

STATE OF THE COASTS of Batangas Province



The Provincial Government of
Batangas, Philippines



Partnerships in Environmental Management
for the Seas of East Asia (PEMSEA)



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Batangas, Philippines



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September 2008

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Published by the Provincial Government of Batangas, Philippines, and Partnerships in Environmental Management for the Seas of East Asia (PEMSEA).

Printed in Quezon City, Philippines

Provincial Government of Batangas, Philippines and PEMSEA. 2008. State of the Coasts of Batangas Province. Partnerships in Environmental Management for the Seas of East Asia (PEMSEA), Quezon City, Philippines. 119p.

ISBN 978-971-812-023-1

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Acknowledgements

The State of the Coasts report for Batangas Province was initiated by the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) in partnership with the Provincial Government of Batangas-Environment and Natural Resources Office (PG-ENRO) and in collaboration with the following government agencies, nongovernmental organizations, the private sector and other stakeholders:

Office of the Provincial Agriculturist

Office of the Provincial Planning and Development Coordinator

Office of the Provincial Environment and Natural Resources Officer

Office of the Provincial Health Officer

Office of the Provincial Social Welfare and Development

Office of the Provincial Assistance for Community Development

Department of Environment and Natural Resources

Bureau of Fisheries and Aquatic Resources

Philippine Coast Guard

Philippine Ports Authority

University of Batangas

Balayan Distillery, Inc.

Batangas Coastal Resources Management Foundation, Inc.

World Wide Fund for Nature-Philippines

Conservation International-Philippines

Municipal offices of the following coastal city/municipalities:

- Balayan
- Batangas City
- Bauan
- Calaca
- Calatagan
- Lemery
- Lobo
- Mabini
- Nasugbu
- San Juan
- Tingloy

These municipal offices include:

Municipal Agriculture Office

Municipal Disaster Coordinating Council

Municipal Engineering Office

Municipal Environment and Natural Resources Office

Municipal Health Office

Municipal Planning and Development Coordinator

Office of the Mayor

People's organizations and other stakeholders:

ANAK-Balayan

Bantay Dagat

MFARMC

Samahang Pangkaunlaran ng San Teodoro, Inc.

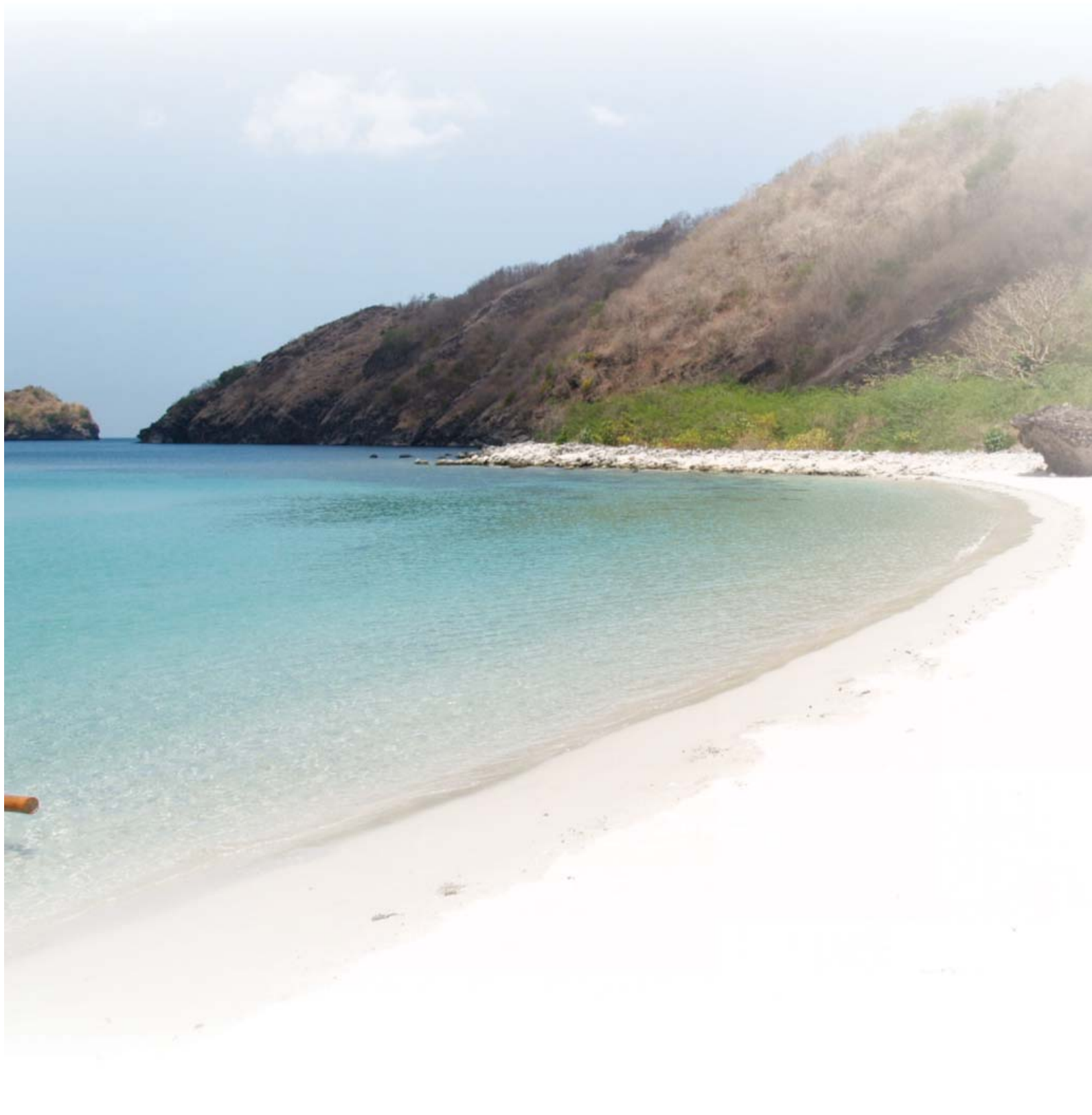
SAMMACA

US Peace Corps Volunteers

The support extended by Governor Vilma Santos-Recto and Mr. Victor M. Reyes, Provincial Administrator, is deeply appreciated.

The final output benefited from the technical refinements of Ms. Daisy Padayao, PEMSEA Technical Assistant for Project Development; Dr. Andre Jon Uychiaoco, PEMSEA Technical Officer for Project Development; with direction and guidance from Mr. S. Adrian Ross, Chief Technical Officer and Prof. Raphael P.M. Lotilla, Executive Director, PEMSEA Resource Facility (PRF).

Editorial and layout support by Ms. Anna Rita Cano, Editor and Mr. Jonel Dulay, Layout Artist, PRF, are likewise appreciated.



Introduction

What is Integrated Coastal Management?

Integrated coastal management (ICM) is a natural resource and environmental management framework which employs an integrative, holistic approach and an interactive planning process in addressing the complex management issues in the coastal area. The ultimate purpose of ICM is to increase the efficiency and effectiveness of coastal governance in terms of its ability to achieve the sustainable use of coastal resources and of the services generated by the ecosystems in the coastal areas. It aims to do this by protecting the functional integrity of these natural resource systems while allowing economic development to proceed. Through integrated planning, ICM aims to address competing conflicts and conflicts arising from multiple use of limited space and resources (Chua, 2006).

What is a State of the Coasts Report?

The State of the Coasts (SOC) is a reporting system developed primarily to assess the progress and impacts of ICM implementation by local governments. Specifically, it aims to:

- a. Define the scope of issues being addressed in ICM;
- b. Delineate the governance mechanisms and implementing arrangements that have been put in place;
- c. Assess the extent and effectiveness of ICM program implementation;
- d. Identify trends or changes in the social, economic and environmental status of the area;
- e. Determine the driving forces for change;
- f. Assess the implications of the trends; and
- g. Promote adaptive management in ICM program implementation, in response to changing conditions.

Who is the SOC target audience?

The State of the Coasts report is intended for:

- a. Chief Executives of local governments;
- b. ICM managers;
- c. ICM practitioners; and
- d. Coastal communities and other stakeholders.

What are the main elements of the SOC Report?

The SOC report contains the following:

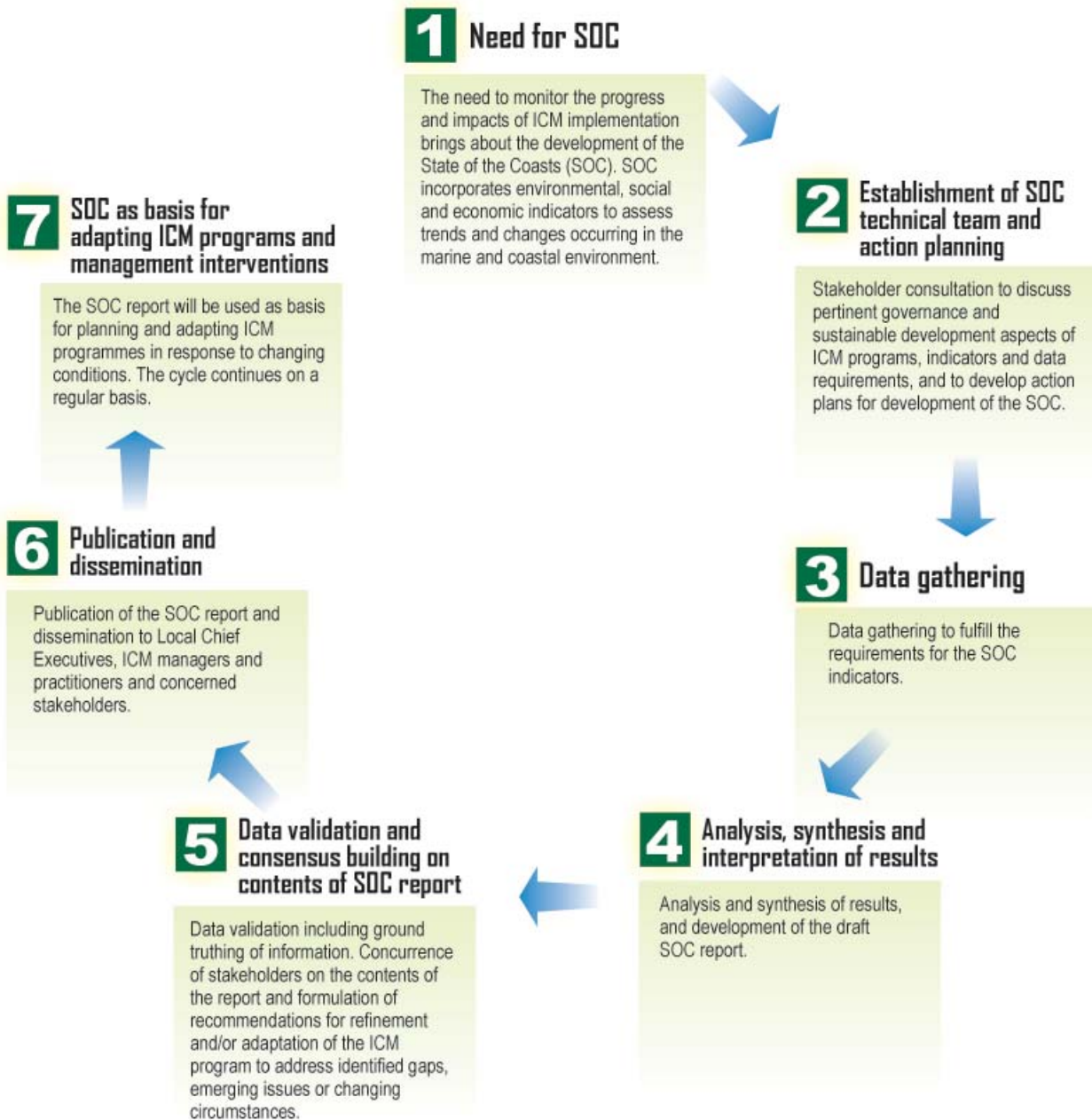
- a. An Executive Summary featuring a fact sheet of the area, and a summary of key findings, implications and recommendations;
- b. A description of the relevance of various indicators of governance and sustainable development aspects of ICM programs based on a common framework for sustainable coastal development;
- c. The results and analysis of each indicator, including the implications of changing conditions and recommendations for mitigating measures, as agreed to by concerned stakeholders; and
- d. A description of the SOC methodology and process, the framework for sustainable coastal development, and the accomplished SOC reporting templates.

Reference


















Chua, T.E. 2006. *The Dynamics of Integrated Coastal Management: Practical Applications in the Sustainable Coastal Development in East Asia*. 468 p. Global Environment Facility/United Nations Development Programme/International Maritime Organization Regional Programme on Building Partnerships in Environmental Management for the Seas of East Asia (PEMSEA), Quezon City, Philippines.



















Guide to SOC Development

Development of the State of the Coasts Report for Batangas Province



Core Indicators for SOC Reporting for Batangas

Category	SOC Code	Indicator	Trend * (1990–2007)
Governance			
Policy, strategies and plans	001	Coastal profile/Environmental risk assessment	
	002	Coastal strategy and action plans	
	003	Local government development plan, including coastal and marine areas	
Institutional arrangements	004	Coordinating mechanism	
	005	Participation of stakeholders in the coordinating mechanism	
Legislation	006	ICM enabling legislation	
	007	Administration and monitoring of compliance to legislation	
	008	Environmental cases filed/resolved	
Information and public awareness	009	Public education and awareness	
	010	Stakeholder participation and mobilization	
Capacity development	011	Availability/accessibility	
	012	Human resource capacity	
Financing mechanisms	013	Budget for ICM	
	014	Sustainable financing mechanisms	
Sustainable Development Aspects			
Natural and man-made hazard prevention and management	015	Level of preparedness for disasters	
	016	Degree of vulnerability to disasters	
	017	Social and economic losses due to disasters	

Category	SOC Code	Indicator	Trend * (1990–2007)
Sustainable Development Aspects			
Habitat protection, restoration and management	018	Habitat management plan and implementation	
	019	Areal extent of habitats	
	020	Protected areas for coastal habitats and heritage	
	021	Reclamation and conversion	
Water use and supply management	022	Water conservation and management	
	023	Access to improved water source	
	024	Incidences/deaths due to waterborne diseases	
Food security and livelihood management	025	Fishery management plan and implementation	
	026	Fisheries Production	
	027	Malnutrition rate	
	028	Poverty, education and employment	
	029	Livelihood programs	
Pollution and waste management	030	Management plans	
	031	Water quality	
	032	Air quality	
	033	Sanitation and domestic sewerage	
	034	Municipal solid waste	
	035	Industrial, agricultural and hazardous wastes	

* Legend:  Improving  Deteriorating  Baseline data only or data not conclusive — No data



Executive Summary

The *State of the Coasts of Batangas Province* was developed to assess the progress and impacts of ICM implementation in the Province. This report was prepared through the concerted efforts of stakeholders, namely: national, provincial and municipal government agencies; nongovernment entities; the private sector; universities; and community groups. The contents of this report were validated through site visits to 10 coastal municipalities for field verification of information, and through interviews with government and nongovernment stakeholders throughout the Province. The results were reviewed and concurred by stakeholders during the final SOC workshop, which was conducted on 24 June 2008 in Batangas City, Philippines (Annex 1). The major findings and recommendations of the stakeholders in the Province of Batangas are summarized below.

Governance of Marine and Coastal Resources in Batangas

Policies, Strategies and Plans

The Province has shown significant progress in expanding its management strategies for sustainable development of the coastal and marine areas over the past 14 years. Starting in Batangas Bay in 1994, ICM programs now cover the entire coastline of the Province. It is emphasized, however, that in order to fully achieve the overall goals and objectives of the Provincial Strategic Environmental Management Plan (SEMP), municipal governments should be encouraged to integrate the action programs identified in the SEMP into their municipal development plans. At present only one municipality has taken this important step.

Institutional Arrangements

The Batangas Bay Region Environmental Protection Council (BBREPC) serves as the only forum in the Province to harmonize the overlapping responsibilities of provincial agencies, as well as the three levels of government (i.e., national; provincial; and local) regarding coastal and marine resource management and to incorporate the interests of stakeholders in policy and decision-making.

The establishment of the Provincial Government-Environment and Natural Resources Office (PG-ENRO) has provided the Province with a lead agency with the mandate and capacity for coordination of action programs and initiatives among different sectors, national and local government agencies and other stakeholders for the management of the marine and coastal resources of Batangas.

To this end, it is important that PG-ENRO, the Secretariat for the BBREPC, maintain a regular meeting schedule of the Council (e.g., annually or bi-annually). Furthermore, considering the geographic expansion of the ICM program to the entire coastline of the Province, the previously submitted proposal for a three-tiered Batangas Environmental Protection Council (BEPC) needs to be raised as a priority consideration of the *Sangguniang Panlalawigan* (Provincial Legislative Board) in the interest of sustainable development in the Province.

Legislation and Enforcement of Laws

There are sufficient legal instruments in the Province to fully enable the implementation of ICM, and to guard against unsustainable use of marine and coastal resources. But, there is a need for strengthening the enforcement of

these laws, including an adequately equipped and skilled team of enforcement officers, as well as a more systematic monitoring and surveillance arrangement in marine and coastal areas. Also, connection between the reporting of violations, apprehension of violators, and the resolution of cases in court needs to be further developed, to ensure that breakers of the law are penalized. The institutionalization of coastal volunteers (*Bantay Dagat*), who have been strong partners in fisheries enforcement over the years, may be considered as a key component in a revised law enforcement regime in the Province.

Public Awareness and Mobilization

The presence of strong environmental partners (nongovernmental organizations and civil society) in the Province provides a great advantage in achieving the overall goals of ICM. Strengthening and maximizing partnership opportunities is essential for coastal management. As indicated earlier, the BBREPC provides a forum for engaging, coordinating and mobilizing public participation in SEMP implementation, and for making the most using the available skills, resources and intellectual capital in the Province.

Capacity Development

There are many skilled human resources in the Province with various capacities in coastal management. However, these resources are not evenly distributed among municipalities and provincial agencies. There is a particular need to encourage municipalities to establish municipal environmental offices and to facilitate training of environmental officers for these offices. The Provincial Government may seek partnership arrangements with national agencies and institutions, as well as donors and international organizations, to create an ICM learning network and to utilize Batangas as a central node for such a network, based on its history of ICM program implementation.

Sustainable Financing

The Provincial Government has been supporting ICM through regular allocations of budget. The SOC report provides the provincial government with a means of determining the benefits and impacts of ICM, and for adapting to change as and when required. Some changes will require reallocation

of resources among agencies or programs, whereas others will require new funding. Innovative sustainable financing methods, such as user fees and private sector partnerships, can be explored and optimized particularly with respect to environmental infrastructure investments. The Province can lead the way for the municipalities in formulating, facilitating and promoting such innovative approaches.

Sustainable Development Aspects of Marine and Coastal Management in the Province of Batangas

Natural and Man-made Hazard Prevention and Management

The Province has an impressive record in its efforts to increase the level of preparedness for natural disasters, particularly earthquakes, volcanic eruptions and typhoons. However, emerging issues related to climate change (e.g., sea level rise; flooding; storm surges; more intensive and more frequent storms) are not currently being considered in disaster planning and preparedness strategies. An assessment of potential impacts from climate change and appropriate adaptation measures can be considered in future planning activities. Likewise, the Provincial Disaster Contingency Plan needs to incorporate man-made hazards into its response program, considering the increasing threats of oil and chemical spills due to industrial development and increased shipping activities in the area.

Habitat Protection, Restoration and Management

Many initiatives have been implemented to protect the coastal habitats of the Province, (e.g., number of Marine Protected Areas has increased; an MPA Network has been established; mangrove and terrestrial forest areas have been rehabilitated). Nonetheless, mangrove areas are declining because of habitat conversion and land reclamation projects. The Province needs to consider innovative approaches to managing and controlling development activities in the coastal areas. For example, the establishment of a Province-wide coastal use zoning scheme would provide

local Chief Executives, policymakers, resource managers and investors with clear direction on developmental activities that are compatible with sustainable use of marine and coastal resources and coastal areas.

Water Use and Supply Management

Indications are that access to water supply in the Province has improved since 1990. Development and annual investment plans include substantial investment to tap and maintain connections to water sources and access to safe water supplies. Seventy-seven percent of the Province is considered difficult for purposes of well construction, with static groundwater levels in central coastal municipalities greater than 40 m below ground level. However, at present, there are no strategies or initiatives at the provincial or municipal levels covering regulation and conservation of freshwater usage. Watershed reforestation and urban greening, as well as water use rationalization through regulation and market-based instruments need to be considered.

In terms of access to safe potable water, there has been a slight decrease in the incidence of waterborne diseases from 2000 to 2007. Nonetheless, waterborne diseases, particularly diarrhea, remain the top cause of morbidity in the area. Seventeen deaths due to diarrhea were recorded in 2006, while seven deaths were reported in 2007. These figures point out the urgent, continuing need to protect water supplies from contamination, and to provide adequate water treatment and supply services to communities of the Province.

Food Security and Livelihood Management

Malnutrition rates in the Province are on a general decline since 1995. Opportunities for employment as well as the absolute numbers of people employed have increased in Batangas since 1990. However, because of population growth, poverty incidence and unemployment rates have been constant or on a slightly increasing trend over the same period. Elementary and secondary school attendance rates have increased since 2003, and the proportion of high school graduates, 18 years of age and above, is higher than the national average. This trend, if continued, will help the Province to reverse the poverty incidence and unemployment rate over time.

Considerable effort has been made to improve fisheries management and a fisheries management plan (2005–2020),

integrated into the SEMP, is a step in the right direction. Fisheries sustainability cannot be assessed using existing data. Improvements in data collection and management would facilitate implementation and evaluation of the fisheries management plan. In addition, unified fishery legislation is recommended to tie up the efforts of all the municipalities in sustaining their fishery resources.

Pollution Reduction and Waste Management

The province and the municipalities have developed plans and strategies for pollution reduction and waste management. The next focus is the heightened implementation of these action programs. Agricultural and municipal solid waste and domestic sewage continue to be priority challenges across the Province, resulting in the deterioration of freshwater and marine water quality, contamination of water supplies, and river and coastal ecosystems. The enactment and/or strict enforcement of ordinances for the management of agricultural wastes are necessary, considering the extensive contamination of groundwater and rivers with nutrients and pathogens as a consequence of mismanagement of livestock residues and chemical fertilizers. The construction of sanitary landfills and sewerage facilities is beyond the capacity of most municipalities in the Province. Therefore, the Province needs to consider taking the lead for the municipalities by introducing innovative and cost-effective approaches in waste management, in partnership with specialized institutions/organizations and the private sector.

Overall, ICM implementation in the Province of Batangas has resulted in positive signs, particularly in the governance elements of the sustainable development framework. However, as this SOC report indicates, these are only the first steps and much still remains to be done before the objectives and goals of the Provincial SEMP are achieved.

Progress is evident, as is the continuing commitment of the Provincial and municipal governments to the cause of sustainable development. With the Governor's strong leadership and the dedication of all concerned stakeholders to ICM implementation, we are assured that the natural services and benefits provided by our marine and coastal resources will be protected and managed for our own well-being and as a legacy for future generations.



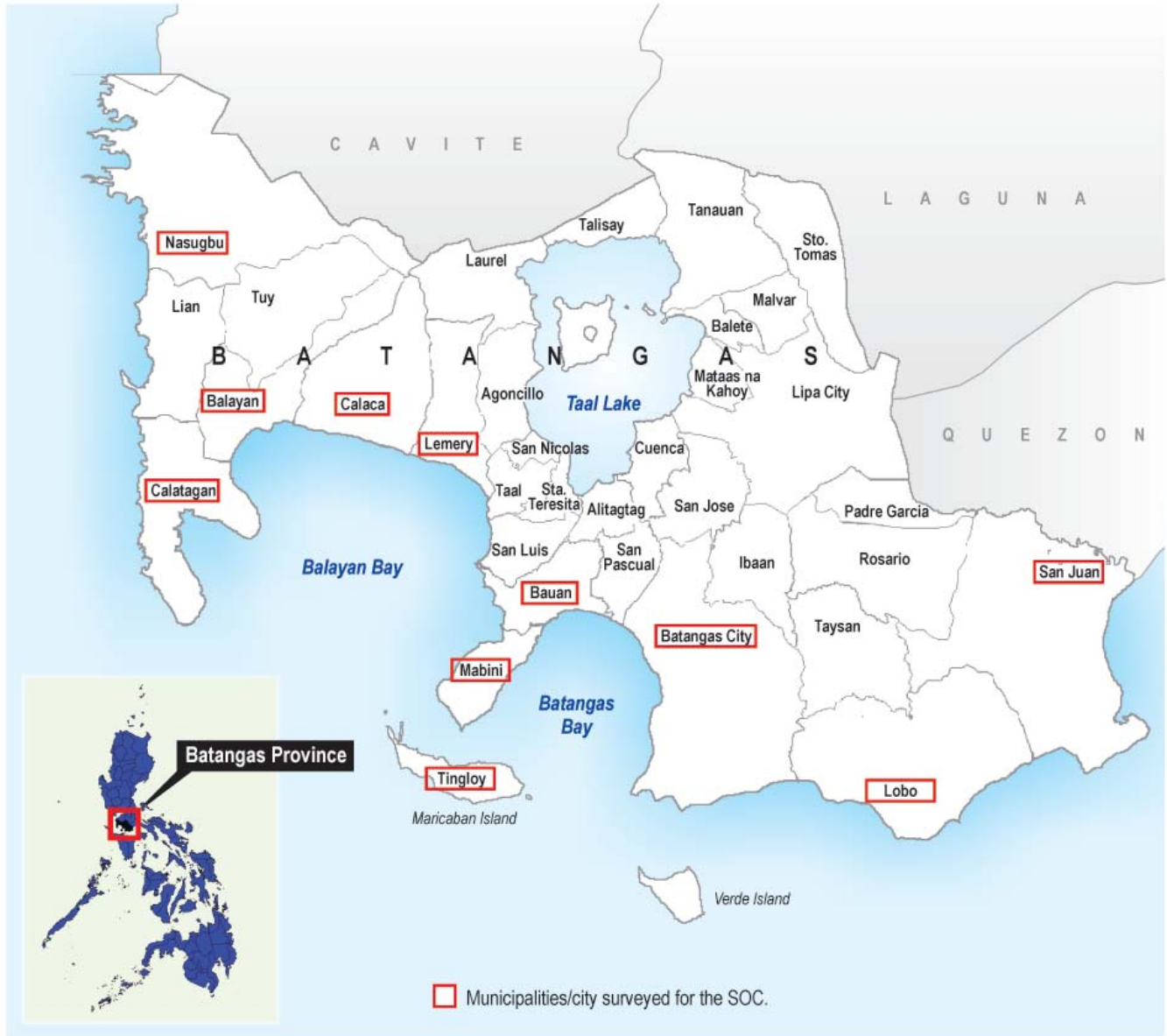
Batangas Province

The Province of Batangas is located along the southwestern edge of Luzon in the Philippines. The Province is part of the Southern Tagalog Region and bordered by the provinces of Cavite to the north, Laguna to the northeast and Quezon to the east. The province has a land area of about 3,166 km² and consists of 34 cities and municipalities, of which 14 are municipalities and 1 is a coastal city. The major bays of the province are Batangas Bay, Balayan and Adjacent Bays, and Tayabas and Adjacent Bays. Calumpang River is the major river flowing into Batangas Bay while Pansipit and Benangbang Rivers are the major rivers flowing into

Balayan Bay. Major economic activities in Balayan and Tayabas Bays are fishing and tourism mainly due to its sandy beaches and coral reefs. Batangas Bay, on the other hand, is dominated by industrial, commercial and shipping activities. Batangas City hosts an international seaport and the majority of the big industries in the province, such as oil refineries and natural gas processing. Verde Passage, located between Batangas City and Mindoro Island, is considered as the center of the global center of marine biological diversity. Maricaban Island between Mabini and Tingloy is a priority dive site.



Administrative boundaries in Batangas Province.



Key Facts about Batangas Province

Land area (km²)	3,165.81
Area covered by ICM (km²)	1,663.51 (53%) (2007)
Coastline length (km)	492
Municipal waters (km²)	7,000 (excluding Taal Lake)
Total number of cities/municipalities	34 (including 3 cities)
Coastal cities/municipalities	15 (including 1 coastal city)
Major bays	Batangas Bay
	Balayan and Adjacent Bays
	Tayabas and Adjacent Bays
Major rivers	Calumpang River
	Pansipit River
	Benangbang River
Total population	1990 – 1,476,783
	1995 – 1,658,567
	2000 – 1,905,348
	2006 – 2,283,351
	2007 – 2,245,869 (Actual census population, National Statistics Office)
Population growth rate	1980–1990 – 2.32 %
	1990–1995 – 2.20 %
	1995–2000 – 3.02 %
Employment Rate	1990 – 90.11 %
	1995 – 90.05 %
	2000 – 87.89 %
	2003 – 87.73 %
Sectoral employment	
• Agriculture (Percentage of total employment)	1990 – 34.00 %
	2003 – 28.71 %
• Industry (Percentage)	1990 – 34.00 %
	2003 – 23.24 %
• Services (Percentage)	1990 – 19.00 %
	2003 – 47.32 %

What are indicators?

Indicators are quantitative/qualitative statements or measured/observed parameters that can be used to describe existing situations and to measure changes or trends over time (Duda, 2002). Indicators are developed as tools to make monitoring and evaluation processes operational. To become powerful ICM management tools, indicators must demonstrate the measure of effectiveness of a project, program or policy. They become effective tools when they are used to reflect changes in the state of coastal and marine environments, trends in socioeconomic pressures and conditions in coastal areas, and corresponding links among anthropogenic activities and ecological health. Finally, when used to evaluate ICM program performance, indicators offer feedback on action plans and provide parameters for subsequent actions that may prove useful in justifying further investments in ICM (Chua, 2006).

What are the indicators for the State of the Coasts?

Indicators for the *State of the Coasts* were determined based on PEMSEA's Framework for Sustainable Development of Coastal Areas thru ICM (Annex 2) to indicate current status, management responses, targets and impacts of management actions in each of the *governance* elements (policy, strategies and plans; institutional arrangements; legislation; information and public awareness; capacity development; and financing mechanisms) and the five *sustainable development aspects* (natural and man-made hazard prevention and management; habitat protection, restoration and management; water use and supply management; food security and livelihood management; and pollution reduction and waste management). The indicators were chosen based on the following criteria: a) simple and meaningful; b) easy applicability in the region; and c) complementary to the indicators identified in relevant international instruments, including the World Summit on Sustainable Development (WSSD), Agenda 21, the Millennium Development Goals (MDGs), the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA), and the Bali Plan of Action.

What are the core indicators for SOC included in this report?

From a total of 160 indicators based on the Framework for Sustainable Development of Coastal Areas thru ICM, a set of core indicators were identified for the development of the initial SOC report for Batangas Province (PEMSEA, 2008). These 35 core indicators are considered to be a basic set of indicators for evaluating changes that have occurred in the Province over time as a consequence of ICM implementation. As the SOC becomes operational, more indicators will be considered in the succeeding SOC reports.



How are the indicators presented in this report?

Each of the indicators is presented in the following format:

- a. Category, which identifies the particular governance element or sustainable development aspect in the Framework for Sustainable Development of Coastal Areas
- b. Name of the indicator
- c. Description of the indicator
- d. Rationale for using the indicator in the SOC
- e. Data requirements
- f. Results which describe the current status, management actions and impacts of management interventions in the area relating to the particular indicator
- g. Implications of results and recommendations to respond to changing conditions

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Policy, Strategies and Plans

001 Coastal profile and environmental risk assessment

Description

This indicator measures the percentage of coastline that has undergone environmental risk assessment, coastal profiling or similar science-based evaluation in order to identify priority

issues/threats to sustainable development of coastal and marine resources.

Rationale

Effective coastal management relies on planning that takes into account strategic and scientific assessment of the area, including social, cultural, political, economic, environmental and policy issues, and the identification of priority concerns

for coastal managers and policymakers. This strategic assessment should be the basis for developing strategies and action plans for coastal management.

Data Requirements

- Total length of coastline
- Coastal environmental profile/environmental risk assessment/other similar assessments

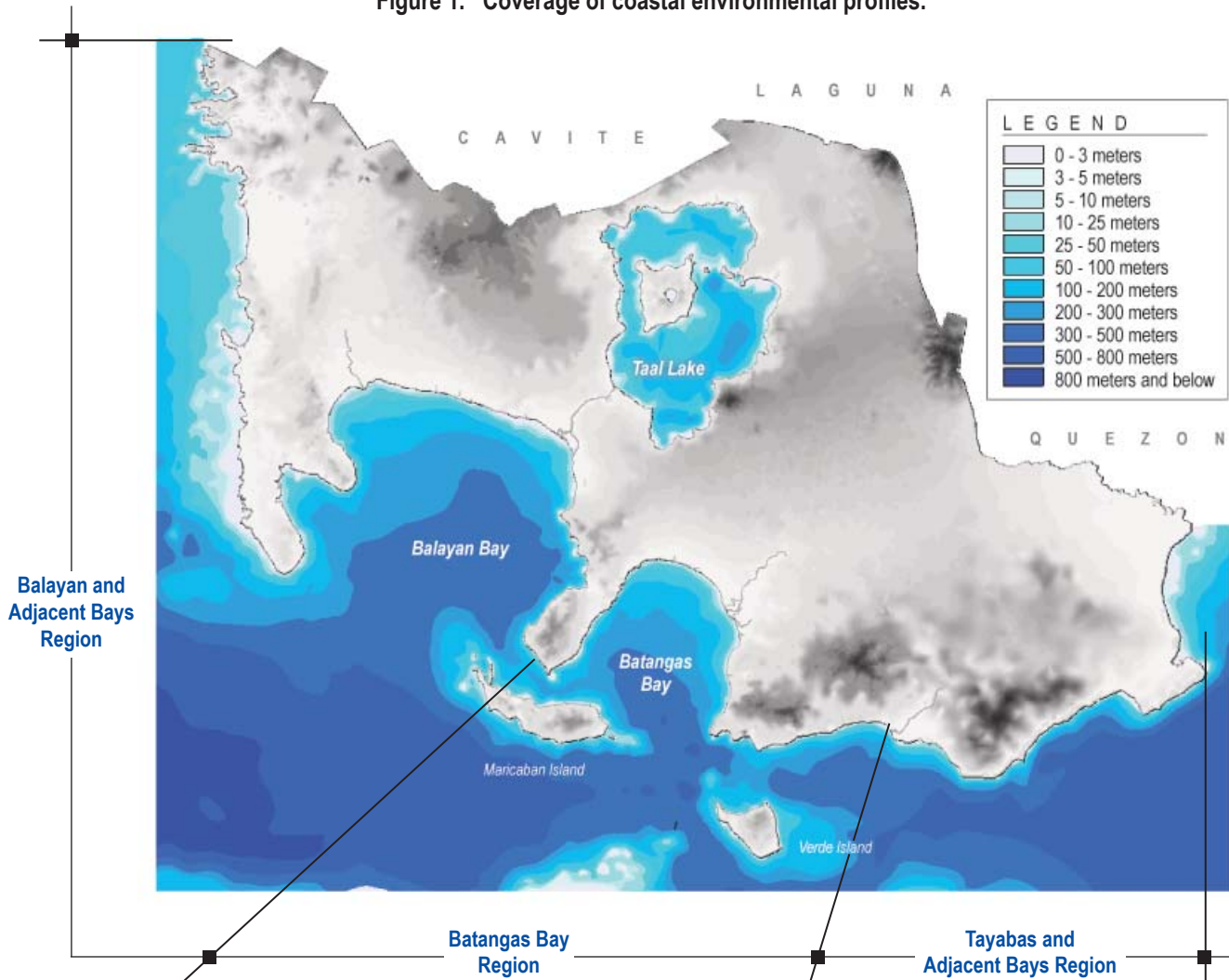
- Length of coastline covered by environmental assessment

Results

The total length of coastline of Batangas Province is approximately 492 km, which includes Batangas Bay, Balayan and Adjacent Bays and the coastlines of San Juan and Lobo as part of the Tayabas Bay Region. Environmental profiling was conducted to prioritize issues of the Batangas

Bay Region (92 km) in 1996 and the Balayan and Adjacent Bays Region (300 km) in 2004. To date, 80 percent of the Province's coastline has undergone coastal environmental profiling (Figure 1).

Figure 1. Coverage of coastal environmental profiles.



Implications and Recommendations

The goal of environmental risk assessment or coastal profiling is to provide an accurate and timely scientific input into policy and decision-making on development and use of the coastal area. The process involves concerted, multidisciplinary and multisectoral input from various stakeholders as well as the scientific community. The process itself promotes information sharing and

collaboration among different players in the coastal area, and bridges the gap between scientists, managers and decision-makers.

Batangas has shown considerable progress in this area with only the Tayabas and Adjacent Bays region requiring environmental profiling/risk assessment.

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- WWF. 2004. *Environmental Profile of Balayan and Adjacent Bays Region*. World Wide Fund for Nature.

Policy, Strategies and Plans

002 Coastal strategy and action plans

Description

This indicator measures the scope, coverage and objectives of coastal management, as delineated in coastal strategies and action plans. The indicator further looks into the specific roles and responsibilities for different stakeholders, proposed interventions to address existing or potential threats to

sustainable development, including economic, biophysical and social aspects with specified targets and timeframes. Finally, the indicator determines the government's commitment to implement the coastal strategy or action plan through its adoption at the provincial/city/municipal level.

Rationale

A coastal strategy is a critical component of ICM, providing a framework for integrated planning and management. It not only serves as a platform for policy reform that promotes good governance, but facilitates interagency consultation, multisector cooperation and stakeholder participation. A coastal strategy identifies conflicts arising from multiple use of limited marine and coastal resources, establishes approaches and actions for protecting or enhancing environmental quality and biodiversity, while facilitating environment-friendly economic development and environmental investment opportunities. The strategy will not be useful if it is not adopted and translated into on-the-ground actions. Action plans define: a) the steps that are required in order to execute the strategies; b) the milestones or indicators that can be used to measure progress and changes; c) the timeframe for the actions; d) the roles of the various stakeholders; and e) the measures for monitoring the implementation of the strategy.

Data Requirements

- Coastal strategy and action plans
- Management boundary (geographic) of the Plan
- Scope of management plans
- Multisectoral participation mechanisms
- Local government commitments to implementation
- Monitoring and evaluation program



The SEMP serves as the platform in the sustainable development of coastal areas in Batangas.

Table 1. SEMP and ICM Plans in Batangas Province.

Year	Description	Coverage	Status
1996	SEMP (1996–2020)	Batangas Bay Region (BBR)	Adopted by the 12 municipalities and 2 cities in the BBR
2004	ICM Plan (2004–2023)	Balayan and Adjacent Bays Regions (BABR)	Adopted by the 12 municipalities in the BABR and adopted by the Provincial Development Council (PDC) in 2005
2005	SEMP (2005–2020)	Batangas Province	Adopted by the Provincial Legislative Body and 31 municipalities and 3 cities in the Province in March 2007
2006	Verde Passage Management Framework Plan (SEMP is a major component)		Formulated and adopted by the TWG (EO 578) in 2006

Results

From the initial Strategic Environmental Management Plan (SEMP) developed in 1996 for the Batangas Bay Region, an SEMP covering the entire province has been developed and adopted (Table 1).

The SEMP covers five major aspects of sustainable coastal and marine area management, namely: man-made hazards; habitat protection and restoration; food security and livelihood; water use and supply; and pollution and waste management.

PG-ENRO has been publishing its annual accomplishment reports with regard to SEMP implementation since 1996, as part of the ICM program in the province. The annual reports are limited to activities identified in approved annual work plans. One limitation is that accomplishments related to the overall SEMP strategies and objectives are not being monitored, evaluated and reported to concerned sectors and stakeholders. As such, there is no report available on the level of the accomplishments and progress relative to the SEMP, or the impact of the SEMP interventions.

Implications and Recommendations

To date, there is no systematic approach in place to monitor and evaluate the progress and impacts of implementing the ICM program in Batangas, or the accomplishments and impacts of the SEMP interventions. This State of the Coasts (SOC) report is a first effort to implement such a system.

The SOC report may be developed, refined and applied over time as an operating instrument of ICM managers and policymakers to monitor trends and changes that are occurring in coastal areas of the Province, and to refine and adapt policies, management strategies and programs in response to such changes.

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Policy, Strategies and Plans

003 Local government development plan, including coastal and marine areas

Description

This indicator reviews the local government units that have integrated coastal management issues and sustainable development of coastal and marine resources into their multi-year development plans.

Rationale

To determine an understanding of their commitment to coastal management, the development plans of local government units can be evaluated to ascertain whether the sustainable use of coasts and near coastal areas and the associated resources have been recognized for their value and the role they play in the development process.

The integration of ICM into the development plans of local government units reflects a local commitment to ensure the protection and development of coastal and marine areas in the broader context of the coastal development strategy/ SEMP, through a more integrated economic, social and environmental policy and planning approach.

Data Requirement

- Local development plans

Results

The Batangas Province SEMP 2005–2020 has been incorporated into the Comprehensive Land Use Plan (CLUP)/Physical Framework Plan of the province. Short-term plans identified include: a) implementation of flood control programs; b) construction or rehabilitation of local government-owned potable water use supply system; c) formulation of an integrated land- and water-use policy plan including a zonation scheme for the bay regions;

d) formulation of program or projects that promote air and water quality, as well as productivity of coastal or freshwater habitats, and agricultural and forest lands; e) creation of a central coordinating body for planning and development of the Province's Bay Region; f) enactment of provincial and local unified Fishery Ordinances; g) implementation of Republic Act 8550 (Fisheries Code); and h) regulation of informal settlers on critical areas and danger zones in the foreshore.

The municipality of Mabini has developed a coastal management plan that supports the Batangas Bay Region's SEMP and the ICM Plan for the Balayan and Adjacent Bays Region. The Plan identifies strategies addressing specific coastal issues and has been integrated into the municipality's development plan. Calatagan and Tingloy are currently in the process of developing their plans. Most of the

municipalities realize the need to develop specific coastal management plans aligned with the Batangas Province SEMP, which will be integrated to their development plans. Executive Order 533 (2006), which adopts ICM as a national strategy for sustainable development of coastal and marine areas, also calls for the development of ICM Plans by coastal municipalities.

Implications and Recommendations

The Province has developed and adopted a Strategic Environmental Management Plan (SEMP) for sustainable development and use of coastal and marine resources. Each coastal city and municipality has a CLUP, Development Plan, and Annual Investment Plan, which integrate sustainable development of coastal and marine areas in a general sense. The majority of plans do not include strategies for specific issues, targets and time frames. Development plans are the basis for managed development of an area. They are used by the area's leadership to determine the acceptability of proposed developments and operational plans and activities, as well as to guide the allocation of resources.

It is therefore important that coastal areas and issues are accurately captured in the documents. Hence the need to develop municipal coastal management plans aligned with the provincial strategies for sustainable development of the marine and coastal areas.

In order to realize the targets identified in the Batangas Province SEMP, the commitment of all cities and municipalities to implement the action plans identified is essential. As such, all cities and municipalities should integrate SEMP objectives and targets into their development and investment plans.

References

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Institutional Arrangements

004 Coordinating mechanism

Description

This indicator considers the presence of a functional interagency and multisectoral coordinating mechanism that oversees the development and implementation of the ICM program. The indicator further looks into

the institutionalization of a local office with adequate administrative resources — staff, budget and equipment — to oversee, guide and coordinate the implementation of coastal strategies and action plans.

Rationale

A fully functional coordinating body consisting of the government agencies, nongovernment entities, the private sector, civil society and other stakeholders, as appropriate, is a key component of ICM programs. The purpose of the coordinating mechanism is to harmonize any overlapping responsibilities of line agencies and stakeholder interests, as well as to integrate policy and management interventions.

Moreover, the availability and allocation of adequate administrative resources for ICM is an expression of the capacity of the ICM management team to administer, coordinate and implement activities over time. In the implementation of ICM, there is a need for a local office to serve as a clearing house, central coordinating agency and focal point for multisectoral activities.

Data Requirements

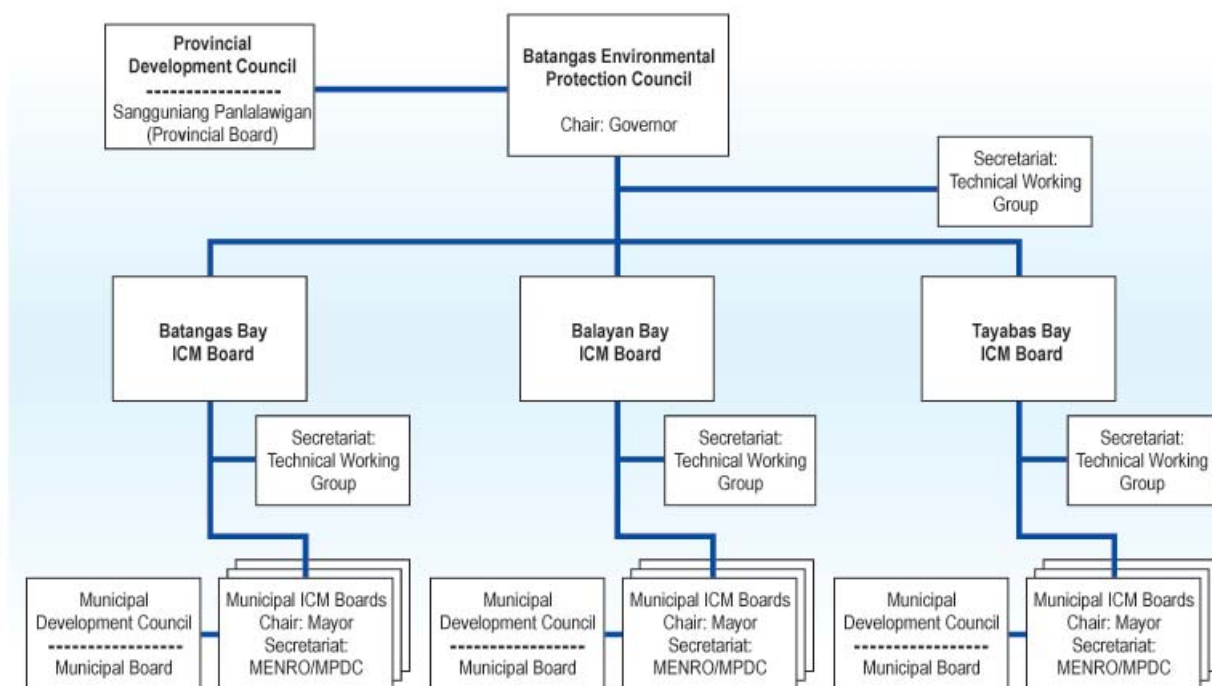
- Coordinating mechanism established and legal basis
- Organizational structure of the coordinating mechanism
- Coordinating office established and legal basis
- Organizational structure of the coordinating office
- Staff and budget allocation of the coordinating office

Results

The Batangas Bay Region Environment Protection Council (BBREPC) was established and institutionalized through Provincial Ordinance 1 Series of 1996 as the coordinating mechanism for ICM implementation in the Batangas Bay Region. There is no coordinating mechanism established for the Balayan Bay and Adjacent Bays Region (BABR) at present, but plans call for the creation of a province-

wide Batangas Environmental Protection Council (BEPC), which will serve as the coordinating mechanism for ICM implementation across the province. The proposed BEPC will integrate the three bay-wide ICM boards and Municipal ICM Councils (Figure 2). The proposed integration is still under review by the Provincial Legislative Board (*Sangguniang Panlalawigan*).

Figure 2. Proposed three-tiered organizational structure of the Batangas Environmental Protection Council.



¹ Municipal Environment and Natural Resources Office (MENRO)

² Municipal Planning and Development Coordinator (MPDC)

The Provincial Government of Batangas established the Provincial Government-Environment and Natural Resources Office (PG-ENRO) through Ordinance No. 3 series of 1995 as the technical secretariat of the BBREPC as well as to perform devolved functions of the DENR and to coordinate the implementation of the SEMP for Batangas Bay by the concerned sectors. PG-ENRO is also tasked as the technical secretariat in the proposed BEPC for ICM implementation in the province. Three full-time PG-ENRO staff are allocated for ICM coordination and implementation since 1999. The annual allocation for the operations of BBREPC was PhP500,000 from 1996–2007. In 2008, PhP150,000 was allocated for BBREPC operations.

The BBREPC met regularly to discuss work plans of agencies included in the coordinating mechanism for the implementation of the SEMP for the Batangas Bay Region. The frequency of meetings, however, declined from quarterly (1994–2004) to twice a year (2005 and 2006). In 2007,

the Council met only once. Despite the decrease in the frequency of meetings, PG-ENRO closely coordinates the implementation of the SEMP action programs.

There is no other regular forum for government agencies, local government units and stakeholders to plan, monitor, evaluate and report on the Batangas Province SEMP, and the implications of sustainable development and use of the Province's coastal and marine areas and resources.

At the municipal level, Mabini, Tingloy and Nasugbu have established their Coastal Resources Management Board (CRMB) through municipal ordinances in 2002, 2003 and 2004, respectively. The CRMB of Nasugbu was not functional since its establishment but there was a directive from the Mayor in May 2008 to reactivate the Board. In the CRM Boards of Mabini and Tingloy, government, nongovernmental organizations, the private sector and academe are represented.





PG-ENRO coordinates ICM implementation in Batangas.

The Municipal Environment and Natural Resources Office (MENRO) in Mabini was established as the coordinating office for coastal resources management (CRM) through a municipal ordinance in 2002. In Tingloy, the Municipal Planning and Development Coordinator (MPDC) was temporarily designated as the coordinating office until the currently vacant post of the Municipal Agriculture Office is filled and acts as the coordinating office as specified through a municipal ordinance in 2003. Three staff are allocated in the MENRO of Mabini and about 10-25 percent personnel time in the MPDC of Tingloy are allocated to oversee CRM

implementation. The budget allocation for MENRO operations for 2008 in Mabini is PhP1.5M. Other municipalities have no coordinating office established for ICM and different agencies implement various aspects of coastal management. In some municipalities, the MENRO leads waste management while the MAO leads fisheries management. The lead agency for coastal management tends to focus on habitat, fisheries or waste, depending on its primary mandate, e.g., MENRO (Calatagan and Lemery) or the Municipal Agriculture Office or MAO (Nasugbu and Lobo). In San Juan, coastal management is led by a Municipal Legislator.

Implications and Recommendations

A representative and fully functional coordinating mechanism is an essential feature of an ICM program. The existence and functioning of such a mechanism reflects the interest, at all levels, in ensuring the sustainable development of the coastal and marine environment and the social and economic benefits derived therefrom. The mechanism ensures the coordination of the different actors influencing coastal and marine areas and resources, as well as ensuring representation of the interests of citizens.

The establishment of the PG-ENRO provided a lead agency with the appropriate mandate and capacity for integration and coordination among the different sectors, national and local government agencies, and other stakeholders for the

proper management of the oceans and coasts of Batangas. Approval of the proposed three-tiered BEPC by the Provincial Legislative Board is in the interest of sustainable development in the Province of Batangas. Likewise, the sustained operation of PG-ENRO through continuous allocation of human and financial resources is necessary. At the municipal level, the creation of environment and natural resources offices (MENROs) which will lead the implementation of coastal management programs is necessary. Likewise, the municipalities and cities in the areas covered by ICM programs are encouraged to establish coordinating mechanisms. Strong coordination of the various agencies implementing various aspects of coastal management is also beneficial in achieving the objectives of ICM.

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Institutional Arrangements

005 Participation of stakeholders in the coordinating mechanism

Description

This indicator reports the pertinent sectors (government, nongovernment, private, civil society, academe) that are represented in the coordinating mechanism for the ICM program and are part of an integrated decision-making process. It further reflects the commitment of government

agencies and other stakeholders to implement, comply with and enforce ICM plans and activities. It also suggests the reality of the execution and performance of ICM initiatives, as well as the degree of acceptance on the part of users subject to the plan.

Rationale

Stakeholder participation is the key to coastal management. The ICM coordinating mechanism provides stakeholders (government and nongovernment) with access to decision-making processes and activities. It provides concerned parties with the satisfaction that their views and concerns are taken into account in the planning and decision-making process. The concerned sectors include those that exploit and use the natural resources for profit, communities that traditionally use natural resources for their food and livelihood, and the

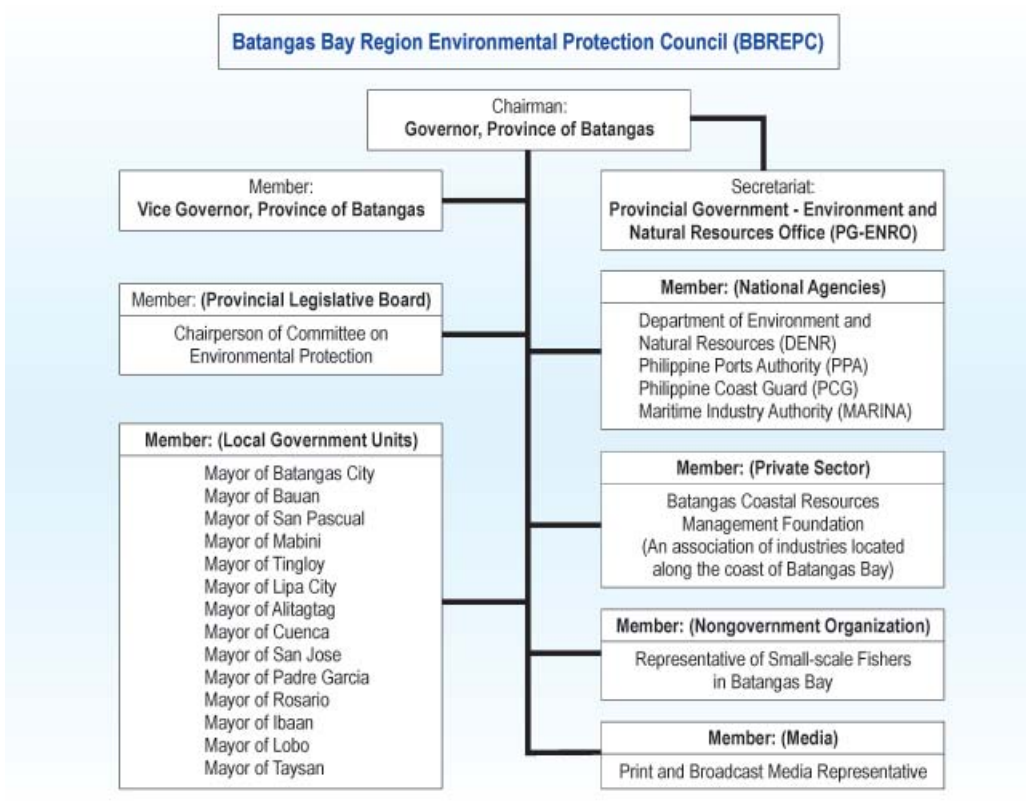
public sectors (local and central) that govern and manage the resources.

Likewise, in order to achieve the targets of sustainable use and development of the oceans and coasts, the commitment of national agencies, local governments and concerned nongovernment stakeholders is essential. Thus, their respective programs, projects and activities should be aligned with the action plans, programs and policies identified in the coastal management plans.

Data Requirements

- Representation of stakeholders in the coordinating mechanism
- Staff and budget allocation of agencies in the coordinating mechanism

Figure 3. Organizational structure of the Batangas Bay Region Environmental Protection Council (BBREPC).



Results

Most relevant stakeholders and sectors appear to be represented in the Batangas Bay Region Environmental Protection Council (BBREPC, Figure 3), which is the established coordinating body for ICM implementation in the Batangas Bay Region. The exception is the scientific sector/academe.

The heads of the line agencies included in the coordinating mechanism are responsible for the implementation of the activities identified in the Plan. Each of these agencies has specific financial allocation for the implementation of

their respective activities. However, the use, outputs and impacts of these activities are not being collated, consolidated, packaged and evaluated in accordance with the objectives and targets of the provincial SEMP.

The commitment of nongovernment stakeholders in implementing the SEMP is reflected in the Memorandum of Understanding and Memorandum of Agreement signed between the Provincial Government and NGOs stipulating that their projects support SEMP implementation.





Joint meeting of the Batangas Bay Region Environmental Protection Council and Provincial Solid Waste Management Board, 14 November 2007, Days Hotel, Batangas City.

Implications and Recommendations

Active participation and satisfaction of stakeholders can improve the success of ICM initiatives by increasing the level of ownership and sustain support. Stakeholder participation is also a measure of the transparency and accountability of the ICM decision-making process.

The successful implementation of the SEMP depends largely on the commitment of national government agencies, local government units and concerned stakeholders to fulfill their roles and responsibilities identified in the Plan. Their activities, programs and plans need to be aligned with and monitored in accordance with the Plan. A systematic approach to determining the level of implementation, compliance and enforcement of the SEMP in the projects and programs of national agencies, local government units and concerned stakeholders represents an essential contribution to the sustainable development of coastal and marine areas, including monitoring their implementation.

The establishment of the Batangas Environment Protection Council is essential as a venue to integrate work plans and

as a body to monitor the implementation of the Batangas Province SEMP.

The participation of the scientific community/academe in ICM provides decision-makers with access to scientific information on which to base management actions, and ultimately the improvement of management actions as a result of scientific input. Given the complexity of the coastal system, effective management cannot occur without a sound scientific basis.

The representation of the scientific community/academe in the proposed Provincial ICM Board (BEPC) is an important addition to the stakeholder participation process.

A systematic process of monitoring and evaluating the activities of stakeholders in the coordinating mechanism aligned with the implementation of the SEMP is essential.

References

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Legislation

006 ICM enabling legislation

Description

This indicator describes the existence and adequacy of legislation enabling the implementation of ICM interventions.

Rationale

The existence, adequacy and effectiveness of legislation are important in order to determine if the goals and objectives of coastal management are supported by a clear and enforceable legal basis. Legislation defines what is required,

permitted and prohibited in the coastal and marine area. Awareness and understanding of coastal management legislation promotes compliance and therefore achievement of coastal management goals and objectives.

Data Requirements

- Legislation/local ordinances regarding the ICM institutional mechanism and management activities, including:
 - a. Coastal use zoning;
 - b. Fisheries, mining and other extraction activities;
 - c. Pollution-related activities;
 - d. Building structures in the coastal environment, including aquaculture structures; and
 - e. Access to rules and regulations.

Results

Apart from the national policy adopting ICM as strategy for sustainable development (E.O. 533, 2006) of coastal and marine areas, there is no national or local legislation covering the development and implementation of ICM.

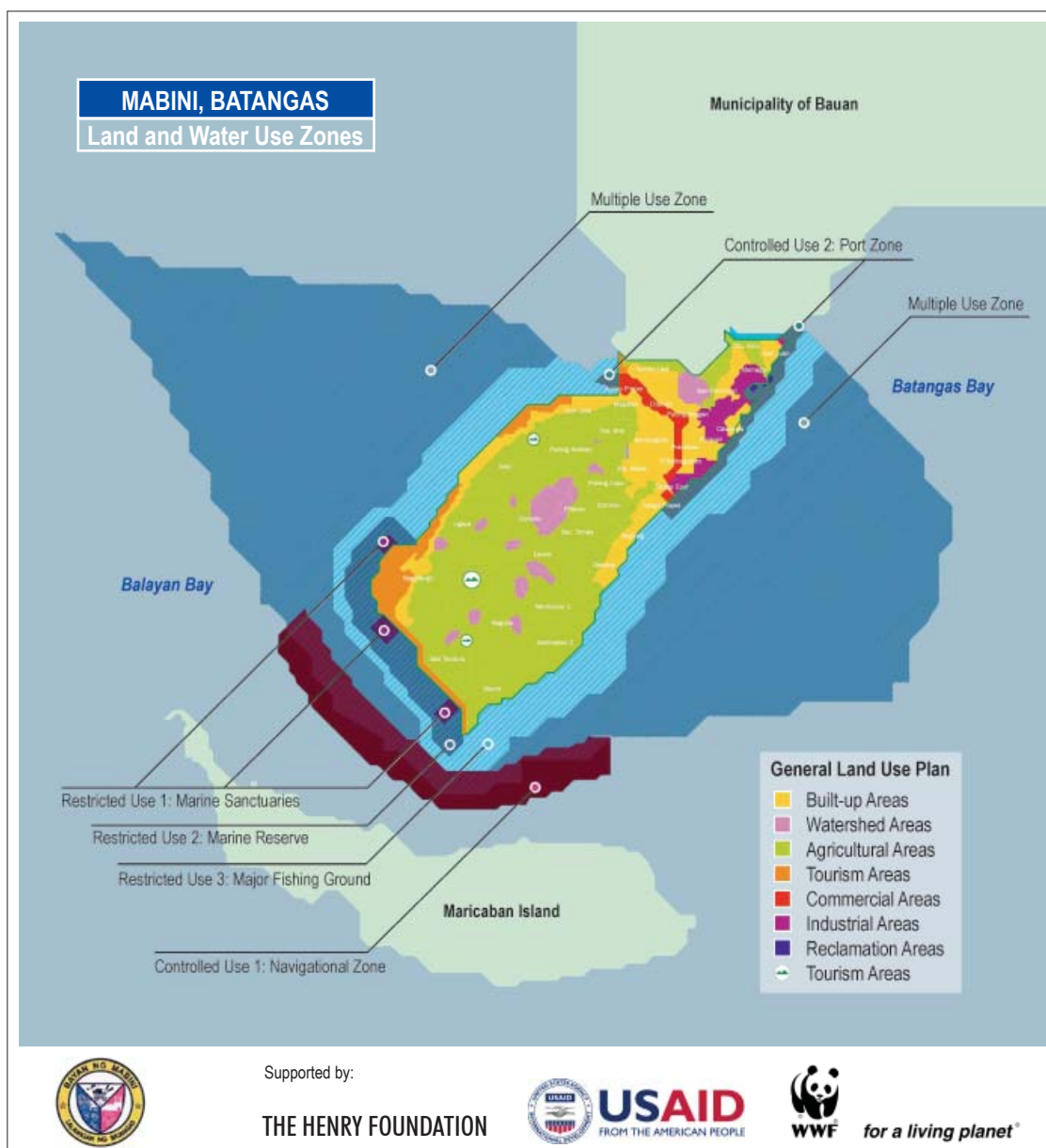
With respect to water use zoning, Mabini has enacted such a regulation through Municipal Ordinance No. 4, 2006 (Figure 4). Nine coastal municipalities included in the survey (Calaca, Calatagan, San Juan, Lobo, Mabini, Tingloy, Balayan, Batangas City, Nasugbu) have passed municipal regulations with respect to fisheries, except Lemery. Batangas City and Calatagan passed Municipal Ordinances (in 1996 and 2006, respectively) that limit fishing in their municipal waters to its own resident fishers. However, only Calatagan enforces this provision. Batangas City reported

that they carefully control the issuance of permits and regularly monitor pollution-related activities, including industrial operations.

Regulations with respect to mining and quarrying are enacted at the provincial level. The Provincial Mining Regulatory Board was established in 1996 and further affirmed through Provincial Ordinance No. 003, 2004, which allocates appropriations for the Board.

Local legislations are posted on bulletin boards located in the municipal and provincial halls and published in local broadsheets for dissemination. Efforts are also being undertaken to translate legislation to Filipino for better understanding of the community.

Figure 4. Land and water use zones for Mabini, Batangas.



Implications and Recommendations

Even in the absence of specific legislation for ICM, general or sectoral legislation can support ICM goals and objectives. However, the existence of ICM legislation serves to incorporate the principles related to sustainable development and specifically to oceans and coasts, supports ICM goals and objectives, sets out processes for institutional cooperation and coordination and lays out ICM management activities and interventions. Furthermore, the effectiveness

of legislation does not necessarily depend on the number of enacted laws but on the commitment of authorities to enforce them. The awareness of the stakeholders on the governing laws in their area is also equally important.

The development and adoption of an ICM law is a significant indication of the extent to which the goals and objectives of ICM are supported by a clear and enforceable legal basis.

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Legislation

007 Administration and monitoring of compliance to legislation

Description

This indicator reports the various types and frequency of inspections conducted in the area to determine compliance with coastal policies and legislation. It further looks into the effectiveness of enforcement of legislation.

Rationale

The available capacity within government to enforce laws and ensure compliance with coastal policy and regulations is paramount to successful implementation of ICM programs. The effective management of illegal and uncontrolled

activities taking place along the coast and in coastal waters is an important step in addressing and minimizing unsustainable practices.

Data Requirements

- Environmental compliance monitoring/inspection programs (e.g., market inspections for fishery violations; aquaculture; manufacturing, coastal polluting and coastal tourism establishments, ports and water transportation)
- Frequency of environmental compliance monitoring/inspection including coastal patrols

Results

The compliance monitoring, inspection and enforcement of coastal regulations and policy is neither systematic nor coordinated across the province. The frequency of inspection and/or monitoring varies from the type of activity being monitored and from one municipality to another.

Fish market inspections are being conducted daily in Mabini, once a month in Lobo, and seasonally in Calatagan while no fish market inspections were reported in Calaca and Balayan. In 2006, 431 fish inspections were conducted in Batangas

City. Most municipalities do not have regular aquaculture inspections but conduct such when the need arises (i.e., when there are complaints). Only six municipalities report that they conduct inspections of coastal tourism establishments on a monthly (Mabini, Calatagan), quarterly (Nasugbu, Bauan) and annual (Tingloy, Calaca) basis. Ports and water transportation inspections on the other hand are being conducted quarterly in Bauan, twice a year in Batangas City and annually in Calaca. Inspections of other coastal polluting establishments varies by

Table 2. Coastal patrol status from April 2006 – February 2007.

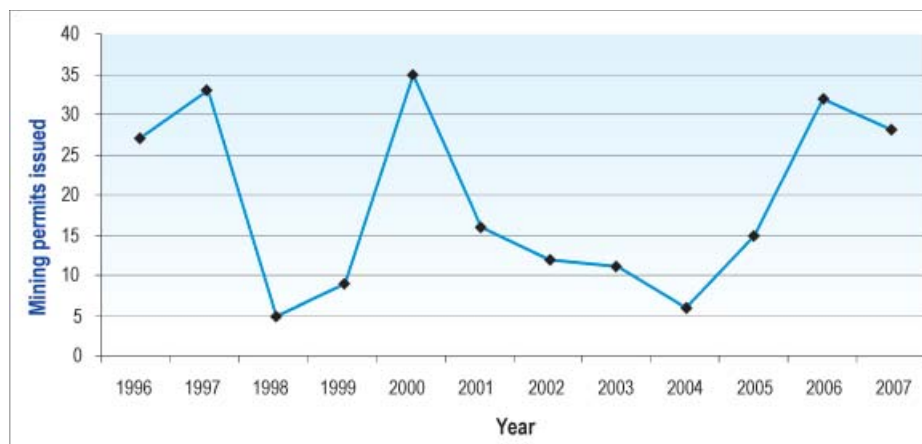
Municipality	Number of Patrol Days	Number of Illegal Fishers Apprehended	Number of Cases Filed	Number of Divers Apprehended
Lobo	25			N/A
Mabini	75	26	3	
Tingloy	82	13	Out of court settlement	9
Balayan	40	6	0	N/A
Calatagan	845	12	3	N/A
Nasugbu	42	22	8	N/A
Total	1,109	79	14	9

Source: Trono and Gutierrez, 2007.

municipality from monthly (Balayan), quarterly (Tingloy, Bauan), twice a year (Batangas City), annually (Nasugbu), or only when there are complaints (Mabini). Mabini reported daily coastal patrols for illegal activities, while other municipalities vary from twice a week (Batangas City), 12 times a month (Tingloy), twice a month (Lobo), to depending on availability of funds for fuel (Nasugbu). From April 2006 to February 2007, a total of 1,109 coastal patrols were reported for six municipalities (Table 2; Trono and Gutierrez, 2007). Compliance inspections of industries are being undertaken quarterly by the Multipartite Monitoring Teams (MMTs).

A total of 229 mining and quarrying permits were issued from 1996 to 2007 (Figure 5). In 2006, 232 manufacturing establishments were recorded in the province. No information was gathered with respect to the number of discharge permits issued in the province. For the regulation of the development of fishponds in the coastal environment, 16 fishpond lease agreements (FLAs) were duly issued by the Department of Agriculture since 1973 to present and covering about 161.64 ha. The highest number of FLAs were issued in 1995 (7 FLAs; 26 ha) but the largest area coverage were issued in 1987 (2 FLAs; 71 ha) (Figure 6; BFAR IV-A, 2007).

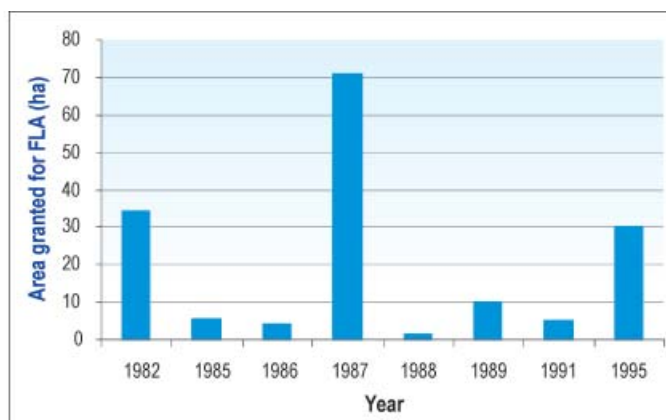
Figure 5. Number of mining permits issued from 1996–2007.





Environmental monitoring of different projects/industries through the Multipartite Monitoring Teams (MMTs).

Figure 6. Area granted for fishpond lease agreement from 1982–1995.



Source: BFAR IV-A, 2007.

Implication and Recommendations

The lack of a systematic approach to compliance monitoring inspection and enforcement of coastal regulations and policies indicates a serious need for capacity development of enforcement activities among the local government units. Opportunities for partnering the efforts of different sectoral agencies with enforcement responsibilities, may be explored as a means of implementing a more cost-

effective and systematic approach to the monitoring and enforcement program across the province. Self-monitoring of municipalities on the implementation of their ordinances and their requirements for compliance with respect to local guidelines can also be beneficial, and will facilitate consolidation and validation at the provincial level.

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Legislation

008 Environmental cases filed/resolved

Description

This indicator reports the total number of cases filed and resolved, and the total value of fines issued for non-compliance of relevant coastal legislations.

Rationale

Effective enforcement of environmental legislation taking place in the marine and coastal areas can be reflected by the number of cases filed, resolved and fines collected resulting

thereof. The strict enforcement of relevant legislation is an important step in addressing and minimizing unsustainable practices in the coastal areas.

Data Requirements

- Total number of reported complaints
- Total number of violations where violators were arrested
- Total number of violations penalized
- Total value of fines collected for non-compliance with relevant legislations

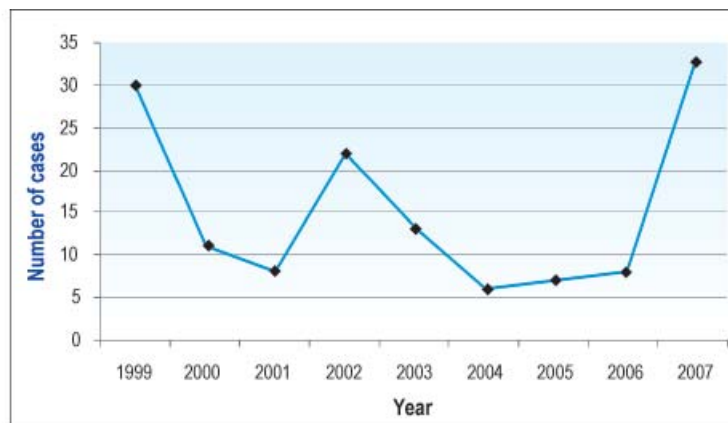
Results

Since 1999, a total of 212 complaint cases of fishery-related violations were reported (Municipal survey, May 2008; Figure 7). The number of cases in 2008 was not included in the graph as it aggregates cases not reported in the specific year. The trend in the number of cases also cannot be assessed since most of the municipalities surveyed only reported cases in 2007 and 2008. Data gathered on violation cases from the survey conducted in the coastal municipalities did not show clear trends but reports compiled by CI-Philippines (2007) showed decreasing violation cases from 2000-2006 (Table 3). Mabini reported that 100 percent of their filed fishery cases were penalized while other municipalities reported 60-90 percent (Municipal

questionnaires, March 2008). Fines imposed for fishery violations in Nasugbu ranged from PhP500 to PhP1,000 per fisher arrested. A total of PhP124,000 was collected in Nasugbu from fines on fishery violations from 2000-2006 while 6 persons were imprisoned in 2000 (5) and 2001 (1). Calatagan reported aggregated collection of PhP500,000 from fines on violations and permit issuances for fisheries violations in the first quarter of 2008.

One of the key partners of the local government in enforcing fishery-related legislation is the *Bantay Dagat* (Sea Watch), a civilian volunteer (normally fisher) patrol force. Six coastal municipalities were involved in stepping up coastal law

Figure 7. Total number of cases of fishery-related violations in 9 coastal municipalities.



enforcement operations focused on fisheries, supported by WWF-Philippines together with *Bantay Dagat* volunteers from 2000–2003 (Table 3). Some municipal fishers reported improvements in their catch during this period in conjunction with the reduction of commercial fishing within municipal waters. Recently, nine coastal municipalities (Balayan, San Juan, Calatagan, Lobo, Mabini, Nasugbu, San Luis, Tingloy, Batangas City) have banded together to form a coastal law enforcement network (*Bantay Dagat* Network) in the province through the facilitation of CI-Philippines and PG-ENRO.

Similarly, better enforcement of mining and quarrying legislations through the Task Force Likas Yaman/Vigilance

for Sustainable Resources (TFLY/VSR) is evident from the increasing number of apprehensions from 17 in 1996 to 101 in 2007 (Figure 8). The revenue generated from fines and taxes also increased from PhP641,999.60 in 1999 to PhP2,267,308.51 in 2006. Revenue generated from foreshore lease from 2004 to 2007 total PhP19M (Morales, 2008. Pers. Comm). Nine pollution-related complaints were also recorded from 2005 to 2007. Inspection reports and recommendations done by PG-ENRO were forwarded to BCRMF for industrial-related pollution for possible mitigation measures and to DENR-EMB for further actions. There are no reports, however, whether these cases were filed in courts.

Table 3. Number of apprehensions for fishery-related violations in Batangas.

Year	Municipalities	Number of Bantay Dagat members	Apprehensions		Average per year	
			Illegal fishers	Cases filed	Illegal fishers	Cases filed
2000–2003	Mabini, Tingloy, San Luis, Calatagan, Nasugbu, Balayan	174	625	70	130	18
2006–2007	Mabini, Tingloy, Calatagan, Nasugbu, Lobo, Balayan, San Luis, San Juan, Batangas City	200	79; 9 divers	14	88	14

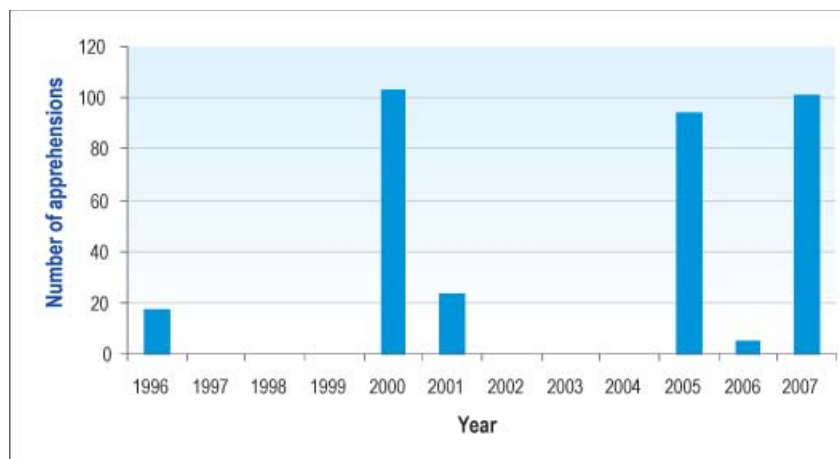
Sources: Gutierrez, 2007 (2000–2003 data); Trono and Gutierrez, 2007 (2006–2007 data).





Strengthened enforcement of legislation on mining and quarrying through the Task Force Likas Yaman/Vigilance for Sustainable Resources program.

Figure 8. Number of apprehensions for mining and quarrying violations from 1996–2007.



Source: PG-ENRO, 1996–2007.

Implication and Recommendations

Better enforcement with respect to fishery-related violations was evident from the decrease in the number of cases filed. Similarly, the increased number of apprehensions and revenue from fines on mining and quarrying violations also indicate improved enforcement. However, the effectiveness of enforcement cannot be assessed with respect to pollution-related violations. The local government has the authority to enforce fishery- and mining-related legislation, while the national government enforces legislation on pollution. Investigations conducted by the local government in response to pollution-related complaints are forwarded to the national government for further action. Upon the turnover of inspection reports and recommendations to the concerned national government agency (DENR), there is no systematic approach for monitoring the status of the legal case.

It is important to adopt a systematic approach of recording and monitoring enforcement data through time as basis for assessment of enforcement effectiveness and input to planning. An improved reporting system, such as submission of the apprehensions report of *Bantay Dagat* to BFAR for monitoring, enforcement and litigation, would streamline the legal process. The establishment of an enforcement network in the province with the PG-ENRO as Secretariat, could also serve a purpose as the repository of information on apprehensions, and facilitator of information sharing across levels of government and enforcement authorities.

Institutionalization of *Bantay Dagat* at the municipal LGUs and the provision of incentives for members may also be considered as a positive and cost-effective means to improve local enforcement.

References

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 Municipal Questionnaires. March 2008.
 PG-ENRO. 1996-2007. Annual Accomplishment Reports.
 Trono and Gutierrez. 2007. Verde Passage Enforcement Strategy presented at the Sulu-Sulawesi Seascape Congress 2007. CI-Philippines.



Information and public awareness

009 Public education and awareness

Description

This indicator reports on communication plans, staff and budget allocations, and public awareness programs initiated by various sectors, and the different communication channels used to promote public awareness.

Rationale

The development and implementation of a well-conceived communication plan promotes increased awareness and education of the general public regarding the value and

benefits of coastal and marine resources, the issues affecting the environment, and the need for coastal management to protect and conserve these resources.

Data Requirements

- Communication plan
- Budget and staff allocation for implementation of communication plan
- Local government’s facilities for public access to information
- Local awareness programs
- Frequency of community participation activities
- Number of participants in community participation activities

Results

A communication plan was developed in 2000 at the provincial level in line with the implementation of ICM in the Batangas Bay Region. From 1996 to 2007, the financial source for the implementation of the communication plan was part of the PhP500,000 allocation for the BBREPC. Currently, PhP400,000 is allocated for public awareness on the environment, which is separate from the BBREPC budget. There is no dedicated communication staff, but the three ICM personnel of PG-ENRO are responsible for the coordination and implementation of the communication plan.

The Province maintains an Environment Library (since 2000) and a website, www.batangascoastalink.net (since 2004), to promote public awareness. Mabini, through its CRM Board, has established a website (www.mabini.gov.ph) as a source of information for coastal resources management. Some municipalities also maintain websites featuring various facts in their communities. Radio broadcasts, environment corner in broadsheets and several public awareness campaigns initiated by various sectors are also conducted regularly.



A well-informed public will appreciate and participate more in ICM programs.

No communication plans have been developed at the municipal level, but municipalities have several public education campaigns to promote environmental awareness. Some municipalities also conduct *barangay* level campaigns particularly on solid waste management. The budget allocation for public education and awareness is incorporated in specific and/or special projects in each of the lead agencies in the municipality. There are no dedicated staff for public education and awareness at the municipal level, but

staff are made available as required for specific activities.

Since 2003, the annual International Coastal Clean up (ICC) has been a regular activity of the province and the coastal municipalities. In 2005, a provincial total of 3,246 volunteers participated in a provincial coastal clean up composed of government and nongovernment agencies, the private sector, academe and other sectors.

Implication and Recommendations

Active stakeholder participation contributes to the success of ICM programs because it creates ownership, thus sustaining support. The Provincial Government has progressed in passing down ownership of the coastal clean up activity to the coastal municipalities to ensure sustained participation in the activity.

A well-informed public, knowledgeable about environment activities and issues, including potential threats to coastal and marine environment, will appreciate and participate

more in ICM programs. Sustaining information and public awareness activities are therefore essential and opportunities for creating public awareness must be maximized.

Production of information and educational materials showcasing best practices of ICM implementation in the Province, as well as identifying the threats to sustainable development of coastal and marine areas, can be very beneficial.

References

Municipal survey for SOC. 2008
 PG-ENRO. 2000. Communication Plan
 PG-ENRO. 2008. Approved work programs for CY 2008.



Information and public awareness

010 Stakeholder participation and mobilization

Description

This indicator reports the number of nongovernmental organizations, civil society groups and other stakeholder organizations who are contributors to sustainable development of the coastal and marine areas.

Rationale

The active involvement of stakeholders reflects their understanding on the value of implementing coastal management and mobilizing activities related to it.

Data Requirements

- Nongovernmental organizations, civil society groups and other stakeholder organizations with environment-related programs and activities
- Types of environment-related programs and activities
- Number of members

Results

Nongovernmental organizations and civil society groups are strong partners in achieving goals of an ICM program. Some of the active groups in the municipalities with coastal management activities are listed in Table 4. *Bantay Dagat* (Sea Watch), a civilian volunteer patrol force composed of fishers, is the key partner of the local government in enforcing fishery-related regulations. *ANAK-Balayan* which has around 900 members, implements programs

on livelihood, public awareness, habitat protection and rehabilitation, and fishery. They also initiated the water quality monitoring in Balayan waters, in partnership with the Batangas Environment Laboratory. SAMMACA is also a strong environmental advocate with programs on organizing, capacity building, policy awareness and networking, livelihood, and habitat protection and rehabilitation.

Table 4. Nongovernmental and people's organizations with coastal management-related activities.

Municipality	Name of organization	Number of members
Nasugbu	Municipal Fisheries Resources and Management Council (MFARMC)	
	HABAGAT	
	KAPITDAMAY	
	Luntiung Nasugbu Multipurpose Cooperative	52
	Nagkakaisang Magsasaka at Mangingisda, Inc.	
Lian	Samahan ng mga Mamamayan ng Calayo, Inc.	
	MFARMC	
Calatagan	Tambuyog	
	SAMMACA	10 chapters in 8 coastal barangays
	MFARMC	
	Bantay Dagat	6 sub-teams; 39 members (2008)
	CapOceans	
	CASEFA	
	BASEFA	
Balayan	Tambuyog	
	ANAK-Balayan	900 (2008)
Calaca	Bantay Dagat	27 (2008)
	MFARMC	50
Lemery	Barangay Fisheries Resources and Management Council (BFARMC)	
	MFARMC	
Taal	Bantay Dagat	13 (2008)
	MFARMC	
San Luis	MFARMC	
Bauan	Batangas Social Development Foundation, Inc. (BSDF)	
	Bauan Chamber of Commerce and Industry, Inc.	
	Kuwarta sa Basura ng Bauan Movement (KKBM), Inc.	
	MFARMC	
	Rotary Club of Bauan	
Mabini	MFARMC	
	Samahan ng mga Mangingisda para sa Kapayapaang Pangkapaligiran (SMKP 2000)	13
	Samahan ng Malilit na Mangingisda	63
	Samahan ng mga Mangingisda sa Talaga East	45
	Kapisanan ng Muling Pag-asa	14
	Bantay Dagat	26 (2008)
	Samahang Pangkaunlaran ng San Teodoro, Inc (SPSTI)	
Tingloy	Marine Reserve-Resource Executive Committee	
	Bantay Dagat	21 (2008)
	Batalang Bato Management Council	
	Center for Advanced Philippine Studies (CAPS)	5
	Coastal Conservation and Education Foundation (formerly Sulu Fund)	
	MFARMC	13 BFARMC (except Brgys. Papaya and Maricaban)
	Pangkaunlarang Kilusan Tungo sa Kalinisan (PKK) Inc.	106
San Juan	Samahan Tungo sa Kaunlaran ng Sto. Tomas, Inc. (STKST)	65
	Bantay Dagat	38 (2008)
Lobo	US Peace Corps Volunteers	
	Bantay Dagat	18 (2008)
Batangas City	Member: Philippines Locally Managed Marine Area (PLMMA) – country-wide network	
	Bantay Dagat	86 (2008)
Baywide/ Province-wide	Balayan Bay Integrated FARMC (BBIFARMC)	established in 2004 but is inactive
	Bantay Dagat Network	
	World Wide Fund for Nature-Philippines (WWF-Philippines)	
	Conservation International-Philippines (CI-Philippines)	
	Batangas Coastal Resources Management Foundation (BCRMF)	
	First Philippine Conservation, Inc. (FPCI) (Tingloy and Verde Island)	
Batangas Bay Region Environment Cooperative (BBREC)		

Sources: WWF-Pilippines, 2004; Municipal survey, 2008.





SAMMACA implements habitat protection and rehabilitation such as mangrove reforestation.



ANAK-Balayan conducts water sampling.



ANAK-Balayan conducts mangrove planting.



Implication and Recommendations

The presence of active groups and organizations in the province implementing coastal management activities is an advantage in achieving sustainable development goals.

As such, strengthening partnership and maximizing partnership opportunities is essential for coastal management.

References

Municipal survey for SOC. 2008.
WWF-Philippines. 2004. Coastal Area Profile of Balayan Bay.

Capacity Development

011 Availability/Accessibility

Description

This indicator reports access to facilities and training programs, staff and budget allocation, and technical resources available for coastal management. It also measures the extent to which local personnel can impart

their knowledge and experiences in coastal management as well as the presence of universities, research institutions and local experts in the area.

Rationale

Building local capacity to plan and manage their own resources is essential in ICM programs. Similarly, access to facilities and training programs, and budget allocation are essential in building local capacity. Local capacity is also enhanced by the availability of institutions such as universities, research institutions and local experts, which

can be tapped in implementing coastal management activities, and training and education programs. Local personnel with the appropriate skills must be able to impart their knowledge and experiences in coastal management to other coastal and natural resource managers.

Data Requirements

- Access to facilities and training programs
- Staff and budget allocation for capacity development
- List of experts
- Universities and research institutions in the area with related courses/research activities
- Local capacity to conduct trainings

Results

In 1996, PG-ENRO started operations with 19 staff. Currently, it has 23 technical staff. At the municipal level, personnel allocation ranged from 2 to 30 staff for coastal resources, fisheries and solid waste management. In 2008, PG-ENRO has PhP535,000 allocation for capacity development incorporated in the special projects budget (PhP5.3M) of the office. At the municipal level, allocation ranges from PhP30,000 to PhP150,000, mostly for enforcement or training and deputization of *Bantay Dagat* volunteers.

The ICM Training Center established at PG-ENRO in 1999 has been a venue for study tours and cross-site visits from within the Philippines and other countries. ICM orientation and sharing of lessons learned and practical experiences in implementing ICM are conducted by PG-ENRO staff to hundreds of participants of study tours and cross-site visits. Formal ICM training courses are not yet being conducted because training materials are not yet available.



The PG-ENRO shares its experiences in ICM by hosting study tours and cross-site visits.

Several universities and research institutions are also located in the area, which can be partners in implementing ICM programs and projects. For example, *Tanggol Kalikasan*, together with the Batangas State University, has established the Institute for Environmental

Governance. No information has been gathered with respect to ICM-related courses being offered in the universities. A roster of individuals from various agencies has been prepared for accessing technical support for ICM-related undertakings.

Implications and Recommendations

Strengthening technical and management skills at the local level is a mark of sustainability for ICM programs. With knowledgeable local managers, ICM programs can be sustained even after the assistance of other entities comes to a close. These trained local personnel must be able to impart their knowledge to other coastal managers in and outside the area. Experts from local institutions can also be tapped for technical training and guidance in relation to coastal management.

The ICM Training Center in Batangas is a valuable resource of the Province, with the potential for building and maintaining ICM awareness and capacities among its municipalities and cities, and the region. An ICM training

program, with associated schedules, needs to be developed and implemented, possibly in partnership with concerned national agencies and international organizations.

The compilation of documents on basic information for coastal management as well as the consolidation of best practices in ICM implementation in the Province are valuable resources that will benefit new coastal managers. Cross-site visits for municipal coastal managers can also be beneficial. Apart from the roster of experts at the provincial level, a similar list can be developed at the municipal level to serve as a pool for technical resources in the province.

References

PG-ENRO. 2008. Approved work programs for CY 2008.
Municipal survey for SOC. 2008



Capacity Development

012 Human resource capacity

Description

This indicator measures local capacity in implementing coastal management in terms of skilled human resources.

Rationale

The knowledge and skills of local personnel are essential for effective implementation of coastal management.

Data Requirements

- Number of people trained in ICM
- Number of skilled personnel working in ICM programs
- Number of graduates in ICM-related courses
- Number of required ICM trained people

Results

To date, 64 staff from local government units (LGUs), including Mayors, and 27 provincial staff, including 23 PG-ENRO staff, are trained in ICM. Of the 64 trained from LGUs, 27 are currently working in positions related to coastal management. ICM training was conducted on-site by PEMSEA (1995, 1996, 1998); WWF-Philippines/SEARCA (2001, 2006) and CI-Philippines/PCAMRD (2006). PG-ENRO personnel (3) allocated for ICM are university graduates in social and natural sciences.

Of the 15 coastal city and municipalities in the Province; all have planning departments (MPDC); 5 city/municipalities (Mabini, Lemery, Nasugbu, Batangas City, Balayan) have Municipal Environment and Natural Resources Officer staff

positions (MENRO); 2 municipalities (Lobo, Calatagan) have staff who are hired for other positions but were given additional tasks/designation as MENRO; while 8 municipalities (Tingloy, San Juan, Bauan, Calaca, Lian, San Luis, San Pascual, Taal) have no environment office/officers. San Pascual also phased out its Municipal Agriculture Office. The distributions of trained LGU staff that are working in ICM are: Batangas City (2); Lobo (5); Mabini (3); Calatagan (2); Bauan (4); Calaca (2); San Juan (1); Tingloy (2); Balayan (2); Nasugbu (2); Lemery (1); San Luis (1); Taal (0); San Pascual (0); and Lian (0). Most of the delegated personnel at the municipal level are graduates of science-related courses (e.g., agriculture, fisheries, marine engineering) and those who are not have undergone various skills training.



Knowledge and skills of local government personnel are essential for effective implementation of ICM.

Capacity needs identified at the municipal level are basic training on coastal management, coastal law enforcement, solid waste management, stock assessment, advanced fishery management, data management and analysis of

biophysical and socioeconomic indicators. In addition, there is a need for skills in community organizing and mobilization activities. Batangas City, Calaca and Lemery specifically identify the need for ICM training.

Implications and Recommendations

Most of the personnel allocated for coastal management-related functions have backgrounds and training needed for coastal management implementation. The enhancement of personnel skills is a continuing process. As such, the training needs identified by the various municipalities can be considered and the capacity of the Provincial Government, as well as local experts, to

provide the training must be determined. A more strategic approach would be to determine who gets trained and what level of training is needed. A tracking system to determine if those trained are using their newly acquired skills, and monitoring the effectiveness of trainings conducted, are also part of a more strategic approach to capacity development.

Reference

Municipal survey for SOC. May 2008.



Financing Mechanisms

013 Budget for integrated coastal management

Description

This indicator reports the financial requirements for coastal management and the government allocation including investments for environmental infrastructure. It also looks

into the financial sources for coastal management, such as loans, and grants from financing institutions and donors.

Rationale

The activities for coastal management have specific budgetary requirements and thus need financial allocation for their implementation.

Data Requirements

- Total budget identified for coastal management
- Total budget allocated by LGU
- Total expenditure for coastal management
- Grants and loans from external sources
- Investments in environmental infrastructure

Results

The annual allocation for PG-ENRO operations increased from PhP4,151,896 in 1996 to PhP17,299,234 in 2007. In 2008, PhP12.1M was allocated for PG-ENRO operations including PhP5.3M for special environmental projects (Table 5).

The budget requested for coastal management (2005-2008) in the Batangas Province SEMP was about

PhP295M. The budget allocated by the Provincial Government for PG-ENRO operations totaled PhP39M (2005-2008). Allocations for other sectors, such as agriculture, safe water supply and sanitation, and health, was approximately PhP325M in 2008. Though not directly linked to the SEMP (safe water supply, sanitation and health), these still contribute to the overall goal of sustainable coastal development. Thus, the actual

Table 5. Approved PG-ENRO Work Programs for CY 2008.

Program / Project	Amount
Provincial Environmental and Solid Waste Management Program	150,000
Bay Regions' Integrated Coastal Management	150,000
Environment and Natural Resources Management Projects	5,000,000
a. Marine and Coastal Biodiversity Conservation Project	580,000
b. Forest Management Project	300,000
c. Parks Management – Taal Lake and Pansipit River Improvement Project	300,000
d. Mines and Geosciences Regulation	470,000
e. Information and Education Campaign	400,000
f. Formulation of Batangas Environment Code	1,500,000
g. Water and Air Quality Monitoring Project	1,450,000

amount spent for coastal management may be more than what is projected considering that municipalities also have counterpart budget (PhP331M for six municipalities) for coastal management.

Grants from financing institutions and other donors are also financial sources for coastal management. The First Philippine Conservation, Inc. (FPCI) has allocated a US\$1M fund for environmental projects in the Verde Island Passage Marine Corridor. The Batangas Coastal Resources Management Foundation (BCRMF), an organization of industries in the province, has also been a partner for ICM

implementation in the province and has various environment-related projects ranging from public awareness to habitat restoration and protection. PEMSEA together with other partners (CI-Philippines, WWF-Philippines among others) have also contributed funds for coastal management implementation in the province. PEMSEA has allocated more than PhP39M (1US\$ = PhP50) from 1996–2003. CI-Philippines contributed as much as PhP16.25M (1US\$ = PhP50) in the last three years (CI-Philippines, 2008), while WWF-Philippines allocated an estimated PhP2.2M in 2006 (WWF-Philippines, 2006) for coastal management activities and projects in the Province.

Implications and Recommendations

Local governments' commitment for sustainable development is reflected through continuous allocation of financial resources not only for those identified in the coastal management plans but to other related sectors. Apart from government allocations, financial donors and coastal management partners are equally relevant in supporting coastal management programs and activities. The presence of active partners in coastal management is a great advantage for the Province. As such, partnerships

need to be nurtured and strengthened in order to maximize opportunities.

There is room for improved tracking of budget allocations, budget expenditures, and their contribution to the SEMP objectives and targets, among the concerned agencies. In addition, coastal municipalities may consider enhancing their budget for ICM as a positive means to improving marine and coastal resource management.

References

- CI-Philippines. 2008. Personal Communication.
Municipal survey for SOC. May 2008.
Provincial Government of Batangas/PG-Environment and Natural Resources Office (PG-ENRO)/PEMSEA. 2005. Strategic Environmental Management Plan 2005-2020. Province of Batangas.
WWF-Philippines. 2006. Annual Report.



Financing Mechanisms

014 Sustainable financing mechanisms

Description

This indicator takes account of the institutionalization of measures and means to support environmental conservation and environmental infrastructure improvements. Economic and market-based instruments, such as public-private partnerships, environmental user fees, user pay schemes, and corporate social responsibility

(CSR) programs are among the tools being considered. The indicator also considers policies and programs put in place to enhance the climate for public and private sector financing of coastal management activities and for constructing and operating environmental infrastructure.

Rationale

Financial support for coastal management implementation may come from different sources. The sustainability of ICM programs is dependent on how revenue sources are developed and managed.

allocation from the government, various financing options must be explored to sustain financial inputs for coastal management activities and environmental infrastructure and service.

Transparency in all financial transactions is necessary to avoid suspicion from stakeholders. Apart from regular

Data Requirements

- Corporate social responsibility
- Private sector financing (e.g., PPP)
- Environment user fees
- Percentage of environmental user fees allocated to environment projects
- Private sector investment for environmental infrastructure
- Standard procurement process in place (e.g., defined ceilings for bidding, canvassing, and shopping)
- Provincial/city/municipality authorized to engage in public-private partnership

Results

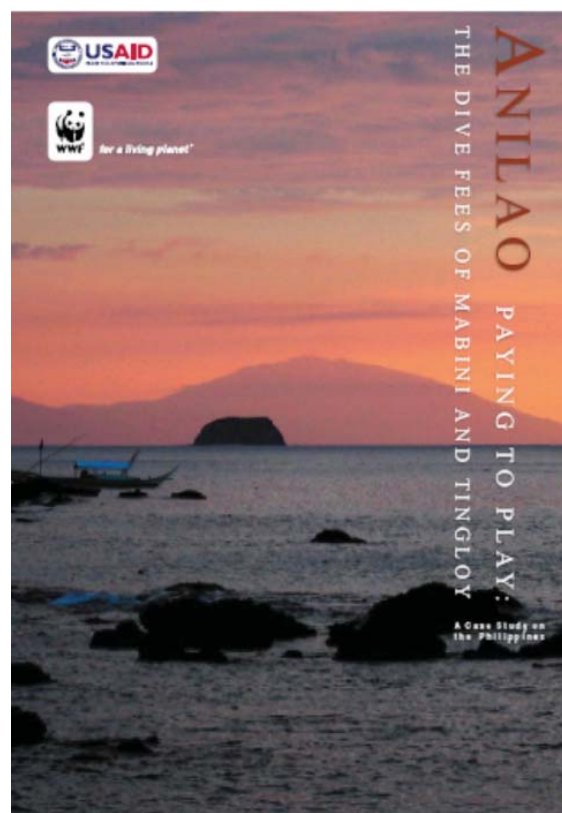
In Mabini and Tingloy, divers' fees have been implemented since 2003. The collection of fees increased from PhP225,000 in 2003 to PhP2.5M in 2007. Eighty-five percent and eighty percent of the fees collected in Mabini

and Tingloy, respectively, are utilized for management of the coastal areas and resources. A case study, *Anilao: Paying to Play, The Dive Fees of Mabini and Tingloy* published by USAID and WWF-Philippines (2007) shares the success

story of the implementation of environmental user fees in the two municipalities. Both municipalities have established environmental funds.

In Calatagan, 70 percent of collection from registration of fishers and boats, as well as fines from fishery violations, are allocated for coastal resource management. Calaca is targeting for the allocation of 70 percent of the fisheries registration fees for FARMC livelihood projects by 2009.

The Standard Philippine Government Procurement Process is being followed for procurement processes. The Province is authorized to engage in PPP. In 1998, a PPP proposal for the construction of an integrated solid waste management facility was developed. However, the project did not materialize as it did not gain social acceptance.



The experiences of Mabini and Tingloy in their implementation of environmental user fees were shared in a case study.

Implications and Recommendations

Revenue generated from the use of the environment must be maximized and allocated for environmental protection and conservation. The creation of a more conducive climate for investment by donors and the private sector is important. Good governance and transparency are keys to creating the necessary climate for investment. Though regular allocation from the government is a sustainable

financial source for coastal management, it may not be sufficient to implement all coastal management activities. Environmental infrastructure projects, for example, entail large investments and may require other financing means. The participation of private sector investors and operating companies is an option to be considered in such projects.

References

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 Sollestre, Loreta. PG-ENRO. 2008. Personal Communication.
 Villas, Luzviminda. MENRO-Mabini. 2008. Personal Communication



Natural and Man-made Hazard Prevention and Management

015 Level of preparedness for disasters

Description

This indicator measures the availability of disaster preparedness and management plans, capable people, equipment, budget and preparations to anticipate, reduce, respond to, and recover from various hazards/disasters.

Rationale

Local communities and disaster management personnel must be prepared to respond to various hazards, if the number of deaths and property losses due to natural and man-made

hazards are to be minimized. Moreover, proper preparation and mitigation measures can reduce the frequency of man-made hazards and severity of disasters.

Data Requirements

- Natural/man-made disaster/environmental emergency response plans
- Scope of natural/man-made disaster/environmental emergency response plan (e.g., floods, earthquakes, oil spill, etc.)
- Identification of mitigation strategies
- Institutional mechanism for the implementation of the emergency response plan
- Number of trained and non-trained personnel allocated
- Early warning system in place
- Availability of adequate equipment
- Budget allocation for natural/man-made disasters

Results

The Provincial Disaster Coordinating Council (PDCC) of Batangas through the Provincial Assistance for Community Development (PACD) of the Batangas Provincial Government has developed a second edition Disaster Calamities and Preparedness Plan in the early 1990s, with the third

edition currently being prepared. The provincial disaster contingency plan (PACD, 2005) covers terrorism, earthquakes, volcanic eruptions, fire, typhoons and corresponding mitigation strategies (e.g., orientation of personnel, disaster operation center — physical facility

Table 6. Number of barangay (Brgy.) and individuals (Ind.) in selected municipalities affected by floods.

Municipality	Category 1		Category 2		Category 3		Category 4		Category 5	
	Brgy.	Ind.	Brgy.	Ind.	Brgy.	Ind.	Brgy.	Ind.	Brgy.	Ind.
	Almost flooded as a result of heavy rains aggravated by high tide or rise in water level or nearby seas, lakes, rivers, etc.		Flooded only after several days of heavy and continuous rains with subsequent rise in water level of lakes, seas, dikes, rivers and canals.		Flooded only after several days of exceptionally heavy or continuous rains.		Never experienced flood but present environmental conditions in the area warrant LGUs' proneness to flood and flashfloods, landslides and mudslides.		LGUs with residential areas, national and provincial road networks prone to landslide and mudslides.	
Balayan	13	18,501	3	23,032	8	21,463	4	6,218	0	0
Bauan	3	5,032	13	21,530	0	0	1	491	0	0
Calaca	7	11,395	8	10,442	5	9,915	4	3,355	0	0
Calatagan	5	10,206	15	25,819	0	0	1	1,581	0	0
Lemery	12	16,599	6	7,041	4	5,134	0	0	4	4,202
Lian	5	2,651	5	1,925	1	288	1	288	1	296
Lobo	0	0	4	5,351	3	5,284	11	9,279	5	7,332
Mabini	0	0	2	2,608	0	0	2	3,374	0	0
Nasugbu	11	28,876	26	53,013	26	53,013	2	3,168	0	0
San Juan	0	0	8	15,557	8	14,707	18	27,719	0	0
San Luis	0	0	0	0	5	7,588	5	5,843	0	0
San Pascual	0	0	0	0	6	2,450	0	0	0	0
Sta. Teresita	5	5,072	3	2,840	17	14,009	0	0	0	0
Sto. Tomas	0	0	14	33,851	3	3,838	0	0	4	15,006
Taal	1	3,742	1	1,260	4	6,142	0	0	3	4,774
Tingloy	2	5,400	2	400	2	1,200	0	0	1	1,000

Source: PDCC, 1993.

with supplies,) and a communication system and partners for communicating among the local communities. The disaster plan describes the roles and contact persons of various partners in disaster management. Table 6 lists the number of *barangay* (village) and individuals in selected municipalities identified to be at risk in times of floods.

At the provincial level, all staff of the PACD have been oriented in disaster management. One person from each of the agencies in the provincial coordinating mechanism, as well as medical respondents, had been trained for rescue

operations. There is an equivalent of one full-time person tasked with disaster management (including maintaining disaster preparedness). Five percent of the provincial budget set aside for disasters may be mobilized only in the event of a disaster, but no other budget or funding (e.g., for disaster preparedness) has been allocated or identified. There is a pending request for a disaster drill to better determine disaster preparedness but funds were not allocated for this.

Only 6 (Balayan, Calaca, Cuenca, Mataas na Kahoy, Nasugbu and San Nicolas) out of 32 municipalities have a





Demonstration of oil spill equipment by Caltex, an oil company located in Batangas.

disaster contingency plan. An institutional mechanism for disaster coordination is mandated for the national, provincial, municipal and village levels by virtue of Presidential Decree 1566 of 1978.

An average of PhP62,500 per annum per municipality has been allocated specifically for disaster preparedness and coordination. Budgets were also reportedly allocated for shoreline protection and flood control infrastructure and maintenance (based upon 10 coastal municipalities surveyed in 2008).

As of a 2005 assessment, 28 out of 32 municipalities/cities had a designated lead person for disaster management but only 11 of these persons were properly oriented on disaster management. Six municipalities/cities had a disaster coordinating council (DCC) that was being adequately

oriented. Of these 6, only Balayan and Calaca are coastal. As of 2005, 7 out of 32 municipalities had a disaster operation center with adequate supplies. The Taal Volcano contingency plan includes an early warning system.

There are eight active Communicators Groups established in the province particularly in Balayan, Calatagan, Nasugbu, Bauan and four in Batangas City that serve as partners of the Municipal DCCs. Calaca, which regularly convenes its disaster coordinating council and alerts key village personnel whenever storm signal #2 is raised, has not lost a human life to a storm since it began implementing its disaster preparedness plans in 1998.

With regards to shipping, a Vessel Traffic Management System for Batangas and Balayan Bay equipped with monitoring radar is currently established in the Province.



Implications and Recommendations

Maintaining readiness requires continuous investment even if benefits will only be realized when disaster strikes. Despite its exemplary history of developing and periodically updating its provincial disaster management plan, municipality/city disaster preparedness is low partly due to staff turnover. Updating the 2005 assessment of municipality/city preparedness for disasters could provide valuable information regarding personnel for training and further facilitate municipality/city disaster preparedness.

Also, considering the concentration of industrial facilities and operations in Batangas Province, the inclusion of man-made hazards and preparedness, including maritime oil and chemical spills, in the coverage of disaster planning would be relevant. Updating of the Provincial Disaster Contingency Plans to include oil and chemical spills as well as soil erosion is required (Batangas Province is the 2nd province in the Philippines at risk in terms of soil erosion/landslides). The Oil Spill Contingency Plan being developed by the

Philippine Coast Guard, and contingency plans prepared by the chemical industries can be integrated into the Provincial Disaster Contingency Plan. Cities and municipalities are also encouraged to develop Contingency Plans aligned with the Province. The integration of disaster risk reduction management in the development of investment and other plans will be useful.

Strengthened compliance with relevant international (e.g., MARPOL) conventions and national laws will also be beneficial.

Global warming and climate change are issues that are currently not being considered. These must however be recognized as threats in order to plan for adaptation and mitigation measures that can be applied. An assessment of the potential impacts in the Province can be considered in future researches.

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Natural and Man-made Hazard Prevention and Management

016 Degree of vulnerability to disasters

Description

This indicator measures the degree to which populations are at risk of exposure to natural and man-made hazards, i.e., populations living within various multihazard zones.

Rationale

The greater the degree of potential exposure to natural and man-made hazards, the more that government and local communities should be prepared and must put in place

mitigation measures for disasters. Identification of the levels of threat from various hazards can also help focus preparations on the most relevant types of threat.

Data Requirements

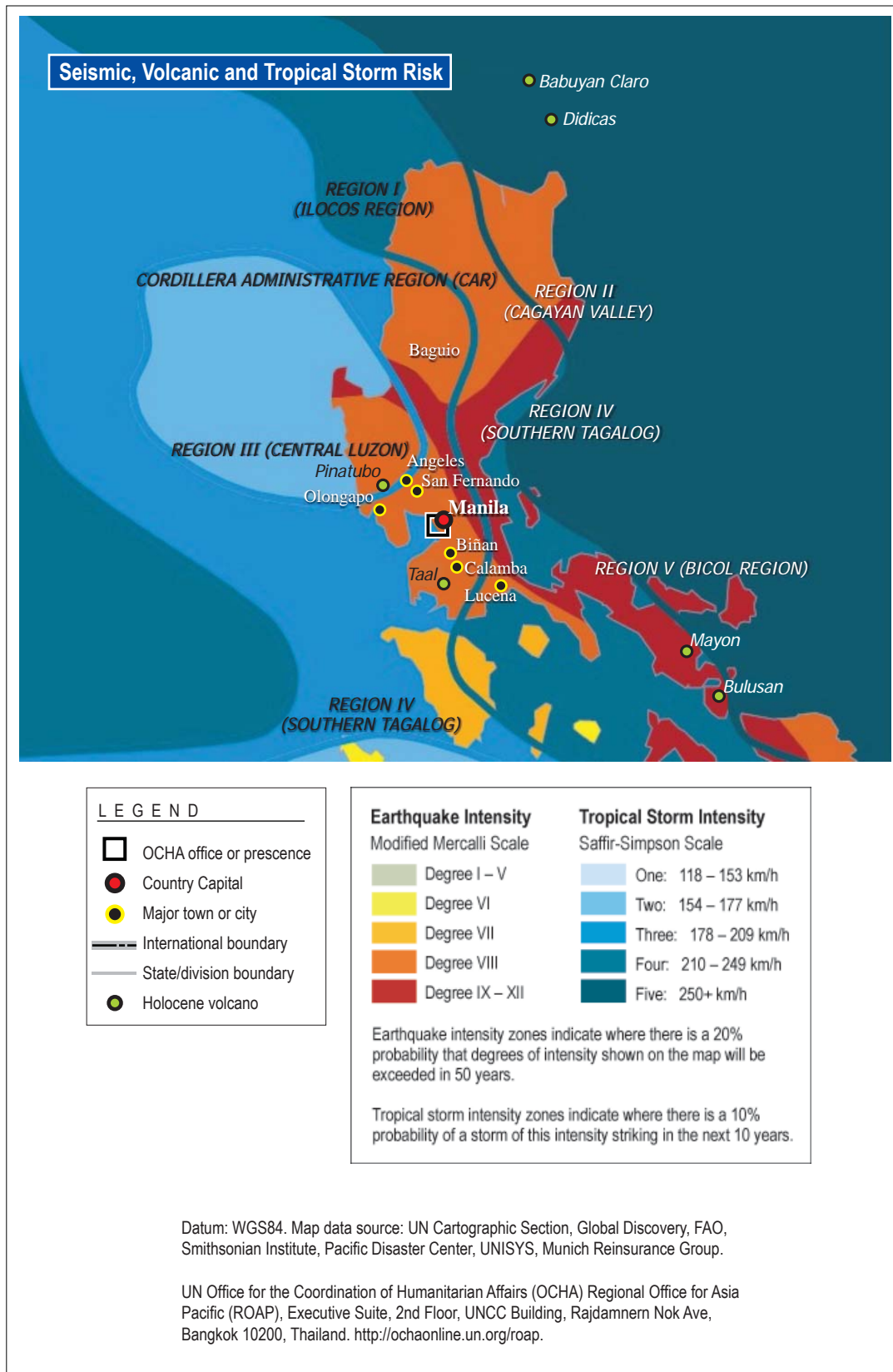
- Multihazard maps (landslides, storms, floods, etc.)
- Number of people located in hazard-prone areas
- Number of people who have relocated or moved away from hazard-prone areas

Results

An assessment of natural hazards in the Philippines estimates that there is a 20 percent probability that an earthquake exceeding Degree VIII intensity on the Modified Mercalli Scale will affect Batangas within 50 years. The assessment also estimates that there is a 10 percent probability that a storm of 210-249 km/h will strike the Lobo-San Juan area within the next 10 years while a storm of 178-209 km/h will strike the rest of the Batangas coast within the next 10 years (Figure 9; Munich Reinsurance Company, 2006).

Although not in map form, an assessment of the level of vulnerability of each village in each municipality to various levels of flood and storm threats is available. Of 15 coastal municipalities in Batangas, 64 villages (approximately 107,000 people — mainly in Nasugbu, Balayan, Lemery and Calaca) are categorized as “almost flooded as a result of heavy rains aggravated by high tide or rise in water level or nearby seas, lakes, rivers, etc.” Ninety-six villages (approximately 171,000 people — mainly in Nasugbu, Calatagan, Balayan, Bauan and San Juan) fall under “flooded

Figure 9. Natural hazards assessment of the Philippines.





Taal Volcano is active and is a recognized natural hazard in Batangas Province.

only after several days of heavy and continuous rains with subsequent rise in water level or lakes, seas, dikes, rivers and canals” (Table 6). A rapid survey of various coastal municipalities showed that residences were precariously positioned along the coasts of Lobo, Batangas City and Balayan.

An estimated 5,000 people live near the crater of Taal Volcano and remain at risk in case of its eruption. This population has not been permanently relocated but

their temporary relocation including details of shelter assignments for the communities are described in the Taal Volcano contingency plan. Coastal municipalities that are at high risk in cases of the volcano’s eruption are Calaca, Lemery, Taal and San Luis; those in less danger include Calatagan, Balayan, Bauan and Mabini (Taal Volcano Hazard Zones, p 119, Paw, et al., 1997). Faultlines are also inferred along the coasts of Batangas City, Mabini and Lobo (MGB, 2004). Batangas City, Mabini, and Tingloy are the municipalities at high risk of oil spills (Paw, et al., 1997).



Communities along the coasts are highly vulnerable in the event of storms, floods and rise in sea levels.

Natural and Man-made Hazard Prevention and Management

Degree of vulnerability to disasters



Implications and Recommendations

It is important that better assessment of the condition of residents living in danger areas along the coast be conducted. The local government can also look into a support program for residents near Taal Volcano and those living in the foreshore for relocation to safer areas.

References

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 Provincial Assistance for Community Development (Batangas, Philippines). 2005. Disaster Contingency Plan.

Natural and Man-made Hazard Prevention and Management

017 Social and economic losses due to disasters

Description

This indicator measures the population affected, deaths and economic losses due to each type of disaster (including the severity of the cause of disaster). It is a measure that integrates: (a) the level and location

of hazards vis-à-vis populations; and (b) the level of preparedness and response mechanisms that result in the frequency and severity of actual disasters.

Rationale

Disasters set back development and especially impacts those least developed. The number of deaths, people and property affected are what hazard prevention and management ultimately aims to reduce.

Data Requirements

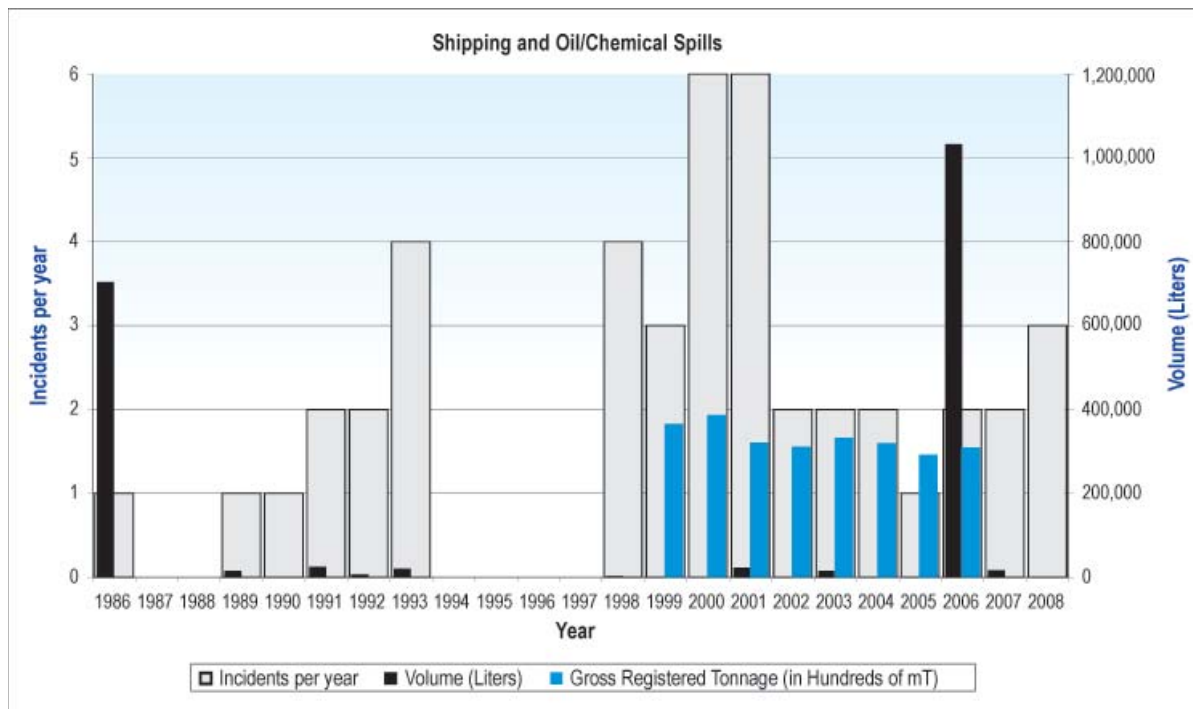
- Frequency of disaster incidents by type
- Number of people severely affected by natural/man-made disaster incidents
- Number of people that have died due to natural/man-made disaster incidents
- Total amount of economic losses due to natural/man-made disaster incidents

Results

Despite loss estimates originating from municipalities to provinces to national records and international databases, trends of losses at the provincial level are not being collected and collated. Consequently, trends of social and economic losses due to disasters were not determined in this initial SOC. In 2006, it was reported that at least 15,150 families in Batangas were affected by super typhoons including Sepat/Egay, Xangsane/Milenyo and Durian/Reming (PACD, pers. comm.). A total of PhP115M were reported as costs incurred resulting from these typhoons, as well as damages from 25 separate fire incidences.

Man-made hazards include spillage related to the manufacturing and shipping industries. After reaching a high of 6 in 2000–2001, the number of incidences of oil and chemical spills has been declining. However, the largest single spillage since 1986 occurred in 2006 (more than one million liters) and 3 spills have occurred in 2008 (Figure 10, Marine Environmental Protection Group, 2008). While the number of fire incidents from 2000 to 2003 is increasing, the total value of damage has decreased (NSCB, 2002; 2005).

Figure 10. Volume of shipping (gross registered tonnage), oil and chemical spill incidents in Batangas Province (data were not available for 1994–1997).



Implications and Recommendations

Trends of deaths, people and property affected due to natural and man-made disasters are currently not available for local performance monitoring and plan adjustment. Systematic recording and compilation of disaster incidents, and social and economic losses are important so that trends may be analyzed and management interventions

can be adjusted. A systematic reporting system for disasters (e.g., including industrial and transport accidents) could be designed to contain information on damages and responses, including reports that simply state that no losses were incurred for the year or the particular incident.

References

- Marine Environmental Protection Group. 2008. Philippine Coast Guard. Batangas Province.
- NSCB. 2002. Batangas Fact Sheet.
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Habitat Protection, Restoration and Management

018 Habitat management plan and implementation

Description

This indicator measures the availability of plans, people, and budget to manage coastal habitats and heritage.

Rationale

Coastal habitats serve as critical life-support systems for a multitude of aquatic living resources. The quality of these habitats must be maintained and improved to sustain their benefits. Local governments need to identify specific

strategies and action plans for habitats and the means to implement these action plans indicate the degree to which habitats will be effectively managed.

Data Requirements

- Availability of habitat management plan
- Staff and budget allocation for habitat management

Results

The Strategic Environmental Management Plan (SEMP) for Batangas includes a component on habitat management. Given that the SEMP has been adopted by the Legislative Board, its Action Program 3 on Habitat Restoration and Management has also been adopted. Land use plans developed per municipality/city also sometimes include elements of sea use. In addition, in 2007, a Verde Island Passage Marine Corridor Management Plan Framework was developed in response to the President's Executive Order 578 (2006), prescribing implementation of a national policy on biodiversity specifically in Verde Island Passage.

In 2008, there are three PG-ENRO personnel for Parks, Protected Areas and Wildlife, and three PG-ENRO

personnel for Forest Management. Budget allocation (2008) for habitat management include PhP580,000 for coastal and marine conservation, PhP300,000 for Taal Lake and Pansipit River management (Parks Management), and PhP300,000 for forest management.

The provincial staff and budget allocation for coastal heritage management was not available.

At the municipal level, the ICRM Plan for Mabini includes management of coastal and marine resources. Most of the municipalities do not have coastal management plans, and thus specific habitat management plans are not available.



Coastal habitats serve as critical life-support systems for a multitude of aquatic living resources, and as life-saving belts for coastal communities.



Implications and Recommendations

The Batangas Province SEMP 2005-2020 identified habitat restoration and management as one of its action programs, and specifically identifies management strategies focusing on: a) protected area management; b) rehabilitation of degraded habitats and ecosystems; and c) urban greenbelts and waterfront reserves. The implementation of these action plans needs to be monitored and evaluated in order to assess the effectiveness of management interventions in achieving targets. Also, based on the proposed coastal use zoning scheme, areas where habitat and fishery resources were located can serve as basis in prioritizing areas for conservation and management.

The development and adoption of a coastal use zoning scheme in the Province as well as in the cities and municipalities would be relevant. Similarly, the Philippine Coast Guard (PCG), which currently is formulating the Oil Spill Contingency Plan for the Province, needs information on the location of coastal habitats (e.g., mangroves, coral reefs, sanctuaries) in order to include these as critical areas for protection.

Reference

Municipal survey for SOC. May 2008.

Habitat Protection, Restoration and Management

019 Areal extent of habitats

Description

This indicator measures the area of various natural habitats (coral reefs, seagrass beds, mangrove forests, beaches, forests, urban green areas).

Rationale

Natural habitats and associated species help sustain products and services that support and benefit human activities. The extent and condition of various habitats also indicate the populations of associated species.

Data Requirements

- Total area (km²) of coastal habitats — coral reef, seagrass, mangrove, natural beach, forest (excluding mangroves), and urban “green” area

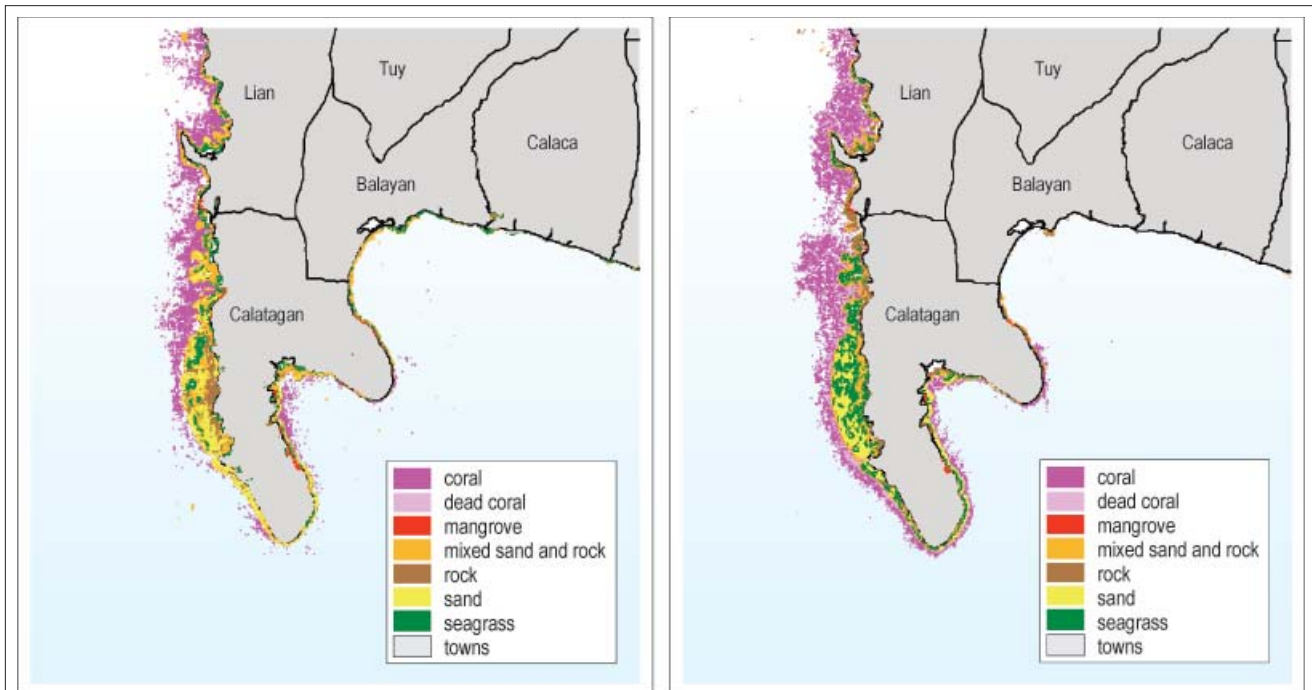
Results

The Verde Island Passage (the area between the coast of Batangas and the coast of Mindoro) is considered to be the center of the global center of marine biological diversity (Carpenter and Springer, 2005). Perception maps indicate mangroves are concentrated in Calatagan while coral reefs are concentrated in Mabini, Tingloy and Batangas City (CI-Philippines, 2007). DENR's Provincial Environment and Natural Resources Office (DENR-PENRO) estimated 510 ha of mangroves in Batangas in 2005 (Morales, pers. comm.). Surveys in 2000 estimated 5 ha of seagrass within Balayan Bay (Leones, 2001, cited in WWF-Philippines). Landsat images indicate beaches are in Calatagan and San Juan. Remaining forests in the province are concentrated in

Lipa City (inland) and Lobo (Philippine Environment Monitor, World Bank, 2004).

Coastal habitats in Calatagan are shown in Landsat images taken in 1990-1993 and 2003 (Figure 11, Abella in CI-Philippines 2007) but may not be conclusive to indicate trends. Anecdotal reports indicated a general decline in the mangrove areas of the Province due to conversion (e.g., fishponds). Currently, no assessment of areas of coral reefs has been conducted in the Province. However, coral cover monitoring data from 1993 to 2003 showed improvement in Calatagan, southern Mabini and Tingloy and decline in Taal, San Luis, Bauan and eastern Mabini (WWF-Philippines, 2007).

Figure 11. Landsat images of coastal habitats in Calatagan, Batangas*.



* Landsat images showing temporal variation of coastal habitats in Calatagan, Batangas. The images represent extent of coastal habitats in Calatagan in 1990–1993 (left) and in 2003 (right).

Source: Abella, 2007.



Implications and Recommendations

Coral reefs are generally improving in areas where they are being protected and laws enforced but mangroves are declining despite rehabilitation efforts. Given the global importance of the Verde Passage as the center of the center of marine biological diversity, coral reef management could be further scaled up with increased support for the coastal law enforcement network, while mangrove management could be scaled up to avoid further loss and degradation.

The geographic extent of habitats, and especially their trends, are not easy to collect. PG-ENRO could explore longer term partnerships with CI-Philippines, WWF-Philippines and DENR-PENRO for periodic monitoring of these parameters. The global significance of the Verde Island Passage warrants external support for such intensive monitoring.

References

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- Carpenter and Springer. 2005. "The Center of the Center of Marine Shore Fish Biodiversity: The Philippine Islands." CI-Philippines. 2007. Perception maps of coastal habitats in Batangas.
- World Bank. 2004. Philippine Environment Monitor. Figure 4.
- WWF-Philippines. 2007. "Status of Corals in Balayan and Adjacent Bays, Batangas, Philippines." Presented during the Joint BBREPC-PSWMB Meeting in November 2007.

Habitat Protection, Restoration and Management

020 Protected areas for coastal habitats and heritage

Description

This indicator measures the area of coastal habitats and heritage effectively protected from degradation, as well as the extent of rehabilitation.

Rationale

The protection of coastal habitats and heritage reflects the commitment of local governments to prevent habitat loss and degradation. The protection of these habitats helps sustain the environmental, social and economic benefits derived from them.

Data Requirements

- Number and area of terrestrial, marine and coastal heritage areas protected by law
- Management effectiveness rating of terrestrial, marine and coastal heritage protected areas
- Natural areas rehabilitated (km²)

Results

The numbers and area of marine protected areas (MPAs) in Batangas has been increasing since the first sanctuaries were declared in 1991. At present, there are 13 MPAs covering about 490 km² or 7 percent of municipal waters.

Roughly 0.02 to 0.1 percent of these MPAs are fully-protected or no-take zones (Table 7). One of the MPAs (Twin Rocks in San Teodoro, Mabini) is considered as one of the best-managed MPAs in the country, with data showing reef

Table 7. Marine protected areas in Batangas.

City/ Municipality	Name of MPA (Established)	Name of Sanctuary (Year Established)	Area (ha)	MPA Rating* (2007)
Balayan	Carenahan Fish Sanctuary and Reserve (2003)		6.5	3
Batangas City	Nalayag Point Fishery Refuge (2002)		1.0	3
	Pulong Bato Fishery Refuge (2002)		2.0	3
	Pagkilatan Fishery Reserve (2005)		1.8	1
Bauan	Dive and Trek Fish Sanctuary (1995)		2.2	n.a.
Calatagan	Pagapas Bay and Municipal Waters Marine Reserve (1992)	Tanagan Marine Sanctuary (1997), 2 ha	48,000.0	3
		Bagong Silang Fish Sanctuary (1998), 2 ha		3
		Sta. Ana Marine Sanctuary (1998), 2 ha		3
		Carretunan Marine Sanctuary (2003), 2 ha		4
		Talisay Marine Sanctuary (20), 2 ha		n.a.
Lobo	Sawang/Olo-olo Fish Sanctuary (2001)		1.8	2
	Malabrigo Fish Refuge and Sanctuary (2002)		3.0	2
	Biga Marine Sanctuary (2006)		20.0	2
Mabini	Marine Municipal Reserve (1991)	Arthur's Rock Sanctuary (1991), 17.9 ha	356.0	4
		Cathedral Sanctuary (1991), 22.9 ha		4
		Twin Rocks Sanctuary (1991), 15.3 ha		4
Nasugbu	Municipal Marine Sanctuary and Reservation (1994)		25.0	n.a.
San Juan	San Juan Marine Protected Area (2006), in 9 barangays		600.0	1
Tingloy	Batalang Bato Marine Sanctuary (2002)		4.8	4
9 LGUs	3 MPAs	7 sub-sanctuaries	49,031.3	

* 0 – pre-rating; 1 – initiated; 2 – established; 3 – enforced; 4 – sustained; 5 – institutionalized

Source: WWF-Philippines, 2007.

improvement from the early 1990s to 2000s. Management effectiveness of the MPAs has been estimated (WWF-Philippines, 2007) as follows: 5 (58 ha) have been sustained (high), 6 (15.5 ha) are enforced (moderate), 3 (32 ha) are established (moderately low) and 2 (602 ha) have just been initiated (low). The Batangas MPA Network has just been established.

The total terrestrial protected area in the province under the National Integrated Protected Areas System (NIPAS) is more than 69,000 ha including the Taal Volcano Protected Landscape (62,292 ha). The level of management effectiveness of the protected terrestrial areas has not

been assessed. Total forest area rehabilitated from the 1970s to the present is about 427 ha (PENRO, 2008). DENR's Provincial Environment and Natural Resources Office estimates 510 ha of mangroves in Batangas in 2005 of which some 117 ha was rehabilitated since 1995 (Morales, 2007 pers. comm.; Mendoza, 2008 pers. comm.).

The extent of proclaimed cultural heritage in the province is not available. A study conducted in Calatagan, however, indicated the archaeological richness of the area and recommended the establishment of cultural resource management (Bautista, 2007).





The coastal waters of Batangas Province are well-known for their marine biodiversity.



Roughly 10–30 percent of each habitat must be fully protected to help sustain ecosystem functions and services.

Implications and Recommendations

Marine scientists estimate that roughly 10–30 percent of each habitat must be fully protected to help sustain ecosystem functions and services. Moreover, Republic Act 8550 (Philippine Fisheries Code), recommends that at least 15 percent of municipal waters and 25 percent of mangroves be protected. While the above recommendations are to be applied per habitat type, in the past, coral reefs have been given more attention in the establishment and study of MPAs. Simulation studies of coral reef protected areas in Mabini and Verde Island based upon current fishing intensity and condition of fish stocks (MERF/UP/CI-Philippines, 2007) indicate that larger total areas of fully-protected MPAs and lower intensity of fishing is needed to sustain reef fish stocks. Specifically, at least 53 percent and 73 percent of coral reefs in Mabini and Tingloy, respectively, are recommended for full protection. Although some individual MPAs in Batangas are well managed, total marine area protected in Batangas is only about 7 percent of municipal waters, of which only a much smaller portion (0.1 percent of municipal waters) is fully protected from extractive and pollutive activities.

Moreover, based upon: a) economies of scale with respect to MPA management and enforcement patrolling costs; and b) ease of movement of fish between core and fishing areas, current sizes of fully protected or “no-take” MPAs (core areas) are quite small. The Philippine MPA Support Network currently advocates that core areas be no smaller than 20 to 30 ha with at least 50 ha preferred.

The Batangas Province SEMP already includes plans for the establishment and strengthening of a network of protected areas. It is thus recommended that the Batangas MPA Network consider the above recommended minimum sizes when setting targets for implementation.

Available technical guidelines for terrestrial and cultural protection must also be considered in setting targets for those other protected areas.

References

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Habitat Protection, Restoration and Management

021 Reclamation and conversion

Description

This indicator measures the area of coastal habitat that has been converted for other uses (e.g., mangrove to fishpond). This also includes the extent of reclamation in the coastal areas.

Rationale

The costs (limited access for some sectors, stability and safety of those using structures built on reclaimed land, destruction of mangrove nursery grounds of marine life, loss of fisheries fry gathering grounds, erosion, etc.), benefits

(ports that would benefit society, etc.) and the sectors that would be affected should be considered before reclamation or land conversion is authorized.

Data Requirements

- Total length of coastline and area reclaimed
- Total coastal area converted to other uses (e.g., mangrove to fishpond)

Results

Trends on the extent of reclamation and conversion activities in the Province of Batangas are not available. There are about five reclamation cases including the development of Batangas Port reported in the Province, of which four were filed in court (Calatagan). There were also reported reclamation in Mabini, San Juan and Tingloy. Five cases of

mangrove areas converted to fishponds were reported in Calatagan (Figure 11). The reported reclaimed area totaled 144 ha excluding the 67 ha reported in Calatagan, which totaled both reclaimed and converted areas. There is also one site in Calatagan where a stream's flow has been altered by a wall.



Mangrove areas in Calatagan are being converted to fishponds.
A quarry nearby serves as a source of soil for pond dikes.

Implications and Recommendations

Conversion of natural habitats is very expensive and difficult (if not impossible) to reverse so proactive prevention is preferred. Foreshore laws are among the least understood coastal environmental laws in the Philippines. A local coastal zoning ordinance based upon sound information can provide a clear framework of what is and is not allowed. For individual projects, guidelines for application, approval, monitoring and revocation of permits must be based upon a harmonized understanding and procedure that considers the various authorities' mandates — Public Estates Authority (PEA), provincial and municipal governments, Bureau of Fisheries and Aquatic Resources (BFAR) and Department

of Environment and Natural Resources (DENR). Fees for exclusive use of the foreshore and penalties for damages must be commensurate with the broader environmental and social costs of exclusion or the damage. Finally, clear and prominently accessible information to the public, a vigilant public, rapid investigation of complaints and physical action as necessary (e.g., demolition) would then support implementation.

Batangas Province SEMP identifies plans for the rehabilitation of degraded habitats such as mangroves that were severely affected by habitat conversion activities in the past.

References

- Batongbacal, JL. *A Crowded Shoreline: Review of the Philippine's Foreshore and Shore Land Management Policies*. www.oneocean.org.
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Water Use and Supply Management

022 Water conservation and management

Description

This indicator measures the demand of the population for freshwater and accounts the intensity of freshwater management efforts through availability of water

management and conservation plans, strategies adopted, and staff and budget allocated.

Rationale

Freshwater is essential for life and effective management for its sustainable use is of utmost importance for a healthy community.

Data Requirements

- Availability of water management and conservation plan
- Mitigation and adaptation strategies identified
- Water use per capita
- Staff and budget for water management

Results

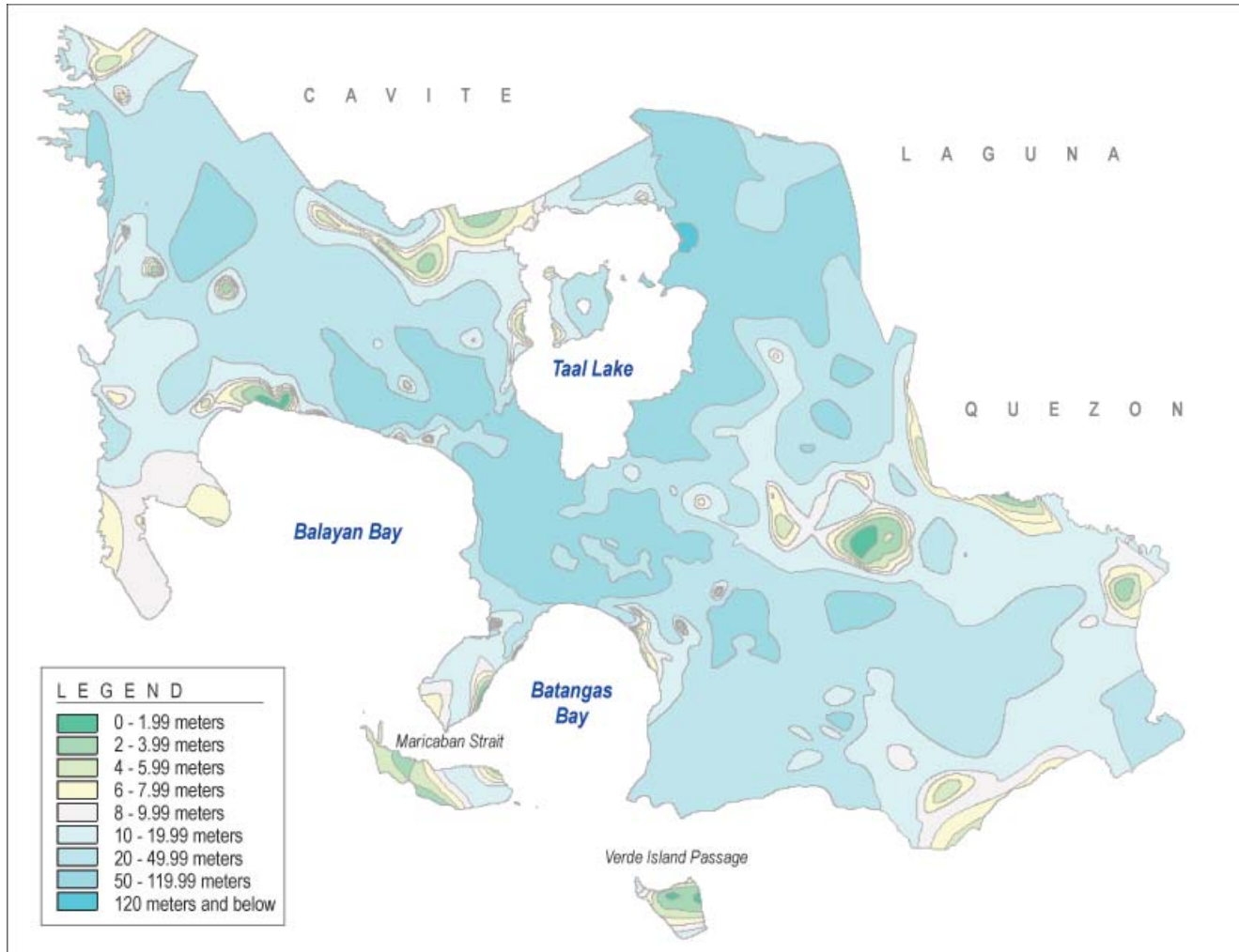
The Philippines has the second to the lowest freshwater availability among Southeast Asian countries, with an estimated 1,907 m³ of freshwater per person each year (JICA Master Plan on Water Resource Management in the Philippines). The surface water and groundwater resources of Region IV are considered to be moderately low relative to the rest of the country at 6,370 million m³ and 1,410 million m³ respectively (World Bank, 2003).

In Batangas, the static water level of the central municipalities from Calaca to Batangas City (but not including Mabini and Tingloy) are much deeper (i.e., greater than 40 m below ground surface and harder to reach)

than those of other coastal municipalities in Batangas (NWRC, 1982) and 77 percent of the area of the province is considered difficult for the purposes of well construction (i.e., “where groundwater depths vary with geological formations that have permeabilities near zero”) (Figure 12).

Development and annual investment plans include substantial investments to tap and maintain connections to sources of water, and to test for safety. However, there are no plans for the province or any of the coastal municipalities surveyed to assess water resources and plan for regulation and conservation of freshwater use.

Figure 12. Depth of static water level in Batangas.



Implications and Recommendations

Assessing water resources and planning for management of water to match available water resources and projected demand per year is an increasingly important component of sustainable development. The Batangas Province SEMP identifies management actions for the protection and management of water resources including research on water demand and supply. It also includes action programs

on community-based watershed reforestation and urban re-greening, water use rationalization through regulation and market-based instruments, public education, awareness and capacity building, and is complemented by its program on habitat protection. These action programs would benefit from the establishment of a coordinating office to plan, develop and coordinate the implementation of activities.

References

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Water Use and Supply Management

023 Access to improved water source

Description

This indicator estimates the population with access to an improved water source, the amount delivered and the price paid by households for water supply.

Rationale

Freshwater resources, whether scarce or abundant, may not necessarily be accessible or equitably accessible. Difficulty of access including high prices disproportionately burdens

those with less resources, especially more vulnerable individuals and households within communities.

Data Requirements

- Population using improved water sources
- Volume produced from piped water sources
- Water pricing per cubic meter

Results

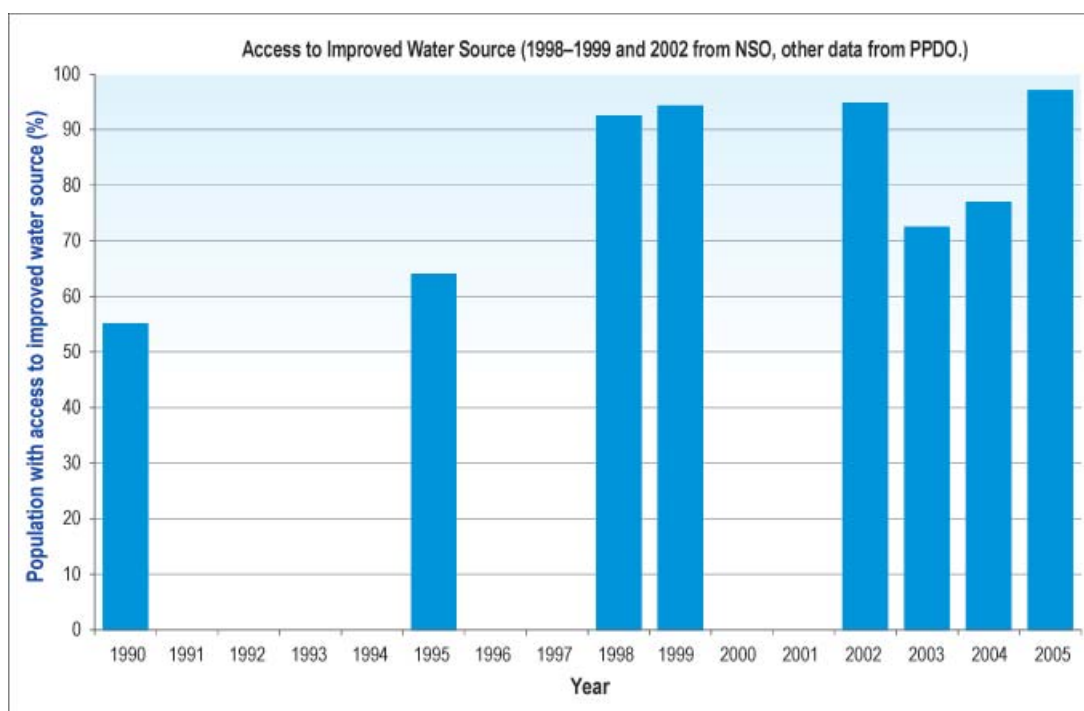
The proportion of population in Batangas with access to an improved water source generally increased from 55 percent in 1990 to 97 percent in 2005 (Figure 13). Based upon data available from 21 municipalities in 2007, 3.6 percent of households do not have access to safe water. Calatagan, Lian and San Juan had the highest proportions of households without access to safe water at about 15 percent, 11 percent and 7.8 percent of households, respectively.

Water districts (i.e., government-owned and controlled corporations managed by users) supply water in Batangas City, Balayan, Lemery, Lobo, Mabini, Nasugbu, San Juan, and Taal. San Pascual's water is supplied by the local

government's municipal water system. In addition, Lobo, Mabini, Taal and San Pascual also have operational Barangay Waterworks Rural Water and Sanitation Associations.

Water consumption was reported by water districts of nine coastal municipalities/city (SEP, 2006); however, the data lack sufficient detail on the units of measurement in order to draw averages across the area. The NWRC study (1982) used an estimate of 190 L water use per capita per day. Water prices ranged from PhP14 to PhP90 per m³ (SEP, 2006).

Figure 13. Proportion of population with access to improved water source.



Implications and Recommendations

The Tap Watch program, which involves testing the quality of potable water in communities, is a necessary service of health offices in the Province. Such initiatives should be continued and expanded. Each year the Province invests more than PhP300M in the water and sanitation sector, but the benefits to the people, in terms of enhanced access to safe water, cannot be confirmed at this point. The Batangas SEMP refers to water use rationalization and the application of market-based instruments (e.g., water use fees) in order to better manage and protect watersheds and control the generation, collection, processing and disposal of solid and liquid wastes that pollute water supply sources. At the same

time, care must be taken to guard against conflicts between domestic, agricultural, industrial and commercial users of water over access to and pricing of potable water.

Improving the collaboration between the Provincial Health Office, which is responsible for water safety and potability, and the Environment Office, which is responsible for waste management and environmental protection, would optimize the use of available resources for planning, implementation of management interventions, and monitoring and reporting on the benefits derived as a consequence of the Province's investments.

References

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Water Use and Supply Management

024 Incidences/deaths due to waterborne diseases

Description

This indicator measures the number of reported cases and number of deaths due to diarrhea and other waterborne diseases.

Rationale

While other factors (such as food handling practices, etc.) may affect these figures, the prevalence of diarrhea and waterborne diseases also indicate the level of sanitation

services and the cleanliness of freshwater supplies and of bodies of water for recreation.

Data Requirements

- Number of incidences of illness/infections and deaths due to waterborne diseases (e.g., diarrhea; typhoid fever; cholera; amoebiasis; schistosomiasis; giardiasis; etc.)

Results

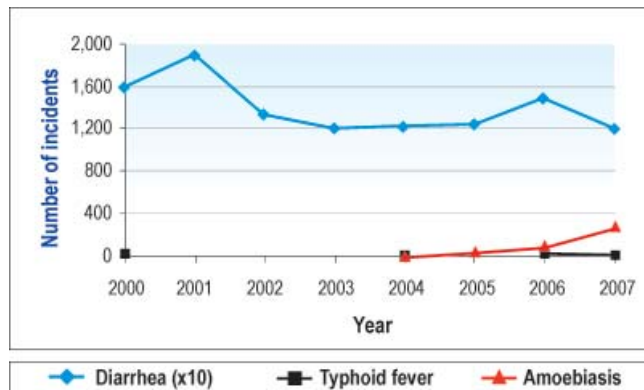
In 2006, diarrhea remained the foremost cause of morbidity in Batangas, at 15,037 cases per 100,000 population, just as it has topped the list of causes of morbidity over the past five years. Incidences of diarrhea and typhoid decreased slightly

from 2000 to 2007 (Figure 14). There is however an increase in the number of reported cases of amoebiasis. Seventeen deaths due to diarrhea were recorded in 2006, while 7 deaths due to diarrhea were reported in 2007.



Children are highly susceptible to waterborne diseases, as a consequence of inadequate sanitation and pollution of freshwater supplies.

Figure 14. Number of incidences of waterborne diseases.



Implications and Recommendations

Though there is a slight decrease in the number of incidences of waterborne diseases, the total numbers are still quite alarming. Additional investment in infrastructure and education and awareness will be required in order to substantially decrease the incidence and suffering caused by these diseases. Some program initiatives include: a) an education and awareness program for food handlers, new mothers, and school children; b) strengthening the enforcement of local bylaws concerning garbage handling

and disposal, the disposal of domestic sewage, and the management of animal wastes; c) promoting and facilitating investments in pollution reduction and waste management facilities and services through public-private partnerships; d) controlling land use/access to areas used as sources of water supply and/or groundwater regeneration areas; and e) as a final line of defense against waterborne diseases, pre-treating and disinfecting potable water prior to distribution and consumption by the public.

Reference

Provincial Health Office. 2008. Incidences of waterborne diseases.



Food Security and Livelihood Management

025 Fishery management plan and implementation

Description

This indicator estimates the extent of fisheries management efforts through availability of fisheries management plans, staff and budget allocated.

Rationale

Fish is a direct product of the coastal zone, providing both food and livelihood to coastal dwellers, and to consumers far from the coast. Fisheries management is a challenging but necessary aspect of managing marine and coastal resources

in order to ensure the sustainability of this valuable natural asset. A management strategy, supported by adequate resources and equipment, are markers of local government towards managing this resource.

Data Requirements

- Fisheries Management Plan
- Staff and budget allocation for fishery management

Results

Batangas' fisheries management plan has been integrated into the Batangas Province SEMP 2005-2020. At the provincial level, coastal fisheries are managed by PG-ENRO and the Provincial Agriculture Office (PAO), with the former focused on conservation and protection of habitats and stocks, and the latter concerned with production (especially aquaculture and livelihood). The three ICM staff of PG-ENRO are also involved in fisheries habitat and stock conservation while two, with one additional support staff out of 89 personnel of the PAO, are allocated for fisheries management. The two fishery personnel in PAO are university graduates in fisheries. In 2008, the thrust

of programs and projects of PAO is mainly for agriculture production and development with budget allocation of PhP12.5M. Fishery programs being implemented in the Province are those implemented by the national government (BFAR) and those coordinated by PG-ENRO.

At the municipal/city level, fisheries management is almost always a significant component of coastal management plans and is managed by the Municipal Agriculture Office (MAO). Generally, however, municipal/city fishery plans consist of a few lines to justify the budgets requested and are not necessarily based upon an in-depth analysis of a



Coastal fisheries is a major source of livelihood for the coastal population of Batangas.

coastal profile. For the 10 coastal municipalities surveyed, CRM programs were staffed by an equivalent average of 1.8 full-time persons and 27 *Bantay Dagat* volunteers. The total number of provincial and municipal staff (10 coastal municipalities surveyed), for fisheries is about 24, and 231 *Bantay Dagat* covering the 492 km coastline of the Province. There are 11 patrol boats in the Province: Calatagan (6);

Lobo (1); Bauan (0); Batangas City (1); Lemery (0); Nasugbu (1); Balayan (1); Tingloy (1); and Mabini expects five boats committed by CI-Philippines and WWF-Philippines. Municipal/city budgets average PhP460,000/year (ranges from approximately PhP50T to PhP1M/year) for fisheries management with the largest proportion being allocated for enforcement activities.

Implications and Recommendations

Considering the length of coastline and the importance of fisheries to the economy of the Province, as well as the livelihoods of the coastal population, this is one sector that requires vigilance. The available data in this report are inconclusive regarding an improving or declining trend in fisheries management. However, there is a sense among stakeholders that a more intensive effort is required in

order to protect and manage coastal fisheries, for example, through improvement of the number and skills of fishery personnel and provision of training and equipment to support *Bantay Dagat* operations. The Provincial Government may further consider hiring fishery personnel to be detailed in the municipalities.

Reference

Municipal survey for SOC. May 2008.



Food Security and Livelihood Management

026 Fisheries Production

Description

This indicator measures the trend in fisheries production and tries to estimate whether fisheries stocks are sustainable (using changes in catch composition and/or the frequencies of various sizes per species).

Rationale

The increasing fish catch would mean either greater dependence of the population to fisheries resources or improved condition of resources.

Data Requirements

- Municipal (small scale), commercial (large scale) and aquaculture fishery production
- Size and composition of fish catch

Results

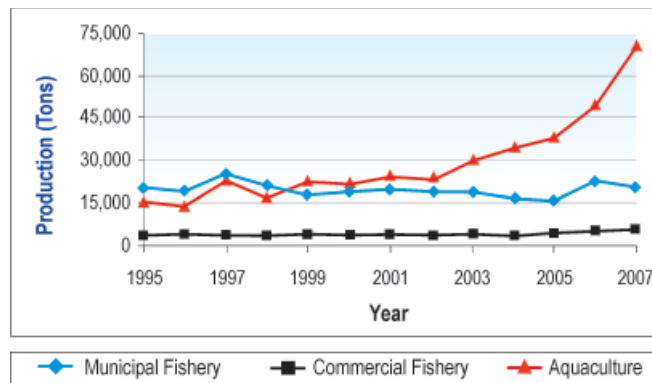
Figure 15 charts fishery production in Batangas from 1995 to 2007. Large fluctuations in the data and significant increases in both commercial and municipal fish are apparent for the years 2006 and 2007. Anecdotal reports suggest that flooding in 2006 caused fish spillage from aquaculture structures, which may have contributed to the increase in municipal fish production in the same year. Nonetheless, the reason behind the apparent increases in fishery production in 1997 and again in 2007 is not clear. Unfortunately, it cannot be

determined whether the observed increasing municipal and commercial fish catch is related to changes in fish landing locations, changes in intensity of fishing effort, or changes in catch composition, since no information on the major fish species caught and catch per unit effort (CPUE) over time was available. Similarly, a steady increase in aquaculture production has been observed, which may be directly attributable to the reported conversion of mangrove areas into fish ponds.



Fish catch monitoring of the identified species and potentially overfished species can be considered.

Figure 15. Fisheries production in Batangas.



Source: BAS, 2007.

Implications and Recommendations

Batangas SEMP's strategy for Fisheries Management already includes strategies on strengthening law enforcement, research, policy and livelihood development. The existing proposals to support the developing coastal law enforcement network through establishing and operationalizing a provincial *Bantay Dagat* as well as providing incentives to municipal/city *Bantay Dagat* would be helpful. While enforcing existing laws would already

do much, existing policies such as regulating fisheries so that they do not exceed maximum sustainable yield (as per Republic Act 8550) would require further research. Fish catch monitoring of the identified species (potentially overfished species) can be considered. The enactment of a Unified Fisheries Ordinance in the Province will harmonize existing municipal fishery ordinances and help in the resolution of conflicts in the fisheries sector.

References

Bureau of Agricultural Statistics. 2007.
Enderez, EM. 2004. Fisheries Resource Assessment of Balayan Bay. WWF-Philippines.



Food Security and Livelihood Management

027 Malnutrition rate

Description

This indicator measures the proportion of the population with access to sufficient daily dietary requirements.

Rationale

Nutrition status is an indicator that integrates availability and equitability of access to food and livelihood. While other factors (such as agriculture and trade) may affect

these figures, nutrition status is also affected by the availability of seafood.

Data Requirements

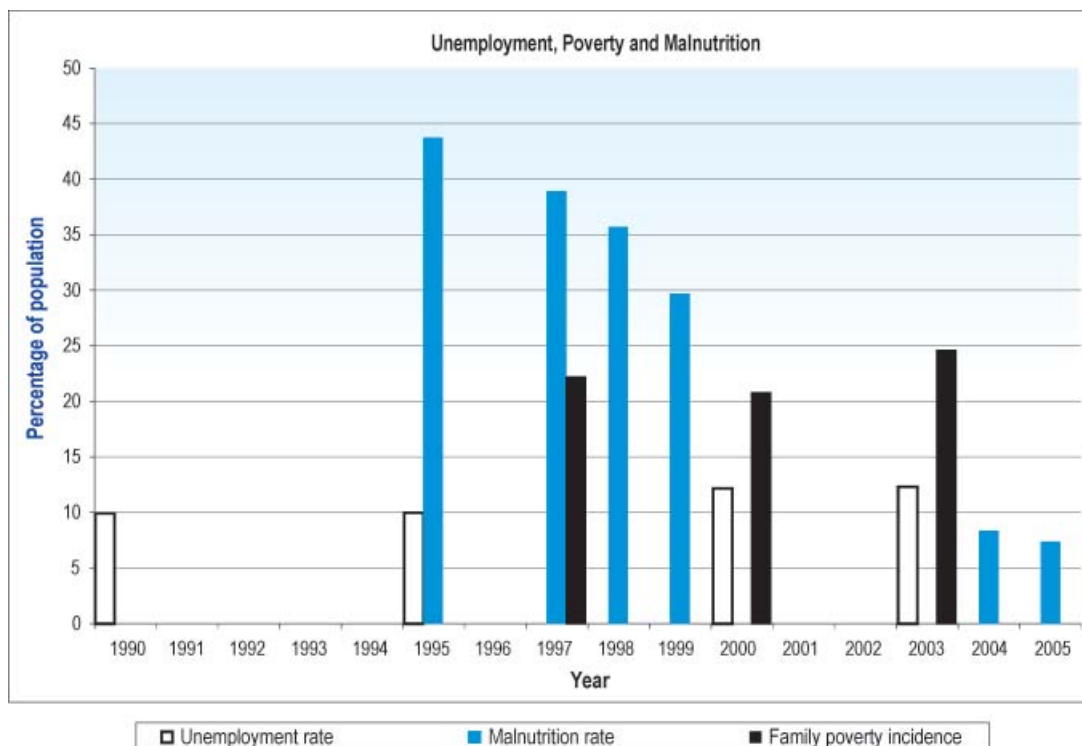
- Number of undernourished males (all ages)
- Number of undernourished females (all ages)
- Number of undernourished males (less than 5 years old)
- Number of undernourished females (less than 5 years old)

Results

The proportion of undernourished children below five years old has declined from 40 percent undernourished in 1995 to an estimated 6 percent undernourished in 2007 (the latter figure is based upon 21 priority municipalities of which 9 are

coastal, Figure 16). Data gathered were gender aggregated and so inferences could not be drawn as to differences in access between sexes.

Figure 16. Unemployment rates, poverty incidence and malnutrition rates in Batangas.



Implications and Recommendations

Food access is improving despite increasing unemployment, which indicates progress for the Province in meeting one of its Minimum Basic Needs targets. To cope with the issue on malnutrition, the Province sustains feeding and nutrition, and

other social assistance programs implemented by its various agencies. The program is getting good results and is a credit to the Province.

References

- Province of Batangas. 2006. Socioeconomic Profile.
 Province of Batangas. 2005. Socioeconomic Profile.

Food Security and Livelihood Management

028 Poverty, education and employment

Description

This indicator estimates the degree of poverty, employment and the potential for employment.

Rationale

The degree of poverty reflects an area's degree of social development. Productive employment is a foundational element needed to provide households with goods and

services in their struggle against poverty, while education is a key to productive employment.

Data Requirements

- Poverty threshold
- Poverty incidence
- Income per capita (male/female)
- Employment rate
- Education; proportion of population (male/female; primary/secondary/tertiary)

Results

In general, the economy of the Province seems to have transitioned through a decline in agricultural employment and farm area (from 1980 to 2002) to an increase in industrial employment (1980 to 1990) to a rise in service employment. While the absolute numbers of people employed, numbers

of industrial establishments, and numbers of visiting tourists (volume of maritime transport activity) seems to have declined after a rise, unemployment rate and poverty incidence has risen as job generation has not been able to keep up with population growth (Figures 17–19).

Figure 17. Number of industrial establishments in Batangas.

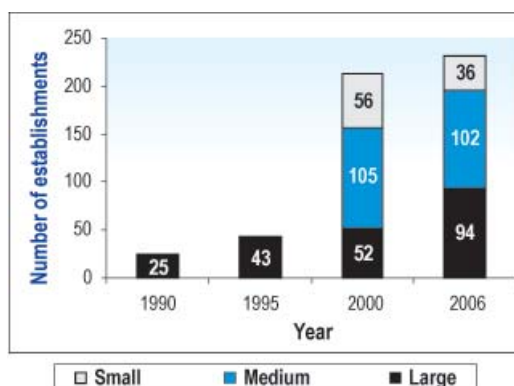
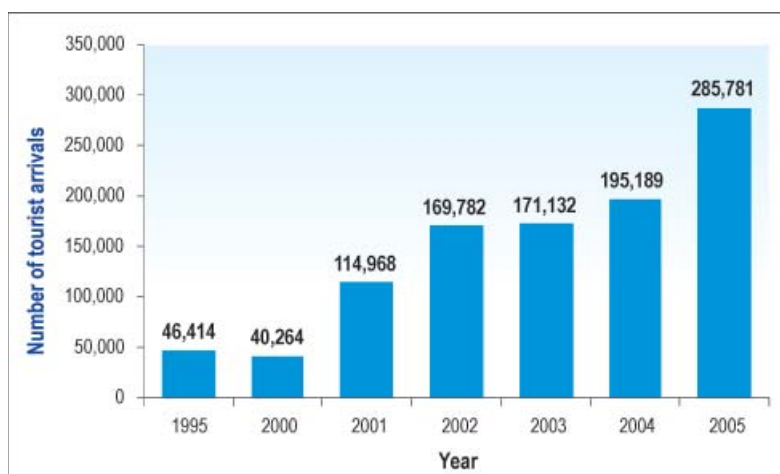


Figure 18. Number of tourist arrivals in Batangas.



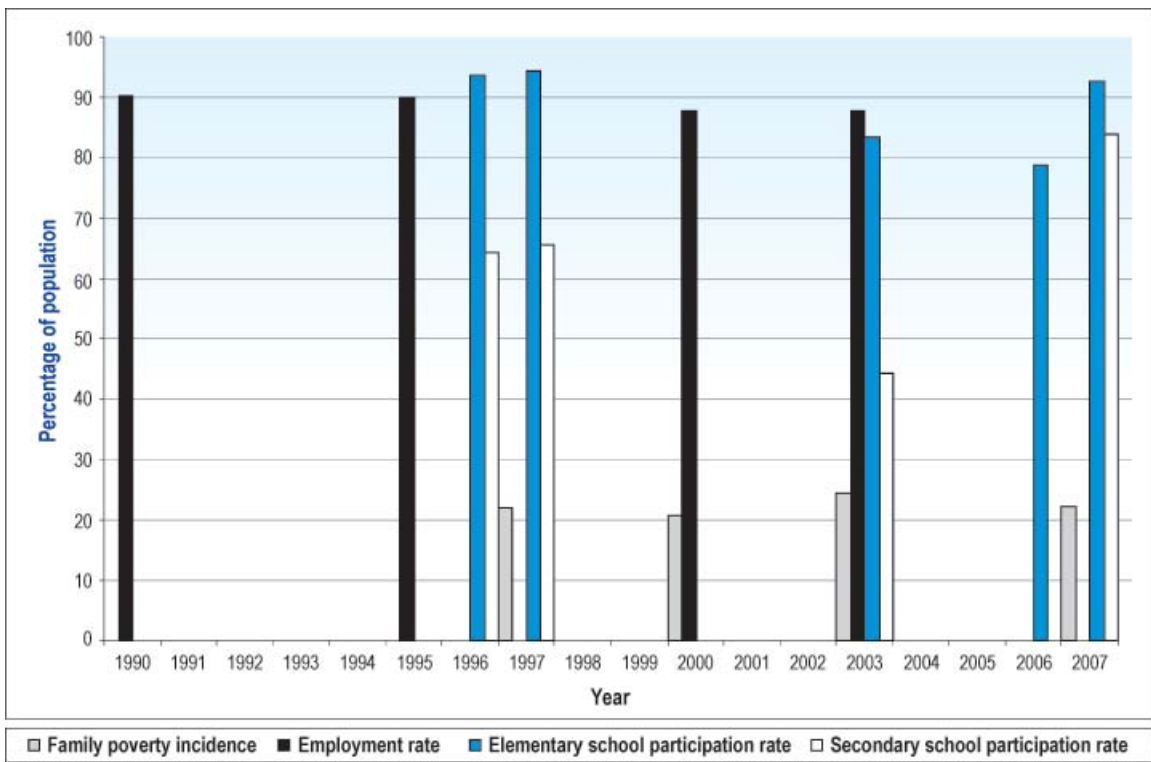
Data on employment within sub-sectors of the economy (e.g., in capture fisheries, aquaculture, tourism, shipping, etc.) are not available and so cannot be used to determine trends for the marine economy vis-à-vis the entire economy.

The elementary and secondary school participation rate (proportion of children of school age who attend school)

declined from 1996–1997 to 2003 and rose in 2007. This trend may be due to issues in the consistency of data collection methods and data sampling. The proportion (55%) of the entire population 18 years old and above who are high school graduates is higher than the national average (2003 as cited in PHDR, 2005).



Figure 19. Poverty, employment and school participation rate.





Batangas experienced significant industrial development. However, due to population growth, even increase in employment opportunities has not been able to address poverty and unemployment.



Implications and Recommendations

It is difficult to assess the condition of the province with respect to this indicator. Further validation is required due to some inconsistencies in information which may be due to differences in methods for data collection and sampling, and

data aggregation. It is also important to acquire provincial disaggregated statistics from National Statistics Office (e.g., employment).

References

- Philippine Human Development Report (PHDR). 2005. Poverty Diagnosis 2007.
- Province of Batangas. 2006. Socioeconomic Profile.
- Province of Batangas. 2005. Socioeconomic Profile.

Food Security and Livelihood Management

029 Livelihood programs

Description

This indicator measures the availability of programs, people, and budget to help enhance coastal livelihoods. It also looks into the sectors benefited and the impacts of these livelihood programs.

Rationale

Livelihood programs help optimize productivity of coastal areas and help households maximize their potential for income.

Data Requirements

- Existing livelihood programs
- Staff and budget allocation for livelihood programs
- Accessibility and budgets
- Sectors covered
- Impacts of livelihood programs

Results

The three personnel of the Provincial Agriculture Office (PAO) who are allocated for fisheries management are mainly concerned with enhancing fisheries livelihood, as is their portion of the PhP5M of the PAO budget (2008). Municipal government budgets for livelihood programs range from PhP250,000 to PhP400,000/year (2008). Municipal and city personnel are required to perform various tasks as part of their fisheries management duties, one of which is the implementation of livelihood programs.

Livelihood programs (i.e., from PAO and MAOs) are available for the agricultural sector (fishers and farmers) as well as

the general population. Livelihood programs vary, including cattle fattening, seaweed production and processing, tilapia dispersal, freshwater ornamental fish dispersal, food processing, and other various skills development training.

The private sector (e.g., KIEPCO and First Gas) also conducts various livelihood skills development training in the Province.

The number of people benefiting from these livelihood programs, as well as the benefits and impacts of these programs, have not been monitored or recorded.



Seaweed farming is an alternative livelihood for fishers in Batangas.



Implications and Recommendations

A retrospective study and analysis as to the effectiveness of coastal livelihood programs would be worthwhile, given the number of initiatives being undertaken across the Province and the anecdotal reports of failed initiatives. An outcome

of improved tracking and recording of results would be scientifically sound, knowledge-based inputs to decision-making regarding the nature and extent of future livelihood programs in the Province.

Reference

Municipal survey for SOC. May 2008.

Pollution and Waste Management

030 Management plans

Description

This indicator accounts the presence of specific policies, plans and programs for pollution reduction and waste management. It further looks into the commitment of local

government to implement the plans through allocation of human and financial resources.

Rationale

Specific strategies and action plans are essential to address issues on pollution and waste management. These action plans must be implemented through the commitment of

facilities and equipment, as well as financial and human resources.

Data Requirements

- Pollution management plans and their scope (water, air, land)
- Monitoring programs
- Budget for pollution and waste management
- Staff allocation for pollution and waste management
- Adequacy of equipment/facilities

Results

An Integrated Waste Management Action Plan (IWMAP) for the Batangas Bay Region was developed and adopted by the stakeholders through BBREPC Resolution No. 2 Series of 1996. The IWMAP covered: a) municipal solid waste; b) industrial hazardous waste; c) ship and port waste; and d) municipal sewage. In response to the IWMAP, the municipalities in the Batangas Bay region started their solid waste management plans, the need for which was further emphasized with the adoption of R.A. 9003 (2002) or the Ecological Solid Waste Management Act. Under RA 9003, each municipality must develop a solid waste management plan (SWMP).

To date, 28 out of 34 cities and municipalities have developed their SWMPs. The Provincial Solid Waste Management Board (PSWMB) was also established in 2002 through Provincial Ordinance No. 007 (2002) to oversee the implementation of R.A. 9003. The annual allocation for the PSWMB operation ranged from PhP350,000 to PhP500,000 (2002–2007). In 2008, PhP150,000 is allocated for PSWB operations. Three full-time personnel in PG-ENRO are coordinating and monitoring the implementation of solid waste management in the Province. At the municipal level, the number of staff responsible for solid waste management range from 2 to 15 personnel, and municipal budgets range



Municipal budgets for solid waste management include garbage collection and construction of material recovery facilities (MRFs).

from PhP161,000 to PhP66M. Budgets allotted for solid waste management include garbage collection, construction of material recovery facilities (MRFs) and the operation of Solid Waste Management Boards (SWMBs).

Lemery, Nasugbu, San Juan and Tingloy reportedly formed municipal SWMBs. In 2007, 26 out of 34 cities and municipalities, and 522 out of 1,078 *barangays* have established MRFs (Solid Waste Management Status Report, 2007).

The Provincial Government has established and sustains a water quality monitoring program for Batangas Bay and Pansipit River, which started in 1997 and 2002, respectively. Quarterly water quality monitoring of Balayan Bay was also initiated during the last quarter of 2007. The monitoring program has been augmented by the Multipartite Monitoring

Teams that are set up for monitoring selected industrial operations. The Batangas Environment Laboratory (BEL), which conducts water quality monitoring in the province, was established in 1998. An expanded BEL facility with additional laboratory equipment was acquired in 2002. Provincial Ordinance No. 003 Series of 2003 authorizes the Provincial Government to collect fees for services rendered by the Laboratory. The ordinance was passed as a measure for supporting the sustainable operation of the BEL. The BEL is currently undergoing accreditation by the Environmental Management Bureau of the Department of Environment and Natural Resources (EMB-DENR). The budget (2008) for water and air quality monitoring in the Province is PhP1.45M. Currently, there are three full-time chemists in the BEL working on water quality monitoring.





Water quality monitoring is done regularly in the province by the Batangas Environment Laboratory.



Implications and Recommendations

It is recognized that the local governments have made significant efforts in developing strategies and action plans for pollution and solid waste management. Only 6 out of 34 municipalities have not developed their solid waste management plans. Water quality monitoring has been sustained over the years and expanded to other bays in the province.

The Batangas Province SEMP (2005–2020) identifies waste management as one of its action programs and covers municipal solid wastes, and industrial and agricultural wastes. While the plans and supporting institutional arrangements have been set up, there is a noticeable absence of facilities and services that would allow these plans to be fully operationalized.

References

- Esmas, Marivic. Batangas Environment Laboratory. Personal Communication.
 MPP-EAS. 1996. *Integrated Waste Management Action Plan for the Batangas Bay Region*. MPP-EAS Technical Report No. 9, 76 pp. GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas (MPP-EAS), Quezon City, Philippines.
 Solid Waste Management Status Report. 2007. Presented during the Joint PSWMB/BBREPC Meeting in November 2007.

Pollution and Waste Management

031 Water quality

Description

This indicator measures the level to which coastal waters and river waters that discharge into the coastal area are within the water quality standards prescribed for the specific

water use (e.g., drinking, swimming, boating, fishing, aquaculture, etc.).

Rationale

Criteria and standards for water quality are based on scientific information related to water use and potential risks to human health (e.g., transmit waterborne diseases), productivity (e.g., decrease fisheries productivity) and/or

the ecosystem health (e.g., destruction and degradation of habitats). Different parameters provide indications of ecosystem health and potential threats to water use.

Data Requirements

Priority parameters (temporal/spatial)

- Water transparency (secchi depth/total suspended solids) (marine/river/beach)
- Dissolved oxygen (DO) concentrations (marine/river/beach)
- Total/fecal coliform counts (marine/river/beach)

Secondary parameters (temporal/spatial)

- Chlorophyll concentrations (marine/river/beach)
- Nutrient (nitrates, phosphates) concentrations (marine/river/beach)
- Biochemical oxygen demand (BOD) concentrations (marine/river/beach)
- Groundwater quality (nitrates and heavy metals)

Results

PG-ENRO's water quality monitoring program covers Batangas Bay (8 stations) and Pansipit River (8 stations). Additional stations are tested when and where requests can be accommodated. In mid-2007, PG-ENRO initiated the monitoring of coastal waters in Balayan Bay.

Results of the monitoring program indicate that total coliform and dissolved oxygen (DO) in Batangas Bay were within acceptable standards, with the exception of a sampling in June 2007 that happened to coincide with heavy rains (Figures 20 and 21). In April 2007, three out of eight Pansipit stations, namely, Pob. Lemery (3.81 mg/L); Bgy. Wawa

(4.66 mg/L); and Delta Wawa (4.85 mg/L) had DO levels below standard (5 mg/L). Pansipit nutrient concentrations measured in 2002 and 2003 showed an improving trend which may be due to the dismantling of fish cages in the River, which started in 2002 as part of the Pansipit River Rehabilitation Program (Table 8). Total coliform levels in some parts of Pansipit River, Benangbang River in Balayan, and in Calumpang River were well above standard on occasion, indicating the discharge of untreated domestic sewage and animal wastes to the rivers as the likely source of contamination (Table 9). No data were gathered on groundwater quality.

Figure 20. Dissolved oxygen in Batangas Bay.

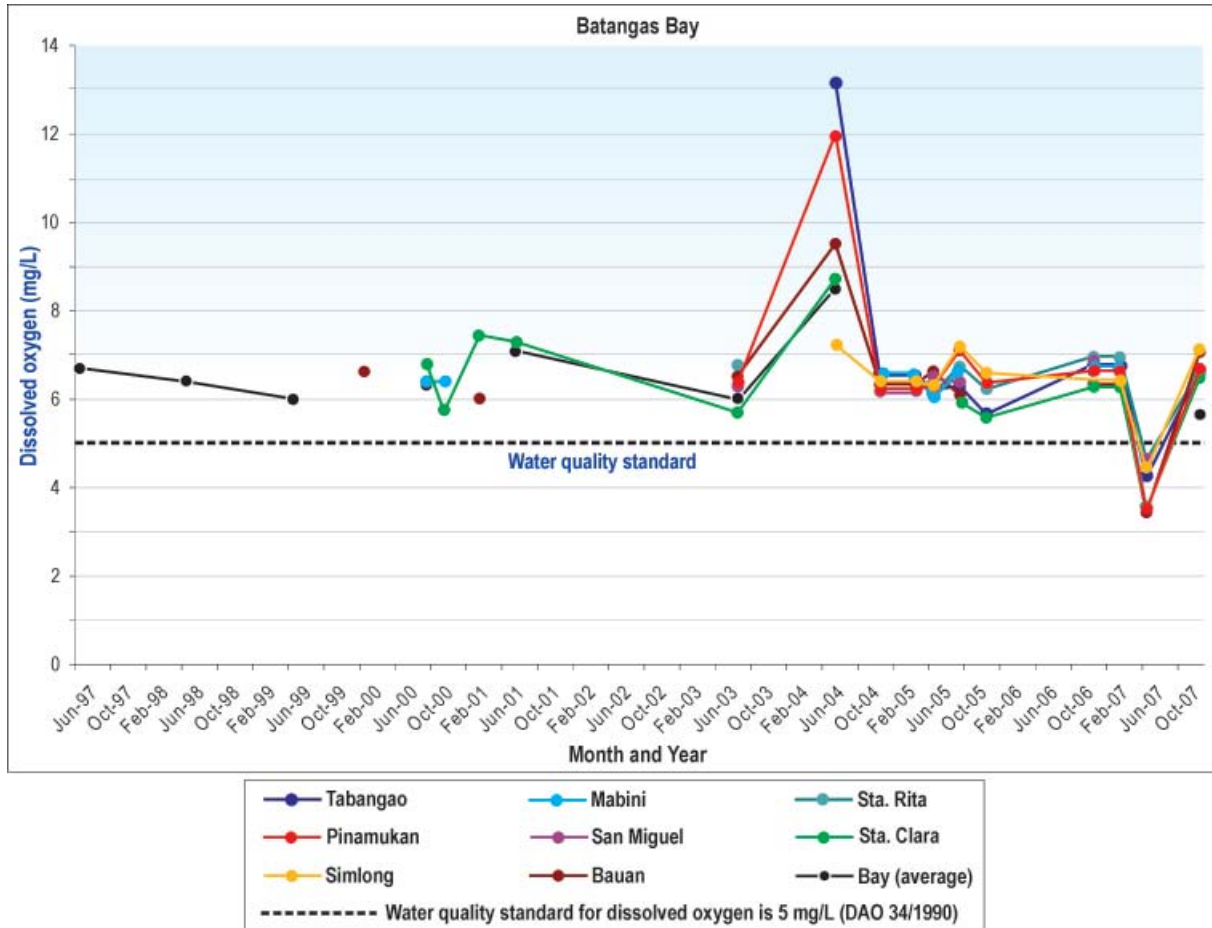


Figure 21. Total coliform levels in Batangas Bay.

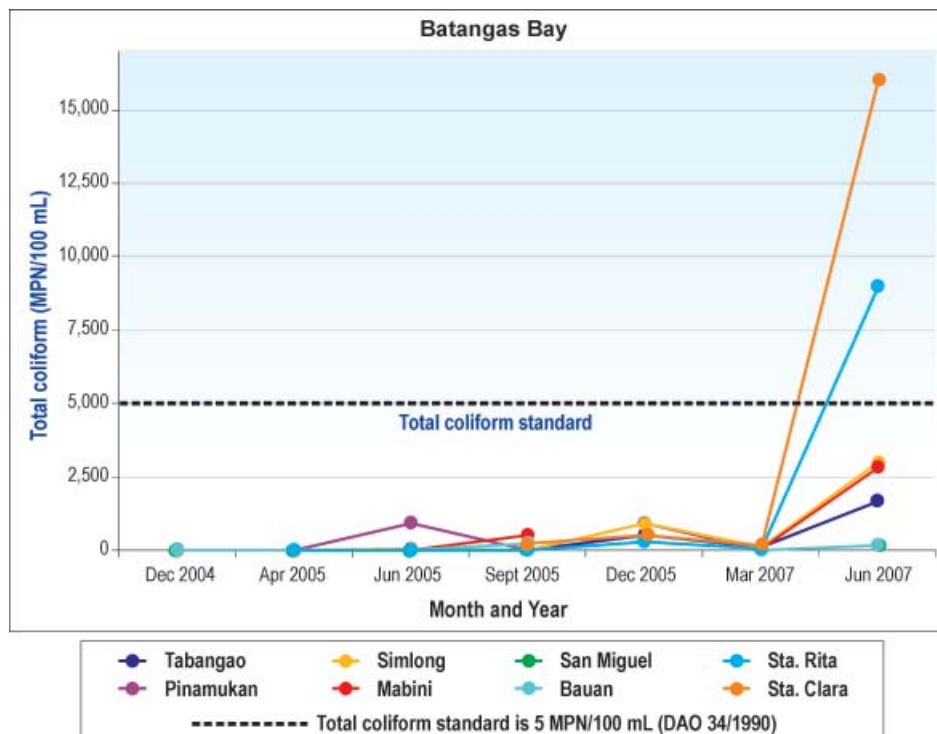


Figure 22. Location of major river systems where water quality parameters were measured.



Table 8. Ranges of nutrient concentrations in Pansipit River.

Parameter	2002		2003		ASEAN Proposed Marine Water Quality Criteria*
	April	September	April	September	
NH ₃ (µM)	130.00 – 220.00	1.00 – 86.00	1.00 – 86.00	0.60 – 70.00	70 (un-ionized)
NO ₂ (µM)	0.006 – 0.062	0.003 – 0.011	0.002 – 0.011	0.002 – 0.008	0.055
PO ₄ (µM)	1.02 – 1.46	0.12 – 0.48	0.42 – 0.266	0.176 – 0.215	0.015 – 0.045 (coastal - estuaries)

* Jusoh, et.al., 2007.

Sources: Batangas Environment Laboratory. 2007-2008.
Batangas Environment Laboratory. 1997-2007.
Batangas Environment Laboratory. 2002-2007.

Table 9. Total coliform levels (MPN/100 mL) in rivers in Batangas.

Date	Benangbang River	Calumpang River	Pansipit River	Water Quality Standard*
1998		13,219		5,000
April 2007			>1,600 – >16,000	
June 2007	16,000			
December 2007	2,000			
April 2008	16,000			

* DAO 34, 1990.

Sources: Batangas Environment Laboratory. 2007-2008.
Batangas Environment Laboratory. 1997-2007.
Batangas Environment Laboratory. 2002-2007.



Water quality monitoring is useful in determining sustainability of different areas of the coast for various uses such as for recreation and aquaculture. The water quality monitoring program of PG-ENRO covers Batangas Bay and Pansipit River.

Implications and Recommendations

A more strategic approach to monitoring of coastal and river waters may be developed by considering water use in the different areas of the coast (e.g., swimming/beach area; navigation/port; fishing/aquaculture; habitat/spawning; etc.) and the water quality prescribed for that particular use/season. Environmental risk assessment is a useful tool for identifying priority locations and parameters for monitoring programs, as well as for interpreting results and evaluating risks to society, the economy and the environment.

An upward trend in coliform contamination of river waters is evident, and this implies a potential concern regarding improved management of domestic sewage and livestock wastes. Municipal LGUs and concerned agencies must strictly enforce regulations on pollution and waste discharges.

Expanding the monitoring area for marine water quality in Batangas Bay to cover Lobo, as well as Tayabas Bay, can

be considered. The monitoring of “hotspot” rivers such as Calumpang River, as well as assessment of groundwater quality, would be relevant to the protection of potable water supplies.

It may also be useful for PG-ENRO to partner with the EMB-DENR and local industries for water quality monitoring. This would result in more efficient use of available resources and information could be shared on a province-wide manner. Also, a more systematic approach to reporting water quality results would benefit all providers of monitoring data, decision-makers and stakeholders. This could probably be handled at the provincial level, where water quality monitoring results from various sectors could be properly collated, analyzed and disseminated.

References

- Batangas Environment Laboratory. 2007-2008. Water Quality Monitoring of Balayan.
 Batangas Environment Laboratory. 1997-2007. Quarterly Monitoring Report for Batangas Bay.
 Batangas Environment Laboratory. 2002-2007. Quarterly Monitoring Report for Pansipit River.
 DAO 34 (DENR Administrative Order No. 34). 1990. Revised Water Usage and Classification (Water Quality Criteria Amending Section Nos. 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations). Environmental Management Bureau, Department of Environment and Natural Resources, Quezon City, Philippines.
 Jusoh, M.M., K.S. Ong, G.A. Vigers, I.M. Watson and C.A. McPherson. 1999. “A Contextual Framework for the Development and Use of Marine Water Quality Criteria in ASEAN.” In: McPherson, C.A., P.M. Chapman, G.A. Vigers and K.S.Ong (eds.). *ASEAN Marine Water Quality Criteria: Contextual Framework, Principles, Methodology and Criteria for 18 Parameters*. ASEAN Marine Environmental Quality Criteria - Working Group (AMEQC-WG), ASEAN-Canada Cooperative Programme on Marine Science - Phase II (CPMS-II). EVS Environment Consultants, North Vancouver and Department of Fisheries, Malaysia. pp. I-1 to I-10.



Pollution and Waste Management

032 Air quality

Description

This indicator reports on the quality of air in terms of total suspended particulates, sulfur oxide, nitrogen oxide, carbon monoxide and volatile organic carbon.

Rationale

Air pollution is harmful to human health and the quality of the environment. Air quality can be measured through different parameters which can serve as basis for management interventions.

Data Requirements

- Total suspended particulates (TSP)
- Concentration of other air pollutants (particulate matter, sulfur oxide, nitrogen oxide, carbon monoxide, volatile organic carbon)

Results

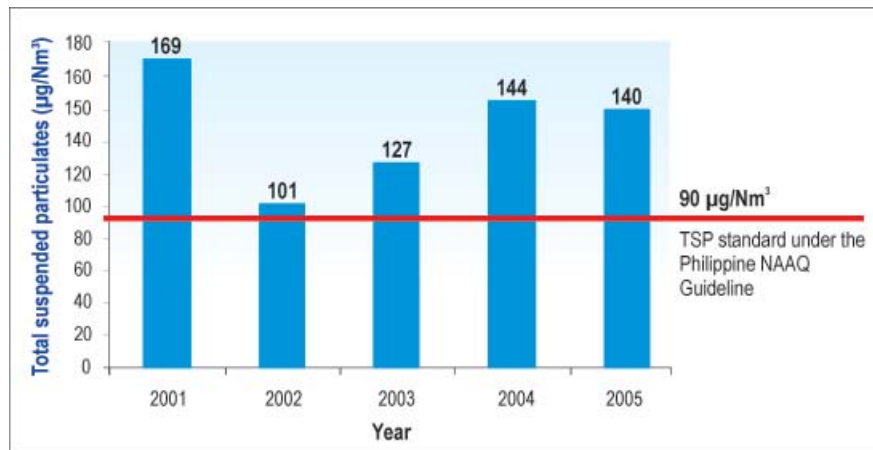
Monitoring of air quality in the Philippines is being conducted by the Environmental Management Bureau (EMB-DENR) in line with the implementation of the Clean Air Act of 1999. Monitoring stations were established in Metro Manila and in major cities in the country, including one station in Alangilang, Batangas City. In Batangas City, from 2001 to 2005 levels of total suspended particulates (TSP) exceeded the Philippine

National Ambient Air Quality Guideline (NAAQ) value of 90 $\mu\text{g}/\text{Nm}^3$ (Figure 23). The data on TSP levels is indicative only of the pollution levels in the vicinity where the monitoring stations were located (generally, located on roadsides) and do not represent the TSP concentration across the Province. Roadside TSP includes vehicle exhaust and re-suspended dust (EMB-DENR, 2004).



Pollution from a factory in Nasugbu.

Figure 23. Levels of total suspended particulates in Alangilang, Batangas City.



Implications and Recommendations

The five-year monitoring data may not be sufficient to indicate the extent of problems in the quality of air in the area. However, it still calls for action from the local government. National programs on motor vehicle emission,

anti-smoke belching, fuel standards and use of alternative fuels should be supported and implemented by local governments.

References

EMB-DENR. 2004. National Air Quality Status Report.
EMB-DENR. 2008. www.emb.gov.ph/air/Air%20Quality/AQ%20Graph.jpg_files/frame.htm. Accessed 5 June 2008.



Pollution and Waste Management

033 Sanitation and domestic sewerage

Description

This indicator reports the proportion of the population with access to sanitation and sewerage systems.

Rationale

The lack of sanitation facilities can affect human well-being and have negative impacts on the quality of the environment especially when disposed untreated to the coastal and marine environment. Moreover, data on access to sanitation

also monitors progress in meeting one of the Millennium Development Goals (MDG) targets for environmental sustainability.

Data Requirements

- Population with access to improved sanitation
- Households connected to septic tanks
- Volume of septage collected/treated
- Population served by public sewerage system (collection)
- Location of sewage treatment plants and discharge pipes
- Level of treatment and volume of sewage treated
- Volume of domestic wastewater generated, treated, recycled or reused

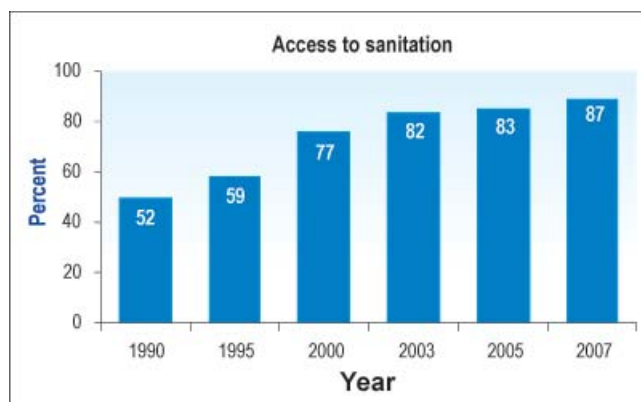
Results

The proportion of households with access to sanitation increased from 52 percent in 1990 to 87 percent in 2007 (OPPDC, 2008; Figure 24). The 2007 data was based from the average of 21 priority municipalities for poverty diagnosis in the province. It is important to note that 6 coastal municipalities were among the top 10 with the highest proportion of households without access to sanitary toilet

facilities. No information was gathered, however, with respect to the proportion of households connected to septic tanks and there is no existing sewerage system in the province.

The 2008 Annual Investment Plan (AIP) for Batangas City includes allocation for the construction of a public wastewater treatment facility.

Figure 24. Proportion of households with access to sanitation.



Implications and Recommendations

The province has significantly progressed in increasing the proportion of households with access to sanitation. However, access to sanitation is only the first step. The Provincial Government can lead the way in assisting the municipalities

with the planning and provision of appropriate sewage collection, treatment and disposal facilities and services for their citizens.



References

- Office of the Provincial Planning and Development Coordinator. 2008.
 Provincial Planning Office. 2008. Poverty diagnosis data 2007.
 Provincial Planning Office. 2007. Initial State of the Coasts template accomplished, October 2007 Workshop.

Pollution and Waste Management

034 Municipal solid waste

Description

This indicator measures the tonnage of solid waste generated, the proportion being recycled or reused, and volume received in dumpsites or sanitary landfills.

Rationale

Uncontrolled waste handling and disposal impact negatively on human and ecological health as well as the aesthetic and recreational values of coastal areas.

Data Requirements

- Volume of solid waste generated
- Volume of solid waste received in landfills/dumpsites
- Volume of solid waste received at recycling facilities

Results

In 2002, the province generated a total of 345,745 tons of waste (SEMP 2005–2020). This increased to an estimated 463,308 tons in 2007. In 2002, 3 municipalities operated controlled dumpsites, while 14 cities/municipalities now have controlled dumpsites (Table 10).

However, it is reported that only 32 percent (403.86 tons/day) of the waste being generated was received at municipal disposal sites (Solid Waste Status Report, 2007). One of the reasons for this low percentage is the fact that garbage collection is normally limited to the *poblacion* or the municipality's central district. Other unserved areas are left to manage their own garbage. Unfortunately, this often results in dumping of waste into vacant lots, drainage systems or rivers and coastal areas. There is no available

information on the amount of solid waste that is reused, recycled or recovered across the Province, as required under RA 9003.

The problem on solid waste management is recognized in the Batangas Province SEMP (2005-2020), where it is stated that the lack of incentives discouraged the interest and enthusiasm on waste minimization efforts, such as waste reuse, recycling and recovery. Segregation of waste at source is not a common practice and, where garbage are segregated, they normally are being remixed in dump trucks and dumping areas due to lack of facilities for solid waste management. Indiscriminate dumping of wastes is commonly observed in many areas due to weak implementation of penalties for this act.



Under Republic Act 9003 (Ecological Solid Waste Management Act) each municipality must develop a solid waste management plan and convert or close their open dumpsites.

Table 10. Waste generation and management in Batangas.

	2002	2007
Total population	2,022,169	2,299,026
Total annual waste generation	345,745 tons	463,308 tons
Controlled dumpsites	3 municipalities	14 municipalities
Open dumpsites	26 municipalities	11 municipalities
Closed dumpsites	1 municipality	3 municipalities
No dumpsites	5 municipalities	6 municipalities

Implications and Recommendations

Strategies for solid waste management have been identified in the Batangas Province SEMP. Implementation of these strategies must be carried out as well as monitoring and evaluation of its implementation.

The amount of wastes which are recycled and the residuals which reach dumpsites are also relevant information for planning, collection, processing and disposal systems. Though the province has progressed in decreasing the number of open dumpsites, the volume of waste is

apparently increasing, as is the amount of uncollected, unmanaged waste.

The construction of MRFs and sanitary landfills for appropriately clustered municipalities would seem to be a positive approach to this growing and highly visible problem. However, such a strategy is difficult to operationalize, and strong leadership and incentives from the Provincial Government are needed.

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Pollution and Waste Management

035 Industrial, agricultural and hazardous wastes

Description

This indicator measures the quantity of agricultural, industrial and hazardous wastes being generated and properly managed within the local government's jurisdiction.

Rationale

Agricultural, commercial, institutional and industrial sectors generate income and employment but they also generate wastes that may affect human health and livelihoods in communities. Hazardous and toxic wastes (e.g., oily waste, pesticide residues; cleaning compounds; hospital wastes;

etc.) are byproducts of various goods, services, processes and systems that customers/citizens demand. The proper management of these wastes is a major challenge to local governments and to sustainable development.

Data Requirements

- Volume of industrial and agricultural wastes generated, handled, treated and disposed
- Volume of hazardous and toxic waste generated, handled, treated and disposed

Results

A study on the hazardous waste in the province was conducted in 1999 and the results indicated that hazardous waste generation was generally very low and insufficient to justify a financial commitment to a waste treatment facility. The study pointed out that the volume will grow, but that the rate of growth will depend on the build up of the chemical industry in the province.

Similarly, medical wastes generation in the province was found to be low. There is no update on medical

wastes in the Province, although it can be assumed that it has grown over time with the increasing population and expanding medical facilities and services in the Province.

The only recent information gathered on hazardous waste was aggregated at the regional level (Region IV-A) in 2005 and 2006. From the regional data, less than 15 percent of the hazardous waste being generated was treated and about 15-20 percent was stored.

Big industries and resorts are reported to have their own wastewater treatment facilities. However, no data was gathered on the actual volume of wastewater generated and treated in those industries.

In 1997, a study was conducted by Madecor Environmental Management Systems, Inc. on agricultural waste generation and management practices in the province. The total daily manure production amounts to about 4,663 MT or about 1.54 million MT of manure per year. City/municipalities which had the highest waste generations were Lipa City (1,731 MT/

day); San Jose (539 MT/day); Rosario (441 MT/day); Taysan (181 MT/day) and San Juan (169 MT/day). About 68.99 percent of the total volume of manure produced within the province was found in the 4th district (highest livestock and poultry population); 13.52 percent in the 1st district and 10.25 percent in the 3rd district. Much of the wastes from San Jose and Lipa City drains through Calumpang River and eventually to Batangas Bay. A projected agricultural waste generation by the year 2020 will amount to more than 5.85 million MT/year. No information was gathered, however, with respect to the current level of agricultural waste generation in the province.

Implications and Recommendations

Little progress has been made in the Province since 1999 regarding management of hazardous and toxic wastes. Although the quantity of hazardous waste being generated is reportedly low, the potential threat to human health and the environment as a consequence of improper management of such waste is evident.

Revisiting this issue would be prudent, in collaboration with the various sectors that are recognized/classified as generators of hazardous and toxic wastes. A partnership arrangement may be considered, whereby those sectors generating hazardous waste, in collaboration with the national and provincial government, would be encouraged to develop and implement a proper hazardous waste management system, serving the entire Province of Batangas.

Considering the substantial amount of agricultural wastes being generated in the province, it is necessary that monitoring of agricultural waste generation be conducted and proper agricultural waste management be in place. The voluntary agreements done by some commercial industries on waste minimization can be duplicated for livestock and poultry farms. A fee system on agricultural wastes can be developed and funds created to have a sustainable program for waste management. Stricter enforcement of environmental policies is likewise essential.

Enact and/or strictly enforce ordinance on agricultural wastes. For backyard raisers, a common waste collection facility can be established and biogas technology can be implemented.

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Annexes



Annex 1. Participants in the workshop for the finalization of the SOC report for Batangas Province.

**Workshop on the Finalization of the SOC Report for Batangas
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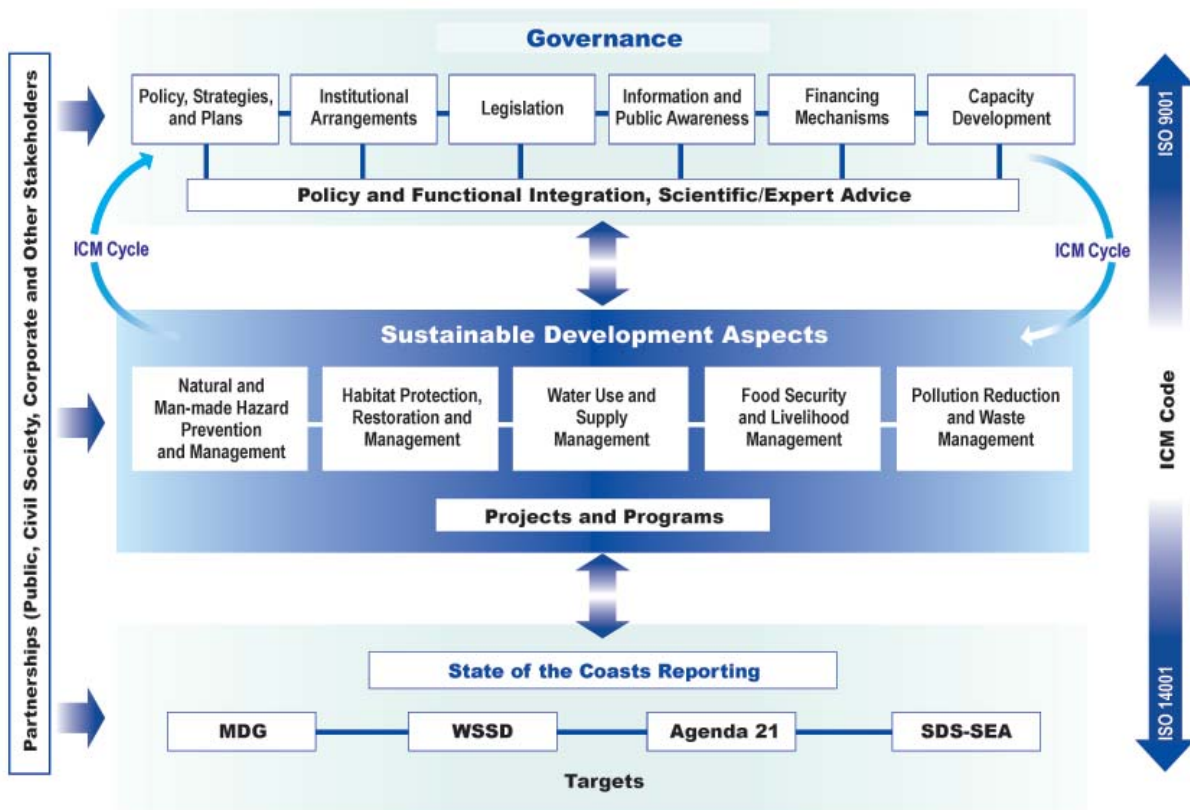
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Annex 2. Framework for the Sustainable Development of Coastal Areas thru ICM.*

The practical experiences of PEMSEA in the application of integrated coastal management (ICM) in the East Asian Seas region over the last 14 years have led to the development of the Framework for Sustainable Development of Coastal Areas (SDCA). This

framework covers a system of governance as well as five components of the sustainable aspects critical to achieving the overall goal of sustainable development. Each of the governance elements and sustainable development aspects are briefly described below.

Process-oriented Common Framework for Sustainable Development of Coastal Areas through ICM Implementation.



* This section is taken from PEMSEA. 2007. *Partnerships in Environmental Management for the Seas of East Asia (1994-2010): A Regional Mechanism Facilitating Sustainable Environmental Benefits in River Basins, Coasts, Islands and Seas*. PEMSEA IEC Material 2. 80p. Global Environment Facility/United Nations Development Programme/International Maritime Organization Regional Programme on Building Partnerships for the Seas of East Asia (PEMSEA), Quezon City, Philippines.

Governance

- a. **Policy, strategies and action plans:** establishing and adopting policy reforms, shared visions and missions, long-term strategies and action plans that express intention, direction, targets and timeframe for managing marine and coastal resources and their sustainable use through an integrated approach.
 - b. **Institutional arrangements:** operationalizing interagency and multisectoral coordinating mechanisms that involve concerned stakeholders in planning, implementing, evaluating and continually improving programs for sustainable development through ICM programs.
 - c. **Legislation:** developing and implementing national legislation and/or local administrative orders, which support new and existing policies that facilitate the effective implementation of ICM.
 - d. **Information and public awareness:** putting into operation communication strategies and plans for ensuring that stakeholders are informed of the scope, benefits and threats to their local ecosystems, and the programs that are being developed and implemented to reduce threats and enhance benefits.
 - e. **Financing mechanism:** institutionalizing the measures and means to support conservation of resources and required environmental infrastructure improvements through public- and market-based sources.
 - f. **Capacity development:** incorporating capacity development as an indispensable component of all aspects of sustainable development programs, from inception and implementation to monitoring and evaluation and, in particular, equipping local personnel and managers with the essential technical and management skills to plan and manage coastal areas and resources.
- c. **Water use and supply management:** Forward-looking water resource management programs are essential to sustainable development, especially in urban centers where water supply shortages are anticipated. Measures include sound water use policy, tariff systems, water allocation/licensing, water conservation and reuse, protection of water sources, and ensuring the quality, adequate supply and accessibility of water services to common citizens.
 - d. **Food security and livelihood management:** The sustainable supply of fisheries, especially from river systems and coastal seas is both a target and an outcome of sustainable development. All other aspects of sustainable coastal and marine areas affect fisheries, and therefore a sustainable supply of fisheries can also be an outcome of good management of these other issues. It is also important to ensure the accessibility of the poor to fisheries, given its role as a major traditional source of animal protein for the coastal poor. Supplemental livelihood programs for coastal communities can also be set in place to reduce overfishing and to increase income from other sources of living.
 - e. **Pollution and waste management:** Pollution reduction and waste management are common challenges for every urban and rural center in order to protect land, air and water (i.e., groundwater, rivers and coastal seas) resources and conserve energy. Sustainable management programs entail an understanding of the sources and characteristics of contaminants and waste materials entering the environment, required societal behavioral shifts to reduce or eliminate pollution, and the introduction of policy reforms, legislation, capacity development, market-based procurement and management instruments, awareness building, and incentive and enforcement mechanisms to promote change.

Sustainable development aspects

- a. **Natural and man-made hazard prevention and management:** The region frequently experiences natural and man-made disasters, including earthquakes, tsunamis, tidal storms, flooding, sea level rise, red tides, oil and chemical spills, etc. A first step in the process is to identify and delineate the likelihood of a disaster occurring, the potential risks, the likely consequences, and the ultimate impact on the lives and property of coastal inhabitants as well as ecosystem health.
- b. **Habitat protection, restoration and management:** Specific habitat management programs, including

Apart from the application of the ICM program development and implementing cycle to plan and execute the various essential activities under the components for governance and sustainable development aspects, other essential components of the Framework are: a) a *State of the Coasts* (SOC) Reporting system to monitor existing conditions and response actions, measurable through process and impact indicators and targets; and b) an ICM Code that adopts international standards (ISO) for quality management and sound environmental management.

Annex 3. Marine water quality criteria (Philippines).¹

Marine water quality		
Description	Water Quality Criteria	Source
Priority parameters		
Dissolved oxygen (Minimum, mg/L)	5, 5, 5, 2	DAO 34 (Classes SA, SB, SC, SD) ²
Total coliform (MPN/100 mL)	70, 1000, 5000, _	DAO 34 (Classes SA, SB, SC, SD)
Total suspended solids	50	Malaysia
Secondary parameters		
Chlorophyll-a (µg/L)	10	ASEAN (Proposed Marine Water Quality Criteria)
Biochemical oxygen demand (mg/L)	3, 5, 7 (10), _	DAO 34 (Classes SA, SB, SC, SD)
Nitrate (mg/L)	0.06	
Nitrite (mg/L)	0.055	ASEAN (Proposed Marine Water Quality Criteria)
Ammonia (µg/L)	70 (un-ionized)	
Phosphate (mg/L)	0.015-0.045 (coastal - estuaries)	

¹ Unless otherwise noted by source.

² Class SA (Waters suitable for the propagation, survival and harvesting of shellfish for commercial purposes; tourist zones and national marine parks and reserves established under Presidential Proclamation No. 1801; existing laws and/or declared as such by appropriate government agency; Coral reef parks and reserves designated by law and concerned authorities); Class SB (Recreational Water Class I - Areas regularly used by the public for bathing, swimming, skin diving, etc.; Fishery Water Class I - Spawning areas for *Chanos chanos* or "Bangus" and similar species); Class SC (Recreational Water Class II (e.g., boating, etc.); Fishery Water Class II (Commercial and sustenance fishing); Marshy and/or mangrove areas declared as fish and wildlife sanctuaries); Class SD (Industrial Water Supply Class II (e.g., cooling, etc.); Other coastal and marine waters, by their quality, belong to this classification).

References

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Annex 4. National ambient air quality guideline values (Philippines).*

Description	Air Quality Criteria	Source
Suspended particulate matter		
a. TSP ($\mu\text{g}/\text{NCM}$; ppm)	a. 230; _	
b. PM-10 ($\mu\text{g}/\text{NCM}$; ppm)	b. 150; _	
Sulfur dioxide ($\mu\text{g}/\text{NCM}$; ppm)	180; 0.07	DAO 81
Nitrogen dioxide ($\mu\text{g}/\text{NCM}$; ppm)	150; 0.08	
Photochemical oxidants as ozone ($\mu\text{g}/\text{NCM}$; ppm)	140; 0.07 (1 hr); 60; 0.03 (8 hrs)	
Carbon monoxide (mg/NCM; ppm)	35; 30 (1 hr); 10; 9 (8 hrs)	
Lead ($\mu\text{g}/\text{NCM}$)	1.5	

* Short-term — Maximum limits represented by ninety-eight percentile (98%) values not to exceed more than once a year.

Reference

DAO 81 (DENR Administrative Order No. 81). 2000. Implementing Rules and Regulations for RA 8749 (Philippine Clean Air Act of 1999). Environmental Management Bureau, Department of Environment and Natural Resources, Quezon City, Philippines.

Annex 5. Sustainable development targets (Philippines).

Sustainable Development Targets

Indicator	National Target by 2015	MDG Target
Eradicate extreme poverty and hunger		
Proportion of families below poverty threshold	19.95	Halve, between 1990 and 2015, the proportion of people whose income is less than US\$1 a day
Proportion of population below poverty threshold	22.65	
Prevalence of malnutrition among 0-5 year-old children (Percentage underweight)	17.25	Halve, between 1990 and 2015, the proportion of people who suffer from hunger
Achieve universal primary education		
Elementary participation rate	100	Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling
Elementary cohort survival rate	84.67	
Elementary completion rate	81.04	
Ensure environmental sustainability		
Proportion of households with access to safe drinking water	86.8	Halve by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation
Proportion of households with sanitary toilet facility	83.8	
Improve maternal health		
Maternal mortality ratio	52.2	Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio
Reduce child mortality		
Under 5-mortality rate (per 1,000 live births)	26.7	Reduce by two-thirds, between 1990 and 2015, the under-5 mortality
Infant mortality rate (per 1,000 live births)	19.0	

Description	Target	Source
Natural and man-made hazard prevention	Substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries	Hyogo Framework for Action 2005–2015
Habitat protection and restoration	Significant reduction in the current rate of loss of biological diversity by 2010	Convention on Biological Diversity and World Summit for Sustainable Development
Food security and livelihood (Fishery)	Restoration of depleted stocks by 2015	Food and Agriculture Organization
Water use and supply	Halve by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation	Millennium Development Goals
Pollution and waste	By the year 2025, dispose of all sewage, waste waters and solid wastes in conformity with national or international environmental quality guidelines	UNEP-Global Programme of Action for the Protection of the Marine Environment

Reference

National Economic and Development Authority and United Nations Development Programme. 2007. Philippines Midterm Progress Report on the Millennium Development Goals. Manila, Philippines.

