

# STRATEGIC ENVIRONMENTAL MANAGEMENT PLAN FOR THE BATANGAS BAY REGION



Environment and Natural Resources Office  
of the  
Provincial Government of Batangas

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## **LIST OF ACRONYMS AND ABBREVIATIONS**

ASEAN	Association of South East Asian Nations
BBCICM	Batangas Bay Council for Integrated Coastal Management
BBR	Batangas Bay Region
BOT	Build-Operate-Transfer Scheme
CALABARZON	Cavite, Laguna, Batangas, Rizal, and Quezon
CENRO	Community Environment and Natural Resources Office, the lowest field unit of the Department of Environment and Natural Resources Office
DA	Department of Agriculture
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DPWH	Department of Public Works and Highways
EPC	Environmental Protection Council
FSP	Fisheries Sector Program
GIS	Geographic Information Systems
IEC	Information, Education, and Communication
IEMP	Industrial Environmental Management Project, a DENR project
IEMSD	Integrated Environmental Management for Sustainable Development, a joint UNDP-DENR program
LGA	Local Government Academy, a training institute under DILG
LGUs	Local Government Units
MBI	Market-based Instrument
MEIP	Metropolitan Environmental Improvement Program
MIS	Management Information System
MPP-EAS	GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas
MSDP	Multisectoral Development Plan of Batangas Province, 1995-2000
MTPDP	Medium-Term Philippine Development Plan, 1993-1998
NEDA	National Economic and Development Authority
NGA	National Government Agency
NGO	Nongovernment Organization
PENRO	Provincial Environment and Natural Resources Office of the DENR
PG-ENRO	Provincial Government's Environment and Natural Resources Office
PMA	Pollution Management Appraisal
RICs	Regional Industrial Centers
SEMP	Strategic Environmental Management Plan
THW	Toxic and Hazardous Waste



## PREFACE

The province of Batangas is endowed with rich resources. Its bounty spans the stretch of coastal and marine areas, the productive agricultural areas, and the extensive urban and rural setting. Recent developments have called for increased utilization of these resources to stimulate growth in the province and its neighbors. To sustain this growth, we must put in place safeguards in order to minimize, if not totally prevent, the attendant social and environmental costs.

This Strategic Environmental Management Plan for the Batangas Bay Region attempts to prescribe the manner by which development should proceed without compromising its environment. Premised on the principle of integrated coastal management, the Plan provides for a more comprehensive approach to the management of the bay and its environment through the active participation of its stakeholders. It attempts to bring together the efforts and concerns of the industry, local and national governments, and nongovernment organizations to help bring about the desired development for the Batangas Bay Region. This is considered a pioneering effort in an urban milieu.

The Plan was the product of a long process of consultation with local and national government officials, private sector representatives, and other local nongovernmental groups which spanned a period of one-and-a-half years. A multisectoral Strategic Planning Committee was created at the provincial level in the early 1995 which initiated the preliminary data collection, situational analysis, a regional preparation, and setting up of the Plan's vision, mission, and objectives for the Batangas Bay Region. The first draft of the Plan was circulated to some members of the Committee, local executives, industries, and other local stakeholders for review, with end-view of establishing common consensus and understanding of its strategies, priority policies, action programs, and implementation arrangements and schedule. A formal presentation of the Plan to key stakeholders was conducted in June 1996 in Batangas City. Insights gleaned from this presentation were incorporated into this final version. Thus, this Plan reflects the vision and aspirations of the people in the Batangas Bay Region. The many individuals and groups who have contributed or provided useful comments/suggestions to the Plan are gratefully acknowledged, but they are too many to mention by name. A separate acknowledgement page is included to cite those who have contributed significantly to the completion of this Plan.

I hope that the local executives, development planners, national agency representatives, industry leaders, and community groups will use this Plan in the pursuit of development for Batangas.

Hermilando I. Mandanas  
Governor

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Especially instrumental were the local executives' constant political support and provision of both staff time and data to complete the Plan and come up with an integrated approach to Batangas Bay Region's sustainable development. Mayors Hon. Eduardo Dimacuha, Hon. Bienvenido Castillo, Hon. Ruben Amurao, Hon. Mario Magsaysay, and Hon. Jovencio Atienza, therefore, deserve special acknowledgments.

## BACKGROUND

The CALABARZON and Batangas Provincial Government's industrialization strategy has triggered the pace of economic development of the Batangas Bay Region (BBR) in recent years; and this is projected to quicken by the beginning of the next century, with the improvement of the physical infrastructure and communication network and the completion of the port conversion in Batangas City into an international port. New industries have been established and old ones have initiated the process of plant improvement and retooling. In addition, others have expanded their facilities and operations. The future is set to witness the transformation of the BBR from an agricultural area into an agroindustrial — or perhaps, industrial — center in the 21st century. Many of the major economic activities tend to concentrate in the coastal areas of the Batangas Bay. This trend will drive up demand for better and efficient infrastructure and facilities. At the same time, future developments will need reliable, integrated environmental management systems to ensure the sustainability of existing and planned activities. The required integrated systems should be able to manage and/or reduce wastes from land- and water-based sources, reduce water and air pollution, conserve special ecosystems, promote tourism development, improve agricultural and fishing productivity, and maintain the environment's carrying capacity. A basic prerequisite of these systems is the establishment of a multisectoral organization that can catalyze and coordinate the various efforts of improving BBR-wide environmental management. These concerns constitute the central focus of the proposed Strategic Environmental Management Plan (SEMP) for the BBR.

## PURPOSE OF THE SEMP

Sustainable development is the SEMP's central theme ensuring compatibility of management actions between the overall development of the BBR and within the Integrated Coastal Management (ICM) framework of its environment. This is articulated in the SEMP vision which envisages the BBR and the bay as models for the achievement of economic development, characterized by a well-planned multiple but non-conflicting mix of land- and water-uses, such as for agriculture, industry, services, commerce, and housing. In pursuing this vision, it will be the mission of the SEMP to mobilize and strengthen the capability and partnerships among the Local Government Units (LGUs), National Service Agencies (NSAs), the private (business) sector, nongovernment organizations, volunteer groups, social organizations, and coastal community organizations and residents.

In consonance with its vision and mission, the SEMP's goal is to achieve an *acceptable balance* between the overall level of economic development and environmental management, especially the management and prevention of marine pollution for land- and water-based sources in the BBR. The SEMP targets the next 25 years (1996-2020) to fulfill this goal, in recognition of the existing management systems, technical capabilities, and resources. The long-term (1996-2020) and short-term (1996-2000) objectives are enumerated in *Box 1*.

## MANAGEMENT APPROACHES

The SEMP's key approaches shall include: (i) application of integrated coastal management system for pollution prevention and management; (ii) application of the principles of sustainable



### Box 1. Long- and short-term objectives of the SEMP.

#### Long-term Objectives

- Develop the BBR's environment and natural resources to the fullest extent possible in accordance with sound management concepts and practices in order to ensure its sustainable use;
- Create environmental conditions conducive to human health, employment, income generation and recreation; and
- Conserve the marine resources and coastal ecosystems for the benefit of the future generations, for the advancement of science, and for the development of tourism and recreation areas.

#### Short-term Objectives

- Establish an integrated coastal management system for BBR's sustainable development, including the mechanisms for multisectoral participation and integration of environmental concerns into development planning;
- Mitigate land- and water-based pollution in the BBR through a proper mix of policy instruments, such as market-based instruments (MBIs) in combination with command-and-control measures;
- Improve and maintain the water quality of the Bay and the river tributaries draining to it, within government-prescribed standards;
- Minimize incompatible and conflicting uses of the bay's coastal zone through land use planning and zoning and passage of appropriate policies and ordinances;
- Strengthen LGUs' and other stakeholders' capabilities on integrated solid waste management, water pollution prevention and monitoring, and other aspects of environmental management, including information management;
- Identify sources of long-term financing for specific programs and projects identified for sustainable management of the BBR and the bay; and
- Harness coastal community organizations for advocacy and management of the Bay's environment and for alternative sustainable livelihood development.

development; (iii) use of proper resource valuation; (iv) application of precautionary principle; (v) adoption of market-based instruments (MBIs) in combination with command-and-control mechanisms for environmental management; (vi) establishment of sustainable financing mechanism; and (vii) institutionalization of public and private sectors, NGOs, and community partnerships for SEMP implementation. These approaches are briefly described below.

Under the ICM, the direction of development for the BBR is focused towards multisectoral/multiusers' perspectives, but at the same time, the coastal environment and resources base are not compromised. Such a framework ensures that the probable adverse impacts of economic development are minimized and the costs to the society on the long term are reduced. Thus, economic benefits are optimized and the functional integrity of the coastal ecosystems are maintained.

Sustainable development is the guiding principle of the SEMP with the incorporation of its key elements, such as ecological stability, economic feasibility, social acceptability, and political viability. The SEMP thus serves as the instrument for bringing all these concerns together in a manner that reinforces each of the elements.

The use of the proper resource valuation will enable the LGUs to reflect the true value of potential environmental damages (or replenishment cost) in the various administrative charges and fees for the use of environmental goods and services. Resource pricing could serve as basis in determining, for example, fees for collection and disposal of solid waste and penalties for excessive dumping of water pollutants, as well as air emissions. Valuation methodologies could also serve as determinant in estimating damages resulting from oil spills, fish kills, and other coastal and marine damages.

The precautionary principle takes account of the dearth of information on the environment that often results in difficulties in making sound prediction on the likelihood of occurrence of environmental problems. This principle emphasizes the use of preventive mechanisms as a basic management strategy for the BBR. It is described as a process of decision-making in which a cautious approach is initially taken by policy makers, which may be relaxed and improved as information becomes more available. This principle carries with it a commitment of resources to safeguard against potentially adverse environmental impact of certain decisions or activities.

The use of MBIs as a management tool can help in achieving the desired development effect at the least cost possible because it requires minimum enforcement and administration and enables the costs associated with the use of environment to be internalized by the resource users. MBIs also generate revenues for the government, which makes their application advantageous to the LGUs facing financial limitations in implementing environmental improvement programs. In the BBR, the use of MBIs should be supplemented by traditional command-and-control measures.

The establishment of sustainable financing mechanisms recognizes the limited government funds for environmental management. The SEMP will take advantage of the opportunities available to the LGUs under the Local Government Code, such as the creation of a trust fund for the management of the BBR environment. Through ordinances, the LGUs can earmark revenues from the use of MBIs to set up such a fund. The mechanics and operation of such a fund can form part of studies to be undertaken so that clear guidelines can be established. Other forms and sources of financing, such as contributions from the private sector to a common fund, will be explored.

The importance of partnerships among the LGUs, NSAs, private sector, NGOs, and community organizations is highlighted as one of the key elements for the effective implementation

of the SEMP. In the BBR, this is not difficult to operationalize as most sectors involved have shown interest and willingness to work cooperatively. What is lacking perhaps is the appropriate legal and institutional arrangements which would strengthen and formalize such partnerships.

## KEY COMPONENTS AND ACTION PROGRAMS

The SEMP will comprise six major components: (i) legal and institutional mechanisms; (ii) integrated policy and planning systems; (iii) integrated management systems and technical interventions; (iv) management and technical skills improvement; (v) information base improvement; and (vi) sustainable financing development.

### *Key Components*

#### 1. Legal and Institutional Mechanisms

This component will support the establishment and strengthening of legal and institutional frameworks and organizational structure necessary to plan and implement integrated environmental management programs. The structure will include: (i) a multisectoral policy-making body (Batangas Bay Council for Integrated Coastal Management) to be composed of the Provincial Governor, the mayors of the coastal municipalities and city along the Bay, and representatives from other government agencies, private sector, nongovernment organizations, and communities; and (ii) a central coordinating unit, the Provincial Government-Environment and Natural Resources Office (PG-ENRO), which will assist the council and facilitate the integration of existing and planned actions by the LGUs and other sectors in the BBR from planning to implementation of environmental policies, plans, programs and projects. The establishment of these mechanisms is a prerequisite to translating into action the principles ICM at the BBR. These mechanisms will also serve as the framework for intersectoral coordination of the SEMP implementation.

#### 2. Integrated Policy and Planning Systems

This component will provide for: (i) the integration and improvement of national, regional, provincial, and municipal plans and policies in environmental management in which the SEMP will fit in; (ii) the spatial translation of the SEMP into a land- and water-use plan which can be used as guide for future development of the BBR; (iii) the updating or development of improved policy support systems concerning land- and water-use zoning, MBIs application, and resource-use pricing structures; and (iv) strengthening of enforcement and monitoring capability of the PG-ENRO and the LGUs.

#### 3. Integrated Management Systems and Technical Interventions

This component will provide direct interventions in the improvement of management systems and application of technical solutions to critical environmental problems in the BBR, particularly the following: (i) integrated waste management, (ii) water pollution abatement, (iii) conservation of coastal



ecosystems (mangroves and coral reefs), (iv) coastal tourism development, (v) municipal fishery development, and (vi) alternative livelihood development. As such, this component comprises the core programs of the SEMP, in which all other components will be provided the necessary support.

#### 4. Management and Technical Skills Improvement

This component will directly respond to the SEMP mission by providing: (i) trainings to the PG-ENRO personnel, LGU staff involved in environmental management, and other support organizations in planning and management of methods and techniques necessary to effectively and sustainably implement the SEMP's core programs; (ii) community organizing services to the coastal communities to catalyze local initiatives for environmental management and strengthen/develop community organizations for community development; and (iii) multisectoral information, education, and communication (IEC) system that includes the promotion of the integration of environmental education into the curricula of elementary and high schools in the BBR.

#### 5. Information Base Improvement

This component addresses the lack of information base needed for a more scientific assessment of environmental issues and in determining the most appropriate management regimes for the bay through the following: (i) conduct of research and extension services to generate the required primary data for integrated environmental planning and management and delivery of such information in a form easily understandable to the end users; and (ii) establishment of an information system with the aid of the Geographic Information Systems (GIS) for sound planning and management. The researches will focus on key environmental data gaps identified in the environmental profile of the BBR which need to be undertaken in the first two years for the updating and improvement of policies, plans, programs, and strategies. In this particular case, the GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas (MPP-EAS), the private sector, the academe, and the external support organizations will carry out the priority research activities of the SEMP. The PG-ENRO will participate in these activities until it acquires the knowledge and skills required for the work.

#### 6. Sustainable Financing Development

This component will identify and develop innovative financing mechanisms, including privatization, build-operate-transfer schemes, trust fund establishment, and mobilization of government and private sector resources to help sustain SEMP implementation. Financing of other aspects of the SEMP (e.g., management and technical capability-building, action plan formulation, and some capital-intensive projects of the core programs) may also be facilitated through the development of a long-term resource generation strategy aimed at foreign funding institutions and local donors.

## MAJOR ACTION PROGRAMS

The major programs of the SEMP will be classified into core and support categories. The core programmes, comprising those under the Integrated Management Systems and Technical Interventions Component, will involve direct interventions in management systems and technical operations in development as safeguard for the protection and sustainable use of the environment. Support programs, which include all other components of the SEMP, aim to aid the core programmes with supportive legal and institutional mechanisms, innovative policies and plans, skilled manpower, improved database, and sustainable financing. The latter programs will, therefore, cut across SEMP's various core programs.

The core programs will consist of: (i) integrated waste management, (ii) water pollution abatement; (iii) conservation of special ecosystems particularly the remaining mangroves and the coral reefs in Mabini and Tingloy; (iv) coastal tourism development in Mabini and Maricaban Island; (v) development of alternative livelihood activities; and (vi) improvement of municipal fishery.

The support programs will include: (i) development of legal and institutional mechanisms, particularly the establishment of the BBR-wide council for integrated coastal management and the staffing and capability-building of the PC-ENRO; (ii) strengthening of integrated planning systems for environmental management; (iii) improvement of policy support systems; (iv) upgrading of monitoring and enforcement capabilities; (v) management and technical capability-building; (vi) community organizing and development; (vii) IEC system establishment; (viii) research and extension; (ix) management information system establishment; and (x) development of sustainable financing mechanisms.

## IMMEDIATE ACTIONS

The translation of the SEMP into detailed action plans for both core and support programmes will be the next major action. However, the preparation of action plans will entail some costs and this implies the need to identify sources of funds to undertake this activity. There are also some program activities which will not involve significant financial resources to carry them out on time, such as the establishment of the council. This section outlines the action programs and some of their activities which can be undertaken in the near term (i.e., remaining months of 1996).

At present, industries in the BBR are implementing various public relations programs aimed at assisting local communities in the establishment of livelihood activities, sports facilities, and other physical infrastructure. Some also organize health and medical missions. These programs can be effectively integrated to plan for the proper allocation or use of the pooled resources of the private sector to focus on priority programs/projects of the SEMP and thus create bigger socioeconomic and environmental impacts. The coordination and implementation of this task can be handled by the BCRMF. This approach will also lessen private sector cost on administration and maintenance and strengthen community and business sector relationships in the BBR.

The passage of an ordinance by the Provincial Government declaring the SEMP as a major LGU administrative guide in the formulation of future development, environment policies, plans, and programs, however, is highly critical to the successful implementation of the SEMP particularly its specific programs. Such a legal instrument will also facilitate access to the larger financing institutions as it will reflect the LGU's high level of political commitment.

## PRIORITY ACTIONS

### *On Legal and Institutional Mechanisms*

- Establishment of BBR Council
- Mobilization and staffing of PG-ENRO

### *On Integrated Policy and Planning Systems*

- Determination of resource-use, pricing mechanisms, and MBIs for:
  - Solid waste collection and disposal
  - Discharge of wastes into rivers and coastal waters
  - Coastal tourism
- Establishment of multisectoral environmental monitoring/ protection committees at community levels

### *On Integrated Management Systems and Technical Interventions*

- Integrated waste management
  - Identification and reservation of potential dump sites
  - Toxic and hazardous waste plan monitoring (follow-up of Industrial Environmental Management Project or IEMP study)
  - Organization of community-based garbage collection system
  - Waste segregation and recycling system development
- Water pollution abatement
  - Trainings and workshops in pollution management appraisal (PMA) system for industries
  - Information campaign/training on sustainable fishing methods
  - Classification and determination of waste discharges by industries

## RESPONSIBLE GROUP/S

Provincial/Municipal Government in coordination with Batangas Coastal Resource Management Foundation, Inc. (BCRMF)

Provincial Government

Provincial Government and the Department of Environment and Natural Resources (DENR), MPP-EAS

Provincial Government, Municipal Governments, DENR, MPP-EAS

Provincial Government, DENR, Municipal Governments, Department of Public Works and Highways

PG-ENRO, BCRMF, DENR

PG-ENRO, Municipal Governments, Barangay Councils, NGOs, Community organizations

PG-ENRO, DENR, and Provincial Government (through local ordinances)

PG-ENRO, DENR, MPP-EAS,

PG-ENRO, Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR), in coordination with the University of the Philippines-Marine Science Institute (UP-MSI)

PG-ENRO, BCRMF, DENR, MPP-EAS



## PRIORITY ACTIONS

- Conservation of special ecosystems
  - Characterization and assessment of mangroves and coral reefs
- Alternative livelihood development
  - Community assessment/consultation to identify potential livelihood projects
  - Development of livelihood development plans/projects

### *On Management and Technical Skills Improvement*

- Capability-building
  - Training of PG-ENRO staff and LGU personnel
  - Publication and dissemination of information materials

### *On Information Base Improvement*

- Research and extension
  - Research activities
  - Documentation and publication of research results

### *On Sustainable Financing Development*

- Identification of potential Build-Operate-Transfer (BOT) projects
- Study of privatization schemes and identification of LGU assets/functions which can be privatized
- Assessment of trust fund mechanisms for application of MBI's
- Establishment of linkages with other programs

## RESPONSIBLE GROUP/S

PG-ENRO, DENR, MPP-EAS in coordination with UP-MSI

PG-ENRO, Provincial/Municipal/Barangay Governments, Provincial Agriculture Office (PAO)

PG-ENRO, Communities, in consultation with LBP and BCRMF

Provincial/Municipal Governments, DENR, MPP-EAS, in coordination with the Department of Interior and Local Government-Local Government Authority (DILG-LGA)

Provincial/Municipal Governments, PG-ENRO, BCRMF, DENR, PAO

PG-ENRO, MPP-EAS

PG-ENRO, MPP-EAS

Provincial Government, PG-ENRO, in consultation with the National Economic and Development Authority (NEDA) and private sector

PG-ENRO, MPP-EAS, in consultation with the Department of Trade and Industry-Bureau of Investments (BOI), Provincial/Municipal Governments

PG-ENRO, MPP-EAS

PG-ENRO, PPDO, DENR in coordination with NEDA, United Nations Development Programme



# Introduction



# CHAPTER 1

## INTRODUCTION

### GEOGRAPHICAL SCOPE OF THE BATANGAS BAY REGION

**B**atangas Bay Region (BBR) is in the southern part of Batangas Province, with a total land area of 1,460.7 km<sup>2</sup> and a coastline measuring 470 km. (Figure 1). Its southern boundary extends to the municipality of Tingloy in Marikaban Island, while the north, south and west boundaries are delineated by the catchment areas or watersheds that drain into the Batangas Bay. Within this region lie 14 coastal and inland municipalities, including the cities of Lipa and Batangas and portions of Lobo and Verde Island. The bay itself forms a semienclosed body of water, with an average depth of about 200 m which renders it ideal for international port and harbor development. This bay has a water area of about 220 km<sup>2</sup>.

This Strategic Environmental Management Plan encompasses the entire BBR; but its immediate focus is the “coastal municipalities” bordering Batangas Bay, which harbor large oil and chemical industries, power-generating plants and commercial establishments. Rapid industrialization in these coastal municipalities has taken place in the last ten years, resulting partly from aggressive implementation of CALABARZON (an acronym for the provinces of Cavite-Laguna-Batangas-Rizal-Quezon) master plan for industrial estate development. Such a shift in economic programs doubtlessly requires an integrated environmental management plan to ensure their sustainable development by means of effective and timely mitigation and prevention of the occurrence of pollution from industrial, municipal, agricultural domestic sources and other adverse impacts.

The “coastal municipalities” referred to in

this Plan surrounding Batangas Bay are Bauan, Mabini, San Pascual, Tingloy, and Batangas City including Verde Island. Together, these municipalities cover about 453.8 km<sup>2</sup>, representing 31 percent of BBR’s total land area.

### STATE OF THE BBR ENVIRONMENT AND RESOURCE MANAGEMENT

The entire BBR is essentially an agricultural area, devoting 60 percent of its total land area for crop production in 1985, which was dominated by sugarcane (23 percent), rice and corn (17 percent), and coconut monoculture or in combination with fruits and other crops (20 percent). Secondary forest occupies only nine percent and is almost nonexistent in the coastal areas. Built-up areas such as human settlements account for only three percent in that same year, which has certainly increased since then although recent reliable estimates are unavailable. Intermixed with different agricultural land uses is the commercial raising of livestock, especially poultry and piggery, which is a growing industry in the region, making BBR a primary supplier of poultry and meat products in the Southern Tagalog Region and Metro Manila. This livestock growing, however, has already encroached on some ricefields and coastal lands. However, the extent of this particular use is still unrecorded. Fishponds, mainly brackishwater aquaculture concentrated in Batangas City, are now occupying less than 100 hectares, from more than 430 hectares in 1985, due to conversion to commercial, industrial, and residential uses.

The coastline of Batangas Bay is currently utilized for industrial, residential, commercial, transportation, and recreational purposes. Twelve large industrial firms

Figure 1. Map of the Batangas Bay Region.



engaged in oil refinery, chemical, and textile manufacturing and food processing are located in the coastal area. Each of these firms emits effluents or generates wastes that need preventive and control measures like the use of efficient or environment-friendly production technologies, the installation of waste-treatment facilities, and the effective enforcement of environmental laws and incentives. While practically all of these firms have waste-treatment facilities with relatively sound production processes and a pool of technical personnel, reports of oil spill and waste discharges have been recorded in the past as briefly discussed below. Another industrial activity in the coastal area that is causing harm to the bay environment and resources is the sand and gravel mining in river beds and the open pit mining for silica

in Mabini which are just a few meters away from the bay.

The extensive use of BBR resources stretches out to its marine territory. At present, municipal fishing, shipping, and ports development are quite intensive in the bay, causing intense competition among these sectors and also endangering the marine environment, its resources, and water quality. For municipal fishing alone, for instance, the ratio of fishing area to fishing boat in the bay stands at only 0.08 (or 0.08 km<sup>2</sup> of fishing area per fishing boat). The actual number of municipal fishers is estimated to be 8,965, but the families dependent on this sector are 4,335. Some people in the coastal areas participate in fish distribution to market outlets and/or in direct marketing.



The bay also receives an increasing number of cargo and passenger ships in the existing 18 ports, three of which are government-owned. In February 1995, the Philippine Ports Authority recorded 1,323 domestic and foreign ships that docked in various ports in the bay. The bulk of foreign ships docked at the Filipinas Shell Petroleum port, while most domestic passenger ships docked at the government port in Batangas City. Vessel traffic is expected to intensify at the turn of the century when the ongoing construction to convert the Batangas City's domestic port to international port is completed and becomes fully operational.

## CURRENT MANAGEMENT ISSUES

Considering the complexity and interrelatedness of the environmental issues identified in the The Coastal Environmental Profile of the Batangas Bay Region (MTE, 1996), they are classified into eight major areas of concern: (i) solid waste generation, collection and disposal; (ii) water and air pollution; (iii) municipal fishing; (iv) mining and quarrying; (v) shipping and port development; (vi) human settlements and population growth, especially in coastal areas; (vii) participation of private sector, and nongovernment organizations in environmental management; and (viii) integrated policies, plans, programs, and institutional support for the purpose of examining the key environmental management issues and the factors that contribute to their occurrence. Table 1 shows a summary of these key issues and contributory factors.

### Solid Waste Generation, Collection, and Disposal

The major sources of solid wastes in BBR are the households, industries, commercial establishments particularly the municipal/city markets, and agricultural producers. The households sector generated more than 103,300 tons of solid wastes in 1994 and is projected to reach about 105,900

tons in 1995 and 119,800 tons in the year 2000, based on the rapid industrialization and urbanization now taking place in the coastal communities and the projected population growth. In addition, a survey of selected industries in 1995 revealed that around 352.5 tons of industrial wastes have been generated from oil refinery, ship building and fabrication, wood treatment, and chemical manufacturing. Table 2 provides additional information on the types and volume of wastes produced by industries. While the types and magnitude of commercial and agricultural wastes in BBR still need to be determined and quantified, there are evidences of their adverse human and environmental impacts. For instance, Calumpang and Pinamucan Rivers, the only two major rivers that provide water supply for crops and animals, are heavily silted due largely to organic wastes discharged from poultry and piggery farms and from market and other commercial areas. The recent epidemic of typhoid fever in the municipality of San Jose, which has been traced from piles of untreated animal wastes in varying stages of decomposition that contaminated sources of drinking water and affected more than 2,000 people, is a glaring example of human impact of improperly disposed and untreated solid wastes.

Apart from land-based sources, solid wastes are also generated by many passenger ships that ply between Batangas City and Mindoro Island. Plastics, styrofoam, and papers are indiscriminately dumped into Batangas Bay, particularly at Matoco Point. This issue is further discussed below.

Inevitably, the accumulation of uncollected solid wastes is a significant management problem. To date, only 60 percent of domestic (household, commercial, and hospital) wastes are collected by sanitary units of the Local Government Units (LGUs). The remaining wastes are simply burned or dumped indiscriminately in the backyard, street, waterways, and Batangas Bay. Composting and recycling of such wastes at the point of generation are rarely practiced. In 1994, uncollected domestic solid wastes was about



**Table 1. Key environmental management issues in Batangas Bay Region.**

AREA OF CONCERN	ISSUES	CONTRIBUTORY FACTORS
Solid Waste Generation, Collection, and Disposal	Accumulation of uncollected solid waste Lecheate pollution Indiscriminate mixing of solid waste and toxic and hazardous wastes	Inadequate dump sites Low collection efficiency Random dumping of uncollected waste Indiscriminate dumping from domestic passenger ships Absence of incinerators Lack of collection fleet/vehicles Narrow roads/streets for large garbage vehicles Irregular street sweeping and open-drain cleaning Lack of incentives and penalties for waste minimization, segregation, and recycling
Water and Air Pollution	Increased threats of oil discharges from industries and oil spill from heavy vessel traffic Disposal of untreated agricultural (poultry, piggery and farmland) and industrial wastes into tributaries and coastal waters Disposal of untreated sewage into coastal waters Habitat destruction/loss, especially the coral reefs	Oil spill from ships, tanks, and pipes of oil refineries Oily wastes from oil refineries, shipyard, and marine construction industries Gas and particulate emissions from industrial and power-generating plants and motor vehicles Organic wastes and chemicals from crop and livestock raising Mine tailings and sediments from mining and quarrying operations Destructive fishing methods Indiscriminate dumping of households and commercial establishments Absence of sewage treatment plants Poor enforcement and monitoring of environmental laws and regulations
Municipal Fishing	Declining fish harvest Decreasing effective fishing area in the Bay Reduced income	Inappropriate fishing methods Overfishing Pollution from oil spill Encroachment of commercial fishing Unregulated waste disposal from land- and water-based sources Conversion of Batangas port to international port
Mining and Quarrying	Unregulated environmentally destructive practices	Application of open-pit mining method Lack of enforcement of environmental laws
Shipping and Port Development	Vessel traffic congestion Oil spill and ship collision Marine pollution	Small water area of the bay Incompatibility with some land and water uses of the bay Unregulated flow of cargo, passenger and fishing vessels Poor enforcement of vessel safety measures Absence of vessel traffic system Inadequacy of vessel traffic monitoring equipment Weak intersectoral cooperation in oil-spill contingency plan execution
Human Settlements and Population Growth, Especially in Coastal Areas	Increasing settlements along coastal areas Poor health and sanitary conditions	In-migration of industrial workers and their families Limited alternative livelihood opportunities Improper household practices Inadequate health facilities and services
Participation of Private Sector and Nongovernment Organizations in Environmental Management	Lack of effective and sustained participation	Inadequate institutional and legal framework for participation and empowerment Insufficient incentive mechanisms for participation Lack of functional organization of coastal communities Low understanding and appreciation of development-environment nexus
Integrated Policies, Plans, Programs, and Institutional Support	Limited emphasis on environment in development planning and management Uncoordinated formulation and enforcement of policies, plans, programs, and projects Occurrence of resource-use conflicts Low compliance to environmental laws and regulations	Absence of a central coordinating body for planning and development of the Batangas Bay Region Lack of an integrated land- and water-use policy and plan, including zonation scheme for the bay region Limited technical capability to integrate environmental concerns into development planning and management Most local planners have no formal training on environmental management Weak interagency, intersectoral and interdisciplinary coordination Unrecognition of LGU powers under the Local Government Code and lack of technical ability to implement them Fragmented information base Poor law enforcement and monitoring of its compliance.



**Table 2. Types and volume of solid wastes generated by some industries in the Batangas Bay Region, 1995.**

Industry Type	Type of Wastes	Volume/Unit (kg)	Percentage of Total (%)
Oil Refinery	Leaded sludge	31	17.32
	Crude sludge	252	
	Spent lime	73	
	Spent caustic soda	432	
	Boiler ash	250	
	Spent catalyst	60,000	
	Asbestos insulation	22	
Ship Building and Fabrication	Grit blasting, paint peelings and copper slags	15,000	4.26
Wood Treatment	Wood resins, Creosote and Bunker sludge, Spent gasket	200	0.06
Chemical Companies			
Latex Production	Latex sludge	45,000	78.30
	Office refuse	21,000	
Alkylates Production	Paper and Cardboard	10,000	
	Hydrofluoric tar	200,000	
Fertilizer Plant	Fertilizer sludge, Used plastic sacks and containers	200	0.6
	Worn-out polyethylene bags	25	
TOTAL		352,485	100.00

**Source:** Survey of Industries, Batangas Bay Demonstration Project Office, Batangas City.

40,946 tons (about 116,990 m<sup>3</sup>), which actually exceeded the full capacity of the existing dumpsite in Barangay Tinga Labac, Batangas City (estimated at 6,350 m<sup>3</sup> by DENR-EMB, 1995). Solid wastes from industries, as noted above, are not yet included in the total waste collection of the LGUs. Under the existing laws, collection and disposal of industrial wastes, both solid and liquid, are part of the environmental protection responsibilities of industry owners under their waste management system. But, compliance to such laws is not well-established, and also poorly monitored. The types of industrial solid wastes include office paper, cardboard, wood, paint containers and

peelings, grits, ashes, and plastics (See Table 3). Some industries dispose solid wastes in municipal dumpsites; others store them on site; while still others donate them to the local communities, such as empty drums and wood trimmings.

Solid waste collection is hampered by a number of factors. First, there is low collection efficiency arising mainly from single or double shifts of garbage vehicles, very small loads compared to their effective capacity, inappropriate route planning, and narrow roads and streets in some residential areas. The limited number of shifts in vehicle use may be partly attributed to heavy traffic condition in urban areas at certain times of the day. Below-capacity

waste loading, however, occurs in the absence of adequate cover to most garbage vehicles so as not to spill wastes on the way to the dumpsites. Second, the present number of collection vehicles appears to be inadequate, except for Batangas City. In Bauan, for example, the three garbage trucks with a combined load capacity of 6.5 tons per trip, or 19.5 tons for three trips a day, can only manage to collect about 7,110 tons annually. However, the total domestic waste generated in this municipality in 1995 has been estimated at 9,125 tons, suggesting that some 2,015 tons were disposed elsewhere. Third, the lack of dumpsites is almost a general problem among the LGUs of coastal



**Table 3. Examples of industrial solid wastes disposed at the Bauan dump site, 1994.**

Industry Type	Type of Wastes	Volume of Wastes (m <sup>3</sup> )
Ship Building and Fabrication	Paper, cardboard, paint peelings, grits	6.72
Wood Treatment	Wood, ashes	300.00
Equipment Fabrication	Paint containers, refuse	62.50
Chemical Company	Office garbage, plastic, wood, used filter bags	65.63
<b>TOTAL</b>		<b>434.85</b>

**Source:** Survey of Industries, Batangas Bay Demonstration Project Office, Batangas City.

communities. Even the type of existing ones (i.e., open dump) is really unsafe to public health and natural environment. The Batangas City dumpsite is an example. It is bounded by a creek on the western portion that flows into the Talon River. The problem of surface water contamination from leachate or from direct surface runoff from the solid waste deposit (EMB-DENR, 1995) has been raised in relation to this dumpsite. Nearby residents also complained of foul odor originating from this dumpsite. Finally, irregular street sweeping and open-drain cleaning make it quite difficult for collectors to schedule trips of garbage trucks. These factors contribute not only to the accumulation of uncollected wastes, but also to the possible occurrence of leachate pollution.

Existing dumpsites in the coastal communities of BBR are not only lacking, they are also small in sizes. The Batangas Bay Demonstration Project, Batangas City dumpsite, the biggest, is only 20,000 m<sup>2</sup>, followed by Bauan and San Pascual, with areas of about 9,150 and 3,000 m<sup>2</sup>, respectively. Mabini has a pit measuring 5 m<sup>2</sup>. None of these

meets the standard (i.e., 10,000 m<sup>2</sup> per 30,000 population) set by the National Housing and Land Use Regulatory Board. This situation leads to disposal of both household and market solid wastes and hospital and industrial wastes in common areas. No segregation of these two types of wastes has apparently been carried out in the past and this aspect requires urgent action, including the identification and development of additional or alternative sites and sanitary landfills. Also, the absence of a set of applicable incentives and regulations to encourage

all sectors in the BBR to minimize, segregate, and recycle wastes at source further contributes to random dumping of uncollected wastes and to indiscriminate mixing not only of the types of wastes under consideration but also of biodegradable and non-biodegradable materials.

#### Water and Air Pollution

Improperly disposed solid wastes, combined with toxic and hazardous liquid wastes discharged by some industries into the bay and by poultry and piggery farms in creeks and rivers or in areas adjacent to them, are the main threats to overall maintenance and protection of the hydrologic system of the BBR. While there appear to be no quantitative data on the impact of industrial and domestic discharges to Batangas Bay and major rivers, the occurrence of water pollution can be traced from the increased sediments and suspended solids in the rivers, such as the Calumpang River which eventually find their way into the bay. Thus, the need for periodic dredging of some rivers becomes a primary concern of government, especially the LGUs. Moreover, the absence of municipal sewage



facilities tends to accelerate the flow of untreated domestic wastes to the bay through various waterways. Many firms along the bay have some level of waste treatment facilities, but the treatment efficiencies achieved are undetermined. A recent World Bank (1993) study of top 100 most polluting industries in the Philippines indicates that their waste treatment facilities have not achieved 100-percent efficiency (Box 1). On the basis of this finding, it can be safely assumed that many firms in the coastal areas

In addition to domestic and industrial waste discharges, pollution of marine waters is expected to escalate due to potential oil spill from increased vessel traffic, unregulated mining and quarrying, and destructive fishing methods. For about eight years, from May 1986 to September 1993, 11 incidents of oil spill have been recorded by the Philippine Coast Guard, or at least one spill per year. But, the most significant of these incidents was that the frequency of oil spills has increased from an average of one occurrence per year from

1986 to 1990, to two occurrences in 1991 and 1992, and four occurrences in 1993. In the case of Pilipinas Shell Petroleum Corporation, these incidents have been attributed to structural defects (such as unstable foundation of oil tanks), inadequate internal inspection, and human error. The prospects of oil spill seem to be high in the next five years in the light of the international port development, which will ultimately intensify the vessel traffic condition in the bay. Mine tailings and sediments from open-pit mining and quarrying operation, although small-scale, can pollute the marine environment, so are the use of cyanide and home-made dynamites in municipal fishing. More

specifically, the destructive fishing methods do not lead only to marine pollution but also to the destruction of fish habitat (coral reefs) and the reduction of the natural reproductive capacity of fish in the bay.

The present effort of the LGUs to stop mining and quarrying in Mabini is in the right direction to give them enough time to study

#### BOX 1. TOP 100 POLLUTING FIRMS

Industrial Sector	Number of Plants	Discharged Per Plant			
		Effluent Flow m <sup>3</sup> /day	Untreated BOD <sub>5</sub> (kg/day)	Treated BOD <sub>5</sub> (kg/day)	Treatment Achieved (%)
Beverage	8	2,410	6,617	2,503	62.0
Textiles	13	2,290	2,773	1,348	51.4
Electronics	1	240	751	564	25.0
Food Processing	44	1,076	3,040	1,477	51.4
Tanneries	2	1,402	5,789	4,123	27.2
Metal Finishing	4	270	932	507	45.5
Chemicals	9	1,494	2,033	1,363	33.0
Pharmaceuticals	3	660	2,675	311	88.4
Pulp and Paper	3	3,488	798	450	43.6
Slaughterhouses	11	921	6,894	4,435	35.7

**Note:** The effluent loadings and Biological Oxygen Demand (BOD) discharges shown are single plant average for each sector.

**Source:** World Bank/UNDP, 1992. *Philippines-Industrial Efficiency and Pollution Control Program, Final Report.*

discharge oils, lubricants, and chemicals which are not completely treated through simple separator or secondary settling and neutralization process. This is particularly true for big firms which use large amount of water in the treatment process. Traces of oil have been found along the seashore which serve as indicator of the presence of oil in the seawater.



the potential environmental impact of such operation, identify appropriate mining methods and conservation measures, determine other potential sites, or design alternative resource use development plan for the subject area.

The plastic, styrofoam, and other wastes disposed off indiscriminately by passenger ships plying Batangas City and Mindoro Island into the waters of Batangas Bay are not only polluting the marine resources, but also endangering the safety of other sea vessels. The latter case is particularly true, and indeed dangerous, to small motor boats because their propellers could easily get tied to the plastics, which may cause trouble to these vessels. This only proves that many passenger ships do not observe proper disposal of wastes and, hence, there is a need to enforce existing applicable environmental laws or formulate appropriate incentives or stricter regulatory measures.

Pollution caused by industrial activities is not limited to water. The air is also affected by the emissions of gases and particulates from oil refineries and chemical plants in the BBR. The increasing number of motor vehicles emits lead and sulfur oxide, among others, which are highly hazardous to both the environment and human health. However, there are no data on the exact types and amounts of pollutants produced by these two sectors. Equipment and facilities for chemical analysis and monitoring may soon be necessary to prevent the level of air pollutants to increase beyond acceptable standards.

#### • Municipal Fishing

In the 1991 Local Government Code, Batangas Bay is classified as municipal waters under the local governments of Bauan, Mabini, San Pascual, Tingloy, and Batangas City. Fishing within the bay is thus limited to municipal fishing. In other words, commercial fishing is strictly prohibited. Local fishers, however, lament the occasional encroachment of commercial fishing boats in the bay. This generates resource-use conflicts between the two fishing sectors and also intensifies

pressures on marine fishery resources.

Sustainability of municipal fishing is a central issue among the residents of the coastal communities, where 70 percent (or 6,275) of municipal fisherfolks in 1994 were directly dependent on this sector. The remaining 30 percent (or 2,690 fishers) sought seasonal employment, such as carpentry and masonry. In that same year, about 7.2 percent of the total coastal population of 360,529 was considered reliant on municipal fishing for daily subsistence. The large number of fisherfolk relative to the bay's water area (i.e., 41 per 1 km<sup>2</sup> of fishing ground) gives an indication of increasing fishing pressure in the bay, which could bring about intense fishing competition and potentially lead to overfishing. At present, there are no available data to assess the impact of such resource-use conflicts on the fishery resources. Even an inventory of fish stock and other marine resources in the bay is limited. Such a scarcity of information constrains both the local governments and communities to determine management and regulatory measures for maximum sustainable yield of the bay's fish resources.

In recent years, the fish landed by municipal fishers in Sto. Domingo, Bauan, and Tabangao, Batangas City, has dwindled, especially for certain species, such as anchovy and slipmouth. Between 1992 and 1993, for example, the quantity of anchovy landed in Sto. Domingo landing site declined by 39 percent from 37,270 to 22,761 kg. This reduction, however, could be attributed partly to seasonal variations and partly to other possible causes mentioned above, like the encroachment of commercial fishing, use of destructive fishing methods, pollution from oil spill and other toxic wastes, and increasing vessel traffic. More sophisticated analytical models and longer time series data are required to ascertain the individual effects of the contributory factors on fish yield and stock. Compounding the decline in fish harvest is the gradual diminution of effective fishing area in the bay with the establishment of private ports and wharves and the

conversion of domestic port in Batangas City into international port. Some firms seem to control the entry of municipal fishers in the immediate vicinity of their private wharves. The expanding conflicts between municipal fishing and other water uses pose a big problem to the sustainability of the sector to contribute to local jobs and income that support over 7 percent of the coastal population.

- Mining and Quarrying

Despite reports of the existence of metallic and non-metallic minerals in the province of Batangas in general and the bay in particular, there is hardly any economically significant mining activity in the bay, except for some sand and gravel and open pit silica mining in Mabini as noted above. Although mining operations are smallscale, they can be as threatening to the overall environment as the commercial mining if they use environmentally destructive practices such as the open-pit mining method. The presence of mining tenements in the bay, specifically in Batangas City, Mabini and Bauan, should be an important concern in the development and management of the bay. Efforts to enforce existing applicable environmental laws and institute more effective ones that make mining operators internalize the costs of environmental protection or marine pollution control, need immediate action.

- Shipping and Port Development

As noted earlier, the bay is increasingly being used by both domestic and foreign vessels resulting in increased vessel traffic over the years. Between 1985 and 1990, the total number of vessels entering the bay rose from 5,052 ships to 6,776. If the ships that docked in February 1995 reflected the monthly rate of vessel entry, then the aggregate number for that year would be about 15,870 ships or 57 percent more than those recorded in 1990. This condition raises three interrelated issues for the management of the bay

resources: the congestion in sea vessel traffic, the potential of oil spill and ship collision, and marine pollution. Concerns over these issues are rooted in the small water area of the bay, the absence of vessel traffic system, the inadequacy of vessel traffic monitoring system, the implementation deficiency of vessel safety measures, and the relatively weak intersectoral cooperation in oil spill contingency plan execution. For shipping and port development to prosper, to coexist with such economic sectors as municipal shipping, and to minimize marine pollution, a traffic system needs to be installed and managed effectively in the near future if it is not yet part of the international port development and management schemes. Strict enforcement of safety measures on all types of vessels before boarding and while plying the bay is also necessary to avoid overloading, oil spill, and ship collision. Overloading of passengers and cargoes is a common cause of shipwreck that involves the loss of lives of hundreds of people and an incalculable value of properties.

- Human Settlements and Population Growth, Especially in Coastal Areas

The influx of industries, accentuated by the international port development in Batangas City, has accelerated the growth of population in the coastal areas. As of 1990, the population of coastal communities estimated at 324,761 posted a growth rate of 2.5 percent, which is higher than that of the whole BBR (2.25 percent) and Batangas Province (2.32 percent). Such a population size is projected to increase to 379,889 in 1996, 421,840 in 2000, and 714,022 in 2020 (Table 4). In-migration influenced by industrial development appeared to be an increasing component of the population growth. This has resulted in the proliferation of coastal settlements, particularly in Batangas City and Mabini areas, thereby aggravating the problem of domestic waste collection and disposal, sustainable utilization of marine resources, and marine pollution prevention.

**Table 4. 1990 population of Batangas Province, Batangas Bay Region and coastal communities, and projections for 1996, 2000, and 2020.**

Area	1990 Census Year	Project Population		
		1996	2000	2020
Batangas Province	1,476,783	1,969,995	1,862,774	2,946,937
Batangas Bay Region	733,240	849,584	937,757	1,546,235
Coastal Communities	324,761	379,889	421,840	714,022

**Source:** Provincial Planning and Development Office, Batangas City. Unpublished Data Files.

**Note:** The coastal communities include Batangas City, Bauan, Mabini, San Pascual, and Tingloy.

A grave concern among coastal residents is the increasing rate of unemployment in spite of overall economic growth of the province. This is partly attributable to labor dislocation of some sectors, especially the marginal fisherfolk. Alternative livelihood development programs are urgently needed to absorb displaced labor and to reduce human pressure on land and marine resources. Generally, the coastal residents do not receive adequate environmental education and awareness program that could help them dispose and recycle domestic wastes properly and increase access to public and private organizations which extend material and technical assistance for the development and management of the environment.

High population growth, proliferation of squatter shanties, and rising unemployment have spawned more significant social problems, such as poor health and sanitation conditions. The growing number of underweight children — an indicator of malnourishment — has been spotted in the coastal communities, notwithstanding the various health establishments in the province. Access to health

and sanitation services is apparently another major problem of most coastal residents that demands effective delivery mechanisms. Such services must embody family and population management practices to arrest the rapid growth of population in the coastal areas.

Participation of Private Sector and NGOs in Environmental Management

Until recently, both national and local governments assume the role of formulating and

implementing solutions in the form of policies, plans, programs, and regulations for practically all the environmental problems and issues identified above. This role is often extended to the actual delivery of public services, thereby dissipating governments' efforts to steer the public to get involved in local governance. The general public is also inclined to support that traditionally perceived role of government, despite the fact that the latter's capacity is slowly shrinking in the face of increasing demand for public services against the scarcity of its technical skills and financial resources, especially at the LGU level. Consequently, there is a very low level of participation by the private sector and nongovernment organizations (NGOs), other voluntary associations, and people's organizations in environmental management on a sustainable manner. The continuing trend toward decentralized development and management brought about by the 1991 Local Government Code underscores the importance of private sector and NGOs participation through socially acceptable institutional arrangements. Although the Code has institutionalized partnership arrangements between government and the



private sector and NGOs, there is no adequate legal framework for participation that is suitable for the BBR. Incentives for active involvement are not also sufficient to encourage potential development partners to invest more time, energy, and financial resources. These incentives may include both economic and noneconomic benefits, such as low garbage fees, efficient waste collection, greater involvement in policy formulation, program design, decision-making, and implementation, sharing management responsibility with government.

Local governments within the BBR can learn more from the experiences of other LGUs which have succeeded in their attempts to improve the management of some environmental aspects, such as the Puerto Princesa City's *Bantay Puerto Program* and Olongapo City's *Integrated Solid Waste Collection Management Program* (See Box 2). Both programs illustrate the need for a strong leadership of the LGU to succeed. But implementation of these programs and the concomitant regulations and strategies requires vigorous organizational and logistical support that enable the private sector, NGOs, POs, and the citizenry to participate effectively in collective efforts.

Contributing to the lack of private sector and NGOs involvement is the generally low level of understanding and appreciation of the link between development and environment. Econo-

mic growth strategies, such as urbanization and industrialization, will hardly be sustained if they do not integrate the necessary environmental considerations, such as marine pollution control and prevention in the bay. Knowledge of key environmental parameters and tools, such as land use planning and environmental impact assessment, is vital to the integration process, which should be applied in the preparation and evaluation of other sectoral development plans and programs. Imparting this knowledge, and eventually translating it into action at the grassroots level require more intensive information

## BOX 2. HOW OLONGAPO CITY SOLVED SOLID WASTE PROBLEMS.

With enough political will, the local government of Olongapo pursued the integrated solid waste management program. In time, the city residents were convinced about the sincerity of the local leaders and extended their wholehearted support to the program.

Lack of the city's garbage trucks has a public address system which broadcasts a jingle, specially created for the program. The garbage collectors and the truck drivers wear uniforms and identification cards. Residents are compelled to put their garbage in plastic bags to facilitate garbage collection. Garbage not placed in the prescribed plastic bags are not collected. A collection schedule is strictly followed. Garbage collection is done twice a week in residential areas and daily in commercial zones and markets. The city government charges fees ranging from P10 to P20 for households and from P30 to P300 for business establishments. To make collection easier, garbage fees are included in the electricity bill.

Sanitary inspectors from the City Health Office regularly inspect the assigned areas. Citation tickets are issued to residents and owners of business establishments whose premises are found in violation of sanitation ordinances. Junk dealers and scavengers have been organized and instructed not to interfere with the collection schedules, and children are strictly kept out of the dumpsites.

The program pays its own way. Operating on a budget of P4 million a year, the program generates an annual income of P6 million from garbage fees. For areas inaccessible to garbage trucks, collection points have been established. Some residents have converted their backyards into mini-dumpsites to ensure that their garbage is properly disposed, if not collected.

The program's success in dealing with its garbage problem is due to the simplicity of the design, the strong political will behind it, a little foreign assistance, and a lot of public support.

**Source:** A condensed version of "Olongapo City: Solid Waste Management Program - A Simple Solution to a Simple Problem" in *Innovations: Excellence in Local Governance*, A special issue of the *LGA Forum*, 1994, pp. 34-39.



and education system along with community organizing, due to inadequate functional organizations of coastal communities. Most local organizations or associations are formed for purposes other than promoting advocacy and collective action for environmental management, such as agricultural and fishing cooperatives. In addition, most of them are not designed and trained to incorporate environmental concerns in their specific development projects.

- **Integrated Policies, Plans, Programs, and Institutional Support**

The limited emphasis on environment in economic development planning and management is also recently recognized by local authorities in the BBR, after problems of waste management, pollution control, health and sanitation, and resource-use conflicts started to mount in an increasingly alarming rate. The more disturbing issue concerns the widespread effects of domestic wastes and pollution problems that transcend administrative boundaries, convincingly invalidating traditional practice of independent policy and plan formulation and execution for each LGU, as well as of separate treatment between development and environment. Any effort to integrate all LGU policies, plans, and programs, however, is confronted with some institutional constraints, such as the absence of a central coordinating body (similar to an Environment and Natural Resources Office at the provincial and/or municipal level) for planning and development of the BBR, the lack of integrated land- and water-use policy including zonation scheme, the low technical capability for integrated sustainable environmental management, the fragmented information base, and the weak coordination and collaboration among the key actors and groups in the BBR. The technical capability problem is more pronounced in some LGUs which seemingly are unable to fully discharge the devolved environment and natural resources management powers and responsibilities,

depriving them of additional potential revenues for local development.

At present, majority of the policies and ordinances intends to control and regulate the various agricultural, commercial, and industrial development programs in the BBR, except for the normal revenue-generating measures, such as fees, licenses, and permits. Such regulatory instruments typically consist of a set of standards and penalties. Incentives that encourage and reward the use of environment-friendly technologies, practices, and processes are not yet given serious attention. The problem with environmental regulations occurs when there is not enough number and qualified LGU personnel who could enforce them effectively and efficiently. Besides, enforcement and monitoring of these regulations usually demand high administrative cost. A proper mix of regulatory measures and economic instruments needs to be drawn up in order to achieve optimum benefits from their enforcement.

Low compliance to environmental laws and regulations by all sectors is another management issue facing the LGUs in the BBR. Large industrial firms are made responsible for the conduct of periodic monitoring of equipment operations and facilities and the submission of necessary compliance reports to the DENR. The present policy is for such reports to be submitted to the DENR Regional Office in Manila. However, regular on-site inspection is evidently not carried out by this office. Both the local DENR offices and the LGUs in the bay area have no copies of the compliance reports. Such a policy deprives the LGUs of the immediate use of the information contained in the reports for effective policy and plan formulation and implementation. Since the LGUs need to protect their environment and the welfare of the people, it is advisable that the monitoring function of industrial compliance to environmental laws should be fully devolved to the LGUs. This implies that the DENR should train and assist the LGU staff on this task. By doing this, the integration of development-environment concerns in planning and implementation

process can be systematically pursued.

## TRENDS AND IMPLICATIONS

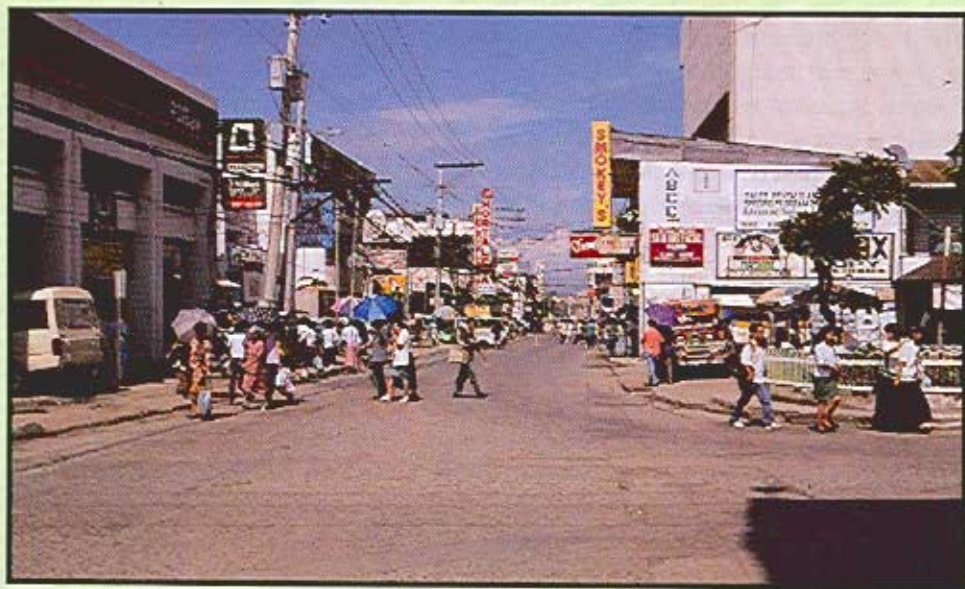
The 1995-2000 Multisectoral Development Plan of Batangas Province has set the goal of transforming Batangas Province from an agricultural area into an agroindustrial center by the beginning of the next century. Agricultural intensification and modernization are two key strategies envisaged by the provincial plan to facilitate the industrialization process. Emphasis is placed on selected crops, such as corn, banana, citrus, and vegetables, as well as on poultry, piggery, and duck raising. Rapid growth, however, would be driven by three major economic sectors: industry, trade, and tourism. An export-processing zone is targeted to be established under the build-operate-transfer (BOT) scheme in Bolbok, Batangas City, within the next five years. The construction and expansion phase of the Batangas international port is also planned to be completed during the period. Considered promising industrial subsectors are electronics, jeep body building, computer services, industrial manufactures, and raising of cutflower and ornamental plants. Coastal tourism is planned to be developed in Mabini and possibly in the Maricaban Island. Many of the development projects tend to concentrate in the BBR, especially along the coastal areas of the bay. This trend will drive up demand for better waste collection and disposal system to meet the anticipated volume of wastes which will be generated during the production and maintenance operations. An important fact that will challenge the local governments of the BBR is that future developments need a reliable environmental monitoring organization and mechanism, which is yet to be realized. Thus, through the leadership of the Provincial Government, some LGUs of the BBR have been consulting each other and with various national government agencies and private sector for more than a year now to forge a consensus on the more appropriate institutional framework for effective coordination and monitoring of environmental management activities not only of

government but also the private sector, NGOs, and organizations of coastal residents. In December 1995, the Batangas Province formally created an Environment and Natural Resources Office (ENRO) at the provincial level to coordinate the integration of environmental planning and management of the BBR, among others. City and municipal governments have also initiated policy and organization reforms to prepare for the greater challenges posed by the provincial plan. Batangas City has modified its garbage fees for all sectors in January 1996 to increase government revenues for the improvement of waste management. The municipality of Bauan also planned to set up an ENRO to take charge of waste management, environmental monitoring and protection, and pollution control and prevention.

Having formulated in the dynamically growing CALABARZON, the Batangas Provincial Plan incorporates and supports some key elements of the CALABARZON Master Plan, as well as the existing Municipal/City Development Plans, Region IV Development Plan and Tagaytay-Taal Master Plan. A key attribute of these plans is that most priority projects concentrate on physical infrastructure to pave the way for industrialization, except for the Tagaytay-Taal Lake area which is reserved for ecotourism. The provincial plan seeks to sustain economic development and growth through some environmental conservation activities: solid waste management, reforestation, marine pollution control, coral reef rehabilitation, construction and improvement of flood control and drainage system, and establishment of municipal and barangay tree parks. The actual integration of development and environmental management efforts requires the participation of all key sectors in the BBR and the pooling together of their resources for common and complementary activities. In both aspects, however, technical and networking skills are required. If capacity-building program is to cope with fast economic development of the BBR, there is a need to prioritize the work of the ENRO and all other concerned organizations in the management of the environment and natural resources.



# Classification and Prioritization of Management Issues



# CLASSIFICATION AND PRIORITIZATION OF MANAGEMENT ISSUES

### CLASSIFICATION OF ISSUES

In the scanning of the environmental management issues in the BBR, eight major areas of concern are used to classify the 21 key issues identified. The early discussions, however, point out that their existence are in fact brought about by a number of management, technical, institutional, legal, social, and economic factors which require *priority* action. This suggests that the solutions to the issues depend on the ability of the government, especially the LGUs, to address the various factors discussed earlier, as summarized in Table 1. Such an ability shall include networking and partnership skills on the part of the LGUs to bring the expertise and resources of the private sector, the NGOs, POs, and other local associations, and the community at large in the task of environmental management.

In this section, an attempt to classify the contributory factors according to the specific issues that they directly affect is made to help LGUs' planners and decision-makers in designing appropriate actions for the effective management and sustainable use of the BBR environment. This information will also enable the LGUs to prioritize and focus the allocation of local resources into the most important environmental issues facing their respective communities. Lastly, this classification provides an opportunity to integrate efforts and energy of the LGUs and other major actors on common environmental concerns. Identification of strategies, programs, and projects for specific issues will be facilitated in the process. Figure 2 shows

the classification results.

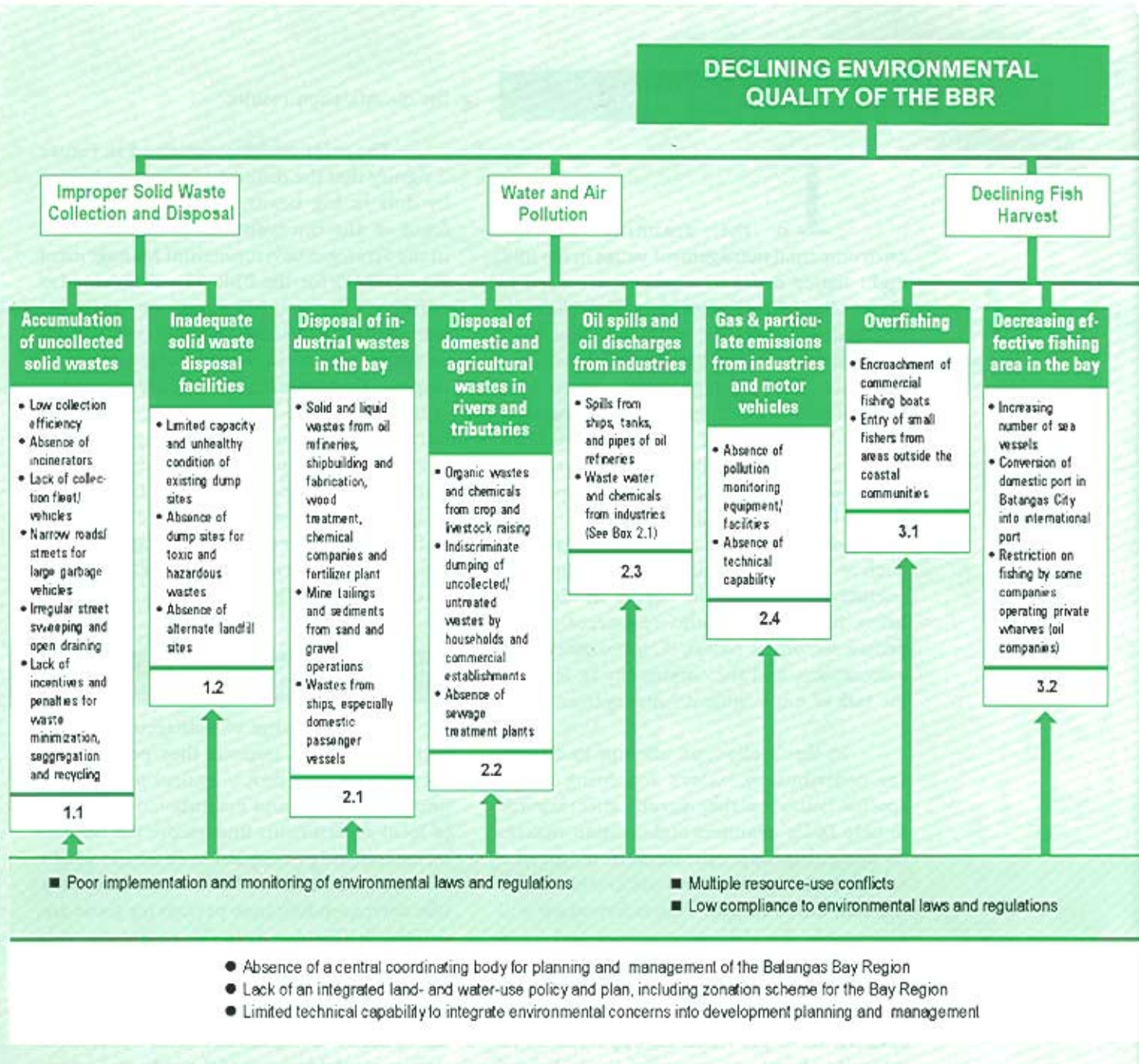
The relationships portrayed in Figure 2 signify that the different factors, indicated by dots in big boxes, should be the main focus of the interventions to be contained in the Strategic Environmental Management Plan (SEMP) for the BBR. The diagram also reflects the right type or mix of interventions to solve specific issues, such as improper solid waste collection and disposal or a combination of two or more issues like water pollution, declining fish harvest and expanding shipping and port development. Depending on the perceived significance of the environmental impacts of specific issues and the resources available to the LGUs, interventions can be designed for the chosen priority issues or factors to be dealt with in the short run.

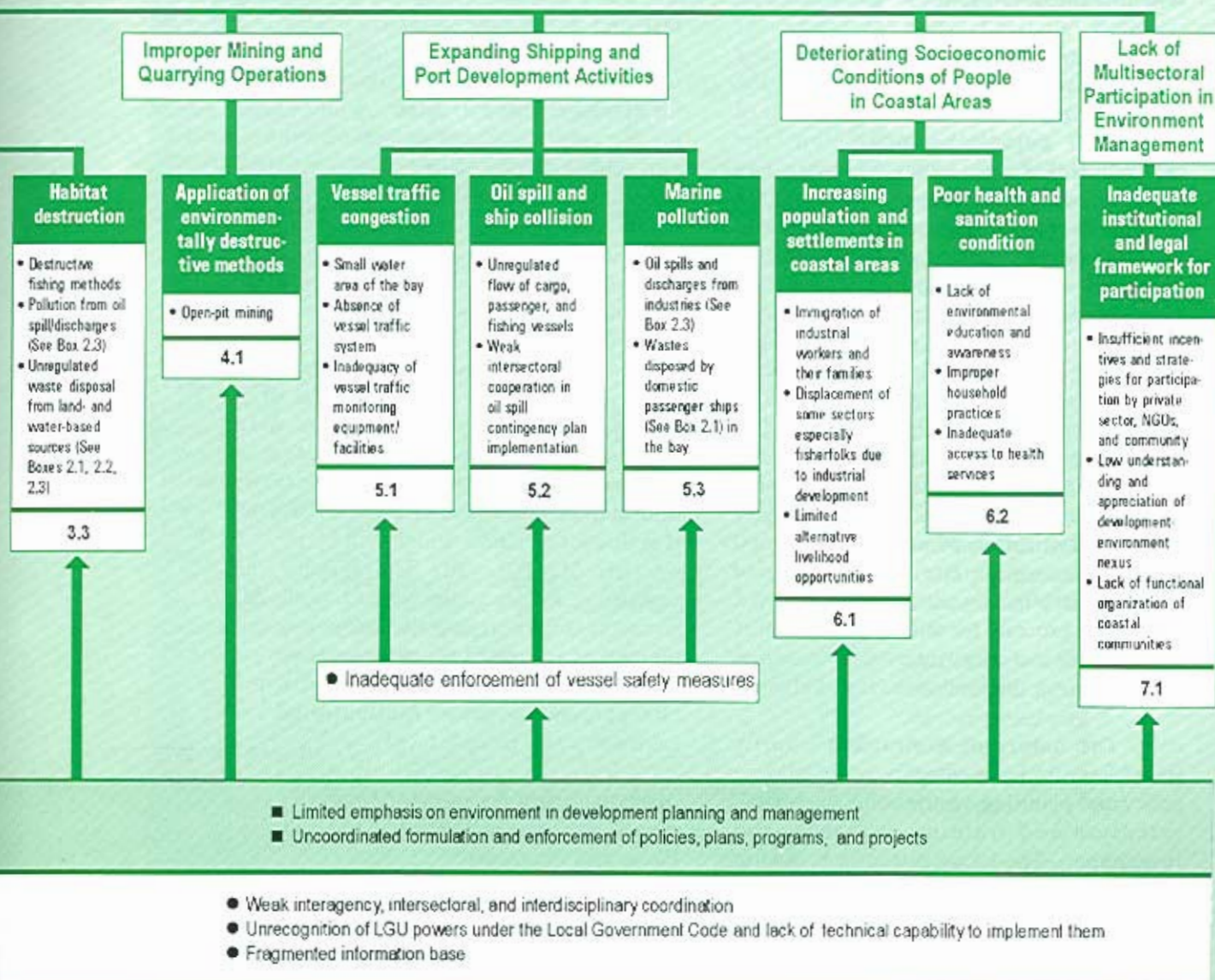
### PRIORITIZATION OF ISSUES

The wide range of management issues and the potential impacts they pose on the environment and people against the existing limited resources and institutional capacities of local governments underscore the need to set meaningful priority issues or factors which the LGUs will tackle in the short and long runs (the corresponding time periods for these are defined in Chapter 3; in the meantime, it is sufficient to assume that they vary in length of time). Two common approaches used in ranking current issues are to determine: (i) the extent of present and potential environmental impacts of the indicated issues and (ii) the relative costs of management measures. But since there is no information on these variables, the perceived significance of solving them from the point of view of



Figure 2. Systematic classification of BBR key environmental issues and their contributory factors.







major users and stakeholders of the BBR environment and natural resources can be taken as a basis of prioritization for the preparation of the SEMP for the BBR. Interviews with key LGU officials, private sector representatives, and NGO members served as main source of information in addition to the Provincial Multisectoral Development Plan. The other criterion used was the identification of issues or factors which could be dealt with by the LGUs at relatively low cost.

Some issues warrant receiving higher priority than others, either because the perceived significance (normally in terms of perceived potential impact on the environment) of some issues are higher than others or because the remedial measures are low cost. In general, the issues or factors with a critical-priority ranking are those in which perceived significance is high and which could be dealt with at relatively low cost. Issues with high-priority ranking are those perceived to be significant, but would normally imply a relatively high cost to mitigate them. Low-priority ranking is assigned to those issues or factors with the lowest perceived significance and with relatively higher remedial cost. A summary of the prioritization of key environmental issues is presented in *Box 3*. The rankings of priority issues/factors should be viewed as a "screening process" for selecting areas where management and policy interventions are best directed, given the limitations noted above.

The nature of the ranked priority issues has also been categorized as follows: policy and planning, institutional, technical, extension and training, research, and investment. The basic intent is to group similar issues into broad themes so that integrated solutions can be identified and developed. In some cases, the outcomes do not necessarily follow a one-to-one correspondence between the issues and broad themes since some issues cannot be effectively solved by using only one type of intervention; for example, policy and planning alone. In this regard, the

concerned issues are placed under the pertinent themes. For example, the low understanding and appreciation by major actors and stakeholders about the relationships between environment and development need to be dealt with not only through extension and training, but also through the establishment of effective management systems which are technical in nature.

The critical priority issues generally fall under the categories of policy and planning, extension and training, institutional and technical aspects. The need for new investments is relatively low, except for the procurement of collection vehicles and the introduction of alternative livelihood development activities. The little reference to research aspect needs qualification. Although there is only one issue (lack of and fragmented baseline information) classified under research, it does not mean that the need for studies aimed at generating more accurate baseline data is also low. On the contrary, most of the issues requiring policy and plan formulation or improvement and technical intervention will necessitate basic information which is unavailable at present. It is this set of issues which will be tackled by this SEMP in the short run. The remaining sections attempt to put similar issues together under the proper major themes, as suggested above, in order to get a clear understanding of their distinct characteristics and implications for environmental management.

#### *Inadequate and Fragmented Environmental and Natural Resource-use Policies, Plans, and Programs*

Under this category, there are 16 critical-priority issues identified, ranging from limited integration of environment in development planning and management and the absence of integrated land- and water-use plan to lack of incentives for citizen and private-sector participation and for waste minimization, segregation, and



### Box 3. Summary of Prioritization of Key Environmental Issues.

#### Critical-Priority Issues (CI)

Absence of a central coordinating body for integrated environment planning and management [I]  
 Inadequate legal and institutional frameworks for multisectoral management [I]  
 Weak interagency, intersectoral, and interdisciplinary coordination [I]  
 Limited integration of environment in development planning and management [P]  
 Absence of integrated land- and water-use plan [P]  
 Poor law enforcement and monitoring of its compliance [P]  
 Limited technical and partnership management skills [E]  
 Low collection efficiency [T]  
 Lack of collection vehicles [In]  
 Irregular street sweeping and open-drain cleaning [I]  
 Lack of incentives and penalties for waste minimization, segregation, and recycling [P]  
 Limited capacity and unhealthy condition of existing dumpsites [T]  
 Solid and liquid wastes discharged by industries [P]  
 Dumping of wastes by domestic passenger ships into the bay [P]  
 Dumping of organic wastes and chemicals by crop and livestock raisers in rivers, etc. [P]  
 Indiscriminate dumping of wastes from households and commercial establishments [P]  
 Oil spill from ships, tanks, and pipes of oil refineries [P, T]  
 Disposal of waste water and chemicals from industries [P, T]  
 Encroachment of commercial fishing boats and small fishers from outside the BBR [P]  
 Increasing number of sea vessels [P]  
 Restriction on fishing by some companies operating private wharves [P]  
 Destructive fishing methods [P, E]  
 Open-pit mining [P, E]  
 Absence of vessel traffic system, including monitoring equipment [T]  
 Weak intersectoral cooperation in oil spill contingency plan implementation [I]  
 Displacement of some sectors, especially fisherfolks due to industries [E]  
 Limited alternative livelihood opportunities [E, In]  
 Lack of environmental education and awareness [E]  
 Improper household practices [E]  
 Inadequate access to health services [E]  
 Insufficient incentives for participation by private sector, NGOs, and community [P]  
 Low understanding and appreciation of environment-development nexus [E, T]  
 Lack of functional organizations of coastal communities [E]  
 Lack and fragmented baseline information [R, I]

#### High-Priority Issues (HI)

Absence of dumpsites for toxic and hazardous wastes [T, I]  
 Mine tailings and sediments from sand and gravel operations [P, T]

#### Low-Priority Issues (LI)

Absence of incinerators [T, I]  
 Narrow roads/streets for large garbage trucks [I]  
 Absence of alternate landfill sites [I]  
 Absence of sewage treatment plants [T, I]  
 Absence of equipment/facilities and technical capability for air pollution monitoring [T, I]  
 In-migration of industrial workers and their families [P]

P - Policy and planning aspect  
 I - Institutional aspect  
 T - Technical aspect

E - Extension and Training  
 R - Research  
 In - Investment

recycling. New regulatory policies and measures will have to be formulated to impose stricter penalties for violators of environmental laws. The poor law enforcement and monitoring of its compliance are, however, the most significant issue which pervades through all economic sectors in the BBR. Existing pricing structures governing the use of land, water, and other resources will need modification to reflect their real values and to make users internalize the cost of damages of their activities on the environment. There are two categories of policy instruments which can be used by the LGUs to effect desired changes in the behavior of resource users. These instruments are the market-based instruments (MBIs) and the command-and-control instruments (CCIs), which are briefly discussed in Chapter 3.

#### *Lack of Legal and Institutional Mechanisms for Integrated and Participatory Environmental Management*

Five critical-priority issues fall under this category, essentially converging on the absence of a central coordinating body which constrains well-coordinated institutional responses to environmental problems in the BBR. This body can spearhead and

consolidate all efforts and resources of the LGUs, the field units of national government agencies (NGAs), the private sector, the NGOs, and the general public for effective environmental management. The inadequacy of existing institutional mechanisms for partnerships among these groups needs improvement to convince and assure potential partners of their importance and shared power in such arrangements. Moreover, the perception about the weak coordination among government organizations (LGUs and NGAs) in the BBR demands clarification of the authorities and obligations to define specific responsibilities for each organization. A responsibility matrix which identifies the roles of key stakeholders and the responsibility-sharing among them needs to be prepared to build an effective BBR-wide administrative structure.

#### *Inadequate Application of Technical Interventions for Environmental Management*

Six critical-priority issues require sound technical interventions to prevent marine pollution and to improve solid waste collection and disposal, vessel traffic condition, and the integration of environmental conservation and socioeconomic development. One specific issue is the low collection efficiency which generally arises from inappropriate route planning, sub-optimal loading of garbage trucks compared to their effective capacity, and single or double shifts of garbage vehicles. Of course, the limited number of garbage trucks in some communities is a major contributory factor which should also be given serious attention. Better route planning will, therefore, consider the traffic situation in Batangas City and Bauan, the compatibility of collection vehicles with quality of road networks, and the spatial distribution of different sectors, especially those who generate considerable amount of wastes. In terms of waste disposal, the main issue centers on the limited capacity and unhealthy condition of existing dumpsites, which generally will not last more than three-four years. Both physical improvement and,

where necessary, chemical treatment of these dumpsites should be undertaken to maximize the use of every available space and prevent the occurrence of waste-related human diseases and environmental damages.

The other three critical issues related to marine pollution include the absence of vessel traffic system, the monitoring equipment, the disposal of waste water possibly contaminated with toxic and hazardous chemicals, and the potential oil spills or discharges from ships, container tanks, and pipes of oil refineries. All these endanger the water quality of the bay and its coastal and marine resources. However, the latter two issues also require policy and planning responses to effect existing instruments to influence actions of industries along the coastal zone and of management or owners of the different ships. Concern over vessel traffic is related to the incidence of ship collision which can cause marine pollution but, more importantly, the loss of human lives and properties.

#### *Limited Knowledge and Capability of Local Stakeholders on Integrated Environmental Management*

There are 10 critical-priority issues classified under extension and training theme, which altogether concern the need to raise the limited knowledge and capability of direct (e.g., municipal fishermen and miners) and indirect (LGUs and other local organizations) resource users on integrated environmental management. The destructive methods employed by some direct resource users are partly attributable to inadequate knowledge on systematic ways to sustainable use of land and water resources. The main issues confronting the indirect resource users relate to inadequacy of basic knowledge on planning and management approaches to participatory and sustainable development, as well as that of increasing the capacity of coastal residents to have greater access to alternative productive activities and basic services. For the coastal residents to benefit from industrialization, the improvement of their



skills required in industries and commercial establishments is of urgent necessity. The fundamental lack of functional organizations of coastal communities indicates that the capacity-building program should include community-organizing activities.

#### *Lack of Baseline Information*

Numerous biological, physical, and other technical information relevant to the clear understanding of many environmental issues examined in Chapter 1 do not exist to date. Those gaps are summed up into lack of baseline information which requires the conduct of special researches or studies to generate information for improved policy-making and enforcement, plan development, and program implementation and monitoring. A list of data gaps is presented in Appendix A of the BBR Coastal Environmental Profile. Availability of basic information will facilitate the LGUs' efforts to achieve an integrated approach to economic development and environmental management of the BBR.

#### *Inadequate Investments to Support the Integrated Environmental Management*

Two critical-priority issues need additional investments to address. First is the lack of collection vehicles in Bauan, San Pascual, and Mabini. In Batangas City, new units will be required to replace old dump trucks that are no longer economically working. Given the narrow road conditions in some residential areas, the appropriate size of new vehicles must be determined. As noted earlier, the new units should possess safety features to avoid wastes to spill during transport to the dumpsites. The second need for investments is to initiate alternative livelihood development projects for residents of coastal communities to reduce pressure on fishery resources and to absorb those who are, or may be, displaced by the establishment of industries along the coastal areas of the bay.

Under the category of high-priority,

two issues are identified which are perceived to be significant but require either high investment cost (i.e., absence of dumpsites for toxic and hazardous wastes, THW) to locate potential sites or high enforcement cost of environmental laws (mine tailings and sediments from sand and gravel operations) compared to the type and scale of existing mining operations. Both issues also need technical interventions to equip resource users with the proper THW disposal system or scientific mining methods. These issues are also considered in the SEMP for the BBR. The immediate LGUs' response can be directed towards strict enforcement of existing environmental laws to ensure that private industries which produce THW will have their own disposal areas.

The low-priority category comprises six issues which also demand investments to address them. These issues are: the absence of incinerators, land-fill sites/facilities, sewage treatment plants, air pollution monitoring equipment, the narrow roads/streets in some areas which make it difficult for large dump trucks to collect domestic wastes and the appropriate action for in-migration of industrial workers. The existing narrow roads and streets may not really require expansion unless there are sufficient funds to carry it out, but may be best served by using small-sized collection vehicles. To do this, however, there is also a need for investments to procure small-sized, preferably locally-assembled, vehicles. The in-migration issue relates to the proper provision of settlement areas for industrial and other sectoral workers who have to transfer residences in the BBR in order to ensure a healthy and well-planned community and environment for them. An affordable housing development program can be a logical response to this issue. These issues will not be directly addressed by the SEMP for the BBR; however, if financial resources become available, they deserve equally important attention as those under the first two categories.



# Vision, Purpose and Approaches of the Strategic Environmental Management Plan



# VISION, PURPOSE, AND APPROACHES OF THE STRATEGIC ENVIRONMENTAL MANAGEMENT PLAN

### VISION AND MISSION

**S**ustainable development is the central theme of the SEMP to ensure confraternity of management actions with the overall development of the BBR and the management of its environment. This is articulated in the SEMP vision which envisages the BBR and the bay as models for the achievement of economic growth while simultaneously guaranteeing environmental integrity. In concrete terms, the vision states that:

- BBR will serve as a model for the attainment of the socioeconomic objectives of the people, together with the conservation of its natural resources and the protection of the environment;
- Batangas Bay will serve as a model for effective marine prevention and management with water quality kept within environmental standards set by the national government to enable industries to prosper with thriving municipal fishery and tourism activities; and
- Economic development of the BBR and the bay will be characterized by a well-planned multiple but non-conflicting mix of land- and water-uses, such as agriculture, industry, services, tourism, commerce, and housing.

In pursuing this vision, the primary

mission of the SEMP will be to mobilize and strengthen the capability and partnership among the LGUs, NSAs, the private sector, NGOs, coastal organizations, and other stakeholders for the integrated environmental management of the BBR in general and the prevention and control of marine pollution in the bay in particular. Marine pollution must be reduced to an acceptable level, based on government standards in the duration of the SEMP to sustain economic development.

### PLAN OBJECTIVES

Consistent with the above vision and mission, the SEMP's main goal is to achieve an acceptable balance between the overall level of economic development and environmental management in the BBR, including the bay, thereby ensuring the functional integrity of its environment and the sustainability of the natural resources for the future generations. The SEMP marks the next 25 years (1996-2020) to fulfill this goal, in recognition of the existing technical capabilities, management systems, technologies, and financial resources. Consequently, the long-term (1996-2020) and short-term (1996-2000) objectives are formulated and classified according to the two criteria for issue prioritization cited in Chapter 2. These objectives are outlined below.

#### *Long-term Objectives*

1. Develop the BBR's environment and natural resources to the fullest extent



possible in accordance with sound management concepts and practices in order to ensure its sustainable use;

2. Create the environmental conditions conducive to human health, employment, income generation, and recreation; and
3. Conserve the BBR's marine resources and biodiversity for the benefit of future generations for the advancement of science and for the development of tourism recreation areas, and other resource-dependent activities.

#### *Short-term Objectives*

1. Establish an integrated management system for BBR's sustainable development that includes mechanisms for multi-sectoral participation and the integration of environmental concerns in development planning and management;
2. Mitigate land- and water-based pollution in the BBR through a proper mix of policy instruments, such as market-based instruments (MBIs) and command-and-control measures;
3. Improve and maintain the water quality of the bay and the river tributaries draining into it, within government standards;
4. Minimize incompatible and conflicting uses of the bay's coastal zone through proper land-use planning and zoning and passage of appropriate policies and ordinances;
5. Strengthen the LGUs and other stakeholders' capabilities on integrated solid waste management, marine pollution prevention and monitoring, and other aspects of environmental management, including data base development;
6. Identify sources of long-term financing for specific programs and projects

identified for sustainable management of the BBR and the bay; and

7. Harness coastal community organizations for advocacy and management of the bay's environment and for alternative sustainable livelihood development activities.

### **OVERALL MANAGEMENT APPROACHES**

#### *Application of Integrated Coastal Planning and Management System for Pollution Prevention and Management*

The SEMP is anchored on the principles of integrated coastal management (ICM) system in all phases of the BBR development, particularly on activities related to marine pollution prevention and management. Under the planetary blueprint for sustainable development, Chapter 17 of Agenda 21 of the United Nations Conference on Environment and Development, ICM has been promoted as a viable approach to resolve multi-dimensional management issues that affect the coastal areas. ICM is characterized by the integration and coordination of all the concerns of various stakeholders in a defined coastal zone covering environmental, socioeconomic, legal, and institutional aspects. ICM seeks to bring about a balance between sustained economic development and conservation of natural resources, minimizing if not eliminating resource-use conflicts, unsustainable economic activities, pollution, and other adverse impacts of unbridled economic development, but at the same time improving the socioeconomic conditions of the communities in the coastal areas, protecting the environment, and ensuring the sustained utilization of the coastal resources.

In sectoral planning, the management of economic activities and natural resources is typically undertaken by several agencies without or with limited coordination among each other and, oftentimes, with very little regard for environmental protection and conservation. ICM, on the other hand, covers



a broader perspective which is the management of the development process upon which these economic activities form an integral part, while ensuring that the resource base and the environment will continue to function sustainably. Thus, sectoral agencies will still continue to manage activities within their mandates or jurisdictions but doing them in close coordination and cooperation with other agencies and stakeholders, while ensuring the functional integrity of the environment.

The ICM framework is being adopted by the SEMP in reinforcing the overall development of the bay region. Coordination with relevant sectoral plans will be made through a consultation process with all sectors involved. The integration with other plans will be highlighted by forging agreements on the linkages of other sectoral activities on the coastal environment and reaching consensus on how mitigation measures may be incorporated both in the SEMP and in appropriate sectoral plans. In the BBR, this management strategy will be consistently pursued within the context of pollution control and prevention. Special emphasis will be placed on pollution monitoring in order to develop an early warning system to measure the extent by which activities of other sectors impinge, negatively or positively, on the bay.

#### *Application of the Principles of Sustainable Development*

Key elements of sustainable development are incorporated into the SEMP. These elements are ecological viability, economic feasibility, social acceptability, and political viability.

Ecological viability refers to the sustainability of the productive functions of the coastal zone within the limits of its carrying capacity. Thus, adequate considerations shall be given to measures which will ensure that harvests from fishing are maintained at sustainable levels and that pollution loads are kept at levels which will not unduly compromise the ability of the bay

to support other economic activities, such as coastal tourism.

The economic feasibility of the SEMP shall be operationalized through measures that will ensure development to proceed without compromising the bay's ecological functions. As an integrated plan, the SEMP shall support the overall development goal envisaged for the province and the BBR in a manner that can be sustained over the long term. Particular emphasis will be given to actions that will result in the minimization of social costs in the long run.

An important element of sustainability is social acceptability. The support of the entire community is important for the SEMP to succeed. After all, almost all sectors will have a role to play in the implementation of the SEMP. They should be able to understand and visualize the relevance of the SEMP to their own interests both as a group and collectively as a community. Consultations must be conducted in a way that will eventually lead to the ownership of the SEMP by the local communities.

Political viability is another vital element of sustainable development. Though related to social acceptability, this pertains to the degree in which the political leaders support the SEMP and the political implications its implementation may have in the region. In the BBR, the support of local leaders is high as evidenced by the strong commitment of the Provincial Governor, municipal mayors, and private sector representatives.

#### *Use of Proper Resource Valuation*

Economic valuation of environmental services and goods is one of the steps in integrating environmental considerations into development decision-making. The goods and services provided by natural resources and the environment are not free despite the absence of a conventional market for such items. Valuation also signals the changing economic scarcities of natural

resources and, therefore, guides users in how resources should be utilized. Finally, it enables planners to translate the environmental impacts of projects into values which can be used in benefit-cost analysis to assess potential damage to the environment and/or return of investment.

In the BBR, resource valuation would be especially relevant in determining the appropriate charges and fees which should be imposed for the use of environmental goods or services. For example, if incorporated into the users' pay principle, pricing could serve as basis in determining fees for collection and disposal of solid waste and penalties for excessive dumping of water pollutants and air emissions. Valuation methodologies could also serve as determinant in estimating damages resulting from oil spills, fish kills, and destruction of coastal and marine resources.

#### *Application of the Precautionary Principle*

For development to proceed on the premise that it will not compromise the environment, sufficient information on the environment, including socioeconomic, legal, and institutional aspects of the area where development is to occur must be available so that adverse impacts can be minimized. In situations where such information is absent, it is difficult to make sound prediction on the likelihood of the occurrence of environmental problems. This is usually referred to as uncertainty, as differentiated from risk, wherein there is known probability of an event happening in the future. Uncertain environmental scenarios often lend themselves to political manipulation, which leads to misinformation and confusion among the public in general. Such issues are dealt with using the precautionary principle. This is described as a process of decision-making in which a cautious approach is initially taken by policy-makers, which may be relaxed and improved as baseline information becomes more available. This principle carries with it a commitment of

resources to safeguard against potentially adverse environmental impacts of certain decisions or activities.

This principle emphasizes the use of preventive mechanisms as a basic management strategy for the BBR. Compared to other water bodies close to rapidly urbanizing centers, Batangas Bay is relatively less polluted. It is, therefore, important that development in the BBR proceeds in such a way that does not exceed the bay's productive capacity. The strategy will entail the setting up of emergency response plans for environmental disasters such as major oil spills, massive fish kills, contamination of groundwater, and other industrial accidents. More importantly, action programs shall be defined along the lines of preventing such major environmental problems to happen. This strategy supports the principle of strategic management, since it is always less costly to invest in preventive activities, rather than embark on rehabilitation measures.

#### *Adoption of the Market-based Instruments in Combination with Command-and-Control Mechanisms for Environmental Management*

The SEMP recognizes that the present set of environmental regulations are inadequate or insufficiently enforced. Penalties are set too low that often it is more costly to comply than pay the fines. This situation has not contributed to improve the compliance to regulations and standards, resulting in worsening environmental quality. Market-based instruments (MBIs) will help both the industries and households in internalizing the costs of using environmental services. Environmental resources are priced at a level that reflects their true scarcity and/or value and the opportunity cost of their use. Resources, therefore, are no longer treated as "free" and thus, users will be forced to economize on their use. Such "costs" translate into economic decisions on the part of the users to rethink their use pattern, technology, or

processing systems.

The use of MBIs as a tool for environmental management can help achieve the desired effect at the least cost possible. This is because it requires minimum enforcement and administration and decisions about the use of environment which are internalized by the resource users. Such instruments also generate revenues for the government, which makes their application advantageous for the LGUs facing financial limitations in implementing environmental improvement programs. An array of instruments for environmental management is available for policy makers, as summarized in Table 5.

The use of MBIs in the BBR shall be supplemented by traditional command-and-control mechanisms. A regulatory framework still has to exist to make the MBIs operational. The most apparent application of these instruments are the use of the marine waters for transport of oil and related products, the dumping of untreated wastes in coastal waters, the use and operation of landfills, and the discharging of hazardous wastes into the river systems and other waterways.

#### *Establishment of Sustainable Financing Mechanism*

The SEMP recognizes that the national government has very limited funds for environmental management. LGUs face the same situation but have more flexibility in generating financing for its programs. The SEMP will take advantage of the opportunities available to the LGUs and will utilize such innovative financing mechanisms to sustain its implementation.

**Table 5. Policy Instruments for Environmental Management.**

#### **ECONOMIC INSTRUMENTS**

Redefining Property Rights	Tradeable emission permits; liability insurance legislation
Tax/Charge Systems	Effluent charges, user charges, product charges, and administrative charges
Subsidies	Financial aid in installing new technology; subsidies to environmental research and development expenditure
Deposit-Refund Systems	Combines charges and subsidies so as to provide incentives to return pollutants for recycling.

#### **REGULATION**

Standards	Effluent, ambient, and technology standards
Resource Use Quotas	Emission quotas, harvesting quotas; by allowing quotas to be traded among market agents, the quota system would be transformed to a system of tradeable permits.

**Source:** OECD, 1989. *Economic Instruments for Environmental Protection*, Paris.

Revenues generated from the use of MBIs offer an important source of financing for SEMP implementation. Through ordinances, the LGUs can earmark revenues therefrom to establish a fund for the management of the BBR environment. The mechanics and operation of such fund can form part of researches so that clear guidelines can be established for its use. Other forms and sources of financing, such as contributions from the private sector to a common trust fund, will be explored.

#### *Institutionalization of LGU-Private Sector-NGOs Partnership Arrangements in the Plan Implementation*

The preparation and implementation of the SEMP requires the cooperation and involvement of all the parties and stakeholders involved. This is an essential element in order to ensure that development proceeds along the



manner defined in the SEMP. In this way, conflicts are resolved early on and all the available resources are mobilized and coordinated to support the SEMP.

The importance of partnerships among the LGUs, private sector, NGOs, and household groups shall be highlighted as one of the key elements for the effective implementation of the SEMP. In the BBR, this is not difficult to operationalize as most sectors involved have shown commitment or willingness to work together cooperatively. What is lacking perhaps is the appropriate legal and institutional arrangements; which would strengthen such a partnership. Once established, responsibilities and accountabilities could be more defined. It could also set in motion the process of resolving possible conflicts and the proper coordination of all development activities affecting the BBR.

## THE SEMP STRUCTURE

The selection of these management approaches takes account of the critical and high-priority environment issues which the short-term objectives of the SEMP seek to address in the first five years of its implementation (hereinafter referred to as

Phase I). The same approaches are also significant in the attainment of SEMP's long-term (the next 20 years, or Phase II) objectives by providing the institutional and policy framework for sustainable management, including financing of the BBR environmental management. The long-term objectives correspond to the low-priority issues. However, only strategies, programs, and projects to be pursued under Phase I are discussed here in greater detail, while those under Phase II are indicative since more information will be needed to define the desired specific activities. Phase I experience will, therefore, serve as a basis for elaborating the Phase II content.

The integrated components of the SEMP are divided into six major themes: policy and planning, institutional, technical, extension and training, research, and investment. Management actions in terms of strategies, programs, and projects are presented under each theme, but linkages among them both at the planning and implementation phases will be indicated. However, this SEMP shall be translated into an operational plan or a number of action plans, based on the resources of all involved organizations and stakeholders.

# Specific Components and Actions of the Strategic Environmental Management Plan





# SPECIFIC COMPONENTS AND ACTIONS OF THE STRATEGIC ENVIRONMENTAL MANAGEMENT PLAN

**T**his SEMP consists of six main elements corresponding to the major themes used to classify and prioritize the key issues in the management of the BBR environment. The strategies, programs, and projects are drawn up for each element in such a manner that they form an integrated plan. The SEMP components and action programs are summarized in Figure 3.

### 1. LEGAL AND INSTITUTIONAL MECHANISMS

The implementation of SEMP depends on a well-functioning central coordinating unit that will assist and facilitate the integration process of existing and planned actions by the LGUs and other sectors from planning to implementation of environmental policies, plans, programs, and projects for the BBR. This unit should serve as a technical arm of the BBR-wide multisectoral organization, comprising of key stakeholders within the region to ensure the attainment of the SEMP's vision, mission, and objectives. These structures and the corresponding working relationships are yet to be fully established and operationalized. The establishment of these mechanisms is a prerequisite to translate into action the principles of ICM. The roles and responsibilities of participating organizations or groups, including the areas of accountabilities for implementation, should be clearly defined and mutually agreed upon. These mechanisms will also serve as the framework for the intersectoral coordination of the SEMP implementation and

eventually pave the way for the institutionalization of the ICM system in the BBR.

#### *1.1. Development of Legal and Institutional Mechanisms for Integrated Planning and Management*

This program seeks to establish the most appropriate multisectoral organization and operation modalities which will harmonize sectoral policies, plans, and programs in the BBR, make priority directions for environmental management, and then mobilize and coordinate the use of resources for effective program implementation. Mechanisms for partnership arrangements, such as the interagency joint mechanism, public-private sector joint mechanism, public-business sector joint mechanism, public-NGO joint mechanism, interindustry joint mechanism, and participation of local communities in decision-making processes both at the planning and implementation stages, or a combination of these mechanisms will also be developed. The major activities are outlined below.

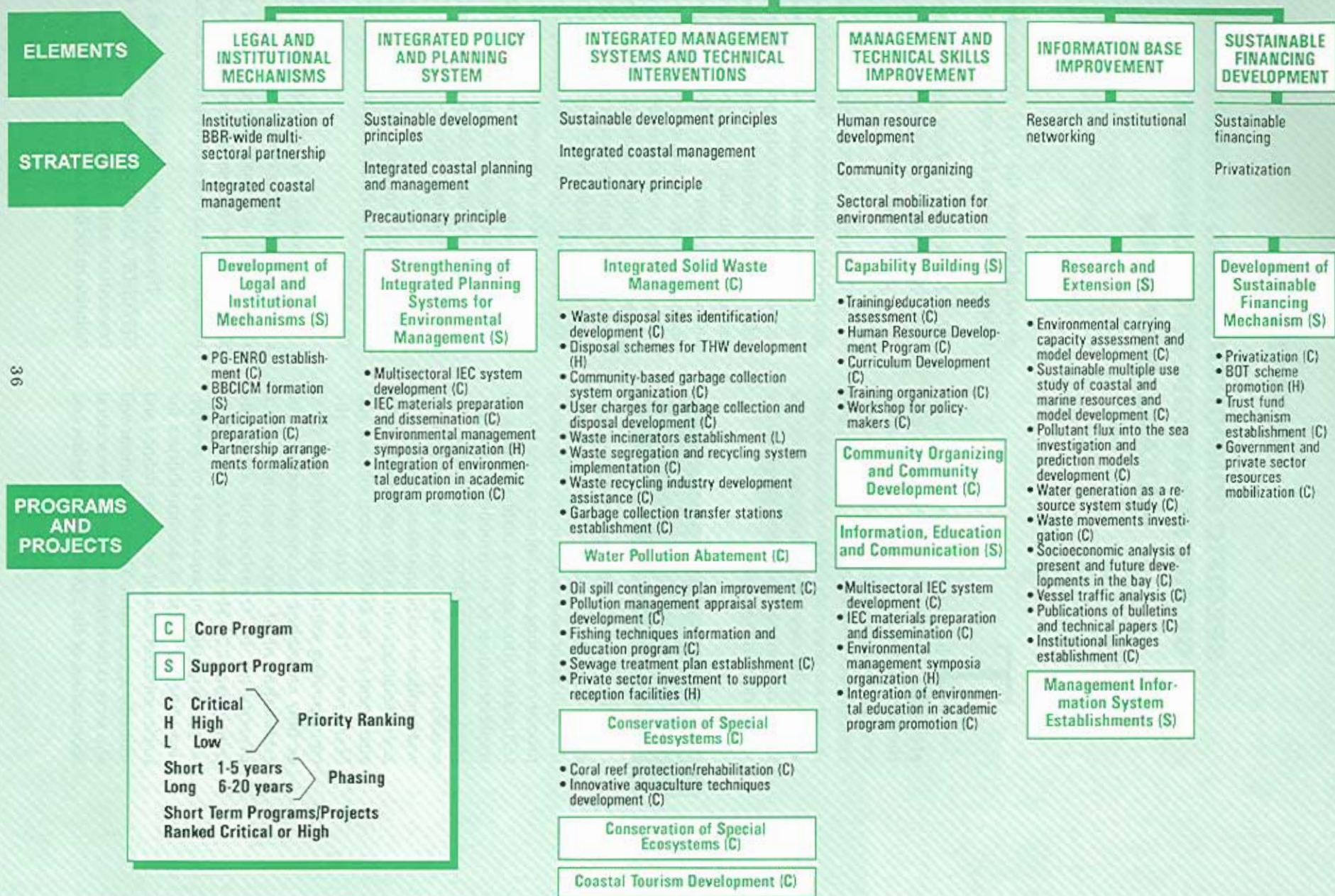
#### *Creation of the Provincial Government-Environment and Natural Resources Office (PG-ENRO)*

The creation of the PG-ENRO, as a central coordinating unit for the BBR environmental management, is a basic prerequisite for the development of the multisectoral coordinating mechanism. This first activity is now underway.

Through the technical support of the GEF/UNDP / IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas (MPP-EAS), the



Figure 3. SEMP components and action programs.





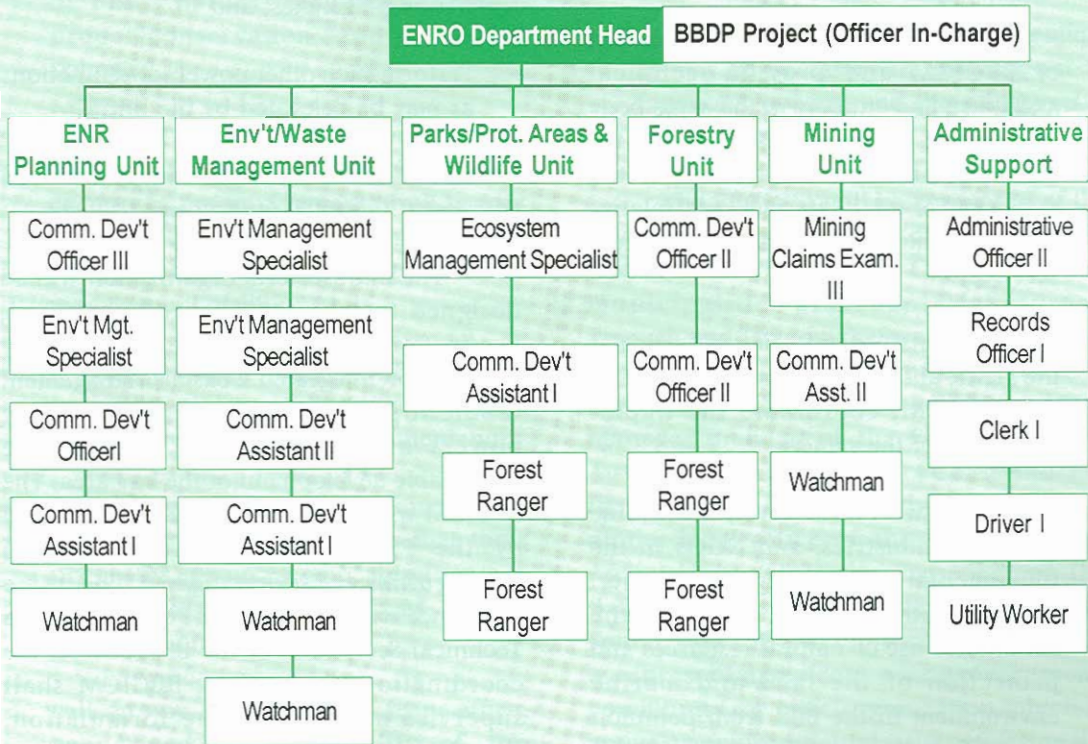
Provincial Government of Batangas created the PG-ENRO to perform the devolved functions of the Department of Environment and Natural Resources (DENR) and coordinate the implementation of this SEMP. Its general mandate includes taking the lead in coordinating the implementation of environmental management programs in the province, developing operational plans and strategies for implementation of environment and natural resources programs and projects, enforcing pollution control and environmental protection laws, rules and regulations, and coordinating the actual implementation of the integrated coastal management programs by the concerned sectors. The PG-ENRO is set up as a separate department in the province to occupy an equal status with the other major departments. It is to be manned by 23 technical personnel and 9 administrative support staff. Figure 4 shows the organizational structure of the PG-ENRO.

The PG-ENRO provides an excellent

opportunity for the institutionalization of a mechanism for the integrated management of the BBR. By its mandate, it shall serve as the focal unit for the coordination of the different activities relative to the implementation of the SEMP. In this regard, the PG-ENRO shall play a catalytic role in all existing environmental programs or projects, such as the MPP-EAS, and others that are still in the pipeline. It shall also function as the central force for engaging the active participation of appropriate sectors in the management of the BBR environment. In recognition of the array of responsibilities to be carried out by the PG-ENRO, set forth below are the measures proposed so that the office can effectively serve as the central coordinating unit for the management of the BBR environment:

1. Undertake a comprehensive capability-building program for the PG-ENRO to enhance its technical expertise in the integrated coastal management, especially for the BBR;

Figure 4. Organizational structure of the PG-ENRO.





2. Subject the PG-ENRO staff to a series of team-building and alliance-building sessions, including the processes of consultation, dialogue, and participatory planning so that they can “internalize” such principles and processes and their work collectively for its successful implementation of the SEMP;
3. Build the overall environmental management approaches of the PG-ENRO on the concept of integrated coastal management to ensure a balanced and sustainable development of the BBR; and
4. Define in operational terms the role of the PG-ENRO vis-à-vis other participating sectors in the BBR environmental management and make it known to all sectors involved.

In anticipation of its possible role of as the Technical Secretariat of the multisectoral coordination mechanism (i.e., the Batangas Bay Council for Sustainable Development or BBCICM, as described below), the PG-ENRO will exercise the following specific powers and functions:

- Formulate measures for the consideration of BBCICM and provide technical assistance and support to the same body in carrying out measures to ensure the delivery of basic services and the provision of adequate facilities relative to environment and natural resources services;
- Develop plans and strategies, in particular the SEMP, and, upon approval thereof by the BBCICM, coordinate the implementation of the same;
- Coordinate with local governments, line agencies, industries, and NGOs in the implementation of integrated coastal management programs to ensure the sustainable use of natural resources and protection of the land and marine environment in the BBR from pollution arising from air-, land-, and sea-based

sources;

- Coordinate the implementation of waste management action plans to reduce or minimize industrial and domestic wastes in the coastal communities;
- Identify environmentally critical areas, and formulate and design protection programs and activities with respect to such areas;
- Undertake the monitoring of environmental quality and compliance to environmental laws and process primary and secondary information for policy directions and management decisions of the LGUs in the BBR;
- Advise, endorse, and recommend to BBCICM such measures which are relevant to the protection, conservation, and sustainable use of the BBR's natural resources;
- Enforce pollution control and environmental protection laws, rules, and regulations in cooperation with relevant national agencies; and
- Perform such other powers and functions as may be delegated by the BBCICM.

#### *Formation of the Batangas Bay Council for Integrated Coastal Management*

The multisectoral organization will be designed to take the form of a council, hereinafter referred to as the Batangas Bay Council for Integrated Coastal Management (BBCICM), which shall have the necessary powers and functions to ensure the sustainable development of the bay area. The BBCICM was created by an ordinance passed by the Provincial Legislative Council (*Sangguniang Panlalawigan*). The same ordinance will designate the PG-ENRO as the Technical Secretariat of the BBCICM. As the coordination mechanism, BBCICM shall supervise and control the formulation, adoption, governance, implementation, and

policy direction of the SEMP and subsequent environmental action plans for BBR.

The ordinance will clearly set forth the policy of the province of Batangas with respect to environment, to wit: (i) to protect and advance the right of the people of Batangas, in particular of the BBR, (ii) to a balanced and healthful ecology in accord with the rhythm and harmony of nature, (iii) to ensure and promote sustainable development of the province's natural resources through proper conservation and utilization, (iv) to promote and encourage the direct involvement of all sectors of society and maximize people participation in natural resources management, and (v) to adopt the necessary measures leading to the creation of an institutional machinery, including, among others, fiscal and financial programs, to ensure the effective and efficient implementation of the SEMP and its action plans. In order to successfully enforce the provisions of this ordinance, BBCICM shall be vested with the following powers and functions:

- develop policies and programs to ensure and promote the sustainable development of BBR's natural resources through proper conservation and utilization policies;
- undertake appropriate information and education activities to promote and encourage the involvement of all sectors of society and maximize people participation in the environmental management of BBR;
- formulate and adopt the SEMP and other environmental management action plans for BBR and oversee its implementation;
- coordinate with national agencies and local governments to ensure that their programs, projects, and activities are aligned with the BBCICM plans, programs, and policies;
- call on any department, bureau, office, agency, or instrumentality of the

government and on private entities and nongovernment organizations for cooperation and assistance in the performance of its functions;

- arrange, negotiate for, and accept donations, grants, gifts, loans, and other funds from domestic and foreign sources to implement its plans, programs, and policies;
- recommend to the local legislative councils (provincial, city, or municipality) or to Congress, whenever appropriate, such matters that may require legislation in support of a more efficient and effective environmental management of BBR;
- delegate its powers to the Technical Secretariat, whenever necessary and appropriate, except the adoption of the SEMP and other policies which affect the whole BBR;
- perform related functions which shall promote the development, conservation, management, utilization, and protection of the natural resources of BBR; and
- perform such other powers and functions as may be necessary in carrying out its functions, powers, and the provisions of the ordinance.

The BBCICM will be composed of the governor of the province of Batangas; the mayors of Batangas City and the municipalities of Bauan, Mabini, San Pascual, and Tingloy; the head of the DENR's Community Environment and Natural Resources Office (CENRO); the local manager or head of the Philippine Ports Authority (PPA); the District Commander of the Philippine Coast Guard (PCG); the head of the local office of the Department of Agriculture (DA); the President of the Batangas Coastal Resources Management Foundation (BCRMF) to represent industry; a representative from a nongovernment, community, or civic organization which is active on environmental issues affecting the



BBR, to be chosen through its own selection process and appointed by the governor for a term of two years; and the Chairperson of the Committee on Environment of the *Sangguniang Panlalawigan*. The head of the PG-ENRO will sit as an *ex-officio* member of BBCICM but without any right to vote. The governor will be the *ex-officio* Chairperson of BBCICM and assisted by a Vice-Chairperson to be chosen by the mayors of the coastal city and municipalities from among themselves. The Vice-Chairperson position will be rotated among the mayors on an annual basis.

The Council will meet at least once every quarter and undertake on-site assessment and monitoring of the implementation of the SEMP and its action plans at least once a year. A majority of the members of BBCICM will constitute a quorum for the conduct of business.

The BBCICM or the province of Batangas, through the Office of the Governor, as the case may be, will enter into appropriate memoranda of agreements with relevant national agencies such as the PCG, DENR, DA, and PPA; with private sector organizations such as the BCRMF; with NGOs and community organizations; and with organizations such as the MPP-EAS. Initially, the budget necessary to carry out the provisions of the ordinance will be charged to the current fiscal year appropriation of the PG-ENRO and to funds available from the MPP-EAS, in relation to its Batangas Bay Demonstration Project. Subsequently, such funds as may be necessary will be included in the annual appropriations ordinance of the province, as well as from those available from outside sources.

#### Preparation of a Participation Matrix

After the BBCICM formation, the PG-ENRO shall convene a workshop involving the council members to formulate a participation matrix that will describe the roles of each member and the inter-

relationships among them. This matrix normally resembles an input-output matrix. Operationally, the sets of roles or functions contained in cells represent those which the member-organizations, whose names appear on the matrix column, commit themselves to perform for other member-organizations cited on the matrix row in order to achieve the BBCICM's objectives. In this case, such objectives shall conform with the overall objectives of the SEMP. Since the process of participation matrix preparation will involve the BBCICM members to make commitments in terms of organizational responsibilities, the attendance of all its members shall be ensured in the workshop. This particular session should be able to arrive at an acceptable system of recording the level of the key actors' participation.

The acceptance of the matrix by all members is a recognition that the management of the BBR is a shared responsibility and that each member is willing to take the necessary action for the BBR's sustainable development.

#### Preparation and Signing of Participation Arrangements' Instrument

The defined roles of the BBCICM members and other participating institutions will be formalized through memoranda of agreements to delineate the specific key actors' roles, responsibilities, and accountabilities. These agreements will be the basis of monitoring and evaluating the participants' level of commitment and performance in the implementation of the SEMP or its action plans.

## 2. INTEGRATED POLICY AND PLANNING SYSTEMS

This component will enable the creation of a suitable planning and policy environment for the implementation of the major interventions identified in the SEMP. Envisaged as a support element, it will lay

the planning systems within which the SEMP will be implemented. It will also set up the necessary policies for effectively carrying out the key innovative mechanisms introduced in the SEMP. The component shall be guided by four of the environmental management strategies discussed in Chapter 3, namely: sustainable development principles, integrated coastal management, precautionary principles, and participatory planning.

### *2.1. Strengthening of Integrated Planning Systems for Environmental Management*

The program seeks to ensure that the SEMP fits into the broader development plans affecting the BBR and, at the same time, makes provisions for the integration of macro plans and strategies. It will also seek to develop a spatial translation of the SEMP into a land- and water-use plan which can be used as guide for future development of the BBR.

#### *Harmonization and Integration of National, Regional, and Local Development Plans*

The SEMP supports the overall development framework envisioned under the 1993-1998 Medium-term Philippine Development Plan (MTPDP). Efforts should, therefore, be made to ensure that the SEMP is consistent with the prevailing national, provincial, and municipal development plans. At the national level, this compatibility translates into the directions of the MTPDP and the role of the CALABARZON area in contributing to the achievement of the desired levels of the country's economic growth. At the regional level, this translates into the role of the BBR and the CALABARZON in terms of the regional economy of Southern Tagalog and its linkages with the adjacent regions. At the provincial level, the significance of the BBR within the context of the province's overall development plan has to be well-defined. Finally, the SEMP should be able to express the consolidated plans of the affected municipalities with regard to environmental management.

The SEMP also supports the national environmental frameworks as defined in the Philippine Strategy for Sustainable Development (PSSD). The strategies in the PSSD are well-integrated and articulated in the SEMP through localized measures (See Box 4).

#### *Development of an Integrated Land- and Water-use Plan*

Land- and water-use plan is the most effective tool in integrating environmental considerations at the outset of the planning process. It serves as a mechanism for both planning and regulation and ensures that development proceeds in a manner that is well-coordinated and consistent with the overall socioeconomic development objectives of Batangas province. As such, it helps to minimize resource use conflicts by defining the limits of development pattern for the area while, at the same time, taking advantage of its natural potentials. The land- and water-use plan will, therefore, serve as a guide for BBR's further development and shall form a major component of the SEMP. The following outlines the steps to be undertaken in the preparation of the land- and water-use plan.

- *Review of the BBR Environmental Profile*

The environmental profile serves as the most logical starting point for land- and water-use planning. It outlines the status, trends, and threats to the BBR's environment, including the socioeconomic characteristics, management issues, and recommended strategies and options. It provides basic information on the limiting conditions for development as well as the critical areas requiring immediate attention. Any land- and water-use plan to be developed has to recognize the physical constraints imposed by the natural characteristics of the area.

As expressed in the profile, the BBR has been identified as a rapidly expanding area, supporting such major sectors as



#### Box 4. Articulation of PSSD Strategies in the SEMP.

##### PSSD STRATEGIES

##### SEMP EXPRESSION

1. Integration of environmental considerations in development decision-making	SEMP as an integrated plan takes into account the dynamics between the economic, environmental, and social dimensions of development within the BBR. This shall also be expressed in terms of the land- and water-use plan to be developed.
2. Proper pricing of resources	SEMP applies this principle in developing a mechanism for pollution charges and collection of user fees for solid waste collection and disposal.
3. Conservation of biodiversity	SEMP will conserve coastal and marine ecosystems and habitats, such as coral reefs and mangroves.
4. Pollution control and residuals' management	SEMP will find ways of reducing marine pollution in the BBR.
5. Control of population growth and development of human resources	SEMP will find ways to manage the coastal populations by strengthening local capability for improved environmental management and by introducing alternative livelihood development projects.
6. Inducing rural development	SEMP supports the development of coastal municipalities by engaging them in more sustainable economic activities.
7. Promoting environmental awareness	SEMP will vigorously pursue an IEC campaign to generate widespread support for SEMP initiatives.
8. Strengthening people's participation	SEMP takes this as one of the major pillars to promote multisectoral involvement and inculcate a sense of shared responsibility for environmental management.

agriculture, industry, and commerce as land-based activities and fishing and shipping as water-based activities. The bay offers a good potential for harbor development and shipping, mainly because of its proximity to Metro Manila and the depth of its coastal waters. While these economic activities can be used to support the BBR's future development, their potential adverse impacts on the environmental integrity of the bay needs to be addressed. Likewise, the anticipated expansion and diversification of land-based activities in the region will be carried into the mainstream of the CALABARZON development and this is expected to increase the pressure on the environment and, at the same time, impose a high demand for environmental services. These factors should be carefully considered in the land- and water- use plan preparation

- Review of National, Regional, Provincial, and Municipal Development Plans

The land- and water-use plan serves as the spatial translation of the development plan for the BBR. It should, therefore, support the development scenario both in the short and medium term. Thus, although the land- and water- use plan spells out the permissible development patterns in the BBR, it should also make provisions for anticipated expansion in economic activities in the long term. These provisions should take off from an analysis of projections in population growth and the corresponding increases in demand for services and other activities. Similarly, it should identify the location and direction of expansion and the allowable changes in future land- and

water-use patterns to accommodate expansion of activities.

- Organization of Consultation Meetings with Stakeholders

As an expression of the development scenario, the land- and water-use plan should have the endorsement and/or concurrence of major stakeholders. This includes those sectors which will be affected by the proposed physical pattern of development. The eventual repercussions of the land- and water-use plan have to be carefully explained in order to create a sense of ownership and thereby minimize opposition or conflicts in the future. It should be emphasized that this consultation process should be undertaken in the design, implementation, and review of the plan. During consultation, it is important to present the various options available, the costs involved, and the sectors most likely to be affected by each. This would facilitate in understanding their implications and, therefore, serve as a useful tool for more informed discussions and decision-making. This would also minimize the emotional debate usually associated with consensus building and help to avoid various interest groups for capitalizing on such debate to pursue their own agenda.

- Collection and Assessment of Primary and Secondary Data

The environmental profile identifies certain data gaps required in the formulation of a comprehensive plan. While some data may require years of research to generate and be used reliably, there is a need to identify the urgent requirements and then proceed to gather them. However, such condition should not deter the development of the land- and water-use plan. The plan may be updated as more data become available.

## *2.2. Strengthening of Policy Support Systems for Sustainable Development*

The program will ensure that appropriate policies are in place to support the implementation of key innovations under the SEMP. It will

strengthen existing policies and develop new instruments required to operationalize the SEMP strategies and approaches discussed in Chapter 3. The key activities of this program are summarized under the Research and Extension Program below.

### *Updating/Improvement of Land- and Water-use Zoning Ordinance*

The most direct application of the land- and water-use plan is the zoning ordinance. The ordinance will set procedures and standards to help the BBR (or PG-ENRO and BBCICM) contain development within the framework of its land- and water-use plan, thus preventing the uncontrolled development and negative environmental and social impacts. The ordinance will consider the guidelines issued by the Housing and Land Use Regulatory Board (HLURB) and the DENR.

### *Application of Market-based Instruments (MBIs) in Combination with Command-and-Control Measures*

This activity will review the various applications of MBIs in the different areas of the country or other countries, including studies which dealt with the assessment of MBIs' use in combination with command-and-control mechanisms. A number of local studies, in fact, have been undertaken in this regard. The Industrial Environmental Management Project (JEMP) of the DENR made an inventory of available instruments and advanced recommendations on appropriate MBIs in the Philippines. It is now developing a national integrated environmental management system which would define the most appropriate legal, institutional, and administrative mechanisms for implementing MBIs on a national level. The Metropolitan Environmental Improvement Program (MEIP), on the other hand, did a study on the levels of charges which would be collected for disposal of industrial water pollutants into the Laguna Lake. Using the Laguna Lake Development Authority (LLDA) as the institutional mechanism for implementation, a presumptive charge was calculated based on total pollution loadings in the lake. The



Program on Integrated Environmental Management for Sustainable Development (IEMSD), is currently doing a study on appropriate MBIs for air pollutants (e.g., sulfur oxides) and water pollutants (e.g., BOD loads). Based on valuation of damage costs, some estimates of effluent charges were made which could serve as basis for determining the levels of pollution discharge fees. The IEMSD has also undertaken a study to determine the possible effects of MBIs on the use of fertilizers in agriculture. A case of successfully applying the MBIs is the experience of Olongapo City in the charging of fixed-rate fees for different types of economic sectors for timely collection and disposal of solid wastes. The differential taxation schemes have remarkable success in terms of disciplining and gaining support from the city population in waste management.

The SEMP should be able to examine lessons from the above experiences in designing its own mechanisms for promoting economic incentives. Considerations in developing such mechanisms should include some estimates of willingness to pay, equity issues, and knowledge of some technical parameters such as the composition and amount of pollutant loadings and their estimated damages to the environment. However, it might be good to consider adopting a minimum level of fees (e.g., the new set of garbage fees being enforced by Batangas City) and make the necessary adjustments later as more information becomes available.

For the BBR, some of the more promising MBIs for specific environmental concerns include user fees or tariff structures for the collection and disposal of solid wastes, discharge fees for industries polluting the waterways and coastal areas, environmental guarantee fund

for oil-carrying vessels, and deposit-refund schemes for recyclable materials (See also Table 5 in Chapter 3). Successful application of MBIs, however, requires a strong monitoring and enforcement capability so that appropriate discharge levels are determined and corresponding set of fees and penalties are set. Details of this will be discussed in another section.

#### Improvement of Resource-use Pricing Structures

Appropriate valuation of environment and natural resources influences the user's behavior by making them more conservative in the way resources are used. By reflecting their true value (e.g., scarcity value), users will treat the resource as valuable and hence will not be subject to excessive use. In the BBR, the policies reflecting such principle will be enunciated by attaching certain values to environmental amenities and services, such as, water use and sanitation. Valuation will also be critical in supporting any market-based instrument to be applied. In Table 6, the types of environmental costs normally measured and/or the valuation methods used in determining the appropriate levels of user

**Table 6. Valuation methods for promising MBIs in the BBR.**

MBIs	Valuation Method
User fees for collection and disposal of solid wastes	Discharge fees for industries
User charges for tourism use	
Environmental guarantee fund for mining and quarrying	Pollution abatement costs; productivity environmental damage costs; losses; estimation of health damages
Contingent valuation method (estimation of willingness to pay) and travel cost method	Estimates of clean-up costs; environmental damage costs

or discharge fees for the use of environmental services are enumerated.

The application of pricing instruments may be administratively feasible within the BBR. LGUs are empowered to set the appropriate levels of fees within their areas of jurisdiction. The LGUs, in turn, may allocate a portion of such fees for implementation of the SEMP or other environment-related projects. Further discussion on financing mechanisms will be discussed in the later portion of this chapter.

### *2.3. Strengthening of Enforcement and Monitoring Capabilities*

Critical to the success of the combined MBIs and command-and-control mechanisms are the strong enforcement and monitoring capabilities of the LGUs and the PG-ENRO. Moreover, it is important to enhance the enforcement of existing laws in order to discourage and/or penalize violators. It is also essential to show that the government is not remiss in implementing its laws in order to gain support from the citizenry as a whole. Following are the key activities under the program.

#### *Setting Up of Environmental Monitoring System*

An environmental monitoring system will be established to (i) measure and promote compliance to environmental laws, rules, and regulations by resource user or waste generators, and (ii) to maintain and protect the BBR's environmental quality. Compliance monitoring will enable the PG-ENRO and the LGUs to assess the level of compliance by resource users and determine the appropriate measures to mitigate environmental violations or to motivate users to act properly in the utilization of natural resources. This will lead to an effective implementation of the combined MBI and command-and-control mechanism in the BBR. The monitoring system will define indicators or parameters to measure the users' actions in preventing or mitigating the occurrence of key environmental issues

identified in Chapter 2. The measurement and analytical methods will also be identified to guide PG-ENRO and LGUs in monitoring resource users' compliance to both national and local environmental laws.

The monitoring system will also address the need for environmental quality monitoring to determine if the levels of contaminants in the bay remain within the criteria values set for the bay's identified beneficial uses. Moreover, the monitoring program will provide an early warning mechanism for adverse impacts of development activities such as pollution incidents and overexploitation of natural resources. Initial efforts will focus on the identification and assessment of parameters or indicators that are considered to have high impact on marine environment and are relatively easy to measure. Core measurements will consist of turbidity, temperature, salinity, and dissolved oxygen. Other measurements will include nutrients (major inorganic forms of nitrogen and phosphorous), human pathogens (fecal and total coliforms), suspended particulate matter (SPM), phytoplankton pigments, and oil grease. These parameters may be increased as resources and capacities expand to consider other possible contaminants from industrial and agricultural/fishery sources.

The resource users' monitoring of environmental quality and compliance to the environmental laws will provide a sound basis for the identification and prioritization of conservation and protection efforts (including the improvement of environmental monitoring criteria or standards) to ensure the maintenance of ecological balance and sustain the use of natural resources in the BBR. However, the chemical and biological analyses of environmental parameters or indicators, such as those cited above, will require a laboratory with adequate facilities in the region. Initially, a feasibility study to set up an analytical laboratory is necessary to make sure that it is technically and economically viable and sustainable. The MPP-EAS has conducted the feasibility study and is now assisting the PG-ENRO in setting up the laboratory.



The PG-ENRO and LGU staff will be trained on the use of the monitoring system. Proper coordination with line agencies and other institutions will be made regularly to avail of trainings on environmental management, such as the DENR-UNDP IEMSD program. Initially, it would be best to develop a simple system of monitoring whereby only few basic parameters are included and which is gradually improved as their competence increases and as more resources become available. The determination of such parameters will have to take into account the magnitude of the potential impact of certain pollutants, the cost of monitoring, and the availability of expertise and equipment.

The successful implementation of this monitoring system would require the cooperation and assistance from various groups (e.g., PG-ENRO, LGUs, line agencies, private sector, and MPP-EAS) involved or operating in the Batangas Bay. These groups are expected to contribute in various ways to the monitoring effort based on their distinct advantages and competencies.

#### Creation of Multisectoral Environmental Protection Committees

Consistent with the SEMP's multisectoral approach, Environmental Protection Committees (EPCs) will be created in different municipalities or barangays within the BBR. The EPCs shall consist of representatives from religious groups, industries, household associations, NGAs (e.g., DENR and Philippine Coast Guard), NGOs, media, military, and LGUs. The main functions of the EPC shall be to serve as environmental watchdog in their localities and bring to the attention of appropriate authorities the problems and proposed solutions. A similar set-up, the DENR's Multisectoral Forest Protection Committees (MFPCs), has proved successful in curbing illegal logging and other environmentally destructive activities. The principle of group pressure applies most effectively when a collective group of sector

representatives becomes active advocates or partners in environmental protection. The creation of such committees mirrors the concept of shared responsibility in environmental management, which relieves the implementing units (PG-ENRO, LGUs, DENR) of financial burden in monitoring and enforcement.

### 3. INTEGRATED MANAGEMENT SYSTEMS AND TECHNICAL INTERVENTIONS

This component is targeted at providing direct interventions in improving management systems and in the application of technical solutions to critical environmental problems in the BBR. As such, the component comprises the core programs of the SEMP. Designs of specific programs have been guided by the three key strategies, such as sustainable development principles, precautionary principles, and integrated coastal management. The programs have been clustered according to the major management issues identified in Chapter 3.

#### 3.1. Development and Implementation of Integrated Waste Management System

The program seeks to develop and implement a comprehensive package of actions designed to address the multidimensional nature of waste management problem while, at the same time, focus the limited local resources and capacities on four major waste streams which are critical to the sustainable development of the BBR, namely: municipal solid waste, industrial hazardous waste, ship and port waste, and municipal sewage.

A four-phase approach will be employed in developing this program to match the gradual build-up of local capacities with the task of integrated waste management. These are: preparation; mobilization; implementation; and development. Action

plans for each of the waste streams will be developed following this framework. However, these plans should be closely linked, bearing in mind the cross-sector and cross-media approach to waste management.

#### Preparatory Phase

This phase will build up an information base on the sources, quantities, and types of wastes being generated, including the existing disposal systems. This will serve as an important basis for planning and projecting future waste loadings. This phase will likewise identify existing applicable laws, rules, and regulations, as well as the requirements to control wastes generated from both land- and sea-based sources.

#### Mobilization Phase

An assessment of needs to improve the existing situation in terms of strategies, technologies, trainings, and institutional mechanisms will be undertaken during this stage. Thereafter, this phase will initiate the strategy formulation, action planning, and scheduling, taking into consideration the prioritization in terms of the target sectors to be addressed, cost effectiveness, and urgency of the proposed intervention. Specific capability-building and other resource requirements will be determined and explored to enable the PG-ENRO, LGUs, and other local stakeholders to implement this program. Specifically, training needs in monitoring and enforcement, waste audits, record-keeping and reporting, management and operation of waste facilities, etc., will be given utmost attention.

Institutional arrangements on waste minimization and compliance monitoring with waste generators will be explored to identify acceptable options for coordinated and integrated action. To the extent possible, "voluntary agreements" will be drawn up with major generators of wastes in order to reduce waste loads to a certain level and within a given timeframe and thus minimize enforcement costs.

#### Improvement Phase

This phase will involve actual implementation of all action plans developed in the mobilization phase, including hands-on experience in the management and disposal of wastes, monitoring and reporting, and training activities. On-the-ground transitional interventions, covering waste minimization, recycling programs, and systematization of collection, handling, and disposal of wastes will be initiated. Funding support will be very important at this stage and sourcing of necessary funds will also be a major activity. Long-term plans for these interventions will be developed, based on the experience of the transitional measures and the voluntary programs.

#### Development Phase

This is the final stage where long-term solutions to waste problems shall have been identified and local capacities are in place for waste management, both in the public and private sectors. Consistent with its role, the public sector would have developed the capacity to monitor and enforce regulations and policies. On the other hand, the private sector would have developed the capacity to respond to regulations and control requirements in a practical and cost-effective manner. This sector would also be capable of making sound decisions concerning the selection of the most appropriate long-term waste management alternatives.

The nature of activities in this phase suggests that long-term investments will be required. Decisions as to whether or not central treatment facilities should be established, landfill sites should be set up, etc., are expected to be made at this stage. The decisions, however, warrant private and external support for sustainable financing of such capital investment projects.

The PG-ENRO will work with MPP-EAS to develop an action plan on integrated waste management to identify and prioritize transitional initiatives in the four major



waste streams.

### *3.2. Water Pollution Abatement*

This program addresses the preventive elements of pollution in the river systems and the bay.

#### **Implementation of Oil Spill Contingency Plan**

The Philippine Coast Guard (PCG) established the Oil Pollution Operation Center by virtue of Presidential Decree 602. The center, in conjunction with the oil companies and the Environmental Management Bureau, maintains an oil spill contingency plan and conducts oil spill response exercises. This effort shall be continued, as the occurrence of oil spills have become more frequent in the last few years. Access to better and more cost-effective measures to combat oil spills shall be pursued through linkages with other similar efforts, such as the Oil Spill Response Action Plan (OSRAP) with other ASEAN member countries. The PCG in the Batangas Bay shall also be actively involved in joint projects with Japan and the ASEAN member countries which provide assistance for oil spill combating equipment, information network systems, and management and monitoring systems. A strong linkage shall be established with the other units of the Coast Guard and the oil industries to help in responding to oil spills with magnitudes which are beyond the local capacity to address.

#### **Implementation of Pollution Management Appraisal (PMA) System for Participating Industries**

This component shall take off from the lessons of the IEMP, which developed the system for pollution management appraisals of industries. Under this system, the internal processes of the firm have been examined with a view to identifying ways to minimize or avoid wastes at various stages in the production process. This is done for each participating industry, and a plan of action to minimize waste is developed. Waste

minimization schemes are also identified through interventions, such as the use of another technology, adjustments in production schedules, use of alternative raw materials, and others. What is important in the use of this approach is that there is agreement between the government and the industry on the specific plans to take and follow-up actions are made based on the plans that have been drawn up. A prerequisites to implementing the PMA is the cooperation of the participating firms and the availability of industry experts who will conduct the review. The SEMP should therefore address these concerns through the BBCIM and by establishing strong linkages with the IEMP and other research institutions to provide technical assistance in carrying out the PMAs. Other alternatives could be explored, such as engaging a pool of industry experts and then assessing participating industries for their services. The role of the PG-ENRO in this case is to present the cost effectiveness in participating in the PMA. The IEMP has shown that there could be considerable savings on the part of the industries to adopt the PMA recommendations.

#### **Information and Education Program on the Use of Sustainable Fishing Techniques**

This component addresses both the water pollution problem and the sustainability of catch from fishing. Reports on the use of cyanide and dynamite fishing are rampant, which results in the destruction of fish habitat and the deterioration of coastal water quality. In conjunction with the more vigorous enforcement of fisheries laws, a massive information campaign directed at fishermen shall be launched to encourage them to shift to more sustainable fishing practices. This activity will be coordinated by the PG-ENRO with the Provincial and Municipal Agricultural Offices. The possibility of creating an institutional mechanism wherein the community is given ownership rights to manage the resource shall be explored, such as co-management arrangement in order to discourage rent-seeking behavior. The experiences of the

Fisheries Sector Program (FSP) of the DA shall be studied, with a view to generating lessons for local adoption.

#### Establishment of Sewage Treatment Plants

In cooperation with the Department of Public Works and Highways (DPWH), every effort should be made to establish a sewage treatment plant within the BBR. At present, most of the raw sewage are discharged into the river systems which eventually drain into the bay. If not properly addressed, this could lead to public health problems and eutrophication, such as the situation in the Laguna Lake and the Pasig River. Efforts should be made to ensure that the project is included in the priority of the DPWH for the region in the short term.

#### Private Sector Investment in Port Reception Facilities

Measures shall be undertaken to encourage private sector investment in the operation of port reception facilities for shipping vessels. This could be operationalized by imposing strict sanctions for shipping operators who do not avail of such facilities in disposing their wastes. The operation of the facility could be commissioned to the private sector or NGOs, which shall be authorized to collect fees to become financially attractive.

#### Linkage with Academic and Research Institutions in the Establishment of Marine Environmental Monitoring, Surveillance, and Assessment System

In consonance with the action program on the strengthening of enforcement and monitoring capabilities, proper coordination with research and academic institutions, such as the Marine Science Institute of the University of the Philippines will be established to facilitate the development of a marine environmental monitoring, surveillance and assessment system, particularly in technology transfer and information generation/exchange. As noted earlier, this system will provide an “early

warning” to the LGUs in the bay area to prevent the occurrence of adverse environmental impacts of various resource development and utilization activities. In other words, it will feed vital information to decision-makers so that timely and preventive actions can be undertaken.

#### Development of Control Measures for Pollution Discharges at Point Source

The objective of this component is to bring to the attention of the industry groups and other sectors generating wastes the wide range of technology and management options available in reducing pollutant discharges at source. This involves linking the local industries with the Philippine Association of Environmental Assessment Professionals (PAEAP), Philippine Association of Pollution Control Officers (PAPCO), and Philippine Business for the Environment (PBE). The intent is to provide better access to the latest and wide range of choices of pollution control technologies that would suit the scale and nature of operations of local industries. Probable actions under this activity may include the following:

- i) classification of industries/sectors according to the levels and types of pollutants generated;
- ii) workshops with industry groups to assess internal processes that contribute to pollution loadings;
- iii) conduct of waste minimization expositions;
- iv) development of waste minimization plans; and
- v) development of a waste exchange program.

#### 3.3. Conservation of Coastal Ecosystems

The conservation of the coral reefs and the remaining mangroves is the primary target of this program in order to sustain



municipal fishing and aquaculture in the BBR. A combination of technical, policy, and education approaches will be employed to protect the mangroves from further conversion into other land uses (e.g., aquaculture, resettlement, etc.) and from pollution associated with industrialization. The coral reefs in the western and southwestern sections of the bay, including those in Maricaban Island, will be protected from potential adverse effects of destructive fishing techniques, oil discharges/spills, waste dumping by ships, siltation, and coral collection activities. Planning of conservation measures will require precise information about the present status and the extent of degradation of these ecosystems. Thus, a link with the research and extension program (discussed below) will be established.

#### Development of Innovative Aquaculture Techniques in Waterways

With barely 80 ha of brackishwater aquaculture in Barangays Sta. Clara and Sta. Rita Aplaya, in Batangas City, there is a need to develop innovative culture techniques such as pen culture of shrimp in waterways to diversify the aquaculture practices. The conduct of applied research-cum-demonstration area will be a vital part of this activity to sustain it. The existing management regimes will also be studied to minimize effluent discharges from aquaculture operation, especially the use of fertilizers. A package of supportive policies to ban the conversion of the remaining mangroves into other uses and establish strict pollution controls to prevent waste dumping into the mangroves areas should be put in place by the FBCICM and/or the respective LGUs (i.e., Batangas City). The land- and water-use zoning should preserve the integrity of the mangrove areas.

#### Conservation and Development of Coral Reefs in Mabini and Maricaban Island

From the available limited information, coral reefs are found to be relatively abundant in the BBR. Although

degradation is not yet an issue in this particular ecosystem, advanced planning for its conservation will ensure a healthy fish habitat in the long run. The plan should identify specific technical interventions and policy measures for its effective protection in the short run and its appropriate development as fishing grounds (e.g., aquarium fishes) and for recreational purposes in the long run. The possibility of declaring a portion of the bay area as a marine reserve should also be considered. The plan for the latter aspect can be tied up with the coastal tourism development.

#### 3.4. Coastal Tourism Development

Coastal tourism in the BBR is presently not well-developed. There are only few beach resorts in the area, largely located in Bauan. The coastal area of Tingloy, particularly the northern tip of Maricaban Island, promises to be a potential tourist area in view of its relatively clean and unexplored shoreline. An immediate goal of the program is to undertake a feasibility study of its potentials for ecotourism development. This study, together with the possible implementation of the program, can be pursued through a build-operate-transfer (BOT) scheme. A more attractive BOT arrangement will have to be formulated to increase private-sector participation in the program.

#### 3.5. Alternative Livelihood Development

The rapid growth of population in the coastal communities, compared to other parts of the province, will exert tremendous pressure on the declining agricultural base and the environment as a whole in the next decade. Many fishers could not be readily absorbed by the industries that are being established. New industrial zones are also planned to be set up within the next five years. While efforts to provide skills development trainings are being undertaken to enable coastal residents to enter the industrial labor market, their real need is a long-term solution to their own *low quality of life* problem. This program aims to identify and

develop alternative development projects that suit the existing capabilities and potentials of the local people. A basic prerequisite of the program is the conduct of a participatory community assessment in which definition of problems and needed solutions is decided by the people themselves. This is critical in establishing the people's sense of ownership and commitment to the program. One such participatory approach is the GOPP (or goal-oriented project planning) approach, which encourages people to think critically and analyze and plan collectively. This program must be integrated with community organizing and development.

#### **4. MANAGEMENT AND TECHNICAL CAPABILITY-BUILDING**

Guided by its mission, the SEMP will direct this component to the provision of management and technical skills to BBR's key actors and stakeholders to enable them to implement its core and support programs effectively and sustainably. The priority targets are the PG-ENRO staff, BBCICM member-organizations, coastal community residents and their organizations, and other potential participants to the SEMP implementation. The nature and scope of training programs will encompass most of the environmental issues raised in Chapters 1 and 2, and other specialized areas which are essential to the BBR's integrated environmental management. This component shall be anchored on three main strategies namely: sustainable human development, community organizing, multisectoral mobilization, and involvement in environmental education.

##### *4.1. Capability-building Program*

The technical capability of the PG-ENRO personnel is critical to the success of the SEMP implementation. Thus, the program will strengthen their capacities in various planning and management methods and techniques based on the results of training and education needs assessment which will be carried out after the completion of the staff

recruitment. The facilities and resources of the MPP-EAS and EMB will be explored to assist in the realization of the program objective. Similarly, the training programs of the Local Government Academy (LGA) of the Department of Interior and Local Government (DILG) and other training institutions will also be accessed to enable the PG-ENRO personnel to attend them. This program will be tied up with the preparation and execution of an investment program as part of the sustainable financing schemes for the SEMP. Other key actors will receive specialized trainings to support their specific roles and functions in the joint management of the SEMP implementation. The major activities of this program are discussed below.

##### *Assessment of Training and Education Needs*

The planning and execution of the SEMP core and support programs require a certain level of special skills and knowledge which are not readily available in the BBR. In the assessment, the first step will be the determination of the type and level of skills/knowledge needed for the SEMP. This can be generated by reviewing the technical requirements for achieving the SEMP objectives, which are good indicators of the needed skills/knowledge. The next step will involve a review of the education, trainings, and experiences of the key actors and stakeholders involved in the SEMP implementation. When these two sets of information are matched, the balance between the type and level of skills/knowledge required and the existing capabilities indicates the training and/or education needs of the program.

##### *Preparation of Human Resource Development Program*

Based on the results of the above assessment, a human resource development program will be prepared to schedule the organization of trainings for the PG-ENRO staff, BBCICM members, and other support groups consistent with the SEMP's overall



implementation schedule. Subject matters which require formal advanced education will also be programmed; and the needed support will be solicited from potential funding organizations; and other projects of government aimed at enhancing the capability of LGUs will also be tapped. This program shall indicate the tentative numbers of target trainees per course per session and the potential sources of funds. Local and foreign scholarships should be explored in coordination with NEDA, LGA, and foreign embassies in the country.

Each support organization should be furnished a copy of the human resource development program to be able to schedule the participation of its staff without adversely affecting its responsibilities.

#### Curriculum Development and Visual Aids Preparation

For the trainings to be organized by the SEMP, the development of training designs, materials, and visual aids should be initiated and completed within the first six months to one year of SEMP implementation so that actual training of PG-ENRO staff and other key actors can commence on time (i.e., in accordance with technical requirements for the delivery of specific services). Modification or improvement in form and substance of the training courses will have to be continuously undertaken to reflect the changing needs and conditions in the BBR, as well as the advancement in management and technological development. In this case, a system of curriculum evaluation should be established.

#### Organization of Trainings

For an effective and timely conduct of trainings, the PG-ENRO should develop a list of potential resource persons or trainers that indicates their areas of competence and time availability, a list of training venues that includes information on board and lodging rates, training facilities and other services, and clear terms

of reference or responsibilities for each of the training staff. Pre-training meetings of trainers and support staff should form a standard procedure for the organization of trainings to consider the peculiarities of expected participants and also ensure the cohesiveness of the course content.

#### Organization of Demonstration, Planning, and Policy Workshops for Decision-makers and Resource Managers

The program shall organize cross-visits, seminars, and workshops for local policy-makers and resource managers from both the public and private sectors to keep them updated with the recent developments within and outside the BBR in relation to the SEMP implementation. These seminars and workshops will also enable the senior-level officials to review and amend existing policies, rules, and regulations to effect better and responsive management measures and technical interventions. This activity may have to include demonstration workshops in which senior-level officials in the BBR will visit specific project areas to acquaint themselves with effective institutional arrangements, policy and planning systems, and management approaches. In recognition of the hectic schedules of senior-level officials, the seminars and workshops shall be designed to cover only a couple of days.

#### Development and Implementation of On-the-job Training Program for Local Professionals and Students

The human resource development program should incorporate a mechanism of bringing other professionals and students in the BBR in the task of environmental management by offering them on-the-job training in certain programs and projects of the SEMP. These professionals and students may be invited to learn-by-doing with the particular program/project activities of interest or relevance to them. While they will acquire some skills in the process, the SEMP will also benefit from their services. Compensation schemes in the form of

subsistence allowance and travelling expenses may also be taken into account to attract more participants in this scheme. Arrangements with local universities and public and private offices may be established to make this activity a continuing endeavor. A close link between this program and the information, education, and communication (IEC) program should be developed and maintained.

#### 4.2. *Community Organizing and Community Development*

This is the key service program which will be provided to coastal community residents in order to ensure the sustainability of the SEMP implementation. It is a fact that only with real and meaningful community participation can the SEMP expect success and sustainability. As such, existing local organizations should be strengthened in the fields of planning, management, decision-making, negotiating, and organizational development. Formation of new local organizations may also be considered by the coastal communities whenever nonexistent, or when the existing ones have been inactive for quite sometime and have lost their significance. However, this option will only be resorted to if the residents themselves make such a decision. The organizing process will be carried out within the context of self-reliant community development. Inevitably, this program will be undertaken, through NGOs which are interested to be part of the SEMP implementing team. The main activities of this program will comprise, among others, the following:

- an assessment of the history, mission, purpose, organization, capabilities, and activities of existing community-level organizations to determine their knowledge and skills requirements;
- organization of community dialogues and consultations to discuss the appropriate ways of solving environmental problems in each *sitio*, barangay, or municipality and establish community contacts for the formalization of entry of the community organizers;

- identification of potential community leaders from the ranks of ordinary residents who normally represent the people's interests and who may come from existing mass-based community organizations;
- establishment of arrangements for community participation to formally define the roles and responsibilities of the SEMP support groups and the community,
- strengthening of the community skills for environmental management and community development which should culminate in community-generated plan of actions and the implementation of such a plan;
- provision of assistance in the preparation of community-based environmental profile, and the earlier plan, including the establishment of community-based environmental monitoring system; and
- assistance in increasing community's access to development support groups for information, technical advice, and materials inputs.

#### 4.3. *Information, Education, and Communication Program*

This program seeks to address the weaknesses in policy and program information dissemination, environmental laws compliance, and management and technical skills requirements. More than the other support programs, the IEC system shall cater to both the core and the rest of the support programs, principally in disseminating the different activities and priority directions of the SEMP to elicit greater general public support. Thus, the program activities will cover not only those specified below but also similar activities of the other programs in the SEMP, such as the documentation and publication of research results and the progress of SEMP implementation in a popular format.



## Development of a Multisectoral IEC System

The first task in the IEC system development involves the identification of the target clientele or users of the information, the types and forms of information required by each user, and the frequency of information delivery. The next step will be the identification of the appropriate communication media that hasten the flow of information to the clientele in the shortest time possible. Thereafter, the main sources of information will be identified, including the types of information they produce. Finally, an IEC system will be formulated to establish the frequency of information flow from the sources to the end users. The local radio network and newspapers should be tapped for this activity. The IEC system should be presented to, and adopted by, the key actors in the implementation of the SEMP, such as the BBCICM, the LGUs, and other partner support groups.

## Preparation and Dissemination of IEC Materials

Technical and management reports should be translated into popular, easy-to-understand materials both in English and Filipino for effective and wider dissemination of information. Links should be established with relevant projects such as IEMP, MEIP, and with the other LGUs for the collection of information materials that are available to minimize the duplication of efforts and to optimize the use of national and local resources. Moreover, actual information dissemination should be integrated in the extension system to impart "how to's" materials, such as waste management for households, offices, schools, markets, and community-wide implementation. This latter type of information, for instance, can be obtained from the Recycling Movement of the Philippines, Inc.

## Organization of Symposia on Environmental Management

One effective way of communicating information with the intended clientele is

the organization of symposia since they provide feedback to the sources concerning the appropriateness of the information and the improvements needed to make them more relevant and usable. Symposia should be categorized according to policy, management, and community levels to enable the PG-ENRO and other partner organizations to fit the designs, methods, and materials for each level. However, for discussion of information or issues that require representatives from all levels (i.e., multisectoral), the symposia shall be designed by taking the community as the central focus. In this case, the accessibility of symposium venues is critical to greater community participation.

## Promotion of the Integration of Environmental Education in Elementary and High Schools Curricula

The integration of environmental education in academic programs in elementary and high schools should be promoted. Coordination with school principals or superintendents as well as with local school boards in this regard, should be initiated and maintained by the BBCICM and PG-ENRO. Selected school teachers should be involved in the preparation of educational materials to fit them with the level of preparedness of the target students. A system of monitoring the effectiveness of environmental education approach and materials should be established to assist the SEMP implementors and school organizations in improving the overall design. Incentives for participation of the schools may be developed to ensure their continued teaching of environmental management. Posters, books, and related materials for school libraries may be one option; another may be the inclusion of some teachers as participants in trainings and symposia.

## 5. IMPROVEMENT OF INFORMATION BASE

The environmental profile of the BBR acknowledges the inadequacy of information

base for a more scientific assessment of environmental issues and in determining the most appropriate management regimes for the bay. Although the SEMF is developed within the purview of available data, the generation of additional information is expected to enhance the present strategies and programs set forth for the BBR's management. In the pursuit of activities under this program, institutional networking will be established as a basic strategy.

#### *5.1. Research and Extension Program*

This program will focus on the generation of primary data on the environmental conditions of the BBR which are identified as data gaps earlier. It also aims at packaging and translating research results and other technical information into popular materials that can be easily understood and applied by a large segment of the population and sectors in the BBR. The establishment of institutional networks will be another important aspect of the program for the purpose of information exchange. The main activities comprising the program are described below.

##### **Environmental Carrying Capacity Assessment and Development of a Model for Determining Changes**

One of the very basic information required for sound environmental planning, such as land- and water-use planning, is the determination of the carrying capacity of a resource system. Unfortunately, this information has not been established for the BBR. The study will help determine the limits by which certain uses of the region may be permitted without seriously degrading its environment, especially the bay. The outcome of the study will be useful in determining the optimal mix of resource uses for the bay area, taking note of its possible compatible/conflicting uses and projections on the future demand for the bay.

##### **Study on Sustainable Multiple Use of Coastal and Marine Resources and Development of Economic Models for their Optimal Uses**

The multiple uses of the BBR, particularly

the bay, often result in conflicts among resource users. While land- and water-use planning will address the appropriate mix of resource uses, it may not be able to quantify the optimal uses of the coastal and marine resources. Economic modeling will be carried out to simulate the different existing and potential development activities so as to establish the sustainable mix and level of resource uses. The resulting model will also provide the range of compatible uses for the bay. This is particularly important in establishing the future levels and types of uses which can be allowed without impairing the carrying capacity of the resource system.

##### **Investigation of Pollutant Flux into the Sea and Establishment of Prediction Models**

The environmental profile stresses the fact that considerable amount of agricultural, domestic, commercial and industrial wastes are discharged into the river systems which eventually find their way into the bay. It is, therefore, important to conduct a study to determine their characteristics, levels, and areas of concentration and to project future pollutant loadings based on various scenarios. The study will identify critical pollutant sources and thus aid the PG-ENRO and the LGUs to determine and prioritize mitigation measures. The study will also support the operationalization of the economic incentives system by making it easier to determine the levels of charges to be imposed to generators of pollutants.

##### **Assessment of Water Movements of the Bay, including Oil Trajectory Model and Oil Spill Contingency Plans**

As a potential area for oil spills, an investigation of water movements is essential to establish the direction and timing of oil diffusion into the bay. An oil trajectory model shall be developed to support the oil spill response contingency plans which are being followed by the oil companies and the Philippine Coast Guard. The results of the study will help minimize, if not avoid, unnecessary damages and provide for a more strategic and timely response to oil spills.



## Socioeconomic Analysis of Present and Potential Developments in the Bay

Economic activities are expected to dramatically increase once the international shipping port is completed and fully operational. It is highly important to determine the potential effects of such and related developments on the land use patterns, water use changes, and environmental quality in general in order to make some predictions on their likely impacts on the livelihood of the coastal population. Mitigating measures will have to be devised if displacement of coastal and fishing communities is anticipated in the future to avoid any undue socioeconomic effects. The study will pinpoint the major sectors most likely to be affected which would serve as basis in drawing up long-term contingency plans.

### Analysis of the Present and Potential Vessel Traffic Conditions

One of the more direct outcomes of the planned harbor and port development in the bay is increase in vessel traffic. An analysis of the present and potential vessel traffic vis-à-vis the capacity of the bay is therefore warranted. The results of the study will be particularly useful in drawing up a long-term plan for a vessel traffic management system for the bay which takes into account the potential volume of vessel traffic increases at specific points in time. Adjustments in infrastructure support and provisions for changes in ancillary industries may then be anticipated and made part of the design. More importantly, such projections will aid in drawing up a more responsive oil spill contingency plan and in making adjustments in the SEMP to take account of its expected impacts on the marine and coastal environment.

### Publication of Results

The results of studies to be undertaken under the program will produce a wealth of information vital for decision-making, planning, and implementation of the SEMP, and as learning materials for academic institutions, the private sector, and the NGOs. Research outputs will be documented and translated both in

technical and popular versions so that they can be communicated effectively to stakeholders and other interested groups. These documents shall be widely disseminated to all concerned.

Progress of the SEMP implementation will also be documented and disseminated to the general public through the IEC program discussed earlier. Reports on this will be packaged in a form suitable for mass publication.

### Establishment of Institutional Linkages for Information Exchange

Batangas Bay offers an excellent case of the local initiative in integrated coastal management. The implementation of the SEMP therefore serves as a model for future undertakings which can generate learnings, success stories, and vital lessons. These qualities are enough to encourage linkage with other institutions so that results can be disseminated widely and compared with other similar programs. Moreover, as a means of augmenting the lack of resources to undertake research, linkages with academic and research institutions shall be established. Such linkages will also serve as an excellent avenue for information exchange.

### 5.2. *Establishment of a Management Information System (MIS)*

A management information system is essential for monitoring the effectiveness of the SEMP implementation and for making accurate decisions and plans for the sustainable management of the BBR environment. Combined with a Geographic Information System (GIS), the processing of available spatial data and those to be generated by the various studies under this SEMP will be facilitated to aid sound planning and resource management. The MIS will be established at the PG-ENRO for effective operation and maintenance. Training and equipment support will be provided to and/or secured for the PG-ENRO staff to develop local capability on MIS operation.

Initial support for the enhancement of local capability in ICM, and spatial data base

system development using GIS is now being provided by the MPP-EAS. The application of GIS will be used not only for data-banking purposes but also to support cartographic activities, spatial and temporal studies, and land use zoning. The data base system will develop and maintain four major data files under the following categories:

- i) *Location base file* — which will contain topographic maps, nautical charts, administrative maps, cadastre, all maps showing locations of certain parameters or objects.
- ii) *Thematic base file* — to contain all maps that are thematic like land use, soil, physiography, geology, etc.
- iii) *Geographical base file* — to contain all derived maps, particularly those resulting from GIS analysis and modeling.
- iv) *Attribute base file* — to contain tabulated and other data that are not in map form, such as rainfall, water quality parameters, population census, etc.

The MIS operation will involve three main tasks. The first task is data acquisition, which will cover both primary and secondary information as envisaged by the data base system, to be undertaken by PG-ENRO in close collaboration with the relevant offices of the city and municipal governments, national government agencies, the private sector, NGOs, and communities. The second task is encoding and processing of both attribute and spatial data. The existing technical assistance from MPP-EAS will enable the PG-ENRO to acquire skills in encoding maps, using GIS and processing procedures that facilitate data transformation into appropriate format, scale, and values. A mechanism of updating information will be established to ensure the integrity of the data-base system. The third task is data production in forms required by the target end users, particularly the BBCICM, LGUs, and other local stakeholders to improve and coordinate resource-use planning, management, and

policy-making. The PG-ENRO will consult these stakeholders to determine the specific types, format, and frequency of delivery of information to enable them to make sound decisions and actions for the sustainable development of the BBR. Based on these consultations, the PG-ENRO will develop and produce sector-oriented information and communication materials to accurately meet specific data requirements of end users in forms they could readily understand and utilize for policy formulation, project planning and management, etc. These materials will also contain the results of the GIS application studies, such as sensitivity mapping, impact assessment, trend analysis, and functional zonation scheme, which require the MIS operation to be closely linked to different programs and activities of the SEMP.

Over the next five years, the MIS component will develop and/or put into operation (i) the data base system, (ii) environmental management atlas of the BBR, (iii) functional zonation scheme of the BBR, (iv) GIS methods for integrated planning, and (v) information and communication materials, both in technical and popular form. The latter output will be made in collaboration with the IEC and Research and Extension programs of this SEMP.

## 6. SUSTAINABLE FINANCING

The SEMP will develop innovative financing mechanisms to help sustain its implementation. This is also based on the recognition that the government has very limited funds to finance its development programs. Financing of the SEMP implementation will follow the strategies of privatization, BOT schemes, trust fund schemes, and other suitable approaches.

### 6.1. *Development of Sustainable Financing Mechanisms*

A financing plan will be developed based on existing mechanisms and other innovative approaches. The components of the financing plan mechanisms are briefly described below.



## Privatization

A privatization scheme will be implemented for appropriate environmental services, such as waste collection and disposal, operation of transfer stations, management of dumpsites, and others. A study shall be conducted to determine the feasibility and define the institutional and administrative mechanism for carrying this out.

## Build-Operate-Transfer Schemes

The government introduced the BOT scheme in order to reduce the pressure on government in financing major infrastructure projects. Coordination with the National Economic and Development Authority shall be made to assist in identifying potential projects, developing corresponding feasibility studies, and in finding sources of financing.

## Trust Fund Mechanism

Collections from the introduction of resource pricing and MBI systems are potential sources of sustainable financing for environmental management. The Local Government Code has appropriate provisions which allow LGUs to allocate a certain amount from local revenue collections to finance local projects, such as for environmental management. A study to determine the feasibility of establishing and maintaining a trust fund to manage resources

from pollution charges and environmental fees will be conducted. It will also investigate the mechanism by which collection from such sources can be earmarked for SEMP implementation.

## Mobilization of Government and Private Sector Resources in the BBR

Resources from the private sector can be more effectively mobilized once the BBCICM is established. An investment program, to accompany the plan, will be formulated to identify potential private-sector financing of the plan. Such activities as information dissemination, capability-building programs, oil spill contingency plans improvement and enforcement, and specific research areas can be readily financed by the private sector. This program will link some of these activities to the requirements of the private sector, such as the dissemination of its products and technologies, as well as the training of labor supply in the area to meet its manpower requirements.

Financing of other aspects of the SEMP may also be facilitated through the development of a long-term resource-generation strategy aimed at foreign and local research and academic institutions, NGOs, and donor agencies. As an experiment in local environmental management, it has excellent potential for attracting support from major financing institutions.

# Implementation Measures and Schedule





# IMPLEMENTATION MEASURES AND SCHEDULE

### RELATIONSHIPS WITH OTHER DEVELOPMENT PLANS

As a local planning initiative, the SEMP is well-linked with macro socioeconomic and environmental plans and programs. The following sets forth the relationships among the different levels of planning frameworks.

#### *Medium-term Philippine Development Plan 1993-1998 (MTPDP)*

The MTPDP lays down the national framework for economic development, with a defined focus on agroindustrial development along selected regional industrial centers (RICs). One such important center is the CALABARZON industrial zone. It sets the overall target for economic growth and identifies the strategies to achieve them.

#### *CALABARZON Master Plan*

The plan spells out the development strategies to develop the CALABARZON area, identified in the MTPDP as one of the very first RICs to be established. As a major investment zone, the plan also defines the infrastructure support requirements to prepare for the establishment of selected industries in the area. Moreover, the plan specifies the contribution of the CALABARZON development to the MTPDP targets.

#### *Multisectoral Development Plan of Batangas Province 1995-2000 (MSDP)*

The MSDP translates the pertinent goals and objectives of the MTPDP and CALABARZON Master Plan into provincial targets and strategies. It defines the role of the provincial economy of Batangas in terms of achieving the overall targets of the CALABARZON Plan and the various priority concerns of its municipalities in such sectors as agriculture, industry, and services. In pursuing its medium-term objectives, the MSDP identifies the major types and locations of development programs, as well as the direction of growth towards the year 2000.

#### *The Strategic Environmental Management Plan (SEMP)*

The SEMP is a local resource-based plan which seeks to define the strategies for the management of the BBR environment and its resources in ways that are compatible with the MSDP, particularly those development initiatives in the BBR, the province, and the CALABARZON region. It envisions to serve as a model for the pursuit of a well-planned multiple, but non-conflicting mix of land- and water-uses, that cover agriculture, industry, services, commerce, and housing. It will utilize and strengthen local governance mechanisms to manage the implementation of the SEMP in order to ensure its sustainability and long-term success.

## ORGANIZATION AND MANAGEMENT ARRANGEMENTS

The provincial government of Batangas and the local governments units of Bauan, Mabini, San Pascual, Tingloy, and Batangas City (herein collectively referred to as LGUs) will be the main executing units of the SEMP. Their respective appropriate environmental management offices will manage and implement the different area-specific programs, projects, and activities set forth in the SEMP. The PG-ENRO shall coordinate the individual LGU efforts and those of the private and NGO sectors to enhance local organizational capacity in integrated environmental management. The overall implementation of the SEMP shall be guided by the principles of multisectoral and participatory management to enhance cooperation and ensure a high degree of success. The specific organizational structure of the SEMP implementation is shown in Figure 5.

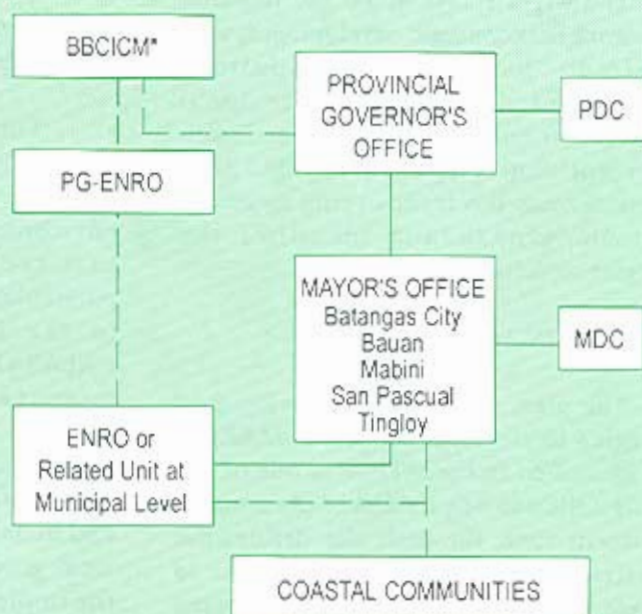
The Batangas Bay Council for Integrated Coastal Management (BBCICM) shall provide overall policy directions for the SEMP implementation. It shall ensure that the SEMP is carried out in accordance with the aspirations and sentiments of the local stakeholders, particularly the communities. It shall also provide for a mechanism for the resolution of issues and outstanding concerns from various groups which may be affected by, or may hinder, the smooth implementation of the SEMP.

The governor of Batangas Province shall serve as the overall Coordinator for the SEMP implementation, through the PG-ENRO. He shall see to it that the SEMP is executed as

designed and in accordance with the guidelines established by the BBCICM. He shall submit or render regular reports to the BBCICM with regard to the progress of implementation and on critical issues affecting implementation. The PG-ENRO shall provide the necessary administrative and technical backstopping for the SEMP implementation. In particular, the PG-ENRO shall exercise the powers and functions defined earlier.

The PG-ENRO shall also be responsible for the implementation of support programs (i.e., those that cut across SEMP components, such as capability-building, IEC, research, and special studies), while the LGUs concerned shall be responsible for the implementation of area-specific programs as noted above which are located in their respective municipalities. With such a type of arrangement, PG-ENRO must have a strong

Figure 5. SEMP organizational structure.



PDC -- Provincial Development Council

MDC -- Municipal Development Council

\* -- Refer to the previous chapter for the composition, powers and functions and organizational arrangements of the BBCICM.



coordinating role in order to ensure that component actions are linked and implemented in a manner that reinforces their contribution to the overall goal of the SEMP. Other implementation modes may be devised for specific projects, such as those with a well-defined participation of the private sector, NGOs, research institutions, etc., which explicitly require a strong coordinative and participatory mechanism.

The participation matrix, which will be prepared by the BBCICM and other local stakeholders under the first main element of the SEMP shall form part of the organization and management instruments.

## IMPLEMENTATION SCHEDULE

A general five-year schedule for the SEMP implementation to achieve its short-term objectives is shown in Table 7. The schedule reflects the priority to organization and mobilization of staff and other key actors/stakeholders who will be involved in carrying out the SEMP. Certain basic activities, such as policy formulation, planning systems establishment and data base generation — which are prerequisites to planning and implementation of specific environmental management projects — will also be scheduled in the early phase of the SEMP. These activities will require minimum level of resources, particularly in terms of budgetary requirements, but the expected results are crucial to the success and sustainability of the SEMP operationalization. Concomitant with this, the PG-ENRO is expected to initiate a resource mobilization strategy to generate the financial resources required to implement the core programs of the SEMP. These are the action programs (otherwise categorized as management and technical interventions for integrated coastal management) which will entail huge investments. Simultaneous with its resource mobilization activity, the PG-ENRO shall link up with the MPP-EAS to undertake special studies and researches necessary to generate baseline information and establish the data-

base management system, anticipating that linkages with other research and academic institutions would be successfully established by that time. Regular SEMP evaluation forms part of the schedule, so that it may be revised and updated as more information and resources become available, and as lessons and experiences are fed back into the planning process.

More detailed implementation schedule shall be prepared by the PG-ENRO in coordination with the key actors and stakeholders once the resources and designs for major programs of the SEMP, particularly the core ones, are firmed up.

## MONITORING AND EVALUATION (M & E) OF SEMP IMPLEMENTATION

The monitoring and evaluation of the entire SEMP implementation shall be the main responsibility of the PG-ENRO as indicated earlier. This particular task will make the PG-ENRO accountable to the BBCICM in discharging the following functions: develop specific measurable environmental management indicators reflective of the distinct characteristics of different priority core and support programs embodied in the SEMP; design reporting formats, including the frequency of its generation and submission to the appropriate units such as the BBCICM; establish and maintain a data base and information feedback system for effective integrated management of the environment in the BBR; spearhead the identification of problems affecting the SEMP implementation and the formulation of recommended solutions for appropriate action by the BBCICM, the governor and/or the city/municipal mayors; and develop a system for the effective information flow among the key actors involved in the implementation of the SEMP. All these M & E related functions shall be carried out in close coordination and collaboration with all the key actors, such as the LGUs, NGOs, POs, industry, and other national line agencies situated in the area. If the municipal governments decide to

Table 7. SEMP implementation schedule.

PROGRAMS AND MAJOR ACTIVITIES	1996				1997				1998				1999				2000			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Development of Legal and Institutional Mechanisms for Integrated Planning and Management																				
2. Strengthening of Integrated Planning Systems for Environmental Management																				
3. Development of an Integrated Land- and and Water-use Plan																				
4. Strengthening of Policy Support Systems for Sustainable Development																				
5. Strengthening of Law Enforcement and Monitoring Capability																				
6. Development of Integrated Waste Management System																				
7. Water Pollution Abatement																				
8. Conservation of Coastal Ecosystems																				
9. Coastal Tourism Development																				
10. Alternative Livelihood Development																				
11. Capability-building Program																				
12. Community Organizing and Community Development																				
13. Information, Education, and Communication																				
14. Research and Extension																				
15. Establishment of MIS																				
16. Development of Sustainable Financing System																				
17. Monitoring and Evaluation of SEMP Implementation																				
18. SEMP Revision and Updating																				



formulate their own M & E systems, the PG-ENRO shall extend the necessary technical support to ensure systematic data collection and to save time and resources which may arise from duplication of efforts. However, each LGU's environmental unit is expected to do its own M & E activities to generate area-specific data.

Monitoring of the SEMP implementation will focus on the delivery mechanisms and conversion processes of inputs into desired outputs. Details of the types of data sets and sources, reports, and target users, including the frequency of monitoring, shall be developed by the PG-ENRO, in coordination with the key actors of the SEMP. It is envisaged that these details will evolve from a consensus made during a multisectoral workshop and eventually be approved by the BBCICM. The reporting system will, therefore, be designed in conjunction with the definition of the monitoring elements. Reports from participating LGUs and other sectors will be made available to the PG-ENRO on a quarterly, biannual, and annual basis for consolidation and submission to the BBCICM and other interested groups.

During the first five years of the SEMP implementation, there will be three major evaluations to be conducted: the initial one after the end of the first year; the second after its third year of implementation; and the last at the end of the fifth year, prior to the preparation of the completion report on Phase 1 of the SEMP. The primary intent of the initial evaluation would be to assess (i) the adequacy and extent of local institutions and organizations made for full-scale implementation of the various programs and projects contained in the SEMP; (ii) the availability and extent of financing (existing, planned, and/or commitments) for the SEMP programs and projects; and (iii) the results of preliminary activities to gauge the manner and scale of implementing the relevant SEMP components.

The other two major evaluations shall

look into the effects and/or impact of the SEMP implementation on the environmental conditions, particularly those areas or ecosystems close to the BBR's coastal communities. The pertinent direct measurable evaluation factors shall be defined by the PG-ENRO, in consultation and coordination with the coastal communities, NGOs, and other local stakeholders. Similarly, certain critical aspects of the implementation process will also be covered by both M & E activities. These are the performance of the different multisectoral institutional arrangements, the effectiveness of community organizing processes and techniques, and the overall implementation strategies of the SEMP.

## REVISION AND IMPLEMENTATION IMPROVEMENT OF THE SEMP

The three major evaluations of the SEMP will serve as opportunities for the BBCICM and PG-ENRO to review and, if necessary, modify the existing policies and ordinances, cross-agency or program coordination mechanisms, implementation strategies, and program/project schedules in order to make them more appropriate to the conditions and requirements of particular areas or communities. If there is a need for new environmental management policies and programs, the PG-ENRO will convene round-table discussions and workshop sessions with a pool of reference stakeholders as well as selected on-site discussions with community representatives with the end-view of determining priority and strategic courses of action to address key environmental issues. These discussions will lead key stakeholders to agree on the best decision on a course or courses of action given optimal use of available accumulated information, time, and resources. Such a decision by key stakeholders will be presented to the BBCICM for approval and, thereafter, incorporated into the revised SEMP by the PG-ENRO.

To improve the SEMP implementation, the PG-ENRO will document early recognizable "success stories" in the course

of monitoring and evaluation so that lessons from its initial programs, projects, or activities can be communicated to concerned key actors and stakeholders. Such lessons will also serve as vital inputs in the revision or improvement of the SEMP to promote the replication or expansion (in area or scale) of tested approaches and technologies for sustainable environmental management. Finally, the lessons from “success stories” will hopefully result in the simplification of some rules and procedures for local stakeholders, particularly the communities, to assume more responsible roles in environmental and natural resource management.

Any changes in the SEMP in terms of scope, duration, and implementation arrangements of specific major programs or projects will be subject to the approval of the BBCICM, with prior consultations with the concerned stakeholders and the concurrence of donor institutions, if necessary. After the planned major evaluations during the initial five years of the SEMP implementation, future revisions will be undertaken parallel to the subsequent SEMP evaluation. This latter activity will be carried out every two years which will commence at the end of the sixth year of implementation.



# Financial Implications



### FINANCIAL IMPLICATIONS

The implementation of the SEMP requires the allocation of resources not normally appropriated by LGUs. The increased responsibility associated with the SEMP implementation, therefore, warrants substantial commitment in terms of providing the appropriate policy and planning environment for the generation of additional resources both from the government and nongovernment sources to carry out the various investment programs identified.

Concomitantly, the challenge is to mobilize the private sector, national, and local resources to finance the SEMP. This can be undertaken by the BBCICM (through the PG-ENRO), serving as the coordinating body with catalytic support from the MPP-EAS. Innovative schemes can serve to cushion the impact of additional financial requirements, by providing sustainable sources of financing.

The SEMP has been prepared in such a way as to allow the LGUs and other local stakeholders to make adjustments in their planning and programming process to ensure its sustained implementation. Following are the major phases of SEMP implementation and their financial implications in terms of magnitude and possible sources.

*Preparatory Phase* — Policy and planning reforms are envisioned to take place in the initial phase of the SEMP

implementation to establish the appropriate framework for a well-coordinated participation, to set the stage for information and education, to enhance the capacity of major stakeholders, and to lay the groundwork for the preparation of an integrated operational plan, with policy support systems that would institutionalize the measures and innovations to be introduced in the latter stages of implementation. This phase will establish the foundation for incremental and progressive undertaking of subsequent activities. Financial requirements are low and activities can be implemented with minimum additional budget support.

This phase can be completed within six months from the commencement of the implementation of the SEMP.

*Development Phase* — This stage will build upon the activities of the preparatory phase and shall involve the preparation of detailed action plans for specific components of the SEMP, networking with national and regional institutions, and mobilization of financial resources for the subsequent phase. Detailed financial requirements shall be prepared, activities prioritized, and potential funding sources identified. Initial contacts with donor groups/institutions shall be established and an initial consultative meeting shall be organized to present the SEMP and its financial requirements. This phase shall also involve the operationalization of financing mechanisms, such as the implementation of pollution charges, establishment of a trust fund, and the



conduct of feasibility studies for projects to be implemented under the BOT and privatization schemes. Financial requirements at this phase are expected to be low to moderate, to focus mainly on the preparation and packaging of projects, policy implementation, and mobilization of resources. Additional resources shall be required, probably from the Provincial and Municipal Internal Revenue Allocation.

At least 6 to 12 months will be required to complete this phase.

*Implementation Phase* — This involves the actual undertaking of activities identified, in accordance with the schedule set forth. Resources generated shall be mobilized to finance the implementation of these activities. This is the stage where the financial requirements are needed and where the intensity of activities is at its highest. Most of these activities are expected to start on the third year of the SEMP implementation.

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