURE

KATUNGGAN IT IBAJAY ECOPARK POSTER



GLOSSARY OF TERMS

ASU	-	Aklan State University
BFA	-	Bugtongbato Fisherfolks Association
CBFMA	-	Community-based Forest Management Agreement
DENR	-	Department of Environment and Natural Resources
DOLE	-	Department of Labor and Employment
DOT	-	Department of Tourism
KII	-	Katunggan It Ibajay
PO	-	People's Organization
LGU	-	Local Government Unit
METB	-	Mangrove Eco-Tourism Board
MTO	-	Municipal Tourism Office
NAMAO	-	Naisud Mangrove and Aquatic Organization
NGO	-	Non-Government Organization
PMC	-	Project Management Committee
TWG	-	Technical Working Group
ZSL-CMRP	-	Zoological Society of London – Community-based Mangrove Rehabilitation Project on the Philippines

Appendix 6. CRMF KAMAMADO

COMMUNITY RESOURCES MANAGEMENT FRAMEWORK

PART I. INTRODUCTION

A. Basic Information

Name and address of the People's Organization (PO)

Katilingban sang Magagmay nga Mangingisda sa Dolores (KAMAMADO)
Barangay Dolores, Nueva Valencia, Guimaras

Head of the PO

Bonifacio Sapio
President

Registration (name of agency, registration number and date)

Department of Labor and Employment (DOLE)
Registration number VI-1009
6 October 1999

Total number of members

86 (64 active and 22 inactive)

Approved CBFMA (number and date of issuance, area covered, location, management)

CBFMA Number 37619 dated February 2009
Area covered: 6.3726 hectares
Located at Basyaw Cove, Barangay Dolores, Nueva Valencia, Guimaras
Community management approach (KAMAMADO)

B. Background

The municipality of Nueva Valencia is a 3rd class municipality in the Province of Guimaras. It has a total land area of 13,712 hectares. Nueva Valencia has 22 barangays, 14 of which are coastal, 2 island and 6 inland. Barangay Dolores is one of the coastal barangays of Nueva Valencia.

Traditionally, Barangay Dolores was acclaimed as one of the barangays with the richest fishing grounds due to its strategic location in the island province of Guimaras. Moreover the mangrove forest of Basyaw Cove and the traditional method of catching fish i.e., hook and line have sustainably maintained the supply of fish and other marine products for a certain period.

With the passing of time however, drastic changes happened in Dolores. Commercial fishing vessels equipped with modern fishing gadgets encroached within the area of marginal fishers. The vast mangrove forest in Basyaw Cove was cut down and converted into fishponds. Other illegal methods of catching fish, i.e., dynamite fishing gradually destroyed the ecosystem resulting in the rapid degradation of the natural resources.

The grim scenario did not go unnoticed by Warlito Garonita, a retired staff of the Philippine Coast Guard who went home to Sitio Guisi, Barangay Dolores to enjoy time with family and relatives. The clamor from small fishers of decreasing catch and non response of the government on the fisher's issues encouraged him to organize the small fishers. The objective was to bring their concerns to the attention of the government. The organization was named Katilingban sang Magagmay nga Mangingisda sa Dolores or KAMAMADO.

KAMAMADO as an organization

Composed mainly of marginal fishers residing in Barangay Dolores, KAMAMADO was organized in July 1998 and was registered with the Department of Labor and Employment (DOLE) on 6 October

1999 with Registration Number VI-1009. The purpose of KAMAMADO is "to form a strong and viable organization for the protection, conservation and rehabilitation of coastal fishery resources in order to alleviate the living conditions of the marginal fisherfolk."

KAMAMADO's objectives are:

1. To protect, conserve and rehabilitate the coastal and fishery resources;
2. To promote public awareness on the importance of protection, conservation and rehabilitation of natural resources;
3. To maintain the ecological balance of the coastal fishing areas; and
4. To increase fish production by at least 10% from the present level.

The highest governing body of KAMAMADO is the General Assembly (GA). The working set of the Board of Directors (BOD) oversee the operational activities of KAMAMADO. **Appendix A** is KAMAMADO's Organizational Structure.

KAMAMADO, has experienced rise and fall in its membership. Peak was established at the time the organization was registered with 120 members. To date KAMAMADO has 86 members. KAMAMADO's set of incumbent officers and members are listed in **Appendix B.**

The organization continues to be beset by problems such as non-cooperation of members. However, despite the many problems faced by KAMAMADO the organization was able to undertake 7 projects, i.e., mangrove reforestation, establishment of the Coral Garden and hosting the Sibiran Festival to mention a few. Conservation and a few organizational strengthening seminars was participated in by some members of KAMAMADO starting from its establishment to date.

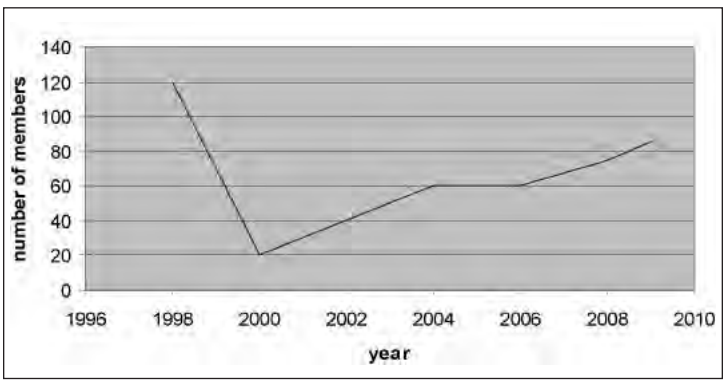


FIG. 1. Graph showing KAMAMADO's membership over time

Process of CBFMA application until approval

With focus on rehabilitating Basyaw Cove, KAMAMADO applied for a CBFMA, a tenurial instrument that would give KAMAMADO the authority to manage the Cove in the next 25 years. The timeline of events (as narrated by Warlito Garonita) from organization to CBFMA application until it was granted is enumerated below. Parallel activities of DENR on KAMAMADO's CBFMA request are likewise highlighted.

TABLE 1. KAMAMADO timeline

Year	Important KAMAMADO activity	Corresponding DENR action
1997	• Period of consultation, coordination and consolidation of fishermen	
1998	• Formation of KAMAMADO with 53 members. Main purpose: protection, conservation and rehabilitation of fishery resources to increase fish production. • Formulation and ratification of CBL.	
1999	• Registration of KAMAMADO with DOLE R6 under RC No. VI-1009. • Start of the Credit Coop concept of lending limited amount to interested members (stopped due to difficulty in payment of loans by members)	

TABLE 1. *(Continued)*

2000	• Ocular inspection of the coastal area to determine priority areas. • Selected members undergo Fish Warden training; simple bookkeeping and accounting; FARMC	
2001	• Seminar orientation on paralegal cooperatives; training on pawikan protection and conservation.	
2002	• Passed Resolution No.01 S-2002 requesting PENRO DENR Guimaras to grant KAMAMADO authority to rehabilitate Basyaw Cove. • Passed Resolution No.2 S 2002 authorizing KAMAMADO President to file application with PENRO Guimaras for CBFMA covering Basyaw Cove.	• PENRO received Resolution No.1 dated 28 July 2002 from KAMAMADO requesting authority to rehabilitate Basyaw Cove • Meeting with Ex Mayor Gonzaga, DENR and BFAR re cancelled FLA
2003	• KAMAMADO became member of BFARMC, MFARMC Nueva Valencia, Federation of Fisherfolk Organization of Nueva Valencia and Federated Fisherfolk Organization in Guimaras. • Selected officers attended seminar on Info Alert for Sustainable Coastal Areas Development; Coastal Resources Assessment and Heritage Tourism.	• DENR Forester attended GA at Dolores; one issue raised was Basyaw Cove • CBFM orientation for KAMAMADO, PLGU, MLGU and BLGU officials
2004	• KAMAMADO and BFARMC jointly formulated Coastal Fishery Resources Recovery Program of Barangay Dolores (200 modules of AR in the Coral Garden and 7 payaw installed). • KAMAMADO became member of Barangay Dolores Tourism Council (BDTC). • Planted 9000 bakhaw propagules in 2 hectares with financial assistance from the PLGU. • KAMAMADO officers undergo Seminar Workshop on Mangrove Management; Seaweeds Farming	
2005	• Planted 9000 propagules of bakhaw in another 2-hectare area in Basyaw Cove with funding from MLGU and PLGU. • Established seaweed farm. • Planted 2000 bakhaw propagules in Basyaw Cove with GENRO and the Guimaras Small Scale Miners Association, ICOW-International Earth Day Celebration	
2006	• Organized the KAMAMADO BDTC Emergency Response Group (50 volunteers) to contain the oil from the 11 August 2006 Oil Spill.	
2007	• Organized and launched the 1st Guisi Sibiran Festival with the theme: Coastal Resources Protection, Conservation, Rehabilitation and Eco-Tourism. Objectives: • to serve as vehicle to revive traditional friendly methods of catching fish • to promote public awareness of the importance of protection/conservation of natural resources • to serve as tourist attraction	• Actual survey of the proposed CBFM area by the DENR survey team • CBFM application endorsement by PENRO Guimaras to DENR Regional Office • Application for CBFMA of KAMAMADO was returned by DENR Regional Office to PENRO Guimaras due to incomplete documents • KAMAMADO GA • PENRO Guimaras returned to Regional Office the CBFMA application of KAMAMADO with complete supporting documents

TABLE 1. *(Continued)*

2008	Conducted the 2nd Guisi Sibiran festival. Assisted DA-BFAR in planting 100 AR modules in Guisi Coral Garden and installation of 7 units of Payao Attended the following trainings and seminar/workshops: ICM Guimaras NVMTACC Workshop Mangrove/Pond Governance LRA training KAMAMADO became regular member of ICM Guimaras, NVMTACC, MAFC	CBFMA papers of KAMAMADO forwarded to the DENR Secretary in Manila for signing
2009	Conducted the 3rd Guisi Sibiran Festival in cooperation with the LGUs, Barangay Council, BDTC, GCO, DES Attended training on Mangrove Ecology, Biology and Taxonomy and Nursery Establishment CBFMA No. 37619 approved by DENR Secretary	CBFMA application of KAMAMADO signed by DENR secretary with CBFMA No. 37619 **(Appendix C)**

CRMF and the Workshop Process

After the CBFMA approval by the DENR, the recipient PO needs to come up with a written Community Resource Management Framework (CRMF) that spells out the PO's vision, mission and objectives, proposed uses and strategies in managing the CBFM area in the next 25 years. The present situation is likewise being examined in formulating the CRMF which is then used as basis for identifying programs for mangrove utilization and management.

A community workshop to formulate the CRMF was conducted by KAMAMADO in April 28-29, 2009 at the Barangay Hall of Barangay Dolores, Nueva Valencia, Guimaras. The activity was participated in by 50 representatives from the Municipal LGU, Barangay LGU, officers and members of KAMAMADO and Zoological Society of London (ZSL)-an NGO working on mangrove project in partnership with the LGU. DENR PENRO of Guimaras acted as the main facilitator for the workshop. The methodology in doing the workshop consisted of presentations, small group discussion, mapping and visioning exercises (refer to **Appendix D** for the Activity Schedule).

The output of the workshop will be consolidated and written as draft according to the format prescribed by the DENR. The draft CRMF will be presented during the GA of KAMAMADO. The document will then be finalized taking into account the comments and suggestions of members during the GA. The final CRMF document will be submitted to PENRO Guimaras for confirmation. After PENRO confirmation, KAMAMADO will meet again to detail activities for the Annual Work Plan (AWP) covering the period June 2009 to May 2010. The AWP will serve as guide for KAMAMADO in implementing plans for organizational strengthening and mangrove utilization and management under the CBFMA.

PART II: PRESENT SITUATION

1. The Community

Demographics. Barangay Dolores has a total land area of 451, 6609 hectares. As of 2009, the population of the barangay is 2055 and the total number of HH is 438. Average HH size is 4.69. Since fishing is the main source of livelihood, the barangay has registered a total of 441 fisherfolk in 2008. The total coastline length of Barangay Dolores is estimated at 4.5 kilometers.

Climate. Barangay Dolores has 2 pronounced seasons i.e. Dry Season from November to April and Wet Season from May to October. Barangay Dolores experienced flooding and drought as a result of extreme climatic changes. Heavy rains in 2008 brought about by typhoons have drowned rice plantations, farm animals, destroyed houses and polluted source of drinking water.

Health. Majority (92%) of HH have toilet facilities. From these, 81% have water sealed toilet types. Other types of toilet used are antipolo and open pit. Means of disposal for HH without toilets are fa-

ther's toilet (majority), anywhere, the forest, communal or neighbor's toilet. (Fig. 2)

Source of potable water is deep well. Burning is still the majority's practice of garbage disposal.

In the last 3 years, only 2% of the total number of children is malnourished; no child was born below 2 kilos.

Food consumption is limited to rice and fish (Table 2). Vegetables are eaten at the maximum of 4x per week. Vegetables are either bought from the market or grown in the back yard. Since meat is bought in the capital town of Guimaras which is San Miguel (locally called Alibhon), consumption is only once in a week. A portion of the catch (fish, shellfish) is being shelved for home consumption.

Diarrhea, dengue and pneumonia are prevalent in 2000-2004 which the residents attribute to stagnant water and dirty surroundings. Typhoid, asthma and skin diseases were the most common illnesses in 2006-2007. The residents consider this as the year when the worst illness happened. This is also the same year when the Oil Spill occurred.

Education. Majority of the residents of Barangay Dolores have reached only the elementary or high school education. Very few were able to reached college (Fig. 3).

Religion. The religion of the majority of residents in Barangay Dolores is Aglipay (Fig. 4).

Source of livelihood and income. Main source of income of the HH (at least 60%) in Dolores is fishing. The average number of years spent in fishing is 20. In a year, 9 months are spent in fish-

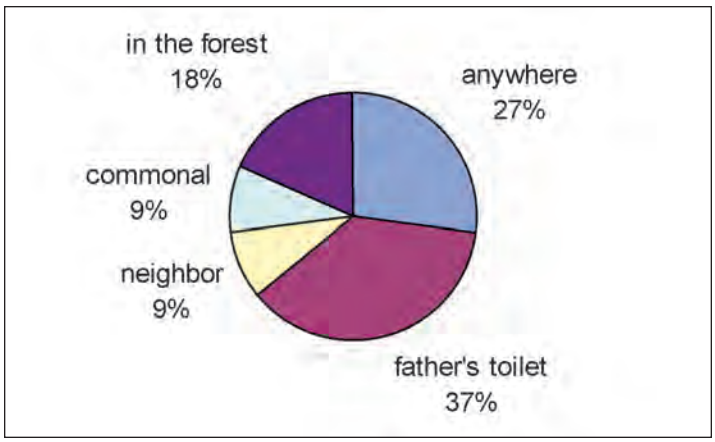


FIG 2. Means of disposal for HH without toilets

TABLE 2. Food consumption pattern of a family in Barangay Dolores

Breakfast	Lunch	Dinner
Rice, fish, bread, banana, eggs	Rice, fish, vegetables, meat (once a week)	Rice, fish, shrimp paste (ginamos), dried fish, salt

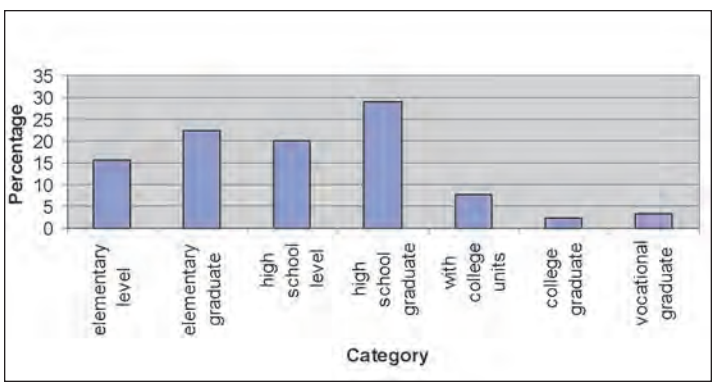


FIG 3. Highest educational attainment

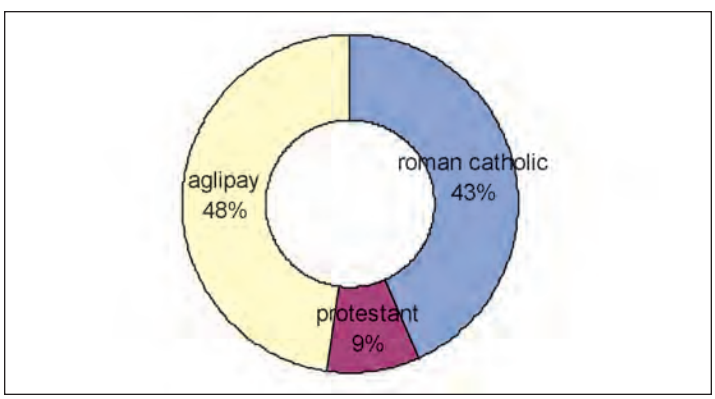


FIG 4. Religious affiliation

ing while in a month 16 days is spent in fishing. On the average only 1 hour is spent per day in fishing. Gear commonly used in fishing are nets. Catch of the majority of fishers are sold directly to consumers and consumed at home. Average HH monthly income is P4505.

Dwelling. Dwelling units of the majority of HH are made of light materials or a combination of nipa/cogon/bamboo. Only 15% of the houses are permanent (concrete).

House and home lot ownership. Majority of the houses are owned and built by the residents themselves. Home lots are owned by 60% of the HH.

Lighting facility. Only 60% of the HH have electricity while 40% do not. Of those without electricity, 94% use kerosene lamp for lighting.

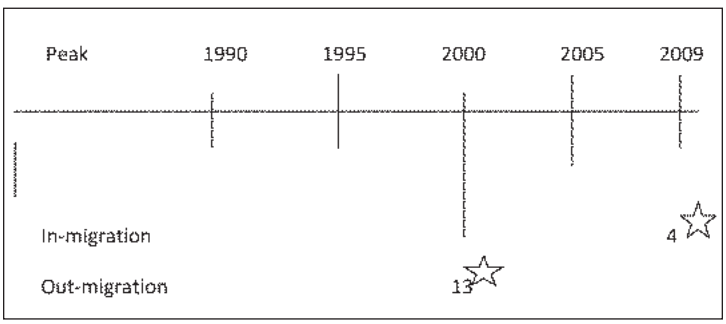


FIG. 5. Migration pattern in Barangay Dolores.

Migration pattern. There are many residents of Dolores who migrate to other places because of marriage and limited work opportunities in the barangay. Major destinations of out-migrants are foreign countries and urban cities. Peak for in-migration is 2009 while out-migration was in 2000 (Fig. 5).

Savings. Eighty percent (80%) of the HH do not have savings as income can hardly cover the daily HH expenses.

HH expenditure. Average total monthly HH expenses is P3,734.00. From this amount, 60% goes to food (Table 3).

Existing livelihoods/enterprises. Livelihoods in Dolores consist of shell gleaning, fish corral, charcoal making and eco-tourism. Majority of the HH are dependent on shell gleaning for livelihood (Table 4).

TABLE 3. Average monthly HH expenses.

Expenses	Amount (PhP)	Percent
Education	400	10.7
Health	500	13.4
Food	2250	60.3
Clothing	200	5.4
Miscellaneous	200	5.4
Electricity	80	2.1
Water	0	0
House repair/ maintenance	100	2.7
Others	4	.1
Total	**3,734**	**100**

TABLE 4. Existing livelihoods in Dolores.

Livelihoods/ enterprises	# of HH dependent	Products	Income (PhP)	Volume of production/ harvest
Shell gleaning	390	Sisi (oysters), imbaw and sobra-sobra (abalone)	100-250	2-3 kg/gleaning activity
Fish corral (Punot)	3	Assorted fish: tabagak, tulingan, sapsap	300/pail (1 pail = 25 kg)	Lean season: 20-30 kg Peak season:50-60 kg
Charcoal making	108	charcoal	75% charcoal maker-25% capitalist sharing scheme	Whole year (300-400 sacks/mo)
Eco-tourism	BDTC members	Eco-tourism packaged activities (bike rent, rappel, lighthouse tour, snorkel)	999/person package	70 visitors/mo (average)

Coastal and marine resources.

a) Mangrove vegetation and biophysical data.

Mangrove patches, mostly *Avicennia* and *Rhizophora* species totalling 4.5 hectares are found inside the cove. During the biophysical survey conducted, mangroves found in the cove comprised 10 species of true mangroves belonging to 4 families and 6 genera -- Family Avicenniaceae represented by *Avicennia marina* and *A. officinalis*, Family Combretaceae represented by *Lumnitzera racemosa* and *L. littorea*, Family Rhizophoraceae composed of *Bruguiera cylindrica*, *Ceriops decandra*, *Rhizophora apiculata*, *R. mucronata* and *R. stylosa*, and Family Sonneratiaceae represented by *Sonneratia alba*.

Three sampling stations were set up for the physico-chemical parameters in Basyaw. The average water salinity was 36.2 ppt, pH is neutral (7.0) and temperature averages 27.9 °C. Basyaw Cove had average soil pH of 6.87, soil salinity of 39.67 ppt and soil temperature of 28.20 °C. Benthic fauna found were mostly shells. Organic matter content of the soil was 19.68%.

As part of the rehabilitation Basyaw Cove, mangrove replanting was done by KAMAMADO in 2004 and 2005 by planting 20,000 bakhaw propagules in a 2-hectare area. However, due to spillover, Typhoon Frank and *tagimtim* (barnacle) infestation, most of the planted bakhaw died thus requiring an immediate rehabilitation of the cove.

b) Coral reef area. Just outside Basyaw Cove is an area estimated to be about 5 hectares with good coral cover. KAMAMADO established this area as a Coral Garden, a marine sanctuary. Legislation from the Municipal LGU through the SB needs to be passed to legalize the establishment of the area as marine sanctuary for protection, management and utilization (snorkeling, diving, scientific research).

c) Seagrass. Also outside Basyaw Cove is a 1 hectare area of seagrass.

In the recently concluded PRA data gathering by the community, decreasing trend in the harvest of fish, shells, crustaceans and other marine organisms (sea urchin, squid and octopus) was reported covering the period 1970-2009 (Fig. 6). The number of HH depending on the resource for livelihood has doubled in 39 years time, i.e., 150 in 1970 to 304 in 2009 (Fig. 7). No species were reported to have disappeared. Most of the methods used in harvesting (traditional hook and line, nets, traps) have not changed.

Many residents believe that the introduction of illegal fishing methods in recent years and the increasing number of fami-

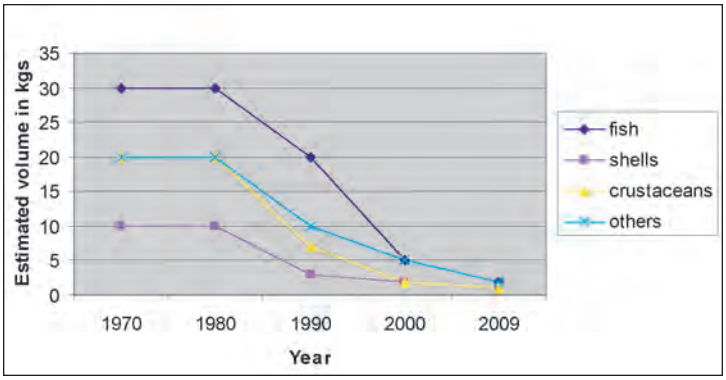


FIG. 6. Volume of harvest over time.

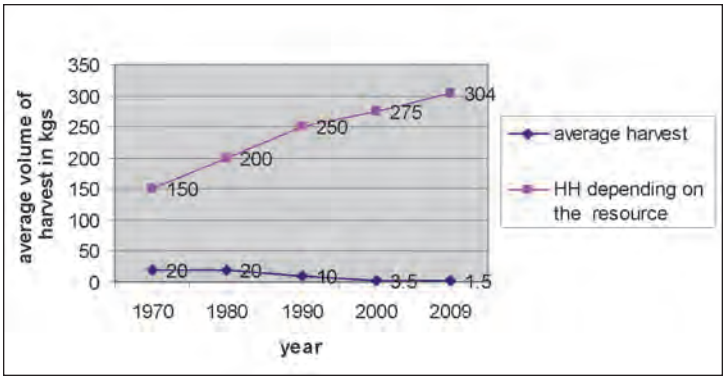


FIG. 7. Comparison of volume of harvest vs HH depending on the resource over time.

lies that depend on the fishery resource for livelihood have contributed to the decline in fishery resources.

The 2006 Oil Spill which damaged the habitat of marine organisms was also considered as one of the main factors for poor harvest.

The issue and problem matrix (PRA data) likewise affirms that catches have been declining as this is considered as the No. 1 problem by the fishers. Other problems are fishing inside the Coral Garden, indiscriminate cutting of mangroves and destruction of corals and sea grass beds by extraction and use of destructive fishing methods.

Existing projects on environment & natural resources. There are at least 5 projects pertaining to environment and natural resources protection and conservation presently on-going in Barangay Dolores. Below is the list of agencies/institutions and the nature of projects implemented (Table 5).

TABLE 5. List of agencies/institutions and the nature of projects implemented.

Name of Agency/institution	Nature of Project
BFAR with KAMAMADO	Coral garden, payaw
KAMAMADO	Mangrove rehabilitation project, coastal resources protection, promotion of eco-tourism in Basyaw Cove
Barangay Dolores Tourism Council	Clean and Green, Heritage tourism
Barangay council	Coastal clean up operation
ZSL in partnership with LGU/ KAMAMADO	Community Based Mangrove Rehabilitation Project

FIG. 8. Map of Basyaw Cove, Dolores, Nueva Valencia, Guimaras.

2. The CBFM Area

a. Location. The CBFM area is within Basyaw Cove in Barangay Dolores (encircled in the map of Nueva Valencia showing Basyaw Cove) (Fig. 8). Basyaw Cove is river like in nature with sea water coming in from the sea. The site is approximately 7.48 kilometers away from the municipality of Nueva Valencia.

b. Present land uses & approximate vegetative cover status. An estimated area of 4.5 hectares in Basyaw Cove is now planted with mangrove species mostly *Rhizophora*. Vegetation cover however is thin. There are 4 existing docking areas for boats of fishers residing nearby. There are 4 entrance and exit points. An area is now being used by 1 person for talaba culture. A 30-meter dilapidated footwalk exists near the entrance from the barangay road.

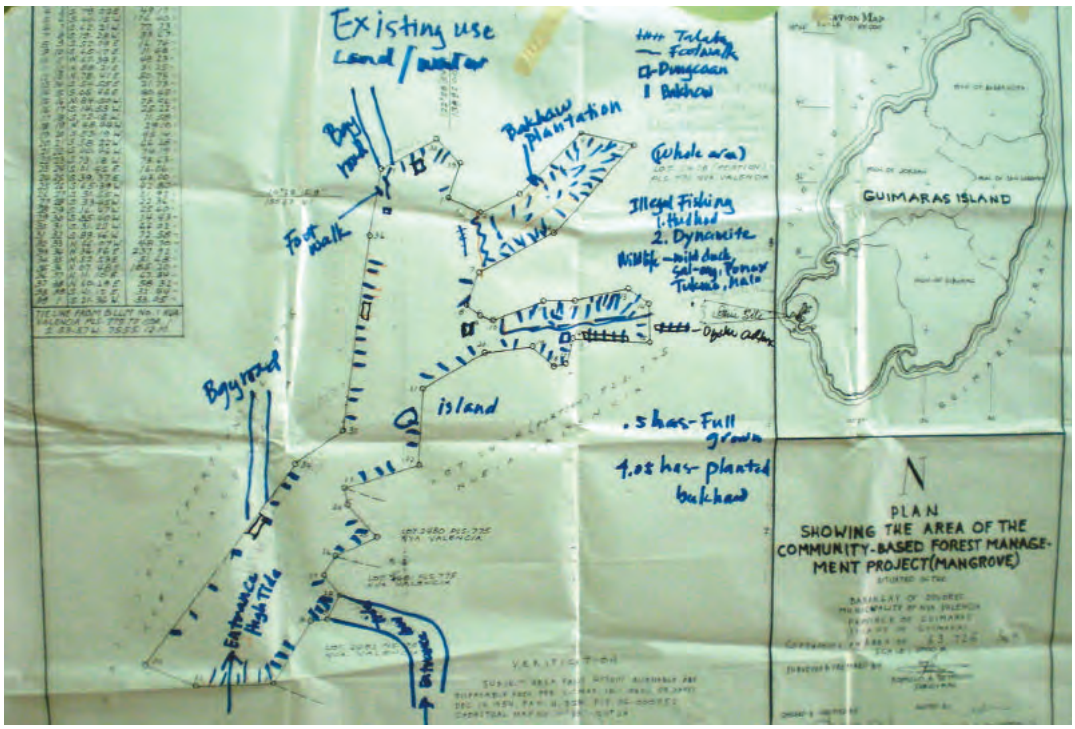


FIG. 9. Existing uses in Basyaw cove.

c. Known important resources on the area

Important resources	Remarks
Non-timber/minor forest product	Shells are abundant
Timber resources	None
Water resources	Estimated at 6 hectares
Wildlife	Native birds (kingfisher, tokmo, punay, tikling, tigwak) halo, snakes
Mineral resources	None

3. Community challenges

a. Known or perceived constraint to CBFM implementation. The known or perceived constraints to CBFMA implementation are the following:

- Lack of cooperation among the members of KAMAMADO
- Inadequate funds for operation/conduct of activities
- Lack of support from LGUs/NGAs
- Processing of papers for CBFMA is too long that members lost interest in the project
- Potential conflict of interest with landowners in the adjacent CBFM area
- Illegal fishing methods within Basyaw Cove and adjacent waters
- CBFM area considered passageway and docking area of small fishing boats
- Community members that who do not conform with the policies/provisions in the CBFMA
- Member's personal interests
- Continuous rain and flooding
- Soil erosion
- Project will not be accepted by the majority of the barangay residents
- Scraping oysters from the newly planted mangroves
- Slow project implementation

b. Assistance required by KAMAMADO from DENR and/or other agencies

Name of agency	Assistance required
DENR	Technical assistance Financial support Conduct of trainings Provision of propagules and planting materials
LGU (Barangay and Municipal)	Legislative support e.g. LGU resolution of boundary conflict between Dolores and Tando; policies to protect Basyaw Cove Law enforcement Oversee activities in the CBFM area Financial assistance
NGO (ZSL)	Financial assistance Conduct of trainings
DTI	Conduct of seminars and trainings
BFAR	Technical assistance Financial assistance
DOLE	Technical assistance Conduct of trainings

Part III: Community Strategic Resources Management Plan

1. Vision

Rehabilitated and well protected Basyaw Cove with mangrove vegetation rich in wildlife and fishery resources and a prime tourist destination where people work hand in hand for economic prosperity.

2. General Goals & Objectives

a. Goals

a.1 Organizational

- Strong and functional KAMAMADO
- Better coordination and linkage established
- Livelihoods implemented
- Accreditation and recognition by the LGU
- Increased income
- Self sustaining

a.2 Physical

- Well protected mangrove area
- 6.37 hectares fully planted with mangrove
- Delineated areas for various uses
- Eco-tourism destination
- Increased fishery resources
- Unique product development

b. Objectives

b.1 Organizational

- To enhance capacity in organizational management of members.
- To educate members on mangrove management through continuous IEC.
- To identify appropriate income generating projects for members.
- To be able to establish good working relationship between KAMAMADO and the various NGOs, NGAs and LGU.
- To be instrumental in improving the economic status of the majority of members/community.
- To foster cooperation and unity among members of the community.

b.2 Physical

- To be able to maximize use of raw materials available in the locality.
- To be able to identify appropriate mangrove species for rehabilitating Basyaw Cove.
- To be able to allocate an area as nursery that can provide continuous supply of seedlings.

3. The Community's Envisioned Forest Land Use and Resource Use Allocation.

TABLE 6. Resource use allocation and activities.

Areas of concern	Activities	Timeframe
Protection	Policy formulation (whenever necessary)	2009-2034
	Passage of policies	2009-2034
	Enforcement of policies	2009-2034
	IEC (conduct of pulong-pulong, attendance during ABC sessions, billboards and signage installation, production of printed materials)	2009-2034
	Creation and selection of DENROs	2010
	Training/orientation on deputation of DENROs (in-house)	2010
Maintenance and management	Training on nursery establishment	2009
	Nursery establishment (collection of seedlings)	2009-2011
	Planting	2009-2011
	Fencing of newly planted materials	2009-2011
	Monitoring	2009-2034
	Technical training	2009-2012
	Fund sourcing	2009-2012
	Coordination/networking with agencies and institutions	2009-2034
	Solid waste management	2009-2034
	Coastal clean-up	2009-2034
	Organizational strengthening activities of KAMAMADO	2009-2012
	Savings mobilization	2010-2034
Utilization	Eco-tourism (training on boat handling, tour guiding, life guard, food handling and preparation, search and rescue)	2010-2012
	Promotion and marketing	2009-2011
	Seedling propagation and marketing	2010-2034
	Mariculture activities	2009-2010
	Infrastructure installation/construction (footbridge, center)	2010
	Livelihood skills training	2010
	Financial management systems installation	2009-2010
	Profit sharing scheme establishment	2009-2010
	Project proposal development	2009-2010
	Fund sourcing	2009-2012

4. Joint Community & DENR Assessment of Resources Usage/Extraction

- Existing mangrove vegetation needs enrichment planting, reforestation and protection.
- Cutting/harvesting of mangroves within CBFM area shall not be allowed (per existing DENR policy).
- Policies (local level) for protection and regulation of activities within CBFM area need to be passed.
- Wildlife within the CBFM area shall be protected by local policies.
- Establish mechanism of monitoring/feedback giving and reporting between the DENR and KAMAMADO.

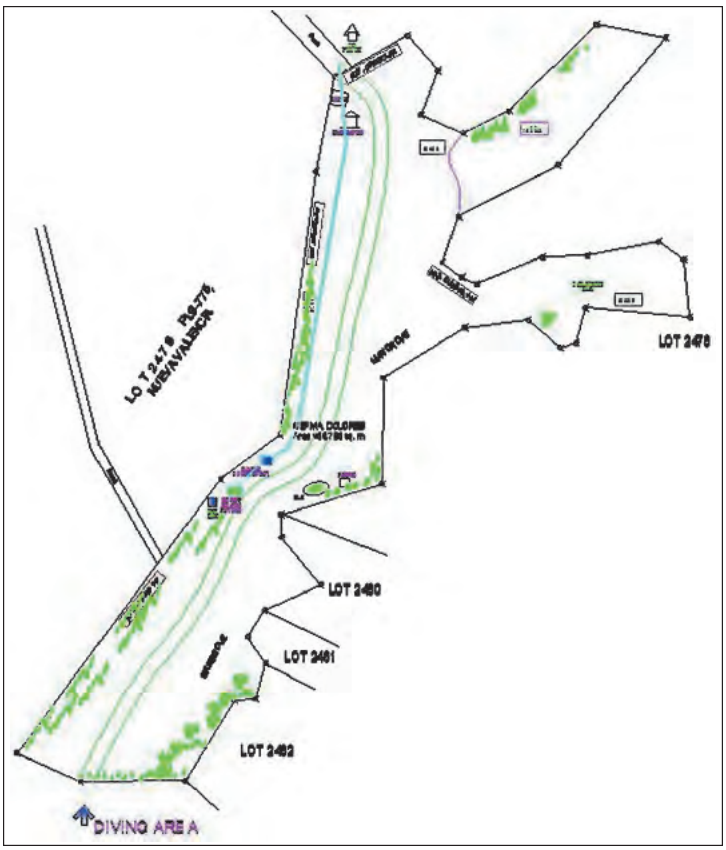


FIG. 10. Proposed uses

5.The Community's Indicative Forest Management Strategies

- Enhance capacities of KAMAMADO for effective forest and organizational management.
- Link/coordinate closely with LGUs, NGas, NGOs for assistance.
- Regular conduct of meetings to monitor progress of CRMF/AWP implementation.
- Participation of the majority of members in CBFM activities, i.e., planting, nursery establishment, trainings/seminars, monitoring and patrol operation.
- Conduct of continuous IEC to community residents of Dolores.
- Fund sourcing for the establishment/promotion of Basyaw Cove as Ecotourism destination.

6. The Community's Proposed Environmental & Socio-economic Impact Indicators

a. Environmental

- Complete reforestation/rehabilitation of the 6.37-hectare mangrove area in Basyaw Cove.
- Increased/sustained population of wildlife in Basyaw Cove.
- Established nursery.
- Policies passed locally for protection and management of Basyaw Cove.
- Mangrove management integrated in the comprehensive CRM/Development Plan of the LGU.
- Reduced soil erosion.
- Reduced vulnerability of communities to climatic changes (typhoons, floods, heavy rains, storms).
- Institutionalized law enforcement activities for environmental protection.
- Reduced violations within the CBFM area.
- Increase in population of marine organisms (fish, shellfish, crustaceans, etc.)
- Tourist and study area destination of schools, private individuals, scientists, etc.
- Appropriate waste management/coastal clean-up practiced regularly.

b. Socio-economic

- Increase in income of members by 20% from the existing income of P4505 (2009).
- Improved dwelling units of 20% of members.
- Improved health and sanitation practices of 50% of members.
- Majority of members practice savings at home.
- Increase in number of members of KAMAMADO.

- Families able to send children to college.
- Functional and operational KAMAMADO.
- KAMAMADO implementing/managing income generating projects.
- Skills training provided for KAMAMADO members.
- Community-based eco-tourism in place.
- Business linkages established with resort and hotels owners.

7. The Community's Proposed Financing Strategy and Accessible Resources/Funds

- Internal resource mobilization i.e. Capital Build Up (CBU) within KAMAMADO.
- KAMAMADO to manage and implement viable income generating projects.
- Creation of the TWG (with membership from KAMAMADO and LGU) that will focus on network building and project proposal development.
- Fund sourcing and resource accessing (from local and foreign donors).

8. The Community's Proposed Marketing Strategies

- Establishment of promotion centers that will showcase products from the community (e.g. handicraft, native delicacies, etc).
- Advertisement of products and services in the internet, radio, TV and newspapers.
- Preparation and reproduction of brochures, flyers and posters of products and services.

Appendix 7. KAMAMADO 2009-2010 AWP

GANTT CHART OF ACTIVITIES COVERING THE PERIOD JUNE 2009-MAY 2010

KAMAMADO Annual Work Plan														June 2009-May 2010	
Key activity/plan of work	Targets	Detailed work plan	Month of Implementation											Logistics needed	Group/ institution/ agency involved
			Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	
Area of concern: Mangrove management															
Nursery establishment	2700 mixed mangrove seedlings (bungalon = 1000, bakhaw = 1000, pagatpat = 500, piagao = 100, bantigue = 100)	1. sourcing of planting materials and bagging (bayanihan system)	x	x											planting materials (nylon, bamboo, coconut fronds, seedling bags)	KAMAMADO, DENR, Dolores BLGU, MLGU, PENRO, ZSL
	1 nursery shed installed	1. shed/nursery (area/location) 2. meeting with PO members 3. gather contribution from PO members (materials)	x	x											coconut fronds, bamboo, nylon/ twine	KAMAMADO members, BLGU
	1 monitoring team established (3 members); schedule set	maintenance/ monitoring (removal of lumot and tagimtim; replacement of dead plants)	x	x	x	x	x	x	x	x	x	x	x	x	record book, planting materials, knife	KAMAMADO members
Planting	5000 bakhaw	sourcing of bakhaw planting materials	x	x	x										tungki/seedlings	KAMAMADO; ZSL
	5000 bakhaw planted	1. meeting with PO members 2. planting @ Sorohan (bayanihan system)				x	x	x	x						snacks	KAMAMADO members, ZSL
	monitoring team established; schedule set	maintenance/monitoring (removal of lumot and tagimtim/barnacles; replacement of dead mangroves)				x	x	x	x	x	x	x	x	x	record book, planting materials, knife	KAMAMADO members
Maintenance and monitoring	1 monitoring team established (all members; monthly monitoring with 8 members per group; 1 overall incharge)	1. creation of monitoring team 2. set schedule for monitoring			x				x	x	x	x	x	x	recording materials; monitoring team	KAMAMADO, ZSL

		Data recording (# planted, species, area)	x	x	x	x	x	x	x	x	x	x	x	x	record book	KAMAMADO members, ZSL
		Mangrove maintenance (basura, tagimtim & lumot removal); replacement of dead mangroves	x	x	x	x	x	x	x	x	x	x	x	x	record book, planting materials, knife	KAMAMADO members, ZSL
Area of concern: Mangrove protection																
Policy formulation	2 policies formulated	1. drafting of policies 2. meeting	x	x	x											KAMAMADO members, ZSL, BLGU
Passage of policies	2 policies lobied for adoption BLGU/ MLGU	1. submission/ lobying 2. adoption by BLGU/MLGU	x	x	x										transportation expenses, copies of policies	KAMAMADO members, BLGU, MLGU
Policy enforcement	2 policies fully enforced	1. IEC 2.GA 3.orientation and training 4. conduct regular patrol				x	x	x	x	x	x	x	x	x	training materials, food, fuel and oil, gasoline	KAMAMADO members, BLGU, MLGU, PENRO, ZSL
Creation of DENROs	1 DENRO team created (7 members)	1. selection of members 2. orientation of roles/ responsibilities								x	x				orientation materials	KAMAMADO members, BLGU, MLGU, PENRO, ZSL
Training/ deputation of DENROs	1 training	1.Conduct of training (DENR) 2. Deputation by Mayor/DENR									x	x			training materials, food	KAMAMADO members, BLGU, MLGU, PENRO, ZSL
Area of concern: PO strengthening																
Conduct of technical trainings	20 members gained technical skills (3 trainings on handicraft, tour guinding, food handling)	1. training design preparation 2. pooling of resource persons 3. preparation of training materials 4.id/ legworking of participants 5. conduct of trainings										x	x	x	resource persons & training materials	ZSL, PEC, MLGU, TESDA, DTI
Conduct of Leadership trainings	2 trainings & all officers	1. training design preparation 2. pooling of resource persons 3. preparation of training materials 4.id/ legworking of participants 5. conduct of trainings	x	x	x	x	x	x	x						resource persons & training materials	ZSL, MLGU
Systems installation	systems installed, trainings conducted on bookkeeping, auditing and accounting	1. meeting with officers 2. training on simple bookkeeping, accounting, auditing		x	x	x	x	x	x						resource persons & training materials	PEC, PEDO-PCO, ZSL

Membership plan formulation	1 meeting conducted	1. organizational meeting 2. plan for membership for discussion	x												food, supplies	KAMAMADO, ZSL
Popularization of organizational policies/CBL	reorientation of all members	1. re-orientation seminar to members on CBL every regular meetings	x	x											copy of CBL	KAMAMADO, ZSL
CBU	to raise P6,600 from 55 members	1. meeting with members 2. policy development on CBU 3.collection of monthly CBU- P10	x	x	x	x	x	x	x	x	x	x	x	x	CBU policy	KAMAMADO, ZSL
Savings mobilization	montly dues collected (P6,600)	1. meeting with members 2. policy development on monthly dues 3.collection of monthly dues- P10	x	x	x	x	x	x	x	x	x	x	x	x	policy on monthly dues	KAMAMADO, ZSL
Area of concern: Infrastructure development																
Construction of the KAMAMADO Center	1 center (light materials)	1. formulate sketch plan 2. meeting with members to set schedule and solicit materials 3. construction		x	x	x	x	x	x						construction materials, work plan and design	KAMAMADO, PLGU, MLGU,ZSL other agencies
Construction of the foot bridge	50 meters	1. sketch plan 2. construction					x	x	x	x	x	x	x	x	construction materials, work plan and design	PLGU, MLGU, ZSL, other agencies
Construction of nursery shed	1 permanent structure	1. formulate nursery sketch plan 2. construction	x	x											construction materials, sketch plan and design	PLGU, MLGU, ZSL, other agencies
Construction of the project signage	4 signages	1. formulate content of the signage 2. construction & installation	x												signage materials	PLGU, MLGU, ZSL, BLGU, other agencies
construction of the info center and CR	1 permanent structure	1. sketch plan 2. construction					x	x	x	x	x	x	x	x	building design, work plan, construction materials	PLGU, MLGU, ZSL, other agencies
Area of concern: Enterprise development																
Eco-tourism establishment	physical structures established (center, footwalk, docking areas, conduct of trainings)	1. meeting and planning 2. monitoring											x	x	PhP 200,000.00	KAMAMADO, BLGU, MLGU, ZSL, DOT
Establishment of Mariculture activities	1 enterprise developed and implemented (mud crab fattening)	1. meeting with PO members 2. id/location of area 3. construction/ installation of livelihood projects 4. fund sourcing 5. operation									X	x	x	x	project proposals/plans, initial capital, materials	KAMAMADO, BFAR, DENR, other agencies

Project proposal development	3 project proposals developed (at least 1 approved)	1. PO consultation 2. proposal writing 3. submission 4. follow-up					x	x	x	x	x	x	x	x	project proposals	KAMAMADO, BFAR, DENR, ZSL
Livelihood skills Training	1 training on identified livelihood	1. training design preparation 2. pooling of resource persons 3. preparation of training materials 4.id/ legworking of participants 5. conduct of trainings								x					training design and materials, resource persons, food	KAMAMADO, BFAR, DENR, ZSL, DOT, DOST, DTI
Fund sourcing	0.5M generated	1. solicitation 2. submission of proposals	x	x	x	x	x	x	x	x	x	x	x	x	project proposals/plans	KAMAMADO, Brgy. Council, ZSL
Profit sharing scheme establishment	profit sharing established	1. meeting and formulation of policy on profit sharing 2. writing of policy 3. implementation								x	x				food, supplies	KAMAMADO, ZSL
Area of concern: IEC activities																
Pulong pulong sessions	At least 3 sessions attended/ conducted	1. participation on bgy general assembly/community activities-fiestas 2. Advocacy with provincial and national tourism council 3. media guesting								x	x		x		Funds for advertisement	KAMAMADO, Tourism Council
Billboard installation	1 billboard installed (IEC)	1. sourcing of printed materials (brochures, posters, comics) 2. regular posting of IEC materials	x	x	x	x	x	x	x	x	x	x	x	x	IEC materials, materials for billboard construction	Other institutions, KAMAMADO, ZSL

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Appendix 8. CRM plan of Ivisan

LOCAL GOVERNMENT UNIT OF IVISAN
COASTAL RESOURCE MANAGEMENT PLAN
2012-2016

LIST OF ACRONYMS

BFAR	Bureau of Fisheries and Aquatic Resources
BFARMC	Barangay Fisheries and Aquatic Resources Management Council
BLGU	Barangay Local Government Unit
BSWM	Bureau of Soil and Water Management
CLE	Coastal Law Enforcement
DA	Department of Agriculture
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DPWH	Department of Public Works and Highways
DTI	Department of Trade and Industry
EO	Executive Order
FLET	Fishery Law Enforcement Team
FRMP	Fisheries Resource Management Project
HLURB	Housing and Land Use Regulatory Board
LCE	Local Chief Executive
LGU	Local Government Unit
MAO	Municipal Agriculture Office
MEO	Municipal Engineering Office
MFC	Municipal Fisheries Code
MFARMC	Municipal Fisheries and Aquatic Resources Management Council
MFMU	Municipal Fisheries Management Unit
MHO	Municipal Health Office
MPA	Marine Protected Area
MPDO	Municipal Planning and Development Office
MTO	Municipal Treasurer's Office
NGO	Non Government Organization
OPA	Office of the Provincial Agriculture
PCA	Philippine Coconut Authority
PCG	Philippine Coast Guard
PCRA	Participatory Coastal Resource Assessment
PLGU	Provincial Local Government Unit
PNP	Philippine National Police
PO	People's Organization
RA 8550	Republic Act 8550 (Fisheries Code of 1998)
SB	Sangguniang Bayan
TWG	Technical Working Group
ZSL	Zoological Society of London

CHAPTER I. BACKGROUND INFORMATION

In Ivisan, a 5 year CRM Plan covering the period 2005-2010 was developed by BFAR through the Fisheries Resource Management Project (FRMP) in 2004. The CRM Plan focused in addressing the coastal resource management issues and concerns of the 10 coastal barangays (from the 15 total barangays) of Ivisan. Recently, the LGU of Ivisan realized that a new CRM Plan needs to be developed to continue projects and programs which were unaccomplished after the 5 years implementation period and come up with a new set of plans that would answer the issues of the current situation. Prior to developing the next set of plans however, the 2005-2010 CRM plan was reviewed and evaluated by key stakeholders. Barangay consultations were conducted where existing coastal issues were identified. The outputs of both activities were then used as basis for developing the CRM plan covering the period, 2012- 2016. The Municipal Fisheries Code (MFC) was also formulated to complement the CRM Plan and will put in place effective protection and management of fisheries and coastal resources whereby overfishing and destructive fishing activities are controlled, utilization of fisheries/ coastal resources are rationalized and damaged habitats are rehabilitated.

A. CRM Vision and Mission

Led by the Municipal Fisheries and Aquatic Resources Management Council (MFARMC), the municipality of Ivisan reviewed and developed the CRM Vision and Mission statements as follows:

CRM Vision: "Progressive coastal and marine area abundant in fish and other resources, sustainably managed and properly protected by people united under a responsive leadership"

Major strategies:

- Continuous strict implementation of the Municipal Fisheries Code and RA 8550
- Implementation of a zoning ordinance on the use of Ivisan waters
- Stop illegal activities in fishing and in the coastal areas such as mangrove cutting
- Regulations passed on proper waste disposal
- Regular patrol operation of the Bantay Dagat
- Government supports community initiatives such as mangrove planting
- Protection and legislation of designated Marine Protected Areas
- Regulations on fishpond related activities
- Cooperation and coordination among key stakeholders such as the community of fishers and the government

B. The CRM Planning Process

In formulating the CRM Plan and the Municipal Fisheries Code (MFC) the following activities were conducted:

1. ***Policy Development Workshop, 25-26 January 2011*** – where issues on CRM from the 10 coastal barangays were identified, analyzed and prioritized by key stakeholders (Appendix A). Initial recommendations were likewise identified.
2. ***Presentation of the Policy Development Workshop output to the SB, 7 March 2011*** –outputs of the Policy Development Workshop were presented to the SB for consideration, outline of the MFO was discussed and dates for the conduct of the CRM workshop was agreed.
3. ***CRM Plan 2005-2010 review and assessment, 21-22 March 2011*** – the 2005-2010 CRM Plan of Ivisan (not legislated by the SB) was reviewed as to accomplishments. Initial gaps identified/ recommended for inclusion in the 2011-2016 CRM Plan (Appendix B).
4. ***Coastal Law Enforcement (CLE) Assessment, 22 March 2011*** – the CLE operations and structure was evaluated where areas to improve performance and strength such as logistical needs, trainings and patrol routes vs violations were identified (Appendix C).

5. ***Participatory Coastal Resource Assessment (PCRA), 6-8 April 2011*** - This process used four essential tools, community mapping, seasonal calendars, daily activity schedules and trends analysis. These tools make the community actively come together and recognize key resources, how the community interacts with one another and with these resources, and the issues in the community as a whole thereby enhancing the capacity of communities in self analysis and decision-making (Appendix D).
6. ***Marine Protected Area (MPA) Assessment, 7 April 2011*** – An assessment tool was used to determine level of MPA management. The gaps were used as inputs for determining MPA activities geared towards better management in the future (Appendix E).
7. ***Coastal Resource Management (CRM) Plan Development and Municipal Fisheries Code (MFC) Formulation Workshop, 12-14 April 2011*** – A workshop which was attended by major stakeholders (Appendix F) in Ivisan was conducted to present results of the PCRA and formulate the detailed CRM management/ operations plan 2012-2016 and draft the MFC.

C. Site profile

History would tell us that Ivisan derived its name from "Ibis" a delicious small fish that abound in the area.

Ivisan serves as the main gateway of the Province of Capiz to the rest of the Provinces in the Island of Panay. It is located along the northwestern coast of Panay Island and bounded by the municipalities of Sapian on the west , Panitan on the southeast, Sigma on the south, Roxas City on the northeast and Sapian Bay on north. It is 15 kilometers from Roxas City through the national Highway and approximately 9 kilometers through the provincial road.

Ivisan has the smallest land area in the province with only 5,420 hectares (54.20 sq. kilometers) mainly broken down into agricultural land (irrigated and rain fed rice lands), areas planted with other crops (coconut, bamboo, banana, corn, vegetables and root crops) and fishponds.

It is classified as a fourth (4^{th}) class municipality with a total income of P43,242,290.08 in 2009.

Total population is 25,882 (2007 NSO survey) with an estimated household of 5,165. Annual growth rate is 1.03 % per annum. Gross population density is at 4.77 persons/ hectare.

The municipality is divided into 15 barangays; of this number 3 are major coastal barangays and 7 barangays have rivers and creeks observed to be reached by seawater during high tide. All of these barangays are accessible by land where mode of transportation is motor tricycle, trisikad and public utility jeepneys. Motorized boat is an alternative means of transportation in the coastal barangays.

Mussel and oyster farming as well as fishing are major livelihoods that occupy the vast area of Ivisan's municipal water measuring 103,000 hectares. Handicraft making using locally available materials such as banig is also a livelihood in the municipality.

Climate in the municipality is the third type with unpronounced seasonal changes. It is relatively dry during the months of November to April and rainy during the rest of the year. There are four varying soil types in Ivisan: Sapian clay, Luisiana clay loam, Bantog clay and hydrosol.

There are eight identified tourism and resort areas in the Ivisan either found in the upland or the beach areas where people can relax and enjoy the beauty of nature.

Education is provided by 3 private and 23 government owned pre-schools, 2 primary schools, 13 elementary schools and 2 secondary schools.

Ivisan has 1 main health center with facilities and serves as the office of the Municipal Health Officer, 13 health centers, 2 private dental clinic, 3 private medical clinics and an ambulance. The health

services are taken cared of by 9 full-time Government Health Personnel (1 MHO, 7 Midwives, and a nurse) and a dentist.

Eight (8) barangays avail of water supply from the Metro Roxas Water District, five (5) have developed spring (level III) while the rest use deep and shallow wells and rainwater. Power supply comes from Capiz Electric Cooperative and supplies all the fifteen barangays.

Main sources of water for irrigation are Anoy River and Malocloc Creek. Other farmers use Small Diversion Dams and Small Water Impounding Projects.

CHAPTER II. DEVELOPMENT PROBLEMS, ISSUES, AND CONCERNS

The PCRA and the Policy Development Workshop highlighted priority problems, issues and concerns of Ivisan affecting its coastal and marine resources, to wit:

1. Construction of Taba

Barangays Poblacion Norte, Poblacion Sur, Agmalobo, Malocloc Sur, Cudian, Agustin Navarra and Matnog identified the construction of "Taba" structure along rivers and creeks as the main cause of fry and fingerling loss as these trap small fishes. Taba structures would ultimately reduce supply of marine organisms aside from limiting the passage area of boats. Taba are likewise blamed for the piling of silt/ sediments on rivers hence making them shallow. Residents of Barangay Matnog even fear that their river will disappear if sedimentation and shallowing of river is not controlled. Taba is said to be one of the major sources of livelihoods of fishers and because of poverty construction anywhere is uncontrollable. At present there is no local policy regulating the control of Taba construction.

2. Illegal activities (such as dynamite fishing, use of fine meshed net, palupad, trawl fishing, drag net, taksay and encroachment of commercial fishing vessels)

All the coastal barangays have identified various types of illegal fishing activities that are currently in existence such as the use of dynamite in fishing, use of fine meshed nets in catching fish, "palupad" and trawl fishing and drag net believed to be using active gear that destroy corals. Trawls are likewise classified as over 3GT and operate on a commercial scale hence encroachment within the municipal waters of Ivisan is considered illegal. Fish that are still small in size and young in age are caught using fine meshed nets thus contributing to "recruitment" overfishing where fish are deprived of the chance to grow big, mature and reproduce. The fishers attribute the proliferation of illegal fishers to non-enforcement of policies, lack of political will, inadequate sea patrol operations, inactive Bantay Dagat and people's (resident fishers or from other areas) lack of respect for the law.

3. Indiscriminate cutting/ damage on mangroves

Barangays Balaring, Basiao, Cabugao, Malocloc Sur, Agustin Navarra, Matnog and Cudian have observed that indiscriminate cutting and damaging of mangroves are existing issues that would need attention. The mangroves in the barangays mentioned are the last remaining mangroves in Ivisan hence protection and conservation is required. The main causes why mangrove destruction is a concern are: 1) areas where mangroves are planted are also areas for boat access to the sea hence planted areas are considered by the residents as hindrance, 2) charcoal making using mangroves is a livelihood of many residents, 3) expansion of existing fishpond areas where mangroves are indiscriminately cut to convert more areas for fish culture, and 4) use of mangrove as firewood by many coastal households and bakeries. In areas where Nipa or other mangroves species would impede water flow in rivers, trimming or removing of such stands needs to be done to maintain efficient water flow, river depth and width. However, necessary permits need to be secured with the DENR.

4. Fishpond expansion by illegally constructing dikes that encroach in river areas

This is a major concern in barangays where culture of fish in ponds is a livelihood with operators wanting to increase area of operation to gain more income. Effects of such an activity are narrowing and shallowing of rivers that would cause flooding, loss of mangroves and limitation of boats navigational passageways. The fishers observed that the BFAR has not been proactively monitoring fishpond operation in the area.

5. Disappearing fish species and decreasing/ poor fish catch

All of the coastal barangays observed that fish species are slowly disappearing and decreasing in volume of harvest over a 40 years period and beyond. Main causes of fish disappearance and decrease catch are harvesting of juvenile fish species, continuous illegal fishing activities, increase in number of residents engaging in fishing for lack of an alternative source of income and shallowing of rivers. Commonly disappearing fish/ shell fish species as mentioned by the fishers are damus, cabasi, bonito, tabangongo, alibalay, pompano, lali, balanak, kikilo, danggit, lukon, bulgan, mangagat, inid, pagi, litob, dalinuan, nipa-nipa, tuway, ubod, bilaog, tikhan, abahong, bagtis, pasayan, bugaong, gisaw, tanga and tilapia. Fishers from barangays Basiao, Cabugao, Cudian and Matnog are presently catching 2-3 kilos/ day of fishing. A very grim scenario is being projected by many fishers that catch in 2015 would be highest at 1 kilo and worst at nothing.

6. Absence of water zoning/ water use plan

The residents of Basiao and Cabugao observed that the present set up of mussel and oyster farms in their areas are crowded because of too many bamboo stakes. Ivisan is known for its best tasting mussels and oysters hence considered as major income generating livelihoods for the many residents particularly of the two barangays mentioned. The lack of a zoning plan to clearly delineate plots allowed people to construct structures anywhere resulting to limitation in passageways of boats. Heavy silt deposit was observed in the area where there are many mussels and oyster stakes (resulting from limitation of efficient circulation/ water flow) making the depths of the coastal areas to become shallow. What aggravates the situation is the lack of a tracking mechanism and a flaw in the LGU permitting and licensing process to allow only Ivisan residents exclusivity in mussel and oyster production within its coastline after necessary payments are made.

7. Improper waste disposal

Wastes classified under this issue can either be domestic garbage or agricultural/ chemical run-off from the uplands and fishponds. Domestic garbage majority of which consists of plastics are usually dumped on the shoreline of Ivisan from the neighboring City of Roxas. This is carried during floods or during days of big waves. Garbage beyond tolerable quantities are pollutants that can cause death to fish and shell fish. Chemical run-offs due to unsound agriculture and aquaculture practices can also cause death to fishes. Chemicals used in fishponds to kill predatory fish species when released to the sea without proper treatment can kill fishes. These dead fish when eaten by humans can become a health hazard. Several policies were already in place as to proper waste disposal however the lack of community discipline and political will to implement the law is still a problem.

8. Inadequate community participation

It was observed that many of the coastal residents particularly fishers lack interest in joining community organizations and its activities due to negative experiences in past projects and simply because they don't see the benefits of environmental projects.

9. Boundary dispute between Ivisan and Sapian on municipal water area

The issue on municipal water area delineation between the adjacent municipalities of Ivisan and Sapian which started 9 decades ago is still present today. In 2005, NAMRIA surveyed and plotted the boundaries however the adjacent municipality of Sapian refused to honor such result. This caused problems on Ivisanon fishers as they are being apprehended and fined by Sapian authorities when caught fishing in the disputed area.

CHAPTER III. MANAGEMENT AND OPERATIONS PLAN

Component 1: Coastal zoning

Objectives

- To delineate zones for specific uses or activities in the municipal waters.
- To eliminate use conflicts in the utilization of the municipal waters.
- To regulate activities in the different zones.

Zoning plan

a. Zone 1 otherwise known as Mariculture Zone - Mariculture area covers the municipal waters at Basiao (specifically tidal flats at Palanas and Looc), Cabugao (specifically Taguikan and Tigis), tidal flats along Cudian river, Matnog and Agustin Navarra for **oyster and mussel culture**; covers the municipal waters at Basiao (specifically Looc and Baybay) and Cabugao Cove at 100 meters from the shoreline, and Malakha islet at 50 meters from the shoreline (on the deeper side where there is no coral growth) for **fish culture in cages.**

Activities allowed in the mariculture zone are research and scientific studies, regulated study visits and production using appropriate method (e.g. hanging and raft method for oyster and mussel culture and anchor or corner poles to prevent siltation for fish cages).

All persons, cooperatives or associations (or corporations) must secure licenses and permits from the municipal government prior to setting up of mariculture activities within the municipal waters of Ivisan. Fishing activities such as pamanti and patuloy are not allowed within the mariculture zone. Dumping of waste in the designated mariculture zone is also prohibited.

Mariculture farm operators/ owners shall be required to submit production report annually. The report shall include investment cost, production report (kilos), type of species cultured, feeds used (commercial or trash fish) and volume, issues and problems and recommendations. A report format will be provided by the office of the MAO. The annual report shall be a prerequisite for issuance/ renewal of license and permit. (MAO needs to reproduce a simplified report form)

b. Zone 2 otherwise known as Protection Zone - Covers the municipal **fish sanctuary and reserve area** in Barangay Balaring (830 hectares) specifically located in Marocol Gamay and Daku, Mahabang Pulo from Marangkalan point to Nailong point; **mangroves** in Barangays Balaring (50 hectares from Sitio Cagusong to Kabulihan), Agustin Navarra (50 hectares from Sitio Dapdap to Talon, Roxas City boundary and the boundary with Matnog), Cabugao (.6 hectares from Cabugao river to Taguikan; .45 hectares from Mayha to Bara Majanlud boundary), Matnog (from the main dike of Alcazaren fishpond to Agmalobo boundary), Agmalobo (from the main dike of Ledesma fishpond to Bulabod river, Poblacion Sur boundary) and Cudian (32 hectares along Cudian river and Dait river); **seagrass beds** found in some parts of Balaring (Dinugmaan point and Kanduyong point; Panublihan to Marangkalan point) and vicinities of Malakha islet.

Future MPAs that will be established (including Tuad island near boundary lines between Roxas City and Ivisan) shall likewise be classified under the protection zone.

Activities in the protection zone are limited to scientific and research studies, education, ecotourism and regulated fishing and gleaning activities. Designated navigational lanes shall be provided in areas where seagrasses are abundant. Cutting and conversion of mangroves for other uses is not allowed. Bird hunting and other human activities (e.g. dumping of solid and human waste) inside the mangroves are likewise not allowed. All protection areas shall be delineated with markers/ buoys.

Areas where artificial reefs are deployed shall be part of the protection zone. Deployment of ARs shall conform with the Joint DENR-DA-DILG-DND Memo Order No.1 Series of 2000.

c. Zone 3 otherwise know an Eco-tourism Zone - Covers the portion of the fish sanctuary and reserve area from Dinugmaan point to Marangkalan point (declared as recreational zone within the marine reserve) and Tuad (watch tower), beach resorts and other areas as may be identified by the LGU of Ivisan.

The recreation area in the marine fish sanctuary and reserve shall be declared as eco-tourism zone. Activities allowed in the recreation area are picture taking, swimming and picnic, bird watching, and island hopping however bringing of foods and cooking are only allowed in designated areas.

The activities that are not allowed in the eco-tourism areas include (nude scene/topless) littering of garbage, gathering or collecting of sand, gravel and corals, bringing and using drugs, public scandals, cutting of trees or destroying of plants and hunting of any animal species.

d. Zone 4 otherwise known as Multiple-Use Zone - Areas within the municipality of Ivisan where gleaning activities are conducted, fish landing areas, fry gathering areas, fish drying areas, rivers and creeks are classified under the multiple-use zone.

Gleaning areas (panginhasan) are found in the shoreline of Malakha island, rocky shoreline in Balaring from Panublihan to barangay proper; Marangkalan to Marokol, Tigis and Magulayag and Mayha in Cabugao.

Overturning rocks and use of rake in shell gathering is not allowed during gleaning.

All fishing boats should land their fish at designated fish landing areas. No dumping of garbage or any waste materials (e.g. use oil, lubricants/grease, etc) is allowed in the coastal areas. Construction of structures in the coastal and marine areas is not allowed without proper permits and licenses from the LGU. Landing of contraband goods in Ivisan shoreline is not allowed.

Fry gathering shall be allowed on concession basis. Necessary LGU permit shall be secured prior to operation. Grant of concession permit shall go through a bidding process.

No fish drying areas shall be permitted within 100 meters from beach resorts. LGU permit is required for large scale fish drying activities while small scale or backyard fish drying activities are not required to secure permits.

e. Zone 5 otherwise know as Fishpond Zone - Identified aquaculture areas within the municipality of Ivisan intended for production of fish and shrimps that are located in Barangays Cudian, Poblacion Norte and Sur, Agmalobo, Matnog, Agustin Navarra, Balaring, Cabugao, Basiao and Malocloc Sur.

All fishpond operators shall operate in areas stipulated in the FLA agreement with BFAR or within the bounds of the title or property.

f. Zone 6 otherwise know as Stationary Fishing Gear Zone - Covers offshore waters at Cabugao, Balaring and Basiao within the Municipality of Ivisan

Stationary fishing gears in offshore waters at Cabugao, Balaring and Basiao shall conform with the provisions of RA 8550.

Middle portion and mouths of rivers and creeks shall be off limits to any construction. Reclamation and gathering of sand and gravel (commercial scale) is likewise not allowed in rivers and creeks.

Strategy 1: Designate Zone for Specific Uses

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	2016	
Formation of TWG to undertake coastal zoning	EO of LCE	x					none
Conduct Information drive on plan for zoning of coastal areas	TWG, BFARMC, MTO, SB, MAO	x					Public address system, IEC materials (P10,000.00/ year)
Conduct of actual survey/ plotting of existing area based on resource map	BFARMC, Brgy Officials, TWG, PNP, Coast Guard, DENR		x				GPS, evelon nylon, markers & buoys (P40,000.00)
Conduct public hearing of the proposed zoning plan	SB		x				Draft ordinance, public address system, IEC materials, maps (P10,000.00)
Enact coastal zoning ordinance	SB		x				none
Install markings or buoys/ setting of boundaries	BFARMC, Brgy Officials, TWG		x				Buoys, containers with flaglets (P30,000.00)
Prepare and reproduce IEC materials	BFARMC, MAO, SB		x				Supplies, computers (P30,000.00)
Formation and operationali-zation of the management & monitoring team	LCE			x			Supplies P10,000.00/year)
Enforcement	BFARMC, MAO, PNP			x			None (included in the BD budget)

Component 2: Fisheries Management

Objectives

- To regulate access to the municipal waters and reserve its resources for the benefits of our local municipal fishers.
- To regulate exploitation of resources and fishing efforts to sustainable levels.
- To ensure sustainable development and management of the fisheries resources whereby productivity of fisheries resources is increased.
- To develop monitoring, control and surveillance mechanism and strengthen law enforcement unit.

Strategy 1: Strengthening the Management of Ivisan Municipal Fish Sanctuary and Reserve

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	2016	
Re-install markers in the area and its maintenance	BFARMC	x	x	x	x	x	1 GPS (Garmin) = P30,000 Improvised Bouys (40pcs)@2,500= 100,000.00/yr
Designation of Reserve Administrator and its staff	LCE	x					No cost

Creation of marine sanctuary management team in Balaring and Basiao and in other proposed areas and its operationalization	MFMU, BFARMC, BLGU	x		x			No cost (back to back with activity on MPA management plan formulation) Operation – P12,000/year
Formulation of MPA management plan	MFMU,MFARMC, BFARMC	x					Workshop (2days):20 pax @150 Plus kit Total=P10,000.00

Strategy 2: Strict Implementation of Municipal Ordinance on Closed Season

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	2016	
Amendment of Ord. no. 96-14	All SB	x					Public hearing 20 pax @ 25 =1,000.00
IEC (installation of Billboards/ stating closed season in all coastal Barangays)	LGU/MAO	x					Billboard/Tarpulin(3X6) 10 @ 540= 5,400, IEC leaflets 500 @ 1.00=500 Total = P6,100.00

Strategy 3: Licensing and Permitting of Municipal Fishers, Fishing Gears and Fishing Boats

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	2016	
Registration of fisherfolk (updated list of fisherfolks including fishing gears used, fishing boats, type of motor, type of mariculture activity (mussel, oyster, cage culture,) etc.)	Barangay officials, BFARMC, MAO	x		x		x	P24,000.00/year
Computerization of MAO system (filing, recording, data banking, etc)	LCE	x					P30,000.00
Creation of the Mun composite team (MAO, Treasurers office) with the assistance of BLGU	LCE, MFMU	x					none
Conduct of ad-measurement of fishing boats and issuance of the following per coastal bgy: LGU permit, license, ID, color coding, certificate of number, certificate of registration, etc.	LGU/MAO Boat inspectors, composite team	x	x	x	x	x	P24,000.00/year

Strategy 4: Regulation of the construction and operation of Fish Corrals, other fishing gears and fishing activities that occupy space in the coastal waters and rivers

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	2016	
Evaluation of the area (conduct inventory of type of fishing gears/owners/operators, current, water quality, depth, ph, temperature, etc.)	MAO, Barangay Official, MPDO, and other technical agency (BFAR, ZSL, DENR etc.)	x	x	x	x	x	P24,000.00/ year
Formulate zoning plan (based on evaluation) and ordinance	MAO/SB, MPDO, DPWH, HLRUB, etc	x					P10,000.00 (workshop)

Strategy 5: Enforcement of fishery laws

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	2016	
Regular conduct of overt and covert operation	FLET	x	x	x	x	x	P400,000.00/year Inclusive of BD honorarium
Re-organize and re-establish Bantay Baybay (coast watch) as intelligence arm of Bantay Dagat	LGU/Bantay Dagat Group	x					Binoculars, compass, communication equipment, mapping training (P50,000.00)
Maintenance of patrol boats (fast patrol boat and support patrol boat)	LGU/Bantay Dagat Group	x	x	x	x	x	P50,000.00/year
Coordination established and operationalized with Phil. Coast Guard/Philippine Navy for support/augmentation	LGU/Bantay Dagat Group	x	x	x	x	x	P10,000.00/year
Review of Municipal Ordinance on Fisheries Laws (94-006 s-1994)	SB, MOA, MFARMC, fisherfolk leaders	x					No cost (SB session)
FLET (2011) enhancement a. training of new members b. deputation (with Special Order) c. Reorganization and clear mechanism of enforcement established with MLGU, BD and PNP d. assignment of 4 PNP personnel in the FLET e. Clear organizational structure established f. Operation plan developed	LGU/MAO/ Bantay Dagat	 x x x x x x	x	x	x	x	Training 20 pax 2 days @150 plus kit @15per pax P 8,250.00
Completion of watch tower (Solar Power)	LGU	x					P200,000.00
Equip the Bantay Dagat Task Force with the following; patrol boat, radio, life jacket, megaphone, GPS, binocular, night vision, maps, hand cuff, first aid medical kits, etc.	LCE/MAO	x					P200,000.00
Implement incentives to BD members	LCE/MAO	x	x	x	x	x	Incentives based on the penalties collected
Provision of additional training: SOLAS- survival of life at sea, First Aid, para-legal, etc.	LGU,MAO, MARINA RED CROSS	x					Training 20 pax 2 days @150 plus kit @15per pax P 8,250.00
Establish close, contact/ coordination and relationship with Legal groups (IBP, ELAC, etc.)	LGU, MAO FLET	x	x	x	x	x	No cost
Established Bantay Dagat Detachment with adequate physical security, equipments and other security measure.	LGU, MAO	x					P5,000.00/year

Strategy 6. Conduct of massive IECs

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	2016	
Reproduction and distribution of Municipal Ordinance to all the coastal barangays	SB/MAO	x					P6,000.00
Provincial Celebration of Fisherfolk and Farmer's Day (every September)	MAO/ MFARMC	x	x	x	x	x	P5,000.00
Celebration of Month of the Ocean –National (every May)	MAO/ MFARMC	x	x	x	x	x	P5,000.00
Celebration of Fish Conservation Week (every 3rd week of October)	MAO, MFARMC	x	x	x	x	x	P5,000.00
Conduct barangay meetings, assemblies and pulong-pulong	MAO/SB, arangay officials, LCE	x	x	x	x	x	P20,000.00
Purchase of 1 unit LCD	LCE	x					P40,000.00
Installation of billboards on: 1) illegal fishing activities 2) the different zones and the MFO, in strategic areas	BLGU/MAO	x					P15,000.00

Strategy 7: Community organizing work

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	2016	
Conduct para- CO training to selected local volunteer and MAO staff for organizing work	LGU Fisherfolks, Local volunteers	x					P20,000.00
Establish contact, linkage with NGO/ CDA for management and organizing support	MAO, MPDC	x	x	x	x	x	P5,000.00
Assessment of past, existing and present organizations	MAO	x					P12,000.00

Component 3: Habitat Management

Objectives

- To protect, conserve and rehabilitate existing habitats.
- To improve productivity and biodiversity of corals, seagrasses, mangrove and estuaries.
- To enhance community participation in the management of the habitats.

Strategy 1: MPA assessment and rehabilitation of existing Ivisan Municipal Fish Sanctuary and Reserve

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	2016	
Conduct biophysical assessment	OPA, MAO, BFAR, DENR	x	x	x	x	x	P25,000.00
Conduct regular feed-backing meeting with the community on the result of biophysical assessment	MFMU, LGU, MAO, Fisherfolks	x	x	x	x	x	P10,000.00/ year
Artificial reef deployment a. area assessment b. training of divers c. completion of deployment of ARs (60 units-jackstone type; 4 units box type) to serve as barriers and habitat enhancement d. IEC on ARs e. underwater monitoring after 6 months deployment and quarterly thereafter f. Note: there are existing ARs in Basiao – 10 units, box type for deployment	Bantay Dagat, MAO, MFARMC	x					P30,000.00-for deployment Diving gears

Strategy 2: Mangrove conservation and rehabilitation

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Training on mangrove mapping with GIS/Remote sensing application	MAO/MPDO, DENR	x					Training 10 pax 2days @150 = P8,250.00
Inventory and survey/ assessment of mangrove areas in the 10 coastal barangays re; mangrove species, area/ location, MCS, etc.	LGU,MAO MPDO	x					P10,000.00
Orientation on community based mangrove management and rehabilitation plan	LGU, MAO, DENR	x					P10,000.00
Process application for CBFMA	PO, MAO, DENR	x	x				P10,000.00
Formulation of CRMF (after awarding of CBFMA) and AWP (after awarding of CBFMA and yearly thereafter)	PO, MAO, DENR, MPDC		x	x	x	x	P5,000.00/year
Conduct IEC on mangroves	PO, MAO, DENR	x	x	x	x	x	P3,000.00/ year

Strategy 3: Conservation and management of seagrass beds

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	2016	
Conduct assessment/survey of seagrass areas, species, abundance, diversity, biomass, etc.	LGU, MAO, ZSL, OPA	x					P10,000.00
Designate area of seagrass beds as protected area or fish sanctuary through a municipal ordinance	LGU, MAO, ZSL, OPA	x					No cost
Formulate management plan for seagrass sanctuary	LGU, MAO, ZSL, OPA	x					P10,000.00

Component 4: Shoreline Management

Objectives

- To protect the shoreline from further degradation due to destructive activities.
- To regulate activities in the foreshore area that would affect the condition of the shore.
- To minimize erosion and loss of beach to natural and human induced forces

Strategy 1: Regulation of sand gathering and banning of coral gathering

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Conduct of public hearing/consultation	SB, MAO, FARMC	x					P10,000.00
Draft, finalize and enact ordinance adopting national law (RA 8550 and Mining Law)	SB	x					None
Conduct information campaign	SB, M/BLGU	x					P10,000.00
Enforce ordinance	FLET	x					(included in the BD budget)
Monitoring and evaluation	SB/ TWG	x					P10,000.00

Strategy 2: Setting up and maintenance of coastal setbacks for all kinds of development

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Conduct IEC (public information campaign/ pulong-pulong) on applicable laws	MEO, Brgy Council	x					P10,000.00
Enact ordinance adopting building code and other related laws	SB	x					None
Enforcement	MEO, Brgy council, PNP, MARICOM, Coast Guard	x					(included in the BD budget)
Monitoring	MEO, Brgy council	x					P10,000.00

Strategy 3: Conservation and Maintenance of seawall/breakwater at Balaring, Cabugao and other selected areas

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Assessment & inventory of existing breakwater/seawall	Brgy council, MEO	x					P10,000.00
Regular maintenance of seawall (As the need arises)	Bgry Council, MEO	x	x	x	x	x	P100,000.00/ year
Fund sourcing	Brgy Council	x	x	x	x	x	P5,000.00, Supplies, resolutions
Extension of breakwater at Balaring (Sitio Kabulihan to proper)	Bgry Council, MEO, NGA (DPWH, PDAF)		x	x	x		P2M

Strategy 4: Watershed Management

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	2016	
Review of the MOA on co-management of watershed	DENR, M/B LGU	x					None
Conduct inventory of trees/plants in the watershed area	DENR, M/B LGU	x					P10,000.00, sketch map, supplies
Prepare watershed development plan	DENR, M/B LGU	x					P20,000.00, supplies, computer, GPS
Conduct of regular tree planting activities at upland areas	DENR, PCA Brgy Council, pupils/ student	x	x	x	x	x	P10,000.00, seedlings
Close monitoring and surveillance of activities in the watershed area	DENR, M/B LGU	x	x	x	x	x	P5,000.00, monitoring forms
Strict enforcement of forestry law (PD 705)	PNP, Tanods, Bantay Gubats	x	x	x	x	x	None (will utilize existing personnel)
Enact ordinance requiring graduating pupils/students/SKs to plant and nurture trees-to reinforce national greening program of PNOY	SB	x					None
Deputize Bantay Gubats	DENR, M/B BLGUs of Cabugao, Agustin, Malocloc Norte, Matnog, Agmalobo, Balaring	x					P30,000.00 for training, Deputation order

Component 5: Coastal Tourism

Objectives

- To develop the local tourism industry of Ivisan.
- To develop local capability in eco-tourism projects that contributes to better coastal management and community development.
- To provide economic incentives for the *barangays* by optimizing the tourism potential of their areas.

Strategy 1: Regulation on the number of tourism facilities and activities at Ilaya-Ivisan, Malocloc Norte, Balaring, Basiao, Cudian, Cabugao, Ondoy and Agustin Navarra.

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	2016	
Identify, designate or appoint tourism officer	Municipal Mayor	x					None
Creation of Tourism Council	LCE	x					None
Tourism council meetings a. set criteria for potential tourist destinations b. Identify the list of tourist destinations (to include Malocloc Norte, 2 mountain resorts for tourism) c. list of requirements to construct/operate resorts d. identify specialty/services per resort/ site	Tourism council	x	x	x	x	x	P12,000.00/year

Strategy 2: Eco-tourism product development

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Development of an Eco-tourism master plan and its adoption	Tourism council	x					P20,000.00 for the Workshop
Improvement and maintenance of support facilities (roads, cottages)	Resort owners, PLGU	x	x	x	x	x	P5M/year
Re-organization of resort owners	Tourism council and resort owners	x					P5,000.00
Skills training of manpower on tourist destination management, good will and tour guiding, waitering, etc	Tourism council and resort owners	x					P50,000.00
Training on product labeling, packaging, marketing of Ivisan products	LGU headed by LCE	x					P50,000.00
Construction of bagsakan center for Ivisan products (kakanin,shell crafts, dried fish etc.)	DTI, tourism council, LGU		x				P500,000.00

Strategy 3: Maintenance of waste disposal facilities

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Develop area for organic herbal medicine (using organic fertilizer) in capsule form	MAO, Solid waste management board		x				P10,000.00
River / coastal clean- up every year (sem break, fiesta, summer) a.2. Solid waste b.2. Demolition of illegal structures (taba, talabahan, tahongan, etc.)	BSWM, PNP, Student volunteers, coast guard, BFAR, MAO, LCE	x	x	x	x	x	P10,000.00/ year
IEC on the use of material recovery facility(MRF)	BSWM, brgy council	x	x	x	x	x	P10,000.00/ year

Strategy 4: Visitors education management

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Designate tourism officer for Ivisan	LCE	x					None
Designate tourism facilitators for the barangays through resolutions	Brgy captains	x					None
Training/ seminar for tourism officers	Tourism council, tourism officers, prov. tourism office	x	x	x	x	x	P30,000.00
Develop promotional materials/ flyers for Tourist and Ivisanon products	Tourism council, tourism officers, prov. tourism office		x		x		P50,000.00
Develop tour packages	Tourism council, tourism officers, prov. tourism office		x				None

Strategy 5: User fees and appropriate business development

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Assess viability of opening part of Marine Sanctuary for diving and snorkeling, also mangroves as eco-parks and other tourist destinations	Tourism council		x				P5,000.00
Identify/ develop user fees and implement	Tourism council		x				P3,000.00

Component 6: Enterprise and Livelihood Management

Objectives

- To develop alternative and supplemental income to fishers in order to lessen fishing effort and fishing pressure to the sea.
- To develop environment-friendly enterprises and livelihood projects.

Strategy 1: Identification and implementation of environment friendly and economically feasible project

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Close supervision and mentoring of PO's	LGU, POs	x	x	x	x	x	P12,000.00/year
Assessment of livelihood projects (past and present)	LGU, MAO, POs	x					P12,000.00/year
Proper recording and monitoring of the projects/ program	LGU, MAO, POs	x	x	x	x	x	P12,000.00/year
Identification of appropriate livelihoods a. Feasibility Study b. Business planning c. Identification of project beneficiaries (with criteria)	LGU, MAO, POs, assisting groups	x	x				P20,000.00/year
Re-orientation/re-org of PO's	LGUs	x		x		x	P4,000.00/year

Component 7: Waste Management

Objectives

- To eliminate or minimize the potential adverse impact of waste to human and environment health especially in the coastal barangays.

Strategy 1: Coastal water quality monitoring

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Create task force to monitor the water quality status at designated sampling stations in coordination with OPA	LGU, Municipal and Brgy working groups	x	x	x	x	x	P10,000.00/ year
Appropriate funds for the utilization by the task force	Same as above	x	x	x	x	x	None

Conduct information dissemination to every coastal barangay	Task force	x	x	x	x	x	P10,000.00/ year
Enact ordinance prohibiting Barangay residents to scatter/ throw/ dispose waste in the river or along the seashore	SB	x					None
Conduct public hearing	Task force	x					P5,000.00

Strategy 2: Integrated Protection for the Environment (IPE)

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Planting of trees , flowers and plants in resorts, poultry rice mills, backyard piggeries as buffer zone	Civic organizations, MLGU	x	x	x	x	x	P20,000.00
Cleaning of surroundings by civic action groups operating in the barangays and municipality	Civic orgs, LGU	x	x	x	x	x	None

Strategy 3: Monitoring, control and surveillance of sewage waste treatment facilities

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Conduct inventory and inspection to all establishments especially resorts , factories, rice mills, backyard piggeries	MHO, DA, SB on Environment, SB Health, SB Tourism	x	x	x	x	x	P5,000.00/ year
Implementation of RA 9003, Solid Waste Management Ordinance and ordinance on waste segregation and management in the barangays	LCE/MAO, MPDC, PNP, BLGU	x	x	x	x	x	P10,000.00/ year (BLGU budget)

Component 8: Legal Arrangement and Institutional Development

Objectives

- To improve mechanism and arrangement for local governance on coastal management.
- To enhance community participation in coastal management planning, legislation, implementation, monitoring and evaluation.
- To improve the delivery of coastal management related services.
- To strengthen the network and linkages with other local government units, BFAR and other local organizations.

Strategy 1: Legislation and approval of Comprehensive Municipal Fisheries Code

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Popularization and implementation of MFO	SB Rules, MAO, SB Agriculture and Environment, FLET	x	x	x	x	x	P10,000.00/ year (also included in the BD budget)
Evaluation of MFO as to effectiveness in terms of implementation	SB Rules, All SBs	x	x	x	x	x	P5000.00
Review of MFO	All SBs			x			P10,000.00

Strategy 2: Formation and strengthening of people's organization

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Inventory and assessment of POs	SB Coops, MCDC, MPDO, NGO/PO Desk- Officer	x					P3,000.00
Accreditation of all registered POs with the Sangguniang Bayan	POs, SB, Coops	x	x	x	x	x	None
Conduct of PO strengthening activities with BLGU involvement	Brgy officials, PO, LGU	x	x	x	x	x	P30,000.00/ year
Mobilization of POs in addressing issues e.g. indiscriminate disposal of waste from tricycle passengers	All SBs, Brgy Officials, PO	x	x	x	x	x	P10,000.00/year

Strategy 3: Strengthening of FARMC, FLET/Bantay Dagat

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Provision of incentives for intelligence report from concerned citizens	MAO, FLET	x	x	x	x	x	P10,000.00/ year
Training of FLET members, e.g. paralegal, affidavit making, boarding procedure, CRM, admeasurement, GPS, plotting	SB Rules, SB Envi, OPA, DENR, BFAR, PCG, DPWH	x					P30,000.00
Study tours	FARMC, FLET		x				P50,000.00
Organization of FARMCs in all coastal barangays	MAO	x					P24,000.00

Strategy 4: Training and staff development on CRM

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Appointment/ designation of MFMU personnel	SB, Mayor	x					None
Refresher course for MAO and MFMU personnel on CRM	MAO		x				P10,000.00

Strategy 5: Fund sourcing

Activities	Groups involved	Timeframe					Logistics needed
		2012	2013	2014	2015	**2016**	
Budget allocation from LGU IRA for MFMU operation/ CRM implementation - Meeting to establish sharing scheme - Provision of yearly allocation - MFMU operations planning/ yearly CRM review	MFMU, SB, LCE	x	x	x	x	x	P300,000.00/ year
Request financial assistance from Prov'l Govt, Congressman, Senators through letters/ personal communication	LCE, MFMU	x	x	x	x	x	None
Collections of fees, charges, licenses and permits	Municipal Treasurer	x	x	x	x	x	None

Appendix A

Policy Development Workshop
Basiao, Ivisan, Capiz
25-26 January 2011

CRM ISSUES FROM THE 10 COASTAL BARANGAYS OF IVISAN, CAPIZ

Barangays Poblacion Norte and Poblacion Sur

Issues related to mangroves/ CRM	Causes	Consequences	Rank	Policy recommendations
Construction of "taba" structures on rivers and creeks	Livelihoods of people		1	Clearing of the river
Use of hud-hud	Source of Livelihood	Less productive	2	Pass municipal ordinance
Construction of talabahan (oyster)	Source of Livelihood	Less productive	3	Pass municipal ordinance

Barangay Balaring

Issues related to mangroves/ CRM	Causes	Consequences	Rank	Policy recommendations
Destruction and vandalizing of mangrove/ seedlings	Construction for boat access	Failure of reforestation	1	Pass ordinance protecting the 8 ha mangrove reforestation Implementation of local ordinance and education
Illegal fishing (taksay)	Economic gain and needs No enforcement	Destruction of fishery Reduced catch	3	Increase allocation and utilization of municipal funds Interaction with BFAR and coastguard for assistance in enforcement
Harvesting of juvenile marine species	Economic gain	Reduced fish population and production	2	Learn the life cycle of important species Ordinance and regulation of harvesting i.e. size of fish, season and location
Policies not enforced	Lack of political will Destruction of resources	People's loss of respect for all policies	4	Enforce strictly

Barangays Cabugao and Malocloc Sur

Issues related to mangroves/CRM	Causes	Consequences	Rank	Policy recommendations
Indiscriminate cutting of mangroves	Charcoal making Use as firewood Fishpond construction Expansion of fishponds Pest infestation Natural calamity Flash flood Massive siltation Destruction of corals	Decrease of population Loss of mangroves Decreased bio diversity Decrease in population of fish, shrimps, crabs, fish and shells Lessen livelihood opportunities	2	Pass local policy prohibiting the cutting of mangroves
Illegal diking	Small area of fishpond – of pond owners in	River getting smaller River getting shallow Flooding	1	Pass municipal ordinance limiting diking of fishponds
Trawl fishing conducted sporadically	Inadequate sea patrol operations	No more fish to catch Corals are damaged	3	Pass municipal ordinance not to allow trawl fishing
Fishponds using chemicals/ poisonous substances	Kills predatory species	Fishpond owners not able to profit The dead fish can be eaten by the people nearby which could become a health hazard	4	Pass municipal ordinance in disposing of chemicals/ poisonous substances

Barangay Agmalobo

Issues related to mangroves/CRM	Causes	Consequences	Rank	Policy recommendations
Illegal structures (taba and oyster) in Bulabod river	Poverty	Limits the space for passage of boats	2	Bgy ord prohibiting illegal structures
Illegal planting of nipa	Poverty	River getting shallow	1	Local ordinance regulating planting of nipa
Improper waste disposal	Laziness	Flood	3	Local ord on waste segregation IEC

Barangays Agustin Navarra and Matnog

Issues related to mangroves/CRM	Causes	Consequences	Rank	Policy recommendations
Illegal cutting of mangroves	Charcoal making and use for firewood	Depletion of resources/ destruction of habitat	1	Adoption of national law for mangrove reforestation Regulate/ zoning of the area
Illegal structure construction-oyster	Use of stakes-crowded/ too many	Siltation Makes river/ creeks shallow/ narrow	2	Mun ord regulating construction, delineating area for construction of oyster

Illegal structure of Taba	Loss of fry and fingerling	Decreased fish supply/ marine resources	3	Mun ord regulating construction, delineating area for construction of taba Strict implementation of fisheries law
Dragnet fishing	Catching of assorted fish species	Destruction of habitat of seedlings/ fry; death-decreased population	4	Strict implementation of net used with mesh size less than 3 cm when stretched
Expansion of fishpond dikes	Expansion of area for fish production	Narrow river Loss of mangrove	5	Resolution addressed to BFAR to review FLA policy

Barangay Basiao

Issues related to mangroves/CRM	Causes	Consequences	Rank	Policy recommendations
Disposing of garbage in the sea/ coast	Not following the law Lack of discipline	Death of fish and shells due to pollution Shoreline getting shallow People getting poorer	1	Strict implementation of the law Plant mangroves Construction of MRF
Lack of zoning	People install structures anywhere Permits not secured People that put up structures are not residents of Ivisan	Passageways in the water are limited Coastal area depth getting shallow Others are deprived of livelihoods	2	Conduct coastal zoning and implement properly with the help of the MLGU, BFAR, DENR and Coast Guard
Illegal Fishing activities	People from other places that do not follow the law Bantay Dagat not active in the Barangay and the town of Ivisan	Low fish catch – poverty Destruction of our resources (corals, seagrass, etc)	1	Formulate Mun Fisheries Ordinance Strengthen Bantay Dagat with the help of the composite team Conduct information campaign with fisherfolk Delineate coastal boundaries of Ivisan
Stealing of sinkers	People from the Barangay steals the sinkers and sell them	No money	3	

Barangay Cudian

Issues related to mangroves/CRM	Causes	Consequences	Rank	Policy recommendations
Mangroves are cut down including the trees on the sides of the creek	Construction of fishpond Used as firewood Material for charcoal making	Decrease mangrove population	1	LGU to develop ordinance to demolish illegally constructed fishponds

Appendix B

ASSESSMENT OF THE 2005-2010 IVISAN CRM PLAN OF OPERATION

Fisheries Management

Objectives:

- To increase productivity of fisheries resources in order to achieve food security.
- To regulate access to the municipal waters and reserve its resources for the benefits of our local municipal fishers.
- To regulate exploitation of resources and limit fishing efforts to sustainable levels.
- To ensure sustainable development and management of the fisheries resources.
- To develop monitoring, control and surveillance mechanism and strengthen law enforcement unit.

Strategies	Actual accomplishment	What still needs to be done?
1. Strengthen management of Ivisan Municipal Fish Sanctuary and Reserve.	- Established 1 Marine Sanctuary in Bgy Balaring (for the whole of Ivisan) at Mahabang Pulo etc. for various uses (core sanctuary, recreational, gleaning) in 2002(?) with an area of 830 hectares - markers/ bouys placed in 2003 to delineate the area of the sanctuary - ordinance # 14 s 2002 in place - zoning in place with each zone delineated with markers	- Re-install markers in the area - Establish Mun Fish Mgt Unit (as stated in the ordinance) - Designate Reserve Administrator as part of the MFMU - Creation of the management team to manage the sanctuary and oversee implementation of the plan - Formulate MPA management plan BFARMC to serve as look out
2. Strict implementation of municipal ordinance on closed season.	- Strictly implemented if at level of LGU (need to download responsibility until barangay level, paralegal training for fishers) ◦ Observed only when patrol operations of bantay dagat is around	- Needs amendment of Ord number 96-014 to take out sahid, trawl, to check operation of sagnoy, patigbi, spear fishing (alleged using cyanide), hudhud, to add baling (to be allowed specific only to hipon/ alamang) - Installation of billboards stating closed season in all coastal barangays for public awareness specifying kinds of fish banned from catching - To include life cycle as IEC material - FLET a. Members who are newly trained need to be deputized/ educated on roles and responsibilities b. Needs re-organization c. Needs to establish clear mechanism of enforcement with MLGU BD and PNP d. Mayor with PNP chief need to assign at least 2 PNP personnel in the FLET with mandate from Mayor and conformed by PNP chief e. Augmentation force to be requested by Mayor from the Prov Command f. Need to complete logistics for BD operation (jackets, hats, flashlights, coffee, telescope, etc) g. Watch tower to be constructed at Tuad Island

3. Licensing and permitting of municipal fishers, fishing gears and fishing boats	- No permits and licenses secured by mun/ marginal fishers including oyster/ mussel farmers (stopped in 2004); what is paying are arong (only a few); to check punong, arong, fish cages (permits, license) - approved by the SB thru an ordinance in 2006 - SB Dagoy and VLlono trained on admeasurement (2008) - fees and charges already with SB (updated) needs approval prior to implementation	- Update data on list of fishers with gears used - Need to revive team for collection of fees at LGU level (Treasury and MAO) that will conduct barangay collections - Applicants need to comply with Barangay requirement i.e. clearance prior to securing LGU permit/ license - Conduct of barangay to barangay admeasurement inspection with corresponding charges - To issue id to fishers and assign certificate of number/color coding for ease of identification during apprehension
4. Regulations of the construction and operations of fish corrals, other fishing gears and fishing activities that occupy space in the coastal waters and rivers.	- No zoning in place - Mun ord number 8 s 2006 in place but lacks implementation	- Check provision in ordinance number 14 - Conduct inventory of existing mussel and oyster farms- involve Barangay and provide incentives in the collected fees - Need to zone uses in the municipal waters of Ivisan
5. Restriction of commercial fishing vessels in the municipal waters.	- Mun ordinance Ordinance No. 94-006 Series of 1994 - Patrol operation suspended at present, BD boat under repair	- Limit environmental law enforcement to mangroves and waste in coastal areas - Admeasurement to be implemented - Call for a meeting with vessel owners with admeasurements of above 3.1 gross tons and above
6. Strict enforcement of environmental laws (mangroves and waste management in the coastal areas) and fisheries laws.	- Mun ordinance Ordinance No. 94-006 Series of 1994 - Patrol operation suspended at present, BD boat under repair	- Clear operational plan formulated by the FLET - FLET reorganization and re-training (when needed) and deputation - Inventory and survey (MCS) of existing mangrove areas - Formulate mangrove laws
7. Strengthen the operation and management of FLET Bantay Dagat at Balaring, Basiao and Cabugao.	- Operation of BD suspended since 2004 (October)	- Re-organization of the FLET - Finish BD boat repair/ maintain - Maintained logbook of operation - Continue sharing of incentive mechanism for the FLET members (40% MLGU, 30% BLGU, 30% PNP)
8. Conduct of massive IECs.	- Informal education done (during meetings) - No IEC materials produced	- Copies of MFO when finished should be furnished to the barangays - Encourage coastal barangays during important celebrations to participate (coastal clean up, fish conservation week celebration, fiesta celebration, farmers day) - Participate in the planning for July fiesta celebration for fishers advocacy- IEC activities suggested are film showing, advocacy booth

9. Community organizing and formation of POs	- At present the following POs were organized in Balaring, Basiao and Cabugao. The status of which are: 1. New BAMA - active 2. Basiao Small Fisherfolk Coop- dead 3. Balaring Small Fisherfolk Coop- dead 4. Cabugao Small Fisherfolk Coop- dead - No Fisher POs in the other bgys - LGU has no capacity to do CO - Project based organizing done – entry point are projects (loan, etc)	- No more organizing in the bgys as LGU do not have the capacity however BFARMC should take on responsibility in overseeing CRM implementation in the barangays - BFARMCs were newly re-organized and needs strengthening (understanding of roles and responsibilities with the MLGOO, conduct of monthly/ quarterly meetings -depending on need) - Updated list of BFARMC members - MFARMC should take proactive role in policy formulation i.e. needs to be consulted in policy formulation

Habitat Management

Objectives:

- To protect, conserve and rehabilitate existing habitats.
- To improve productivity and biodiversity of corals, seagrasses, mangrove and estuaries.
- To enhance community participation in the management of the habitats.

Strategies	Actual accomplishment	What still needs to be done?
1. Strengthen management of Ivisan Municipal Fish Sanctuary and Reserve (corals, and seagrass areas)	- Management of Ivisan Municipal Fish Sanctuary and Reserve lodged with the MLGU - Seagrass and mangrove habitats included in the Ivisan sanctuary	- Need to conduct biophysical assessment of the sanctuary - To request from OPA/ BFAR for the conduct of dive surveys - Conduct feedback with community re status of the MS - Review of PCRA data - Formulate MPA management plan
2. Management of mangrove areas especially at *barangay* Agustin Navarra under the CBFM framework	- At present 2 barangays are doing mangrove rehab- Balaring and Agustin Navarra (only Balaring applies for CBFMA)	- 10 barangays need to be surveyed and assessed as to area, species, issues on mangroves and MCS - Include mangrove policies in the MFO - Develop mangrove rehabilitation plan in the barangays with mangroves (if needed)
3. Protection of seagrass beds by regulating fishing activities destructive to the habitat	-Included in the MPA in Balaring only; none in the other sites	- Need to conduct inventory of seagrass beds – to check areas in Balaring and Basiao (area, status) - Review PCRA data

Coastal Zoning

Objectives:

- To delineate zones for specific uses or activities in the municipal waters.
- To eliminate use conflicts in the utilization of the municipal waters.
- To regulate activities in the different zones.

Strategies	Actual accomplishment	**What still needs to be done?**
1. Strengthen the implementation of the approved Municipal Water Boundary Ordinance.	- Water boundary delineated and approved by MLGU Ivisan; Sapian non-conforming	- ???
2. Enactment/and approval of the Cabugao-Basiao Cove Zoning Ordinance.	Not done	- Conduct community mapping - Conduct zoning as to uses (with technical descriptions) - Enact zoning ordinance - For Balaring - refer to CRMF for uses on mangroves/ coastal area

3. Designation of zones for specific uses (aquaculture, mangrove, fish pen, fish cages, fishing, tourism, and navigation)	Not done	- Conduct of community mapping (same as above)
		- Conduct zoning as to uses (with technical descriptions)
		- Enact zoning ordinance
		- For mussel and oyster farming
		  - encourage staking with longline and raft method to decrease siltation problem
		  - provision that stakes/ structures need to be taken out physically after area is not used anymore

4. Preparation and approval of coastal water use plan in all the coastal *barangays* of Ivisan.	- At present CLUP undergoing review, water use included	- CRM plan as input to the CLUP of Ivisan
5. Regulation of fishing activities and use of fishing gears in every zone		- Development of Zoning ordinance and implementation/ develop and legislate MFO - Conduct of community mapping - Fishing license and permit of fishers need to be secured (where gear used is specified) - Continuous updating of data bank on fishers

Shoreline Management

Objectives:

- To protect the shoreline from further degradation due to destructive activities.
- To regulate activities in the foreshore area that would affect the condition of the shore.
- To minimize erosion and loss of beach to natural and human induced forces.

Strategies	Actual accomplishment	What still needs to be done?
1. Regulation of sand and coral gathering.	- National law implemented - Corals included in the sanctuary ordinance - No local policy on sand, coral and other mineral extraction	- To put in place ordinance regulating sand extraction or quarrying and other minerals
2. Protection and conservation of mangroves.	Same as above	
3. Setting up and maintenance of coastal setbacks for all developments.	- Issue on illegal diking - Construction of structures (houses, etc) within the setback area - No permit for construction secured	- In the coastal areas Barangays need to regulate construction following what is stated in the law (CLUP/ HLURB guidelines) - Building permits shall be secured from the MLGU
4. Construction and maintenance of seawall at Balaring Basiao, Cabugao and selected areas	- Only Balaring (portion) has seawall constructed - Basiao-none; not as open as Balaring; - Cabugao is fishlanding area	- Continue mangrove reforestation done in front of Balaring seawall - Construction of seawall in Basiao and Cabugao not necessary
5. Conduct of massive IECs	Same as above	
6. Water shed management	- Tree planting activities done in Agustin Navarra - Mianay Mun eco-park and private citizen (coconut) estimated at 1,500 hectares; co-mgt bet DENR and MLGU/BLGU - Existence of CASCOFAMCO which supports coco industry of Capiz (coco oil, copra, VCO, soap, dust, coco coir, coco matting, vinegar, shell crafts)	- Continuous replacement planting (1 tree cut 1 tree needs planted)
7. Community organizing	- Coco farmers organized in 12 (?) barangays - 2 irrigators association - CAMMMA (ARC) beneficiaries in 6 bgys - 5 rice cluster farmers associations	- Monitoring of organized groups - Strengthening of coco groups (CASCOFAMCO extends assistance in terms of strengthening barangay based coco groups and marketing of coco products from farmers)

Coastal Tourism Management

Objectives:

- To develop local capability in eco-tourism projects that contributes to better coastal management and community development.
- To provide economic incentives for the *barangays* by optimizing the tourism potential of their areas.

Strategies	Actual accomplishment	What still needs to be done?
1. Regulation on the number of tourism facilities and activities at Basiao, Sta Cruz, Balaring, Ilaya Ivisan, Malocloc Norte and Agustin Navarra.	- In place regulation policies but limited to locational clearance and other permits - ECC complied in Basiao, Sta. Cruz, Ilaya Ivisan and Molocloc Norte - Sta Cruz not operational - No resort in Balaring - Tourism plan included in the CLUP - Mun owned Nova Marine resort- as training center, income generating for LGU-operate cottages for rent - IPE project (integrated palm planting) in all roads (roadside planting) for eco-tourism/ ecological development	- Include Malocloc Norte 2 mountain resorts for tourism - To fully develop Nova Marine - Promotional materials needs to be developed
2. Eco-tourism product development	- Kakanin out of coconuts-individual producers - MLGU assists in product labeling and marketing-trade fairs; shell craft - Organized group of resort owners-provincial level where Ivisan based owners are members	- Eco-tourism master plan needs to be developed - Improvement of support facilities (roads, cottages) - Training of manpower on skills
3. Maintenance of waste disposal facilities	- In the eco-park demo on vermin composting, SALT, turn waste into organic fertilizer, organic vegetable production using organic fertilizer - At present bailing of residual wastes at the eco-park- plastic sold, plastic cups as potting container - Bio-degradable materials turned into organic fertilizer	- To develop area for organic herbal medicine using organic fertilizer- in capsule form
4. Visitors education and management	- At present department concerned do orientation; no tourism officer trained to do visitors education	- Need to designate point person on tourism
5. User fees and appropriate business development	- Not done	- Assess viability of opening part of MS for diving and snorkeling; also mangroves as eco parks - Establishment of eco-parks and other tourist destinations (after assessment)

Enterprise and Livelihood Management

Objectives:

- To develop alternative and supplemental employment to fishers in order to lessen their fishing effort and fishing pressure to the sea.
- To diversify income source of the fishers to lessen dependence on fishing.
- To develop environment-friendly enterprise and livelihood projects.

Strategies	Actual accomplishment	**What still needs to be done?**
1. Identification and implementation of environment friendly and economically feasible project.	Established livelihoods projects: - Coop store- Basiao, Balaring, Cabugao, - Seaweeds culture- Basiao [marankalan] - Fish vending- cabugao, Basiao - LEAD [livelihood enhancement and _ from NAFC] projects [arong]- 27 fisherfolk beneficiaries in Balaring - LEAD project Cabugao- crab culture in mangroves, store; proceeds from crab culture used in fish cages [approx 30 members] - LEAD project in Basiao- fish drying [approx 30 beneficiaries] - Balaring- shell craft and handicraft, candle-making [FRMP/ BFAR], bago-ong/ dayok packaging training conducted by DTI, 1 FF engaged in shellcraft production - Micro-lending- Balaring, Cabugao; capitalization range PhP2,000.00 up to 10,000.00 per beneficiary - DOLE assistance PhP300,000.00 for livelihood restoration- palay farming, hog raising, talaba/ tahong culture, fishing paraphernalia [Balaring, Basiao, Cabugao] @ PhP5,000.00 per beneficiary - Seaweeds culture- coop managed, trial planting undertaken; feasibility study [?] done through trial and error	- POs need to recognize LGU mentoring and supervision in organizational meetings and affairs - Assessment on livelihoods systems and procedures and project ID Note: FRMP started in 2000, livelihoods implemented in 2004, BFAR exit 2005, 2007-2008 livelihoods failed - Phasing/ timeliness in implementation of livelihood; livelihoods implemented near project end, hence no observation on project viability in 3 cycles - No proper turn-over of documents
2. Identification of beneficiaries	- BFAR introduced the shopping list/ menu [availability of resource person] of proposed projects that were presented to coop - Beneficiaries identified and made proposals for the projects	- Projects should be identified by members themselves whether individual or group-managed

Waste Management

Objectives:

- To eliminate or minimize the potential adverse impact of waste to human and environment health especially in the coastal *barangays*.

Strategies	Actual accomplishment	What still needs to be done?
1. Coastal water quality monitoring in coordination with OPA in designated station.	- OPA initiated/ conducted water quality monitoring - OPA trained local technicians on water sampling - Proper gathering and transport of water samples	- Monitoring results shall be made available to the LGU
2. Red tide monitoring in coordination with OPA	Same as above	
3. Sewage waste treatment, especially for tourism and industrial facilities	- Septic tanks for waste installed in resorts	- Inventory of backyard piggeries as to disposal of wastes need to be conducted - Conduct inventory of households along coast without toilets - Tie-up with MHO with regards to data and project implementation on health in the coastal barangays
4. Monitoring, control and surveillance	- Regular/ on-call inspection done by the sanitary inspector (upon request)	- Reports shall be made available to the barangays for appropriate action
5. Conduct of massive IECs	- Mun solid waste mgt plan 2005-2015 in place - Solid waste mgt board organized - Monitoring done upon application of building permits and whenever there are complaints	- Mun solid waste mgt plan to be made popular to Barangay residents

Legal Arrangement and Institutional Development

Objectives:

- To improve mechanism and arrangement for local governance on coastal management.
- To enhance community participation in coastal management planning, legislation, implementation, monitoring and evaluation.
- To improve the delivery of coastal management related services.
- To strengthen the network and linkages with other local government units, BFAR and other local organizations.

Strategies	Actual accomplishment	What still needs to be done?
Legislation and approval of Comprehensive Municipal fisheries Ordinance.	No MFO Piecemeal ordinances e.g. sanctuary, closed season formulated and passed	Formulation and legislation of Ivisan MFO
Strengthening of FARMC, FLET/*Bantay Dagat*	7 BFARMCs and 1 MFARMC organized and functional	Newly organized BFARMC needs to be trained Monitoring of activities Study tours, mangrove training
Training and staff development on CRM	FLET training on admeasurement, GPS training, plotting	Paralegal training for BFARMCs, POs [affidavit making, boarding procedure] CRM training

Appendix C

STATUS OF MUNICIPAL COASTAL LAW ENFORCEMENT (CLE) INITIATIVES

Area: Municipality of Ivisan
Date administered: 22 March 2011

1. Is there an existing CLE team? Yes

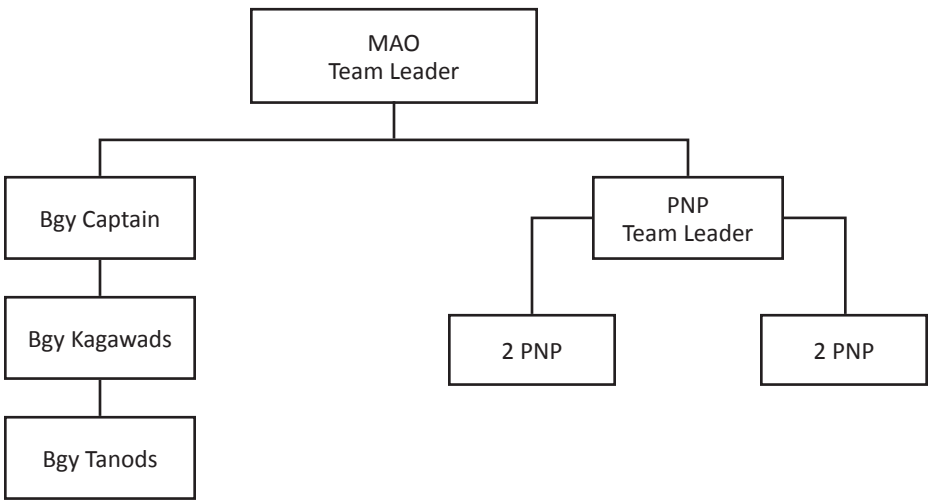
2. Name: Fishery Law Enforcement Team

3. Level (municipal/barangay/other): Municipality

4. Structure and composition:

Composition: 4PNP, 1 LGU (MAO), Bantay Dagat of Balaring composed of 1 Bgy Kapitan, 7 Bgy Kagawad and 15 Bgy Tanods

Structure:



Responsibilities:

Team Leader
- Fishery Regulatory Officer
- Initiates boarding procedure with PNP
- Responsible for the patrol operations (schedules, request for budget, writes incident report with PNP)

PNP Team Leader
- writes incident report with MAO
- blotter the incident
- makes affidavit
- files case in court with technical assistance from MAO

PNP personnel
- goes with the team during patrol operations
- in rules of engagement, reads the Miranda doctrine

Bgy Captain
- takes over command if Team Leader is absent

Bgy Kagawad
- do the GPS reading
- acts as patrol boat operator
- records all patrol operation activities
- crew

Bgy Tanod
- crew

For every patrol operation: team is composed of 1 Bgy Kagawad, 2 Tanods, 2 PNP, Bgy Captain and MAO

5. Membership: 28
6. When created/ established? 2003
7. Legally recognized? If so, through what? No EO; only deputation papers
8. Equipment, logistics available: 12life jackets, 2 searchlights, 1 megaphones, 1GPS, kape, bugas, 1talibong, 8 hunting knives, 3patrol boats – 2 operational, 1 speed boat has no engine (non-operational)
9. Budget? Where from? PhP 150, 000/year from MLGU Ivisan
10. External support? What and where from. Patrol boat-BFAR

    Note: 1 patrol boat (BFAR) non operational at present, engine transferred to the smaller speed boat

11. Available skills:

Skill	Availability	Who / Organization
Wildlife specialist	x	-
Pollution / poison specialist	/	MAO (limited to pollution)
Legal specialist	/	PNP, Fiscal, private lawyer
Fish examiner	/	MAO
Gear specialist	/	MAO
Investigator	/	PNP
Intelligence officer	/	PNP, MAO
Navigator	/	Bgy Kagawad
Communicator	/	Bgy Kagawad, Bgy Kap, MAO
Information specialist	/	MAO
Licensing specialist	/	MAO
General inspector	/	MAO

12. Violations: (common / top 3-5) (indicate season if violations are seasonal)
    a. Trawl (3 gross tons below, active gear used in shallow waters) fishing within municipal waters
    b. Palupad (commercial trawl, 3.1 gross tons and above-steel boat)
    c. Kayagkag (gill net), cast in round manner to encircle school of fish specifically used for sardines
       - illegal due to usage during closed season, mesh size of net is small (less than 3cm in diameter when stretched)

- Fishing without permits (applies to both resident fishers and outside fishers)-no LGU permits shown as proof of registered fishers

d. Taba with small mesh sized nets (less than 3 cm) and without permits

13. SOP from Apprehension to Penalization

Sightings of illegal vessels – boarding – reading of Miranda doctrine – ordered to dock on shore – temporary custody in the detachment in Balaring – crew are summoned at the PNP for investigation – other crew sent home however Boat Captain is being held until case is settled- PNP blotter and makes incident report with MAO – administrative fine/ penalty determined relative to the ordinance – owner summoned – meets Mayor for settlement/ MAO/ team (Chief PNP, Treasurer and MAO) – fines paid – cleared – released

2 cases – commercial boat captain was filed case – MTC Dao for illegal fishing – amicable settlement in court

Criminal – BD gunned down by the boat captain and arms were sequestered

14. Training activities undertaken / year / by which agency

Training Activity	Date	Facilitating Agency	Participants
FLET	2003	BFAR	BD, PNP, MAO
Communication	2003	BFAR, NTC	-the same-
Bantay Baybay (plotting, GPS, compass reading, surveillance)	2004	BFAR	-the same-
Fishery law enforcement (trainers training)	2005	BFAR	MAO
Legal aspects of law enforcement	2008	BFAR	BD, MAO, Mayor, 2SB
Mangroves laws	2010	ZSL	MAO
Vessel admeasurement	2009	Marina	MAO

15. What fishery-related ordinances/laws have been passed?

a. Mun. ordinance No. 94-003 Series of 1994
b. Mun. ordinance No. 94-006 Series of 1994
c. Mun. ordinance No. 96-014 Series of 1996
d. Mun. ordinance No. 14 Series of 2002

16. What are perceived needs to strengthen CLE in the area?

Reorganization of the FLET, re training of FLET, logistical support increased, identification of committed FLET members, with clear mandate/ EO, with structure and defined roles and responsibilities; designation of responsibilities

17. Summary of Bantay Dagat Operation (Year 2000-2004)

Year	Months covered	Number of days Operation was conducted	Number of days with apprehensions	Number of apprehensions	Fines collected (PhP)
2000	15 Mar – 15 Nov	26	8	11	26,500.00
2001	7 Feb – 26 Sept	7	7	13	27,800.00
2002	15 Jan – 21 Dec	24	9	15	141,000.00
2003	Jan - Dec	90	37	49	140,000.00
2004	Jan - Oct	66	17	25	187,000.00
Total	**51 months**	**213**	**78**	**113**	**522,300.00**

Summary of apprehensions according to type of violations

Year	Number of apprehensions	Trawl	Zipper	Palupad	Kayagkag	Others
2000	11	10				1
2001	13	11	2			
2002	15	6	6		3	
2003	49	37	3	3	4	2
2004	25	18	1	3		3
Total	**113**	**82**	**12**	**6**	**7**	**6**

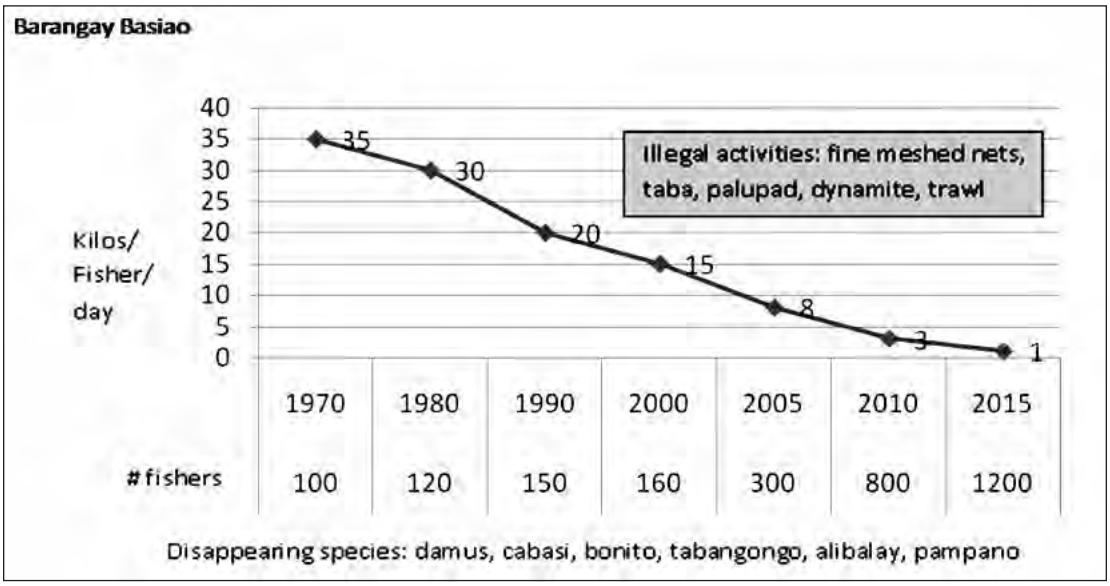
Others: caught in the act of catching crabs, fishing inside the reserve area using spear gun
Fishing inside the marine fish sanctuary
Fishing with the use of gillnet without permit

18. Violations/ patrol and surveillance map of Ivisan

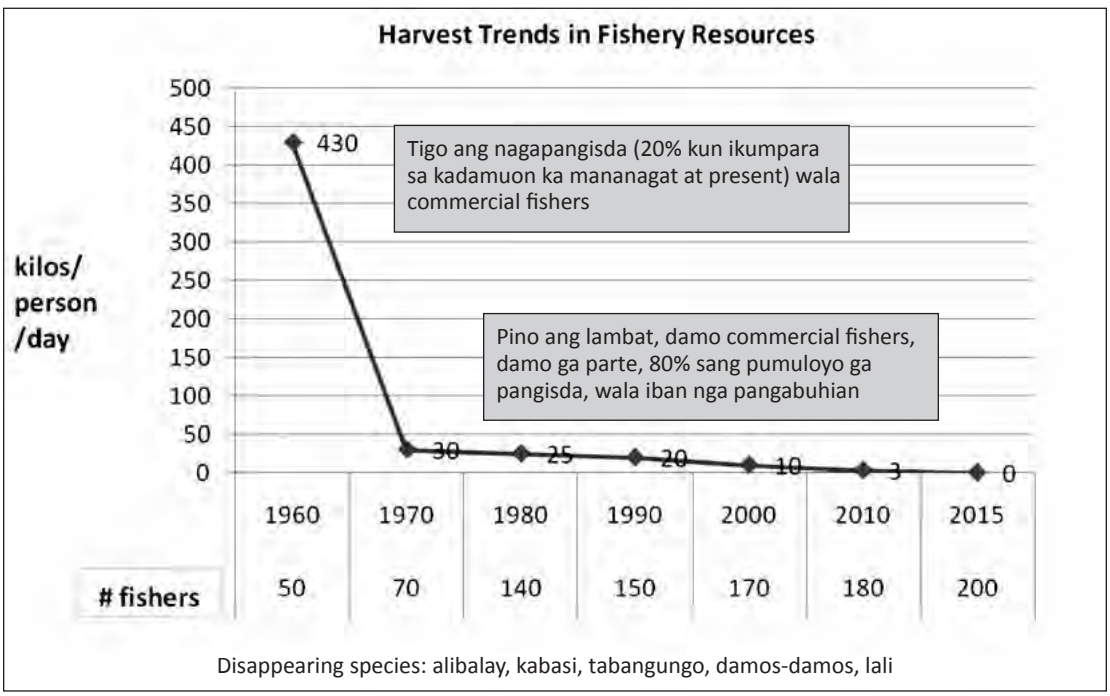
Appendix D

PARTICIPATORY COASTAL RESOURCE ASSESSMENT RESULT

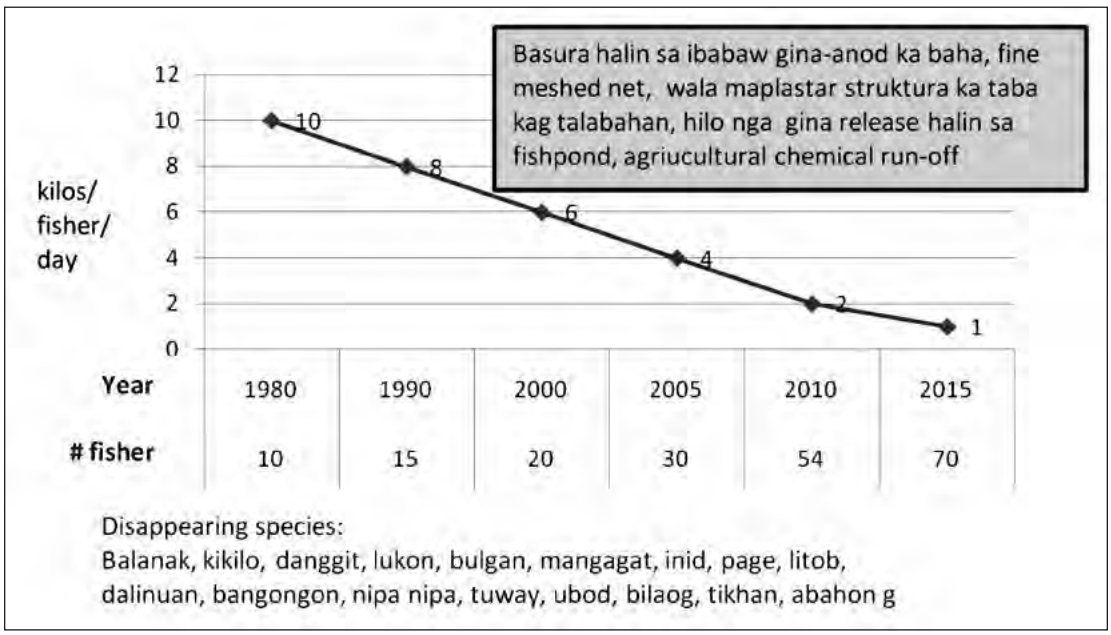
A. Trends in Harvest of Fishery Resources



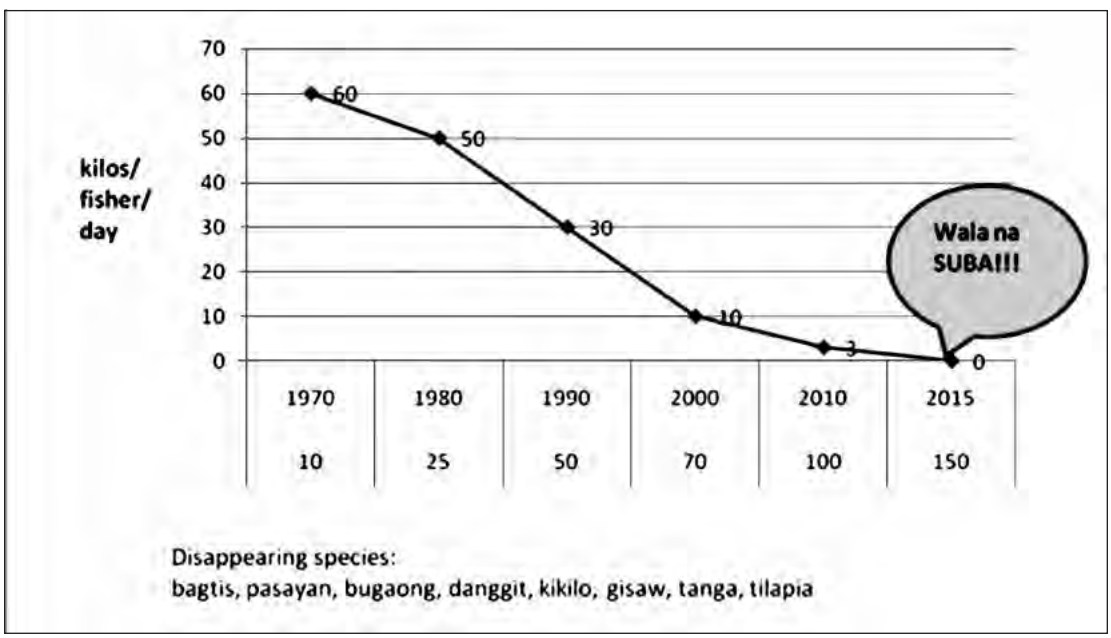
Barangay Cabugao



Barangay Cudian



Barangay Matnog



B. Seasonal Calendar

Barangay Agmalobo

Variables	J	F	M	A	M	J	J	A	S	O	N	D
Peak season in fishing (plenty of fish caught)	→	→	→	→	→	→	→	→				
Lean season (less fish caught)									→	→	→	→
Weather condition (rainy, dry, amihan, habagat)	A	A	☺ A	☺ A	H	H	H	A/H/ S	A/H/ S/T	A/H/ S/T	A/H/ S/T	A/H/ S/T
Species of fish caught	Pasayan, tanga, tilapia, gisaw, bul-a, bangrus, alimango, danggit, kikilo, bulgan, bulanbulan, bulawis, sigisigi, ulang, tangkapan, hipon, kalampay											
Type of gear used	Hudhud, patuloy, timing, taba, bintol, balaybay, pamuho, panghagap, panikhan											
Health of fishers	Liptospirosis (malamig ang tiyempo)								Ubo, lagnat, sipon, trangkaso, salapo			
Income (high or low)	HI		LI	HI			LI			HI (taba, pamanggal, patuloy, hudhud, balaybay, pamuho)		

Barangay Agustin Navarra

Variables	J	F	M	A	M	J	J	A	S	O	N	D
Peak season in fishing (plenty of fish caught)	→	→	→	→	→	→	→	→				
	Tahongan											
Lean season (less fish caught)												
Weather condition (rainy, dry, amihan, habagat)	A	A	A/ H	A/H	H	H	H	H	H	A/H	A	A
Species of fish caught	Tilapia, pasayan, kasag, asu-os, gisaw, danggit/ kikilo, buga-ong, alimango,											
Type of gear used	Sibot, bintol, tapangan, timing, panghagap											
Health of fishers	Ubo, sipon, trangkaso, arthritis									Ubo, sipon, trangkaso, arthritis		
Income (high or low)	LI	HI					LI					

Barangay Balaring

Variables	J	F	M	A	M	J	J	A	S	O	N	D
Peak season in fishing (plenty of fish caught)		→	→	→	→	→	→	→	→	→	→	→
				Arong, patuloy, kayagkag								
Lean season (less fish caught)												
Weather condition (rainy, dry, amihan, habagat)	T ☺ A	T ☺ A	T ☺ A/H	☺ A/H	H	H	H	H	H/AT	T	A	A
Species of fish caught	Bolinao, lokus, dagoldolan, sapsap											
Type of gear used	Arong, patuloy, kayagkag, hirata											
Health of fishers	Ubo, sipon										Ubo, sipon	
Income (high or low)	LI		HI						LI			

Barangay Basiao

Variables	J	F	M	A	M	J	J	A	S	O	N	D
Peak season in fishing (plenty of fish caught)				→	→	→	→	→	→			
				Arong								
Lean season (less fish caught)	→	→	→							→	→	→
Weather condition (rainy, dry, amihan, habagat)	A	A	A	☺ A	☺ H	☺ H	☺ H	☺ H	☺ A	A	A	A
Species of fish caught	Bolinao, sapsap, tabagak, kasag											
Type of gear used	Net											
Health of fishers	Ubo, sipon, trangkaso										Ubo, sipon, trangkaso	
Income (high or low)	LI				HI				LI			

Barangay Cabugao

Variables	J	F	M	A	M	J	J	A	S	O	N	D
Peak season in fishing (plenty of fish caught)	→	→	→					→	→	→		
	Hasahasa, bolinao, lokos, tanga							Tahong, talaba				
		→	→	→	→	→	→	→	→	→		
Lean season (less fish caught)				→	→	→	→				→	→
Weather condition (rainy, dry, amihan, habagat)	A	A	A/ H	H	H	H	H	H	H/A	A	A	A
Species of fish caught	Pasayan, kasag, hipon, tabagak											
Type of gear used	Taba, arong, patuloy, hudhud											
Health of fishers	Lagnat, Ubo, sipon									Lagnat, Ubo, sipon		
Income (high or low)	HI			LI				HI			LI	

Barangay Cudian

Variables	J	F	M	A	M	J	J	A	S	O	N	D
Peak season in fishing (plenty of fish caught)									→	→	→	→
Lean season (less fish caught)		→	→	→	→	→						
Weather condition (rainy, dry, amihan, habagat)	☺ A	☺ A/H	☺ A/ H	☺ H	,,,,,,,, H ☺	,,,,,,,, H ☺	,,,,,,,, H/A	,,,,,,,, H/A	,,,,,,,, A	,,,,,,,, A	,,,,,,,, A	,,,,,,,, A
Species of fish caught	Pasayan, gisaw, tanga, alimango											
Type of gear used	Sihod, taba, patuloy, hudhud, timing, laya											
Health of fishers		Sore eyes, sakit ulo								Ubo, sipon, trangkaso		
Income (high or low)	**HI**	**LI**							HI			

Barangay Malocloc Sur

Variables	J	F	M	A	M	J	J	A	S	O	N	D
Peak season in fishing (plenty of fish caught)	→	→	→	→						→	→	→
Lean season (less fish caught)					→	→	→	→	→			
Weather condition (rainy, dry, amihan, habagat)	,,,, ☺ A	☺ A	☺ A/ H	A/H	,,,,,,,, H	,,,,,,,, H	,,,,,,,, H	,,,,,,,, H	,,,,,,,, H	,,,,,,,, A	,,,,,,,, A	,,,,,,,, A
Species of fish caught	Pasayan, alimango, similya lukon/ alimango, tilapia, batad, bulawis, bagtis, kalampay, gunggong, bugaong											
Type of gear used	Net (#13 and #17), taba, panggal/timing											
Health of fishers										Ubo, sipon, trangkaso		
Income (high or low)	**HI**	LI (mananaba) HI (sangha)								HI (taba, pamanggal) HI (sangha)		

C. Daily activity schedule

Barangay Agustin Navarra

Time	Activity
4:00AM	Bugtaw, mangape
6:00	Pamahaw, manghagap
9:30	Baligya sa palibot, pahuway
11:30-12:00	Panyaga, pahuway
1:00	Malakat sa bukid
1:00-4:00	Manglimpyo, gahit katamnan, mangahoy, tuba saging
4:00	Puli, pahuway, istorya sa asawa kag maghulat panyapon, talgsa inom-inom
7:30	Panyapon, lantaw TV

10:00	Tulog

Total working time: 18 hours

Barangay Balaring

Patuloy

Time	Activity
5:00 AM	Pangape
6:00	Pananggot
7:00	Pamahaw
8:00	Bis-ak kahoy, bahog baboy, sabod manok
9:30	Pahuway-huway
11:00	Tig-ang panyaga
1:00 PM	Panyaga
1:00-2:00	Tulog-tulog, pahuway
2:00-3:00	Bahog baboy, sabod manok, pananggot
3:00	Inom-inom
5:00	Tig-ang
6:00	Panyapon
6:30	Tan-aw TV
9:00	Tulog

Lambat

Time	Activity
4:00 AM	Init tubig, mangape, pahuway-huway, himos palawod
6:00	Palawod, managat
8:00	Puli halin sa panagat, pahuway huway, hulat pamahaw
9:00	Pamahaw, pahuway, pulupungko, tan-aw TV
11:00	Balik sa lawod
11:00-12:00	Managat, kadto sa lawod
2:00	Kadto sa bukid, mangahoy
3:00	Bis-ak kahoy, pahuway huway
4:00	Digamo panyapon
5:00	Panyapon, pahuway huway
7:00-9:00	Tan-aw TV
9:00	Tulog

Arong

Time	Activity
6:00 AM	Bugtaw
7:00	Pangape, pamahaw
7:00-9:00	Digamo, sabod manok, bahog baboy

9:00-10:00	Bukid (pananom kahoy, saging)
10:00	Puli
11:00-12:00	Manyaga
12:00-1:00	Relax sa TV
1:00-3:00	Tulog, obra usok
3:00-4:00	Digamo
6:00	Panyapon
6:00-7:00	reparer lambat kag iwag
8:00	Pa lawod
9:00-12:00 Midnight	Bantay iwag
12:00-6:00AM	Tulog

Barangay Cudian

Time	**Activity**
2:00AM	Bugtaw, kadto suba,sibot ang taba/pili/takos
5:00	Baligya sa suki, puli sa balay
6:30	Digamo, bahog baboy, sabod manok, balik suba-harvest taba, kay-o taba, patuloy-pang sud-an
9:00-10:00	Takas, mamahaw/ panyaga, pahuway huway
1:00	Puna lambat, preparer butong
4:00	Bisita panagat sa lawod, puli
5:00-6:00	Bis-ak kahoy, sanggot lubi, preparar sumsuman, doyan-doyan, shot-shot
7:00-8:00	Panyapon
8:00-9:30	Lantaw TV
9:30	Tulog

Appendix E

MPA REPORT GUIDE

This **MPA Report Guide** can assist in organizing information on individual MPAs and the environment that the MPA protects. If completed yearly, it will provide MPA managers, local governments, non-government organizations, academe or other interested parties with information on the status and quality of management, the status and quality of the environment and benefits being derived from the MPA. It will also provide feedback on how the MPA is rated compared to other MPAs and on how to improve management of the MPA.

I. MPA DESCRIPTION & STATUS

MPA name*: The Ivisan Fish Sanctuary and Reserve

Region: **6**

Province*: **Capiz**

Municipality/City*: **Ivisan**

Barangay*: **Balaring**

Date of survey*: **2000**

MPA size (hectares)*: **830 hectares**

Habitat/ecosystem(s) within MPA:

[x] Coral reef	**[x] Seagrass bed**	**[x] Sandy bottom**
[x] Rocky intertidal	**[x] Open water**	

Type of coral reef:

[ ] Patch	**[x] Atoll**	[ ] Offshore reef / Shoal

Boundary coordinates (deg-min-sec)*

Lines	Latitude	Longitude
1	11°33'45"	122°38'03"
2	11°33'45"	122°37'09"
3	11°35'24"	122°37'09"
4	11°35'24"	122°38'54"
5	11°34'30"	122°38'54"

Year legally established*: **2002**

Basis for legal establishment*: **[x] Municipal Ordinance No. 14 otherwise known as "The Ivisan Fish Sanctuary and Reserve Ordinance of 2002"**

MPA establishment history (brief chronological order of events):

- LGU observed the potential of the area even before the BFAR project was implemented in Ivisan
- MPA was established with the help of BFAR thru the FRMP
- The area of the MPA was delineated by NAMRIA
- Ivisan LGU installed the bouys given by BFAR to serve as boundary markers

MPA objectives/reasons for establishment*:

e. To protect the coral reefs around Mahabang Pulo and Mabaay Islets in their natural state and free from disturbance, allowing them to function as feeding, nursery, and spawning areas for fish and other aquatic organisms, and hence maintain biodiversity and contribute to fisheries production in the adjacent areas where fishing is permitted;

f. To preserve the scenic and spiritual beauty of Mabaay Islets as a popular picnic ground, ensuring it for the recreational enjoyment of present and future generations;

g. To bestow formal recognition to the area around Marokol Dako and Marokol Diutay Islets as traditional gleaning grounds of the nearby local inhabitants;

h. To prohibits fishing around the immediate vicinities of Mahabang Pulo and Mabaay Islets, enabling fish to grow undisturbed and replenish depleted stocks in the adjoining fishing grounds; and

i. To limit fishing to specific types beyond the immediate vicinities of Mahabang Pulo and Mabaay Islets in order to provided a gradual transition between the highly protected "no take" area around the two islets and the open fishing ground.

OPERATIONS MANAGEMENT

Indicate classification of group (Select letter to indicate classification)

[ ] People's organization (PO)
[ ] Barangay government
[x] Municipal government
[ ] Provincial government
[ ] Government agency (*e.g.* BFAR)
[ ] Non-government organization (NGO)
[ ] Dive shop/Resort owner
[ ] Others, specify:_____

Current managing group* *(The main group directly managing the MPA)* - **CLET**

Current assisting group/s* *(Groups providing technical assistance or support for effective implementation of the MPA)* - **none**

Presence of marker buoys? [ ] Yes **[x] No**

Number of moorings/anchor buoys? **None**

Number of signs posted? **None**

Date MPA management plan was approved? **None**

Management zones*:

Zone	Size (has)	Regulations
Sanctuary Zone	**76**	• strict protection • core preservation area to provide natural spawning, nursery and permanent residence for the replenishment and genetic protection of all marine life • off limits to visitors and closed full time for any consumptive use • fishing in any form, aquaculture, gathering and collecting of fishery resources and other marine products shall not be allowed • scientific, research and educational activities may be allowed by permit only • boats may enter or pass through by permit or in emergency cases only • the natural vegetation, including the mangroves, of Mahabang Pulo Islet shall be preserved • cutting for firewood shall not be allowed • the harvesting of coconuts, bamboo and other products by the legal claimants shall be done after prior notification of the MFMU

Recreational Zone	**148**	• is for picnic, and recreation and purposes • visitation shall be controlled in order to limit environmental impact • visitors shall be enjoined to observe proper waste disposal and not to litter, deface and vandalize the natural scenery • over night stay in Mabaay Islet shall be allowed by permit only • the natural vegetation, including the mangroves, of the islets shall not be cut for firewood or altered for cultivation • no permanent structures, except the mooring system, shall be constructed on the Islet • only swimming, snorkeling and diving shall be allowed • fishing, including spear fishing, aquaculture, gathering and collecting of shells, corals and other organisms for souvenir are prohibited • reef walking and turning of rocks and boulders, especially at low tide should be avoided • swimmers and divers shall take care not to come in contact with the corals • boats shall make use of mooring buoys and mooring piles in the Islet; their anchors, anchor ropes and chains should avoid coming in contact with the corals • boat shall keep away from shallow reef areas • boat operators should avoid spilling fuel and oil into the water • water skiing shall be prohibited • scientific, research and educational activities may be allowed by permit only • the legal claimants of the Islet shall notify the MFMU before harvesting coconuts bamboo and other products
Gleaning Zone	**52**	• traditional collecting of marine organisms for food allowed however, rare, threatened, endangered and protected species as listed in the CITIES and as determined by DA and DENR shall not be collected • only gleaning activities to be undertaken by the local residents • for subsistence purposes shall be permitted • gleaners should take care not to uproot or destroy the root system of the seagrassess • the use of rakes shall be prohibited • dredging and activities that cause water turbidity, shading and aquatic pollution shall not be allowed. • the natural vegetation of Marokol Dako and Marokol Diutay Islets shall be preserved • scientific, research and educational activities may be allowed by permit only
Reserve Zone	**554**	• buffers the Sanctuary, Recreation and Geaning (partially) Zones from the outside general use fishing area, providing a transition between the no-take and limited use protected areas and the open fishing ground where fishing is more intense • only hook and line, (“pamunit”) bottom-set gillnet (“palubog”), surface gillnet (“patuloy”, “pamante”) and gleaning shall be permitted • no license granting fishery rights or privileges within the municipal waters of Ivisan shall be interpreted to allow fishing within the Reserve Zone other than through hook and line, bottom-set gillnet, surface gillnet and gleaning • the establishment of aquaculture shall not be allowed • scientific, research and educational activities may be allowed by permit only

FINANCIAL MANAGEMENT

Sustainable financing mechanism in place? **No**

Policy, guidelines, system* **Not applicable**

Gov’t budget allocation - **Yes only for the protection and budget included in the CLET**

Who manages the funds? **[x] Municipal gov’t**

How much is the estimated annual gross income of the MPA? Php - **None**

How much was spent on annual MPA management/operations? Ph₱

Expenditures covered what items? **Enforcement support/materials and supplies – PhP 150,000.00**

Supplemental or alternative livelihood created as a result of establishing MPA: **None**

ENFORCEMENT

Penalty imposed? **[x] Yes 2,500/head** [ ] No

II. MANAGEMENT RATING

The MPA rating system is intended to assist local governments and communities to improve the management of their MPA. This simple rating system is dynamic and is not a definitive statement on the status of any MPA rated. *Put a check mark (√) on the box provided if the criterion is fully satisfied or accomplished. Carefully consider MPA age in assessment.*

Date of survey*: 6 April 2011

Level 1: *MPA is initiated - Passing* **(Year 1 since legal establishment)** (6 points required)

1a	MPA concept accepted *(MPA started through local initiative or social acceptance sought through public consultations by external groups. Consulted members of affected stakeholders: fishers, other resource users and social groups, both men and women)*	1
1b	Site surveyed using standard/accepted methods with baseline assessment complete, preferably conducted in a participatory process *(Reports completed on fish abundance, coral cover and profile on community and coastal management)*	
1c	Site selected *(Site chosen based on baseline assessment results and public consultations)*	
1d	Education program raising awareness about MPA functions and benefits started *(Conducted a series of public education activities)*	
1e	Management body membership tentatively determined *(Management core group starting to conduct regular meetings with proper documentation)*	
1f	Preliminary management plan drafted	

Level 2: *MPA is established - Fair* **(Year 1 or 2 since legal establishment)** (16 pts required)

2a	Community acceptance gained and documented *(Documented through public consultation documents e.g. Barangay Resolutions and/or signature campaigns)*	
2b	Ordinance passed and approved by the Municipal Council *(Ordinance should be well-drafted and enforceable and should be consistent with the concepts of sustainable use and equitable sharing of resources)*	
2c	Management body formally organized and recognized *(Management group has legal mandate and is recognized by the local government; For POs – registered with Securities and Exchange Commission or Dept. of Labor and Employment)*	
2d	Management plan adopted by community and LGU or PAMB *(Management plan initially implemented and endorsed by LGU/PAMB)*	
2e	Management activities started *(Conducted initial MPA activities such as: installation of enforcement support structures, patrolling and surveillance, apprehension of violators, etc.)*	

2f	Biophysical monitoring includes local participation *(Locals were trained to do biophysical survey using standard/accepted method)*	
2g	IEC activities conducted to raise understanding on MPA rules and regulations *(MPA rules & regulations disseminated using appropriate & practical means to target all direct users and other stakeholders; initial stakeholder knowledge assessment conducted)*	
2h	Anchor buoys, marker buoys and/or boundary markers installed	
2i	MPA rules and guidelines posted at strategic locations	
2j	MPA outpost or other structures constructed *(Guardhouse and/or other MPA-related structures constructed)*	

Level 3: *MPA is enforced - Good* **(Only applies for 2 years or older)** (24 pts required)

3a	Education program sustained public awareness and compliance *(A long-term IEC program exists and is currently being implemented in support of enforcement and the general MPA objectives)*	
3b	Regular biophysical monitoring measuring habitat condition and changes conducted *(Documented surveys conducted at least once annually using standard/accepted method)*	
3c	Collaborative patrolling and surveillance conducted by mandated enforcement group and local community volunteers *(Fish wardens on rotation assigned to guard and patrol the MPA, day and night with assistance from local community volunteers)*	

3d	MPA billboard signs, boundary markers and anchor buoys maintained *(Funds allocated for maintenance of enforcement support structures. May be part of the municipal CRM budget)*	
3e	Management body active *(Implements the management plan; Coordinates enforcement activities; Members attend meetings regularly; Coordinates and participates in regular monitoring activities)*	
3f	Budget from local gov't or from other sources allocated and is accessible for MPA mgmt *(There is a legal document by the local government or an agreement with the private sector allocating budget for MPA mgmt)*	
3g	Fishing effectively stopped inside of sanctuary zone *(No fishing-related violations/ apprehensions in the sanctuary reported for the past year)*	
3h	Illegal and destructive fishing reduced outside of MPA *(Violations/apprehensions reported w/in 500m from the MPA boundary was reduced by 50% for the past year)*	

Level 4: *MPA is sustained - Very good* **(Only applies for 3 years or older)** (30 points)

4a	MPA management plan updated in a participatory process *(Mgmt plan amended with the participation of various stakeholders: fishers, resort and diveshop operators, local government units, other resource users, both men and women)*	
4b	Annual biophysical monitoring and feedback of results supervised by the managing body and implemented for 2 years or more *(Documented surveys using standard/accepted method. Reports are available)*	
4c	Budget from government or from other sources allocated and was accessed for 2 or more consecutive years *(There is a legal document made by the local government or an agreement with a funding group allocating budget for MPA operations; Financial report available)*	

4d	Management body trained and capacitated to run the MPA independently *(Management body supervises management activities {implementation of plans, enforcement, budgeting, monitoring and evaluation} and coordinates activities with partners)*	
4e	Enforcement system fully operational *(Enforcement group with mandate and workplan; Enforcement support structures maintained and patrolling activities sustained over the years)*	
4f	Illegal and destructive activities stopped inside and within the vicinity of MPA *(No violations/apprehensions reported inside and w/in 500m from the MPA boundary in the past year)*	
4g	Environment friendly enterprise and/or user fees collected as a sustainable financing strategy *(Sells environment friendly products/goods to tourists; Imposes collection of user-fees; etc.)*	

Level 5: *MPA is institutionalized - Excellent* **(Only applies for 4 years or older)** (40 pts)

5a	Information and education program on MPAs maintained over the years *(Information dissemination activities sustained according to long-term IEC program)*	
5b	Ordinance passed by the Provincial Council giving MPA stronger political support *(Gives MPA institutional support to strengthen enforcement and collaboration)*	
5c	Management plan refined for adaptive management *(Incorporates further refinements after gaining much experience and lessons to improve management strategies)*	
5d	Management plan incorporated in the LGU development plan *(MPA incorporated within the long-term LGU area-wide development plan)*	
5e	Evaluation of impacts on ecology & socio-economy conducted & feedback of results completed *(Assessment of resource status and long-term trends conducted. Analysis of change in local economy and long-term-trends of user groups conducted. Reports of these studies have been completed and reported back to stakeholders)*	
5f	Revenues from enterprise and/or user fees sustained and accounted for *(Existing sustainable financing mechanisms are well-managed and well documented; Financial reports easily accessible)*	

5g	Management body capacitated for financial management and fund sourcing *(Management body is well-trained to manage funds effectively {Facilitates proper handling, wise use & proper documentation}; They are also trained to seek for financial assistance {Formulated and submitted proposals})*	
5h	MPA emphasizes on public education and is being used as a study tour site, residents advocate for MPA *(After much experience, members are ready to share lessons and impart knowledge. Presence of an identified group that conducts tours & is capable of giving talks on MPA; Paper/s written on their success stories published)*	
5i	Expansion strategies or enhancement programs initiated *(MPA coverage is expanded e.g. from a sanctuary to a park, or; Scope of conservation activities is heightened e.g. coral reef restoration, re-seeding of clams, etc.)*	

Total points accumulated: 9.0

Level 1 – Level 2 (remaining activities for Level 1 needs to be completed)

- Total possible points: 40
- All points are cumulative
- Points from higher levels can be used to satisfy lower rating levels
- Adapted from the work of the Coastal Resource Management Project team of Negros Oriental (William Ablong and Erwin Dolumbal, with assistance from Dr. Alan White, January 2001.)

Priorities for improved management: *(Choose top 3 answers)*	[ ] Lack of community awareness and support **[x] Weak government support** [ ] Weak law enforcement [ ] Lack of a sustainable financing mechanism **[x] Need for management capacity development** [ ] Politics [ ] Multiple resource use conflict **[x] Lack of supplemental and alternative livelihood** [ ] Others, specify: _____

Appendix 9. MFC Ivisan

IVISAN MUNICIPAL FISHERIES CODE OF 2011

A Code for the sustainable management, development and conservation of the Municipal Waters of Ivisan including its Marine and Coastal Fishery Resources.

Be it enacted by the Sangguniang Bayan of the Municipality of Ivisan, Capiz in its regular session assembled, That:

Section 1. Title

This Code shall be known as " Ivisan Municipal Fisheries Code of 2011"

Article I. Declaration of Policy, Definitions and Application

Section 2. Declaration of Policy

It is hereby declared the policy of the municipality of Ivisan:

a. to achieve food security as the guiding principle in the utilization, management, development conservation and protection of major habitat (mangroves, seagrass and corals) and fishery resources in order to provide the food needs of the population;

b. to regulate access to the fishery and aquatic resources of Ivisan;

c. to ensure the rational and sustainable development, management and conservation of the fishery and aquatic resources in Ivisan with the objective of maintaining ecological balance, protecting and enhancing the quality of the environment;

d. to protect the rights of municipal fisherfolk by giving them the preferential use of municipal waters;

e. to provide support to the fishery sector and the municipal fisherfolk (men and women) and youth sectors, through appropriate technology and research, adequate financial, production, construction of post-harvest facilities, marketing assistance, and other services.

f. to manage fishery and aquatic resources, in a manner consistent with the concept of an integrated coastal area management with technical services and guidance provided by the concerned agencies and the municipality; and

g. to grant the private sector the privilege to utilize fishery resources under the basic concept that the grantee, licensee or permittee thereof shall not only be a privileged beneficiary of the municipality but also an active participant and partner in the sustainable development, management, conservation and protection of the fishery and aquatic resources of Ivisan.

The LGU of Ivisan shall ensure the attainment of the following objectives of the fishery sector;

1. Conservation, protection and sustained management of the municipality's fishery and aquatic resources;

2. Poverty alleviation and the provision of supplementary livelihood among municipal fisherfolk;

3. Improvement of productivity of aquaculture within ecological limits;

4. Optimal utilization of offshore and deep-sea resources; and

5. Upgrading of post-harvest technology and facilities

Section 3. **Definition of Terms (adopted from RA 8550)**

a. Aquaculture - fishery operations involving all forms of raising and culturing fish and other fishery species in fresh, brackish and marine water areas.

b. Aquatic Pollution - the introduction by human or machine, directly or indirectly, of substances or energy to the aquatic environment which result or is likely to result in such deleterious effects as to harm living and non-living aquatic resources, pose potential and/or real hazard to human health, hindrance to aquatic activities such as fishing and navigation, including dumping/disposal of waste and other marine litters, discharge of petroleum or residual products of petroleum Of carbonaceous materials/substances, and other, radioactive, noxious or harmful liquid, gaseous or solid substances, from any water, land or air transport or other human-made structure. Deforestation, unsound agricultural practices such as the use of banned chemicals and excessive use of chemicals, intensive use of artificial fish feed, and wetland conversion, which causes similar hazards and deleterious effect shall also constitute aquatic pollution.

c. Aquatic Resources - includes fish, all other aquatic flora and fauna and other living resources of the aquatic environment including, but not limited to, salt and corals.

d. Artificial Reef - any structure of natural or man-made materials placed on a body of water to serve as shelter and habitat, source of food, breeding areas for fishery species and shoreline protection.

e. Baling (beach seine) – is fishing with a cast net far from shore in shallow (4–5 m deep) sections of a body of water. The fish are surrounded by a wall of net encompassing a volume of water from the bottom to the surface; the net is lifted and the water volume gradually diminishes to the point at which the fish can be scooped out. Two vessels at a distance of several meters apart cast the net around a school of fish and lift it out of the water. The net is brought up without losing any fish between the wings of the net. During the seining, the boats remain anchored. Cast nets 400-500 m long and 5-6 high are used for this type of fishing. Beach-seine fishing requires a receiving vessel on which to unload the fish.

f. Closed Season - the period during which the taking of specified fishery species by a specified fishing gear is prohibited in a specified area or areas in municipal waters.

g. Coastal Area/Zone - is a band of dry land and adjacent ocean space (water and submerged land) in which terrestrial processes and uses directly affect oceanic processes and uses, and vice versa; its geographic extent may include areas within a landmark limit of one (1) kilometer from the shoreline at high tide to include mangrove swamps, brackish water ponds, nipa swamps, estuarine rivers, sandy beaches and other areas within a seaward limit of 200 meters isobath to include coral reefs, algal flats, seagrass beds and other soft-bottom areas.

h. Commercial Fishing - the taking of fishery species by passive or active gear for trade, business or profit beyond subsistence or sports fishing.

i. Commercial Scale - a scheme of producing a <u>minimum</u> harvest per hectare per year of milkfish or other species including those raised in pens, cages, and tanks not less than <u>300 kilos per hectare</u>

j. Coral - the hard calcareous substance made up of the skeleton of marine coelenterate polyps which include reefs, shelves and atolls or any of the marine coelenterate animals living in colonies where their skeletons form a stony mass. 'They include: (a) skeletons of anthozoan coelenterates characterized as having a rigid axis of compact calcareous or horny spicules, belonging to the genus corallium as represented by the red, pink, and white corals which are considered precious corals; (b) skeletons of anthozoan coelenterates characterized by thorny, horny axis such as the antipatharians represented by the black corals which are considered semi-precious corals; and (c) ordinary corals which are any kind of corals that are not precious nor semi-precious.

k. Coral Reef - a natural aggregation of coral skeleton, with or without living coral polyps, occurring in interlidal and subtidal marine waters.

l. Electrofishing - the use of electricity generated by batteries, electric generator and other source of electric power to kill, stupefy, disable or render unconscious fishery species, whether or not the same are subsequently recovered.

m. Endangered, Rare and/or Threatened Species - aquatic plants, animals, including some varieties of corals and sea shells in danger of extinction as provided for in existing fishery laws, rules and regulations or in the Protected Areas and Wildlife Bureau of the Department of Environment and Natural Resources (DENR) and in the Convention of the International Trade of Endangered Species of Flora and Fauna (CITES).

n. FARMCs - the Fisheries and Aquatic Resources Management Councils

o. Filter net (Balaybay)– *Filter net or "sanggab"*. – A fixed stationary fishing gear made of natural/synthetic materials with a fine screen/ net at cod-end forming a conical bag with "non-return" valves. Its mouth is held open by sets of anchors and floats or by tying two (2) laterals sides of the rib lines to a set of rings attached to two (2) vertical posts and bottom line pulled down by sinkers and set against the tidal current, both ebb and flood. In Ivisan this fishing devise is used in harvesting fish and other species in the mangroves. The length of net depends on the area where harvest is targeted. Usually 1- 2 persons operate a filter net.

p. Fine Mesh Net - net with mesh size of less than three centimeters (3 cm.) measured between two (2) opposite knots of a full mesh when stretched or as otherwise determined by the appropriate government agency.

q. Fish and Fishery/Aquatic Products - include not only finfish but also molluscs, crustaceans, echinoderms, marine mammals, and all other species of aquatic flora and fauna and all other products of aquatic living resources in any form.

r. Fish Cage - refers to an enclosure which is stationary or floating made up of nets or screens sewn or fastened together and installed in the water with opening at the surface or covered and held in a place by wooden/bamboo posts or various types of anchors and floats.

s. Fish Corral or "Baklad" - a stationary weir or trap devised to intercept and capture fish consisting of rows of bamboo stakes, plastic nets and other materials fenced with split bamboo matting or wire matting with one or more enclosures, usually with easy entrance but difficult exit, and with or without leaders to direct the fish to the catching chambers, purse or bags.

t. Fish fingerlings - a stage in the life cycle of the fish measuring to about 6-13 cm. depending on the species.

u. Fish fry - a stage at which a fish has just been hatched usually with sizes from 1-2.5 cm.

v. Fish pen - an artificial enclosure constructed within a body of water for culturing fish and fishery/aquatic resources made up of poles closely arranged in an enclosure with wooden materials, screen or nylon netting to prevent escape of fish.

w. Fisherfolk - people directly or personally and physically engaged in taking and/or culturing and processing fishery and/or aquatic resources.

x. Fisherfolk Cooperative - a duly registered association of fisherfolk with a common bond of interest who have voluntarily joined together to achieve a lawful common social or economic end, making equitable contribution to the capital requirement and accepting a fair share of the risks and benefits of the undertakings in accordance with universally accepted cooperative principles.

y. Fisherfolk Organization - an organized group association, federation, alliance or an institutions of fisherfolk which has at least fifteen (15) members, a set of officers, a constitution and by-laws, an organizational structure and a program of action.

z. Fisheries - refers to all activities relating to the act or business of fishing, culturing preserving processing marketing, developing, conserving and managing aquatic resources and the fishery areas, including the privilege to fish or take aquatic resource thereof.

aa. Fish Pond - a land-based facility enclosed with earthen or stone material to impound water for growing fish.

bb. Fishing Boat/Gear License - a permit to operate specific types of fishing boat/gear for specific durations in areas beyond municipal waters for demersal or pelagic fishery resources.

cc. Fishery Management Areas - a bay, gulf, lake or any other fishery area which may be delineated for fishery resource management purposes.

dd. Fishery Operator - one who owns and provides the means including land, labor, capital, fishing gears and vessels, but does not personally engage in fishery.

ee. Fishery Refuge and Sanctuaries - a designated area where fishing or other forms of activities which may damage the ecosystem of the area is prohibited and human access may be restricted.

ff. Fishery Reserve - a designated area where activities are regulated and set aside for educational and research purposes.

gg. Fishery Species - all aquatic flora and fauna including but not restricted to, fish, algae, coelenterates, molluscs, crustaceans, echinoderms and cetaceans.

hh. Fishing - the taking of fishery species from their wild state or habitat, with or without the use of fishing vessels.

ii. Fishing gear - any instrument or device and its accessories utilized in taking fish and other fishery species.

a. Active fishing gear - is a fishing device characterized by gear movements, and/or the pursuit of the target species by towing, lifting, and pushing the gears, surrounding, covering, dredging, pumping and seating the target species to impoundments; such as, but not limited to, trawl, purse seines, Danish seines, bag nets, “paaling,” drift gill net and tuna long line .

b. Passive fishing gear - is characterized by the absence of gear movements and/ or the pursuit of the target species; such as, but not limited to, hook and line, fish pots, traps and gill nets across the path of the fish.

jj. Fishing vessel - any boat, ship or other watercraft equipped to be used for taking of fishery species or aiding or assisting one (1) or move vessels in the performance of any activity relating to fishing, including, but not limited to, preservation, supply, storage, refrigeration, transportation and/or processing.

kk. Fishing with Explosives -the use of the dynamite, other explosives or other chemical compounds that contains combustible elements or ingredients which upon ignition by friction, concussion, percussion or detonation of all or parts of the compound will kill, stupefy, disable or render unconscious any fishery species. It also refers to the use of any other substance and/or device which causes an explosion that is capable of producing the said harmful effects on any fishery species and aquatic resources and capable of damaging and altering the natural habitat.

ll. Fishing with Noxious or Poisonous Substances - he use of any substance, plant extracts or juice thereof, sodium cyanide and/or cyanide compounds or other chemicals either in a raw or processed form, harmful or harmless to human beings, which will kill, stupefy, disable or render unconscious any fishery species and aquatic resources and capable of damaging and altering the natural habitat.

mm. Food Security - refers to any plan policy or strategy aimed at ensuring adequate supplies of appropriate food at affordable prices. Food security may be achieved through self-sufficiency (i. e. ensuring adequate food supplies from domestic production) through self-reliance (i. e. ensuring adequate food supplies through a combination of domestic production and importation) or through pure importation.

nn. Foreshore Land - a string of land margining a body of water: the part of a seashore between the low-water line usually at the seaward margin of a low tide terraces and the upper limit of wave wash at high tide usually marked by a beach scarp or berm.

oo. Gross Tonnage - includes the underdeck tonnage permanently enclosed spaces above the tonnage deck except for certain exemptions In broad terms all the vessel's 'closed-in' spaces expressed in volume terms on the bases of one hundred cubic feet (that equals one gross ton)

pp. Inland Fishery - the freshwater fishery and brackish water fishponds

qq. Lift net (Arong) – are stationary fishing gears operated seasonally usually from March to September. It is made of bamboo poles and nets submerged in the bottom with lights (to attract fish) placed on top of the unit (at least 20 units). Lift nets are installed at a minimum depth of 2 fathoms and maximum depth of 12 fathoms and can catch various fish species. The term lift net connotes that fish are harvested by lifting the nets.

rr. Mangroves - a community of intertidal plants including all species of trees shrubs, vines and herbs found on coasts swamps or border of swamps.

ss. Maximum Sustainable Yield (MSY) - is the largest average quantity of' fish that can be harvested from a fish stocks/resource within a period of time (e. g. one year) on a sustainable basis under existing environmental conditions.

tt. Monitoring, control and surveillance

a. Monitoring - the requirement of continuously observing: (1) fishing effort which can be expressed by the number of days or hours of fishing, number of fishing gears

and number of fisherfolk; (2) characteristics of fishery resources; and (3) resource yields (catch);

b. Control - the regulatory conditions (legal framework) under which the exploitation, utilization and disposition of the resources may be conducted; and

c. Surveillance - the degree and types of observations required to maintain compliance with regulations.

uu. Municipal fisherfolk - persons who are directly or indirectly engaged in municipal fishing and other related fishing activities.

vv. Municipal fishing - refers to fishing within municipal waters using fishing vessels of three (3) gross tons or less, or fishing not requiring the use of fishing vessels.

ww. Municipal waters - include not only streams, lakes, inland bodies of water and tidal waters within the municipality which are not included within the protected areas as defined under Republic Act No. 7586 (The NIPAS Law), public forest, timber lands, forest reserves or fishery reserves, but also marine waters included between two (2) lines drawn perpendicular to the general coastline from points where the boundary lines of the municipality touch the sea at low tide and a third line parallel with the general coastline including offshore islands and fifteen (15) kilometers from such coastline. Where two (2) municipalities are so situated on opposite shores that there is less than thirty (30) kilometers of marine waters between them, the third line shall be equally distant from the opposite shore of the respective municipalities.

xx. Non-governmental organizations (NGO) - an agency, institution, a foundation or a group of persons whose purpose is to assist peoples organizations/associations in various ways including, but not limited to, organizing education, training, research and/or resource accessing.

yy. Payao - a fish aggregating device consisting of a floating raft anchored by a weighted line with suspended materials such as palm fronds to attract pelagic and schooling species common in deep waters.

zz. People's Organization - a bonafide association of citizens with demonstrated capacity to promote the public interest and with identifiable leadership, membership and structure. Its members belong to a sector/s who voluntarily bands themselves together to work for and by themselves for their own upliftment, development and greater good.

aaa. Person - natural or juridical entities such as individuals, associations, partnership, cooperatives or corporations.

bbb. Post-harvest facilities - these facilities include, but are not limited to, fish port, fish landing, ice plants and cold storages, fish processing plants.

ccc. Purse Seine - a form of encircling net having a line at the bottom passing through rings attached to the net, which can be drawn or pursed. In general, the net is set from a boat or pair of boats around the school of fish. The bottom of the net is pulled closed with the purse line. The net is then pulled aboard the fishing boat or boats until JTC fish are concentrated in the bunt or fish bag.

ddd. Sea farming - the stocking of natural or hatchery- produced marine plants or animals, under controlled conditions, for purposes of rearing and harvesting, but not limited to commercially-important fishes, molluscs (such as pearl and giant clam culture), including seaweeds and seagrasses.

eee. Superlight - also called magic light, is a type of light using halogen or metal halide bulb which may be located 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.

fff. Taba – usually installed stationary in rivers and creeks and is made of nets to catch fish and other species; it operates like a trap (baklad) but small scale.

ggg. Trawl - an active fishing gear consisting of a bag shaped net with or without otter boards to open its opening which is dragged or towed along the bottom or through the water column to take fishery species by straining them from the water, including all variations and modifications of trawls (bottom, mid-water, and baby trawls) and tow nets.

Section 4. Application of its Provisions

The provisions of this Code shall be enforced in:

1. All areas within the municipal waters of Ivisan, as defined in this Code;
2. All coastal and marine resources in the municipal waters;
3. All lands, activities or businesses relating to the use, development, conservation and management of the municipal waters and its coastal and marine resources; and
4. All persons, entities, or corporations that use and/ or intend to use the coastal and fishery resources of Ivisan.

Article II. Utilization, Management, Development and Conservation of Coastal and Fishery Resources in the Municipal Waters

Section 5. Jurisdiction of municipal government

The Ivisan LGU shall have jurisdiction over its municipal waters and coastal and marine resources. The Ivisan LGU through the Municipal Fisheries and Aquatic Resources Management Council (MFARMC) and the Municipal Fisheries Management Unit (MFMU) shall be responsible for the management, conservation, development, protection, utilization and disposition of all coastal and fishery resources within the municipal waters.

The Ivisan LGU shall enact corresponding ordinances and other measures which maybe recommended by the MFARMC; *Provided*, however that all ordinances enacted and other measures issued shall conform to existing national laws and policies and shall not endanger the sustainability of or destroy the ecological balance of the coastal and fishery resources;

The Ivisan LGU in consultation with the MFARMC and or BFARMC, registered organization of fishers and other concerned agencies or groups shall enforce laws pertinent to fishery resources and related ordinances enacted by the Sangguniang Bayan.

Section 6. Regulation of fishery activities

The following fishery activities engaged by any person, cooperative, or corporation shall be regulated by the municipal government in areas declared as overfished (based on available data or information) or is in danger of being overfished and there is a need for regeneration of the coastal and fishery resources in areas within municipal waters:

1. Use of fish net as Taksay, Kayagkag (encircling gill net), Patuloy/ Palubog (bottom set gill net), Patuloy/ Pamanti (surface gill net), Sagnoy (dragnet), Hudhod (scissor net/push net), Balaybay (long net installed along mangrove areas)

2. Stationery fishing gears (Taba) in rivers or offshore areas
3. Timing (use for catching blue crabs, shrimps)
4. Tapangan (use for catching mud crabs)
5. Tahongan (mussel culture)
6. Talabahan (oyster culture)
7. Arong (stationery lift net)
8. Surambaw (mobile lift net)
9. Pamunit/panglabay (hook and line)
10. Pamintol (use for catching mud crab)
11. Panginhas (gleaning)

Only after licenses or permits are secured from the municipal government shall operation of the above mentioned activities be allowed.

Section 7. **Banned fishery activities**

The following fishing activities are totally banned from operating within the municipal waters of Ivisan:

1. Fishing with the use of compressor
2. Trawl fishing
3. Spear fishing (particularly inside the Fish Sanctuary and Reserve)
4. Electro fishing
5. Fishing with the use of poisonous/ noxious substances such as cyanide, "lagtang" or "tubli" and teaseed
6. Use of explosives/dynamite
7. Commercial fishing operation (with active gear)
8. Mechanized push net (hudhod)
9. Fishing with the use of super lights
10. Gathering of sea cucumber and other shells using rake
11. Crab fattening along the river
12. Building structures in the river and the river easement
13. Dumping of all kinds of wastes (solid, liquid and toxic) in rivers, creeks and the shoreline

Section 8. **Zoning of municipal waters (classification, location and allowed activities)**

The municipal waters of Ivisan are classified according to the following zones:

a. Zone 1 (Mariculture Zone) –Mariculture area covering the municipal waters at Basiao (specifically tidal flats at Palanas and Looc), Cabugao (specifically Taguikan and Tigis), tidal flats along Cudian river, Matnog and Agustin Navarra for **oyster and mussel culture**; covers the municipal waters at Basiao (specifically Looc and Baybay) and Cabugao Cove at 100 meters from the shoreline, and Malakha islet at 50 meters from the shoreline (on the deeper side where there is no coral growth) for **fish culture in cages**. The Municipal Assessor's Office, Municipal Agriculture Office (MAO) and the Municipal Planning and Development Office (MPDO) shall be responsible for establishing the technical descriptions of the mariculture zone and shall furnish the SB with a copy for reference.

Activities allowed in the mariculture zone are research and scientific studies, regulated study visits and production using appropriate method (e.g. hanging and raft method for oyster and mussel culture and anchor or corner poles to prevent siltation for fish cages).

All persons, cooperatives or associations (or corporations) must secure licenses and permits from the municipal government prior to setting up of mariculture

activities within the municipal waters of Ivisan. Fishing activities such as pamanti and patuloy are not allowed within the mariculture zone. Dumping of waste in the designated mariculture zone is also prohibited.

Mariculture farm operators/ owners shall be required to submit production report annually. The report shall include investment cost, production report (in kilos), type of species cultured, feeds used (commercial or trash fish) and volume, issues and problems and recommendations. A report format will be provided by the office of the MAO. The annual report shall be a prerequisite for issuance/ renewal of license and permit.

b. **Zone 2 (Protection Zone)** – covers the municipal **fish sanctuary and reserve area** in Barangay Balaring (830 hectares) specifically located in Marocol Gamay and Daku, Mahabang Pulo from Marangkalan point to Nailong point; **mangroves** in Barangays Balaring (50 hectares from Sitio Cagusong to Kabulihan), Agustin Navarra (50 hectares from Sitio Dapdap to Talon, Roxas City boundary and the boundary with Matnog), Cabugao (.6 hectares from Cabugao river to Taguikan; .45 hectares from Mayha to Bara Majanlud boundary), Matnog (from the main dike of Alcazaren fishpond to Agmalobo boundary), Agmalobo (from the main dike of Ledesma fishpond to Bulabod river, Poblacion Sur boundary) and Cudian (32 hectares along Cudian river and Dait river); **seagrass beds** found in some parts of Balaring (Dinugmaan point and Kanduyong point; Panublihan to Marangkalan point) and vicinities of Malakha islet. The Municipal Assessor's Office, Municipal Agriculture Office (MAO) and the Municipal Planning and Development Office (MPDO) shall be responsible for establishing the technical descriptions of the protection zone and shall furnish the SB with a copy for reference.

Future MPAs that will be established (including Tuad island near boundary lines between Roxas City and Ivisan) shall likewise be classified under the protection zone.

Activities in the protection zone are limited to scientific and research studies, education, eco-tourism and regulated fishing and gleaning activities. Designated navigational lanes shall be provided in areas where seagrasses are abundant. Cutting and conversion of mangroves for other uses is not allowed. Bird hunting and other human activities (e.g. dumping of solid and human waste) inside the mangroves are likewise not allowed. All protection areas shall be delineated with markers/ buoys.

Areas where artificial reefs are deployed shall be part of the protection zone. Deployment of ARs shall conform with the Joint DENR-DA-DILG-DND Memo Order No.1 Series of 2000.

Nipa planting shall be prohibited in easement areas.

c. **Zone 3 (Eco-tourism Zone)** – covers the portion of the fish sanctuary and reserve area from Dinugmaan point to Marangkalan point (declared as recreational zone within the marine reserve) and Tuad (watch tower), beach resorts and other areas as may be identified by the LGU of Ivisan. The Municipal Assessor's Office, Municipal Agriculture Office (MAO) and the Municipal Planning and Development Office (MPDO) shall be responsible for establishing the technical descriptions of the eco-tourism zone and shall furnish the SB with a copy for reference.

The recreation area in the marine fish sanctuary and reserve shall be declared as eco-tourism zone. Activities allowed in the recreation area are picture taking,

swimming and picnic, bird watching, and island hopping however bringing of foods and cooking are only allowed in designated areas.

The activities that are not allowed in the eco-tourism areas include (nude scene/ topless) littering of garbage, gathering or collecting of sand, gravel and corals, bringing and using drugs, public scandals, cutting of trees or destroying of plants and hunting of any animal species.

d. Zone 4 (Multiple-Use Zone) – Areas within the municipality of Ivisan where gleaning activities are conducted, fish landing areas, fry gathering areas, fish drying areas, rivers and creeks are classified under the multiple-use zone. The Municipal Assessor's Office, Municipal Agriculture Office (MAO) and the Municipal Planning and Development Office (MPDO) shall be responsible for establishing the technical descriptions of the multiple-use zone and shall furnish the SB with a copy for reference.

Gleaning areas (panginhasan) are found in the shoreline of Malakha island, rocky shoreline in Balaring from Panublihan to barangay proper; Marangkalan to Marokol, Tigis and Magulayag and Mayha in Cabugao. Harvesting/gleaning of shells shall be limited to those that are fully mature to allow natural reproduction.

Overturning rocks and use of rake in shell gathering is not allowed during gleaning.

All fishing boats should land their fish at designated fish landing areas. No dumping of garbage or any waste materials (e.g. use oil, lubricants/grease, etc) is allowed in the coastal areas. Construction of structures in the coastal and marine areas is not allowed without proper permits and licenses from the LGU. Landing of contraband goods in Ivisan shoreline is not allowed.

Fry gathering shall be allowed on concession basis. Necessary LGU permit shall be secured prior to operation. Grant of concession permit shall go through a bidding process.

No fish drying areas shall be permitted within 100 meters of beach resorts. LGU permit is required for large scale fish drying activities while small scale or backyard fish drying activities are not required to secure permits.

e. Zone 5 (Fishpond Zone) – Identified aquaculture areas within the municipality of Ivisan intended for production of fish and shrimps that are located in Barangays Cudian, Poblacion Norte and Sur, Agmalobo, Matnog, Agustin Navarra, Balaring, Cabugao, Basiao and Malocloc Sur. The Municipal Assessor's Office, Municipal Agriculture Office (MAO) and the Municipal Planning and Development Office (MPDO) shall be responsible for establishing the technical descriptions of the fishpond zone and shall furnish the SB with a copy for reference.

All fishpond operators shall operate in areas stipulated in the FLA agreement with BFAR or title/ property. Fishpond operators along rivers and seafront areas shall be obliged to follow the establishment of a buffer or greenbelt area (20 meter strip from property line inward). Other payments required of fishpond operators shall follow the Municipal Revenue Code.

f. Zone 6 (Stationary Fishing Gear Zone) – covers offshore waters at Cabugao, Balaring and Basiao and designated rivers and creeks within the Municipality of Ivisan. The Municipal Assessor's Office, Municipal Agriculture Office (MAO) and the Municipal Planning and Development Office (MPDO) shall be responsible for

establishing the technical descriptions of the stationary fishing gear zone and shall furnish the SB with a copy for reference.

Installation of stationary fishing gears in the offshore waters at Cabugao, Balaring and Basiao and Taba in rivers (Cudian River, Ivisan River, Majanlod River) and creeks (Agomang- ang, Cabugao, Matnog, Agmalobo) shall be regulated to conform with provisions of RA 8550.

Middle portion and mouths of rivers and creeks shall be off limits to any construction. Reclamation and gathering of sand and gravel (commercial scale) is likewise not allowed in rivers and creeks.

Section 9. **Use and users of municipal waters**

The use of the municipal fishery including the coastal and marine resources of Ivisan shall be given priority to bonafide residents, registered municipal fisherfolk with permits and license to operate or fish in the municipal waters of the municipality.

Non-residents of Ivisan (not exceeding 100 individual fisherfolk) shall be allowed to fish only (but not to set up stationary fishing gears) provided they must secure the necessary license, permits and other requirements from the LGU prior to fishing activity.

Non registered municipal fisherfolk, commercial fishers and illegal fishers are not allowed to operate within the municipal waters.

Section 10. **Registry of coastal and fishery resource users**

The LGU of Ivisan shall maintain the Municipal Fisherfolk Registry for the purpose of regulating and monitoring fishing activities and limiting entry into the municipal waters. The Municipal Agriculture Office shall be tasked to maintain the Municipal Fisherfolk Registry and shall be updated annually.

All fisherfolk in the municipality of Ivisan needs to be registered. To be officially registered, the fisher applicant needs to fill up Municipal Fisherfolk Registration Form provided by the MAO with 2X2 I.D. photo, pay the fees and charges before issuance of a Fisherfolk I. D. card. The BFARMC endorses the application of the fisher to the Barangay Captain for certification.

The MFARMC, MAO, SB Committee Chairpersons on Fisheries and Agriculture and SB Committee on Rules and Laws shall set the criteria on who shall be included in the registry of fishery resource users.

Section 11. **Public participation enhancement**

Public participation is needed to ensure transparency and accountability, gather suggestions and ideas, share experience/s, ensure cooperation/support of all stakeholders, get comments and recommendation for decision making and arrive at win-win solution.

Several forms of enhancing public participation include consultation/dialogue, meetings/pulong-pulong sa barangay, public hearings, membership in special bodies and community workshop/seminars.

Section 12. **Environmental Compliance Certificate**

All proposed projects e.g. beach resort, construction of commercial building in coastal areas, large scale piggery/ poultry shall secure an ECC from the concerned government agency prior to construction. The LGU and the affected community shall be involved in the consultation process of securing the EIA.

Section 13. **Protection of rare, threatened and endangered species**

All rare, threatened and endangered species (as identified by the concerned agencies) in Ivisan shall be protected through strict enforcement of fishery laws, rules and regulations. IEC activities (e.g. pulong-pulong sa barangay, installation of billboards, etc) shall be intensified to enhance awareness of communities.

Section 14. **Assistance and support to municipal fishers**

The LGU shall provide assistance and support to the municipal fishers by enhancing regulatory and enforcement services of the Bantay Dagat, linkage to other government agencies for financial assistance, organizing fisherfolk organizations/coop and BFARMC/MFARMC, provide start up funds for alternative livelihoods project, provide resource enhancement projects (e.g. fish sanctuary and reserve establishment) and enhance knowledge and skills through conduct of trainings and seminars and continuing IEC.

Section 15. **Monitoring of activities in the coastal and marine areas**

The FARMC at the barangay and municipal levels, MAO, Bantay Dagat and NGOs shall be tasked to monitor activities in the coastal and marine areas. For effective monitoring of activities, regular meetings and reporting (quarterly), data documentation and actual field validation or visitation needs to be established.

Article III. Exclusive Fishery Privileges

Section 16. **Grant of exclusive fishery privileges**

The LCE may grant exclusive fishery privilege to fishers, cooperatives or corporations who wish to operate mussel and oyster culture, culture of fish in cages, arong and taba installation in designated areas within the municipal waters of Ivisan. In granting of exclusive fishery privileges priority shall be given to bonafide residents of Ivisan, registered municipal fishers granted with permits and licenses to operate. Non- illegal and non-destructive fishing methods and practices, fishery projects which have no adverse environmental impacts can be granted exclusive fishery privileges.

Section 17. **Steps/ procedure in granting of fishery privileges**

The following steps must be followed in securing for exclusive fishery privileges:

1. Applicant must register as municipal fisherfolk or show proof as registered fisher
2. BFARMC endorsement
3. Clearance from Barangay Captain
4. Validation/ assessment and recommendation by the MAO of the viability of fishery projects or activities applied
5. Confirmation by the MPDC regarding area availability/ assignment (with reference to the master zoning plan)
6. Assessment and payment of fees and charges by the Municipal Treasurer
7. Approval by the LCE
8. Issuance of permit and license

Article IV. Management and operation of mariculture activities

The identified mariculture activities in Ivisan are oyster culture, mussel culture, crab culture and culture of fish in cages. Permits and licenses need to be secured prior to construction and operation of mariculture activities. Licenses and permits shall be renewed annually. Only bona-fide residents and or registered fisherfolk, cooperatives and registered associations based in Ivisan are allowed to construct and operate mari-

culture activities in Ivisan. Dummies and sublease are not allowed in constructing and operating mariculture activities.

Grounds for cancellation/ rejection of permits/ application for mariculture activities are the following:

a. Violation of the conditions set in the permit/ license
b. Non-renewal of annual license/ permit
c. Introduction of methods destructive to the environment
d. Construction/ installation of mariculture activities in the zone/s where it is not allowed
e. Dummies and subleasing

Mariculture activities shall be monitored by the MAO with the assistance of the BLGU, FARMC and the Bantay Dagat. The Office of the Provincial Agriculturist (OPA) shall take the responsibility of monitoring and reporting incidence of red tide and water pollution.

***Section 18.* Mussel and oyster farming**

Production areas for mussel and oyster farms shall be limited to a maximum of 200 square meters area/ HH in Cabugao, Basiao, Cudian, Agmalobo and Agustin Navarra. Mussel and oyster farms shall observe a 2 meters distance between farms. Mussel and oyster farm operators shall reserve an area of 12 meters as main navigational route.

The office of the MPDC shall be responsible for assigning areas for the operation and establishment of mussel and oyster farms with reference to the LGU master zoning plan.

In the eventual abandonment/ operation stoppage of the mussel and oyster farm, the owner shall be responsible for dismantling all related structures. In the event that the owner fails to dismantle the structures, the municipality will initiate dismantling at the expense of the owner/ operator/ farmer/ leasee.

***Section 19.* Fish cages**

Fish cage operation shall be limited to 150 square meters area per applicant for Ivisan residents. Operators of fish cages shall observe the 6 meters distance in structure installation between trenches/ fencing. No dummies are allowed.

The office of the MPDC shall be responsible for assigning areas for the operation and establishment of fish cage culture with reference to the LGU master zoning plan.

In the eventual abandonment/ operation stoppage of the fish cage culture, the owner shall be responsible for dismantling all related structures. In the event that the owner fails to dismantle the structures, the municipality will initiate dismantling at the expense of the owner/ operator/ farmer/ leasee. Transfer and selling of rights are not allowed.

Operation of fish cages shall follow the Code of Practice for Responsible Aquaculture in determining stocking density, technology and other related activities.

Section 20. Taba (fish corral)

Taba operators in shall observe 200 meters distance between structures (inside the Cove) while operators from Malakha island going seaward shall observe 500 meters distance. Navigational route shall be freed from construction of Taba and other permanent structures.

Taba operators shall use nets with mesh size of not less than 3 centimeters in diameter (when stretched).

The office of the MPDC shall be responsible for assigning areas for the operation and establishment of Taba with reference to the LGU master zoning plan.

In the eventual abandonment/ operation stoppage of Taba, the owner shall be responsible for dismantling all related structures. In the event that the owner fails to dismantle the structures, the municipality will initiate dismantling at the expense of the owner/ operator/ farmer/ leasee.

Taba construction in rivers and creeks shall be regulated to avoid heavy siltation and extinction.

Offshore Taba shall be installed in areas far (at least 1 km radius) from the fish sanctuary and reserve.

Section 21. Arong

Arong operators shall be allowed use of fine meshed nets (mainly for catching bolinao) and must observe a distance of 750 meters between structures.

The office of the MPDC shall be responsible for assigning areas for the operation and establishment of Arong with reference to the LGU master zoning plan.

Arong shall be installed in areas far (at least 1 km radius) from the fish sanctuary and reserve.

In the eventual abandonment/ operation stoppage of Arong, the owner shall be responsible for dismantling all related structures. In the event that the owner fails to dismantle the structures, the municipality will initiate dismantling at the expense of the owner/ operator/ farmer/ leasee.

Article V. Marine Protected Areas

Section 22. Designated MPA

At present there is one marine protected area, the Ivisan Fish Sanctuary and Reserve located in Barangay Balaring which measures 830 hectares and has the following boundary coordinates:

Lines	Latitude	Longitude
1	11º33'45"	122º38'03"
2	11º33'45"	122º37'09"
3	11º35'24"	122º37'09"
4	11º35'24"	122º38'54"
5	11º34'30"	122º38'54"

The zones in the Ivisan Fish Sanctuary and Reserve (IFSR) as defined in Ordinance No. 14 Series of 2002 including activities allowed and not allowed in the zones shall be observed.

Section 23. Management of the MPA

The MFMU under the office of the MAO shall be created through an Executive Order issued by the LCE and shall be responsible for supervising the management of the MPA.

A management team shall be established on site which will be tasked to perform the following functions:

a. Establish and maintain knowledge of the resources, users and activities in the area
b. Prepare a participatory annual detailed action oriented management plan to include permitting, budget, monitoring, surveillance, enforcement, public contacts, maintenance and human resources development
c. Monitoring and evaluation (adopting widely accepted tools)
d. Coordination with community leaders, barangay council, fisherfolk organization, FARMC's and academe
e. Oversee/ supervise the Bantay Dagats, Bantay-Gubat/ Katunggan

Environmental and user fee at the rate of PhP 30.00 per head shall be charged in the use of IFSR recreational areas (Mabaay and Tuad Island).

Article VI. Management of fishponds

Section 24. Promotion of fish culture in ponds

Culture of fish in ponds shall be considered by Ivisan LGU as a means to promote diversification of income. Provided that these resources are responsibly used and adverse impact on the environment and the community are minimized. Provided, further, that access of people to fishing grounds will not be affected. Provided finally that appropriate environmental assessment, monitoring and mitigation to minimize adverse ecological changes and related social consequences resulting from water extraction, discharge of effluents, use of drugs and chemicals and other aquaculture related activities are established.

Section 25. Operating fishponds

Permits and licenses from the LGU need to be secured in operating fishponds within the municipality's jurisdiction. These permits shall be renewed yearly.

In securing permits, the fishpond operator shall provide proof of ownership (title for privately owned ponds) a valid FLA issued by BFAR for government leased ponds or contracts for joint venture. The amount to be paid by the fishpond operator in securing LGU permit shall be consistent with the Municipal Revenue Code of Ivisan.

A yearly inventory and monitoring on production and utilization of fishponds shall be conducted by the LGU (specifically the MFMU) for titled and privately owned ponds. Report will be provided to BFAR for proper action and disposition of abandoned (FLA) fishponds.

Article VII. Mangrove management

The coordinates for the mangroves in Barangays Balaring, Basiao, Agustin Navarra, Cabugao, Matnog, Agmalobo, Cudian, Poblacion Norte and Sur shall be established by the office of the MPDC for reference.

Section 26. Mangrove zones

The following are the zones that shall be established in the mangrove areas:

- Mangrove Reservation Zone - are areas with existing mangroves that are set aside for protection and tourism purposes. This included natural grown mangroves found in Agustin Navarra, 25 hectares; Balaring, 20 hectares; Cudian, 10 hectares, and Poblacion's Norte and Sur, 5 hectares.
- Mangrove Reforestation Zone - are areas that are set aside for Afforestation and Reforestation purposes. This included areas found in Balaring, 28 hectares; Cabugao, 10 hectares; Agustin Navarra, 25 hectares; Cudian, 7 hectares; Basiao, 10 hectares and Matnog, 10 hectares.

Section 27. Ban on mangrove conversion

All existing mangrove areas within the jurisdiction of Ivisan shall not be converted for any purposes. The provisions in RA 8550 shall be observed concerning mangroves and shall be adopted by Ivisan LGU. Mangrove areas covered by existing permit (e.g. FLA) but are now either abandoned or undeveloped shall be reported to BFAR for cancellation and turned over to DENR for reversion and restoration back to mangroves.

Section 28. Regulation of activities within mangrove areas

The following activities that are considered not stressful and not a threat to existing mangrove stands shall be allowed in the mangroves areas:

- Aqua silviculture operation on planted, matured and over matured mangroves by the CBFMA holders
- Collection of wildlings for plantation purposes (with proper permit from the concerned agency)
- Scientific research and educational activities with permit from the LGU as endorsed by the DENR
- Trimming and pruning shall be allowed when necessary

Restricted activities in the mangrove consist of:

- Cutting and uprooting of mangroves in all areas
- Conversion and disposition of mangroves for other purposes
- All other prohibitions as stated in PD 705 (otherwise known as the Philippine Forestry Law)
- Charcoal making and gathering for firewood

Section 29. Promotion of community based mangrove rehabilitation

Local communities, particularly traditional mangrove users have a strong role to play in mangrove rehabilitation and management. By organizing themselves into a Peoples Organization (PO) they can apply for CBFMA with the DENR and become stewards of mangrove areas in their locality for a period of 25 years.

Article VIII. Seagrass management

The coordinates of seagrass beds found in some parts of Balaring, Basiao and the vicinities of Malakha islet shall be established by the office of the MPDC for reference.

Section 30. Regulation of activities in seagrass areas

The following restrictions in seagrass areas shall be observed:

- Uprooting and collection of seagrasses in all areas
- Conversion and disposition of seagrass areas for other purposes
- Use for navigation particularly in areas with thick seagrass growth

Scientific research and educational activities may be allowed (with proper permits) in the seagrass areas.

Article IX. Waste management

Section 31. Regulation of waste management activities

The following policies on waste management shall be observed in the coastal barangays of Ivisan:

- Municipal Ordinance No. 14 Series of 1996 on anti-littering
- R.A. 9003 National Solid Waste Management Act of 2000

- Municipal Ordinance No. 001 Series of 1996 prohibiting the dumping, throwing of waste or any garbage and construction of illegal structures in the rivers of Ivisan
- Municipal Ordinance No. 4 Series of 2011 otherwise known as the Municipal Comprehensive and Integrated Solid Waste Management Ordinance

Section 32. Implementation of the waste management plan

A Municipal Waste Management Plan (covering the period 2005-2015) which was formulated by Ivisan LGU through the Solid Waste Management Board and Committees under its jurisdiction shall see to its strict implementation.

Waste segregation shall be practiced in all the barangays.

In order to enhance public awareness, the LGU Ivisan shall play the "Basura" jingle regularly, post the Municipal Ordinance No.14 Series of 1996 and RA 9003 on waste disposal and segregation in strategic places within the municipality and establish schedules for pick-up of segregated residual wastes for all barangays only.

The municipality of Ivisan has designated Mianay as the municipal eco-park.

Section 33. The role of the Barangay in waste management

Each barangay shall manage their own waste based on RA 9003 through the leadership of the Barangay Council and the Solid Waste Management Committee.

The barangays shall be responsible for providing a Material Recovery Facility which will serve as temporary collection area for residual waste and further segregation, composting center and eco-garden.

Article X. Sale of fishery products

The MFMU shall issue an auxiliary invoice to fish and fishery products transported from Ivisan to any other point of destination. Provided, that fish and other fishery products are caught in accordance with the law and are declared healthy for human consumption. Illegally caught fish and fishery products shall not be issued auxiliary invoice and shall be confiscated and disposed of properly.

The basis for paying of auxiliary invoice is the amended Municipal Ordinance No. 97-003.

Article XI. Fishery licenses and permits

Section 34. Issuance of fishery license and permit

All persons, cooperatives, firms or corporations who are listed in the Municipal Registry of Ivisan shall be issued Fishery License and Permit by the LCE upon payment of the prescribed fee prior to engaging in any fishing or fisheries related activity in the municipality.

Fishery license and permit that are not transferrable even to immediate family member or inheritor within the same household. The holders of fishery license and permit shall comply with all policies and regulations governing fishing and other fishery related activities. The licensee shall likewise assume responsibility for any acts concerning fisheries. In case of loss of license or permit, the holder shall immediately inform proper authorities for replacement with due charges and an affidavit of loss.

Section 35. Renewal of fishery licenses and permits

Licenses and permit shall be renewed annually. The period when licenses and permits are issued/ renewed shall be on or before the 20th day of January of each calendar year.

***Section 36.* Requirements and procedures for securing license and permit**

Applicants for Fishery License shall submit the following documents:

- Duly accomplished application form
- Community Residence Certificate (for individuals) or Certificate of Registration/ Accreditation (for organizations, cooperatives, firms or corporations)
- Police clearance
- Barangay clearance
- ECC (when necessary)
- Official receipt for payment of application of license

Applicants for Fishery Permit shall submit the following documents:

- Fishery License
- Duly accomplished application form
- Registration paper (for motorized boats, fisherfolk)
- Official receipt of payment for registration
- MFARMC endorsement
- Zoning clearance

Applications for licenses and permits shall follow the prescribed procedure of the municipal government.

All applications shall be submitted to the MFMU for checking/ validation. The MAO then checks feasibility of the project and endorses application to the MPDC to certify site availability referring to the zoning master plan. The project is then assessed by the municipal treasurer regarding appropriate payment. After payment has been made, the application is signed by the LCE and a license or permit is issued.

***Section 37.* Schedule of Fishery License Fees**

License to exploit, culture, capture, produce or gather fish and other fishery products in the municipal waters shall be granted upon payment of fishery license fees at the rate stated hereunder:

License for Individuals	-	P 100.00
License for fisher cooperatives, organization/ association	-	P 500.00
License for firms or corporations	-	P 5,000.00

***Section 38.* Schedule of Permit Fees** (adopted from the Municipal Revenue Code of 2011)

Permit fee for specific fishery activity shall be granted to licensed persons, organizations, firms or corporation upon payment of fees at the rate stated hereunder:

1. Motorized/ non-motorized boats

Description	Fee
a.) Motorized with engine of 10 horse power or less	50.00
b.) Motorized with engine of more than 10 H.P. but less than fifteen (15) H.P.	100.00
c.) Motorboats with more than 15 H.P.	200.00
d.) Non-motorized boats	15.00
d.1. Baroto	
d.2. Bancas with sail	
Small	15.00
Big	30.00
Issuance/re-issuance of Certificate of number (renewed every 3 years)	
4 cylinder	120.00

3 cylinder	100.00
1-2 cylinder	50.00
Permit to operate (annual)	
4 cylinder	120.00
3 cylinder	100.00
1-2 cylinder	50.00
Motor boat operator's license (annual)	
4 cylinder	240.00
3 cylinder	240.00
1-2 cylinder	120.00
Inspection fee (every 3 years)	
4 cylinder	120.00
3 cylinder	120.00
1-2 cylinder	120.00
Racing boat (registration)	150.00
Motor boat for hire	200.00

2. Gears used in Fishing

Kind of Fishing Gear	Fee
Panti	500.00
Palubog	500.00
Panggal	150.00
Bintol	150.00
Bobo (Big)	200.00
Bobo (small)	150.00
Sahid	500.00
Surambaw	400.00
Sikpaw	50.00
Labay	200.00
Anud	800.00
Sagiwsiw	200.00
Patigbi	100.00
Kayagkag	1,000.00
Timing	500.00

3. Construction and operation of mussel and oyster farms

Type of shellfish culture	Fee
Oyster (talaba) culture	3.00/ sq meter
Mussel (tahong) culture	3.00/ sq meter

4. Construction and operation of arong

Type of fish capture method	Fee
Arong (deep sea)	750.00
Arong (shallow water)	300.00

5. Construction and operation of taba

Baklad / Taba (deep sea)	800.00
Baklad / Taba (along shoreline)	500.00

6. Construction and operation of fish cages - 10.00/ sq meter
7. Ponds (for fish or prawns or multi-crop) - 50.00/ hectare
8. Fish/prawn breeding grounds - 1.00/sq meter
9. Fishpens - 200/ for 1st 20 sq. m. & P10/ sq. m. for succeeding sq meter

Article XII. Creation and operation of support structures

Section 39. Fishery Law Enforcement Team (FLET)

There is hereby created a Fishery Law Enforcement Team for Ivisan based on Ordinance 014-S2002 Section 9.

The FLET shall be composed of representatives from the PNP, Barangay Council members from the coastal Barangays, Tanods, deputized Bantay Dagats, patrol boat caretaker, BFARMC chairman or an authorized representative from the coastal barangays and the MFARMC chairperson or its authorized representative. An Executive Order from the LCE needs to be passed that spells out FLET roles and responsibilities and incentive mechanism among others.

The FLET shall have an Operational Plan as reference for its seaborne patrol/ surveillance operation.

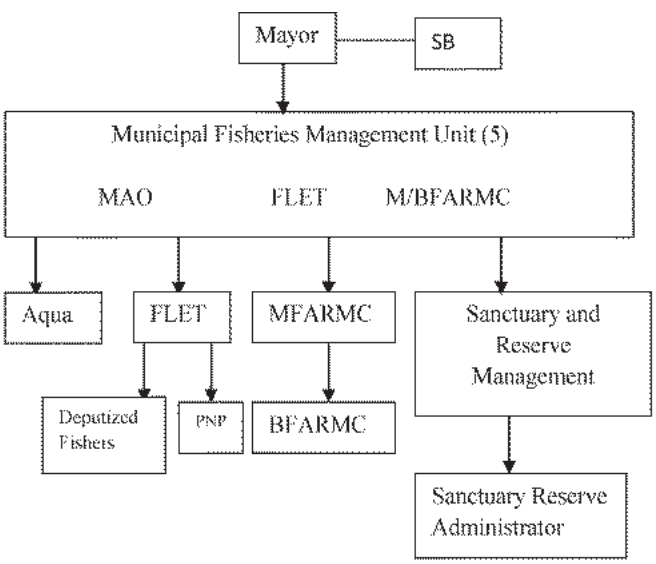
Section 40. Fisheries and Aquatic Resource Management Council (FARMC)

The creation, composition and functionality of the FARMC shall be in accordance with the provisions of Fisheries Administrative Order (FAO) 196 and Sections 69, 73 and 74 of RA 8550.

Section 41. Municipal Fisheries Management Unit (MFMU)

The MFMU shall be composed of the MAO, FLET Team Leader, MFARMC Chairperson. The MFMU shall elect among themselves who shall act as the Team Leader of the MFMU. The MFMU shall set the date for the regular monthly meeting schedule. A special meeting shall be called for by the MFMU Team Leader when necessary.

The structure of the MFMU shall be the following:



Municipal Fisheries Management Unit shall be under the Office of the Mayor. The Municipal Mayor shall designate from the MFMU the Sanctuary and Reserve Superintendent who shall be the lead staff.

The MFMU shall execute the following:

a. acquire detailed/ updated knowledge of the resources, the users and their activities in the area

b. prepare an annual detailed action-oriented management plan (to include permitting, budget, monitoring, surveillance, enforcement, public contact, maintenance, human resource development, and other management tasks)

c. investigate and evaluate the operation of the plan

d. supervise the management of the Sanctuary and Reserve to include coordination with the community residents, Barangay Councils, fisher organizations, FARMC's, schools, resort operators, private business, legal claimants of the islets, other department of the municipality, FLET, PNP, Office of the Provincial Agriculturist of Capiz, BFAR, DENR, and other agencies for cooperation and assistance

Article XIII. Prohibitions and penalties

Section 42. Compliance with National Laws

The municipal government shall adopt the provisions and penalties embodied in RA 8550 (New Fisheries Code), PD 705 (Forestry Law) and RA 7161 (ban on the cutting of mangroves).

Section 43. Fishing without Licence and Permit

Any person caught fishing within the municipal waters of Ivisan without permit and license to fish shall be fined an amount of PhP2,500.00/ person or imprisonment of not exceeding 6 months or upon the discretion of the court or both.

Section 44. Commercial fishing in the municipal waters

No commercial fishing vessels shall be allowed to fish within the municipal waters. When caught fishing within municipal waters, a fine of PhP 2,500.00/ person shall be imposed or imprisonment of not exceeding 6 months or upon the discretion of the court or both. The vessel including fishing accessories used shall be impounded until penalties are fully settled. Fish catch shall be confiscated and be disposed of in accordance with law. The boat captain shall be detained at the municipal jail of Ivisan until penalties charged for the crew are fully settled.

Section 45. Fishing with the use of explosives, noxious or poisonous substances and or Electricity

The use of dynamite, cyanide, tubli, thiodan, boxer and electricity in fishing shall be considered unlawful and shall be penalized in accordance with the law.

Section 46. Use of fine meshed nets in fishing

Fine meshed net shall be allowed to be used for specific species e.g. hipon/ alamang, bolinao (small when fully mature) the use however shall be limited to season when this species are in abundance (as determined by the MAO). Any person caught using fine meshed net in fishing shall be fined an amount of PhP 2,500.00/ person. Catch and nets used shall be confiscated.

***Section 47.* Construction of structures on the shore**

Structures constructed in the beach areas shall follow existing laws on easement. Any person violating such a provision shall be fined an amount of PhP2,500.00 or in accordance with existing laws whichever is higher and demolition/ removal of such structures which shall be at the expense of the owner.

***Section 48.* Extraction of corals**

Extraction of corals shall not be allowed. Any person caught in the act of extracting corals (alive or dead) shall be fined PhP2,500.00 per person or the total value of the corals whichever is higher or a case shall be filed in court.

***Section 49.* Gathering and sale of threatened, rare and endangered species**

Gathering and sale of threatened, rare and endangered species as declared by DENR, BFAR and Convention of International Treaties on Endangered Species (CITES) shall be unlawful. Persons caught in the act of gathering and selling of rare, threatened and endangered species shall be fined PhP2,500.00 per person.

***Section 50.* Use of active gears and gears destructive to marine habitats**

Gears classified as active and destructive to marine habitats by BFAR shall not be allowed to operate in the municipal waters. Fine imposed shall follow what is stated in RA 8550 or fined an amount of PhP 2,500.00 per head whichever is higher plus gear confiscation.

***Section 51.* Illegal construction and operation of mussel, oyster, fish cages, taba, arong and other similar structures**

It shall be considered unlawful when permits and licenses are not secured prior to construction and operation of mussel, oyster, fish cages, taba, arong and other similar structures. These structures shall comply with the provisions of the zoning ordinance. Any person caught violating this provision shall be fined Php 2,500.00 and shall be advised to pull out/ destroy structures. In the incapacity of the owner to self demolish, the LGU shall demolish the structures at the owners expense.

***Section 52.* Gathering and selling of sand, pebbles and other substances**

Quarrying of sand, gravel and other substances in Ivisan are not allowed. If a permit from the PLGU was secured by the applicant, the MLGU still has the right to determine feasibility of the area for quarrying (e.g. highly critical areas, part of a sanctuary/ major habitat, requires an ECC, community consultation needed). Violations of this provision are fined PhP2,500.00 under penal provisions of RA 8550.

***Section 53.* Cutting and conversion of mangroves**

Provisions under PD 705 (Forestry Law) shall be observed on concerns related to mangroves (e.g. cutting and conversion of mangroves). Prohibitions and penalties under PD 705 shall likewise be observed. Penalty of PhP2,500.00/ person is charged for violating this provision or the penal provisions under PD 705 whichever is higher shall be imposed.

***Section 54.* Fishing during closed season**

It shall be unlawful at all times during closed season (Nov-March of each year) established herein for any person to engage in the fishing operation within Ivisan Municipal Waters with the use of any fishing gears using fishnets. Except for (1) scientific projects, studies with the approval of the Bureau of Fisheries and aquatic Resources; (2) sustenance fisherman using handlines, cover pot (panggal) fish pot (bubo), pole and line,

multiple hand-lines (bira-bira), long-line (palagree) cast net (laya), sikpaw, patigbi, crab-lift net, patuloy and fishing gears to catch bangus and sugpo fry. Violators of this provision shall be fined PhP2,500.00/ person under penal provisions of RA 8550.

Section 55. Commercial vessel intrusion in municipal waters

Commercial vessels are not allowed within the 15 kilometers municipal water. Violations of this provision shall be subject to the penal provisions of RA 8550 or fine of PhP 2,500/ person.

Section 56. Fishing and other activities inside the marine sanctuaries

a. *Fishing within the sanctuary or recreation zones*. It shall be unlawful for any person whether or not possessing a valid fishing license, to engage in fishing within the sanctuary and recreation zone. A person who violates this provision shall be liable for a fine in the amount of two thousand five hundred pesos (P2,500.00) or imprisonment for six months.
b. *Use of unauthorized gear within the reserve zone*. It shall be unlawful for any person whether or not possessing a valid license, to fish with the use of gears other than hook and line button-set gillnet and gleaning within the reserve zone. A person who violates the provisions shall be liable for a fine in the amount of two thousand five hundred pesos (P2,500.00) or imprisonment for six months.
c. *Fishing other the gleaning within the gleaning zone*. It shall be unlawful for any person whether or not possessing a valid license, to fish other than glean within the gleaning zone. A person who violates the provisions shall be liable for a fine in the amount of two thousand five hundred pesos (P2,500.00) or imprisonment for six months.
d. *Designation of buoys, signs and markers*. It shall be unlawful for any person to steal, cut or destroy the buoys, signs and markers of the Ivisan Fish Sanctuary and Reserve. A person who violates the provisions shall be liable for a fine in the amount of two thousand five hundred pesos (P2,500.00) or imprisonment for six months.
e. *Gathering or collecting of fishery resources within the sanctuary and recreation zones*. It shall be unlawful for any person whether or not possessing a valid fishing license to gather or collect fishery resources like corals, shell and other marine products within the sanctuary and recreational zone. A person who violates the provisions shall be liable for a fine in the amount of two thousand five hundred pesos (P2,500.00) or imprisonment for six months.

Section 57. Waste mismanagement

All households in the coastal areas shall have toilet facilities with septic tanks. Piggeries shall be constructed outside of the easements provided by law. All barangays shall comply with RA 9003. Violations of this provision shall be fined an amount of PhP2,500.00/ person.

Article XIV. General Provisions

Section 58. Persons/ groups authorized to enforce this ordinance

The PNP, Barangay Council, Tanods, FLET, MAO, MFMU and Officers of the MLGU shall be tasked to enforce this ordinance.

Section 59. Mandatory review

The SB with the MFARMC shall be responsible for conducting the mandatory review of the Municipal Fisheries Code after 5 years.

Article Topic XV. Transitory Provisions

The mariculture projects that are existing / operational prior to the passage of this ordinance shall comply with the approved Municipal Fisheries Code. A grace period of 100 days shall be given to the operator until such time that structures are transferred (at the owners expense) to its new location (as certified by the MPDC).

Article XVI. Final Provisions

Section 60. Allocation

An allocation to be determined by the SB shall be provided for the first year of the implementation of the Municipal Fisheries Code.

Section 61. Repealing clause

Any existing ordinances enacted by the SB that are inconsistent with the provision of this Municipal Fisheries Code shall be deemed repealed or amended accordingly.

Section 62. Separability clause

If, for any reason or reasons, any part or provisions of this Code shall be held unconstitutional or otherwise invalid, other parts or provisions thereof which are not affected thereby shall continue to be in full force and effect.

Section 63. Effectivity clause

This Code shall take effect 15 days after a copy hereof has been posted in a bulletin board at the entrance of and in at least two (2) conspicuous places of the Ivisan Municipal Hall and publication in a local newspaper of general circulation in the municipality.

Appendix 10. Village policies Pedada

Republic of the Philippines
Province of Iloilo
Municipality of Ajuy
Barangay Pedada

BARANGAY ORDINANCE NO. 1
Series of 2011

Sponsored by: Kagawad Ben Palmejar

Section 1. Title. This Ordinance shall be known as "An Ordinance declaring open and closed seasons in fishing and shell gleaning at designated Zones in Barangay Pedada, Ajuy."

Section 2. Location and coverage. Barangay Pedada has an estimated 29 hectares of mangroves with open spaces where catching fish and gleaning of shells are allowed.

Section 3. Management and supervision. Barangay Pedada Fisherfolk Association (BPFA) has applied for Community Based Forest Management Agreement (CBFMA), a tenurial instrument which gives BPFA the right to manage and protect the mangroves of Pedada in 25 years period.

Residents from the adjacent Barangay of Luca will be allowed to fish and glean in Pedada.

Each zone will be delineated using GPS and proper signage will be installed for public information.

Section 4. Zones within the mangroves of Pedada

Zone 1 – Dingle: Within the boundaries of Luca, Pedada and Bay-ang.
Zone 2 – Boundary of Vocal's property until the boat docking area near Chiquito compound
Zone 3 – Boundary from Chiquito compound until the Tipolo boat docking area
Zone 4 – Tipolo boat docking area until the property of Edwin del Carmen

Section 5. Closed and open season periods that needs to be observed per zone

Zone 1 and 3 – Closed January to March
Open April to June
Closed July to September
Open October to December

Zone 2 and 4 – Open January to March
Closed April to June
Open July to September
Closed October to December

Section 6. Activities allowed and not allowed

a. Open season.
   I. Regulated shell gleaning shall be allowed (e.g. for crab catching/ gathering using bintol is allowed but not digging of crab holes)
   II. Catching of fish/ shell fish using "Pahubas" shall be allowed provided that the mesh size of the net is 3 cm

b. Closed season.
   I. No activity is allowed

Section 7. Objectives of declaring open and closed seasons

a. To allow crabs and shells to grow big and reproduce in volume
b. To allow fingerlings a sanctuary area where they are not disturbed
c. To make fishing and shell gleaning more sustainable

Section 8. Penalties and sanctions

For violation of any provision of this Ordinance, the following penalties shall be meted upon the offender, payable at the Barangay Treasurer's Office:

a. First offense. A penalty of P100.00 shall be charged and violators shall be obliged to plant 20 mangrove seedlings
b. Second offense of the same person. Penalty shall be increased to P200.00 and the violator is obliged to return caught shells, crabs and fishes in the zones where these were taken or if already sold the violator has to turn over the sales to BPFA

SECTION 9. Repealing clause. Ordinances, rules and regulations in conflict with this Ordinance, in whole or in part, are hereby repealed or amended accordingly.

SECTION 10. Separability clause. If for any reason any part or provision of this Ordinance shall be held unconstitutional or invalid, the other parts or provision hereof which are not affected thereby shall continue and remain to be in full force and effect.

SECTION 11. Effectivity. This Ordinance shall take effect thirty (30) days after approval and subject to the following:

a. Public Hearing or consultation with the residents/ fisherfolk of Brgy. Pedada.
b. Publication in a newspaper of general circulation in the Municipality of Ajuy, Iloilo, wherever available.
c. Posting copies of this Ordinance in three (3) conspicuous places in the Poblacion/ Barangay.
d. Posting copies of this Ordinance in the other Barangays of this Municipality.

APPROVED AND ENACTED, November 19, 2011.

Punong Barangay Alberto D. Babiera Sr.
Kgd. Imelda B. Londres
Kgd. Virgilio B.Balasote
Kgd. Ben C.Palmejar
Kgd. Danny B.Rotor
Kgd. Rolando C.Velasco Jr.
Kgd. Luzanta B.Bordago
Kgd. Edgar B.Balasote
SK Chairperson Myhra Sheery D.Babiera

Republic of the Philippines
Province of Iloilo
Municipality of Ajuy
Barangay Pedada

BARANGAY ORDINANCE NO. 2
Series of 2011

Sponsored by: Kagawad Edgar Balasote

Section 1. Title. This Ordinance shall be known as "An ordinance declaring Barangay Pedada as Bird and Wildlife Sanctuary."

Section 2. Location and coverage. The ordinance will cover the whole land area of Barangay Pedada which measures 269.04 hectares.

Section 3. Objectives. The following are the reasons why Barangay Pedada needs to be declared as Bird and Wildlife sanctuary:

a. To provide areas where migratory birds cannot be disturbed
b. To increase biodiversity and population of birds and wildlife
c. To allow birds to serve as natural courier of seeds
d. To protect and conserve birds and wildlife population in Pedada
e. To stop hunting of birds and wildlife

Section 4. Observed birds and wildlife in Pedada

Birds	Maya bungol Maya costa Maya capra Kiwkiw Pitaw Tukmo	Tulabong Kurit Kurokok Mantarorok Galansiyang Bangbangon	Dicol Tamsi Pingganpinggan Maya pula Punay Uwak	Talimbabatang Dagit Tikling Lapayan Ombok Kabog
Reptiles	Magkal Maninina Man og sa balay Cobra Burakan	Tuko Halo Bao	Tiki Tambilihan Ibid	Tangkig
Insects	Buyog	Subay	Pala Hamtik	Putyukan
Fish	Tambasakan			

Section 5. Information and awareness raising. Signages bearing pictures and descriptions of birds and wildlife species that are prohibited from catching, gathering, hunting and selling shall be posted in strategic places in Barangay Pedada for public awareness.

The DENR, MLGU Ajuy and other NGOs shall be encouraged to conduct Information, Education and Communication (IEC) campaign in Pedada and other coastal barangays.

A big billboard stating the name and the title of the ordinance declaring Pedada as Bird and Wildlife sanctuary shall be posted at the entrance of Barangay Pedada.

Section 6. Violations. Hunting, gathering, catching and selling of any birds and wildlife species in Pedada shall be considered a violation and shall be punishable under Wildlife Act and RA 7160.

SECTION 7. Repealing clause. Ordinances, rules and regulations in conflict with this Ordinance, in whole or in part, are hereby repealed or amended accordingly.

SECTION 8. Separability clause. If for any reason any part or provision of this Ordinance shall be held unconstitutional or invalid, the other parts or provision hereof which are not affected thereby shall continue and remain to be in full force and effect.

SECTION 9. Effectivity. This Ordinance shall take effect thirty (30) days after approval and subject to the following:

a. Public Hearing or consultation with the residents/ fisherfolk of Brgy. Pedada.
b. Publication in a newspaper of general circulation in the Municipality of Ajuy, Iloilo, wherever available.
c. Posting copies of this Ordinance in three (3) conspicuous places in the Poblacion/ Barangay.
d. Posting copies of this Ordinance in the other Barangays of this Municipality.

APPROVED AND ENACTED, November 19, 2011.

Punong Barangay Alberto D. Babiera Sr.
Kgd. Imelda B. Londres
Kgd. Virgilio B.Balasote
Kgd. Ben C.Palmejar
Kgd. Danny B.Rotor
Kgd. Rolando C.Velasco Jr.
Kgd. Luzanta B.Bordago
Kgd. Edgar B.Balasote
SK Chairperson Myhra Sheery D.Babiera

Republic of the Philippines
Province of Iloilo
Municipality of Ajuy
Barangay Pedada

BARANGAY ORDINANCE NO. 3
Series of 2011

Sponsored by: Kagawad Virgilio Balasote

Section 1. Title. This ordinance shall be known as "An ordinance requiring applicants to plant/ bag 20 mangrove seedlings/ propagules before securing Barangay Clearance from Pedada. "

Section 2. Location and coverage. All residents of Pedada, Ajuy will be covered by this ordinance. Planting/ bagging will be inside the 29 hectares mangrove area of Pedada.

Section 3. Objectives. The objectives of requiring the planting of mangroves are:

a. To increase area planted with mangroves
b. To enhance understanding of communities on their roles and obligations in protecting and conserving Pedada mangroves
c. To replace old and dying mangroves with newly planted young seedlings

Section 4. Sanction. Applicants who will not comply with the provision of planting/ bagging mangroves shall not be issued Barangay clearance/s.

SECTION 5. Repealing clause. Ordinances, rules and regulations in conflict with this Ordinance, in whole or in part, are hereby repealed or amended accordingly.

SECTION 6. Separability clause. If for any reason any part or provision of this Ordinance shall be held unconstitutional or invalid, the other parts or provision hereof which are not affected thereby shall continue and remain to be in full force and effect.

SECTION 7. Effectivity. This Ordinance shall take effect thirty (30) days after approval and subject to the following:

a. Public Hearing or consultation with the residents/ fisherfolk of Brgy. Pedada.
b. Publication in a newspaper of general circulation in the Municipality of Ajuy, Iloilo, wherever available.
c. Posting copies of this Ordinance in three (3) conspicuous places in the Poblacion/ Barangay.
d. Posting copies of this Ordinance in the other Barangays of this Municipality.

APPROVED AND ENACTED, November 19, 2011.

Punong Barangay Alberto D. Babiera Sr.
Kgd. Imelda B. Londres
Kgd. Virgilio B.Balasote
Kgd. Ben C.Palmejar
Kgd. Danny B.Rotor
Kgd. Rolando C.Velasco Jr.
Kgd. Luzanta B.Bordago
Kgd. Edgar B.Balasote
SK Chairperson Myhra Sheery D.Babiera

Republic of the Philippines
Province of Iloilo
Municipality of Ajuy
Barangay Pedada

Excerpts from the minutes of the Barangay Council session held November 19, 2011 at the Barangay Hall of Pedada, Ajuy.

Present: Punong Barangay Alberto D. Babiera Sr.
Kgd. Imelda B. Londres
Kgd. Virgilio B.Balasote
Kgd. Ben C.Palmejar
Kgd. Danny B.Rotor
Kgd. Rolando C.Velasco Jr.
Kgd. Luzanta B.Bordago
Kgd. Edgar B.Balasote
SK Chairperson Myhra Sheery D.Babiera

BARANGAY RESOLUTION NO. 13
Series of 2011

A RESOLUTION REQUIRING VARIOUS ORGANIZATIONS, INSTITUTIONS, AGENCIES AND NON-GOVERNMENT ORGANIZATIONS TO CONDUCT PROPER STUDIES PRIOR TO ANY MANGROVE PLANTING ACTIVITY IN PEDADA, AJUY.

WHEREAS, Barangay Pedada is actively involved in mangrove planting;

WHEREAS, mangroves will serve as habitat for various marine organisms and ensure for a sustainable fisheries;

WHEREAS, the people of Barangay Pedada believes that thick mangrove vegetation can serve as protection against storms, big waves and soil erosion;

WHEREAS, previous planting activities were observed to have poor survival hence putting time and effort to waste;

WHEREAS, it was observed that due to inadequate knowledge and technology, poor planting strategy and the lack of a proper study on the soil type where mangrove can grow, poor survival rate on the mangrove planted was experienced;

NOW, THEREFORE, on motion of Kagawad Danny Rotor, duly seconded by Kagawad Edgar Balasote;

BE IT RESOLVED AS IT IS HEREBY RESOLVED that proper study shall be required from various organizations, institutions, agencies and non-government organizations prior to any planting activity in Pedada, Ajuy.

RESOLVED FURTHER, to furnish copies of this Resolution to the Sangguiniang Bayan of Ajuy for information and appropriate action.

I certify to the correctness of the above-quoted resolution.

PELSY F. BARBER
Barangay Secretary

Attested by:

HON. ALBERTO D. BABIERA SR.
Punong Barangay

Appendix 11. LGU Leganes Mangrove Ordinance

Republic of the Philippines
Province of Iloilo
Municipality of Leganes
OFFICE OF THE SANGGUNIANG BAYAN

EXCERPTS FROM THE MINUTES OF THE REGULAR SESSION OF THE SANGGUNIANG BAYAN HELD AT THE SANGGUNIANG BAYAN SESSION HALL ON AUGUST 9, 2011 AT 2:00 O'CLOCK IN THE AFTERNOON.

Present:

Hon. Jose Romi S. Marañon	- Vice Mayor, Pres. Officer
Hon. Ronnie J. Landoy	- SB Member
Hon. Joseph Allen D. Español	- " "
Hon. Epifania A. Jinon	- " "
Hon. Rene H. Arguelles	- " "
Hon. Marites Griño-Quilino	- " "
Hon. Salvador B. Guillergan Jr.	- " "
Hon. Adolfo D. Jaen II	- " "
Hon. Antonio V. Unarce	- " "
Hon. Yeno Van T. Lego	- " ", SK Fed. Pres.

Absent:

Hon. Vicente P. Jaen II	- SB Member, Liga Pres. (Official Travel)

ORDINANCE NO. 2011-227

AN ORDINANCE DECLARING THE MANGROVE PROTECTED AREAS IN THE MUNICIPALITY OF LEGANES, ESTABLISHING REGULATIONS FOR THE CONSERVATION AND PROTECTION, AND PROVIDING PENALTIES IN VIOLATION THEREOF

WHEREAS, mangrove forests play a very significant role in the environment; are among the most productive terrestrial ecosystems; and are natural, and renewable resources;

WHEREAS, among the numerous importance of mangroves, they protect coastline areas from erosion, protect coral reefs, sea-grass bed and shipping lanes against siltation, absorb pollutants, serve as sanctuary for avifauna, provide opportunities for education, research and ecotourism, and many others;

WHEREAS, current global situation made mankind realize that it is very essential to conserve the biodiversity in the mangrove ecosystem;

WHEREAS, not merely the people of Leganes must take part in the preservation and protection of mangroves because it is a duty under the law, rather, it is a responsibility of each to give back and yield to nature;

WHEREAS, under Section 447 of RA 7160, it is within the powers, duties and functions of the Sangguniang Bayan to enact Ordinances which protect the environment and impose appropriate penalties for acts which endanger the environment;

NOW THEREFORE, in consideration of the foregoing premises -

Section 1. This Ordinance shall be known as "AN ORDINANCE DECLARING THE MANGROVE PROTECTED AREAS IN THE MUNICIPALITY OF LEGANES, ESTABLISHING REGULA-

TIONS FOR THE CONSERVATION AND PROTECTION, AND PROVIDING PENALTIES IN VIOLATION THEREOF" or the "Leganes Mangrove Ordinance"

Section 2. Definition of Terms

Mangrove – trees and shrubs that grow in marine and brackishwater habitats in the intertidal zone.

"Protected Area" refers to identified portions of land and water set aside by reason of their unique physical and biological significance, Managed to enhance biological diversity and protected against destructive human exploitation;

Mangrove Protected Areas – all coastline areas of the Municipality with mangroves, primarily or secondarily grown. These include:

a. all areas of the Punongbanwa located along Barangays Nabitasan and Gua-an
b. shoreline of Barangays Napnud, MV Hechanova, Bigke and Camangay
c. all riverbanks within the municipality affected by intertidal zone

Preservation – maintain in safety from injury, peril or harm; to keep in unaltered condition; maintain unchanged

Grazing – feed an animal in pastures

Section 3. Mangrove Protected Areas

All coastline areas of the Municipality with mangroves, primarily or secondarily grown, shall be declared Mangrove Protected Areas. These include:

a. all areas of the Punongbanwa located along Barangays Nabitasan and Gua-an.
b. shoreline of Brgys. Napnud, MV Hechanova, Bigke and Camangay
c. all riverbanks within the municipality affected by intertidal zone

Section 4. Regulatory Provisions

I. The following acts which destroy or tend to destroy Mangrove Protected areas shall be unlawful:

a. uprooting, cutting and/or trimming of mangroves, except those recommended by the Mangrove Task Force and approved by the Local Chief Executive
b. utilize mangrove areas for grazing animals
c. throwing of garbage of any form
d. use the areas for destructive fishing to the detriment of mangrove protected areas
e. excavation, dredging or backfilling for any purpose
f. flooding, draining and other alterations of water flow that will damage the mangroves.

II. The following activities judiciously done, preserving at all times the mangrove protected areas may be allowed:

a. gathering of worms as fish bait
b. shell gleaning
c. gathering of mud crab
d. gathering of mangrove seedlings

Section 5. Non-Conversion of Mangrove Areas

Mangrove Protected Areas shall not be converted into fishing grounds or for any other purpose, except thru the recommendation of the Mangrove Task Force and approved by the Sangguniang Bayan, thru an Ordinance.

Section 6. Mangrove Protection Task Force and its Functions

A Mangrove Protection Task Force shall be created by virtue of this Ordinance, the members to be appointed by the Municipal Mayor

Chairman : Municipal Agriculturist or Environment Officer
Vice Chairman: Representative from the Office of Municipal Mayor
Members : SB Chair, Committee on Environment and Natural Resources
SK Federation representative
LIGA representative
NGO Representative (ZSL)
MPDO or his representative
PNP representative
District Supervisor or his representative

The following are the functions of the Task Force:

a. design and spearhead programs, projects and activities geared towards the preservation, protection and enhancement of the mangrove areas of the municipality
b. conduct continuous studies and research on how to improve current practices preserving and protecting mangroves, likewise, on its expansion to afford maximum protection
c. encourage volunteers to help enhance the mangrove protection programs
d. shall monitor violators, make summary report and recommendation for the imposition of proper sanctions
e. Recommend to Sangguniang Bayan applicable regulations pertaining thereto
f. Performs such other functions as maybe delegated by the Local Chief Executive.

Section 7. Recognition and Support

Due recognition and technical support shall be provided to individuals, groups or organizations which markedly endeavor in the preservation, protection and enhancement of mangrove protected areas.

Section 8. Penal Provisions

Violations of Section 4 of this Ordinance shall be penalized as follows:

First Offense — community service, specifically planting and growing of mangroves equivalent to the number destructed plus 50 mangroves to be Planted

Second Offense — community service, specifically planting and growing of mangroves twice the number destructed plus 100 mangroves to be planted

Third Offense — community service, specifically planting and growing of mangroves thrice the number destructed plus 150 mangroves to be planted and a fine of Php 2,000 and/or imprisonment of not more than one (1) month as maybe determined by the Court.

The seedlings that will be used in the aforementioned mangrove re-planting and growing shall be provided by the Municipal Agriculture Office.

Section 9. Repealing Clause

Any Ordinance prior approved which is inconsistent with this Ordinance, is/are hereby repealed or modified accordingly.

Section 10. Separability Clause

If any portion or provision of this Ordinance is declared unconstitutional or invalid, the other portions or provisions hereof, which are not affected thereby, shall continue in full force and effect.

Section 11 Effectivity Clause

The Ordinance shall take effect fifteen (15) days after its publication.

RESOLVED FURTHER to furnish copies of this ordinance to the Office of the Department of Agriculture for their information and guidance.

ENACTED this 9th day of August, 2011 on motion of Hon. Epifania A. Jinon and duly seconded by Hon. Rene H. Arguelles.

I HEREBY CERTIFY to the correctness of the foregoing ordinance.

EVA G. TABANDA
Secretary to the Sangguniang Bayan

WITH MY CONCURRENCE:

JOSE ROMI S. MARAÑON
Vice Mayor
Presiding Officer

A P P R O V E D :

ENRIQUE M. ROJAS
Municipal Mayor

Appendix 12: LGU Ibajay mangrove ordinance

Republic of the Philippines
Province of Aklan
Municipality of Ibajay

Office of the Sangguniang Bayan

EXCERPT FROM THE MINUTES OF THE 19th REGULAR SESSION FOR CY 2009 OF THE SANGGUNIANG BAYAN (2007 –2010) OF IBAJAY, AKLAN HELD AT THE SANGGUNIANG BAYAN SESSION HALL ON MAY 20, 2009.

PRESENT:

Hon. Nelson D. Santamaria	Vice Mayor, Presiding Officer
Hon. Mabini M. Ascaño	Sangguniang Bayan Member
Hon. Ariel M. Alag	"
Hon. Salvador S. Maagma	"
Hon. Victor Manuel M. Garcia	"
Hon. Beldad S. Tabañar	"
Hon. Ainor D. Orencio	"
Hon. Tadeo M. Belinario	"

ABSENT:

Hon. Plaridel M. Solidum (*On Official Travel*)	Sangguniang Bayan Member
Hon. Elmer F. Colangoy	Liga Pres., SB Member (*Ex-Officio*)
Hon. Ma. Mae S. Senatin	SK Fed. Pres., SB Member (*Ex-Officio*)

x - x - x

ORDINANCE NO. 092
SERIES OF 2009

"AN ORDINANCE DECLARING AND ESTABLISHING THE FORTY FOUR AND 22/100 (44.22) HECTARES OF MANGROVES IN BARANGAYS BUGTONGBATO AND NAISUD, THIS MUNICIPALITY, AS MANGROVE ECO-TOURISM PARK, AND PRESCRIBING RULES, REGULATIONS AND PROHIBITIONS AND PENALTIES THEREFFOR.

Sponsored by Hon. Plaridel M. Solidum

"BE IT HEREBY ORDAINED by the Sangguniang Bayan of Ibajay, Aklan, in session duly assembled that:

"SECTION 1. **Title**. This Ordinance shall be known as the "Bugtongbato – Naisud Mangrove Eco – Tourism Park Ordinance".

"SECTION 2. **Definition of Terms**. As used in this Ordinance, these terms shall mean as follows:

Aquaculture – fishery operations involving all forms of raising and culturing fish and other fishery species in fresh, brackish and marine water areas.

Aquatic pollution – the introduction by human or machine, directly or indirectly of substance or energy to the aquatic environment which result or is likely to result in such deleterious effects as to harm living and non-living aquatic resources, pose potential and/or real hazard to human health, hindrance to aquatic activities such as fishing and navigation, including dumping/disposal of wastes

and other noxious or harmful liquid, gaseous or solid substance, from any water, land or air transport or other human-made structure.

FARMC – the Fisheries and Aquatic Resources Management Councils.

Fisher folk – people directly or personally and physically engaged in taking and/or culturing and processing fishery and/or aquatic resources.

Fishing – the taking of fish and toher fishery resources from their wild state or habitat, with or without the use of fishing vessels.

Mangrove – an ecosystem of trees or shrubs that have the common trait of growing in shallow and muddy salt water or brackish waters, especially along quiet shorelines and in estuaries.

TWG KII – Technical Working Group Katunggan it Ibajay.

"SECTION 3. **Location and Coverage**.

a. The Bugtongbato – Naisud Mangrove Eco - Tourism Park is a mangrove area consisting of a total of Forty Four and 22/100 Hectares (44.22 has.) situated in Barangays Bugtongbato and Naisud, generally classified as Timberland and covering Lot Nos. 3619 and 3207, this Municipality.

b. The Bugtongbato – Naisud Mangrove Eco - Tourism Park is bounded and delineated by the coordinates as stated in the technical description, and depicted in the sketch plan and vicinity map hereto attached as Annex "A" of this Ordinance.

c. Concrete monuments or markers shall be installed to mark the perimeter of the ecotourism park.

d. Billboards which contain relevant information, map, directions, signages, area, etc., shall also be erected in prominent places.

"SECTION 4. **Management, Administration and Control**. The Bugtongbato – Naisud Mangrove Eco – Tourism Park shall be under the supervision of the Municipal Government of Ibajay, Aklan through the Barangay Councils of Bugtongbato and Naisud. The Technical Working Group (TWG) of Katunggan it Ibajay (KII) that the LGU of Ibajay created shall evolve into the Mangrove Eco - Tourism Board (METB) and will be delegated with responsibilities of supervision and monitoring activities in the Mangrove Eco – Tourism Park. The METB shall create four committees: Protection Committee, Monitoring and Evaluation Committee, Training and Management Committee, and Livelihoods Committee. The METB shall report to the Office of the Municipal Mayor.

A Project Management Committee (PMC) will be formed on site to directly manage and operate the Mangrove Eco - Tourism Park. The PMC shall be composed of representatives from Bugtongbato Fisherfolk Association (BFA), and Naisud Mangrove Aquatic Organization (NAMAO). The PMC reports directly to the METB.

Monthly meetings shall be conducted separately by the METB and the PMC. The METB shall require the PMC Chairperson to attend the meeting and report the progress of the project.

"SECTION 5. **Membership**. The members of the Mangrove Eco - Tourism Board (METB) shall be as follows:

Chairperson	:	Municipal Vice Mayor
Members	:	Chairpersons of the Sangguniang Bayan Committees on: Tourism, Agriculture, and Environments
		Municipal Planning & Development Coordinator
		Municipal Agricultural Officer
		Chairperson, Ibajay Tourism Council

Chairperson, Municipal Fisheries and Aquatic Resources Management Council (MFARMC)
Cultural Affairs Officer, or equivalent
Punong Barangay, Bugtongbato
Punong Barangay, Naisud
Representative, Aklan State University, Ibajay Campus
Secretariat : Municipal Tourism Officer, or equivalent

The PMC shall be composed of eleven (11) members coming from the Bugtongbato Fisherfolks Association (BFA) and Naisud Mangrove and Aquatic Association (NAMAO), both accredited people's organizations in the locality.

"SECTION 6. **Officers**. The Mangrove Eco - Tourism Board (METB) shall elect a Chairperson and a Secretary. Four (4) committee chairpersons will be elected within the METB. The Committee Chairpersons shall choose two members each from among the members of the METB.

The PMC shall also elect a Chairperson, Vice-Chairperson, Secretary, Treasurer, and Bookkeeper. The Auditors of both the BFA and NAMAO shall conduct an audit on the financial status of the mangrove project managed by the PMC.

"SECTION 7. **Functions**. The METB shall have the following functions:

e. Formulate policies and guidelines on the management, protection and utilization of mangroves;
f. Monitoring and evaluation of the eco-park project;
g. Supervision of the People's Organization (PO) in eco-park management;
h. Approves the annual work plan of the PMC; and
i. Provide the over-all direction and coordination of activities in the mangroves of Bugtongbato and Naisud.

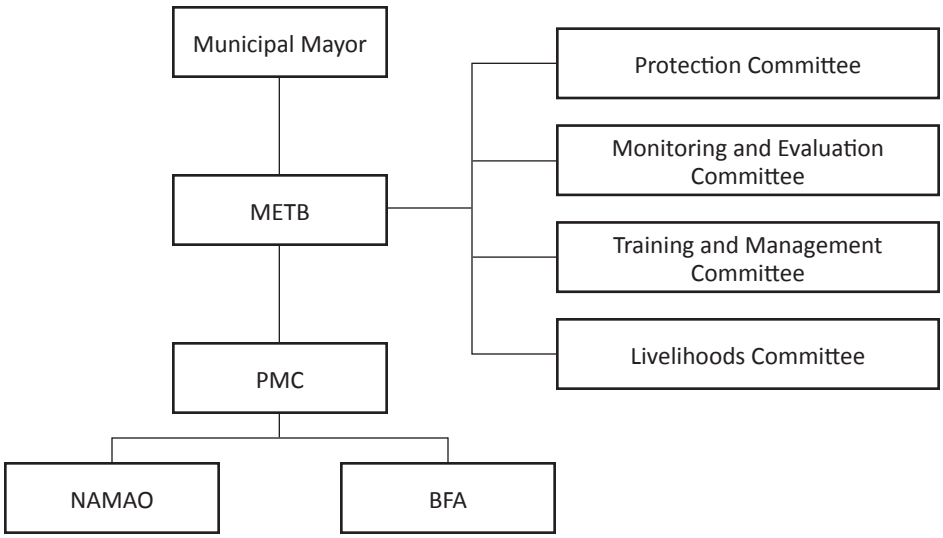
The Committees within the METB shall function as follows:

j. Protection Committee – formulation of policy enforcement plan; coordination with law enforcement groups/bodies; policy recommendation.
k. Monitoring and Evaluation Committee – assessment of projects viability; conduct of regular observations of the bio-physical and socio-economic results and changes brought about by the operation of the mangrove eco-tourism park.
l. Training and Management Committee – plan for the rehabilitation and reforestation activities; monitor health and growth of mangroves; IEC.
m. Livelihoods Committee – management/systems installation of the eco-park; identify and access funds for IGPs; fund sourcing; coordinate with the PMC regarding construction of infrastructure facilities; promotion and marketing.

The PMC shall function as follows:

n. Directly manages the mangroves, and supervise the activities in the Bugtongbato and Naisud Mangroves, including the management of the Eco-Tourism Park;
o. Prepares and implements the annual work plan;
p. Keeps record of activities including logbook of visitors/guests to the park;
q. Reports to the METB the status of the project, finances, policy enforcement, among others.

"SECTION 8. **Organizational Structure**. The Bugtongbato – Naisud Mangrove Eco - Tourism Park shall generally function through this structure:



"SECTION 9. **Zones within the Eco-Park**. The following acts shall be the designated zones within the Eco-park:

r. Strict Protection Zone. This is the area where the century-old trees grow. No human activities (shellfish and crustacean gathering, cutting, firewood gathering, wildlife bird hunting) allowed except for research/educational study and sight-seeing.

s. Multiple-use Zone.

1. Nipa Production and Utilization Zone. The area for Nipa production and utilization and limited to the existing planted area. Value-adding of nipa products for livelihood shall be allowed or provided to prevent further expansion of Nipa plantation. Conversion of areas planted to true managrove species to nipa plantation is prohibited.

2. Eco-Park Zone. The area with established infrastructures within the mangrove area in support of eco-tourism activities.

3. Reforestation/Rehabilitation Zone. Area delineated for enrichment planting or mangroves.

4. Fish Production Zone. Creeks, water tributaries within the mangrove area that can be utilized for small scale fishing using temporary small-scale catching structures that do not obstruct waterways, aquaculture, shell gleaning, catching of crustaceans as long as this activities do not harm the mangroves. No expansion of fish production zones shall be allowed.

"SECTION 10. **Prohibitions**. The following acts shall be punishable under this Ordinance:

a. Cutting of mangroves, gathering for firewood, use of mangroves for housing/ construction material, uprooting/looting of mangrove plants

b. Fishing activity, gathering or collection of any fishery resource within the strict protection zone

c. Bringing of alcoholic beverages and drinking within the eco-park

d. Littering/throwing of garbage waste

e. Destroying/vandalism of billboards, signages and other infrastructure facilities

f. Gambling
g. Bringing of deadly weapons
h. Hunting of wild fauna
i. Theft or removal of any material/equipment
j. Any other activities that may harm/destroy the mangroves

"SECTION 11. **Exemptions**. The following acts shall be exempted from punishment:

a. Research and educational studies
b. Sight-seeing, picture-taking
c. Small-scale fishing, mariculture activities
d. Boating
e. Use of nipa for livelihood
f. Any other activity with prior consent from the METB

"SECTION 12. **Funds**. The amount of Thirty Thousand Pesos (₱30,000.00) is hereby appropriated for the purpose of the immediate implementation of this Ordinance. Thereafter, the appropriation for implementing this Ordinance shall be a regular item in the annual appropriations of the Municipality. Entrance fees collected shall be used for operation and maintenance; the amount of which shall be decided by the METB and the PMC.

The Municipal Government of Ibajay, shall appropriate funds for the construction of infrastructure facilities in the Eco-park, including but not limited to foot walk, resting areas, entrance, eco-sanitary toilets, electrical and water service facilities. Other organizations who may wish to contribute to the development of the Eco-park are welcome. The LGU, through the METB, shall be duly informed of such contribution.

"SECTION 13. **Enforcement**. Local residents shall be trained by the DENR and deputized by the Local Chief Executive (LCE) as Bantay Kalikasan (BK). The Protection Committee shall supervise the BK.

The Philippine National Police (PNP) assigned in the Municipality of Ibajay, Aklan, the Barangay Councils of Bugtongbato and Naisud, Civilian Volunteer Officers, members of the Municipal Fishery Law Enforcement Team, Fish Wardens, and others who have undergone training in law enforcement and have been deputized by the Municipal Mayor of Ibajay, Aklan, shall help enforce this Ordinance. The BK shall establish a coordination mechanism with the groups mentioned for effective law enforcement.

The Municipal Mayor shall assign two (2) personnel from the Philippine National Police to regularly conduct patrol operation in the Mangroves of Bugtongbato and Naisud. They shall coordinate with the Protection Committee.

"SECTION 14. **Information and Education**. The Municipal Government of Ibajay, Aklan shall support the Training and Management Committee in the development and implementation of an education program to stimulate the necessary community support and awareness.

"SECTION 15. **Ecological Solid Waste Management**. Ecological solid waste management shall be practiced in the Eco-park. Eco-sanitation toilets will be installed in strategic locations within the park.

Training on solid waste management will provide the PMC with the basic knowledge to be able to set up and implement an efficient solid waste management program shall be conducted. Part of the training will be on waste segregation, in anticipation of the volume of garbage or waste materials that will be dumped on the park once it is opened for eco-tourism to the public.

Mechanism for garbage collection will be coordinated with the LGU of Ibajay, Aklan. Fifteen (15) units of 100–liter plastic containers for collection of garbage shall be installed at 200 meters interval in the Eco-park. The plastic containers shall be installed in groups of three, and color-coded for reusable, bio-degradable, and non-biodegradable garbage. The BLGUs of Naisud and Bugtongbato shall be responsible for implementing ecological solid waste management in the community; part of the program shall be the installation of a Material Recovery Facility (MRF) in the two barangays.

"SECTION 16. **Technical and Other Assistance**. The Aklan Provincial Government, DENR-PENRO, BFAR BFO, NGOs, Academe and other concerned government agencies and institutions shall provide technical, financial and other assistance for the implementation and operation of the Bugtongbato – Naisud Mangrove Eco – Tourism Park Project.

"SECTION 17. **Periodical Review**. The Municipal Government of Ibajay, Aklan, the METB, and the PMC shall conduct a periodic review of the management of the Mangrove Eco – Tourism Park Project yearly to allow continual refinement as conditions change, and as more experience and research information becomes available. They shall consider desirable modifications as indicated from the result of the implementation arrangements, surveillance and monitoring research.

"SECTION 18. **Penalties and Sanctions**. For violation of any provision of this Ordinance, the following penalties shall be meted upon the offender, payable at the Municipal Treasurer's Office:

g. First Offense - Fine of from Five Hundred Pesos (P500.00) to One Thousand Pesos (P1,000.00)

h. Second Offense - Fine of from One Thousand Pesos (P1,000.00) to One Thousand Five Hundred Pesos (P1,500.00)

i. Third Offense - Fine of Two Thousand Five Hundred Pesos (P 2500.00), or an imprisonment of one (1) month to six (6) months, or both, at the discretion of the Court.

In any of the offenses above enumerated, the equipment/materials and other paraphernalia used in the commission of the offense shall be held in custody by the Municipal PNP until the case is duly resolved.

"SECTION 20. **Repealing Clause**. Any existing ordinance, rule or regulation in conflict with this Ordinance, in whole or in part, are hereby repealed or amended accordingly.

"SECTION 21. **Separability Clause**. If for any reason any part or provision of this Ordinance shall be held unconstitutional or invalid, the other parts or provision hereof which are not affected thereby shall continue and remain to be in full force and effect.

"SECTION 22. **Effectivity**. This Ordinance shall take effect thirty (30) days after approval and subject to the following:

j. Public Hearing or consultation with the residents/fisherfolks of Brgys. Bugtongbato and Naisud.

k. Publication in a newspaper of general circulation in the Municipality of Ibajay, Aklan, wherever available.

l. Posting copies of this Ordinance in three (3) conspicuous places in the Poblacion.

m. Posting copies of this Ordinance in the other Barangays of this Municipality.

"APPROVED AND ENACTED. - - - - May 20, 2009."

x - x - x

CERTIFIED CORRECT:

MUJANE BEGONIA C. MIROY
Secretary to the Sanggunian

ATTESTED:

NELSON D. SANTAMARIA
Vice Mayor, Presiding Officer

APPROVED:

MA. LOURDES M. MIRAFLORES
Municipal Mayor