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**GEOGRAPHIC
INFORMATION
SYSTEM
FOR
COASTAL
AREA
MANAGEMENT
AND
PLANNING
PROJECT**

**FEBRUARY 1994
ICLARM-IDRC-
NEDA REGION I**

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~~Report~~ on the
Regional Workshop on
Resources Use Zonation for Lingayen Gulf

~~GIS~~CAMP Project 1994
ICLARM-IDRC-NEDA Region I

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Report on the
Regional Workshop on
Resources Use Zonation for Lingayen Gulf

GISAMP Project 1994
ICLARM-IDRC-NEDA Region I

13302

Introduction

The Lingayen Gulf Coastal Area Management Plan (NEDA, Region I 1992) completed under the ASEAN/US Coastal Resources Management Project in late 1991 recommended that a zonation scheme be established for Lingayen Gulf. It noted the numerous resource use conflicts in addition to resource over-exploitation and diminution of socioeconomic benefits for the coastal fisherfolk. The zonation scheme would be one of the several options aimed at sustainable development of the Lingayen Gulf area resources.

At the onset of the GISCAMP Project, it was envisaged to use geographic information systems (GIS) for spatial data management and to develop application modules relevant to coastal area management and planning. The recommendation of the plan for a zonation scheme made it necessary to enlarge the scope of the project. In the plan, the zonation scheme focused largely on the marine environment with minimal consideration on the terrestrial component. In light of the new development thrust of the Philippine Government for Region I beginning 1993, significant changes must be made to alter the scope of the proposed zonation scheme. The Lingayen Gulf area, particularly Pangasinan would be an industrial zone for Region I. Accordingly, several development plans gear towards industrialization have been approved for implementation. Hence, the formulation of the zonation scheme included the major inter- and intra-regional development plans that will be implemented within the next 5-6 years.

A draft zonation scheme was completed in early December 1993 and further refined after a national workshop held sometime in mid-December. This report covers the evaluation of the zonation scheme by the regional technical representatives of key agencies in Region I including the academe. It was held at the Miramonte Resort, Poro Point, La Union on 18 January 1994.

Objectives of the workshop

The objectives of the workshop were to:

1. review the criteria needs for various resource use allocation;
2. review and evaluate suitability and acceptability of resource uses;
and
3. evaluate overall resource use zonation for Lingayen Gulf.

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Summary of the workshop

The workshop was held at the Miramonte Resort on 18 January 1994. There were 19 participants from various agencies in Region I including two representatives from the academic institution. The list of participants is in Annex I. The workshop was divided into two sessions. The morning session was devoted to the presentation of the zonation scheme including discussion on the criteria used. The various topics presented are in Annex II. Presentation was made by the project staff. The presentation focused on criteria used in identifying and assessing suitable areas for mangrove reforestation, artificial reefs, brackishwater aquaculture and coastal tourism as well as for marine fisheries zonation and the overall Lingayen Gulf area zonation scheme. An open forum was held after the presentation.

The afternoon session was used for discussion of issues regarding the zonation scheme and holding of the plenary session. The discussion centered on two key issues: resource use conflicts and implementation of the zonation scheme. The participants were divided into two groups to deliberate on the key issues and make recommendations. Four project staff acted as facilitators during the working group sessions. The results of the two working groups were presented at the plenary. The plenary provided some useful insights on improving the zonation scheme including its implementation. A summary of the plenary discussion is in Annex III.

Specific Recommendations

The participants made the following recommendations regarding the zonation scheme:

1. Review land use plans and zoning ordinances, especially by the local government units.
2. Settlements should be minimized along known natural hazard areas (e.g., faults, flooding).
3. Criterion score (weights) for environmental factors should be increased in the prioritization of programs and projects.
4. Consultation with provincial and municipal government should be conducted.
5. Delineation of roles of the various agencies with respect to the implementation of the zonation scheme.

In light of the above recommendations, the zonation scheme will be refined prior to its presentation at the Regional Land Use Committee meeting set sometime before July 1994. The committee will decide on the acceptability of the zonation scheme as well as its further refinement for implementation.

**MASTERLIST OF PARTICIPANTS TO THE REGIONAL WORKSHOP ON
RESOURCE USE ZONATION FOR LINGAYEN GULF**

Miramonte Beach Resort, Poro Point

San Fernando, La Union

January 18, 1994

PARTICIPANT	AGENCY	ADDRESS
LCdr. Juanito R. Abalos	Philippine Navy	Poro Point, San Fernando, La Union
CPO Lucas P. Padayao	Philippine Navy	Poro Point, San Fernando, LA Union
Cdr. Rodolfo B. Casilang	Philippine Navy	Poro Point, San Fernando, La Union
For. Fernando A. Gines	DENR	San Fernando, La Union
Ms. Victoria H. Ramos	DILG	Marcos Bldg., San Fernando, La Union
Col. Alfredo L. Daluyaya	PNP	Camp Diego Silang, San Fernando, La Union
Mr. Avelino B. Piano	DPWH	Aguila Road, San Fernando, La Union
Mr. Ben Molano	DENR	San Fernando, La Union
Ms. Corinthia Naz	DENR	San Fernando, La Union
Ms. Irma C. Devadeb	NEDA	Guerrero Road, San Fernando, La Union
Dr. Lauro B. Tacbas	DMMMSU	Sapilang, Bacnotan, La union
Mr. Benjamin A. Tirao	DAR	Lingsat, San Fernando, La Union
Ms. Erlinda F. Manipon	DA	Aguila Road, San Fernando, La Union
Ms. Gina G. Alanes	NEDA	Guerrero Road, San Fernando, La Union
Ms. Melanie C. Untalasco	NEDA	Guerrero Road, San Fernando, La Union
Mr. Ernesto V. Balicha	PPDD - La Union	Capitol, San Fernando, La Union
CInsp. Florante R. Rea	RECOM - PNP	San Fernando, La Union
Ms. Rosemary Quito	DTI	Quezon Ave., San Fernando, La Union
Dr. Porferio L. Basilio	PSU	Lingayen, Pangasinan

**Regional Workshop on
Resource Use Zonation for Lingayen Gulf
18 January 1994
Miramonte Beach Resort
San Fernando, La Union**

Objectives of the Workshop

By the end of the workshop, the participants shall have:

1. reviewed criteria needs for various resource use allocation;
2. reviewed and evaluated suitability and acceptability of resource uses; and,
3. evaluated overall resource use zonation for Lingayen Gulf.

Activities

A. Morning Session

Opening Program

Invocation
Pambansang Awit
Introduction of Participants
Presentation of Objectives and Rationale of the Workshop
James N. Paw

Presentation/Discussion of Criteria Used for Identification of Potential Sites for the Following

Urban/Settlement Expansion
Nestor Rillon

Tourism Expansion
Konifacio Casuga

Fisheries Management Zones
General Use Zone
Exclusive Fishing Zone
Special Management Zone
Pia Domingo

Aquaculture and Mangrove Area
James N. Paw

Development Pressure Area
Josefino Tadifa

Presentation/Discussion of Resulting Zonation Schemes
Agnes Grace Cargamento

Open Forum

B. Afternoon Sessions

Workshop: Discussion of issues and conflicts in the zonation scheme
Resource Use conflicts
Implementation of the zonation scheme

**Plenary Sessions: Presentation of Workshop Outputs and Agreements on
the Strategies to Resolve issues**

Workshop Group 1: RESOURCE USE CONFLICTS

ISSUES

RECOMMENDATIONS

- | | |
|---|---|
| <p>1. Conflict in resource use</p> <ul style="list-style-type: none">a. settlement in tourism areasb. settlement in industrial areasc. settlement in agricultural areasd. tourism areas in industrial areas. <p>2. What to do with those existing and non-conforming uses.</p> <p>3. Fishing activities in tourism areas</p> <ul style="list-style-type: none">- complementary- distracting- inconvenience to tourists
e.g. Hundred Islands Beach Resorts- squatting along beach reports. <p>4. Aquaculture and mangrove resource conflict</p> <ul style="list-style-type: none">- aquaculture - more lucrative than mangrove reforestation- almost 100% mangroves are converted to fishponds. <p>5. Hazard-prone areas with various economic activities - industries, tourism, settlement</p> <ul style="list-style-type: none">- flooding- liquifaction- fault zones. <p>6. Prioritization of programs/projects.</p> | <p>1. Review of landuse plans and zoning ordinances by LGUs.</p> <p>2. Strict implementation of zoning ordinances.</p> <p>3. Incorporate zonation schemes to substantiate/improve landuse plans.</p> <p>4. Capability building of implementors/enforcers.</p> <p>1. Comply with zoning conditions.</p> <p>2. Control non-conforming conditions.</p> <p>1. Identify fishing villages.</p> <p>2. Provision/designate of adequate strategic fish landing ports and facilities.</p> <p>3. Implement policies - no residential/settlement areas in salvage zones.</p> <p>4. LGU to identify resettlement areas for squatters (with alternative livelihood).</p> <p>1. Limitations based on 60-40 conversion guideline</p> <ul style="list-style-type: none">- 60% retention limit for mangrove areas to maintain ecological balance- control issuance of aquaculture permits. <p>2. Revert non-productive aquaculture areas (those mangrove areas that had been previously converted to aquaculture).</p> <p>3. Include mangrove in the log ban.</p> <p>4. Discourage new fishpond development; improve productivity of existing aquaculture; encourage mariculture and seafarming.</p> <p>1. Settlement relocation with alternative livelihood.</p> <p>2. Decongest to satellite areas/growth nodes.</p> <p>3. Compaction of land.</p> <p>4. Adopting and strict enforcement of building codes.</p> <p>5. Adoption of mitigation measures.</p> <p>1. Increase weight of environmental factors.</p> |
|---|---|

Workshop Group 2: IMPLEMENTATION OF THE ZONATION SCHEME

ISSUES

RECOMMENDATIONS

I. Institutional

- | | |
|--|---|
| <ol style="list-style-type: none">1. Willingness of La Union and Pangasinan to enact a resolution adopting the zonation scheme and indorsing it to RLUC.2. Role of the agencies and committees coordination and linkages of various committees/agencies at various levels.3. Capability of LGUs (provincial or municipal) to translate the zonation scheme into their respective levels.4. Administration of projects covering more than one municipality e.g. Provincial LGU or special committee comprising the municipalities.5. Monitoring and evaluation of the zonation scheme implementation at various levels. | <ol style="list-style-type: none">1. Conduct of provincial/municipal level consultations.2. Delineation of roles of agencies.3. Capability building for provincial and municipal planning and development officers.4. Identification of a body to monitor the project.5. Identified body to administer the project. |
|--|---|

II. Social

- | | |
|---|---|
| <ol style="list-style-type: none">1. Resettlement as a result of settlers e.g. problem on mobility. | <ol style="list-style-type: none">1. Identification of resettlement areas; LGUs to enact economic incentive measures e.g. tax laws. |
|---|---|

III. Environmental

- | | |
|---|--|
| <ol style="list-style-type: none">1. Establishment of pollutive firms contrary to landuse/zonation but of high socio economic impact. | <ol style="list-style-type: none">1. New firms prepare an Environmental Impact Assessment (EIA) and get an Environmental Compliance Certificate (ECC) and to mitigation measures. DENR to issue EIA and to continue to monitor existing as well as new firms.2. LGU/NGO/DENR to act as monitoring team. |
| <ol style="list-style-type: none">2. Consistency of coastal zonation scheme with environmental protection and enhancement. | |

ACTIVITY 9 ZONATION SCHEME FOR LINGAYEN GULF

PREPARATION OF DEVELOPMENT PRESSURE MAPS

The Development Pressure Maps were first established using the information and data gathered from the six development/management plans for Region I (Medium Term Regional Development Plan, Regional Physical Framework Plan, regional Tourism Master Plan, Northwestern Luzon Growth Quadrangle Master Plan and Fast Track: Towards Pangasinan 2000). Each of these plans has specific programs/projects usually with spatial component. The development pressure maps are used to determine the potential or future development activities in the study area.

The generation of development pressure maps involved several steps:

- a. All the programs/projects in each development plan that will be implemented within five years, whether it is a long- or medium-term plan, were determined.
- b. These projects per plan were prioritized according to the criteria set by NRO I. Two levels of prioritization were used to come up with development pressure maps. Under the first level, two prioritization stages were used. The first stage was based on each project's social and economic desirability, environmental integrity, cost and financing and regionwide effects. The second stage was based on each project's implementability with consideration of the result of the first stage prioritization, funding support, feasibility study and implementation schedule. A Delphi method was used in the prioritization in which five sectoral staffs of NRO I prioritized the projects per plan.
- c. From the result of the first level of prioritization, all the programs/projects per plan were tabulated according to their respective prioritization scores. These were then plotted on a map (project map per plan) using GIS.
- d. Some projects in each plan have no specific location and/or area, thus aside from plotting vectors and polygons, point data was used in which a zone of influence (buffer) was constructed around each point based on its probable impact as derived from existing information.
- e. The second level of prioritization involved another two stages. The first stage covered the prioritization of the plans based on each

plan's social and economic desirability, environmental integrity, cost and financing and regionwide effects. Due to the compatibility of the Regional Physical Framework Plan and the Medium-Term Regional Development Plan as far as programs/ projects are concerned, and also are the major plans for the region, these were combined as one plan in the prioritization. The second stage involved the prioritization of the programs/ projects across plans. This was done by multiplying the rank of each project (second stage, first level ranking) by the rank of each respective plan. The project with the lowest score was ranked the highest. In cases where there were area overlaps among the projects, the project with the lower score was considered. For example, when two projects from two different plans overlapped, the lower score project was considered; when three projects from three different plans overlapped, but two of them are the same projects the average score of the two projects was compared with the score of the other project and whichever had the lower score, prevailed.

- f. All the project maps per plan were combined through an overlay method. The projects with area overlap were shown in one map and these were classified whether they are complementary with each other, conflicting, neutral or conflicting but can be managed. The projects without area overlap were also shown in another map wherein the first ten with the lowest scores were considered the highest priority projects, the next fourteen - higher priority projects, the other next fourteen - high priority projects and the rest are priority projects. The spatial presentation by classes is color both as vectors and polygons.
- g. In addition, another map indicating the location of existing industries and agrolivestock facilities was also established.
- h. The resultant maps are the Development Pressure Maps.

**CRITERIA FOR PROJECT PRIORITIZATION
(FIRST LEVEL)**

NOTE: IT IS A PRECONDITION THAT THE PROGRAMS/PROJECTS TO BE PRIORITIZED ARE CONSISTENT AND SUPPORTIVE OF THE REGIONAL THRUSTS AND STRATEGIES OF REGION I

PRIORITIZATION CRITERIA AND WEIGHTS

A. FIRST STAGE

- 1. Economic Desirability-----35 pts.**
 - a. generation of employment opportunities 6
 - b. generation of net foreign exchange 6
 - c. Impact on sectoral targets and objectives 6
(production level, growth rate, productivity)
 - d. Increase in income levels 5
 - e. promotion of the region's comparative
advantage 4
 - f. potential for backward/forward linkages 4
 - g. promotion of a more equitable distribution
of income 4

- 2. Project has no Adverse Environmental-----18 pts.**
Effects (e.g., public health; land, air
and water pollution; destruction of
critical habitats; and erosion)

- 3. Project Cost and Financing-----18 pts.**
 - a. project has revenue generating capability 9
 - b. project does not require excessive
budgetary counterpart 9

4. **Social Desirability**-----18 pts.
- a. **improvement in the level and quality of community services**6
 - b. **development of the full potential of human resources in terms of health, education, and skills, and its effective harnessing through productive employment** 6
 - c. **promotion of a stable social and political environment (peace and order, discipline, etc.)** 6
5. **Project has Regionwide Effects**-----11 pts.
- TOTAL**-----100 pts.

PROPOSED CRITERIA FOR PROJECT PRIORITIZATION

PRIORITIZATION CRITERIA AND WEIGHTS:

1. **Relative impact on regional growth and overall economic performance (i.e., consistency and support to regional thrusts and strategies)**-----16 pts.
2. **Economic Desirability:**
 - a. **Generation of employment opportunities**-----8 pts.
 - b. **Generation of net foreign exchange**-----8 pts.
 - c. **Impact on sectoral targets and objectives (production level, growth rate, productivity)**-----5 pts.
 - d. **Increase in income levels**-----4 pts.
3. **Project has no adverse environmental effects (e.g., public health; land, air and water pollution; destruction of critical habitats; and erosion)**-----16 pts.
4. **Project Cost and Financing:**
 - a. **Project has revenue generating capability**-----8 pts.
 - b. **Project does not require excessive budgetary counterpart**-----7 pts.
5. **Social Desirability:**
 - a. **Improvement in the level and quality of community services**-----4 pts.
 - b. **Development of the full potential of human resources in terms of health, education, and skills, and its effective harnessing through productive employment**-----7 pts.
 - c. **Promotion of a stable social and political environment (peace and order, discipline, etc.)**-----7 pts.
6. **Project has regionwide effects**-----10 pts.
- TOTAL**-----100 pts

CRITERIA FOR PLAN PRIORITIZATION

CRITERIA AND WEIGHTS

1. **Economic Desirability**-----35 pts.
 - a. **Generation of employment opportunities** 10
 - b. **Promotion of the region's comparative advantage** 9
 - c. **Potential for backward/forward linkages** 8
 - d. **Promotion of a more equitable distribution of income** 8

2. **Plan promotes environmental integrity**-----18 pts.
(e.g., public health; land, air and water; critical habitats; etc.)

3. **Plan Cost and Financing**-----18 pts.
 - a. **Plan contains/defines projects with revenue generating capability** 9
 - b. **Plan contains/defines projects which do not require excessive budgetary counterpart from government** 9

4. **Social Desirability**-----18 pts.
 - a. **Improvement in the level and quality of community services** 6
 - b. **Development of the full potential of human resources in terms of health, education and skills, and its effective harnessing through productive employment** 6
 - c. **Promotion of a stable social and political environment (peace and order, discipline, etc.)** 6

5. **Plan has regionwide effects**-----11 pts.

- TOTAL**-----100 pts.

ZONATION GUIDELINES FOR THE LINGAYEN GULF COASTAL AREA AND VICINITY

A zonation scheme is necessary to ensure that all resource use activities are compatible with each other and the environment. This section is a guide to formulating a zonation scheme for Lingayen Gulf and its vicinity. Additional information is being gathered by a two-year GIS Coastal Area Management and Planning Project funded by the International Development Research Centre of Canada so that guidelines be made operational.

BROAD POLICY GUIDELINES

1. The coastal area shall be divided into zones in accordance with the goal of sustainable resources management with which LGUs enacting ordinances should be consistent.
2. The coastal zone plans and implementing regulations shall be in accordance with or should form part of municipal development plans.
3. The broad policy guidelines provided herein shall be translated into specific rules and regulations using the two planning process prescribed by HLURB to the extent applicable.

RECOMMENDED ZONES

Land use Component

Existing land uses shall be respected unless seriously inconsistent with the goal of sustainable development. The land use areas that may be broadly provided for are: residential, agricultural, forest land, timberland, industrial and tourism. Authorities shall indicate no-access, limited-access and open-access zones.

Aquaculture Zone

Rationale:

The benefits of limiting aquaculture activities to suitable sites are many. Siting farms away from dense human settlements and commercial areas may prevent contamination by wastewater and sewage, thus minimizing public health risks. Away from critical habitats (e.g. coral reefs), the negative environmental impact of aquaculture may be minimized. Potential conflicts between aquaculture and other economic activities can be avoided if aquaculture is discouraged in rich fishing grounds or vice-versa. Successful aquaculture ventures can be assured in part by proper siting, thereby decreasing the chances of pond abandonment and

reverting the waste of habitat and economic resources.

Criteria for delineating the aquaculture zone

The aquaculture zone shall include both existing and potential aquaculture sites. It will cover brackish aquaculture (pond culture of fish and shrimps) and mariculture (culture of oysters and other mollusks, fishcage culture, seaweed culture and ocean ranching). The existing brackishwater or mariculture farm should meet the following criteria for inclusion in the aquaculture zone:

1. It must be commercially viable.
2. It must not seriously affect water quality and circulation in the area.
3. It should not obstruct navigation.
4. It must not be located too close to critical habitats or landscapes with scenic value.
5. It must not be located within flood-prone areas, along fault lines or near other areas with natural hazards.
6. Mariculture farms should not be sited in breeding, feeding and nursery grounds of crustaceans and finfishes.

Zone regulations

These are the considerations in preparing the regulations to be enforced in the aquaculture zone:

1. Aquaculture farms should be allowed only inside the aquaculture zone not in any other zone.
2. Environmental laws must be enforced strictly in the aquaculture zone and its vicinity. This should be emphasized in traditional oyster-growing areas near dense human settlements and commercial areas.
3. Carrying capacity must be considered in determining the size and number of farms that maybe allowed in suitable areas.
4. Ponds should not be sited within 100 m. from the riverbanks, according to the National Mangrove Committee (NMC).
5. In the absence of legal setback lines along coasts, ponds should be 40-100 m. from the mean high waterline, according to NMC. The buffer zone may be increased in eroding areas.

Mangrove Rehabilitation Zones

Rationale:

Mangrove protect the coastline from erosion and promote accretion. When harvested at sustainable rates, mangrove can provide a continuing supply of wood for charcoal, furniture, resins and other products. Most of the mangroves in

Lingayen Gulf were converted into fishponds in the 1950s-1960s. The benefits provided by thriving mangrove communities can be regained only after their sufficient rehabilitation.

Criteria for delineating mangrove rehabilitation zones

These factors shall be considered in establishing Mangrove Rehabilitation Zones:

1. The few remaining mangrove swamps in Lingayen Gulf should be preserved and made part of the mangrove rehabilitation zone.
2. Areas previously covered with mangroves (e.g. abandoned fishponds) shall be made candidate for reforestation.
3. Mangrove afforestation (planting in an area not previously covered with forest) will have second priority to reforestation. It may be attempted in areas that possess the following characteristics.
 - o Rehabilitation zones should be located in intertidal areas that are underwater for several hours each day. These areas should not be exposed to strong currents or wave action. Shore conditions should favor accretion.
 - o The soil type should be sandy and/or muddy.
 - o The salinity of the water should have a range of 18.46 - 36 ppt.
 - o Water temperature should be between 17-30⁰C.
 - o Rehabilitation zones should be accessible but not located too close to human settlements.

Zone Regulations

1. Entry in tothe mangrove rehabilitation zones and their buffer zones should be allowed only for the purpose of monitoring, conduct of scientific research and supervised educational visits.
2. Mangrove rehabilitation zones that have recovered sufficiently as determined by DENR may be opened to sustainable harvesting of wood by organized coastal communities.

Coral Reefs Reserves

Rationale:

The coral reefs in Lingayen Gulf provide finfish, aquarium fish, seaweeds and various invertebrates such as shellfish and sea cucumbers. The reefs and their neighboring habitats also serve as tourist attractions. The deterioration of the gulf's coral reefs therefore represents an enormous and irrecoverable loss for the coastal communities.

The rehabilitation of coral reefs can be facilitated by a well-designed, multiple-use coral reef reserve. The reserve will contain zones in which different regulations apply, depending on their intended function. The most important zone is the core zone, a reef area that has good coral cover and contains a high number of species. It will serve as a source of coral larvae which can recolonize damaged reefs. The other zones that may be defined within the reserve may include a fisheries management zone, where particular fish stocks are monitored and catch levels are controlled and a scientific zone, where ecologically sound research is allowed.

Designing coral reef reserves

Reserves should be established in Sector I which coastal communities will manage following the successful examples in the Visayas (White, 1988). Extensive community work and public education will be conducted to prepare communities for their role as stewards and main beneficiaries of the reserves. In time the increase in fish yields and possibly revenues from tourism will become incentives for the fishing communities to maintain the reserves. These guidelines deal mainly with the physical aspects of establishing coral reef reserves.

The core zone must be delineated in the reserve. It should contain 95% of the species in the area and include not just the coral reef but portions of its neighboring habitats such as reef flats, seagrass communities, algae beds and sand flats.

Potential core zones are coral reefs of Barangay Malinap in Santiago Island and Cangaluyan Island in Anda (UPMSI, 1988b). Reef areas with 40-49% coral cover should also be considered. These are found in Barangays Trinchera, Lucero and Guyoden in Bolinao, and Barangays Cabangon, Sablig, Macaleeng and Batiara.

A buffer zone shall be defined to serve as a transition between the core zone and the area outside of the reserve. Less strict regulations are applied in the buffer zone. It includes the rest of the neighboring habitats. It may also include areas which influence the core zone but are not necessarily adjacent to it. Beaches, dunes, watersheds, agricultural lands and urban and industrial areas may be included in the buffer zone if there are potentially damaging or hazardous activities in these areas (e.g. mining) or if there are identifiable physical processes (e.g. water currents) which link them to the core zone.

Other zones may be defined within the buffer zone such as traditional fishing zone. It might be necessary, for instance to delineate a fisheries management zone for siganids in Bolinao. In general, however, the zonation of the reserves should be kept simple. Additional zones should be introduced at

later stages after the simple schemes gain acceptance, and only if absolutely necessary.

Reserve regulations

1. Within the core zone, fishing and harvesting of resources shall not be allowed. Boats shall not be allowed to drop anchor in this zone but may be secured to mooring buoys specially installed for this purpose. Non-extractive activities such as scientific research and controlled tourism may be permitted.
2. Entrance fees may be collected from tourists (e.g. snorkelers and scuba divers) to raise funds for the maintenance of the reserves. Sites near tourist areas where this might be possible include Trinchera, Sablig, Macaleeng and Batiarao.
3. Within the buffer zone, fisheries laws should be strictly enforced. All destructive methods (e.g. muro-ami and the use of fine-meshed nets) will be disallowed and correspondingly penalized. Traditional fishing within the buffer zone using simple gear such as traps, hook and line and spear fishing (without scuba) may be allowed. More efficient municipal gear such as the bag net shall be excluded from this zone.
4. A special siganid fishery may be set up in Bolinao. This zone may be closed during spawning run. Fish corrals which impede the migration of juvenile siganids may be ordered to relocate to more suitable places.

Exclusive Fishing Zones

Separating competing fishing gear categories is one way of reducing the intense competition among fishermen. It is also a fair and reasonable means of allocating resources in favor of the more disadvantaged fishing communities. The proposed amendments to the existing Fisheries Code (PD 704), which limit the area in which commercial fisheries may operate, propose the separation of certain municipal gear. The proposals call for the separation of passive and active fishing gear. A passive fishing gear is an instrument or device used to capture aquatic animals in a manner where gear movements of sweeping the waters or motorized pursuit are absent, such as hook and line, fish pots, traps and gill net set across the path of fish. An active fishing gear effects capture by lifting, towing or driving fish into an impoundment such as trawl, purse seine, ring net, encircling gill nets, Danish seine and bag net. The Fisheries Code appears likely to allow the establishment of communal fisheries areas within the zone reserved for passive gear. Communal fisheries areas will be allocated for the exclusive use of selected families or fishing communities. When the Code becomes law, authorities may divide the CPM area into active or passive zones as the situation dictates. Such efforts, however, should be planned carefully and should not conflict with the larger objective of establishing a single CPM for the gulf.

General Use Marine Zone

The waters of Lingayen Gulf that are not included in the above zones should be designated as a general use marine zone. No special regulations are necessary for this zone. Still existing environmental laws that apply to this zone should be strictly enforced by the authorities concerned.

ZONATION SCHEME IMPLEMENTATION

These overall coastal guidelines are expected to be adopted by the two provinces which are mandated to adopt adequate measures to safeguard and conserve land, mineral, marine, forest and other resources in coordination with the mayors of component cities and municipalities. The provincial legislative body is also authorized to adopt measures and safeguards against pollution and to preserve the natural ecosystem in the provinces in consonance with approved standards on human settlements and environmental sanitation. Under the broad mandate of the Sangguniang Panlalawigan (SL, i.e., provincial council) to enact ordinances, approve resolutions and appropriate funds for the general welfare of the province and its inhabitants, the legislative body of the two provinces shall enact this zonation policy scheme in the form of a resolution which shall be binding on and shall guide the formulation by the component cities and municipalities of their respective ordinances and resolutions affecting planning, land use allocation and zonation. Compliance with these policies by the LGUs concerned may be monitored by the provinces through its review power over all the ordinances approved by the Sanggunian of the component cities and municipalities and the executive order issued by the mayors of these LGUs. Compliance with this zonation policy scheme can likewise be ensured through SL's review of the comprehensive land use plans and zoning ordinances of component cities and municipalities.