



MARINE PROTECTED AREA (MPA) ESTABLISHMENT AND MANAGEMENT TRAINING COURSE

Implementation by:



COASTAL RESOURCE MANAGEMENT PROJECT
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AND AQUATIC RESOURCES

COASTAL RESOURCE MANAGEMENT PROJECT

5th Floor, Cebu International Finance Corporation Towers, J. Luna Street corner
J. L. Briones Avenue, North Reclamation Area, Cebu City, Philippines

Telephone: (032) 2321821 to 22, 4120487 to 89, 4120645 Fax: (032) 2321825

CRM Hotline: 1-800-1-888-1823 Email: crmhot@mozcom.com and/or crmp@oneocean.org

Website: <http://www.oneocean.org>

Marine Protected Area (MPA) Establishment and Management Training Course

Background

The Marine Protected Area (MPA) Establishment and Management training course is one of the training packages formulated and conducted by the Coastal Resource Management Project (CRMP) of the Department of Environment and Natural Resources (DENR) with support from the United States Agency for International Development (USAID).

This manual was developed from various experiences of CRMP together with its partners as carried out in the learning areas particularly in the province of Bohol. Over the years of project implementation, several community-based initiatives were undertaken with coastal communities of which these experiences proved to be valuable in the formulation and development of this training manual.

More recently, the Coastal Resource Management Project (CRMP) and the Fisheries Resource Management Project (FRMP) jointly conducted a training program on fish sanctuary management. The inputs on this training activity provided enrichment to some modules and the overall design of the program. Such joint endeavor indeed, showed how inter-project collaboration could effectively share lessons and experiences leading to a more improved training package.

Course objectives

The training course is designed to equip participants (technical staff and local communities) with fundamental skills in establishing and managing a community-based marine protected area. Specifically, the participants, at the end of the course will:

- Enhance their knowledge and skills on the processes involved (i.e. resource mapping, baseline data collection, management plan formulation, monitoring and evaluation) in establishing and managing a marine protected areas particularly community-based fish sanctuaries;
- Strengthen capabilities in facilitating MPA establishment and management process with optimum involvement of local communities;
- Demonstrate the process of coming up with a MPA management plan using existing documented information and results of community consultation activities;



Expected outputs

- Coastal area profile of a study site
- Resource Map delineating boundaries and zones
- MPA management plan (management objectives, strategies, zoning schemes, policies and implementing structure)

Training Package Design

This training package consists of 10 sessions covering a wide range of inter-related topics. Description and objectives of each session as well as the materials required, is included in the session guides. Each topic is supplemented with reading materials for participants' quick reference.

The training program uses various methodologies such as classroom lectures, sharing of experiences in small groups, case analysis, field activity and small group workshops. During field exercises, swimming and snorkeling skills are required to fully accomplish the activities designed for this purpose.

Notes for the Users

CRMP encourages development partners to adopt this package wherever appropriate provided proper acknowledgment is cited. Users may also modify the training package when deemed necessary to fit to the needs of the participants. Should you have comments and suggestions, please forward them to this address: CRMP, 5th Floor, CIFIC Towers, North Reclamation Area, Cor. J.L. Briones and Juan Luna Sts., Cebu City 6000.

Acknowledgement

While this training manual is a collective effort of various partners of CRMP, it is worthwhile to mention individuals who are at the forefront in the development and formulation of this package spearheaded by CRMP's training component.

Among those from CRMP are Mr. Stuart Green, Provincial Coordinator of Bohol; Dr. Alan White, Deputy Chief of Party; Ms. Evelyn Deguit, CO/CD Advisor; and Mr. Alexis Yambao, CRM Specialist.

Credit should also be due to Mr. Benjamin Francisco, Regional Advisor of FRMP; Dr. Benjamin Gonzales, ICRM specialist of FRMP; and Mr. Timoteo Menguito of Gilutongan Island, Cordova, who made valuable contribution to the enrichment of some modules.



To everyone who in one way or another made this manual possible, your contributions do not go unnoticed.



Program of Activities

Day One

8:00-10:00 Arrival of Participants, Registration and Settling in

10:00-10:45 **Opening Program** (see separate program)

10:45-11:30 Rational and Leveling of Expectations

11:30-12:00 Introduction to the Course

12:00-1:00 Lunch

1:00-3:00 **Session 1: Introduction to Coastal Ecosystem and Reef Fisheries**

- *Habitats of the coastal zone*
- *Mechanisms for exchange of benefits among ecosystems*
- *Food chains and food webs*
- *Reef ecology and biodiversity*
- *Reef fisheries: reproductive biology and recruitment*
- *Threats to habitats of the coastal zone*

3:00-4:00 **Session 2: Introduction to Coastal Resource Management**

- *Definition of CRM*
- *Components of CRM*
- *Objectives and Strategies of CRM (MPA as one of the strategies)*
- *Role of LGUs and other stakeholders in various phases of CRM implementation*

4:00-5:30 **Session 3: Marine Protected Area: A Strategy for Managing Habitats and Fisheries**

- *Definition and categories (IUCN, NIPAS, Fisheries Code)*
- *Brief history of MPAs in the Philippines*
- *Purpose and benefits of Marine Protected Areas*
- *Attributes of a good MPA (social and technical)*
- *Factors of the success of MPAs*
- *Lessons learned and recommendations on MPAs*

Day Two

8:00-10:00 **Session 4: MPA Establishment and Management Process and Community Organizing**

- *Phases and activities in MPA establishment and management*

Pre-establishment

*Planning and zoning
Implementation and enforcement
Monitoring and evaluation*



10:00-12:00 **Session 5: IEC Strategies in MPA Establishment and Management**

- *Stakeholder analysis*
- *IEC in MPA establishment and management*

12:00-1:00 Lunch

1:00-3:00 **Session 6: Resource Mapping and Baseline Data Collection**

- *Criteria for site selection*
- *Size and Shape of MPAs*
- *Techniques in;*
 Resource Mapping
 Using PCRA results and
 Manta Tow Techniques
 Baseline data collection (land- and sea-based)
- *Community involvement in various pre-establishment activities*

3:00-5:00 **Session 7: MPA Planning and Zoning**

- *Basic concepts and considerations in planning (participation, partnership, etc.)*
- *Importance of a MPA management plan*
- *MPA management objectives*
- *Minimum contents MPA establishment and management plan*
- *Delineating zones*
- *Zoning schemes and regulatory mechanisms*
- *Kinds and uses of buoys*
- *Buoy installation*

Day Three

8:00-10:00 **Session 8: Local Legislation and Enforcement Schemes**

- *Importance of legislative support in MPA establishment and management*
- *Review of the local legislative process in formulating an ordinance declaring a community-based MPA*
- *Minimum contents of an ordinance declaring MPA*

10:00-12:00 **Session 9: Revenue Generation, and Budgeting**

- *Initial investment costs*
- *Recurrent costs*
- *Expected revenues*
- *Cases for revenue generation in MPA*

12:00-1:00 Lunch

1:00-3:00 **Session 10: Monitoring and Evaluation of MPAs**

- *Concept of Monitoring*
- *Various techniques in M&E*



Session	Guide
3:00-5:00	Briefing for field exercises and materials preparation
<i>Day Four</i>	
8:00-5:00	FIELD EXERCISE <ul style="list-style-type: none"><i>The participants (in two groups) will conduct and/or demonstrate the following:</i> Resource mapping and socio-economic data collection (land-based activity) Manta tow and fish visual census (sea-based activity)<i>Processing of field experiences</i>
<i>Day Five</i>	
8:00-12:00	WORKSHOP <ul style="list-style-type: none"><i>The participants (of two groups) will process the data and draft a management plan</i>
12:00-1:00	Lunch
1:30-3:00	Plan Presentation (by group)
3:00-4:00	Processing and Synthesis
4:00-5:00	Closing Program



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Marine Protected Area Establishment and Management

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SESSION

OBJECTIVES

1.0 Coastal Ecosystem and Reef Fisheries

At the end of the session, participants will be able to:

- ◆ describe biological processes in coastal zone particularly the inter-relatedness between and among habitats
- ◆ explain some aspects of the biology and ecology of coral reef,
- ◆ discuss the issues (causes and effects) of habitat degradation and the need for management

IMPORTANCE

Basic knowledge on the biological processes in the coastal zone and the understanding of the interconnectedness of the ecosystems is vital in establishment and management of marine protected areas.

METHODOLOGY

Group Activity; Lecture

TIME

2 hours

MATERIALS & EQUIPMENT

Idea Cards, Manila paper, Markers, Masking tape, Overheads, Overhead projector, Slide projector, Screen

HANDOUTS & READING MATERIALS

- Philippine Coastal Management Guidebook Series # 5
- The values of Philippine Coastal Resources: Why Protection and Management are Critical



TRAINING SESSION 1.0

CONTENT AND ACTIVITY PLAN



20 minutes

Group Activity on Definition of Ecosystem

Break the participants up into groups and refresh their knowledge on coastal ecosystem. Ask the groups to consider:

- ◆ *what is an ecosystem/habitat?*
- ◆ *how do different habitats link together?*
- ◆ *how do humans affect habitats?*

Write down their ideas on overhead transparency. These ideas will be considered again after the presentation.



1 hour

Presentation on Critical Habitats

Recall the common tropical coastal ecosystems. Zero in on the characteristics and nature of coastal and marine environment. Emphasize the following points;

- ◆ *seawater facilitates reproduction through the spread of gametes and larvae as well as transport of food and other life essentials (nutrients, gases) to and from other places (give sample life cycle of organisms e.g. shrimp, etc., and detritus food chain, food web),*
- ◆ *open system character of coastal and marine environment is vulnerable to pollutants and infestations (refer to group outputs on some pollutants affecting marine organisms),*
- ◆ *uses of and threats to coastal habitats and the need for management interventions (i.e. marine protected area)*

Lecture outline may include:

- ◆ *Units of ecosystems*
- ◆ *Coastal habitats (mangrove, seagrass, coral reefs)*
- ◆ *Mechanisms for exchange of benefits among ecosystems*
- ◆ *Nature of seawater*
- ◆ *Reproduction cycle of marine organisms*
- ◆ *Detritus food chain*
- ◆ *Food web*
- ◆ *Reef ecology and biodiversity*
- ◆ *Reef fisheries: reproductive biology and recruitment*
- ◆ *Effects of pollutants to marine organisms*



- ◆ *Typical uses of various coastal and marine habitat*
- ◆ *Human Impacts on Philippine Coastal Environments*



30 minutes

Briefing on the Situationer

Present the current ecological situation in the Philippines with respect to coastal resources. If possible, also give a briefing regarding the state of resources at that particular training site (i.e. at the provincial or municipal level), to give them an idea how they are linked to the bigger Philippine scenario. Refer them to handouts for further reading. Use the outline below for the presentation of the status.

- ◆ *The Philippine Coastline*
- ◆ *Fisheries in Decline*
- ◆ *Mangroves in Trouble*
- ◆ *Lost Reefs*
- ◆ *Marine Pollution*



10 minutes

Summary

Summarize the concepts discussed under this session by drawing out ideas of the participants on the following points:

- *key biological processes in the coastal zone and ecosystem*
- *human activities which have negative impacts on coastal zone*



HANDOUT #1.0

Relationship of Mangrove, Seagrass and Coral Reef Ecosystem

(by: Ben Gonzales)

1. Physical interactions

Seagrasses and mangroves are highly dependent on the hydrodynamic barrier created by coral reef, which reduce wave energy. The growth of seagrasses is enhanced when these barrier are present.

Coral reefs are active producers of carbonate materials. Large amounts of these materials are broken down and washed ashore. These materials form shoals, and islands that may be eventually colonized by seagrasses and mangroves.

Seagrasses on the other hand, trap and stabilize sediments, which is important to coral reefs. Trapping and stabilizing sediments reduces sediment load that could cover the reefs particularly when there is typhoon.

Mangroves act as a depositional basin and are effective binders of sediments. As a result, the sediment load into the coastal waters is reduced. They also reduce the freshwater inflow into the marine environment.

2. Nutrient Transport

Inorganic nutrients particularly phosphorus and nitrogen are essential to the primary producers in the three ecosystems. However, their requirement varies. Mangroves can tolerate a high nutrient input. Seagrasses tolerate high rates of eutrophication. Coral reefs recycle nutrients and do not tolerate large influxes from other sources. Corals grow best in low nutrient areas.

Mangrove and seagrass ecosystems export nutrients as dissolved and particulate organic matter that nourish some coral reef organisms.

3. Animal Migration

There are two types of migration that exist in these ecosystems. These are:

- a. Short term feeding migration - this is exhibited by animals such as turtles, grunt, and snappers that feed on seagrasses and mangroves during the day and return to coral reefs during the night for shelter.



- b. Life history migration between systems this is exhibited by lobster. After spawning, lobster larvae are carried by currents and waves into the shore. The larvae settle among the roots of mangroves and in seagrass beds. As juveniles grow, they move back to coral reefs, where they generally hide during the day and emerge at night to feed.

4. Human Impact

a. Mangrove

In case of riverine mangroves, destruction will allow terrigenous sediments to flow onto seagrass beds and coral reefs. There will be an excessive outflow of sediments that will cause shading and eutrophication.

b. Seagrass

Sediments may become unstable with removal of seagrasses. This has deleterious effects on coral reefs, mangroves and adjacent seagrass beds.

c. Coral Reefs

Actual removal of the reef framework will lower protection from wave energy and allow erosion of sediments from the coastal zones.

BIOLOGY OF CORALS

ORIGIN OF ATOLL

- Fringing Reef
- Barrier Reef
- Atoll

FOOD

- Organic nutrient excreted by zooxanthellae and from their prey. (Algae supply 98% food to corals)
- Inorganic nutrients adsorb from the sea and food captured by coral polyps and zooxanthellae (phosphates, nitrates, iron)



GROWTH

- Corals thrive best in depths 0-20m. They are rarely found > 40m. The maximum water temp. is 35° C and minimum is about 20° C.
- Massive reef structures are built over thousands of years by tiny coral polyps aided by minute dinoflagellate algae (zooxanthellae) that live their tissues, calcifying algae, and other organisms that secrete calcium carbonate and adhesives. This process of reef formation is heavily dependent upon photosynthesis by these reef-building organisms.
- Acropora (*A. hyacinthus*) can grow 10 cm/yr.; branching colonies of staghorn, 15 cm/yr. Massive Colonies (8m in height are nearly 1000 years old) and grow only 1-3 cm/year

REPRODUCTION

- Asexual duplication or sexual reproduction
- Individual polyp bail-out and develop into new colony
- Daughter polyp develop when stress (in *Fungia*)
- Corals having gonads of both sexes may fertilize themselves
- Male release sperm to females for internal fertilization
- Male and female gonads are released for external fertilization

TERRITORIALITY AND AGGRESSION

- Corals attack one another during nighttime when tentacles are extended.
- Other corals are fast growing but vulnerable to the effects of storms or boring organisms. - branching, soft corals



ENEMIES OF CORAL

- Crown-of-thorns starfish, avoids massive colonies (Porites, Diploastrea)
- Gastropod (Drupella etc.)
- Boring organisms, mussel and peacock worm.
- Fishes are greatest predator, scraping, and biting off. 1/3 of annual growth of coral colony consumed by fishes.
- Coral fishes: parrot fish, scraping and biting off coral; butterfly fish eat coral polyps; and puffer fish, boxfish, gobies, and some damsel fishes eat invertebrates.
- Human activities: sedimentation, coral collection, dynamite fishing, anchoring, gleaning, tourism, cyanide fishing, etc.
- Disease called coral bleaching, algae being expelled or die off, turning corals into white.

CORAL COMMUNITY

COMPETITION WITHIN THE COMMUNITY

- Sessile coral-reef organism must compete for space.
- Corals compete for space by overgrowing or directly attacking their neighbors. Sweeper tentacles are used to sting neighboring colonies
- Soft corals are important competitors for space on reefs. They can grow rapidly and are resistant to predators and can occasionally move about.
- Competition on fish species. They have similar diets on corals, algae, and carnivore.
- Corals and seaweeds compete for light as well.



PREDATION

- The crown-of-thorns
 - most prominent predator
 - attacked Great Barrier Reef in 1960s and 1980s
 - increase in numbers of larvae have been correlated with rainfall and increase in nutrients from rivers during floods
 - human induced activity may be the collection of predator shells, forest clearing and, fertilizing crops.

GRAZING

- Grazers help prevent fast-growing seaweeds from overgrowing other sessile organism on the reef.

LIVING TOGETHER

- Symbiotic relationships are very important in coral reef communities. Coral reefs have more examples of symbiosis than any other biological communities:
 - corals and zooxanthellae
 - giant clams, sea anemones and snails also have zooxanthellae
 - sponges and cyanobacteria
 - parasites, commensals and mutualist
 - commensalism between corals and crabs, shrimps (40 species), shells, fishes
 - sea anemone and anemone/clownfish

PATTERNS OF FISH MOVEMENT AND DISPERSAL**1. Fish Habitats, Coastal Region**

- About 80% of the 10,000 or so fish species in the shallow seas live in warm temperate or tropical waters most associated with coral reefs and atolls, where water temperature doesn't fall below 18°C. Coral reefs are distributed between 30° North and 30° South latitude.
- At night, squirrelfishes, luminescent pempherids emerge from daytime hiding places, while parrotfish retires to sleep in mucous cocoon.
- Camouflage ambush predators also exist in the coral reefs.



2. Temporal Patterns of Fish Movement

a) Diel Cycle

- Shallow warm water with photoperiods in which the length of day and night are similar and the transition between the two is rapid. This transition is accompanied by change in assemblage of active species.
- Daytime colored species (damsel, parrot) stay close to the reef. Herbivores are generally diurnal species.
- Squirrel fishes and sweepers are nocturnal feeding on zooplankton.
- As sunset approaches diurnal fishes make vertical or horizontal movement from feeding areas to shelter.
- 20 minutes transition period before nocturnal species swim to their feeding areas. Piscevore has visual advantage.

b) Tidal Cycle

- Photoperiod of high activity coincide with the predicted times of high tide.
- Adaptation to an intertidal life is the ability to find shelter because of the

3. Patterns of Movement and Use of Space

a. Shoaling

- Shoaling for social reasons, schooling for swimming migration, aggregating responding to environmental cue (temperature, current)
- Shoaling for foraging, protection, from predator, accuracy of migration to suitable area/habitat.



- b. Habitat Selection * Stimuli: presence of substratum, cover, food, suitable depth of water.
 - Existence of same species at different life stages in the same habitat.
 - Difference species living in same habitat.

- c. Territoriality and home ranges
 - Territoriality breaks down when there is high density of intruders.

- d. Directional Movement
 - When feeding fish move from site to site, resulting to weak directional movement.
 - Fish has strong directional movements when going to and from spawning grounds.

- e. Migration
 - Movement to suitable habitats at appropriate times during the life span
 - reproduction
 - feeding
 - refuge/shelter
 - Complex if habitats suitable for feeding or refuge are different at different stages in the life cycle.

 - Grunts (Haemulidae) refuge on coral reef and prey in sandy or seagrass beds.
 - Transplanted individual learns patterns from local residence.



3. Larval Dispersal

- Planktonic larval stages of benthic adults do serve as their dispersal strategy.
 - non-feeding larvae has food stored in yolk form.
 - Basically the probability of finding an appropriate place to settle will decrease with distance travelled
- If parents have survived to breeding age in a given area, then that region can be regarded as of guaranteed suitable for the offspring
- The longer these tiny organism spend in the water dispensing, the greater the change being consumed by the predator, thus more must be produced to counter balance such losses
- Tidal and wind driven current carries planktonic larvae
- Dispersal of lobster larvae of Australia

The Relationship Between Length of Marine Planktonic Larval Life and the Distance likely to be Transported Away from the Point of Release (Crisp, 1978)

<u>Duration</u>	<u>Approximate Distance Transported (km)</u>
3-6 hrs.	0.1
1-2 days	1.0
1-2 weeks	10.0
0.5-3 months	100.0
1 year	1000.0



Benefits of Openness (1994, UNEP)

Transport of gametes and larvae

- One of most important connections between marine habitats involves the transport of gametes (=microscopic eggs and sperm) and larvae (=bizarre, usually microscopic, immature forms of most marine organisms). For most organisms, gametes and/or larvae are planktonic.
- Most organisms release thousands to millions of gametes into the water column. For organisms with a free-living larval stage (either because of direct development from egg to juvenile or because of brooding sperm enters a nearby adult and fertilizes the egg within the body of that adult).
- Many species of corals release buoyant gametes. Larval development to the juvenile form takes several days. The larvae is likely to be dispersed away from the parent reef and that new corals on one reef must come mainly from other reefs. Because of this, the reef depends on each other for a continued supply of larvae. Therefore, individual reefs can not be managed appropriately in isolation. Whether coral disperses a long or short distance, may depend on the species, current patterns or other factors prevailing when spawning occurs.

Transport of food, nutrients and gases

- Most sessile and many mobile marine organisms are planktivorous. Sessile organisms must wait for food and nutrients to be brought to them. When plankton and larger organisms die and begin to decompose, this material is also carried in seawater and is consumed by other organisms. Very little is wasted in marine environments. Decomposing bits of plants and animals (detritus), is a major constituent of diets in many food webs.
- Nutrients (e.g. nitrogen, phosphorus, calcium, silica, and carbonate) and life sustaining gases (e.g. oxygen and carbon dioxide) are transported in particulate or dissolved form in seawater.
- Most marine organisms are well adapted to surviving on low concentrations of nutrients characteristic of most marine environments; but currents allow what little there is to be distributed more or less evenly among marine communities.



- Major natural inputs to the marine environment include rivers and the recycling of nutrients released when organisms die and decompose.

Hazards of Openness

Transport of pollutants and contaminants

- Like larvae and nutrients, pollutants and toxins are easily spread by currents tens to hundreds of kilometers away.
- Spills can spread over the ocean surface, throughout the water column and/or over benthos, i.e. spread in 3 dimensions.
- Contaminants can also be spread by mobile organisms, especially marine ones which usually travel further relative to body size.
- Interconnectedness of marine habitats resulting from transporting properties of sea water makes the marine environment especially vulnerable to pollution.
- Epidemics of noxious or pest organisms e.g. crown-of-thorn starfish.

Threats of Man's Uses of the Marine Environment

- Overexploitation - removal of resources faster than they can be replaced naturally or artificially
- Destructive techniques of usage - destruction of habitat essential to growth, survival and reproduction of resource or destruction of non-targeted species or juveniles of desired species (e.g. explosive fishing, trawling close to reefs, fish "driving", etc.)
- Pollution

Sewage/detergents - interfere with physiological processes, i.e. biochemical reactions inside organisms allowing them to feed, grow, reproduce, respond to change and hence survive.



Sewage/fertilizers and other nutrient-rich wastes - stimulate growth of phytoplankton, algae and other plants beyond ability of herbivores to keep them in balance (Eutrophication). These phytoplankton "blooms" often followed by blooms of zooplankton. These, plus increased bacterial production breaking down dead planktonic organisms, can deplete available oxygen in water. Algae can overgrow and smother corals and other sessile organisms.

Sediments/turbidity - excess sediment directly smothers sessile organisms, preventing them from feeding and breathing normally. Increased turbidity (i.e. increased "cloudiness" of water) reduces light penetration and thus ability to photosynthesis.

Herbicides - Damage or destroy zooxanthellae living in tissues of corals, giant clams and other sessile organisms, thus cutting off means by which these animals obtain significant proportion of food. Also damage or kill free-living phytoplankton, algae, seagrasses, even at very low concentration.

Pesticides - Particularly harmful to planktonic larvae. May also destroy or damage other zooplankton or reef communities. Interferes with normal physiological processes.

Petroleum hydrocarbons - Wide range of damaging effects on survival, growth, reproduction, photosynthesis, cell structure, larval settlement, feeding and behavior of marine organisms. Contact poisons physiological processes

Direct coating clogs breathing organs in plants and animals and, in sunny conditions, raises body temperature of affected organisms. Coating on water or sediment raises temperature up to 10°C "cooking" organism.

Larvae of marine invertebrates 10-100x more vulnerable than adults.

Many factors affect nature and magnitude of damage: type and amount of oil spilled, prevailing weather and current conditions, state of tide, type of organisms contacting oil, types of detergents and dispersants used to clean up spill, and interaction with other pollutants.

Heated water from power-plants - since temperature critical factor in distribution, reproduction and other physiological processes, thermal pollution changes overall ecology and nature of communities.



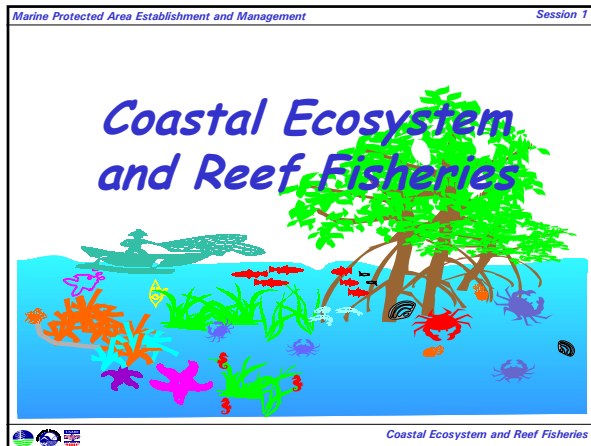
Hypersaline waste water from desalination plants - Salinity is another critical factor in organization and survival of marine communities. Effects of hypersaline waste water similar to effects from heated waste water.

Heavy metals (e.g. mercury, cadmium, lead) - tend to be accumulated in plant and animal tissues, with severe effects on physiology of sessile and mobile species. Heavy metals passed on up food chain to large predators, which may accumulate dangerous or lethal concentrations to man.

Anti-fouling points and agents - likely to be important only near major harbors, shipping lanes and industrial plants cooled by seawater. Destroy or damage zooplankton and reef communities.



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Ecology (Environmental Biology)

The study of inter-relations of organisms or groups of organisms and their relationships with the non-living environment.

Ecosystem

Ecosystem is the basic functional unit of ecology in which both the biotic communities and the abiotic environment are inseparably connected and interact maintaining the equilibrium necessary for life.

Abiotic Biotic

Coastal Ecosystem and Reef Fisheries

Marine Protected Area Establishment and Management Session 1

Units of Ecosystems

Abiotic substances <ul style="list-style-type: none">• organic• inorganic	Decomposers <ul style="list-style-type: none">• saprobic - fungi• parasitic - bacteria
Producers (autotrophs) <ul style="list-style-type: none">• plants	
Consumers (heterotrophs) <ul style="list-style-type: none">• primary consumers - herbivores• secondary consumers - carnivores• tertiary consumers - predatory animals	

Coastal Ecosystem and Reef Fisheries



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Marine Protected Area Establishment and Management Session 1

Important Coastal Ecosystems and Habitats

The various ecosystems are interconnected, each plays a critical role in maintaining the viability and health of the entire coastal zone as the other ecosystems.

Coastal Ecosystem and Reef Fisheries

Marine Protected Area Establishment and Management Session 1

The Hydrologic Cycle

The Hydrologic or Water Cycle is the passage of water through earth's natural systems. As it passes over the ground, water collect sediments, nutrients, toxic compounds, trash and heat.

Coastal Ecosystem and Reef Fisheries

Marine Protected Area Establishment and Management Session 1

Freshwater Entrains Saltwater to Enhance Mixing in an Estuary

The mixing of freshwater and saltwater provides an inward flow of nutrients-rich water that promotes growth of estuarine primary producers.

Coastal Ecosystem and Reef Fisheries



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Marine Protected Area Establishment and Management *Session 1*

The Food Chain or Food Web of the Coastal Ecosystem

A Food Chain refers to the transfer of food energy from plants (primary producers) through a series of organisms eating one another.

Coastal Ecosystem and Reef Fisheries

Marine Protected Area Establishment and Management *Session 1*

Mangroves

Mangroves are salt tolerant, woody, seed-bearing plants ranging in size from small shrubs to tall trees. They occur along sheltered intertidal coastlines and in association with estuaries and lagoons. Although mangroves occur on saline soils they have the usual plant requirements of freshwater, nutrients, and oxygen.

Coastal Ecosystem and Reef Fisheries

Marine Protected Area Establishment and Management *Session 1*

Mangroves and their Ecological and Economic Benefits

Benefits to humans:

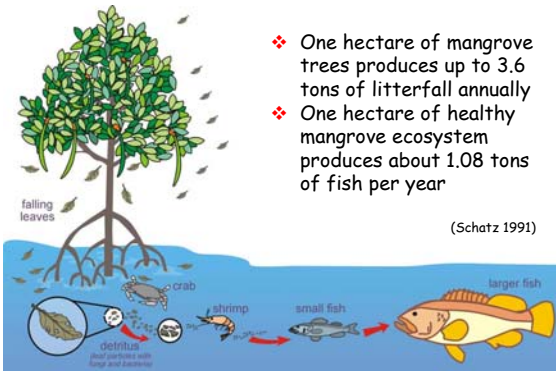
- Clean water
- Fish, shellfish, mollusks, etc.
- Medicines
- Tannins
- Wood (fuel and construction)
- Honey
- Alcohol
- Shore protection
- Research data
- Education
- Recreation/tourism
- Biodiversity

Coastal Ecosystem and Reef Fisheries



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Marine Protected Area Establishment and Management Session 1



- ❖ One hectare of mangrove trees produces up to 3.6 tons of litterfall annually
- ❖ One hectare of healthy mangrove ecosystem produces about 1.08 tons of fish per year


(Schatz 1991)

Coastal Ecosystem and Reef Fisheries

Marine Protected Area Establishment and Management Session 1

Seagrass Beds

Seagrass beds are composed of rooted, seed-bearing, marine plants (halophytes). They occur in shallow, nearshore coastal waters that are sheltered from high wave energy, and in estuaries and lagoons. The seagrasses epiphytes and the abundant detritus found in seagrass beds together comprise a highly productive habitat that supports a large quantity of commercially important organisms.

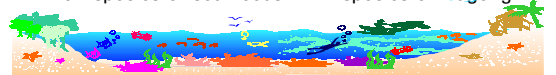


Coastal Ecosystem and Reef Fisheries

Marine Protected Area Establishment and Management Session 1

Seagrass

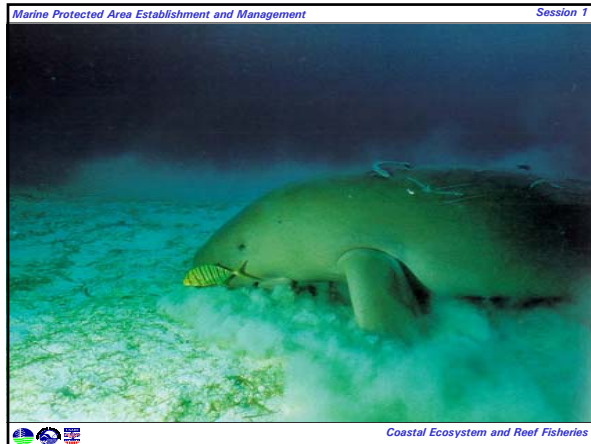
- Seagrass beds harbor a rich assemblage of marine organisms that all contribute to the important role of seagrasses in the marine ecosystem
- Seagrass beds support at least:
 - 172 species of fish
 - 45 species of algal epiphytes
 - 46 species of invertebrate
 - 1 species of sea turtle
 - 51 species of seaweeds
 - 1 species of Dugong

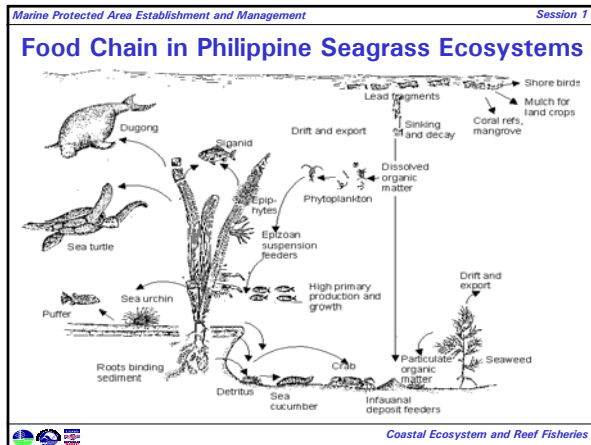


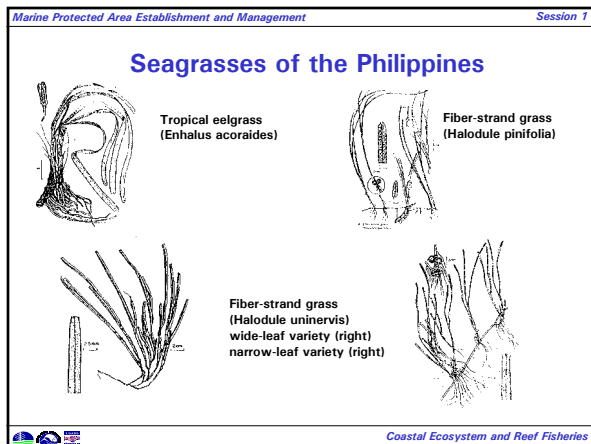
Coastal Ecosystem and Reef Fisheries



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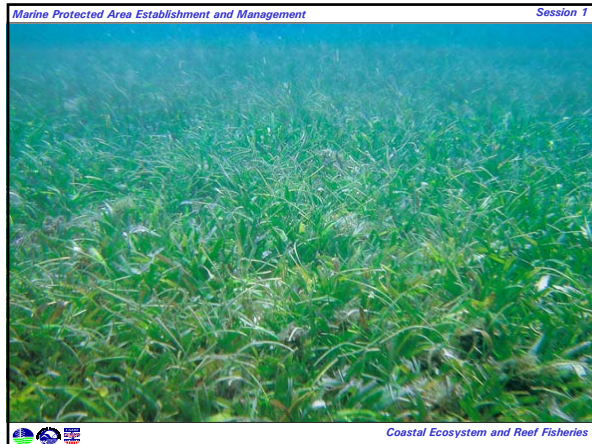









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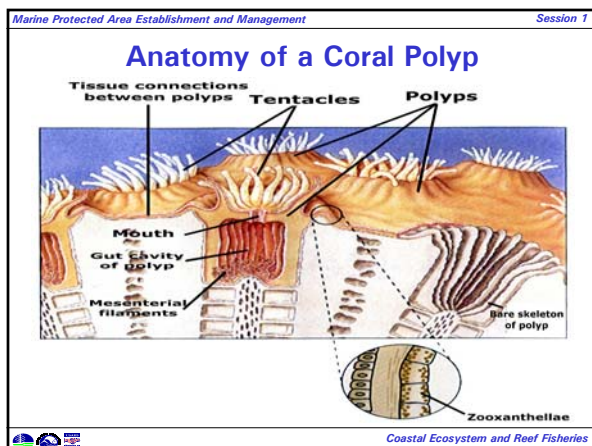
Coral Reefs

Coral reefs consist of a large rigid structural mass of calcium carbonate formed by the cemented skeletal remains resulting from the successive growth and development of hermatypic corals. Coralline algae also contribute to the structural foundation of the reef. The corals constitute the more important component since they give vivid color and impressive three dimensional form to the reef.



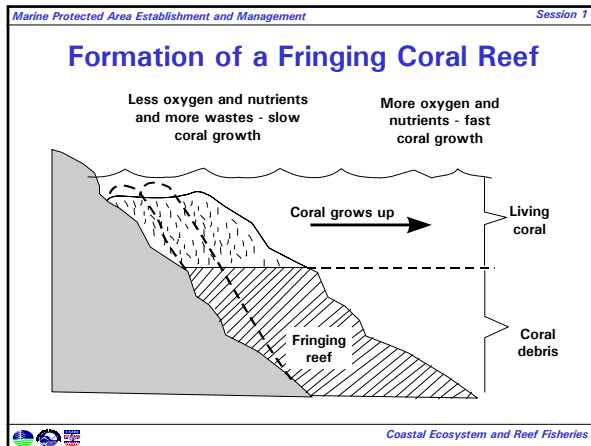
Coastal Ecosystem and Reef Fisheries

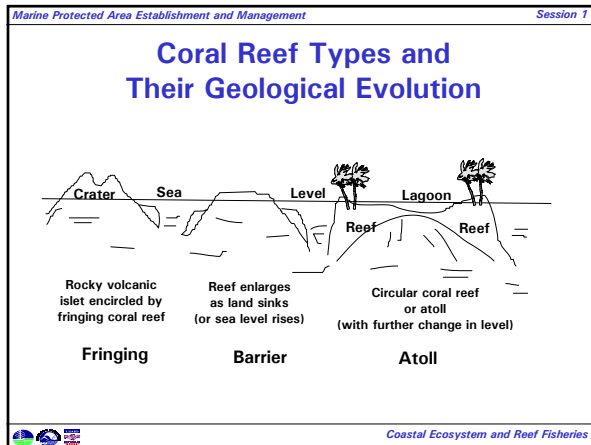
The photograph shows a vibrant coral reef. Various types of corals are visible, including branching and table corals. The colors are bright and diverse, ranging from oranges and yellows to greens and blues. Small fish can be seen swimming around the reef.

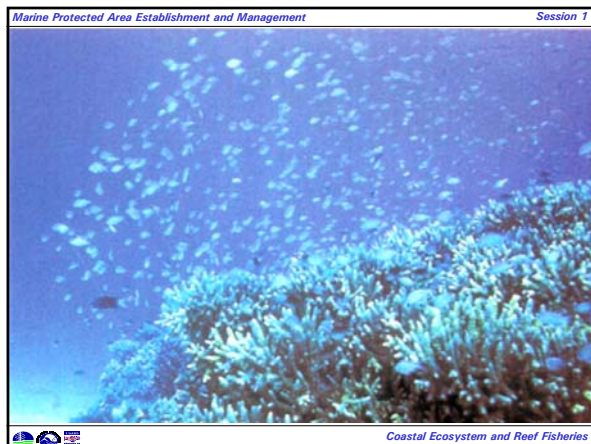




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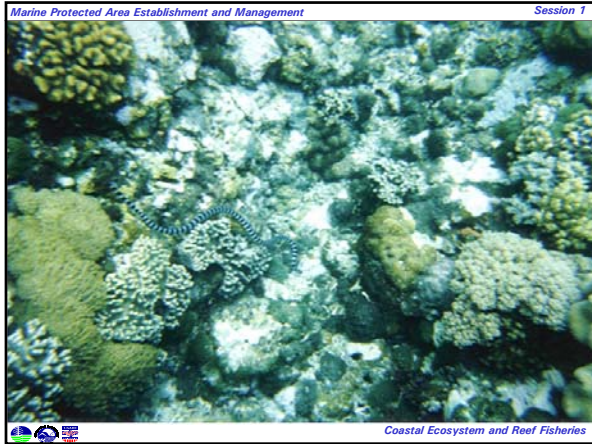








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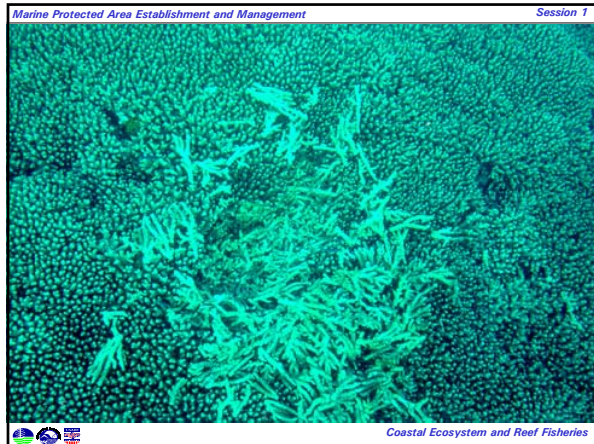








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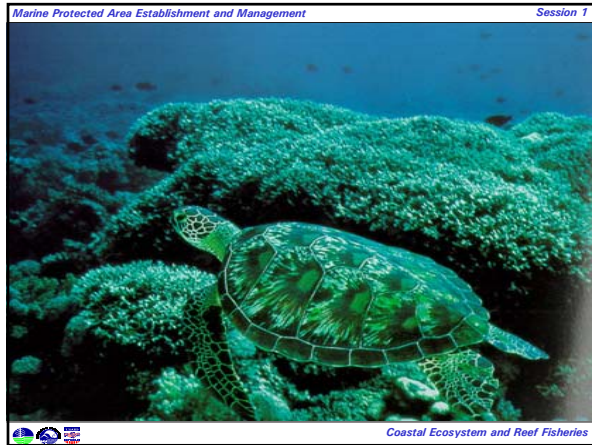


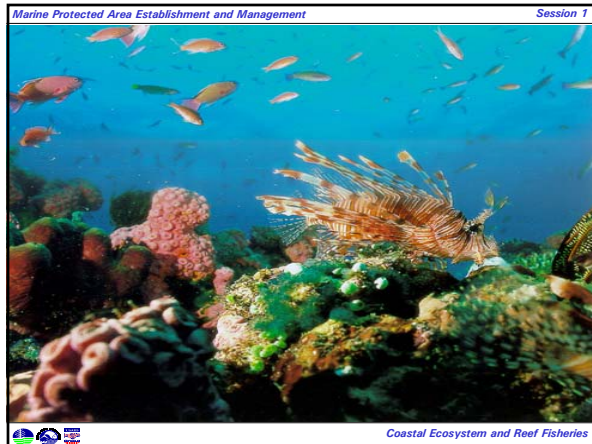
Marine Protected Area Establishment and Management

Session 1

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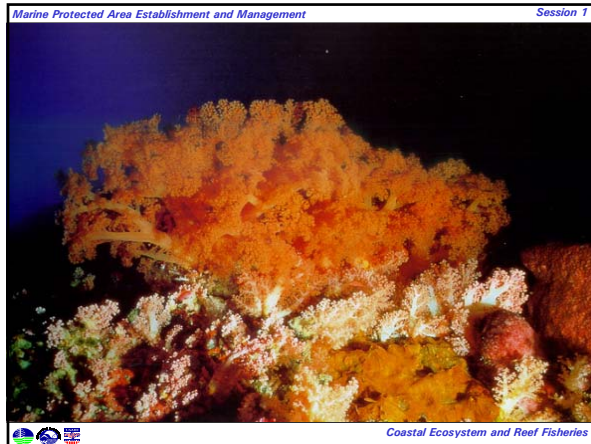


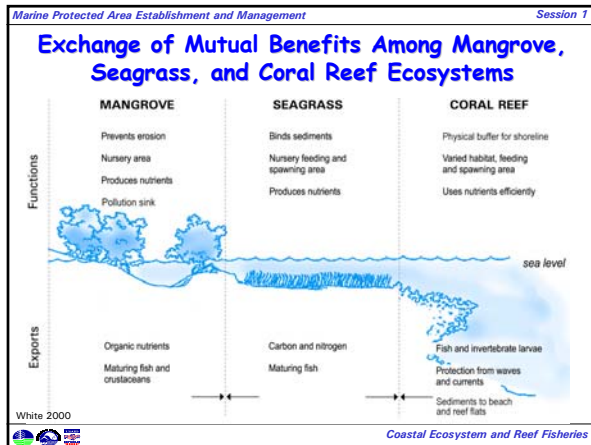






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Marine Protected Area Establishment and Management Session 1

Watershed

A watershed is any area of land draining water, sediment and dissolved materials to a common outlet at some point along a drainage canal. It extends from the uplands to the coast. The flow of water defines the boundaries of a watershed and defines the condition of a watershed through river sediment load and flooding.

Any number of watersheds can be defined in a landscape varying in size from several hectares to thousands of square kilometers. The smallest watersheds are sometimes referred to as *micro-watersheds*, while the largest are *macro-watersheds*.

Coastal Ecosystem and Reef Fisheries



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Marine Protected Area Establishment and Management Session 1

Micro-watershed Area

Coastal Ecosystem and Reef Fisheries

Marine Protected Area Establishment and Management Session 1

Settlements

The shoreline is in increasingly strong demand for human settlements, agriculture, trade, industry, amenity and marine activities such as shipping, fishing boats and recreational marinas.

Coastal Ecosystem and Reef Fisheries

Marine Protected Area Establishment and Management Session 1

Mangroves in Trouble

- Mangrove forests in the Philippines have shrunk primarily as a result of fishpond development
- Poor management and unsustainable aquaculture practices have resulted in low yields from fishponds
- Natural production from mangroves, which contributes some 670 kg of fish per hectare of mangrove per year has proven more cost effective and sustainable than aquaculture production

Year	Thousands of hectares
1918	450,000
1970	288,000
1980	175,000
1988	140,000
1995	138,000
2030 (Projected)	< 100,000

Coastal Ecosystem and Reef Fisheries



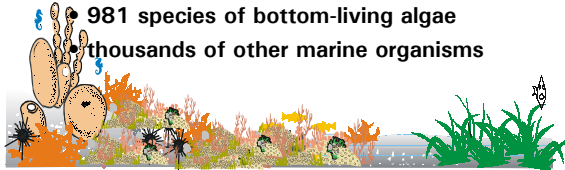
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Marine Protected Area Establishment and Management Session 1

Rich Reefs

Philippine coral reefs host:

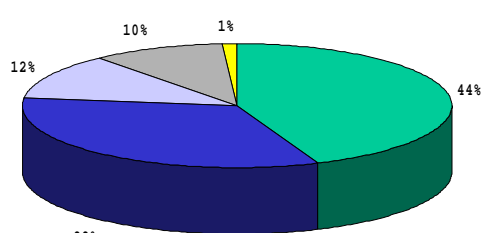
- more than 2,000 species of fish
- 5,000 species of clams, snails and other molluscs
- 488 species of corals
- 981 species of bottom-living algae
- thousands of other marine organisms



Coastal Ecosystem and Reef Fisheries

Marine Protected Area Establishment and Management Session 1

Marine Pollution




Source	Percentage
Runoff and discharges from land	44%
Airborne emissions from land	33%
Shipping and accidental spills	12%
Ocean dumping	10%
Offshore mining and oil and gas drilling	1%

Coastal Ecosystem and Reef Fisheries

Marine Protected Area Establishment and Management Session 1

Dwindling Global Supply of Fish

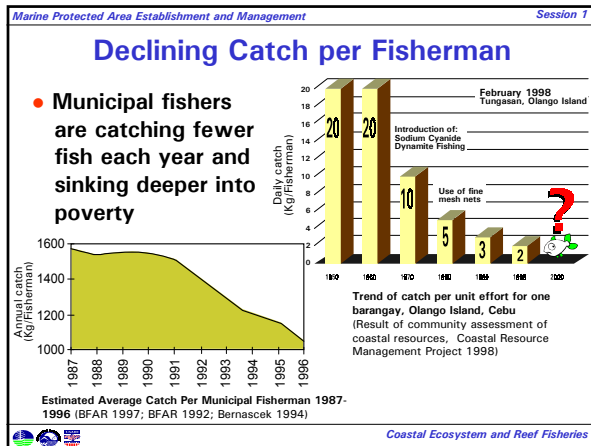
- Global catch of ocean life peaked at 90 million tons in 1989
- Over 60 percent of the world's 200 main fish stocks are fully exploited, overexploited, or depleted
- 11 of the world's 15 major fishing grounds have reached, or even exceeded maximum sustainable yields



Coastal Ecosystem and Reef Fisheries



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SESSION**OBJECTIVES****IMPORTANCE****METHODOLOGY****TIME****MATERIALS & EQUIPMENT****HANDOUTS & READING MATERIALS****2.0 INTRODUCTION TO COASTAL RESOURCE MANAGEMENT**

At the end of the session, participants will be able to:

- ◆ explain the rationale of CRM as a basic service of local governments,
- ◆ answer basic questions on the concept of CRM and identify the major characteristics,
- ◆ define the unit of CRM and enumerate the goods and services derived from the coastal area
- ◆ describe the development and implementation of CRM plans,
- ◆ relate various coastal management activities (with emphasis on MPAs) to the framework of CRM as basic service of local governments

Basic understanding of the concepts of CRM allows the participants to relate marine protected areas (importance and function) to the overall scheme of coastal management.

Small Group Activity; Lecture

2 hours

Idea Cards, Manila paper, Markers, Masking tape, Overheads, Overhead projector, Screen

- Philippine Coastal Management Guidebook Series # 1 (Definitions and trends in coastal management; and introduction to the coastal management process in the Philippines)
- Coastal Resource Management For Food Security



TRAINING SESSION 2.0

CONTENT AND ACTIVITY PLAN



20 minutes

Group Activity on the Concept of CRM

Introduce the session to the participants. Start by asking the participants to recall their understanding of CRM. List the key words/ideas down on a manila paper. Present the definition and elaborate this by relating their ideas to the concept of CRM. The presentation may follow this outline:

- ◆ *define coastal resource management*
- ◆ *why is coastal resource management necessary?*
- ◆ *coastal environmental management issues*
- ◆ *what are the goals of CRM?*
- ◆ *principles of CRM*
- ◆ *major features of the approach*
- ◆ *basic contents of CRM plan*
- ◆ *characteristics of CRM programs*
- ◆ *objectives and strategies of CRM (MPA as one of the strategies)*



30 minutes

Presentation on ICM as a Basic Service

Go through each of the phases of the CRM process and show examples. Point out that some of these phases are not usually given equal importance during implementation. Zero in the implementation phase including MPA as one of the strategies and components of CRM implementation.

Also present the legal basis that LGUs are in fact mandated to carry out the functions illustrated in the CRM framework. Ask the participants what other legal provisions they know, that support the institutionalization of CRM. Present statistics of LGUs adopting CRM as a basic service and note that very few coastal municipalities thought about adopting CRM as a basic service.

- ◆ *evolution of coastal management*
- ◆ *legal basis of CRM as basic service*
- ◆ *ICM framework and activities (highlight MPA in the cycle)*
- ◆ *institutional arrangements*
- ◆ *key results indicators (highlight MPA as one of the best practices)*
- ◆ *status of LGUs adopting CRM*



- ◆ *what can LGUs do to mainstream CRM*
- ◆ *cases (investments vs. revenues)*



10 minutes

Wrap up

Stress that the LGUs have already sufficient legal mandate to initiate CRM. What may be needed is to put a little more direction and establishment of programs to start establishing the CRM as a basic service of local governments including most especially, the establishment and effective management of marine protected area.



HANDOUT #2

COASTAL RESOURCE MANAGEMENT

WHAT IS CRM?

- ◆ Coastal Resource Management (CRM) is defined as a coherent, multi-sectoral and multi-disciplinary process within a legal and institutional framework that assures equitable involvement and participation from all relevant sectors.
- ◆ CRM combines the bio-physical, socio-economic, cultural and political aspects in the conservation and sustainable use of coastal resources.
- ◆ Coastal Resource Management is a "...dynamic process in which a coordinated strategy is developed and implemented for the allocation of environmental, socio-cultural, and institutional resources to achieve the conservation and sustainable multiple use of the coastal zone."

WHY IS COASTAL RESOURCE MANAGEMENT NECESSARY?

Increasing populations, with advancing technologies, are making increasing demands on shrinking resources

- ◆ 3.5 billion people live in the coastal region (63% of the total global population)
- ◆ impacts on coastal ecosystems increasing
- ◆ ability of coastal ecosystems to provide goods and services decreasing

Coastal ecosystems are a source of food, materials, and income for lower socio-economic groups. If they lose these livelihoods, what will replace them?

- ◆ subsistence activities
- ◆ artisanal fishing
- ◆ small scale mariculture, tourism
- ◆ small scale extractive industry



Nations are planning development in the coastal zone to provide jobs and earn foreign exchange in

- ◆ mariculture
- ◆ tourism
- ◆ industrial developments
- ◆ mineral extraction

WHY IS THIS HAPPENING?

coastal resource management is primarily a governance challenge, and there is traditionally low governance capacity

- ◆ coastal resources are often common property resources
- ◆ little governmental experience in resource management
- ◆ little relationship between laws, technical plans and implementation
- ◆ little commitment to public process
- ◆ lack of constituency or leadership for resource management
- ◆ lack of human capacity to create workable, implementable programs

SIGNIFICANCE OF COASTAL RESOURCES AND REGIONS

existing and new development

- ◆ tourism
- ◆ coastal mariculture
- ◆ nearshore/offshore gas and oil
- ◆ new and intensified industrial development
- ◆ ports
- ◆ coastal mining
- ◆ intensification of fisheries
- ◆ intensification of agriculture
- ◆ new and expanding cities

ecological

- ◆ high productivity
- ◆ high biodiversity
- ◆ mitigation of flooding and erosion



sociocultural

- ◆ food
- ◆ fuel
- ◆ cultural religious sites
- ◆ recreation

INSTITUTIONAL ISSUES IN THE PHILIPPINE COASTAL ZONE

- ◆ weak law enforcement
- ◆ weak judicial support for enforcement
- ◆ inconsistent laws and ordinances
- ◆ lack of capability and knowledge in planning, implementing and monitoring coastal management
- ◆ overlapping functions among government organizations over the implementation of laws relevant to coastal environment
- ◆ lack of political will in implementing coastal resource management programs

GOALS OF CRM

- ◆ Sustainable development of coastal areas
- ◆ Protection and rehabilitation of coastal environments and habitats
- ◆ Clean up of polluted coastal water bodies

MAJOR FEATURES OF THE INTEGRATED APPROACH

- ◆ multi-sectoral, multi-agency and multi-disciplinary
- ◆ creates opportunities to link planning and implementation
- ◆ directs research at questions of direct relevance to resource management
- ◆ involves those affected by management schemes in all phases of the strategy
- ◆ promotes sharing of experiences among resource managers

CHARACTERISTICS OF A CRM PROGRAM



- ◆ has continuity
- ◆ has defined boundaries with both seaward and landward components
- ◆ has institutional identity as ...
 - ◇ an independent organization
 - ◇ or a network of organizations
- ◆ integrates all uses of the coastal zone, including actual and potential
- ◆ is culturally and spiritually responsive
- ◆ is gender sensitive

PRINCIPLES OF CRM

- ◆ holistic, integrated and multi-sectoral in approach
- ◆ consistent with, and integrated into, development plans
- ◆ consistent with the national environmental and fisheries policies
- ◆ must build on, and integrate into, existing institutionalized programs
- ◆ planning and implementation must be participatory
- ◆ builds on local/community capacity for sustained implementation
- ◆ builds self-reliant financing mechanisms for sustained implementation
- ◆ address quality of life issues of local communities as well as conservation issues

OVERALL PROCESS OF CRM

- ◆ identification of major issues
- ◆ issues evaluation and prioritization
- ◆ formulation of detailed management plans for selected issues
- ◆ plan adoption
- ◆ plan implementation
- ◆ evaluation and adjustment

COMPONENTS OF A CRM PLAN

- ◆ objectives for management
- ◆ general policies
- ◆ strategies to solve issues
- ◆ actions for each strategy
- ◆ institutional structure for implementation



CHARACTERISTICS OF A GOOD PLAN

- ◆ issue-based
- ◆ realistic management actions
- ◆ definite criteria for decision-making
- ◆ supported by factual data
- ◆ participatory and popular

PLAN FORMULATION

- ◆ What are the needs?
 - ◇ *Identify issues*
- ◆ Which of the needs shall we be able to meet and when?
 - ◇ *Issues evaluation and objective setting*
- ◆ How shall we meet them?
 - ◇ *Strategy formulation*
- ◆ Who is to do what?
 - ◇ *Implementing structure*
- ◆ How can we cope with environmental impacts?
 - ◇ *Evaluation mechanisms*
- ◆ What resources must be developed?
 - ◇ *Resource identification and budgeting*
- ◆ When will the steps be taken?
 - ◇ *Work planning*
- ◆ How do we ensure progress?
 - ◇ *Monitoring schemes*



COASTAL RESOURCE MANAGEMENT (CRM) PLANNING

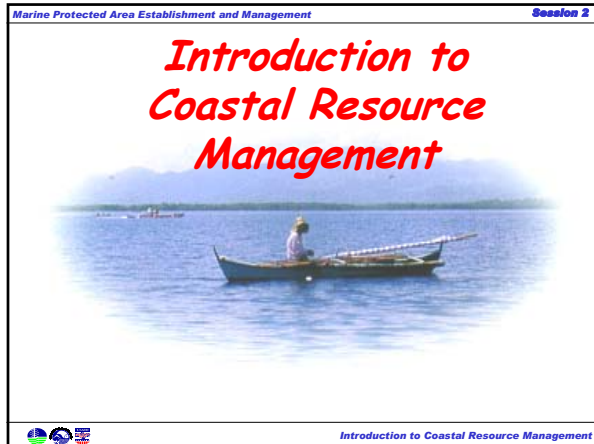
Coastal Resource Management planning is a process of comprehensively studying resources, economic activities, and societal needs, including problems and opportunities in the designated planning area or zone, and proposing future actions. (Clark: 1995). It is a process of organizing ideas and resource to make things happen. Two questions are important to be answered in planning: (1) What do your want to happen: and (2) How do you want it to happen?

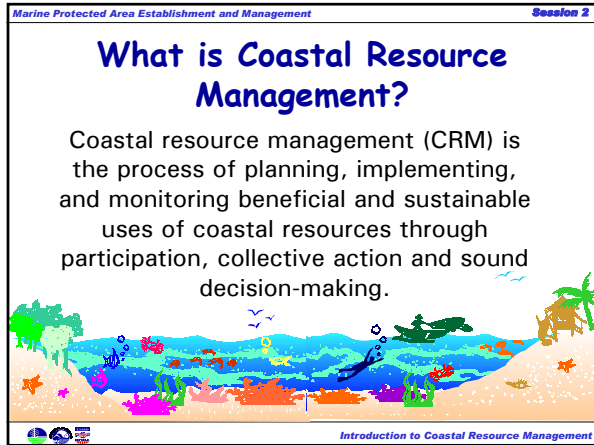
An CRM Plan plan for any area (barangay, municipality or city, multi-municipal wide) requires basic contents to make a good plan. The essential parts of a good plan follow. (White: 1999):

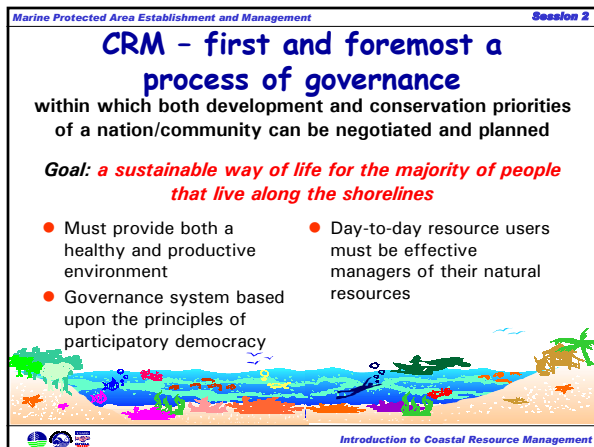
1. **Description of the area** provides background information. This can include geography, demography, important coastal resource and their condition, socio-economic status of the people, institutions and laws and other relevant information for management.
2. **Maps** of different scales needed. Include a map of the entire area and detailed maps of the coastal area with resource locations and use patterns, existing management interventions and other data.
3. **Management issues** must be clearly stated along with their contributing causes and factors. Trends in decline of resources can be used to illustrate issues of concerns.
4. **Goals and objectives** should derive from the main issues. The goal is broad while each objective must be achievable and measurable within 3 to 5 year life of the plan.
5. **Strategies and actions** are the heart of the plan. One strategy and several actions with assigned responsibilities should address each major issue. A strategy is a well-conceived means to solve a problem. The actions implement the strategy. Actions can be budgeted.
6. **Institutional and legal framework** is needed to support plan implementation. This section explains what institution is responsible and why as supported by law.
7. **Timeline** for implementation helps organize all responsible parties to implement the plan.



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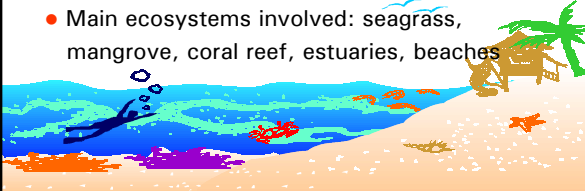


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Marine Protected Area Establishment and Management Session 2

CRM

- Involves both land and sea-based resources
- Involves human behavior in addition to the biophysical environment
- Main ecosystems involved: seagrass, mangrove, coral reef, estuaries, beaches




Introduction to Coastal Resource Management

Marine Protected Area Establishment and Management Session 2

Why Coastal Resource Management?

“Oceans are under increasing stress from pollution, overfishing and degradation. It affects everything from the climate to the coral reefs.”



Agenda 21, Chapter 17

Introduction to Coastal Resource Management

Marine Protected Area Establishment and Management Session 2

Significance of coastal resource and regions

Existing and new development


- > tourism
- > coastal mariculture
- > nearshore/offshore gas and oil
- > new and intensified industrial development
- > ports
- > coastal mining
- > intensification of fisheries
- > intensification of agriculture
- > new and expanding cities

Ecological

- > high productivity
- > high biodiversity
- > mitigation of flooding and erosion

Sociocultural

- > food
- > fuel
- > cultural religious sites
- > recreation



Introduction to Coastal Resource Management



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Marine Protected Area Establishment and Management Session 2

The coastal area also

- Contains the lion's share of infrastructure, industry and tourism
- Absorbs most of the wastes that human activities produce (not a sustainable development)

"The pace at which human beings are altering coastal regions is accelerating and the qualities to make these areas good habitat for people are declining."

USAID Center for Environment



Introduction to Coastal Resource Management

Marine Protected Area Establishment and Management Session 2

Why Philippines should manage coastal resources



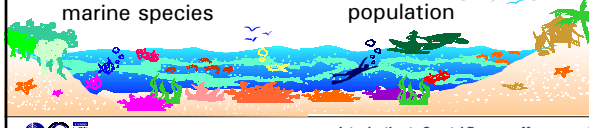
- Richest tropical marine biodiversity region in the world
- Potential high economic values:
 - ◆ coral reefs = \$120,000/km /year
 - ◆ mangroves = \$50,000/km /year
 - ◆ open-water fisheries = \$1,000/km /year
- Source of 50-80% of dietary protein

Introduction to Coastal Resource Management

Marine Protected Area Establishment and Management Session 2

Philippine coastal areas - a life giving resource

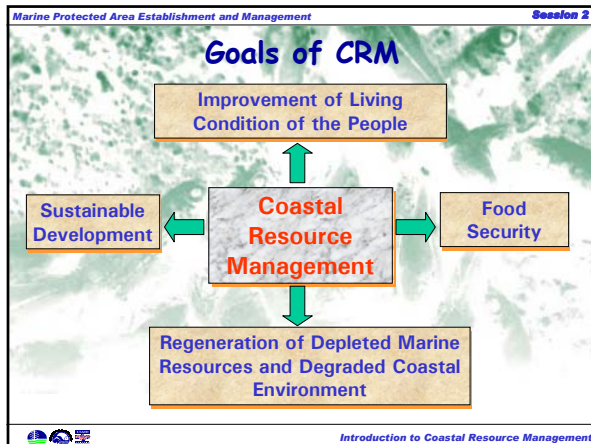
- Coastline stretches to more than 18,000 kms
- Encompasses 27,000 sq kms of coral reefs
- Serves as nursery habitats for many marine species
- Helps moderate the effects of pollution coming from land
- Supports our economy
- Feeds our growing population




Introduction to Coastal Resource Management



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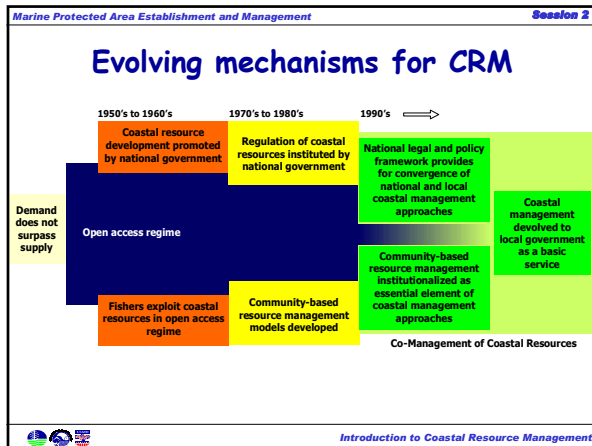


- Marine Protected Area Establishment and Management Session 2
- ### Principles of CRM
- > holistic, integrated and multi-sectoral in approach
 - > consistent with, and integrated into, development plans
 - > consistent with the national environmental and fisheries policies
 - > builds on, and integrate into, existing institutionalized programs
 - > planning and implementation must be participatory
 - > builds on local/community capacity for sustained implementation
 - > builds self-reliant financing mechanisms for sustained implementation
 - > addresses quality of life issues of local communities and conservation
- 
- Introduction to Coastal Resource Management

- Marine Protected Area Establishment and Management Session 2
- ### Major features of integrated approach
- > multi-sectoral, multi-agency and multi-disciplinary
 - > creates opportunities to link planning and implementation
 - > directs research at questions of direct relevance to resource management
 - > involves those affected by management schemes in all phases of the strategy
 - > promotes sharing of experiences among resource managers
- 
- Introduction to Coastal Resource Management



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Comparison of municipal water and land area for coastal municipalities of 3 provinces

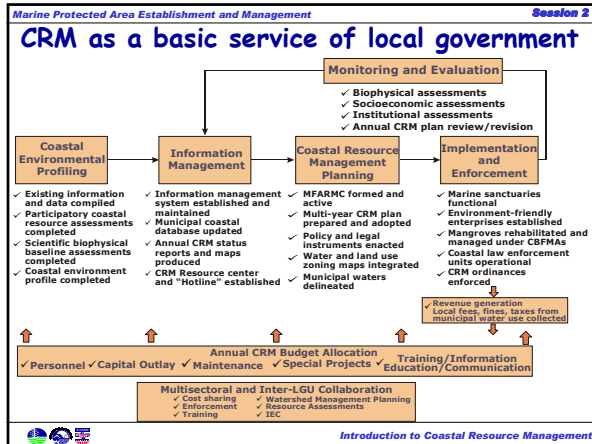
Province	Coastal Municipalities			Shoreline Length (Km) **
	Total Municipal Water Area (Km ²)	Total Municipal Land Area (Km ²)	Water/Land Ratio	
Siquijor	1,715	318	5.4	102
Bohol	6,427	2,329	2.8	642
Negros Oriental	3,260	4,336	0.8	369

Notes:
 * Estimated figures based on calculations made using geographic information system, CRMP (1999)
 ** Water/Land ratio = 1 means that the land area of a coastal municipality is equivalent to the municipal water area
 *** Shoreline length is based on shoreline of the province and excludes small islands and islets

Introduction to Coastal Resource Management



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Marine Protected Area Establishment and Management Session 2

Strategies to Achieve Critical Result 2
Illegal and destructive fishing practices stopped




- Enforce fishery laws
- Pass municipal ordinances that prohibit destructive fishing practices

Introduction to Coastal Resource Management

Marine Protected Area Establishment and Management Session 2

Strategies to Achieve Critical Result 3
Critical coastal habitats protected

- Strictly enforces laws protecting coastal habitats
- Establish marine sanctuaries to rehabilitate habitats and increase fisheries production
- Develop community-based forest management agreements for sustainable mangrove resource use
- Revert abandoned fishponds to mangrove areas
- Establish PAMBs for Marine Protected Areas



Introduction to Coastal Resource Management

Marine Protected Area Establishment and Management Session 2

Kilometers of shoreline with improved management of coastal resources

For every municipality/city:

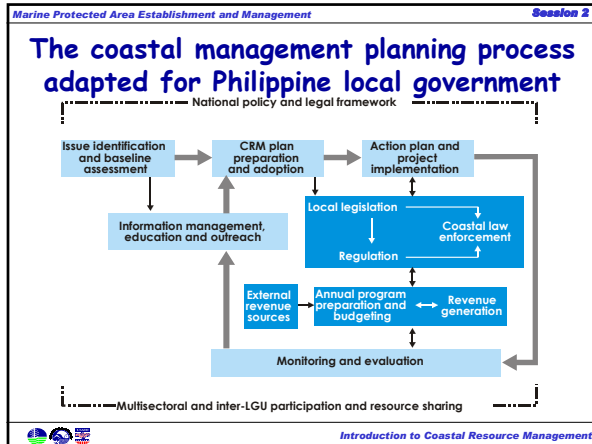
- √ 1. Annual LGU budget allocated for CRM
- √ 2. Coastal resource management organizations formed and active
- √ 3. Best CRM practices being implemented:
 - a. CRM plans adopted
 - b. Fisheries and coastal management ordinances implemented
 - c. Environment-friendly enterprises established
 - d. Enforcement units operational
 - e. Marine sanctuaries functional
 - f. Mangroves under CBFMAs
 - g. Municipal water boundaries enforced
 - h. Other habitat protective measures/open access restrictions in place



Introduction to Coastal Resource Management



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- Marine Protected Area Establishment and Management Session 2
- ### Coastal Resource Management (CRM) Programs
- Habitat Management
 - Fisheries Management
 - Shoreline Management
 - Coastal Tourism Management
 - Enterprise and Livelihood Management
 - Waste Management
 - Watershed Management
 - Coastal Zoning
 - Legal Arrangements and Institutional Development
-
- Introduction to Coastal Resource Management



8. **Monitoring and evaluation** must be included as a set of activities to provide feedback on plan implementation and impact on environment.

Following are some of the basic programs and strategies on coastal management. There is a number of strategies that have been proven technically feasible and are being implemented in some local government units. However, aside from looking at the technical feasibility of each program and strategy, social acceptability is also important. Note that the success of the implementation of the programs lies both on their technical feasibility and social acceptability.

Strategies are not exclusive to one program. There are strategies that can be used in two or more programs, such as the establishment of sanctuary - a strategy in fisheries management and in habitat management. There are also cross-cutting strategies, such as IEC and community organizing, that are applicable in all programs. The strategies can be operationalized through specific activities and actions.

1. 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 the municipal fishers
- To regulate the exploitation of fisheries resources and limit fishing efforts to sustainable levels
- To ensure the rational and sustainable development and management of the fishery resources
- To develop monitoring, control and surveillance mechanisms and strengthen law enforcement units
- To ensure equity in fisheries exploitation

Strategies

- Establishment and management of marine protected areas or fish/marine sanctuaries
- Designation of closed season in harvesting commercially and ecologically-important fish and invertebrates during their spawning season and/or their juvenile stage.
- Designation of closed areas for identified migration route of commercially and ecologically-important fish



- Licensing and permitting of fishers, fishing gears and fishing boats
- Sustainable management of coastal aquaculture
- Regulation on the deployment, use of and access to artificial reefs
- Regulation of the construction and operation of fish corrals, other fishing gears and fishing activities that occupy space in the coastal waters
- Restriction of commercial fishing vessels in the municipal waters
- Enforcement of environmental and fisheries laws
- Setting-up of fisheries monitoring mechanism
- Conduct of massive information, education and communication (IEC) campaign
- Community organizing and formation of fishers' organization for and conservation

2. HABITAT MANAGEMENT

Objectives

- To protect, conserve and rehabilitate existing habitats.
- To improve productivity and biodiversity of corals, seagrasses, mangroves and estuaries.
- To enhance community participation in the management of the habitats

Strategies

- Establishment of marine protected areas (corals, mangroves, seagrass)
- Management of mangroves under the Community-Based Forest Management (CBFM) framework
- Protection of seagrass beds by regulating fishing activities destructive to the habitat
- Enforcement of environmental and fisheries laws
- Conduct of massive information, education and communication (IEC) campaign
- Community organizing and formation of fishers' organization for and conservation



3. COASTAL ZONING

Objectives

- To delineate zones for specific uses or activities in the municipal waters
- To eliminate use conflict in the utilization of the municipal waters
- To regulate activities in the different zones

Strategies

- Delineation of municipal waters boundaries
- Designation of zones for specific uses (for strict protection, rehabilitation, aquaculture, tourism, trade and navigation, ect.)
- Regulation of fishing activities and use of fishing gear in every zone
- Conduct of massive information, education and communication (IEC) campaign
- Community organizing and formation of fishers' organization for and conservation

4. SHORELINE MANAGEMENT

Objectives

- To protect the shoreline from further degradation due to destructive activities.
- To maintain access of the people to foreshore area
- 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

- Regulation of sand and coral mining
- Protection and conservation of mangroves
- Setting-up and maintenance of coastal setbacks for all development
- Construction and maintenance of seawall
- Conduct of massive information, education and communication (IEC) campaign
- Community organizing and formation of fishers' organization for and conservation
- Watershed management



5. COASTAL TOURISM MANAGEMENT

Objectives

- To provide economic incentives for the municipality and the coastal communities by optimizing the tourism potential of certain areas.
- To develop local capability in ecotourism projects that contribute to better coastal management and community development
- To develop incentives for resource conservation

Strategies

- Regulation on the number of tourism facilities and activities
- Maintenance of wastes disposal facilities
- Ecotourism product development
- Visitors education and management
- User fees and appropriate business development
- Conduct of massive information, education and communication (IEC) campaign
- Community organizing and formation of fishers' organization for and conservation

6. ENTERPRISE AND LIVELIHOOD MANAGEMENT

Objective

- To develop alternative and supplement employment to fishers in order to lessen their fishing effort and 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

- Identification and implementation of environment-friendly and economically-feasible projects
- Identification of beneficiaries



7. WASTE MANAGEMENT

Objective

- To eliminate or minimize the potential adverse impact of wastes to human and environmental health.

Strategies

- Water Quality Monitoring
- Domestic waste segregation
- Sewage waste treatment, especially for tourism and industrial facilities
- Monitoring, control and surveillance
- Conduct of massive information, education and communication (IEC) campaign

8. LEGAL ARRANGEMENTS AND INSTITUTIONAL DEVELOPMENT

Objectives

- To improve mechanisms and arrangements for local governance on coastal management
- To enhance community participation in coastal management planning, legislation, implementation, monitoring and evaluation
- To strengthen environmental and fishery law enforcement
- To improve the delivery of coastal management-related services
- To strengthen network and linkage with other local government units, national government, international and local organizations and community and people's organizations

Strategies

- Legislation of comprehensive CRM ordinance
- Formation and strengthening of peoples' organizations
- Strengthening of FARMC, Bantay Dagat, and Fish Warden
- Monitoring, Control and Surveillance
- Training and staff development on CRM
- Information, Education and Communication
- Fund-Sourcing

Following is a proposed outline of a CRM Plan:



Outline of the
Coastal Resource Management Plan
of the
Municipality of _____

Chapter One: Introduction

Why the Plan?

Scope of the Plan

History of the Planning Process

Goals and Objectives of the Plan

Chapter Two: Coastal Environmental Profile

Introduction

Brief Historical Background

Geography and Physical Setting

Status of Resources

- Fisheries
- Coastal Habitats
- Other Resources

Population, Demography and Socio-Economics

- Population Distribution
- Education
- Health, Water and Electricity
- Transportation
- Markets
- Livelihood

Resource Uses



Session 2

- Capture Fisheries
- Culture Fisheries
- Tourism
- Mangroves

Institutional and Legal Framework

- Ordinances and Resolutions

Chapter Three: Management Issues, Strengths and Opportunities

Introduction

Resource Degradation

Socio-Economic and Livelihood

Legal, Institutional and Administrative

Education, Public Awareness and Participation

Chapter Four: Coastal Management Programs, Strategies and Actions

Introduction

Fisheries Management

- Background
- Recommended Policies
- Strategies
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)
 - Strategy 2 (Activities, Schedule, Budget, and Agencies)
 - Strategy 3 (Activities, Schedule, Budget, and Agencies)

Habitat Management

- Background
- Recommended Policies
- Strategies
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)
 - Strategy 2 (Activities, Schedule, Budget, and Agencies)
 - Strategy 3 (Activities, Schedule, Budget, and Agencies)

Coastal Zoning

- Background



- Recommended Policies
- Strategies
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)
 - Strategy 2 (Activities, Schedule, Budget, and Agencies)
 - Strategy 3 (Activities, Schedule, Budget, and Agencies)

Shoreline Management

- Background
- Recommended Policies
- Strategies
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)
 - Strategy 2 (Activities, Schedule, Budget, and Agencies)
 - Strategy 3 (Activities, Schedule, Budget, and Agencies)

Enterprise and Livelihood Management

- Background
- Recommended Policies
- Strategies
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)
 - Strategy 2 (Activities, Schedule, Budget, and Agencies)
 - Strategy 3 (Activities, Schedule, Budget, and Agencies)

Coastal Tourism Management

- Background
- Recommended Policies
- Strategies
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)
 - Strategy 2 (Activities, Schedule, Budget, and Agencies)
 - Strategy 3 (Activities, Schedule, Budget, and Agencies)

Waste Management

- Background
- Recommended Policies
- Strategies
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)
 - Strategy 2 (Activities, Schedule, Budget, and Agencies)
 - Strategy 3 (Activities, Schedule, Budget, and Agencies)

Legal Arrangements and Institutional Development

- Background



- Recommended Policies
- Strategies
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)
 - Strategy 2 (Activities, Schedule, Budget, and Agencies)
 - Strategy 3 (Activities, Schedule, Budget, and Agencies)

Chapter Five: ADMINISTRATION AND COORDINATION OF IMPLEMENTATION

Introduction

Plan Implementation

Implementing Structure

Monitoring and Evaluation



SESSION**OBJECTIVES****IMPORTANCE****METHODOLOGY****TIME****MATERIALS & EQUIPMENT****HANDOUTS & READING MATERIALS****3.0 MPA: A STRATEGY FOR MANAGING HABITATS AND FISHERIES**

At the end of the session, participants will be able to:

- ◆ elaborate the definition of marine protected area and other related concepts i.e. fish sanctuary, reserve, park,
- ◆ explain the brief history of marine protected area in the Philippines
- ◆ distinguish the categories of marine protected area as defined under NIPAS and Fisheries Code
- ◆ explain the benefits and possible management objectives of marine protected areas
- ◆ identify key factors in implementing successful MPA

Appreciation of the role of marine protected areas in habitat enhancement and fisheries management gives the participants proper perspective how MPAs work.

Lecture

1.5 hours

Idea Cards, Manila paper, Markers, Masking tape, Overheads, Overhead projector, Screen

- Philippine Coastal Management Guidebook Series # 5



TRAINING SESSION 3.0

CONTENT AND ACTIVITY PLAN



40 minutes

Discussion on the Concept of MPA

Ask the participants to consider following:

- ◆ what is a marine protected area?
- ◆ how is it different from marine sanctuary, reserve, park, etc?
- ◆ what were the significant milestones as regards MPA in the Philippines?
- ◆ why marine protected areas for managing habitats and fisheries?
- ◆ how marine protected areas work?

Write down their ideas and process them by clustering related ideas. Process their answers. Link the discussion on the definition of MPA, historical background, categories and characteristics using the outline below as guide

- ◆ Definition of MPA, sanctuary, reserve, park
- ◆ Similarities of MPA, sanctuary, reserve, park
- ◆ Differences of MPA, sanctuary, reserve, park
- ◆ History of MPAs in the Philippines
- ◆ National and local categories of MPA

Elaborate the concept of marine protected area by differentiating marine protected area from sanctuary, reserve, park;

- ◆ emphasize the conceptual and practical similarities and differences,
- ◆ point out the national and local categories for protected areas and its jurisdictional basis,
- ◆ stress that marine protected area is one of the strategies in fisheries and habitat management programs. Give examples.



40 minutes

Lecture on MPA Management Objectives

Emphasize that there are several MPAs having various objectives. Encourage participants to share what sort of objectives they are aware. Explain that good understanding of benefits of MPA can lead them to clearly think of the possible objectives. Lecture outline may include:

- ◆ Benefits of MPA
- ◆ Management objectives of MPA



- ◆ *Factors in implementing a successful MPA*



10 minutes

Wrap up

Summarize the presentation by asking the participants some questions using the session objectives as basis.



HANDOUT #3

MPAs: A Strategy for Managing Habitats and Fisheries

(By: Stuart Green)

Fisheries and Habitat Management

MPAs are merely one of the options under fisheries management and habitat management programs under CRM

1. Quotas,
2. Gear restrictions,
3. Minimum mesh sizes,
4. Closed seasons etc

Most of these are difficult to enforce and manage and are not so successful in management

Because ...

1. *Need large amounts of information about the life histories of fish species (which scientists have not yet got)*
2. *Most theory is based on single species theory on stocks which is NOT applicable to multi-species, multi-gear fisheries, as in the Philippines.*
3. *Enforcement is difficult and expensive*

Therefore it looks like the best Fisheries management strategy to be implemented is the fish sanctuary or MPA and it is gaining worldwide recognition now that it is the most effective fisheries management strategy for implementation

Definition of a protected area



Fisheries Code (R.A. 8550)

- 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"

- Fishery reserve

"A designated area where activities are regulated and set aside for educational and research purposes"

NIPAS Act (RA 7586)

- Protected Area

" 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"

- Resource Reserve

"An extensive and relatively isolated and uninhabited area normally with difficult access designated as such to protect natural resources of the area for future use and prevent or contain development activities that could affect the resource pending the establishment of objectives which are based upon appropriate knowledge and planning"

Marine Protected Area (MPA)

- Any specific marine area which has been reserved by law or other effective means and is governed by specific rules or guidelines to manage activities and protect part or the entire enclosed coastal and marine environment.



Sanctuary

- An MPA where all extractive practices, such as fishing, shell collection, seaweed gleaning, and collecting of anything else is prohibited. It also allows for control of other human activities, including access, in order to protect the ecosystem within the specific site.

Reserve

- An MPA where strict sanctuary conditions are not mandated for the entire area yet there is still a desire to control access and activities, such as boating, mooring, and various fishing techniques. It allows for zones that include a sanctuary area.

Marine Park

- An MPA where multiple uses are encouraged that emphasize education, recreation, and preservation; usually implemented by zonation schemes that can include a sanctuary area (White 1988).

Basically a CB Marine sanctuary should have the following characteristics:

- No take
- Managed and enforced by the community and the MLGU - co management
- Have a legal basis

Traditional 'Sona' in Central Visayas

Traditional sanctuaries called 'Sona'

These can be traced back to the 1950's and 1960's and before in Northern Bohol and other parts of the Visayas

They functioned as fish sanctuaries for 11 months of the year and then for one month of the year it could be harvested, these seem to be the first traditional sanctuaries in Visayas region from fisherfolk conversations



Also have the fiesta version, which is bidden out to the community during fiesta and then harvested using dynamite

Objectives of Marine protected Areas

Possible Objectives for establishing MPAs adapted from R.V.Salm, John Clark and Erkki Siirila (2000)¹

1. Preservation of Biodiversity and Genetic biodiversity

- Ocean covers over 70% of earth's surface and over 3.5 Billion Years old (Norse, 1993)
- Very biodiverse habitats (variety of life forms, species, communities, populations etc.)
- Species on land have been well researched, coastal poorly yet fish are fat, thin, round, box shape, live in arctic waters and in tropics, yet we still know very little, should therefore take a precautionary approach to fishes and other marine organisms
- Medicines
- Other possible uses

2. Conserving Ecosystems and Maintaining Ecological Processes

- Protecting unique areas and the different ecosystems, such as estuaries, Coral reefs, seagrasses, mangroves etc.
- Endangered species e.g. Dugong, protect habitat then you can help protect the species
- Imagine Food web / food chain, remove some parts of it begins to break up
- MPA should act as *insurance areas* for conserving certain habitats which are dependent and interlinked with each other

¹ Marine and Coastal Protected Areas A guide for Planners and Managers



3. Sustainable Use of Resources

Three main types of uses of Coastal Resources:

- *Permanent uses:* E.g. urban development, reclamation etc.
- *Extractive Uses:* E.g. Fishing, mangrove poles etc
- *Non extractive uses:* E.g. Public recreation, research, tourism etc.
- Many current practices and activities are already dependent on the coastal ecosystem
- The coastal ecosystems offer us a variety of free services that we often do not consider, once these services begin to slow down or become affected that is when we realize
- Many people live in or near coastal zone

4. Protecting Commercially Valuable Species

- Fisheries and the people / workers and families who depend on these
- Food protein, vitamins, almost 50% animal protein consumed in Philippines comes from Sea
- Free mariculture / no need for aquaculture
- Identify bottleneck areas, spawning grounds to include in MPA sites can have huge impact on fisheries

5. Replenish Depleted stocks

- Many species, especially more sessile / less mobile species are already depleted e.g. Sea cucumber, Giant Clams,
- Protection of various habitats e.g. Coral Reefs
- Other fishes in bottleneck situations, e.g spawning aggregations etc.



- Identify nursery grounds (All organisms are most vulnerable when young)
- MPA can be focused to provide protection and rehabilitation of these areas to ensure that the rest of the areas will be supplied with seed and juveniles

6. Education and Research

- Public Education and awareness raising on the role of the ocean (it is not just a big mass of blue, but a living and breathing mass or soup of organisms)
- Research stations / marine biology to further understand the ocean and its impacts on our lives, weather etc.
- Advancing science and identifying the role of the various organisms and habitats so that later on perhaps we can avoid other mistakes being made

7. Protection from Natural Hazards

- Coastal protection
- Fringing and barrier reefs
- Storm protection
- Sea Level rise
- Acts as buffer to all these impacts and with MPA can ensure quicker recovery of organisms to area through natural seeding etc.

8. Recreation and Tourism

- Majority of tourists see sea as place for relaxing and holidaying
- Scuba diving, snorkelling,
- An intact MPA can attract many tourists to an area e.g. Apo Island
- Jobs and economic diversification



9. Multiple Objective MPAs

- Most MPAs have one or several of the above mentioned objectives
- In Philippine case the most common is to increase fishery productivity and to have community become managers of their own areas
 - It is important to have these however put into your MPA management Plan and base

Four considerations² for when you decide your management objectives:

- Participation and Equity
What so stakeholders want?
- Feasibility (realistic)
Size, area etc.?
- Sustainability

How to try and make it as sustainable as possible

- Use Adaptive Management Project Cycle (*ensures better monitoring and lessons to be learned*) and keep referring back to the plan and adjusting as you go along

In theory all MPAs should all be integrated together to produce a network of MPAs internationally which would should cover all representative, unique and critical habitats including species rich areas and the processes which link these marine organisms and habitats together. This would offer us the insurance and pockets of protection which can hasten recovery of degraded habitats, organisms as we will no doubt require in the future...

Attributes of a good MPA (social and technical)

² Aliño, P and Uychaico², A Marine protected Areas, A National Workshop (1998)



- ✓ Reasonable quality of resources, if poor make it bigger and include more habitats
- ✓ Management committee organized and active with clearly defined roles and medium term action plan
- ✓ All sectors have a role in the sanctuary, women, fishers, youth council etc.
- ✓ At least 60% of community are willing to support the sanctuary
- ✓ Clear and strict guidelines developed through a series of consultations
- ✓ Clear, delineated and marked boundaries and zones with guidelines on the use of each zone
- ✓ Clear, attractive, well positioned and in local dialect, signboards

Factors of the Success of MPA

- ✓ Need a good initiator/facilitator with experience in implementation of coastal projects
- ✓ Counterparting of resources and involvement of all agencies with a mandate
- ✓ Involvement of all sectors of community and town - Co-management
- ✓ Continuous IEC
- ✓ Clear and strict guidelines for the sanctuary
- ✓ A good management committee is established with clear management plan
- ✓ Full time guarding and patrolling
- ✓ Aware and well informed community
- ✓ Budget needed for future years
- ✓ Variety of strong leaders in the community as well as second liners



Lessons learned and recommendations

- ✓ Slowly - go at the pace of the community
- ✓ If there are problems go back a step and start again
- ✓ Need a good area which will give some impact within 6 months to one year
- ✓ Strong IEC even after establishment
- ✓ It is a process which takes 6 months to two years to implement
- ✓ Include large buffer zone with restricted fishing gears
- ✓ Include landward section and other habitats in the area
- ✓ Monitor it !
- ✓ Have a formal launching ceremony
- ✓ Be open to offer Technical assistance even after establishment
- ✓ Staff should have a technical background
- ✓ Make the guardhouse an education center
- ✓ Make the sanctuary a showcase with other visitors if it is doing well



Benefits of Reserves (Roberts, 1997)

1. Increased spawning stock

Fishery reserves allow the rapid build up of fish spawning stock biomass. Overall (multi-species) levels of biomass per unit area can double or quadruple within two to ten years of closure. Biomass of some target species vulnerable to overexploitation can increase by more than an order of magnitude within reserves.

2. Increased spawning per unit stock

Reserves increase the numbers of older, larger and more reproductively active fishes within a population closure. This leads to potentially very large increases in larval production by fish stocks because egg production scales exponentially with increasing fish body size. For some species currently being regularly captured below the size of sexual maturity, reserves will increase reproductive output by several orders of magnitude. For sedentary species, benefits from increased spawning stock biomass can be expected to rapidly spread to fishing grounds via larval export. For more mobile species, they will also be transferred via "spillover".

3. "Spillover" - Enhanced catches close to reserves

The principal benefit from reserves is increased spawning stock size and reproductive output. However, as stocks build up inside, conditions get more crowded and a net emigration from the reserve can occur: "spillover" of juveniles and adults can enhance catches close to reserve boundaries. Fishermen "fishing the line" in places with long-established reserves are prevalent. Catches near to reserves are more valuable due to higher proportion of high-value species and greater numbers of large individuals present.

4. Migratory species also benefit

Migratory species can benefit from permanently closed reserves in at least six ways:

- Reserves restrict access to a stock for at least part of the year, thereby reducing fishing mortality.



- Reduction of fishing mortality could be considerably greater than simply proportion of area closed, since migratory species almost all go through “bottlenecks” during their migrations. These are areas where the population becomes concentrated and density increases such that the species becomes more vulnerable to capture. Fisheries for many migratory species are highly seasonal, targeting only areas of stock concentration. Reserves sited in such bottlenecks will reduce fishing mortality by amounts significant to the entire stock.
- Reserves located over spawning areas may increase reproductive success by reducing disturbance from fishing operations.
- Migratory species having specific nursery areas may be caught as by-catch by other fishing gears. Reserves sited in nursery grounds should increase numbers surviving to recruit to the fishery and eventually to spawn.
- Migratory species could benefit from enhanced feeding conditions as they pass through reserves. As well as increasing growth and reproductive output, improved feeding conditions are likely to encourage migratory species to remain in protected areas for extended periods during migrations, thus affording greater protection from fishing.
- Some migratory species appear to include non-migratory but reproductively active individuals. Such individuals within reserves would benefit from full protection from fishing.
- Established reserves in several parts of the world have been shown to benefit mobile and migratory species.

5. Improved habitats, increased productivity and carrying capacity

Reserves protect habitat from damage by fishing gear in closed areas, thereby recovery of animal and plant populations and increased productivity. Habitat protection leads to increased structural complexity which together with higher productivity will allow the habitat to support higher stock biomass. These benefits can feed into fishing grounds through migration of fishes through or out of closed areas and increased larval production from reserves



6. Maintained genetic diversity within stocks

Natural selection and fishery selection act differently. In an unexploited population, the bulk of reproduction is by older, larger individuals. Fishing selectively removes the most reproductively active individuals favoring those that mature at smaller sizes. Such individuals spawn fewer eggs than large individuals would. Over long periods, genetic diversity is lost from stocks due to selective removal of later maturing fish. By allowing such individuals a refuge in which to grow and reproduce, reserves will help protect the genetic diversity of stocks.

7. Enhanced biodiversity and species protection

Fishing has totally transformed the structure of marine ecosystem. Protecting habitat from damage by fishing gear will benefit literally thousands of species, allowing the redevelopment of complex associations of organisms on the seabed. No-take reserves will enhance populations of target species, many of which are now threatened by overexploitation. Reserves in many regions have shown an increase in biodiversity of both target and non-target species within only a few years of creation. Reserves can also provide refuges for marine mammals, many of whose populations are threatened by pollution and by-catch by various fishing gears.

8. Reduced conflict among fishery sectors and between fisheries and other uses

One fishery sector often impacts on another by catching as by-catch, fish on which the other depends, or by damaging habitats critical to the target species of other fisheries. For example, some fisheries catch juveniles of species important to other sectors of the industry, or damage nursery grounds. Reserves placed in areas upon which different fishery sectors are mutually dependent, can potentially benefit both, thus reducing conflict.



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Marine Protected Area Establishment and Management Session 3

Marine Protected Areas:
A Strategy for managing habitats and fisheries

Marine Protected Area: A Strategy for Managing Habitats and Fisheries

Marine Protected Area Establishment and Management Session 3

MPA - one of the options under fisheries and habitat management programs under CRM

- Quotas
- Gear restrictions
- Minimum mesh sizes
- Closed seasons

Marine Protected Area: A Strategy for Managing Habitats and Fisheries

Marine Protected Area Establishment and Management Session 3

Most of these are difficult to enforce and manage and are not so successful in management because...

1. Need large amounts of information about the life histories of fish species (which scientists have not yet got)
2. Most theory is based on single species theory on stocks which is **NOT** applicable to multi-species, multi-gear fisheries, as in the Philippines.
3. Enforcement is difficult and expensive

MPAs- best fisheries and habitat management strategy and is now gaining worldwide recognition as the most effective management tool

Marine Protected Area: A Strategy for Managing Habitats and Fisheries




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Marine Protected Area Establishment and Management Session 3

Fisheries Code (RA 8550)

- **Fishery refuge and sanctuaries**
“A designated area where fishing or other forms of activities which may damage the ecosystem of the area and human access may be restricted.”
- **Fishery reserve**
“A designated area where activities are regulated and set aside for educational and research purposes.”

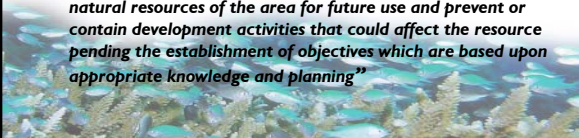


Marine Protected Area: A Strategy for Managing Habitats and Fisheries

Marine Protected Area Establishment and Management Session 3

NIPAS Act (RA 7586)

- **Protected Area**
“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.”
- **Resource reserve**
“An extensive and relatively isolated and uninhabited area normally with difficult access designated as such to protect natural resources of the area for future use and prevent or contain development activities that could affect the resource pending the establishment of objectives which are based upon appropriate knowledge and planning”



Marine Protected Area: A Strategy for Managing Habitats and Fisheries


Marine Protected Area Establishment and Management Session 3

Marine Protected Area (MPA)

“Any specific marine area which has been reserved by law or other effective means and is governed by specific rules or guidelines to manage activities and protect part or the entire enclosed coastal and marine environment.”

Sanctuary

“An MPA where all extractive practices, such as fishing, shell collection, seaweed gleaning, and collecting of anything else is prohibited. It also allows for control of other human activities, including access, in order to protect the ecosystem within the specific site.”



Marine Protected Area: A Strategy for Managing Habitats and Fisheries



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Marine Protected Area Establishment and Management Session 3

Reserve

“An MPA where strict sanctuary conditions are not mandated for the entire area yet there is still a desire to control access and activities, such as boating, mooring, and various fishing techniques. It allows for zones that include a sanctuary area.”

Marine Park

“An MPA where multiple uses are encouraged that emphasize education, recreation, and preservation; usually implemented by zonation schemes that can include a sanctuary area (White 1988).”

Marine Protected Area: A Strategy for Managing Habitats and Fisheries

Marine Protected Area Establishment and Management Session 3

Marine Protected Area (MPA)

MPA — Specific area reserved by law, governed by specific rules or guidelines to manage activities and protect part or the entire enclosed environment.

Sanctuary — An MPA where all extractive practices, such as fishing, shell collection, and collecting of anything else is prohibited.

Reserve— An MPA where strict sanctuary conditions are not mandated for the entire area but control to access and activities are regulated, i.e boating, mooring, and some fishing techniques.

Marine Park — An MPA where multiple uses are encouraged like education, recreation, and preservation, implemented by zonation schemes.

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Benefits of MPA

1. Increased spawning stock
2. Increased spawning per unit stock
3. “Spillover” – Enhanced catches close to reserves
4. Improved habitats, increased productivity and carrying capacity
5. Maintained genetic diversity within stocks
6. Enhanced biodiversity and species protection
7. Reduced conflict among fishery sectors and between fisheries and other uses

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Dispersal of Fish and Larvae from the Sanctuary of a Marine Reserve

Larval and fish dispersal

Reserve area with limited fishing allowed Fishery sanctuary

Source: Bohnsack (1990)

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Characteristics of community-based MPA

- Encompasses NO-TAKE
- Co-management — managed and enforced by the community and the LGU
- Has a legal basis

Marine Protected Area: A Strategy for Managing Habitats and Fisheries

Marine Protected Area Establishment and Management Session 3

Sumilon Island, Cebu: Coral reef and reserve

Sumilon Island

Buffer zone

Buffer or traditional fishing zone

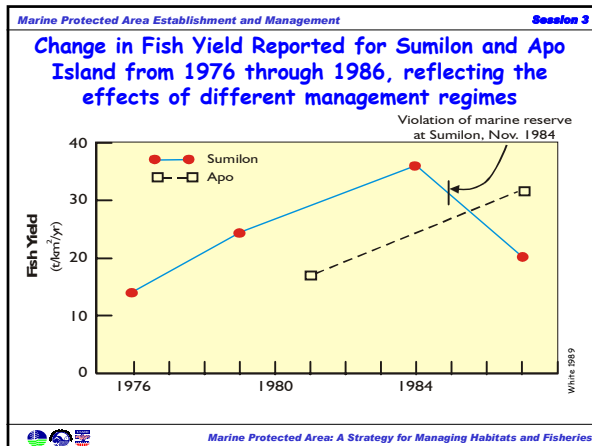
Coast of the adjacent zone

Circa 1984

Marine Protected Area: A Strategy for Managing Habitats and Fisheries



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- Marine Protected Area Establishment and Management Session 3
- ### Attributes of a good MPA
- Reasonable quality of resources, if habitat is poor, make it bigger and include more habitats
 - Management committee organized and active with clearly defined roles and medium term action plan
 - All sectors have a role in the sanctuary, women, fishers, youth council etc.
 - At least 60% of community are willing to support the sanctuary
 - Clear and strict guidelines developed through a series of consultations
 - Clear, delineated and marked boundaries and zones with guidelines on the use of each zone
 - Clear, attractive, well positioned and in local dialect, signboards
- Marine Protected Area: A Strategy for Managing Habitats and Fisheries

- Marine Protected Area Establishment and Management Session 3
- ### Factors of the Success of MPA
- Need a good initiator/facilitator with experience in implementation of coastal projects
 - Counterparting of resources and involvement of all agencies with a mandate
 - Involvement of all sectors of community and municipality – Co-management
 - Continuous IEC
 - Clear and strict guidelines for the sanctuary
 - A good management committee is established with clear management plan
 - Full time guarding and patrolling
 - Aware and well-informed community
 - Budget allocated for future years
 - Variety of strong leaders in the community as well as second liners
- Marine Protected Area: A Strategy for Managing Habitats and Fisheries



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Marine Protected Area Establishment and Management **Session 3**

Lessons learned and recommendations

- Slowly – go at the pace of the community
- If there are problems go back a step and start again
- Need a good area which will give some impact within 6 months to one year
- Strong IEC even after establishment
- It is a process which takes 6 months to two years to implement
- Include large buffer zone with restricted fishing gears
- Include landward section and other habitats in the area
- Monitor it !
- Have a formal launching ceremony
- Be open to offer Technical assistance even after establishment
- Staff should have a technical background
- Make the guardhouse an education center
- Make the sanctuary a showcase with other visitors if it is doing well

 *Marine Protected Area: A Strategy for Managing Habitats and Fisheries*



SESSION

OBJECTIVES

IMPORTANCE

METHODOLOGY

TIME

MATERIALS & EQUIPMENT

HANDOUTS & READING MATERIALS

4.0 MPA ESTABLISHMENT AND MANAGEMENT PROCESS AND COMMUNITY ORGANIZING

At the end of the session, participants will be able to:

- ◆ enumerate the phases of MPA establishment and management process,
- ◆ discuss the essential activities/elements of each of the phases of the process
- ◆ identify the activities/elements in establishing a marine protected area.
- ◆ explain the steps required to formulate an effective community organizing strategy for MPA establishment and management,

Knowledge of the MPA establishment and management process allows the participants to relate the community organizing activities.

Group Activity, Lecture

1.5 hours

Idea Cards, Manila paper, Markers, Masking tape, Overheads, Overhead projector, Screen

- Philippine Coastal Management Guidebook Series #s 4 & 5



TRAINING SESSION 4.0

CONTENT AND ACTIVITY PLAN



40 minutes

Discussion on MPA Establishment and Management Process

Start the discussion by drawing out the experiences of participants in establishing and managing marine protected areas. Use the guide questions below.

- ◆ what are the phases of establishing and managing MPA?
- ◆ what are the essential activities/elements in each of the phases?

Process their answers about the phases on establishing and managing MPA (bullet # 1) and seek consensus. Ask each participant to post their answers to question (bullet #2) under appropriate phases of the process. Process the overall activity.

Link the presentation to their output by elaborating the some points that are not properly covered in the activity. Emphasize that the phases of MPA establishment under community or LGU initiative should include:

- ◆ issue identification and baseline assessment
- ◆ plan preparation and adoption
- ◆ action plan and project implementation
- ◆ monitoring and evaluation
- ◆ information management, education and outreach



40 minutes

Group Activity on CO Process

Link the discussion on CO by noting that closely associated in various phases of MPA establishment and management is the on-going community organizing efforts. Ask the participants;

- ◆ why is community organizing in MPA establishment and management?
- ◆ what is the role of CO in MPA establishment and management?
- ◆ what will likely to happen when CO is deficient or ineffective?

Publish their responses. Then, connect their responses to the importance and purposes of community organizing in MPA establishment and management. Emphasize that, critical to the success of a MPA is a strong community awareness the benefits and



costs that will be accrued by the stakeholders and the overall acceptability of the endeavor.

Start the discussion of the CO process with a group activity. The big group will be divided into two and each will be given the same set of idea cards where specific activities during each CO phase are written. Facilitator will briefly discuss the different stages/phases in organizing the community for sanctuary establishment and management. Each group will now decide where to stick each activity and under which phase. Facilitator will then process the group outputs and relate the CO process to the MPA establishment and management process discussed in the preceding session.

Another way of discussing the topic on the CO process is to present a case study on CO experiences on Marine Protected Area (MPA). Ask the participants what are the lessons to be gathered on these experiences and proceed to discuss the CO process.

The following is a brief outline of the discussion on the CO for sanctuary establishment and management (see attached reading materials for details)

- ✓ *Why involve the community?*
- ✓ *What is community organizing?*
- ✓ *Who comprises the community?*
- ✓ *What is the role of the community organizer?*
- ✓ *What does community organizing entail? (The CO Process)*
 - *social preparation*
 - *integration phase*
 - *mobilization phase*
 - *strengthening the organization*
 - *evaluation and monitoring*
 - *phase-out/termination*



10 minutes

Wrap up

Summarize the presentation by asking the participants some questions using the session objectives as basis.



HANDOUT #4

Phases and activities for marine protected area establishment and management within local government jurisdictions.

Phases of Coastal Management	Stages and activities for MPA Establishment and Management
<p>1. Issue identification and baseline assessment</p>	<p>Recognition of a need and program preparation Integration with the community and assessment of issues</p> <ol style="list-style-type: none"> 1. Community organization and mobilization 2. Conduct of baseline studies 3. Information, education, and communication
<p>2. Plan preparation and adoption</p>	<p>Definition of goals and objectives: Formation of the core group and development of the management plan</p> <ol style="list-style-type: none"> 1. Formation of the core group 2. Definition of goals and objectives 3. Preparation of management strategy and action plan 4. Determination of reserve boundaries and zones
<p>3. Action plan and project implementation</p>	<p>Implementation: Formalization of the reserve, implementing management strategies, enforcement, and community strengthening</p> <ol style="list-style-type: none"> 1. Formalization of the reserve through local ordinance 2. Implementation of strategies for managing the reserve 3. Enforcement 4. Permits and user fees 5. Strengthening of community involvement
<p>4. Monitoring and evaluation</p>	<p>Monitoring and evaluation Refinement of the management plan</p>
<p>5. Information management, education, and outreach</p>	<p>Review of status of MPA and its benefits Refinement of education program from experience Development of outreach program as appropriate</p>



A Conceptual Framework for Community-Based Marine Sanctuaries in the Philippines

Steps in the Process	Time (months)	Actions Taken	Intermediate and Final Outcomes
1. Community Entry, Preparation and Appraisal	3-6	<ul style="list-style-type: none"> • Larger community consultation for initial identification of issues • Community site selected • Field officer assigned full-time to the community • Baseline surveys conducted • Selected PRA activities conducted • Informational meetings (formal and informal) and discussions concerning the project and goals • Preliminary public education activities carried out • Community core group identified • Stakeholder analysis conducted and identification of PCDA participants 	<ul style="list-style-type: none"> • GRM issues in the community identified • Socioeconomic, cultural and environmental context understood by project team and members of core group • Widespread community understanding of project objectives and approach • Information of resource status gathered
2. Planning including: <ul style="list-style-type: none"> • Public Education • Capacity Building • Community Consultation • Ordinance Formulation 	12-24	<ul style="list-style-type: none"> • Cross-visits with successful marine sanctuary sites • Public education on coral reef ecology, marine sanctuary concept, environmental laws and enforcement • Training on community monitoring and mapping of reef • Selected early actions on issues of concern to the community implemented • Training on financial management and accounting 	<ul style="list-style-type: none"> • Community understanding of human impacts on coastal resources, environmental laws and sanctuary concept • Map of the coral reef developed by the community to be used as basis of marine sanctuary site selection • Community awareness of local coral reef conditions and capacity for on-going monitoring established • Widespread community support for the project objectives and marine sanctuary concept



Steps in the Process	Time (months)	Actions Taken	Intermediate and Final Outcomes
		<ul style="list-style-type: none"> • Study tour, training or development of potential supplemental livelihood opportunities such as tourism • Community core group training on coastal management • Community ordinance contents drafted • Community consultation meetings and discussions (formal and informal) conducted • Community ordinance revised and final version completed 	<ul style="list-style-type: none"> • Community capacity for participatory planning, implementation and fund management strengthened • Community capacity to address CRM problems with simple solutions strengthened • Widespread participation of stakeholders in planning • Widespread/majority community consensus on marine sanctuary location, size, allowable and prohibited activities, sanctions and management arrangements
3. Community Ordinance Approval	1-12	<ul style="list-style-type: none"> • Vote of approval for the sanctuary at a community meeting(s) and by barangay resolution • Approval and signatures on the municipal ordinance by the municipal council • Review of municipal ordinance by the province • Formal opening ceremony conducted with government representatives in attendance • Funding mechanisms for implementation (donations, fees, fines, grants, endowments, got. Allocations, etc.) identified and planned 	<ul style="list-style-type: none"> • Formal acceptance of the marine sanctuary by the community and local government • Sound legal basis for management and enforcement • Financial resources for implementation determined



Steps in the Process	Time (months)	Actions Taken	Intermediate and Final Outcomes
4. Implementation and Adjustment	∞ (forever)	<ul style="list-style-type: none"> • Boundary markers installed and maintained • Information signboards installed • Management plan developed • Management committee meeting • Reef and fisheries monitoring conducted • Enforcement actions occurring • Sanctions taken against violators • Public education ongoing • Implementation activities budgeted • Implementation funds received, spent and accounted for • Coordination and networking with external technical, financial or organizational support institutions occurring • Program monitoring, evaluation and adjustment by the community ongoing 	<ul style="list-style-type: none"> • High compliance with rules governing the marine sanctuary • Effective management of the marine sanctuary occurring • Improved coral cover inside the marine sanctuary • Increased fish abundance and diversity in the sanctuary • Increased catch of reef-related target fish species adjacent to the sanctuary • Other quality-of-life improvements/benefits for the community attained • Sufficient resources (financial or in-kind) for the implementation allocated, obtained and utilized • Access to outside support systems maintained • Management measures adjusted as needed

Source:

Crawford, B., M. Balgos, C. Pagdilao. 2000. *Community-based sanctuaries in the Philippines: A Report on Focus Group Discussions*. Coastal Management Report # 2224. PCAMRD Book Series No. 30. CRC. pp. 26-27.



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Marine Protected Area Establishment and Management		Session 4	
Steps in the Process	Time (months)	Actions Taken	Intermediate and Final Outcomes
4. Implementation and Adjustment	∞ (forever)	<ul style="list-style-type: none"> ➢ Boundary markers installed and maintained ➢ Information signboards installed ➢ Management plan developed ➢ Management committee meeting ➢ Reef and fisheries monitoring conducted ➢ Enforcement actions occurring ➢ Sanctions taken against violators ➢ Public education ongoing ➢ Implementation activities budgeted ➢ Implementation funds received, spent and accounted for ➢ Coordination and networking with external technical, financial or organizational support institutions occurring ➢ Program monitoring, evaluation and adjustment by the community ongoing 	<ul style="list-style-type: none"> ➢ High compliance with rules governing the marine sanctuary ➢ Effective management of the marine sanctuary occurring ➢ Improved coral cover inside the marine sanctuary ➢ Increased fish abundance and diversity in the sanctuary ➢ Increased catch of reef-related target fish species adjacent to the sanctuary ➢ Other quality-of-life improvements/benefits for the community attained ➢ Sufficient resources (financial or in-kind) for the implementation allocated, obtained and utilized ➢ Access to outside support systems maintained ➢ Management measures adjusted as needed

Source: Crawford, B., M. Balgos, C. Pagdilaog. 2000. Community-based sanctuaries in the Philippines: A Report on Focus Group Discussions. Coastal Management Report #2224. PCAMRD Book Series No. 30. CRC. pp. 26-27.

MPA Establishment and Management Process and Community Organizing



SESSION**OBJECTIVES****5.0 INFORMATION EDUCATION AND COMMUNICATION (IEC) STRATEGIES IN MPA ESTABLISHMENT AND MANAGEMENT**

At the end of the session, participants will be able to:

- ◆ devise steps required to formulate an effective IEC strategy for MPA establishment and management,
- ◆ utilize appropriate participatory tools to analyze various stakeholders' information and education needs.
- ◆ describe various IEC strategies appropriate to specific audience having stake in the MPA.

IMPORTANCE

Basic understanding of the appropriate use of IEC strategies in MPA establishment and management is necessary for effective and efficient use of IEC materials and enhance support to the MPA.

METHODOLOGY

Lecture, Workshop

TIME

1.5 hours

MATERIALS & EQUIPMENT

Idea Cards, Manila paper, Markers, Masking tape, Overheads, Overhead projector, Screen

HANDOUTS & READING MATERIALS

- Philippine Coastal Management Guidebook Series # 4



TRAINING SESSION 5.0

CONTENT AND ACTIVITY PLAN



10 minutes

Introduction to IEC

Introduce the session noting the lessons with regard to marine protected area establishment and management vis-à-vis information, education and communication. Also relate IEC to previous topic on MPA establishment and management process and community organizing. State the title, objectives, topics and expected outputs of the session.



20 minutes

Discussion on the Rationale and Role of IEC in MPA

Start the session by asking the following questions:

- ◆ *why is information, education and communication necessary in MPA establishment and management?*
- ◆ *what is the role of IEC in MPA establishment and management?*
- ◆ *what will likely to happen when IEC is deficient or ineffective?*

Publish their responses. Then, connect their responses to the importance and purposes of IEC in MPA establishment and management. Stress that like in community organizing, IEC is a potent tool for building awareness and the costs and benefits of Marine Protected Area. This needs to be planned.



20 minutes

Workshop on Stakeholder Analysis

Introduce stakeholder analysis as one of the tools to determine various interest groups supportive or non-supportive to marine protected area. Demonstrate the use of the tool. Relate the tool to IEC strategies particularly in identifying IEC messages.



**40 minutes****Discussion on Various IEC Strategies used in MPA**

Emphasize that IEC strategies vary from one group of audience to another. Stress that attitude and behavior of various stakeholders towards MPA vary. Highlight the need for an information campaign plan to effect change to attitude and behavior of various stakeholders.

Present some lessons from existing and on-going initiatives. Encourage participants to share their experiences regarding IEC activities. Summarize the lessons learned and reinforce the discussion by presenting basic concepts of effective IEC.

**10 minutes****Wrap Up**

Summarize the presentation by asking the participants some questions using the session objectives as basis



HANDOUT #5

Information Campaigns for MPAs

- A very high level of public information and awareness raising is required for MPAs
- The MPA is also a tool which causes the most misperceptions as to its objectives and what it is to do
- Most fisherfolk think that it will do harm to them by removing a fishing ground (and normally their best fishing ground if site selection is carried out properly), but if explained properly however these misconceptions can be dismissed.
- An average fishing community hosts a variety of personalities and opinions ranging from those who see a need for change, to those who are completely against the MPA.

Comments from the community...

- What right to remove the fishing ground that my fathers' grandfather fished in!
- We have a hard enough life and now you want to take away all our fishing rights in the area and therefore livelihood
- Ang Mga Philosopho..
- You thus need to Be Prepared!

Planning your info Campaign

- Info Campaigns have to focus on pre, during and post establishment phases, being a cross cutter for the different parts of the cycle
- Most public education campaigns have been aimed specifically at fisherfolk organizations and only to a few other members of the community.



Hands on lessons in Bohol

- **Balance:** the staff, a potent mix, is composed of community organizers with solid technical backgrounds, e.g. fisheries graduates with experience in community organizing.
- **Concepts and examples:** ideas relevant to the daily life of the fisherfolk must be stressed, for example, what has worked well in Bohol is to explain the MPA as a SEA BANK, an area which will act as a long term bank account with interest that will grow over time. If easy concepts are used the fishers will remember them and be able to do most of the information dissemination themselves.
- **Feedback:** The facilitating staff must also be able to feedback the progress and / or any mis-conceptions. In a project of this kind it is very common that there are large misconceptions and they must be addressed as soon as they arise, either by the fishers themselves or with the help of the facilitator.
- **Hands on:** This approach should be adopted. All staff and beneficiaries should be involved in all project components, like in manta tows, resource assessment, teaching the fisherfolk how to conduct semi-scientific research, etc.
- **Localize:** Everything, from language to trainers, use local beliefs, local examples, local names of fish / resources etc.
- **Popular Education:** These techniques work best; be creative. Games, acting, role plays all should be used within the trainings and more importantly are fun and therefore get remembered!
- **Production:** Written materials about the MPA; this needs to be done with a lot of graphics and be written in the local dialect and can be very cheap and effective if properly done.
- **Trust:** Must be gained from the community as much as possible; sometimes it is much more effective to sit down and (optional) have a glass of tuba (coconut wine) and listen to the fishers than to keep giving seminars / workshops etc.
- **Visuals:** Use as many as possible, videos, (even better of local area), underwater photos, (needn't be expensive or technical, use disposable cameras), leave the outputs behind.



- **Documentation:** of whole process, involving the community in the process; such as by doing a short, rough video of the whole process, or the community writing their own documentation alongside the facilitator etc.
- **Monitor and Evaluate:** the whole process, a lot of feed-backing is required to facilitate good community relations and better plans for the future.

Table 1:- Showing the possible target groups, message that should be communicated to them and ways of involving them in the MARINE SANCTUARY awareness raising and education process.

Target Sector	Possible Message regarding the benefits of the MARINE SANCTUARY.	Possible ways of involving the target group in the MARINE SANCTUARY process.
<u>Fisherfolk</u>	Increased and more consistent fish catch in the long run; Ability to manage and control a small area which can later be expanded to larger areas and control illegal fishing.	-Attend fisherfolk meetings / give training / seminar -Do a participatory research exercise on land and in the sea. -Cross visit to another MARINE SANCTUARY. -Guarding the MARINE SANCTUARY
<u>Women / gleaners</u>	-Ability to allow one area to rehabilitate and produce more fish / shells in the long run.	-Do a shells / fish identifying exercise / talk to womens organization in area etc. - Be responsible for guarding the MARINE SANCTUARY in the day etc.
<u>Community as a whole</u>	-More consistent fish supplies;	-Involvement in guarding of the area.
<u>Municipal Government</u>	-Possible increase in 'tourism'. -Increased health, social and economic benefits from more fishery products	-To produce and sponsor the declaration of the area as an MARINE SANCTUARY. -To donate materials to the guardhouse.
<u>Private Sector</u>	-The development of tourism and / or more visitors to the area.	-Help with lobbying and possibly donate materials to the MARINE SANCTUARY.
<u>Fish Sellers</u>	-Larger specimens and more higher quality 'food fish' as opposed to 'trash fish', hence more profit	-Video showing / seminar etc.



Target Sector	Possible Message regarding the benefits of the MARINE SANCTUARY.	Possible ways of involving the target group in the MARINE SANCTUARY process.
<u>Barangay Government</u>	<p>-To stress that the barangay development process should include livelihood based / food security activities aside from infrastructure projects such as basketball courts etc.</p> <p>-Increase in barangay incomes / alternative livelihood through Eco-tourism / visitors to the area etc.</p>	<p>-Facilitate organizing barangay wide beach clean up / mangrove reforestation etc.</p> <p>-Attend Barangay Council meetings.</p> <p>-Invite local barangay officials to all trainings etc. in the barangay.</p>
<u>Church</u>	<p>-The protection of the resources that were given to us by God.</p> <p>According to the bible these resources were given to the people to manage, yet at the moment are not being managed very well.</p>	<p>-Attend church council meetings</p> <p>-Invite priest to bless guardhouse etc.</p> <p>-Attend pastoral parish council meetings</p>
<u>Schools</u>	<p>-The insurance of fishing as a livelihood to the school children.</p> <p>-Food security.</p>	<p>-Dramas / Poster competitions, essay contests etc.</p> <p>-Attend parent-teacher association meetings.</p>
<u>National and local line agencies</u>	<p>-As mandated by their job.</p>	<p>-To map the sanctuary (DENR) / attend trainings / act as resource speakers to trainings etc.</p> <p>-Help in baseline data gathering.</p>
<u>Provincial Government</u>	<p>-The long term sustainable development of the province.</p>	<p>-Cross Visits / snorkeling / free diving lessons / lobbying / multi-sector dialogues etc.</p>
<u>Tourists / Dive shops</u>	<p>-Better quality diving / snorkeling</p> <p>-Sustainable diving</p>	<p>-Advertising, handouts, payment of a donation towards the reef protection.</p>
<u>National Government</u>	<p>Food security, 10 point master plan Agenda 21 etc.</p>	<p>-Letters / documentaries sponsorship of reef.</p>



Clarify the benefits of the marine sanctuary that the community will have

- Protect and increase habitat quality
- Increase abundance and size of fish
- Eggs and larvae increase
- Leakage concept, enhances catches of organisms around area
- Protect populations of fishes particularly vulnerable to fishing ensuring against stock collapse
- Increase genetic diversity
- Easier to enforce than other fisheries management approaches
- "Open access regime" shifts to closed and managed regime which has many spin-offs
- Increased recreational and educational opportunities
- Benefits not so obvious for migratory species
- Maintenance of a more natural population and community structure



SEABANK

Use the concept of "SEABANK" Bangko sa Dagat

Deposit

Guard / bantay

Interest

In a bank interest increases stays level, in a seabank,

It increases over time;

The longer the timespan the bigger the interest

Why does interest increase over time?

Main impacts of a marine sanctuary:

- Marine organisms in a sanctuary will get bigger in size
- Exhibit more species
- Species will become more abundant

This leads to..

1. Fish in the area will grow to maturity; (a lot of fish and marine organisms are harvested before they are mature) Many fish in today's markets are immature at a rough guess some 70% of fish in an average market in Bohol are immature (with similar numbers for other parts of the country)
2. The marine sanctuary provides a much more intact food web and food chain for all organisms living within it, therefore in theory encouraging better energy flow, dynamics of the organisms within the area.



Fecundity of fishes

Bigger fish and marine organisms have much larger fecundity;

Fecundity increases exponentially with size / age in fishes

One 10-Kg snapper compared to one-Kg snapper

1:212¹

Life histories

Some fish species have interesting and non-predictable life histories, a sanctuary can help provide a stability / insurance to those with unpredictable life histories;

Sequential hermaphroditism

E.g. Coral Trout (sono)

- Sex change is partially dependent upon size / age.
- Once these fish reach a certain size / age depending on a series of environmental variables, they will change sex from Female to Male;
- Catch many coral trout = smaller size
- In theory smaller size means more females, less males
- A fish sanctuary will allow fishes of all sizes to grow and get bigger, allowing for more even distribution of sexes and so therefore reproduction within the species;

Some fish also have other similar life history traits which make them very vulnerable to fishing pressure and a sanctuary will ensure their return

¹ Bohnsack, J.A. 1990



Characteristics of fish making them vulnerable to fishing pressure

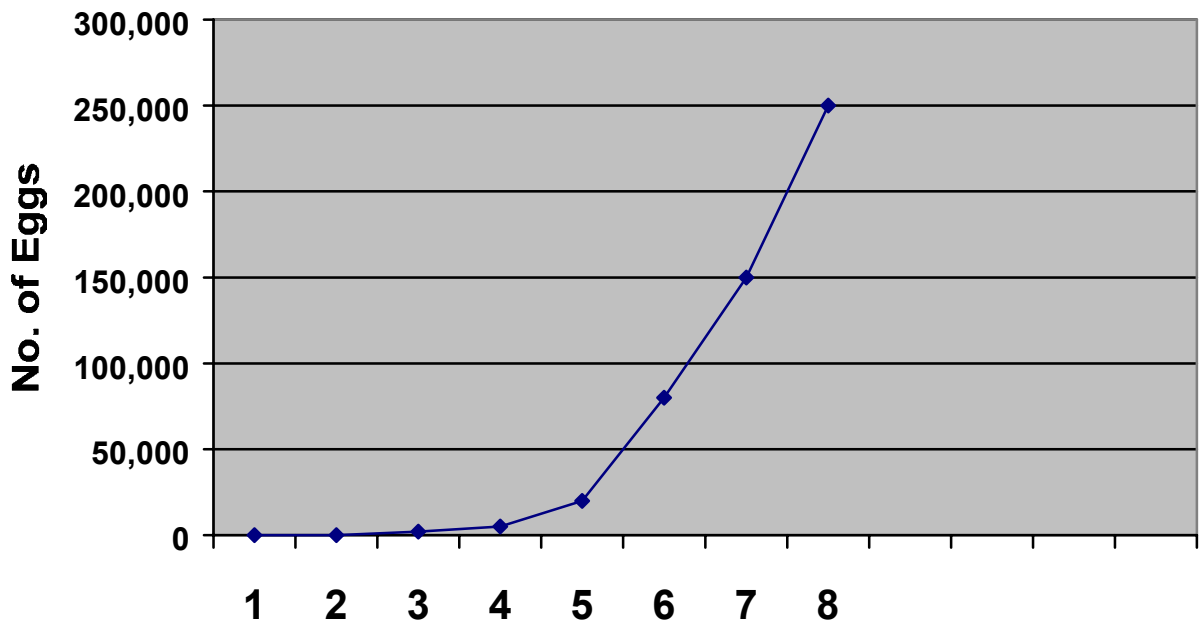
- Long age to maturity
- Slow growing
- Small population density
- Spawning aggregations

Maturity

Some examples of age at maturity

- Giant Clam up to 10 years
- Abalone 3-4 years
- Sea cucumbers up to 3 years depending on species
- Spiny lobster 7 years
- Some groupers 10 plus years

Typical fecundity of a fish over time (no of eggs vs Age (years))



IEC Bits and Bobs....

- Home made Videos: Very effective, perhaps with an underwater camera (expensive) doing a time series analysis of the sanctuary and interviews with the fishers about the area. Or even showing the status of the reef to the barangay folk etc.
- Television: Usually expensive and sometimes will not reach people without television (most fisherfolk in Bohol); this depends on your budget. A cheaper way is to produce a local video and then ask the local cable channel to play the video or show it in the barangay, it is enjoyed a lot by the local community and helps a lot in the education process.
- Radio: Very effective in the barangays as most fishers own radios. Again, target local radio stations to begin with and those that use the local tongue. This can also reach far flung barangays who otherwise would not hear of such tools.
- Newspapers: Target local newspapers; It is a sure way of getting to the local influential people. One newspaper in Bohol developed a section about the environment specifically for NGO's. Also, journalists are usually quite interested in environmental stories. If the stories are good enough the local journalists can help you look for more national coverage.
- Meetings / trainings / workshops: Often held to discuss particular agendas and can involve very diverse groups of people; A very good place to learn and listen to different opinions and why the people feel that way regarding the MPA etc. Should encourage participation of all sectors of the community and have a good facilitator.
- Comics / Fisherfolk publications: These can be used to disseminate information at the local level; They must be only a few pages long, be in local language and have a clear point relating to daily life with plenty of illustrations; can be produced very cheaply and one copy can reach at least one whole family if well presented.
- Posters / calendars / fixed exhibits: Very effective if placed in the correct place; A poster with underwater photos of the sanctuary can be very effective as long as it is done well and in local language etc. A calendar will stay on a wall for a year!
Barangay monitoring boards;
- T shirts: Sometimes very helpful in helping with awareness raising e.g. All the fishery wardens or all the members of an organization etc. They are often a good conversation starter and the person wearing the t shirt is someone who is bound to be quite active and aware.



- Sponsoring events: Local events can be sponsored such as basketball competitions or even a disco held by and for the local fisherfolk. Theme nights about the sea, such as an environmental concert where the fisherfolk all write and sing songs about the changes in the sea in the last twenty years in their barangay are also very effective.
- Curriculum Development: We have been able to involve the local schools in the process and have waged a strong Primary and High School advocacy campaign in two of our project areas. This has included inserting some coastal ecology into the syllabus within the High Schools. The DECS system has its subjects with 'Minimum Learning Competencies' and there is ample room for entry of basic marine ecology if the school teachers are open to it.
- Cross visits of the different involved sectors, teachers and students to an MPA is a good entry point, especially if the MPA is nearby. Our experiences include students who have conducted their High School science projects on the effects of a local MPA, along with them presenting a drama at the local fiesta, and other activities such mangrove reforestation, poster competitions etc. Very effective!
- Recreational activities: One strategy which has worked very well with local politicians and government agencies is to hold picnics / snorkeling days at sea. These are good fun and if the staff are capable it can enable a lot of informal education.

Next Steps

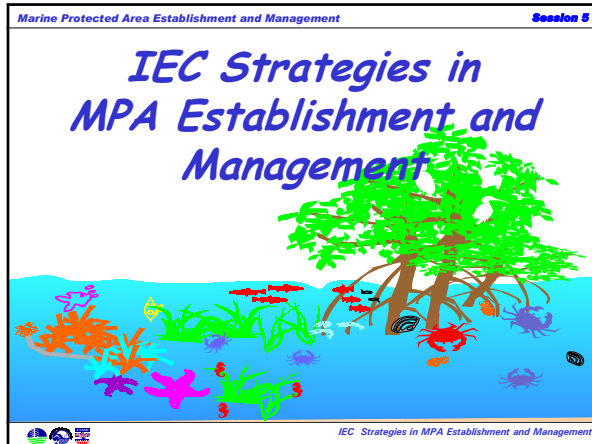
- The MPA provides a brilliant working IEC example for communities to study and to see what can happen when management is devolved to them. It is therefore of vital importance to tap this learning experience, build upon it, let it evolve and see what can further be gained from it.
- An MPA managed by a community should lead to numerous other possible management measures / research / interest for the community. It also serves as a graphic illustration to a community that should make them realize that not fishing in an area can actually produce more fish, which the idea of truly intrigues some fisherfolk.

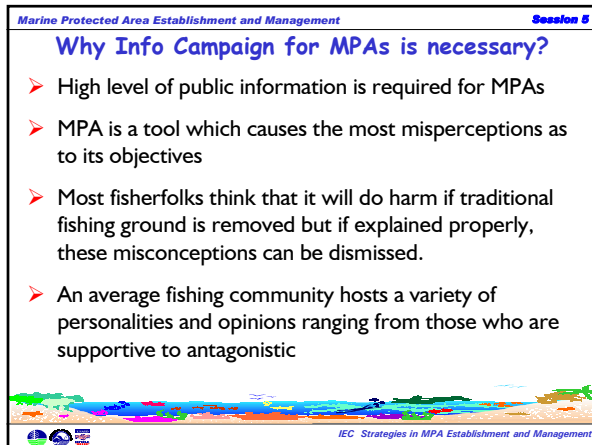


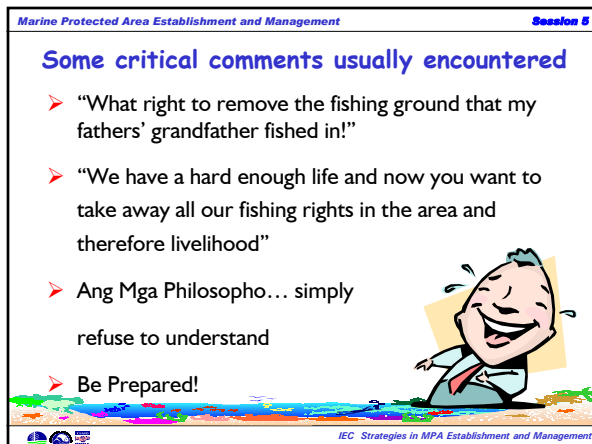
- This is the stage when the MPA itself should now begin to be used as a case study and the education process built around the MPA and the target groups expanding to not only fishers but the general public as a whole.
- The guardhouse should be made the educational center as such of the MPA and it should have plenty of photos and educational materials / posters inside it. A logbook of fisherfolk observations / arrests / visitors is also very good to leave in the guardhouse.



Click slide to view in full-screen mode










Click slide to view in full-screen mode

Marine Protected Area Establishment and Management Session 5

Planning your info campaign

- Info campaigns have to focus on pre-, during-and post- establishment phases, being crosscutting strategy in MPA establishment and management
- Most public education campaigns have been aimed specifically at fisherfolk organizations and only to a few other members of the community.




IEC Strategies in MPA Establishment and Management

Marine Protected Area Establishment and Management Session 5

Hands on Lessons in Bohol

- **Balance** : the staff, a potent mix, is composed of community organizers with solid technical backgrounds, e.g. fisheries graduates with experience in community organizing.
- **Concepts and examples** : ideas relevant to the daily life of the fisherfolk must be stressed e.g., in Bohol MPA is explained as a SEABANK, an area which will act as a long term bank account with interest that will grow over time.




IEC Strategies in MPA Establishment and Management

Marine Protected Area Establishment and Management Session 5

cont.

Hands on lessons in Bohol

- **Feedback** : The facilitators must feed back the progress and/or any misconceptions to communities. It is very common that there are large misconceptions and these must be addressed as soon as they arise.
- **Hands on** : All staff and beneficiaries should be involved in all project components, like in manta tows, resource assessment, teaching fisherfolks how to conduct semi-scientific research, etc.



IEC Strategies in MPA Establishment and Management




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Marine Protected Area Establishment and Management Session 5

cont. **Hands on lessons in Bohol**

- **Localize** : From language to trainers, use local beliefs, local examples, local names of fish etc.
- **Popular education** : Be creative! Games, acting, role plays, practical exercises should be used within the trainings. These methods are fun and therefore get remembered easily.
- **Production of materials**: Written materials about the MPA need to be done with a lot of graphics and be written in the local dialect.




IEC Strategies in MPA Establishment and Management

Marine Protected Area Establishment and Management Session 5

cont. **Hands on lessons in Bohol**

- **Trust** : Must be gained from the community as much as possible; sometimes it is much more effective to sit down and (optional) have a glass of tuba (coconut wine) and listen to the fishers than to keep giving seminars / workshops etc.
- **Visuals** : Use videos, (even better of local area), underwater photos, (needn't be expensive or technical, use disposable cameras), and leave the outputs behind.




IEC Strategies in MPA Establishment and Management

Marine Protected Area Establishment and Management Session 5

cont. **Hands on lessons in Bohol**

- **Documentation** : doing a short, rough video of the whole process, or the community writing their own documentation alongside the facilitator etc.
- **Monitor and evaluate** : giving of feedback is required to facilitate good community relations and better plans for the future.



IEC Strategies in MPA Establishment and Management


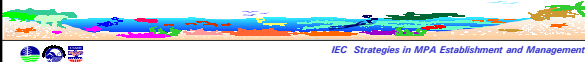


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Marine Protected Area Establishment and Management Session 5

IEC Bits and Bobs

- **Homemade videos** : doing a time series analysis of the sanctuary and interviews with the fishers about the area.
- **Television** : usually expensive and won't reach people without television; a cheaper way is to produce a local video and then ask the local cable channel to play the video






Marine Protected Area Establishment and Management Session 5

cont.

IEC Bits and Bobs

- **Radio** : very effective in the *barangays* as most fishers own radios; target local radio stations that use local tongue.
- **Newspapers** : target local newspapers, a sure way of getting to the local influential people; some newspapers have a section on environment and journalists are usually quite interested in environmental stories.






Marine Protected Area Establishment and Management Session 5

cont.

IEC Bits and Bobs

- **Meetings, trainings, workshops** : involves diverse groups of people, a good place to learn and listen to different opinions about MPA etc. A good facilitator is necessary to maintain order and focus in the discussion.

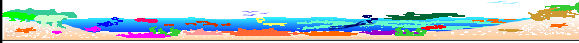


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Marine Protected Area Establishment and Management Session 5

cont. **IEC Bits and Bobs**

- **Comics, fisherfolk publications:** used to disseminate information at the local level; few pages in local language and have a clear message relating to daily life;
- **Posters, calendars, fixed exhibits:** very valuable if placed correctly; a poster with underwater photos of the sanctuary proved to be effective; a calendar will stay on a wall for a year! barangay monitoring boards;




IEC Strategies in MPA Establishment and Management

Marine Protected Area Establishment and Management Session 5

cont. **IEC Bits and Bobs**

- **T-shirts:** useful in awareness raising e.g. all the fishery wardens or members of an organization etc; often a good conversation starter.
- **Sponsoring events:** local events can be sponsored such as environmental concerts or even a disco held by and for the local fisherfolk with specific theme nights about the sea.

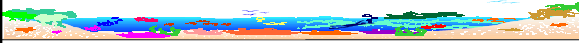


IEC Strategies in MPA Establishment and Management

Marine Protected Area Establishment and Management Session 5

cont. **IEC Bits and Bobs**

- **Curriculum development:** involving the local schools by inserting some coastal ecology into the syllabus when teachers are open to it.
- **Cross visits:** good entry point for teachers and students who conduct science projects on the effects of MPA;
- **Recreational activities:** holding picnics and snorkeling, a form of informal education if carefully designed.



IEC Strategies in MPA Establishment and Management



SESSION

OBJECTIVES

IMPORTANCE

METHODOLOGY

TIME

MATERIALS & EQUIPMENT

HANDOUTS & READING MATERIALS

6.0 RESOURCE MAPPING AND BASELINE DATA GATHERING

At the end of the session, participants will be able to:

- ◆ enumerate the criteria for site selection,
- ◆ identify necessary data requirements for establishing a marine protected area,
- ◆ use existing baseline data from PCRA
- ◆ demonstrate techniques in baseline data gathering
- ◆ design forms and format for baseline data collection

Determining the basic information required to establish an MPA is necessary in management

Lecture, Workshop

1.5 hours

Idea Cards, Manila paper, Markers, Masking tape, Overheads, Overhead projector, Screen, PCRA map

- Participatory Coastal Resource Assessment Handbook
- Philippine Coastal Management Guidebook Series # 5
- Coral Reef Monitoring for Management
- Photocopies of selected articles of Participatory Methods in CBCRM



TRAINING SESSION 6.0

CONTENT AND ACTIVITY PLAN



10 minutes

Introduction

Introduce the session noting the coverage and the expected output at the end of the session and its relation to the overall output of the training program. Recall the discussion on site selection criteria and shapes and sizes of MPA. Tell the participants that refreshing their knowledge on these items is vital in this session.



45 minutes

Plenary Discussion and Presentation

Ask the participants what are the criteria they used in selecting MPA. List down their answers and add or clarify points of each of the criterion mentioned. Make the criteria as starting point in discussing the data to be collected for site selection. Reference to a resource map may be made.

After showing the map, ask the participants what data are needed to establish a marine protected area? Write their answers and process them. The data/information requirements should cover the following;

- ◆ *Socio-economic and political environment (i.e. basic resource management issues to be addressed; existing and traditional socioeconomic and resource use patterns for the area; individuals, groups or institutions that control resource use patterns; goals people expect as outcomes from resource management intervention)*
- ◆ *Bio-physical factors (mangrove density, seagrass cover, coral cover, presence of fish species indicators; fish species affected most; causes of overfishing).*

Inform the participants that PCRA data and other secondary sources can be used in the process of determining the situation of the area being considered.



1 hr

Discussion on Data Gathering Techniques



Explain that there are various data gathering techniques used in resource mapping and site selection. Make use of the PCRA map if it is available. Proceed in discussing the manta tow as one of the techniques in resource mapping and data gathering. Once data requirements are agreed and firmed up, divide the participants into small groups to design forms and formats for baseline data gathering.

Show other data gathering techniques relevant to data needed (i.e. venn diagram and stakeholder analysis for socio-political environment; and fish visual census for bio-physical factors).



25 minutes

Pre-Field Exercises Briefing

Group the participants into land- and sea-based groups. Remind them of the outputs of each of the groups. Land-based group shall produce a socio-economic profile and a resource map plotting various info such as; general features, habitats, resources, uses, settlement sites, issues, and other relevant information. Sea-based group shall produce a resource map using manta tow and an analysis of fish abundance of a selected site. Make sure that sea-based group members are equipped with swimming skills.

Summarize the presentation by asking the participants some questions using the session objectives as guide.



HANDOUT #6

Criteria for site selection

Your site selection will depend on the objectives of your sanctuary. Possible criteria that you can be used;

1. Ecological importance

How important is the area / ecosystem being chosen?

What commercially and ecologically important species are there in the area, what parts of their life cycle etc.

How many people use the area for gleaning etc.

Is it good quality habitat still and diverse (many species) i.e. will it be able to recover

Uniqueness, is it unique or important

Contains a variety of habitats and encompasses one system

2. Social importance

The area is going to be accepted by the community at large as a closed area

Is it near to people who will arrange and guard it / within view of the community, if it is too far away it will be difficult to manage

Are there certain types of fishing gear already in the area, where will they be displaced to

Are all the involved groups, recreationers, fishers, gleaners willing to close the area

Heritage, historic, cultural aspects

3. Economic importance

Is it acting as nursery area / refuge area for fishes at present

Does the community have enough funds to put buoys in the area, build a guardhouse etc.



Does it have potential for tourism / diving later on?

4. Practical

Size, is it going to be biologically feasible? balance the size based on feasibility and community aspects

Is it really going to cause a major upset to the community income / livelihood

Have you got financial funding to get the sanctuary up and running

Is there a lead group in charge etc.

5. Other criteria

Urgency

How badly does the community need the sanctuary

Effectiveness

How useful will the sanctuary be to the community

Manageability

Is it manageable

Size and Shape of sanctuaries

Better to have larger sanctuaries (in theory).

All sanctuaries are helping, many processes unknown still and even in a massive area with low habitat there may be larval, eggs and other impacts which are unseen

Smaller reserves will look after smaller range fishes, larger sanctuaries will allow for fishes with larger ranges. (predators large ranges) damselfishes anenome fishes small range

Opportunity cost

It is actually quite expensive to set up and manage, patrol and so on a sanctuary.



In Bohol we therefore encourage the limit of about 10 hectares minimum for a sanctuary. This will insure that the impact and return on fish catch of the sanctuary is worth the investment and sacrifice of the fisherfolks (again case to case basis). If there is a better impact then much higher chance of sustainability of sanctuary

In theory about 20% of the fishing ground or habitat should be enough to act as insurance policy for main fishes and corals and invertebrates within the area



Data Checklist Form								
Question, issue or problem	Possible Indicators	What may cause change	Where to Monitor	When to Monitor	Monitoring Method	Materials Needed	Person(s) Assigned	Target Dates & # days needed
Overfishing Poaching in MPA	Fish sizes & abundance	Changes in fishing effort, natural disturbances, changes in coral cover, management	Inside and outside the MPA	Northeast monsoon, southwest monsoon, summer	Fish Visual Census	50-m rope marked at 5-m intervals, mask & snorkels, slates w/ pencils, banca & gasoline, data sheets	MPA monitoring Team	1 st weekend of January, 1 st weekend of May.
	Invertebrate abundance	Same as above	Same as above	Same as above	Invertebrate Census	Same as above	Same as above	Same as above
Habitat Degradation	Fishing Effort, Catch per unit	Increase in fishing effort, management practices like MPA enforcement	Whole village	At least once a week	Fish Catch Monitoring	Data sheets & pencils, logbook or notebook, fish identification materials, resource map, weighing scale, calculator	MPA monitoring team, women's group	Every Wednesday. Collection /submission of data forms 4 th Saturday of the month data summarization
	Coral cover	Destructive fishing practices, natural disturbances, management practices like MPA enforcement	Inside & outside the MPA	Once a year	Manta tow, Snorkel Survey	50-m rope marked at 5-m intervals, mask & snorkels, slates w/ pencils, banca & gasoline, data sheets	MPA monitoring team	1 st weekend of May, 1-2 days



Design

Should try and include land as part of area and should block off the whole of an area (easier enforcement and some species still move onto land occasionally etc.)

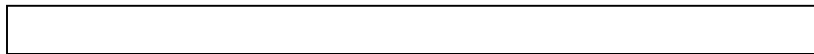
Should try and include coral reefs and other associated habitats and nursery grounds such as seagrasses, mangroves etc.

Surface area to Volume ratio

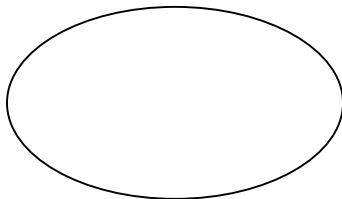
'Leakage' concept

possible designs for a 10 hectare sanctuary

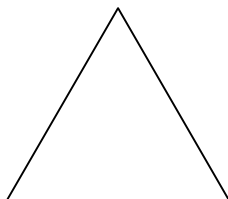
Rectangle 1000*100 Large surface area, more leakage



Circle *Medium size surface area to volume ratio*



Triangle *Large area for leakage*



Square Smallest surface area compared to volume



However remember to fit your optimum area around the features of the reef (i.e. drop off, inshore portion etc).

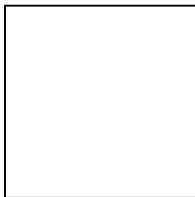
Rules of thumb: Lots of guess work, ask the older fisherfolks!!

Try and fit in with the features of the reef and area, i.e. drop off reef crest include all of this and then perhaps add 100-200 Metres extra etc.

Examples of sanctuary set up

Can also include 2 blocks e.g. Calayugan Sur, Sandingan Island, Loon, Bohol

Block one coralline area



Block two seagrass area



Lomboy, Pangangan, Calape, Bohol

All area covered, deeper in middle portion and shallower at sides, square



Cabacongan, Cabilao, Loon, Bohol

Steep drop off reef rectangle shape

Placement Conclusions

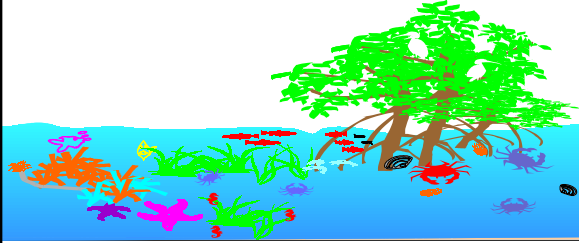
- Involve community in whole process
- Use mapping as mainstay of process to identify what is the best areas
- Involves compromises
- Consider both social and biological factors
- Include adjoining ecosystems and habitats which fishes use e.g. seagrass with corals
etc.
- Include land if possible
- Put it in an area which is easy to protect (visible)
- Put it in an area where there are few full time fishers
- Talk to the older fishers!



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Marine Protected Area Establishment and Management Session 6

Resource Mapping and Baseline Data Gathering



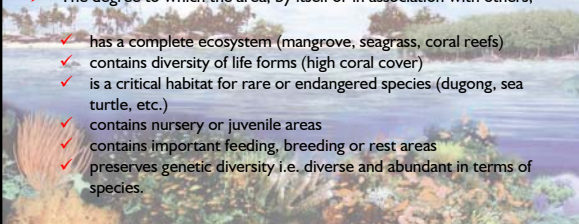
Resource Mapping and Baseline Data Gathering

Marine Protected Area Establishment and Management Session 6

Criteria in selecting MPA

Ecological importance

- Contributes to maintenance of essential ecological processes or life support systems e.g. source for larvae for downstream areas;
- The degree to which the area, by itself or in association with others;
 - ✓ has a complete ecosystem (mangrove, seagrass, coral reefs)
 - ✓ contains diversity of life forms (high coral cover)
 - ✓ is a critical habitat for rare or endangered species (dugong, sea turtle, etc.)
 - ✓ contains nursery or juvenile areas
 - ✓ contains important feeding, breeding or rest areas
 - ✓ preserves genetic diversity i.e. diverse and abundant in terms of species.




Resource Mapping and Baseline Data Gathering

Marine Protected Area Establishment and Management Session 6


Social importance

- Existing or potential value to local, national or international communities because of heritage, historic, cultural, aesthetic, educational or recreational qualities
- The degree to which the area impacts on the community (who and how many will be adversely affected)



Economic importance

- Existing or potential contribution to economic value by virtue of protection of: recreation, subsistence use by traditional inhabitants, tourism, refuge, nursery area, recruitment source for commercially important species.




Resource Mapping and Baseline Data Gathering



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Marine Protected Area Establishment and Management Session 6

Practicality/feasibility considerations




- Degree of insulation from external destructive influences
- Social and political acceptability
- Community support
- Accessibility for education, tourism, recreation
- Compatibility with existing uses, particularly by locals
- Ease of manageability (location, area covered)
- Compatibility with existing management regimes

Resource Mapping and Baseline Data Gathering

Marine Protected Area Establishment and Management Session 6

Site selection process and resource mapping

- **PCRA map** – the use of a coastal resource map from PCRA in determining the sites of potential MPA sites.
- **Manta Tow Technique** – the observation of an underwater area of good visibility by a snorkeler who is being pulled by a boat.



Resource Mapping and Baseline Data Gathering

Marine Protected Area Establishment and Management Session 6

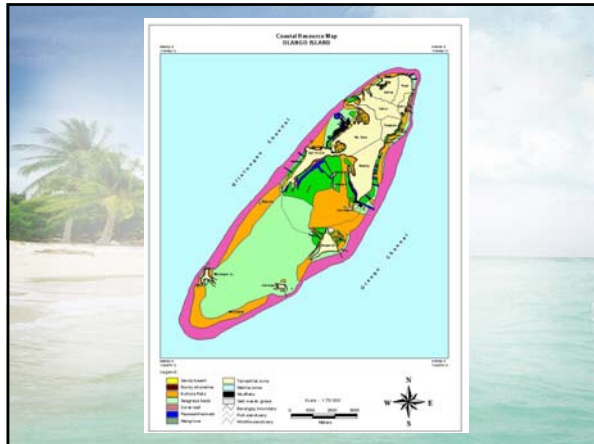
MANTA TOW DATA FORM Form 3

Date (month/day/year):		Time:		Municipality & Province:		Observer:		Timer/Mapper:	
04/26/1999		1:00-5:00 PM		LOOY, BHOLO		Andro/Polya		Polya/Andro	
Tow No.	Start Time	Latitude & Longitude/Compass Bearing/Landmarks		Depth (m)	Substrate cover				Notes (e.g. crown-of-thorns starfish, Diadema spines, algae, etc.)
		Start	End		Hard Coral	Soft Coral	Dead Coral	DC w/ Algae	
1	16:07:25	9°51.873 122°46.481	9°51.793 122°46.404	80	5	0	0	30	Observer: AU
2	16:10:00	9°51.792 122°46.404	9°51.722 122°46.335	70	0	0	0	5	Observer: AU
3	16:12:50	9°51.557 122°46.327	9°51.568 122°46.240	70	0	0	0	0	Observer: AU
4		9°51.849 122°46.241	9°51.606 122°46.987	86	0	0	0	0	Observer: AU
5			9°51.297 122°46.053						none
6	16:25:36	9°51.870 122°46.063		86	0	0	0	0	Observer: PNG
7	16:29:00	9°51.866 122°46.997	9°51.610 122°46.907	80	0	0	0	5	Observer: PNG
8	16:32:00	9°51.857 122°46.896	9°51.683 122°46.807	55	0	0	0	0	Observer: PNG
9	16:34:30	9°51.892 122°46.791	9°51.780 122°46.717	30	5	0	0	0	Observer: PNG
10	16:37:00	9°51.790 122°46.743		30	0	0	30	0	Observer: PNG
11	16:40:15	9°51.912 122°46.712	9°51.952 122°46.712	60	0	0	0	30	4

Resource Mapping and Baseline Data Gathering



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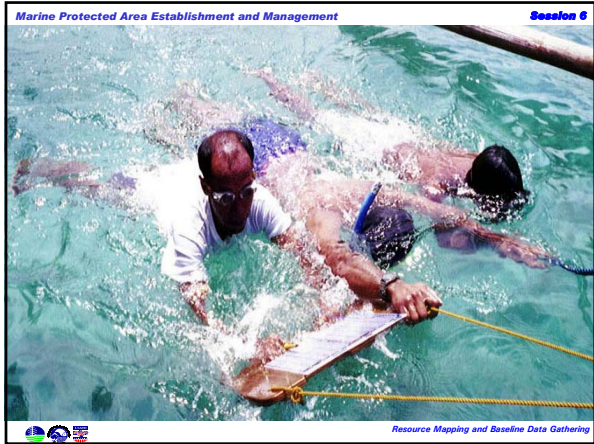




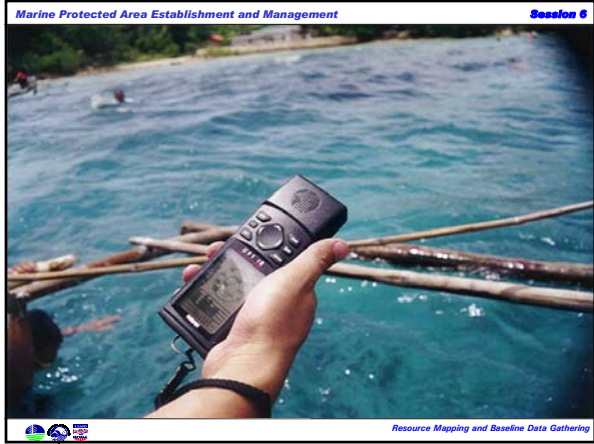




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Marine Protected Area Establishment and Management

Session 6

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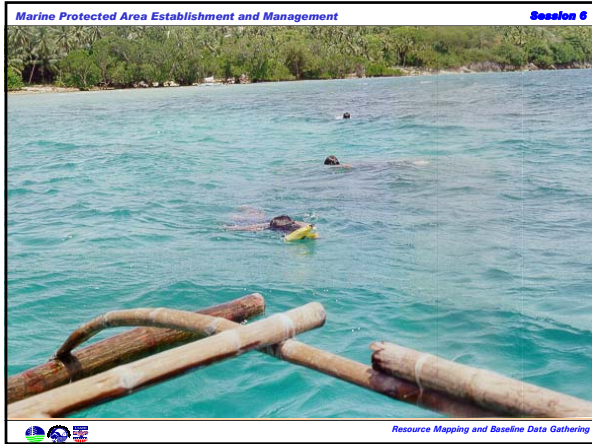




Marine Protected Area Establishment and Management

Session 6

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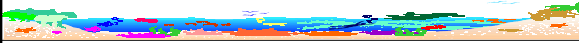


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Marine Protected Area Establishment and Management Session 6

Opportunity cost

- It is actually quite expensive to set up, manage, and patrol a sanctuary.
- In Bohol, the limit is set up to about 10 hectares minimum for a sanctuary. This will insure that the impact and return on fish catch of the sanctuary is worth the investment and sacrifice of the fisherfolks (again case to case basis).
- In theory about 20% of the fishing ground or habitat should be enough to act as “insurance policy” for main fishes and corals and invertebrates within the area




Resource Mapping and Baseline Data Gathering

Marine Protected Area Establishment and Management Session 6

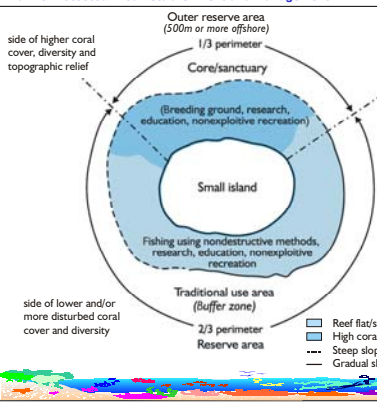
Design

- Should try and include land as part of area and should block off the whole of an area (easier enforcement and some species still move onto land occasionally etc.)
- Should try and include coral reefs and other associated habitats and nursery grounds such as seagrasses, mangroves etc.



Resource Mapping and Baseline Data Gathering

Marine Protected Area Establishment and Management Session 6



Outer reserve area (500m or more offshore)
1/3 perimeter

Core/sanctuary
(Breeding ground, research, education, nonexploitive recreation)

Small island

Fishing using nondestructive methods, research, education, nonexploitive recreation

Traditional use area (Buffer zone)
2/3 perimeter

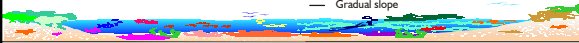
Reserve area

side of higher coral cover, diversity and topographic relief

side of lower and/or more disturbed coral cover and diversity

- Reef flat/slope
- High coral cover and relief
- Steep slope
- Gradual slope

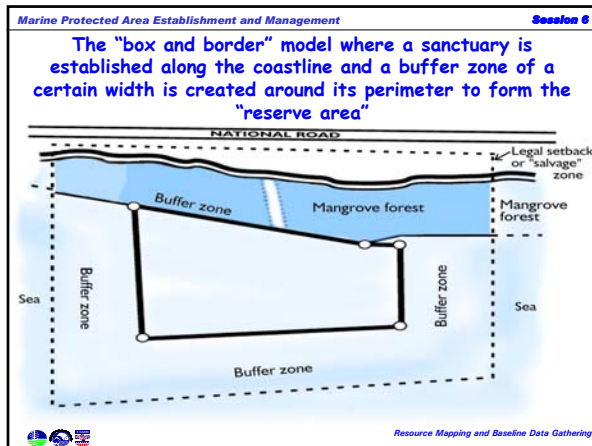
Example of Reserve System with Core Sanctuary and “Traditional Use” Buffer Areas applied to islands

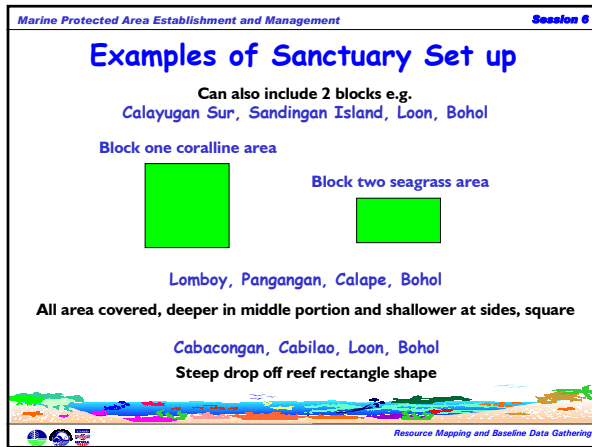


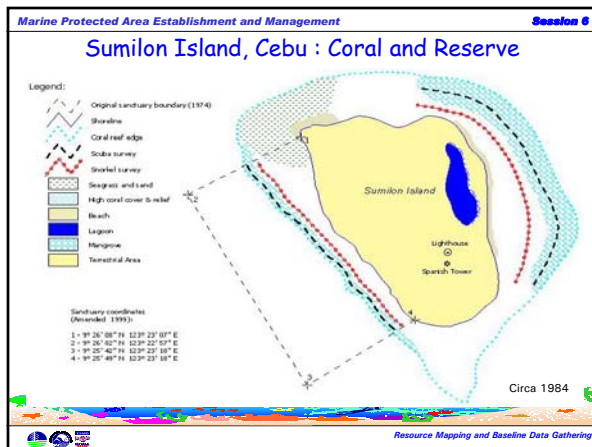
Resource Mapping and Baseline Data Gathering



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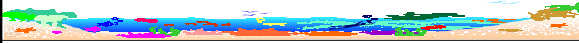


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Marine Protected Area Establishment and Management Session 6

Practical Reminders

- Remember to fit your optimum area around the features of the reef (i.e., drop off, inshore portion etc).
- Rules of thumb: Lots of guess work, ask the older fisherfolks!!
- Try and fit in with the features of the reef and area, i.e. drop off reef crest include all of this and then perhaps add 100-200 meters extra etc.




Resource Mapping and Baseline Data Gathering

Marine Protected Area Establishment and Management Session 6

Placement Conclusions

- Should involve community in whole process
- Use mapping as mainstay of process to identify what is the best areas
- Involves compromises
- Consider both social and biological factors
- Include adjoining ecosystems and habitats which fishes use e.g., seagrass with corals etc.
- Include land if possible
- Put it in an area which is easy to protect (visible)
- Put it in an area where there are few full time fishers
- Talk to the older fishers!



Resource Mapping and Baseline Data Gathering



SESSION**OBJECTIVES****IMPORTANCE****METHODOLOGY****TIME****MATERIALS & EQUIPMENT****HANDOUTS & READING MATERIALS****7.0 MPA PLANNING AND ZONING**

At the end of the session, participants will be able to:

- ◆ discuss the planning process for MPA establishment,
- ◆ generate a resource map with indicative zoning scheme for MPA management,
- ◆ articulate some policy guidelines and regulatory mechanisms for each of the zone.

Knowledge on MPA planning and zoning processes is a requisite to come up with a management plan

Lecture, Workshop

2 hours

Idea Cards, Manila paper, Markers, Masking tape, Overheads, Overhead projector, Screen, PCRA map

- Philippine Coastal Management Guidebook Series #s 5
- Zoning types
- Basic Contents of MPA Management Plan
- Philippine Coral Reefs Under Threat: Lessons Learned After 25 Years of Community-Based Reef Conservation



TRAINING SESSION 7.0

CONTENT AND ACTIVITY PLAN

10 minutes

Introduction

Introduce the session noting the coverage and the expected output at the end of the session and its relation to the overall output of the training program. Link the session on baseline data collection and resource mapping to this session. Also recall the discussion on site selection criteria and shapes and sizes of MPA. Tell the participants that refreshing their knowledge on these items is vital in this session.



45 minutes

Group Sharing on Experiences in Planning

Start the discussion by asking the participants their idea of planning in general and MPA planning in particular. (where possible, start with a group activity before drawing out concepts of planning.) Note down their answers and link to the definition of planning.

Characteristics of effective planning process include the following:

- ◆ *Participation – planning should be a participatory exercise involving the organization’s clients and other outside individuals or groups who will be affected by the plan together with those whole will be responsible for implementing the plan. A plan which seeks to dictate programs without this consultation and involvement is likely to be far less effective.*
- ◆ *Bias towards action – many factors affect how useful any planning exercise will be but none is more important than the presence or absence of a “bias towards action”. There need to be a real commitment from the organization to implementation of the plan. This is sometimes lacking if planning is undertaken just to meet statutory and bureaucratic obligations or because it is “the thing to do”.*
- ◆ *Decision making framework – circumstances relevant to a plan will change. Plans that propose a series of actions to be undertaken in response to current circumstances without clearly linking these to broader objectives can quickly become outdated. Effective plans establish clear outcomes and objectives, establishing a framework which can be used to guide future decisions and to help formulate strategies to cope with new problems or opportunities.*

Discuss the minimum contents of the plan (see handouts). Tell them that they need to come up with MPA management plan at the end of the training.





50 minutes

Group Discussion and Exercises on Zoning

Discuss various zoning schemes by showing the sample resource map. Emphasize the need and the reason for zoning in managing properly the MPA. Ask the participants

- ◆ *what types of MPA zones they are familiar with?*
- ◆ *what are the policy guidelines and regulatory mechanisms for each of these zones?*

Note their answers and elaborate some points using the prepared acetates. Remind them that zoning scheme should be part of the MPA management plan they need to produce at the end of the course



10 minutes

Wrap Up

Summarize the key points in this session and note its link to the expected output of the course. Also ask the participants some questions using the session objectives as guide.



HANDOUT #7

Basic Contents of MPA Management Plan

I Overview

II Background Information

Socio-economic and political environment

Community's perception and attitude towards MPA

Traditional activities of fishers in the proposed area

Biophysical factors

Habitat (coral, seagrass cover and/or diversity)

Fish species indicators

III Summary of Management Issues and Opportunities

IV Management Objectives (Purpose)

V Programs and Strategies

Habitat enhancement

Enterprise/livelihood development

Education and capability building

Policy and law enforcement

Monitoring and evaluation

VI Zoning Plan and Policy Guidelines

Resource Map and Delineated Zones

Policy Guidelines and Regulatory Mechanisms

VII Implementation and Administrative Arrangements

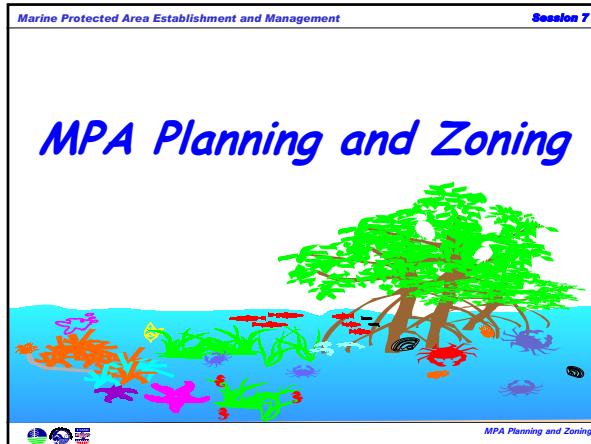
Organizational structure

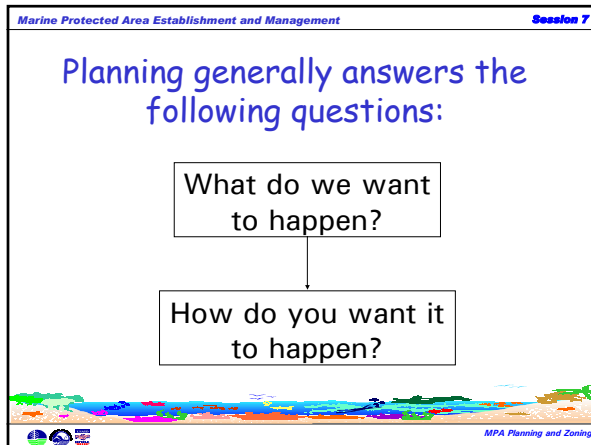
Roles and responsibilities of various offices and stakeholders

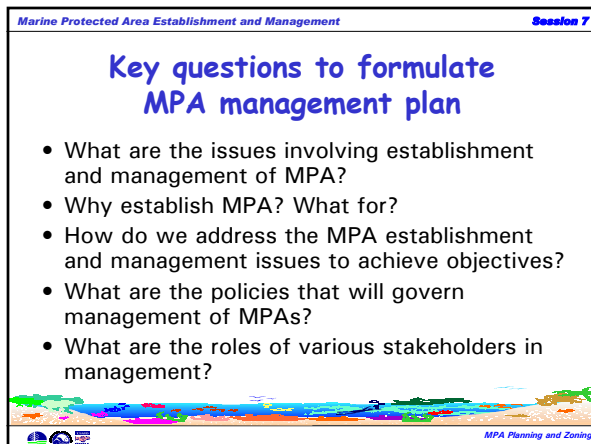
VIII Attachments



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Marine Protected Area Establishment and Management

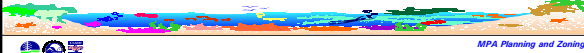
Session 7

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Marine Protected Area Establishment and Management **Session 7**

Program Components of MPA Management Plan

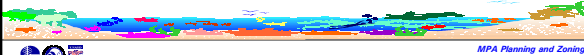
- Habitat enhancement
- Enterprise/livelihood development
- Education and capability building
- Policy and law enforcement
- Monitoring and evaluation



MPA Planning and Zoning

Marine Protected Area Establishment and Management **Session 7**

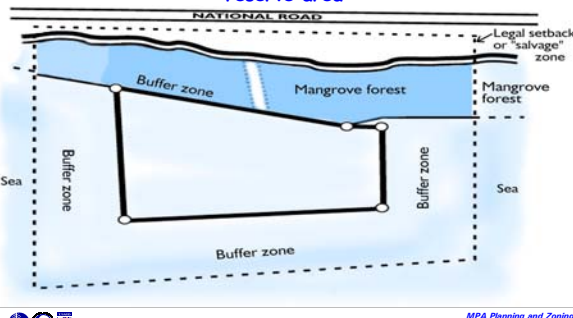
Zone	Prohibited	Regulated
Core		
Buffer		



MPA Planning and Zoning

Marine Protected Area Establishment and Management **Session 7**

The "box and border" model where a sanctuary is established along the coastline and a buffer zone of a certain width is created around its perimeter to form the "reserve area"

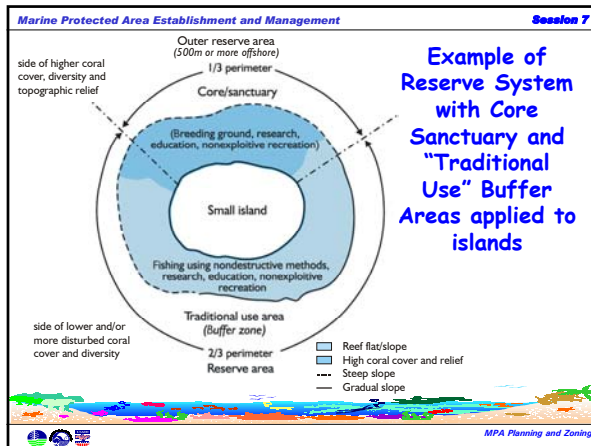


The diagram illustrates the "box and border" model. It shows a coastal area with a "NATIONAL ROAD" at the top. Below the road is a "Legal setback or 'salvage' zone". The main area is divided into a "Buffer zone" (indicated by a dashed line) and a "Mangrove forest" area. The "Sea" is on both sides. The "Buffer zone" is shown as a rectangular area surrounding the "Mangrove forest" area.

MPA Planning and Zoning



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- Marine Protected Area Establishment and Management Session 7
- ### Stakeholders in MPA management
- Office of the Mayor
 - Sangguniang Bayan
 - MAO and other line agencies in the municipality
 - PNP and other law enforcement units
 - Municipal/Barangay FARMC
 - Barangay Captain, Council, Tanod
 - Fishermen's association
 - Private sector
- MPA Planning and Zoning

- Marine Protected Area Establishment and Management Session 7
- ### Basic Contents of MPA Management Plan
- I Overview**
- II Background Information**
- Socio-economic and political environment*
- Community's perception and attitude towards MPA
 - Traditional activities of fishers in the proposed area
- Biophysical factors*
- Habitat (coral, seagrass cover and/or diversity)
 - Fish species indicators
- III Summary of Management Issues and Opportunities**
- MPA Planning and Zoning



Marine Protected Area Establishment and Management

Session 7

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Marine Protected Area Establishment and Management **Session 7**

(Cont.) Basic Contents of MPA Management Plan

- IV Management Objectives (Purpose)**
- V Programs and Strategies**
- VI Zoning Plan and Policy Guideline**
 - Resource Map and Delineated Zones*
 - Policy Guidelines and Regulatory Mechanisms*
- VIII Implementation and Administrative Arrangements**
 - Organizational and Functional Structure*
 - Schedule of Activities and Budgetary Requirement*
- VIII Attachments**




MPA Planning and Zoning

Marine Protected Area Establishment and Management **Session 7**

Buoys

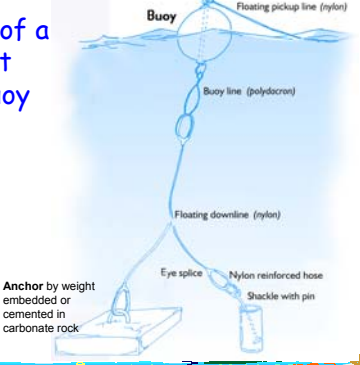
- **To mark boundaries of MPA**
- **To differentiate zones**
- **To mobilize people participation in MPA establishment (a 'tangible' activity)**
- **To facilitate effective enforcement**
- **To permit MIE**



MPA Planning and Zoning

Marine Protected Area Establishment and Management **Session 7**

Components of a Permanent Mooring Buoy



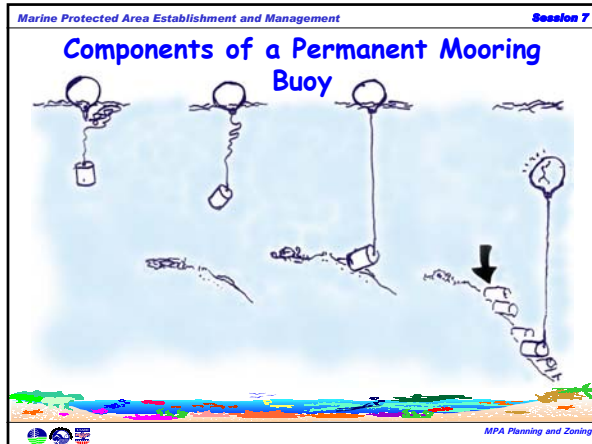
MPA Planning and Zoning

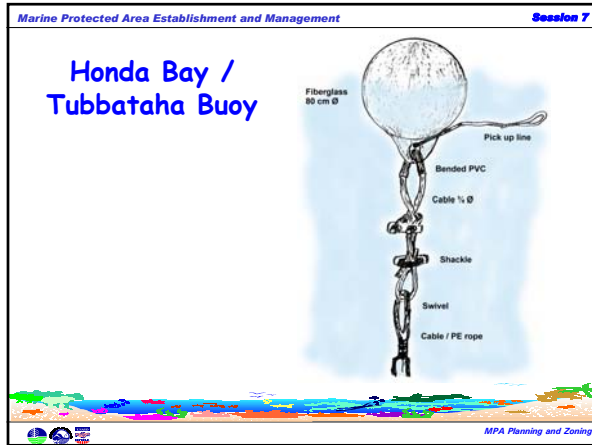


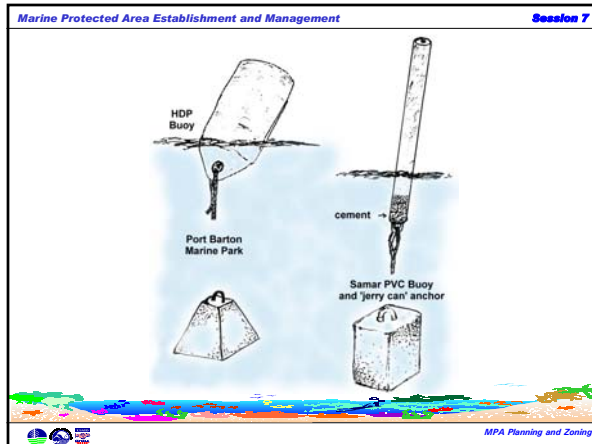
Marine Protected Area Establishment and Management

Session 7

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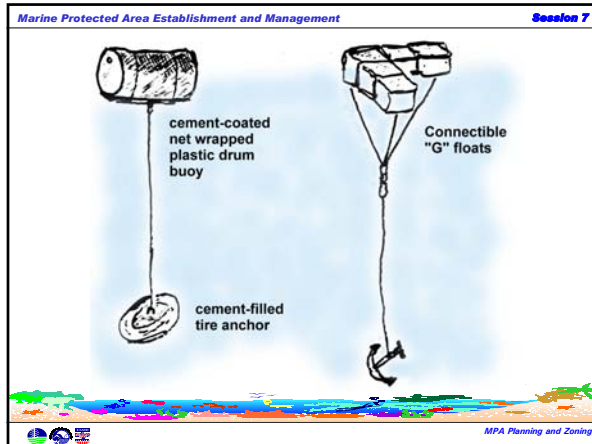




Marine Protected Area Establishment and Management

Session 7

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SESSION**OBJECTIVES****IMPORTANCE****METHODOLOGY****TIME****MATERIALS & EQUIPMENT****HANDOUTS & READING MATERIALS****8.0 LOCAL LEGISLATION AND LAW ENFORCEMENT**

At the end of the session, participants will be able to:

- ◆ discuss the need for legislative action for MPA,
- ◆ explain the legislative process in formulating a community-based MPA,
- ◆ enumerate the minimum contents of the ordinance declaring a MPA.
- ◆ explain the key elements of patrolling schemes applicable for marine protected area management

Knowledge on the processes involved in local legislation to establish an MPA and vital provision therein is very critical in successful implementation and enforcement

Lecture, Workshop

2.0 hours

Idea Cards, Manila paper, Markers, Masking tape, Overheads, Overhead projector, Screen,

- Philippine Coastal Management Guidebook Series #s 2, 5, 6 & 8
- Sample ordinance declaring a marine protected area
- Sample fisheries ordinance
- Sample comprehensive CRM ordinance



TRAINING SESSION 8.0

CONTENT AND ACTIVITY PLAN



10 minutes

Introduction

Introduce the session. Stress the objectives and its relation to MPA establishment and management process



20 minutes

Question and Discussion on MPA Legislation

Ask the participants the following questions to start the discussion:

- ◆ *what are their experiences relative to local legislation particularly the process of passing an ordinance?*
- ◆ *why is it that legislative support in a form of resolution and/or ordinance is important in the establishment and management of a marine protected area?*
- ◆ *how should the crafting of the ordinance declaring a marine protected area be made?*

Note down their answers and relate these to the presentation.



30 minutes

Presentation on Local Legislation

Link presentation to the points discussed earlier. The presentation may follow this outline.

- ◆ *The importance of legislative support in MPA establishment and management*
- ◆ *Local legislative process in formulating an ordinance declaring a community-based marine protected area*
- ◆ *Minimum contents of an ordinance declaring a marine protected area*



20 minutes

Buzz Session to Critique Sample Ordinance

Distribute sample ordinance and form buzz groups. Ask each group to critique the ordinance as regards the contents. Encourage exchange of ideas. Note down their answers.



Relate the outputs to comprehensive CRM plan a local government unit may have formulated. Stress the how the two measures relate.

HANDOUT #8
Sample Ordinance

Republic of the Philippines
Province of _____
MUNICIPALITY OF _____

Excerpts from the minutes of the regular session of the Sangguniang Bayan of _____, held in its Session Hall on _____.

Present:

- Hon. _____, Vice-Mayor and Presiding Officer
- Hon. _____, Member, Sangguniang Bayan
- Hon. _____, Member, Sangguniang Bayan
- Hon. _____, Member, Sangguniang Bayan
- Hon. _____, Member, Sangguniang Bayan
- Hon. _____, Member, Sangguniang Bayan
- Hon. _____, Member, Sangguniang Bayan
- Hon. _____, Member, Sangguniang Bayan
- Hon. _____, Member, Sangguniang Bayan
- Hon. _____, Member, Sangguniang Bayan
- Hon. _____, Member, Sangguniang Bayan

Absent : None

Ordinance Non. _____ Series of 2000
An Ordinance Establishing a Marine Sanctuary
in the Municipal Waters of _____

BE IT ORDAINED by the Sangguniang Bayan of the Municipality of _____, Province of _____, That

Section 1. Title. - This ordinance shall be known as the _____
Marine Sanctuary Ordinance of 2000.



Section 2. Declaration of Policy. - This is hereby declared the policy of the municipality:

1. to manage the coastal and fishery resources of the municipality, in a manner consistent with the principle of coastal resource management;
2. to protect and manage the municipal waters its coastal and fisheries resources for the enjoyment and benefits of the municipal fishers in perpetuity; and
3. to enhance people's participation in the management of the coastal and fishery resources of the municipality.

Section 3. Definition of Terms. - As used in this ordinance, the following terms and phrases shall mean as follows:

1. **Marine Sanctuary** - a designated area in the municipal waters where fishing and other fisheries activities are prohibited and human access may be restricted and which is characterized by high productivity and/or high biodiversity.
2. **MFARMC** - shall mean Municipal Fisheries and Aquatic Resources Management Council.
3. **Municipal Waters** - include not only streams, lakes, inland bodies of water and tidal waters within the municipality which are not the subject of private ownership and not included within the national parks, brackish water fishponds leased by the government, and national fishery reserves, refuge and sanctuaries but also marine waters included between two 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 15 kilometers from such coastline. Where two municipalities are so situated on opposite shores such that there is less than thirty (30) kilometers of marine waters between them, the third line shall be a line equidistant from opposite shores of the respective municipalities.
4. **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 band themselves together to work for and y themselves for their own upliftment, development and greater good.



Section 4. Boundaries of the Marine Sanctuary. There shall be a marine sanctuary in the municipal waters of this municipality within the following geographic coordinates:

From Pt. 1 $XX^{\circ} XX' XX''$ N latitude, $XX^{\circ} XX' XX''$ E longitude
To Pt. 2 $XX^{\circ} XX' XX''$ N latitude, $XX^{\circ} XX' XX''$ E longitude
To Pt. 3 $XX^{\circ} XX' XX''$ N latitude, $XX^{\circ} XX' XX''$ E longitude
To Pt. 4 $XX^{\circ} XX' XX''$ N latitude, $XX^{\circ} XX' XX''$ E longitude

Provided, That fishing and other human activities in the marine sanctuary are prohibited: Provided, however, That scientific and educational activities shall be allowed in the sanctuary, only if written permission is obtained from the municipal government.

Section 5. Management of the Marine Sanctuary. The municipal government, the people's organization, the barangay council, and the MFARMC, shall be responsible for the management, protection, conservation and development of the marine sanctuary.

Section 6. Formulation of Sanctuary Management Plan. Within thirty (30) days from the approval of this ordinance, the municipal government, the people's organization, the barangay council and the MFARMC, shall formulate a management plan for the operation of the sanctuary.

Section 7. Appropriation. The municipal government shall allocate the amount of _____ for the implementation of this ordinance. The Sangguniang Bayan shall provide for the appropriation for the management of the sanctuary for the succeeding years to be included in the annual budget of the municipality.

Section 8. Penalty. Violators of this ordinance shall be penalized with a fine not exceeding two thousand five hundred pesos (₱2,500.00) or an imprisonment for a period not exceeding six (6) months, or both at the discretion of the court.



Section 9. Repealing Clause. All previous ordinances, executive orders, rules and regulations or parts thereof which are inconsistent with this ordinance are hereby repealed and modified accordingly.

Section 10. Separability Clause. If, for any reason or reasons, any part or provision of this ordinance shall be held unconstitutional or invalid, other parts or provisions hereof which are not affected thereby shall continue to be in full force and in effect.

Section 11. Effectivity Clause. This ordinance shall take effect ten (10) days after a copy of the thereof is posted in a bulletin board at the entrance and in at least two (2) other conspicuous places of the municipal building and the ordinance has been published once in a local newspaper of general circulation in the municipality.

SO ORDAINED . . .

APPROVED this _____, 2000 at _____.

I HEREBY CERTIFY the correctness of the foregoing Ordinance.

Secretary to the Sangguniang Bayan

ATTESTED:

Vice-Mayor
Presiding Officer, Sangguniang Bayan

APPROVED:

Mayor

Date of Approval _____



Patrolling Scheme

Patrolling scheme formulation does not start only during implementation or establishment of an MPA but commences right on the planning and consultation stages.

Stages of Patrolling Scheme Formulation

- Planning
 - identify potential committed individuals who can take charge in the enforcement
 - involve where possible the barangay council and other units within the barangay such as FARMC, Tanod, Fish Warden, Sangguniang Kabataan.
 - at the municipal level, evaluate the level of support incumbent officials can provide, including the PNP.
 - In effect, the patrolling scheme commences right at the onset of MPA planning and zoning consultations. Absence of an element of enforcement and patrolling scheme during planning and zoning discussions may be in the longer term not so favorable
 - The pulse of local communities as regards these issues can be determined during PCRA, resource mapping and baseline data collection. This should be actively sought after during this activity.
- Implementation and Maintenance
 - Ensure the arrangements are clear (i.e. committee on enforcement; rotation basis of individuals or task groups, etc),
 - Ensure provision and maintenance of equipment and infrastructure for enforcement purposes such as; binoculars, radio communication unit, megaphone, guardhouse, boat and gasoline.
 - Encourage volunteerism among community members. But urge barangay council where possible to provide incentives



- Collect fees on the use of a designated area within the protected area.
- Ensure sharing scheme be agreed and bulk of the revenues be used for the maintenance of the MPA

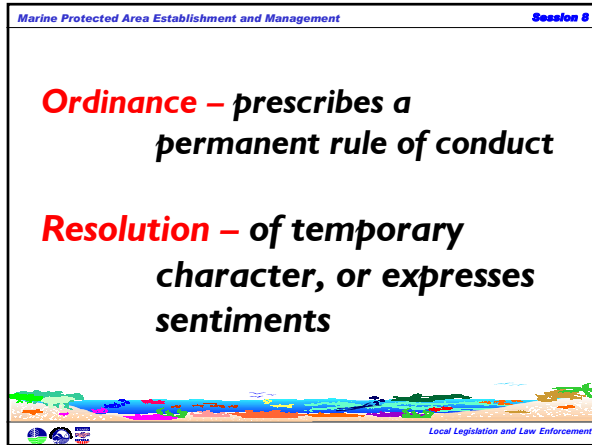
Lessons from Gilutongan Marine Sanctuary

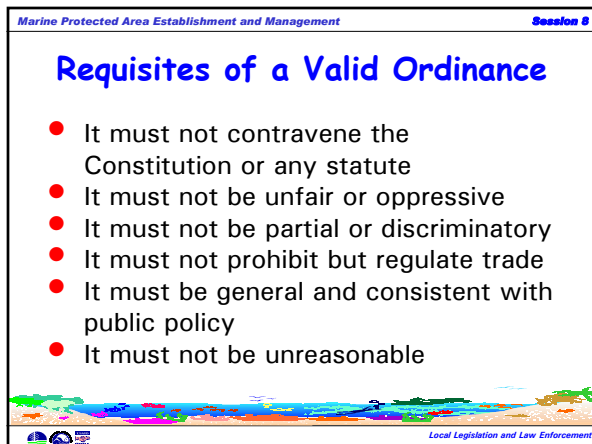
- Enforcement should be from the start community-driven, not solely a municipal initiative.
- Continuous education should be pursued. There is no other best law enforcement tools except continuous education.
- Patrolling and law enforcement arrangement should be tied with revenue collection and sharing scheme where possible. The same should be used for the management and maintenance of an MPA.



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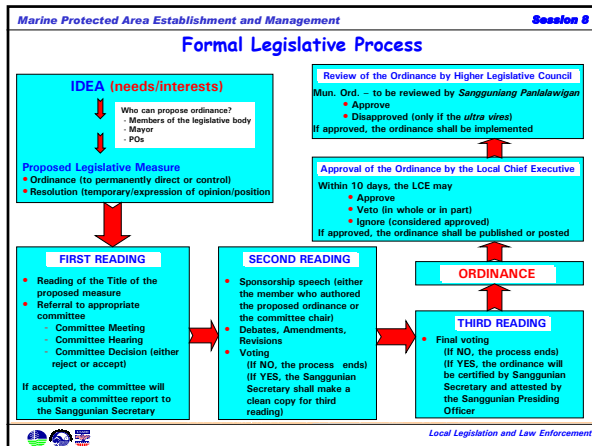








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-
- Essential Parts of an MPA Ordinance**
- Title
 - Declaration of Policy
 - Definitions of Terms
 - Boundaries of the MPA
 - Management Arrangement
 - Formulation of Management Plan
 - Appropriation
 - Penalty Clause
 - Repealing and Separability Clauses
 - Effectivity Clause
- Local Legislation and Law Enforcement

Patrolling Scheme

Patrolling scheme formulation does not start only during implementation of an MPA but commences right on the planning and consultation stages.

Local Legislation and Law Enforcement



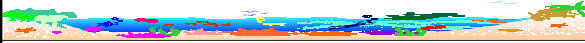
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Marine Protected Area Establishment and Management Session 8

Stages of Patrolling Scheme Formulation

Planning

- Identify potential committed individuals who can take charge in the enforcement
- Involve where possible the *barangay* council and other units within the *barangay* such as FARMC, Tanod, Fish Warden, *Sangguniang Kabataan*.
- At the municipal level, evaluate the level of support incumbent officials can provide, including the PNP.
- In effect, the patrolling scheme commences right at the onset of MPA planning and zoning consultations. Absence of an element of enforcement and patrolling scheme during planning and zoning discussions may be in the longer term not so favorable
- The pulse of local communities as regards these issues can be determined during PCRA, resource mapping and baseline data collection. This should be actively sought after during this activity.




Local Legislation and Law Enforcement

Marine Protected Area Establishment and Management Session 8

Implementation

- Ensure the arrangements are clear (i.e., committee on enforcement; rotation basis of individuals or task groups, etc).
- Ensure provision and maintenance of equipment and infrastructure for enforcement purposes such as; binoculars, radio communication unit, megaphone, guardhouse, boat and gasoline.
- Encourage volunteerism among community members. But urge *barangay* council where possible to provide incentives
- Collect fees on the use of a designated area within the protected area.
- Ensure sharing scheme be agreed and bulk of the revenues be used for the maintenance of the MPA




Local Legislation and Law Enforcement

Marine Protected Area Establishment and Management Session 8

Lessons from Gilutongan Marine Sanctuary

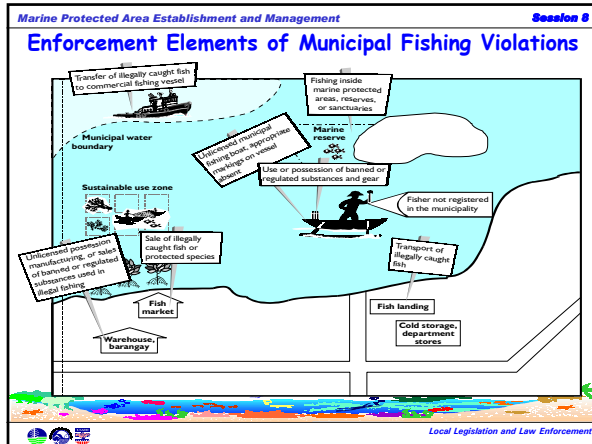
- Enforcement should be from the start community-driven, not solely a municipal initiative.
- Continuous education should be pursued. There is no other best law enforcement tools except continuous education.
- Patrolling and law enforcement arrangement should be tied with revenue collection and sharing scheme where possible. The same should be used for the management and maintenance of an MPA.

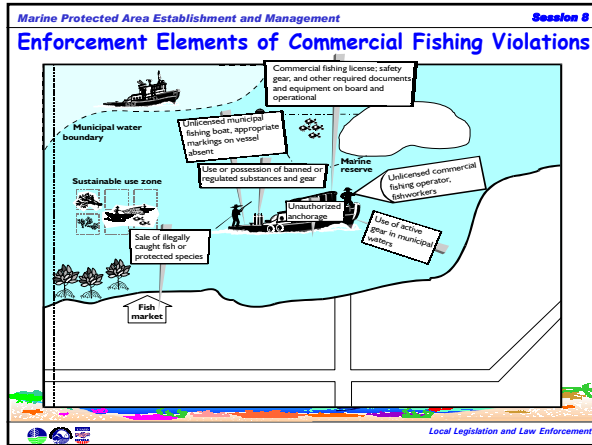


Local Legislation and Law Enforcement



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SESSION**OBJECTIVES****IMPORTANCE****METHODOLOGY****TIME****MATERIALS & EQUIPMENT****HANDOUTS & READING MATERIALS****9.0 REVENUE GENERATION AND BUDGETING**

At the end of the session, participants will be able to:

- ◆ come up with initial estimates of a proposed marine protected area,
- ◆ explain the cost-benefit analysis for MPA

Determining the budget items (both initial and recurrent) as well as the potential revenues from the sanctuary helps the participants appreciate the management and maintenance funding requirements.

Lecture; Workshop

1.5 hours

Idea Cards, Manila paper, Markers, Masking tape, Overheads, Overhead projector, Slide projector, Screen

- ◆ The Values of Philippine Coastal Resources: Why Protection and Management are Critical
- ◆ Collected Essays on the Economics of Coral Reefs
- ◆ Sample budget and cost estimates of an MPA
- ◆ Case Study of Cost-Benefit Analysis for MPA – Olango Island Case Study



TRAINING SESSION 9.0

CONTENT AND ACTIVITY PLAN



10 minutes

Introduction

Introduce the objectives and coverage of the session. Stress its relation to MPA management and maintenance.



20 minutes

Group Activity on Budget Items

Break the participants into small groups. Ask each group to consider what are the items constituting for initial investments and what are the recurrent costs. Let them present their answers and encourage them to explain why they are considered as initial investments and recurrent costs accordingly.



20 minutes

Presentation on Budgeting

Elaborate the various items under initial investments and recurrent costs. Note the importance of these concepts vis-à-vis annual programming and budgeting cycle of local governments or any organization for that matter. Give examples of these costs and its variations. Ensure that these items include the following:

Initial Investment

- ◆ *buoys and markers*
- ◆ *ropes*
- ◆ *boat*
- ◆ *guardhouse materials*

Recurrent Costs

- ◆ *gasoline*
- ◆ *honorarium for the guard*
- ◆ *buoy maintenance*
- ◆ *IEC and training materials*
- ◆ *monitoring and evaluation*





40 minutes

Presentation of CBA Case Study

Relate the discussion on budgeting on cost-benefit analysis. Emphasize that in MPA, it does not only talk about benefits but costs as well. Encourage participants to exchange some views on the matter.

Present a case study. Encourage participants to give their comments and critique on the case.

Wrap up the session noting the necessity for investments to generate revenues for the communities as shown in the case.



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Marine Protected Area Establishment and Management Session 9

REVENUE GENERATION AND BUDGETING

Revenue Generation and Budgeting

Marine Protected Area Establishment and Management Session 9

Estimated annual costs required to support coastal resource management in Olango Island

Olango Island Wide Management Costs ¹	
Resource assessments and monitoring	US\$
Two reef surveys (2 x US\$2,000)	4,000
Two wetland surveys (2 x US\$2,000)	4,000
Community Organizing	
4 CO's full-time working with communities (US\$4,000/person/year)	16,000
Education and training	
12 seminars	12,000
Education and training materials	3,000
Law enforcement	
1 full-time patrol boat, crew and maintenance	10,000
Information dissemination	
Weekly radio broadcasts	2,000
12 Public meetings	6,000
Water posters (2) (annualized over 10 years)	3,000
Planning activities	
1 full-time CRM planner and technical guide	4,000
4 Planning workshops (US\$1,000/workshop)	4,000
	70,000
Gilungon Marine Sanctuary (1 km ²) Operations and Maintenance Costs ²	
Reef surveys, monitoring and buoy maintenance	2,000
Community organizing	3,500
Education and training	3,500
Planning and resource center (annualized over 10 years)	1,000
Law enforcement (small patrol boat)	3,000
Information dissemination	2,000
Planning and operation	
1 full-time Project Director (on-site)	3,000
Honorarium for part time community staff	3,000
Municipal LGU staff and advisory group support	1,000
	21,000

Revenue Generation and Budgeting

Marine Protected Area Establishment and Management Session 9

Incremental annual benefits from Olango Island resource use per km² for different management regimes and the cost of management

Management Regime	Total benefits	Tourism benefit	Fisheries benefit	Costs
Gilungon Marine Sanctuary reef	~180,000	~170,000	~10,000	~20,000
Olango Island Reef	~30,000	~25,000	~5,000	~2,000
Olango Island Wetland	~60,000	~50,000	~10,000	~2,000

Revenue Generation and Budgeting



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Marine Protected Area Establishment and Management Session 9

Background History, Gilutongan Marine Sanctuary

1991

- Gilutongan Marine Sanctuary was established
- No clear management plan
- No accurate technical description
- Community members have very limited participation and involvement in the marine sanctuary
- No clear basis or criteria in site selection
- Only one person was active in law enforcement

Revenue Generation and Budgeting

Marine Protected Area Establishment and Management Session 9

(cont.)

1993

- Barangay resolution was passed imposing collection of users' fees for those who use the marine sanctuary, but was stopped.

1995

- Implementation of the ordinance was stopped

1998

- Marine Sanctuary was reestablished
- Municipal Ordinance was passed reestablishing the marine sanctuary
- PCRA was conducted
- Participatory Reef Assessment was undertaken regularly

Revenue Generation and Budgeting

Marine Protected Area Establishment and Management Session 9

Issues identified from PCRA

- Overexploitation of fisheries resources and destruction of coastal habitats
- Lack of fishery law enforcement
- Lack of alternative livelihood
- Low awareness on the status and condition of the coastal area
 - Continuous decline of fish catch among marginal fisherfolks
 - Lack of electricity and potable water in the island

Revenue Generation and Budgeting

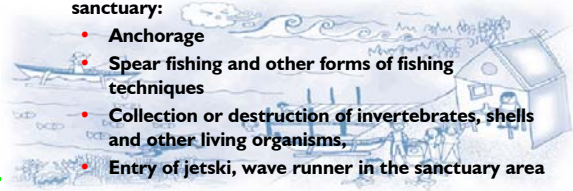


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Marine Protected Area Establishment and Management **Session 9**

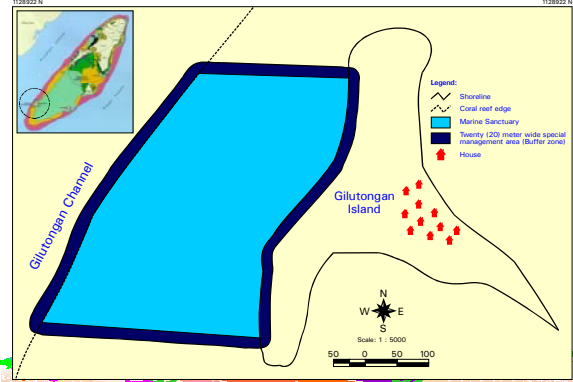
Highlights of the First Ordinance

- Formally established the 15-ha. marine sanctuary
- Clear technical description of the site
- 20-meter buffer zone was agreed including the shoreline
- Prohibited the following activities within the sanctuary:
 - Anchorage
 - Spear fishing and other forms of fishing techniques
 - Collection or destruction of invertebrates, shells and other living organisms,
 - Entry of jetski, wave runner in the sanctuary area



Revenue Generation and Budgeting

Marine Protected Area Establishment and Management **Session 9**



Legend:
- Shoreline
- Coral reef edge
- Marine Sanctuary
- Twenty (20) meter wide special management area (buffer zone)
- House

Gilutongan Channel
Gilutongan Island

Scale: 1 : 5000
50 0 50 100


Revenue Generation and Budgeting

Marine Protected Area Establishment and Management **Session 9**

Participatory reef assessment

- The Process
 - Undertaken by UP-MSI and CRMP
 - Involved representatives of the community, LGU, NGAs, NGOs local universities
 - Collected information on coral cover and fish species within and outside the sanctuary area

Undertook the same activity on a yearly basis



Revenue Generation and Budgeting




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Marine Protected Area Establishment and Management Session 9

Baseline survey results

- Improved interest and enthusiasm among members of the community
- Live hard coral was 48% within the sanctuary, but coral rubbles were apparent
- Dead standing corals was 24%
- Very few fish species were observed
- Reports indicated that spear fishing and use of dynamite were still rampant
- About 3,000 tourists visit the island and more than 300 boats put their anchor within the sanctuary every month




Revenue Generation and Budgeting

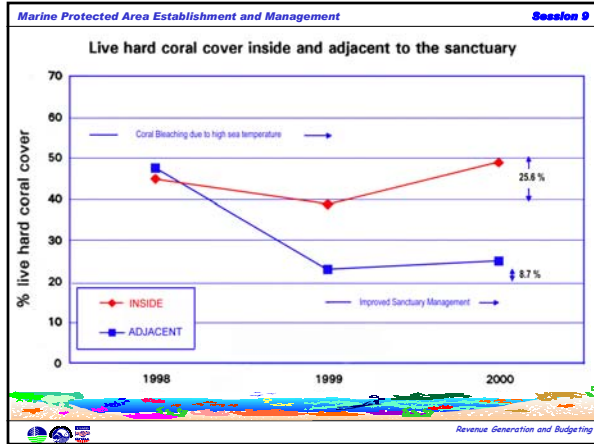
Marine Protected Area Establishment and Management Session 9

Results To Date

- Enforcement of laws: 24 hours a day
- Use: reduced the number of visitors to the island
- Quality of the environment: high improvement, a noticeable increase of fish catch outside the sanctuary
- LGU collection from user fees: PhP20,000 – 25,000/month
- Has provided other livelihood opportunities to other members
- New study site: has increased number of educational tours and cross-visit from various sectors interested to establish marine sanctuary

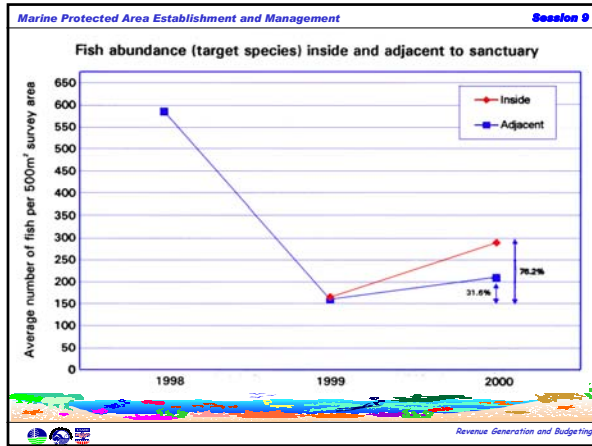


Revenue Generation and Budgeting





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Fish Type (English)	October 1998		March 1999		November 1999		March 2000		March 2001	
	Inside Sanctuary	Outside Sanctuary	Inside Sanctuary	Outside Sanctuary	Inside Sanctuary	Outside Sanctuary	Inside Sanctuary	Outside Sanctuary	Inside Sanctuary	Outside Sanctuary
Layer (English)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Layer (Karugay)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Labayan (Wrasse)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Layer (Scaevola)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Kalambut (Serranidae)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Sibat (Pomacentridae)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Pindugan (Gobiodon)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Sibat (Bream)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Alibangbang (Butterflyfish)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Indangan (Surongmang)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Pibung (Flatfish)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Bawal-Bawal (Nasobrycon)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Alibano (Pomacentridae)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Sibat (Pogonidae)	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉

Legend (fish observed per 500 m² survey area):
 ☉ 0 - 5 fish ☉-☉ 6-25 fish ☉-☉-☉ 26-50 fish ☉-☉-☉-☉ 51-100 fish
 ☉-☉-☉-☉-☉ 101-250 fish ☉-☉-☉-☉-☉-☉ 251-500 fish ☉-☉-☉-☉-☉-☉-☉ More than 500 fish

Prepared: Coastal Resource Management Project (CRMP) / University of the Philippines - Marine Science Institute (UP-MSI), Central Region V, SPAR Region V, the University of Cordova, Zamboanga City, Cotabato, Philippines. CRMP is an initiative of the Government of the Philippines implemented by the Department of Environment and Natural Resources, funded by the United States Agency for International Development and managed by Tetra Tech EM, Inc.



SESSION**OBJECTIVES****10.0 MONITORING AND EVALUATION OF MPAs**

At the end of the session, participants will be able to:

- ◆ Describe the tools for monitoring reef cover and fish species.
- ◆ Demonstrate the use of these tools

IMPORTANCE

Basic understanding of the concepts and techniques in monitoring and evaluation helps improve sound management of an MPA

METHODOLOGY

Simulation; Lecture

TIME

2 hours

MATERIALS & EQUIPMENT

Idea Cards, Manila paper, Markers, Masking tape, Overheads, Overhead projector, Screen, Slate Boards, Transect Tapes

HANDOUTS & READING MATERIALS

- Reef Assessment Handbook
- Sample Monitoring and Evaluation Document



TRAINING SESSION 10.0

CONTENT AND ACTIVITY PLAN



30 minutes

Group Discussion on MPA M&E

Start the discussion by showing MPA establishment and management process. Emphasize the role of monitoring and evaluation for the success of a marine protected area.

Ask the participants what monitoring and evaluation tools they are familiar with. Note their answers down. Relate their answers to the earlier session on resource mapping and baseline data collection. Discuss the following tools for monitoring:

- ◆ *manta tow techniques*
- ◆ *fish visual census*
- ◆ *fish catch monitoring*



1.0 hour

Demonstration of Use of M&E Tools

Group the participants into three or four and ask each group to demonstrate the process of data collection using their assigned tools.



30 minutes

Data Processing and Presentation

Remind participants that data is useless unless the community or other users are make use of it in decision-making processes and other management actions. Explain the procedure in data processing. Show some community level examples.

Summarize the session by highlighting the key points to consider during the field exercises.



HANDOUT #10

Monitoring and Evaluation of MPAs

Information is something we all need in every day life in order for us to make informed decisions about things

When using the adaptive management cycle this is even more important

Many Sanctuaries have been implemented but very few have been properly monitored

Much money is spent on implementation but again very little on evaluation of these inputs

Resource Assessment

- Assess trends and information and feeds into adaptive management cycle
- Finds out what a resource has, its main features and what is important
- Assesses an area in preparation for planning to occur

Research

- Understanding factors that predict the abundance of the fauna and flora in the area
- Looking for signals of activities that are influencing the area and 'noise', the impacts of these activities and their links
- Assessing causes and changes in an area

Monitoring

- Measure the impact of a specific management intervention
- Looking for temporal changes in both qualitative and quantitative indicators
- Evaluating the success or failure of certain interventions and developing conclusions for future implementation



In conducting assessments of marine sanctuaries there are several techniques which can be used, as facilitator you must be able to choose which is the best for the situation and each will be different for different areas

The most important though before you do anything is ask the question why are we going to monitor this area, if you are again clear with your objectives then you will be easily guided as to what is best.

It is also advisable to again include your key leaders from the area in the whole process from deciding which tool to use to actual implementation of the research.

RESEARCH overview (Community based monitoring book, Uychaio et al.)

Selecting representative areas
Numbers of areas and timeframes

Manta Tow

Community based fish visual census

Community based fish catch monitoring

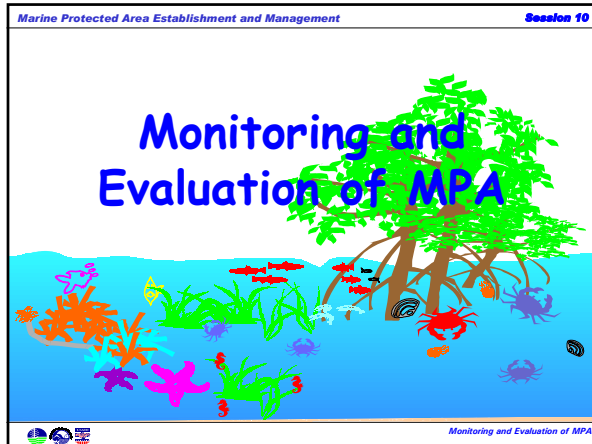
More technical and scientific monitoring, through the use of diving teams etc

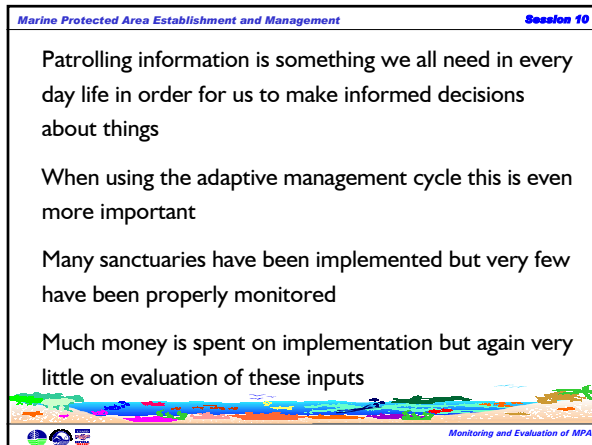
Conclusions

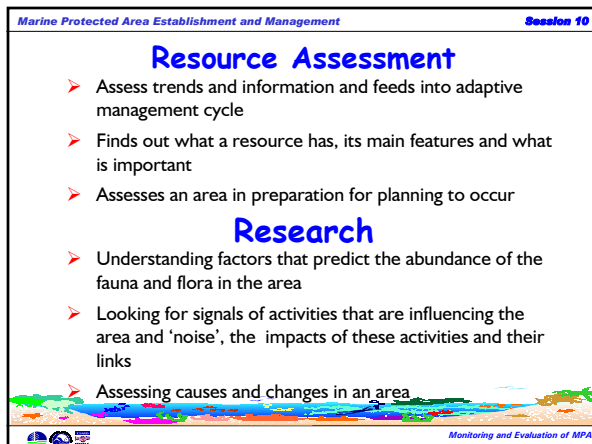
- Pick the tool based on objectives, why are we doing the monitoring?
- Copious amounts of participation
- Include community in research team
- Feed the information back and validate it properly and solicit feedback
- Publicly publish the results in barangay
- Long term sustainability, budget and so on
- Re-define / adjust your plan based on findings of the monitoring



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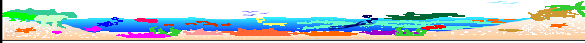


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Marine Protected Area Establishment and Management Session 10

Monitoring

- Assess and measure the impact of a specific management intervention
- Looking for temporal changes in both qualitative and quantitative indicators
- Evaluating the success or failure of certain interventions and developing conclusions for future implementation
- In conducting assessments of marine sanctuaries there are several techniques which can be used, as facilitator you must be able to choose which is the best for the situation and each will be different for different areas
- The most important though before you do anything is ask the question why are we going to monitor this area, if you are again clear with your objectives then you will be easily guided as to what is best.
- It is also advisable to again include your key leaders from the area in the whole process from deciding which tool to use to actual implementation of the research.




Monitoring and Evaluation of MPA

Marine Protected Area Establishment and Management Session 10

Research Overview

- **Selecting representative areas, numbers of areas and timeframes**
- **Manta tow**
- **Community based fish visual census**
- **Community based fish catch monitoring**
- **More technical and scientific monitoring, through the use of diving teams etc.**




Monitoring and Evaluation of MPA

Marine Protected Area Establishment and Management Session 10

Conclusions

- Pick the tool based on objectives, why are we doing the monitoring?
- Copious amounts of participation
- Include community in research team
- Feed the information back and validate it properly and solicit feedback
- Publicly publish the results in *barangay*
- Long term sustainability, budget and so on
- Re-define / adjust your plan based on findings of the monitoring



Monitoring and Evaluation of MPA



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