

# STATE OF THE COASTS of Guimaras Province



The Provincial Government of  
Guimaras, Philippines



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





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Guimaras, Philippines



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June 2012

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Republic of the Philippines  
Province of Guimaras



## Office of the Governor

### *Message*

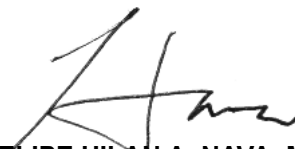
Guimaras is blessed with rich natural resources and scenic spots suited for agri-tourism development. A common vision, "*Guimaras is the Agri-Tourism Capital of the region with empowered, self-reliant and healthy families enjoying a progressive economy which is anchored on the principles of sustainable development,*" was adopted by the various stakeholders to ensure that development activities are aligned towards attaining this vision. We are also continuously identifying appropriate strategies to make the agriculture and tourism industry in the province more sustainable. Furthermore, we are putting in place mechanisms to allow the province and the people to better respond to natural and man-made hazards. We do not want to experience another oil spill event such as the one in 2006 that almost crippled the economic drivers of our province.

In the early part of my administration, the province adopted Integrated Coastal Management (ICM) as a strategy for achieving sustainable development. The ICM program covers the entire island ecosystem of the province, putting into practice the "ridge to reef" approach to management. The coordinating mechanism consisting of the Project Coordinating Committee (PCC), the Project Management Office (PMO) and the Scientific Advisory Group (SAG) were created to oversee the implementation of the ICM Program and to ensure policy and functional integration. For the program to be more effective, a guiding document has been developed that would serve as basis in determining the social, economic and environmental changes in the province and their implications to management. The document shall contain information, issues and concerns duly prioritized by the stakeholders that need to be addressed by the program.

It is with great pride that I present the *State of the Coasts of Guimaras Province* to all *Guimarasnons* and partners. This document serves as our guide in understanding how the management interventions that we have put in place have led to improvements in the governance as well as in the social and economic well-being of the province. This document will also serve as a timely reminder of our individual obligations to the proper management of our rich natural resources. I would like to appeal to each and everyone to support this reporting system and contribute to its regular updating. In this way, we can proudly claim that we have contributed to achieving our common vision.

Lastly, I would like to extend my thanks and appreciation to PEMSEA, the national government agencies, the municipal governments, the NGOs/POs and all other stakeholders who in one way or the other have helped the PMO in making this document possible.

***Mabuhay!***



FELIPE HILAN A. NAVA, M.D.  
Governor



Republic of the Philippines  
Province of Guimaras  
**INTEGRATED COASTAL MANAGEMENT PROGRAM**  
**Office of the Program**  
**Management Office Director**

*Message*

Greetings to all *Guimarasnons*, practitioners and stakeholders of the Integrated Coastal Management (ICM) Program of Guimaras.

Immediately after the oil spill tragedy in 2006, the Provincial Government of Guimaras endeavored to employ an environmental management framework that promotes a holistic and integrative approach to addressing issues and concerns of the coastal and marine areas of the province. This led the province to adopt ICM and became the third local government unit in the Philippines that has been designated as an ICM parallel site under PEMSEA. The province subsequently became a member of the PEMSEA Network of Local Governments for Sustainable Coastal Development (PNLG), which include member local governments from other countries in the East Asian region.

ICM has been recognized by the Government of the Republic of the Philippines through Executive Order 533 as a strategy for achieving sustainable coastal and marine development. To effectively implement ICM, there is a need to utilize important tools that will consolidate information coming from all available sources. Such a tool will provide useful inputs in determining and prioritizing pertinent issues and concerns that need to be included and addressed by the ICM Program. Guimaras therefore embarked on the State of the Coasts reporting to consolidate available information for the establishment of benchmarks and performance targets for the ICM Program. The State of the Coasts report includes information on the governance as well as ecological concerns and socioeconomic conditions of the province before the ICM Program was initiated.

Coming up with this State of the Coasts reporting system for the Guimaras ICM Program was not easy and immediate. It took time and perseverance on the part of the Project Management Office (PMO) staff responsible in conducting a series of consultation and validation workshops and in consolidating the final document. The diligence of Ms. Nancy Bermas and Ms. Daisy Padayao of PEMSEA who painstakingly reviewed and provided additional inputs to improve the document is also recognized.

With the strong commitment of support of the various stakeholders to implement the State of the Coasts reporting, one tangible outcome our people could expect is that the Provincial Government of Guimaras will be more effective not only in assessing the progress in ICM implementation but also in the attainment of its vision, mission and goals.

***Mabuhay!***

**GUALBERTO G. GALIA**  
Provincial ENR Officer/PMO Director



## Partnerships in Environmental Management for the Seas of East Asia



### *Message*

Firstly, I would like to congratulate Guimaras for the publication of its State of the Coasts report. This significant document establishes the baseline assessment of the socioeconomic and ecological conditions, as well as the governance mechanisms that the Guimaras province has put in place for the sustainable development of its coastal and marine areas. The effectiveness of any management program can only be properly evaluated when baseline information is available, and with which new data/information or changes can be compared.

Despite being the youngest ICM parallel site of PEMSEA in the Philippines, Guimaras Province can be commended for having made remarkable strides in managing its coastal and marine areas. Since the initiation of its ICM program in 2008, the province has established the institutional (i.e., Project Coordinating Committee and Project Management Office) and legal mechanisms, including the allocation of staff and budget for its ICM implementation. As highlighted in this report, the province has various programs to address specific management issues including: natural and man-made hazards management; habitat protection and restoration; food security, fisheries and livelihood management; water use and supply and pollution reduction and waste management.

It can also be gleaned from the report how strong leadership support and support from the relevant stakeholders, scientific community and academe, government agencies, and other entities, were instrumental in the successful implementation of ICM activities. This is working to the province's advantage and should be nurtured and strengthened.

The SOC reporting system is an important monitoring and evaluation tool for the ICM program. The province should endeavor to operationalize the implementation of this reporting system and to regularly update the information on the SOC indicators. This will serve as basis for the regular evaluation and refinement of the ICM program so that the various sustainable development targets for the marine and coastal areas of the province can be achieved.

I believe that the significant and useful information contained in this report would be of great use to the general public, environmental managers and policymakers of Guimaras, all of whom have a stake in the sustainable development of the province's rich coastal and marine resources.

**Prof. Raphael P.M. Lotilla**  
Executive Director  
PEMSEA Resource Facility

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# List of Abbreviations and Acronyms

ABC	- Association of Barangay Captains	GPEFI	- Guimaras People's Economic Foundation Inc.
ABS-CBN	- Alto Broadcasting System-Chronicle Broadcasting Network	GTZ	- German Technical Cooperation
AFDP	- Agri-Fishery Development Program	GUIMELCO	- Guimaras Electric Cooperative
APWD	- Association of Persons With Disability	ICM	- Integrated Coastal Management
AQD	- Aquaculture Department	ICODE	- Iloilo Caucus of Development
ARC	- Alaguisoc Rice Cluster	IEC	- Information, Education and Communication
BALMAR	- Balcon Maravilla Rice Cluster	IIMS	- Integrated Information Management System for Coastal and Marine Environment
BFAR	- Bureau of Fisheries and Aquatic Resources	ISFFA	- Igang Small Farmers and Fisherfolks Association
BFARMC	- Barangay Fisheries and Aquatic Resource Management Council	IRA	- Initial Risk Assessment
BOD	- Biochemical Oxygen Demand	ISO	- International Standards Organization
CEP	- Coastal Environment Profile	JBLFMU	- John B. Lacson Foundation Maritime University
CLUP	- Comprehensive Land Use Plan	JOJODMULCO	- Jordan Jeepney Owners and Drivers Multi-Purpose Cooperative
CSR	- Corporate Social Responsibility	JOTODA	- Jordan Tricycle Owners and Drivers Association
CRM	- Coastal Resource Management	KALIPI	- Kalipunan ng Liping Pilipina
CY	- Calendar Year	KAMAMADO	- Katilingban sang Magagmay nga Mangingisda sa Dolores
DA	- Department of Agriculture	KOICA	- Korea International Cooperation Agency
DAO	- DENR Administrative Order	KSPFI	- Kahublagan sa Panimalay Foundation, Inc.
DAR	- Department of Agrarian Reform	LAFARMA	- La Paz Fisherfolks Aquatic Resource and Management Association
DBP	- Development Bank of the Philippines	LBP	- Land Bank of the Philippines
DENR	- Department of Environment and Natural Resources	LGU	- Local Government Unit
DepEd	- Department of Education	LSS	- Living Standard Survey
DO	- Dissolved Oxygen	LWUA	- Local Water Utilities Administration
DOST	- Department of Science and Technology	M/T	- Motor Tanker
DPWH	- Department of Public Works and Highways	MALLFA	- Matagsing Langab Laborers and Farmers Association
DSWD	- Department of Social Welfare and Development	MAO	- Municipal Agriculture Office
DTI	- Department of Trade and Industry	MARINA	- Maritime Industry Authority
EAS	- East Asian Seas	MARO	- Municipal Agrarian Reform Office
ECA	- Environmental Critical Areas	MBO	- Municipal Budget
ECC	- Environmental Compliance Certificate	MC	- Memorandum Circular
ECCD	- Early Childhood Care and Development	MCPI	- Marine Colloid of the Philippines Incorporated
ECP	- Environmentally Critical Projects	MCTC	- Municipal Circuit Trial Court
EIA	- Environmental Impact Assessment	MDCC	- Municipal Disaster Coordinating Council
EMB	- Environment Management Bureau	MDF	- Municipal Development Fund
EO	- Executive Order	MDG	- Millennium Development Goal
FARMC	- Fisheries and Aquatic Resource Management Council	MEO	- Municipal Engineer's Office
FLA	- Fishpond Lease Agreement	MFARMC	- Municipal Fisheries and Aquatic Resource Management Council
FRMD	- Fisheries Resource Management Division	MGB	- Mines and Geosciences Bureau
GAEPI	- Guimaras Agri-Environmental Productivity Initiative	MLGO	- Municipal Local Government Operations
GCCI	- Guimaras Chamber of Commerce and Industry	MLGOO	- Municipal Local Government Operations Officer
GCS	- Guimaras Coastal Strategy	MMRMB	- Municipal Marine Reserve Management Board
GCSIP	- Guimaras Coastal Strategy Implementation Plan	MOSCAT	- Misamis Oriental State College Agriculture and Technology
GDP	- Gross Domestic Product	MOU	- Memorandum of Understanding
GEF	- Global Environment Facility	MPA	- Marine Protected Area
GENRO	- Guimaras Environment and Natural Resources Office		
GFARMC	- Guimaras Fisheries and Aquatic Resource Management Council		
GIFTS	- Guimaras Iloilo Ferry Service Terminal		
GIS	- Geographical Information System		
GIZ	- German International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit)		

MPC	- Multi-purpose Cooperative	PNLG	- PEMSEA Network of Local Governments for Sustainable Coastal Development
MPDC	- Municipal Planning and Development Coordinator	PNP	- Philippine National Police
MPDO	- Municipal Planning and Development Office	PO	- People's Organizations
MPN	- Most Probable Number	POAS	- Provincial Office for Agricultural Services
MRF	- Materials Recovery Facility	PPA	- Philippine Ports Authority
MSWDO	- Municipal Social Welfare and Development Office	PPDO	- Provincial Planning and Development Office
NAMRIA	- National Mapping and Resource Information Authority	PPP	- Public-Private Partnership
NATCCO	- National Confederation of Cooperatives Network	PSWDO	- Provincial Social Welfare and Development Office
NCPERD	- Negros Center for People Empowerment and Rural Development	LGU	- Local Government Unit
NGA	- National Government Agency	PTCA	- Parents-Teachers Community Association
NGO	- Nongovernmental Organization	PVSO	- Provincial Veterinary Services Office
NMRDC	- National Mango Research and Development Center	PWD	- Persons With Disability
NVPECFI	- Nueva Valencia People's Economic Council Foundation Incorporated	PYAP	- Pag-asa Youth Association of the Philippines
NVSFA	- Nueva Valencia Small Farmers Association	RA	- Republic Act
OGA	- Other Government Agency	REDAS	- Rapid Earthquake Damage Assessment System
OMA	- Office of Municipal Agriculture	RFU	- Regional Field Unit
OMAS	- Office for Municipal Agricultural Services	RSBE	- Rural Bank of San Enrique
PAFERN	- Philippine Agro-Forestry Education and Research Network	SACDEC	- Sibunag Ati Community Development Cooperative
PAWCZMS	- Protected Areas, Wildlife and Coastal Zone Management Service	SAGMATODA	- Sta. Ana Motorcycle and Tricycle Owners and Drivers Association
PAH	- Polycyclic Aromatic Hydrocarbons	SB	- Sangguniang Bayan
PBSP	- Philippine Business for Social Progress	SBO	- Sangguniang Bayan Office
PCC	- Project Coordinating Committee	SDCA	- Sustainable Development of Coastal Areas
PCG	- Philippine Coast Guard	SEAFDEC	- Southeast Asian Fisheries Development Center
PCRA	- Participatory Coastal Resource Assessment	SEA-K	- Self Employment Assistance-Kaunlaran
PDCC	- Provincial Disaster Coordinating Council	SGP	- Small Grants Programme
PDIP	- Provincial Development Investment Plan	SILPODA	- Sibunag L300/Public Utility Jeepney Operators and Drivers Association
PDP	- Provincial Development Plan	SMTODA	- San Miguel Owners and Drivers Association
PDPFP	- Provincial Development and Physical Framework Plan	SOC	- State of the Coasts
PDRRMC	- Provincial Disaster Risk Reduction and Management Council	SPDA	- Sitio Paglanutan Development Association
PEBABEA	- Parreño Estate Bugnay Agri-Fishery Beneficiaries Association	SSGTAI	- Sibunag Seaweeds Growers and Traders Association Incorporated
PEDO	- Provincial Economic Development Office	SSMP	- Small-scale Mining Projects
PEMSEA	- Partnerships in Environmental Management for the Seas of East Asia	SSPA	- SSPA Sweden AB
PENRO	- Provincial Environmental and Natural Resources Office	TESDA	- Technical Education and Skills Development Authority
PEO	- Provincial Engineering Office	TINMAR	- Taklong Island National Marine Reserve
PG-ENRO	- Provincial Government-Environment and Natural Resources Office	TSKI	- Taytay sa Kauswagan
PHIVOLCS	- Philippine Institute of Volcanology and Seismology	TSP	- Total Suspended Particulates
PHINMA	- Philippine Investment Management Consultants Incorporated	UNDP	- United Nations Development Programme
PHO	- Provincial Health Office	UNOPS	- United Nations Office for Project Services
PhP	- Philippine Peso	UPIESM	- University of the Philippines Institute for Environmental Science and Meteorology
PLDT	- Philippine Long Distance Telephone Company	UPLBIA	- University of the Philippines Los Baños Institute of Agro-Forestry
PMO	- Project Management Office	UPMSI	- University of the Philippines Marine Science Institute
PMRB	- Provincial Mining Regulatory Board	UPV	- University of the Philippines Visayas
		USAID	- United States Agency for International Development
		WACS	- Waste Assessment Characterization Survey
		WOW	- World Ocean Week
		WSSD	- World Summit on Sustainable Development
		ZSL	- Zoological Society of London

# Acknowledgements

The *State of the Coasts* baseline report for Guimaras Province was initiated by the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) in partnership with the ICM-Project Management Office and in collaboration with the following government agencies, nongovernmental organizations, the private sector and other stakeholders:

Governor's Office

Guimaras Environment and Natural Resources Office

Provincial Office for Agricultural Service

Provincial Planning and Development Office

Provincial Health Office

Provincial Social Welfare and Development Office

Provincial Economic Development Office

Sangguniang Panlalawigan Office

Provincial Disaster Risk Reduction and Management Council

Provincial Law Enforcement and Public Safety Taskforce

Philippine National Police

Provincial Environment and Natural Resource Office — Department of Environment and Natural Resources

Bureau of Fisheries and Aquatic Resources

Philippine Ports Authority

University of the Philippines Visayas

Department of Trade and Industry

Special Project Office for Environmental Studies — Governor's Office

Municipal offices of the following coastal municipalities:

- Buenavista
- Jordan
- Nueva Valencia
- San Lorenzo
- Sibunag

These municipal offices include:

- Municipal Agriculture Office
- Sangguniang Bayan Office
- Municipal Disaster Risk Reduction and Management Council
- Municipal Engineering Office
- Municipal Health Office
- Municipal Planning and Development Office
- Municipal Social Welfare and Development Office

People's Organizations and other stakeholders:

KAMAMADO  
BFARMC  
MFARMC

The final output benefitted from the technical refinements of staff from the PEMSEA Resource Facility: Ms. Daisy Padayao, Technical Assistant for Project Development; Ms. Nancy Bermas-Atrigenio, Senior Country Programme Manager; with direction and guidance from Mr. S. Adrian Ross, Chief Technical Officer and Prof. Raphael P.M. Lotilla, Executive Director, PEMSEA Resource Facility.

Editorial and layout support by Ms. Anna Rita Cano, Communications Associate; Mr. Jonel Dulay, Senior Artist; and Mr. John Christian Castillo, Graphic 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 conflicts arising from multiple use of limited space and resources (Chua, 2006).

## What is a State of the Coasts Report?

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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

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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 Guimaras Province



## Core Indicators for SOC Reporting for Guimaras

Category	SOC Code	Indicator	Trend* (2000-2009)
<b>Governance</b>			
Policy, strategies and plans	001	Coastal profile and 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	
<b>Sustainable Development Aspects</b>			
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 * (2000-2009)
<b>Sustainable Development Aspects</b>			
<b>Habitat protection, restoration and management</b>	018	Habitat management plan and implementation	
	019	Areal extent of habitats	
	020	Protected areas for coastal habitats and heritage	
	021	Reclamation and conversion	
<b>Water use and supply management</b>	022	Water conservation and management	
	023	Access to improved water source	
	024	Incidences/deaths due to waterborne diseases	
<b>Food security and livelihood management</b>	025	Fishery management plan and implementation	
	026	Fisheries Production	
	027	Malnutrition rate	
	028	Poverty, education and employment	
	029	Livelihood programs	
<b>Pollution and waste management</b>	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 Guimaras Province, Philippines, was developed to determine the baseline social, economic and environmental conditions and identify priority issues that will be addressed in the Integrated Coastal Management (ICM) Program of Guimaras. The SOC baseline provides the benchmark for determining the impacts of management responses and interventions on the socioeconomic and environmental status of the area. The SOC report may be developed, refined and regularly updated through time to monitor trends and changes that are occurring in the coastal areas of the province, and to refine and adapt policies, management strategies and programs in response to such changes.

The report covers the period 2000 to 2009. The report is the output of the combined efforts of different stakeholders of the province, including: the national, provincial, and municipal government agencies; the academe; the private/business sector; the nongovernmental organizations (NGOs) and peoples' organizations (POs). The data included in the report were validated through a series of field visits to the municipalities. The draft report was presented to the members of the Guimaras SOC Task Team for review and validation on 25 June 2010, the comments and recommendations of which were considered in refining the report. On 14 September 2010, the refined Guimaras SOC Baseline was presented for review, validation and concurrence of the Project Coordinating Committee (PCC). The major findings and recommendations are summarized below.

## Governance of Marine and Coastal Resources in the Province of Guimaras

### Policies, Strategies and Plans

The province has indicated commitment for sustainable development of its marine and coastal areas through the integration of coastal management programs into the Provincial Development Investment Plan (PDIP,

2005-2010), and the ICM Program into the Provincial Development and Physical Framework Plan (PDPFP, 2008-2013). At the municipal level, the integration of the ICM program into the medium- and long-term municipal development plans is yet to be considered and sanctioned by the Local Chief Executives.

The development of the Guimaras Coastal Strategy and its implementation plan has been initiated. This is an important component of the ICM Program because it serves as the blueprint for sustainable development of the marine and coastal areas of the province. Its development is therefore essential to guide ICM implementation since it embodies the vision of the stakeholders in the province for the long-term development of its marine and coastal resources.

### Institutional Arrangements

There exists in the province a functional interagency and multisectoral coordinating mechanism consisting of the Project Coordinating Committee (PCC), the Scientific Advisory Group and the Project Management Office (PMO). The PCC provides policy direction and guidance for the development and implementation of the ICM program while the Scientific Advisory Group provides scientific advice and technical support in program implementation. The PMO serves as the Secretariat of the PCC and oversees the day-to-day operation of the ICM program. The establishment of the provincial and municipal level coordinating mechanisms provides the platform for relevant stakeholders to take part in policymaking and decisionmaking for the ICM program at all levels.

The indicator further looks into the institutionalization of a local office with adequate administrative resources — staff, budget and equipment — particularly to oversee, guide and coordinate the implementation of the Coastal Strategy and Implementation Plan. The creation of the Guimaras ICM Project Management Office (PMO) enabled close coordination and collaboration with line



government agencies at the national and local levels, and other relevant stakeholders regarding projects/activities for the province's marine and coastal resources management and development. The local government should endeavor to maintain the mechanisms' operation through continuous allocation of staff and financial support.

It is imperative that the PCC meets regularly, preferably twice to thrice a year, to discuss the progress made, as well as constraints in program implementation, and to provide policy direction for the ICM program. The PCC is also key to harmonizing the overlapping responsibilities of related national government agencies, provincial offices, and major stakeholders in managing and developing the coastal and marine resources, and aligning the action programs and initiatives of different sectors towards the attainment of the environment goals and objectives of the province.

### **Legislation and Enforcement of Laws**

Legislations creating the coordinating mechanisms and coordinating offices have not been enacted at the provincial and municipal levels. These mechanisms were previously created under an Executive Order.

Although the province and municipalities have enacted several ordinances for environmental resources protection, conservation, and management, such as Provincial Ordinance No. 2 (2005) for the Guimaras Environment Code, and other sectoral ordinances covering fisheries, extraction of natural resources, establishment of protected areas, pollution and solid waste management, the effectiveness of such legislations is difficult to discern. The enforcement of these laws, including the capacity of concerned authorities to implement them, needs to be evaluated and strengthened accordingly.

Moreover, the integration of sea uses with the Comprehensive Land Use Plans (CLUPs) and the passing of the necessary legislation or ordinance is important to reduce use conflicts and enhance development while ensuring environmental sustainability.

### **Information and public awareness**

The successful implementation of any program may be measured through the awareness of the people involved. In Guimaras, mechanisms exist for information dissemination and advocacy for environmental programs implemented. This has built awareness of the stakeholders on the values and threats in the coastal environment, including emerging

issues like climate change, thus enhancing appreciation on the results of management interventions that were undertaken.

The existence of different organized civil society and nongovernmental organizations (NGOs) in the province and municipalities is of great advantage in the implementation of the ICM program. The different stakeholder groups can be mobilized and tapped to support the implementation of ICM-related activities as well as mainstreaming their programs and activities into the ICM program.

### **Capacity Development**

Strengthening the technical and managerial skills of the staff at the provincial and municipal levels is essential for sustaining the ICM program. Local government staff at the provincial and municipal levels have attended a series of trainings related to ICM and coastal resource management. As a result, the number of people trained has been constantly increasing. The province as well as the municipalities have staff and budget allocations for capacity development related to coastal management.

The local governments should strengthen collaboration and linkages with universities and research institutions and other relevant agencies and stakeholders (e.g., NGAs, OGAs, NGOs, POs) to further improve the skills and technical know-how of local personnel and boost their confidence in implementing the ICM program.

### **Financing Mechanisms**

The local governments have been supportive to ICM program implementation by allocating financial resources regularly. Furthermore, other financing institutions or means (e.g., KOICA, GIZ, PBSP, etc.) were tapped to support livelihood programs for the coastal communities, thus providing alternative sources of income and avenues for growth and development opportunities.

The local governments should look into other means of generating additional funds for coastal management such as the implementation of the environmental user's fee system. This is within the legal authority of the LGUs, i.e., to impose new taxes and fees for generation of management revenues. Forging partnerships with the private sector may be further explored and developed, particularly with respect to environmental infrastructure investments.

## **Sustainable Development Aspects of Marine and Coastal Management in the Province of Guimaras**

### **Natural and Man-made Hazard Prevention and Management**

Guimaras Province is less frequented or exposed to natural hazards (e.g., storms and tropical depressions) compared to other provinces in the country in view of its geographic location. Occasional occurrences of flooding and landslides were experienced in some areas in the province. However, the island province is vulnerable to oil spills due to the navigational and shipping lanes along the Guimaras Strait. It is therefore essential to develop sensitivity maps and contingency plans for oil spills. The province and four of its five municipalities have developed disaster response plans covering natural and man-made disasters.

The province should maximize the use of its existing Geographical Information System (GIS) in providing information on areas which are vulnerable to various types of disasters. An assessment of potential impacts of climate change and appropriate adaptation measures can be considered in the development of future response and contingency plans.

### **Habitat Protection, Restoration and Management**

In view of the rich coastal habitats, several habitat management, protection and restoration programs have been initiated in the province. However, habitat management plans have yet to be developed in order to ensure the continuous delivery of the coastal habitats' goods and services.

An assessment of the status of coastal habitats in the province was undertaken more than ten years ago. Recent studies on mangroves revealed that the mangrove areas in the province have been decreasing. A re-assessment of coastal habitats and information update is warranted.

Management effectiveness at five declared marine protected areas (MPAs) in Guimaras has been rated at 60 percent, which is a cause for concern. The most common problems encountered were unsustainable human practices (e.g., destructive fishing practices, mangrove cutting, quarrying/sand mining, dumping of domestic wastes, etc.), weak law enforcement, and inefficient monitoring and evaluation. The communities and other stakeholders are beginning to actively participate and show a sense of ownership for the

management of the MPAs in their areas. This can be further strengthened through integration of MPA management into the ICM program.

Ports and wharves expansion supports economic development. However, a balance between economic development and environmental sustainability should be considered. The development of an integrated provincial land and sea use zoning plan will provide local chief executives, policymakers, resource managers and investors a clearer direction on the developmental activities, which are compatible with sustainable use of marine and coastal areas.

### **Water Use and Supply Management**

Various programs related to water conservation and management are being implemented at the provincial and municipal levels. Data from 2005 to 2009 showed a significant increase in the number of households with access to improved water sources. It was also indicated that some areas in the province have difficulty in accessing groundwater resources. A general decline in the incidence of waterborne diseases was noted in some areas.

To date, there are no strategic plans at the provincial or municipal levels for the long-term management of water resources. The development of a water conservation and management strategy should be considered. Likewise, the province should also sustain its management efforts for the provision of safe and clean water and invest more in infrastructure and public education and awareness, which are necessary to significantly reduce, if not totally eliminate waterborne diseases affecting the populace.

### **Food Security and Livelihood Management**

The provincial and municipal governments have been exerting enormous efforts on implementing fishery management programs in Guimaras in partnership with various stakeholders. Fisheries production is limited to municipal fishing and no commercial fishing was reported in the province. An increasing production was recorded on the seaweeds and aquaculture industry. As fishing is one of the major sources of livelihood in the province, there is a need to improve data collection and management in order to better facilitate the drafting of a province-wide resource management plan. It is also recommended that a unified fishery legislation be passed to tie up the efforts of the five municipalities in sustaining their fishery resources.

The malnutrition rate in the province showed a decreasing trend since 2005. In terms of education, the province has a literacy rating of 94.97 percent. In 2000, the employment rate in the province was higher than the regional and national rates. Tourism is a growing industry in the province where visitor arrivals are steadily increasing. Several livelihood programs are being initiated and implemented that have benefited the different sectors. A significant reduction in malnutrition in children, higher employment and literacy rates in the province are attributed largely to the various programs that have been implemented by the local government units (LGUs) and actively supported by the communities. Socioeconomic monitoring provides government planners, policymakers and local leaders a basis for improving their social and economic development plans and programs.

### **Pollution Reduction and Waste Management**

In terms of pollution and waste management, the province has allocated financial and human resources for the implementation of several relevant programs. Annual monitoring is being conducted by a multi-partite monitoring team to assess compliance of small-scale mining operations in the province. Water quality monitoring has also been undertaken since 2003, the results of which are presented to the concerned stakeholders. In terms of solid waste management, four municipalities have developed their solid waste management plans. The LGUs, however, need to

ensure that the plans are implemented to support the implementation of R.A. 9003 or the Ecological Solid Waste Management Act. The LGUs should also endeavor to provide sanitation services to their constituents in order to reduce impacts on the coastal environment and to protect the health of their communities. Moreover, it is important to develop a comprehensive plan to guide local governments in managing both land- and sea-based sources of pollution.

In general, earlier efforts on coastal management and the current ICM program in the Province of Guimaras have facilitated improved understanding among the different sectors in the government, private sector and the coastal communities on the importance of the participatory approach to ensure sustainable development in the province. The SOC report indicates that governance mechanisms have been set up and are functioning to guide and coordinate the implementation of the ICM program. As the province advances towards achieving its ultimate goal of sustainable development, the continuing commitment of the provincial and municipal governments to on-the-ground actions is essential. With the Governor's strong political will and leadership, good technical capacity among participating agencies and the commitment of all concerned stakeholders to the ICM program, it is anticipated that the environment and natural resources particularly the coastal and marine areas will be sustainably utilized, protected and conserved for the next generation of *Guimarasnons*.



# Guimaras Province

Well-known for its mangoes, Guimaras is an island province located Southeast of Panay and Northwest of Negros Island in Western Visayas, Philippines (**Figure 1**). The Province of Guimaras is composed of five (5) municipalities and ninety eight (98) *barangay* (villages) with Jordan as capital (**Table 1**). The province takes pride of its pristine sandy beaches, coves, caves, islets, green landscapes, rustic countryside, agri-tourism sites and culturally-based festivals, offering unique experiences to visitors. Hiligaynon is the native language.

The five coastal municipalities have their own unique features. Buenavista, the oldest of the five municipalities, is the center for higher education, considered as the secondary growth center and alternative gateway to Guimaras. Jordan, the second oldest town situated in the center of the island, is considered as the primary growth and commercial center and gateway to Guimaras. Nueva Valencia is the tourism capital and major fishing ground of the province. San Lorenzo is the major agri-fishery producer and commuter gateway to Negros. Sibunag is the major agri-fishery producer and cargo port of entry linking Guimaras to Negros.

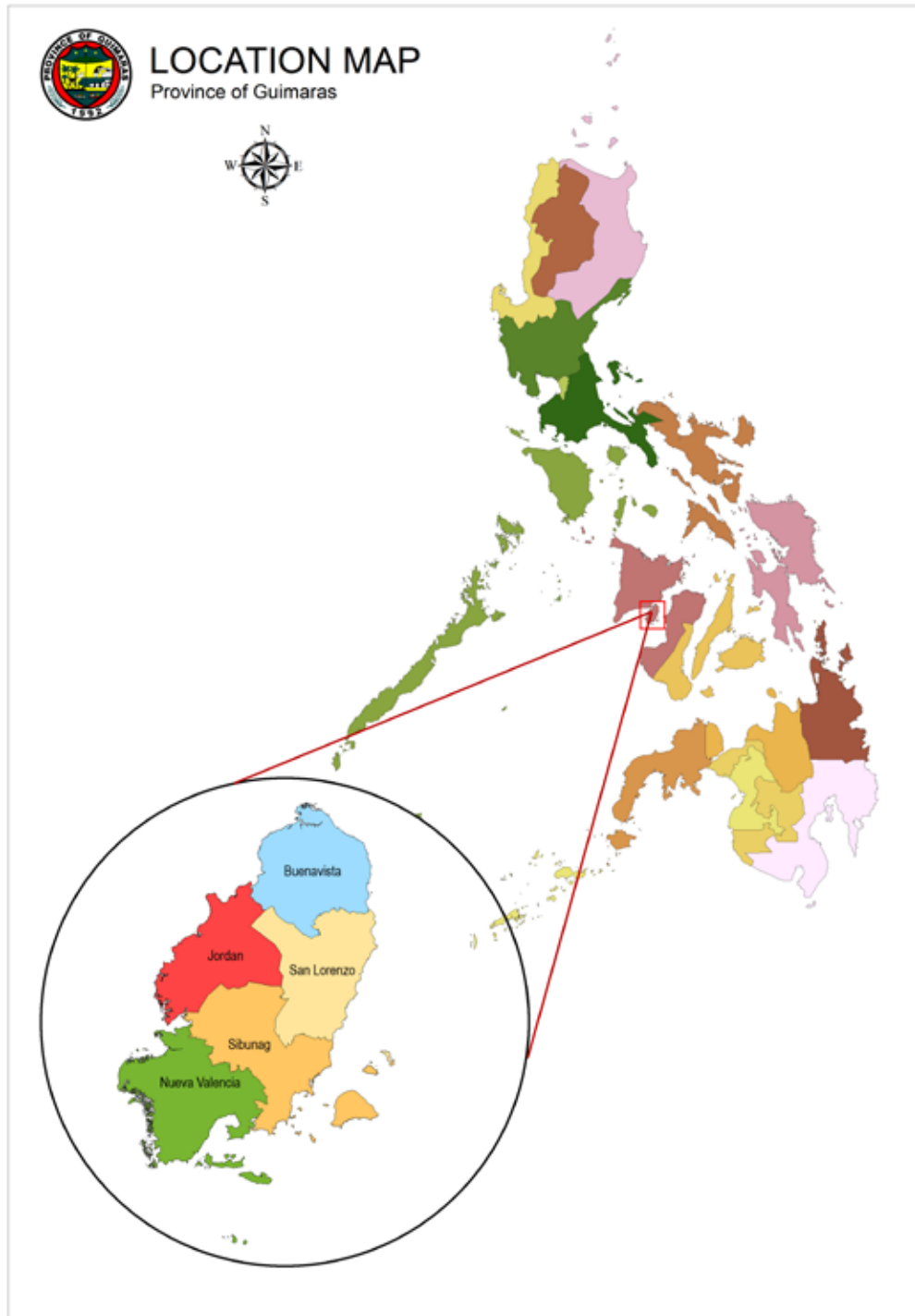


Guimaras Province has a total coastline length of 470.29 km and covers a land area of 60,457 ha. It consists of eight islands and has four major rivers, namely Igang River, Sibunag River, Cabano River and Mantangigi River.

The province has generally gently sloping to rolling topography with land elevation ranging from zero to 300 m above sea level.

The total population of the province increased from 117,990 in 1990 to 151,238 in 2007 with the municipality of Buenavista having the highest population (**Figure 2**). The average population growth rate in the Province is 2.43 percent (1995–2000) and declined to 0.93 percent from 2000–2007 (Provincial Development and Physical Framework Plan) (**Table 2**).

**Figure 1. Location map of Guimaras Province, Philippines.**



Apart from its world-class mangoes, the province also derives its livelihood from agriculture and fisheries. Other sources of income in the Province include tourism, mining and quarrying, lime production, fruit processing and handicraft-making.

In 2004, the GDP of the Province was PHP 2,393 million. In 2003, the highest share in GDP was from the agriculture,

fishery and forestry sectors (48.21 percent), followed by the transportation and communication sectors, banking and financing, wholesale and retail trade, and services (37.50 percent), and mining and quarrying, construction and electricity, gas and water, manufacturing (14.29 percent).

Figure 2. Total population in Guimaras (1990-2007).

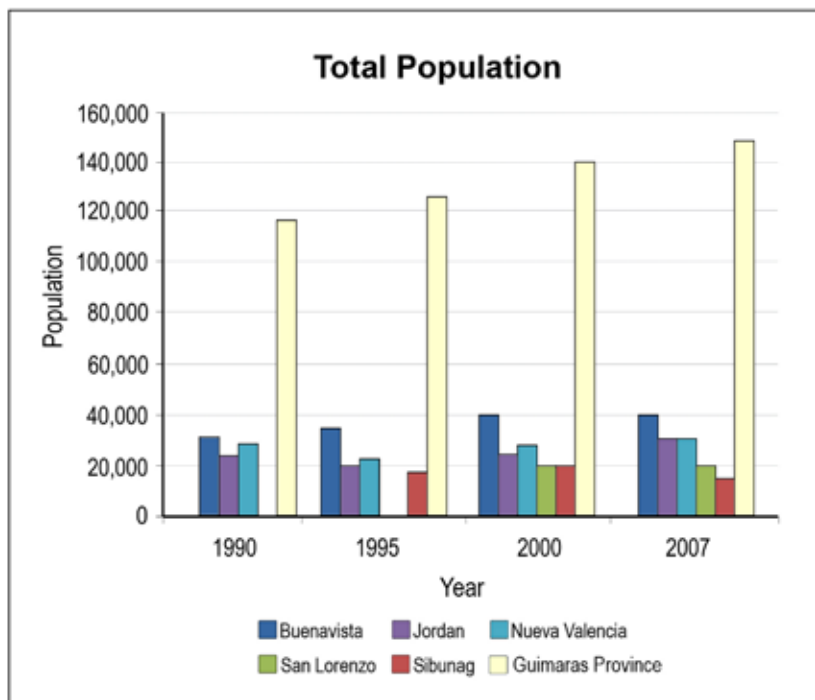


Table 1. Land area and number of *barangay* (villages) by municipality.

Municipality	Area (hectares)	Number of <i>barangay</i>	Number of coastal <i>barangay</i>	Total coastal population	Coastal population density (km <sup>2</sup> )
Buenavista	12,826	36	17	17,985	416
Jordan	12,611	14	8	15,000	3,114
Nueva Valencia	13,712	22	16	22,721	2,837
Sibunag	12,004	14	6	8,786	148
San Lorenzo	9,304	12	6	13,484	280
<b>Total</b>	<b>60,457</b>	<b>98</b>	<b>53</b>	<b>77,976</b>	

Table 2. Population, annual population growth rate and density of the Province of Guimaras by municipality (1995, 2005 and 2007).

Municipality	Annual Population Growth Rate (Percentage)		Density (persons/km <sup>2</sup> )		
	1995-2000	2000-2007	1995	2000	2007
Buenavista	2.2	0.68	294	325	342
Nueva Valencia	2.67	0.31	221	250	255
Jordan	2.75	1.72	201	228	258
San Lorenzo	1.82	1.41	199	217	240
Sibunag	2.67	0.80	122	138	146
Guimaras	2.43	0.93	209	234	250



## What are indicators?

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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?

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Indicators for the *State of the Coasts* were determined based on PEMSEA's Framework for Sustainable Development of Coastal Areas thru ICM (**Annex 1**) 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) (**Annex 2**), 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?

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From a total of 160 indicators based on the Framework for Sustainable Development of Coastal Areas through ICM, a set of 35 core indicators were identified for the development of the initial SOC report. 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 (PEMSEA, 2011).



## How are the indicators presented in this report?

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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

## References

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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 the Guimaras Province, comprising of five municipalities, is 470.29 km (Table 3).

Table 3. Length of coastline of the five municipalities in Guimaras.

	Guimaras Province	Buenavista	Jordan	Nueva Valencia	Sibunag	San Lorenzo
Length of coastline (km)	470.29	60.83	70.82	239.16	73.15	26.33



In 2004, the Province embarked on the development of Coastal Environmental Profiles (CEPs) for the five (5) municipalities covering all the coastal barangay. The CEPs describe the physical features, natural resources (minerals, forest and coastal), socio-political, institutional and legal framework, management issues and opportunities in the municipalities. The CEPs were developed through Participatory Coastal Resource Assessment (PCRA) with the participation of barangay officials, women, fishers, youth and the people's organizations of each coastal barangay. The PCRA were conducted in coordination with DENR-Region VI, DENR-PENRO, Provincial Office for Agricultural Services (POAS), and representatives from the Municipal Agriculture Offices (MAOs) and the Guimaras Environment and Natural Resources Office (GENRO). The resource assessments were done using several tools including the transect diagram, seasonal calendar, trend diagram and resource mapping. The actual resource assessment was participated in by DENR-Region VI, DENR-PENRO, POAS, representatives from MAOs, and GENRO.

Apart from the CEPs and various researches conducted after the oil spill, this SOC baseline report for Guimaras is the first comprehensive assessment of the current economic, social and environmental conditions of the province and attempts to determine the priority environmental and management issues in the area.

In response to the Solar I Oil Spill, which occurred in August 2006, the province is currently supporting several scientific researches to determine the effects of the oil spill to the socioeconomic and environmental conditions of the area. Researches are being conducted by experts from the University of the Philippines Institute of Environmental Science and Meteorology (UPIESM), University of the Philippines Marine Science Institute (UPMSI) and the University of the Philippines Visayas (UPV) and include the following:

- Responses of seagrasses and mangroves to the Solar I Oil Spill;
- Assessment of the municipal fisheries of Guimaras in relation to the Solar I Oil Spill;
- Evaluation of the socioeconomics of Guimaras after the Solar I Oil Spill;
- Indications of biological available toxicants in selected gastropods in Guimaras;
- Study of the hydrologic carrying capacity of Guimaras through community watershed management;
- Hydrocarbon residues in sediments and coastal erosion in Guimaras; and
- Health and environmental assessment of communities exposed to bunker oil in Guimaras.



Survey of seagrass and mangrove areas to determine the impacts of the 2006 oil spill.





**Experts from the University of the Philippines conducted scientific studies on the indications of environmental stress due to Solar 1 oil spill as shown by shore mollusc and crustacean assemblages.**

The results of the scientific studies are presented to the stakeholders of Guimaras during August each year to commemorate the oil spill incident. The results provide an important basis for crafting appropriate management responses and guide policy decisions for the management of the coastal and marine areas of the province.

Similarly, some 23 monitoring studies and researches were independently conducted by UPV on the effect of the oil spill incident in the Taklong Island National Marine Reserve located in Nueva Valencia, which was one of the hard-hit municipalities. Below is the list of studies undertaken by UPV:

- Some structural changes of seagrass meadows in Taklong Island National Marine Reserve, Guimaras, Western Visayas, Philippines after an oil spill;
- Monitoring of the impacts, response and recovery of mangrove trees, saplings and wildings within Taklong Island National Marine Reserve, Guimaras, Philippines (Year I);
- Monitoring of the first year effects of the Solar I Oil Spill on the benthic infaunal assemblages in Southern Guimaras, Philippines;
- Monitoring of reef faunal assemblages and seagrass-associated echinoderm populations in the Taklong Island National Marine Reserve;
- Post-spill plankton and larval flux monitoring studies in Taklong Island National Marine Reserve;
- Temporal variations of total polycyclic aromatic hydrocarbons (PAHs) in M/T Solar I oil spill-affected sediments;
- Temporal variations of petroleum hydrocarbons in M/T Solar I oil spill-affected sediments;
- Monitoring of the catch per unit effort (CPUE) of bottom set longline operating in Southern Guimaras, Philippines;
- Monitoring of the gonad of the rabbitfish (*Siganus guttatus*) in an oil spill affected and unaffected area;
- Impacts of oil spill-affected marine environment on the food safety and quality of aquatic organisms;
- Socioeconomic monitoring of Solar I Oil Spill effects: resiliency and recovery of fishers and fishing in selected fishing communities of Southern Guimaras;
- Health status and effects of MT Solar I oil spill exposure among residents of Brgy. Lapaz and San Roque in Nueva Valencia, Guimaras;
- Environmental sensitivity index mapping of the Province of Guimaras;
- Development of bioremediation technology (using inorganic fertilizer) for oil spill cleanup in Guimaras: temporal variations of petroleum hydrocarbons in M/T Solar I oil spill affected sediments;

- Development of bioremediation technology (with packed bio-filters) for oil spill cleanup in Guimaras: temporal variations of petroleum hydrocarbons in M/T Solar I oil spill affected sediments;
- Oil digestion via a three (3) stage biodigester;
- *Tubig at langis*: an analysis of women's experiences of gender bias following the M/T Solar I oil spill;
- Gender-differentiated response and recovery efforts of communities in Guimaras affected by the oil spill: implications on resiliency;
- Documentation of aid and aid programs extended by

NGOs and private corporations to selected municipalities affected by the M/T Solar I oil spill in the Province of Guimaras;

- Gender perspectives in disaster responses and interventions to Solar I oil spill incidence in Guimaras, Philippines;
- Communicating disaster management: documentation, assessment of good practices and reform initiatives by stakeholders in the Solar I oil spill in Guimaras; and
- Livelihood initiatives in response to disaster: the case of the M/T Solar I oil spill.

## Implications and Recommendations

The results and recommendations of the various studies and researches are significant inputs to planning and management of the coastal and marine areas of the province. In particular, they provide the scientific and sound basis for identification of priority issues and corresponding management strategies and activities. The results of these studies should be made available in a format that is understandable to local chief executives, planners and resource managers for consideration and reference in policymaking and decisionmaking.



**Barangay La Paz, Nueva Valencia – one of the hard-hit areas of the oil spill.**

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## 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
- Operational management plans
- Multisectoral participation mechanisms
- Local government commitments to implementation
- Monitoring and evaluation program

## Results

Programs for coastal resource management (CRM) in the province started in 2004. One of the key outputs of the CRM process are the Coastal Environmental Profiles (CEPs) of the five coastal municipalities which were developed through Participatory Coastal Resource Assessment (PCRA). Five barangays in Nueva Valencia (e.g., Tando, La Paz, Igdarapdap, Pandaraonan, Dolores) have drafted their CRM plans in 2009 but are yet to be approved and adopted. Adoption of the plans was hindered by unclear management issues on coastal water boundaries at the barangay level.

In 2005, through Provincial Ordinance No. 2, the Guimaras Environment Code was enacted, which was the first Environment Code enacted in Western Visayas. The Code provides guidance to the local government on its pursuit for sustainable development and covers: land-use development; management of forest resources, inland and groundwater resources, coastal and marine resources, mineral resources; conservation of biodiversity; pollution control; health and sanitation; public safety; and tourism.



On 11 August 2006, the Solar I mishap caused two million liters of bunker oil to be spilled into Guimaras' coasts. This resulted to an environmental and economic disaster and affected more than half of its population living along its 470-km coastline. On the other hand, the incident provided a window of opportunity for the province to consider the development and implementation of an ICM program for sustainable coastal development.

The Province of Guimaras signified its interest to implement ICM through a letter forwarded to PEMSEA on 21 September 2007. Consequently, a site evaluation was conducted on 28-30 April 2008 to determine the suitability of the province in implementing ICM as well as to identify the various environmental challenges and the ongoing initiatives of the local government and other stakeholders for the sustainable management of its marine and coastal resources.

In August 2008, through a Memorandum of Understanding signed by the Provincial Government, the Department of Environment and Natural Resources and PEMSEA, the Province of Guimaras was officially recognized as PEMSEA's third ICM parallel site in the Philippines in addition to Bataan and Cavite. Guimaras is considered a very unique site since it is the first in the Philippines to implement ICM in an island ecosystem. The scope of the ICM program covers the entire province. As a parallel site, the province is implementing ICM using its own human and financial resources. PEMSEA on the other hand, is providing technical assistance to support ICM implementation, as well as opportunities for capacity development and in securing additional support from other sources.



#### Sunken M/T Solar 1

The fully-supportive Governor of Guimaras, Hon. Felipe Hilan A. Nava, exhibiting exemplary leadership by spearheading ICM implementation in the province, issued Administrative Order No. 4 (2008) establishing the Guimaras ICM Project Coordinating Committee (PCC) and the Project Management Office (PMO) along with the necessary budgetary allocations for their initial operation. The province has developed a three-year work program delineating the key activities for 2008-2010, including the development of Guimaras Coastal Strategy (GCS) and the Guimaras Coastal Strategy Implementation Plan (GCSIP).

The province has embarked on the development of the GCS and the GCSIP, which is targeted for completion in 2012.





**MOU signing between the Provincial Government, DENR and PEMSEA for the establishment of Guimaras as PEMSEA's parallel site for ICM implementation.**



**Guimaras has initiated the development of its Coastal Strategy and Implementation Plan.**

### Implications and Recommendations

The Coastal Strategy is an important component of an ICM program as it serves as the blueprint for the long-term sustainable development of the marine and coastal areas of the province. It also embodies the vision of all stakeholders in the province on how they want their coastal and marine areas to be in the next 25 years, which coincides with the timeframe of the Provincial Physical Framework Plan. Its development is therefore essential not only to guide ICM implementation but also to ensure that the coastal and marine areas of the province are properly managed. It is thus essential that the Provincial Government move forward in developing the GCS and GCSIP and work towards the adoption of these relevant

documents, including their translation into on-the-ground actions.

The province has an advantage in having the strong support of the province's local chief executive, which facilitated the timely adoption and implementation of the activities of the ICM program. This should be seen as a window of opportunity to facilitate the development of the GCS and GCSIP and its integration into the development plans of the province and the five municipalities as well as strengthening the mechanisms for the implementation of activities identified in the ICM program.

### References

Fisheries and Aquatic Resource Management Section, OMAS Nueva Valencia. Province of Guimaras ICM-PMO/2008-2009 Annual Accomplishment Reports.



## 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/ Strategic Environmental Management Plan, through a more integrated economic, social and environmental policy and planning approach.

## Data Requirements

- Local development plans

## Results

The province and the five municipalities have their respective development plans, which serve as blueprint for the development and management of the land and coastal and marine areas. The Provincial Comprehensive Land Use Plan (2005-2035) integrates strategies relevant to coastal and marine management, including:

- Management of protected areas;
- Regulation of developments in environmentally constrained areas;
- Promotion of agro-forestry in watershed areas;
- Regulation and enhancement of aquaculture and salt-production areas;

- Regulation of mining activities and strengthening of the Provincial Mining and Regulatory Board (PMRB);
- Regulation of tourism activities; and
- Development of water supply, sanitation and sewerage system.



ICM was identified as one of the major programs of the Provincial Development and Physical Framework Plan (PDPFP) 2008-2013, the medium-term development plan of the Province. Apart from ICM, the major programs identified in the PDPFP included the following:

- Agri-fishery and tourism development;
- Agro-forestry development;
- Weather and climate monitoring;
- Flood control;
- Health monitoring;
- Healthy lifestyle;
- Guimaras-wide water supply development;
- Renewable energy development;
- Sewerage development;

- Solid waste management;
- Socialized housing;
- Roads and ports development;
- Capacity development;
- Provincial agri-infrastructure; and
- Employment generation.

Coastal management programs were also integrated into the Provincial Development Investment Plans (2005-2010).

Moreover, the Comprehensive Land Use Plans (CLUPs) of the five municipalities cover coastal and marine issues and management and provide annual allocation for its implementation. The CLUPs, however, are yet to be adopted by the various municipalities.

## Implications and Recommendations

The integration of the ICM program into the development and investment plans of the province (PDPFP and Provincial CLUP) is an indication of the commitment of the provincial government for the sustainable development of its marine and coastal areas. Since the PDPFP guides the local leadership to determine the acceptability of development programs and activities, including allocation of resources, support for the implementation of the ICM program is anticipated.

The significant commitment of the provincial government should be translated at the municipal level. The municipalities should also consider the integration of the ICM program in their respective development plans, which will be adopted by local chief executives as basis for developing the operational plans.

## References

- Provincial Comprehensive Land Use Plan (2005-2035).  
Provincial Development and Physical Framework Plan (PDPFP), 2008-2013.



## Institutional arrangements

### 004 Coordinating mechanism

#### Description

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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

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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

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- 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

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The establishment of mechanism for relevant sectors to participate in policymaking and decisionmaking is an important component of ICM implementation. It promotes integration, coordination, conflict resolution and ownership

of the ICM program. Through EO No. 4 series of 2008, the Project Coordinating Committee (PCC) was established. It serves as the multisectoral coordinating body for the implementation of ICM in the province.



Regular PCC meetings are being conducted to update and consult the PCC members on the progress of ICM implementation.

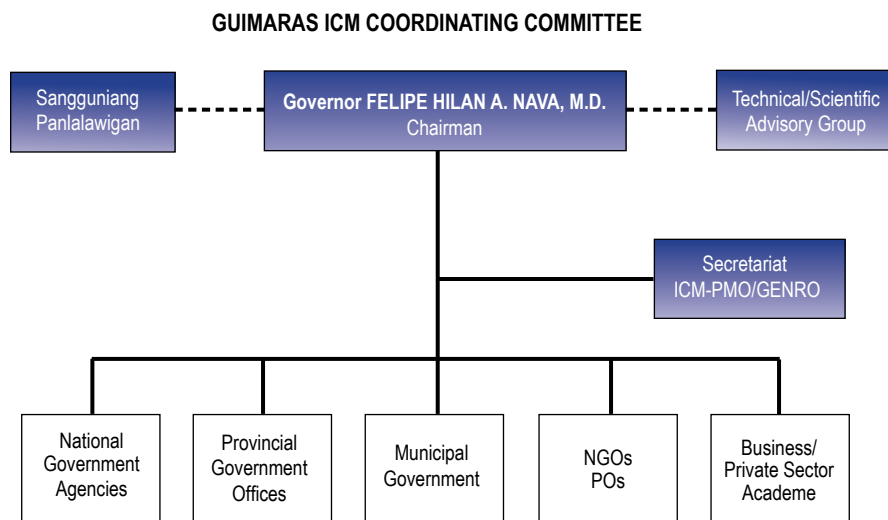
The PCC consists of representatives from the national and provincial agencies, the five coastal municipalities, nongovernmental and people’s organizations, financial and technical institutions and the Provincial Board (Figure 3). The PCC met twice in 2008, while in 2009, it was convened

to review the project proposal submitted to the GEF/UNDP Small Grants Programme (SGP). PhP 70,000 and PhP 60,000 (approximately US\$ 1,555 and US\$ 1,333) were allocated for the PCC operations in 2008 and 2009, respectively.

Institutional Arrangements  
Coordinating mechanism



Figure 3. Project Coordinating Committee of the Guimaras ICM Program.



Through the same Executive Order, the Guimaras Environment and Natural Resources Office (GENRO) was designated as the Project Management Office (PMO) and serves as the coordinating office and technical arm of the PCC in ICM implementation (**Figure 4**). Eight staff are

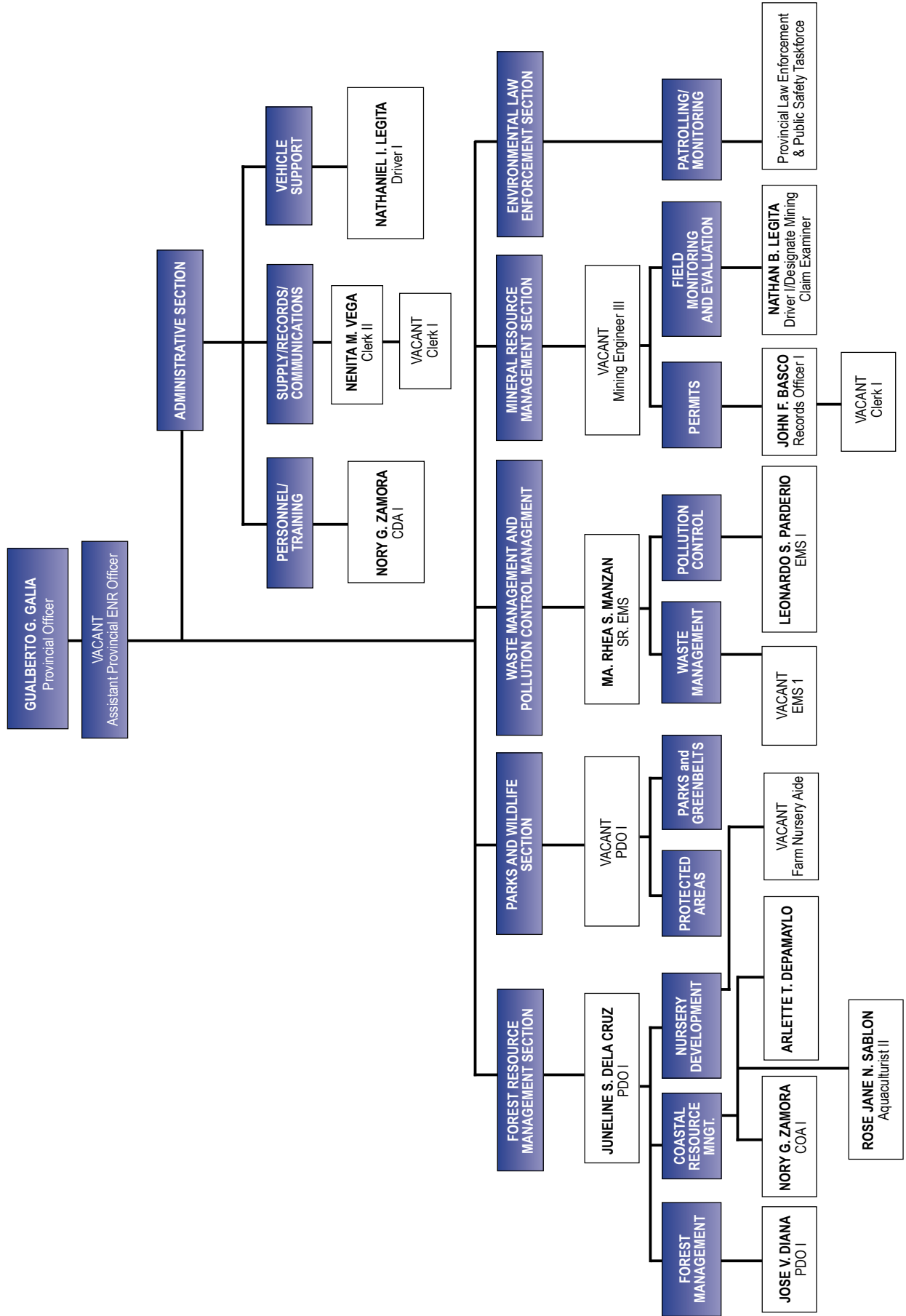
allocated in the PMO for the implementation of ICM activities and programs. Budget allocations for ICM implementation were PhP 2.6M (approximately US\$ 57,700) and PhP 1.5M (approximately US\$ 33,300) in 2008 and 2009, respectively.



**A committed leader enjoins various agencies and sectors to actively participate in the ICM program.**

Figure 4. Organizational structure of the Guimaras Environment and Natural Resources Office.

GUIMARAS ENVIRONMENT AND NATURAL RESOURCES OFFICE  
ORGANIZATIONAL STRUCTURE



Institutional Arrangements  
Coordinating mechanism

Similarly, multisectoral coordinating mechanisms and coordinating offices were also established through Executive Orders at the municipalities for ICM implementation with corresponding staff allocation (Table 4).

Budget allocation for ICM implementation is part of the regular operating budget of the concerned departments or sections at the municipalities. The organizational structures of the municipal PCCs are shown in Figures 5a-5e. The offices of the municipal agriculture (MAOs) and the municipal planning (MPDCs) serve as lead agencies for ICM implementation at the municipal level.

Table 4. ICM implementation in the five coastal municipalities.

Municipality	ICM Coordinating Mechanism	ICM Coordinating Office
Buenavista	EO 08-028, 2008	EO 08-028, 2008
Jordan	EO No. 61, 2008	EO No. 61, 2008
Nueva Valencia	EO No. 22, 2008	EO No. 22, 2008
San Lorenzo	EO No. 26, 2008	EO No. 26, 2008
Sibunag	EO No. 2008-16, 2008	EO No. 2008-16, 2008

Figure 5a. Project Coordinating Committee of the ICM program in Jordan.

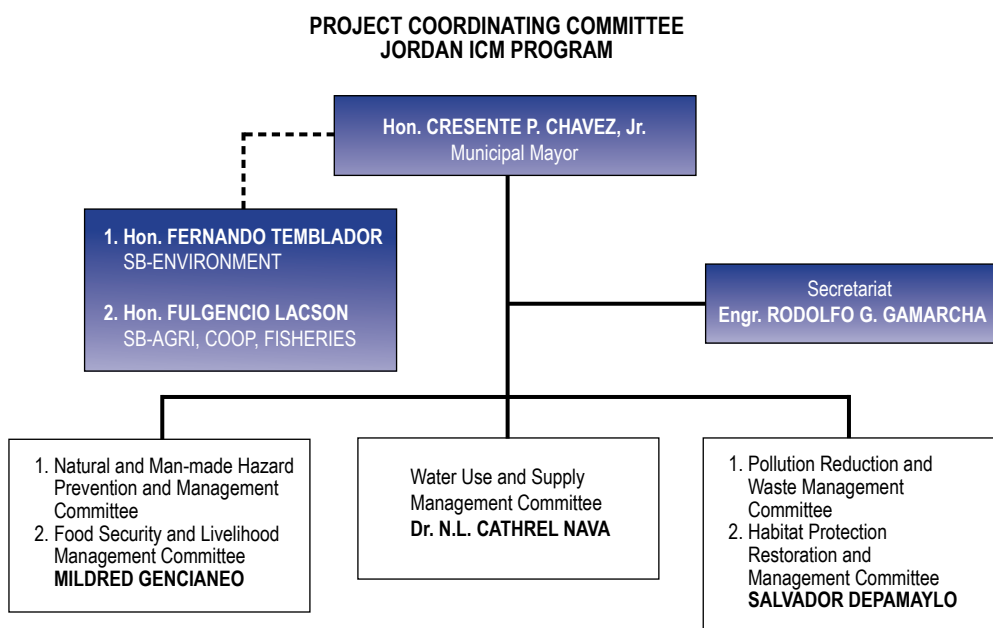




Figure 5b. Project Coordinating Committee of the ICM program in Nueva Valencia.

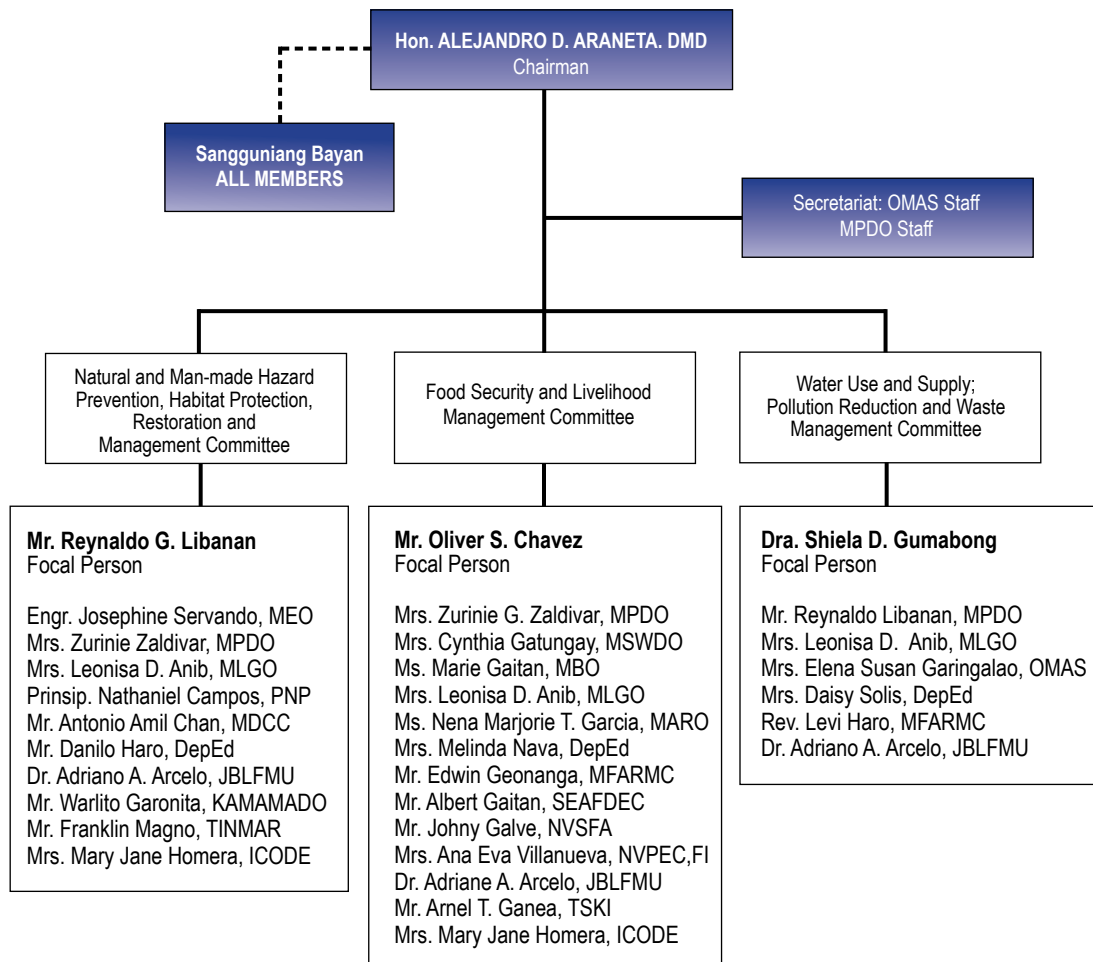


Figure 5c. Project Coordinating Committee of the ICM program in San Lorenzo.

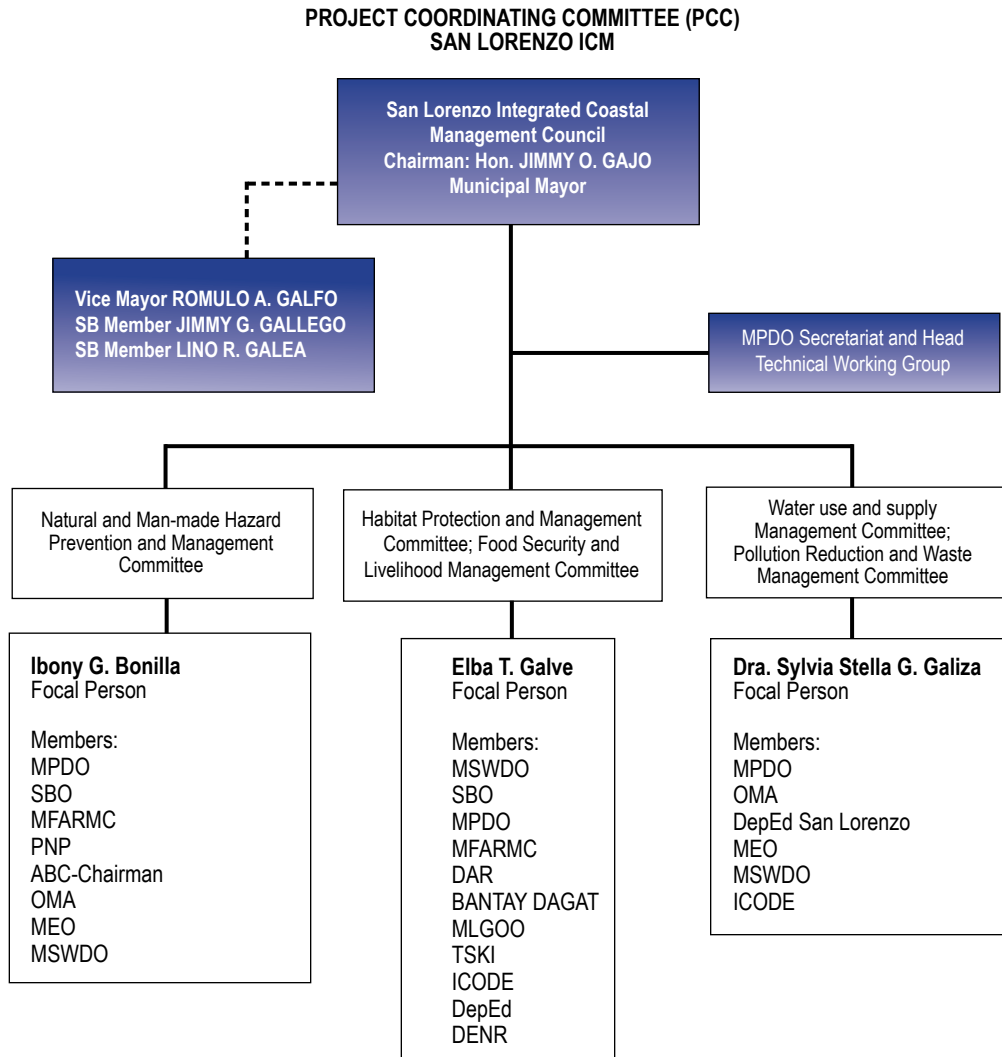
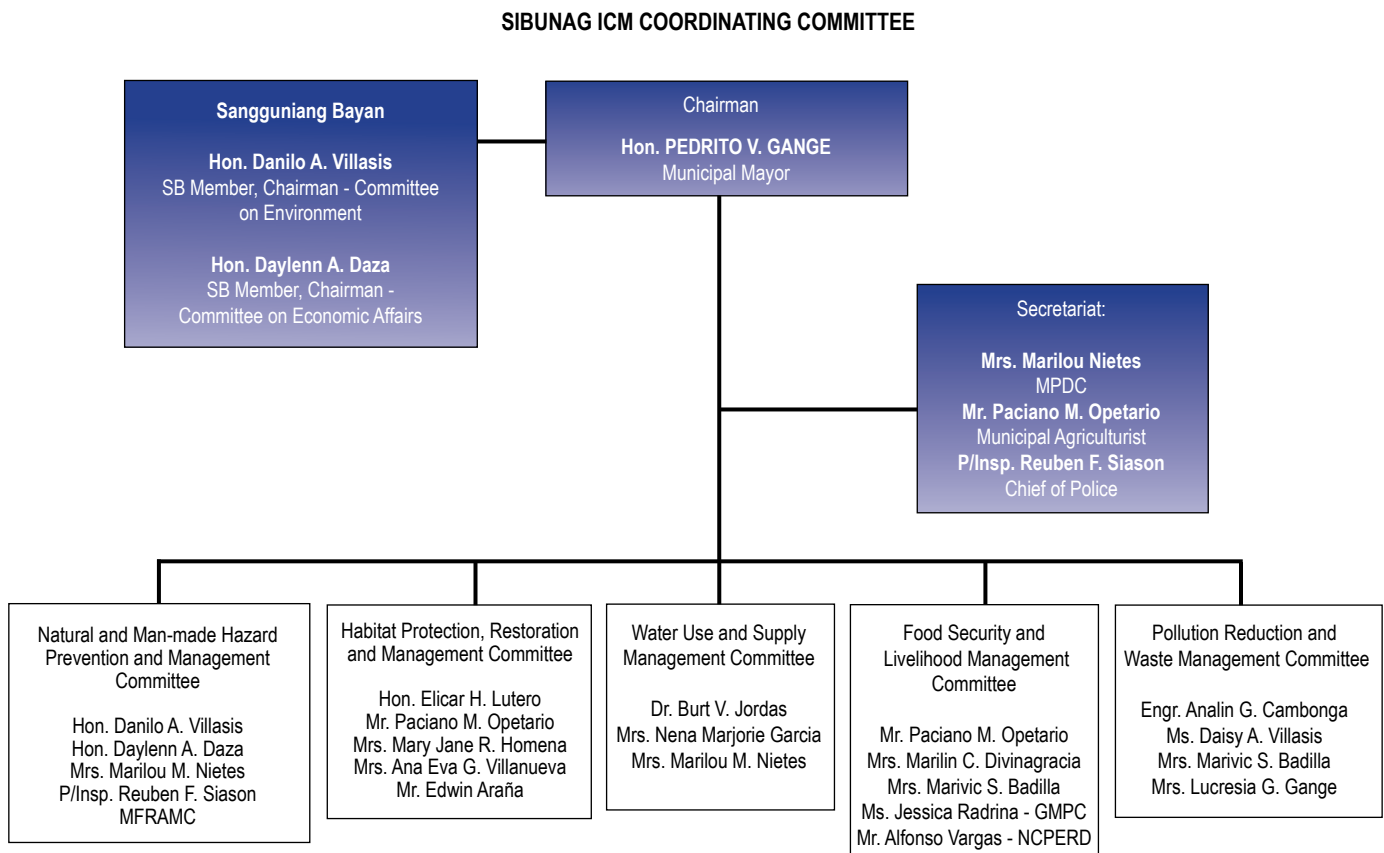



Figure 5d. Project Coordinating Committee of the ICM program in Sibunag.



Institutional Arrangements  
Coordinating mechanism



Figure 5e. Project Coordinating Committee of the ICM program in Buenavista.

 Republic of the Philippines  
Province of Guimaras  
Municipality of Buenavista  
**OFFICE OF THE MUNICIPAL MAYOR**

Executive Order No. 01-02  
Series of 2008

RECEIVED  
09-03-08 10:40  
DATE TIME

**AN ORDER DESIGNATING PERSONNEL TO SERVE AS OFFICIAL REPRESENTATIVE OF THE MUNICIPALITY TO THE GUIMARAS ICM PROJECT COORDINATING COMMITTEE (PCC) SUSTAINABLE DEVELOPMENT ASPECTS' SUBCOMMITTEES**

*Whereas*, the Province of Guimaras, with the Partnership in Environmental Management for Seas of East Asia (PEMSEA) and the Department of Environment and Natural Resources (DENR) had just concluded the MOA signing for the Guimaras Integrated Coastal Management (ICM) Program;

*Whereas*, in a workshop conducted relative to the agreement, it was concluded that a permanent representative to the Project Coordinating Committee be identified by every member agency or organization;

*Whereas*, the Municipality of Buenavista, being a member of the Guimaras ICM-PCC Sustainable Development Aspects Sub-committees, is duty bound to identified who shall be its official representatives to the various sub-committees as established;

**NOW THEREFORE**, by virtue of the power vested upon me pursuant to the laws and regulations governing my authority as Local Chief Executive under Republic Act No. 7160 or the Local Government Code of 1991, **I, SAMUEL T. GUMARIN, M.D., MPH.**, do hereby designates of the following persons to the various sub-committees, to wit:

1. Natural and Man-made Prevention and Management Committee
  - a. HON. EFIFANIA VARGAS (Regular Representative)
  - b. HON. CARLITO GABO (Alternate Representative)
2. Habitat Protection, Restoration and Management Committee
  - a. ENGR. NILDA SILAYA (Regular Representative)
  - b. MR. JOEL TACADAÑO (Alternate Representative)
3. Water Use and Supply Management Committee
  - a. DR. GRACE FERRER-CORTEZ (Regular Representative)
  - b. MS. BELLIE CORTEZ (Alternate Representative)

The Scientific Advisory Group was also established, comprising of representatives from the UP Institute of Environmental Science and Meteorology (UPIESM), University of Philippines Marine Science Institute (UPMSI)

and Institute for Fisheries Policy and Development Studies of the University of the Philippines Visayas, to provide scientific advice and technical support to the ICM program.

## Implications and Recommendations

The province has significantly progressed in establishing a multisectoral coordinating mechanism for ICM implementation. A representative and fully functional coordinating mechanism is an important component of the ICM program. It provides policy guidance and a means to address the interests of all stakeholders in the program.

The establishment of a coordinating mechanism at the provincial and municipal level also facilitates relevant stakeholders to take part in policymaking and decisionmaking processes. The operations of the coordinating mechanism in Guimaras can be further strengthened through awareness building and continuing engagement of the key stakeholders.

This will ensure the usefulness and relevance of the PCC and its role in guiding ICM implementation.

In the same way, a competent coordinating office with knowledgeable staff and adequate budget ensures that implementation of the ICM program will be properly coordinated and implemented among relevant sectors.

The local government should endeavor to sustain the operation of such mechanisms by ensuring the adequacy of budget allocation and regular assessment and updating of staff capacities and skills.

## References

EO 08-028, Series of 2008. Office of the Mayor, Municipality of Buenavista.  
EO No. 61, Series of 2008. Office of the Mayor, Municipality of Jordan.  
EO No. 22, Series of 2008. Office of the Mayor, Municipality of Nueva Valencia.  
EO No. 26, Series of 2008. Office of the Mayor, Municipality of San Lorenzo.  
EO No. 2008-16, Series of 2008. Office of the Mayor, Municipality of Sibunag.  
2008 Annual Accomplishment Report. Province of Guimaras, ICM-PMO, GENRO.  
Special Environmental Studies Accomplishment Reports, CY 2009.



## 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 decisionmaking 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 decisionmaking processes and activities. It provides concerned parties with the satisfaction that their views and concerns are taken into account in the planning and decisionmaking 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

## Results

The participation of all relevant stakeholders in the coordinating mechanism is essential to ensure that their views and concerns are reflected in the policymaking and decisionmaking processes of the ICM program and LGUs in general. In the Guimaras ICM program, all relevant sectors

are represented in the multisectoral coordinating mechanism including the five (5) coastal municipalities, fifteen (15) national and provincial government agencies, civil society and people's organizations, the private sector, financing institutions and the academe.



Five sub-groups representing the sustainable development aspects (natural and man-made hazards prevention, habitat protection and restoration, water use and supply, food security and livelihood, and pollution reduction and waste management) are also included in the coordinating mechanism. **Table 5** presents the composition of the Guimaras PCC.



Focal persons for each of the member agencies in the coordinating mechanism have been identified. They participate in the activities of the ICM program. Among the member agencies in the coordinating mechanism, only

DENR has budget allocations for a coastal management program. Other national and provincial government agencies have financial allocations for ICM, which are included in their general operations budget.



**Consultation dialogue on the implementation of the ICM Program in the Province.**



**Table 5. Composition of the Guimaras ICM Project Coordinating Committee.**

National Government Agencies	Provincial/Regional Government Offices	Municipal Governments	Private Sector/Business/Academe	NGOs/POs
Department of Environment and Natural Resources; Department of Public Works and Highways	Provincial Office for Agricultural Services	Jordan	Jordan Water District	<i>Kahublagan sa Panimalay Foundation, Inc.</i>
Land Bank of the Philippines; Philippine Coast Guard; Development Bank of the Philippines	Guimaras Environment and Natural Resource Office	Nueva Valencia	Buenavista Water District	GIZ (German International Cooperation)
Bureau of Fisheries and Aquatic Resources	Provincial Planning Development Office	Buenavista	Guimaras Chamber of Commerce and Industry; <i>Taytay sa Kauswagan</i> , Incorporation	Iloilo Caucus of Development
Philippine National Police; Philippine Ports Authority; Maritime Industry Authority	Provincial Engineering Office	San Lorenzo	Guimaras Resort Association; Jordan/Buenavista Motorbanca Association	Guimaras Fisheries and Aquatic Resource Management Council
Department of Science and Technology; Department of Agrarian Reform; Department of Agriculture	Provincial Economic Development Office	Sibunag	Rural Bank of San Enrique); Guimaras Electric Cooperative	<i>Katilingban sang Magagmay nga Mangingisda sa Dolores</i> , Mabini Limers and Farmers Association
Department of Trade and Industry; Department of Interior and Local Government	Provincial Health Office		University of the Philippines	
Department of Education; National Mango Research and Development Center	Provincial General Services Office; Provincial Veterinary Services Office; Regional Disaster Risk Reduction and Management Council		Guimaras State College	Southeast Asian Fisheries Development Center

## Implications and Recommendations

Guimaras has put in place a multisectoral coordinating mechanism that facilitates inter-agency coordination through the establishment of the PCC. It is critical that the PCC and PMO remain active to ensure that the necessary consultative platform is available to the various sectors and stakeholder partners of the province. Regular meetings in particular, and presided by the Governor Chair, should be conducted to apprise the PCC members of progress made in ICM implementation and to seek their guidance in addressing challenges and potential constraints. It is also important that the operationalization of the PCC should be seen as a responsibility of the various stakeholder partners and that majority should benefit from the coordination process. The goal is to build confidence in the program, which is anticipated to elicit continuing stakeholders' participation and ownership.

The representation of the scientific community/academe/ research institutions (e.g., UPV, GSC) in the coordinating mechanism is an important component of the stakeholder participation process. The participation of the scientific community/academe provides the local government with access to scientific information on which to base management actions. Given the complexity of the coastal ecosystems, crafting effective management interventions must have sound scientific basis.

As the PCC becomes strengthened, Guimaras should endeavor to transform it into a permanent mechanism to facilitate its integration into the local government system and ensure its sustainability.



**Presentation of results of the post-oil spill studies and researches are conducted annually during the Solar 1 oil spill commemoration.**

## References

Annual Accomplishment Report. 2008. Province of Guimaras, ICM-PMO, GENRO. ICM-PMO PCC Files.



## Legislation

### 006 ICM enabling legislation

#### Description

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

#### Rationale

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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

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- Legislations/local ordinances regarding ICM institutional mechanism and management activities
- Coastal use zoning
- Fisheries, mining and other extraction activities
- Pollution-related activities
- Building structures in the coastal environment, including aquaculture structures
- Access to rules and regulations

#### Results

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The effective implementation of action programs and plans to achieve the goals and objectives of the ICM program can be facilitated by the presence of supporting legislations or ordinances. In Guimaras, legislations establishing the coordinating mechanisms and coordinating offices shall be enacted at the provincial and municipal levels to support the existing Executive Orders creating the coordinating mechanism and coordinating office to sustain

ICM implementation. An Environment Code (Provincial Ordinance No. 2, 2005) has been enacted to guide the protection, conservation and management of the environment of the province.

The province has yet to develop an integrated land and sea use zoning plan, hence, there is currently no legislation which supports coastal use zoning.



**Public consultation on the establishment of Igang Bay Marine Sanctuary.**

ICM enabling legislations have also been enacted in the five municipalities and at the provincial level in Guimaras (**Table 6**). The ordinances cover fishery, extraction of natural resources, establishment of protected areas and pollution and solid waste management.

In the course of developing an ordinance, public hearings are conducted involving concerned

stakeholders. Some municipalities conduct mobile public announcements to disseminate and raise awareness on the regulations (e.g., solid waste management). Fishery-related ordinances are disseminated to the fishing communities through the regular conduct of meetings of the Municipal Fisheries and Aquatic Resources Management Councils (MFARMCs) and Barangay Fisheries and Aquatic Resources Management Councils (BFARMCs).



**Table 6. Relevant legislations in the municipalities of Guimaras Province.**

Ordinance No.	Year	Title
<b>BUENAVISTA</b>		
194	2007	Comprehensive ecological solid waste management ordinance of Buenavista.
187	2007	An ordinance providing for the sustainable management, utilization, conservation and development of coastal and fishery resources of Buenavista, amending for such purpose the existing Fishery Ordinance No. 075, series of 1993 and other Fishery Ordinances of the Municipality.
212	2009	An ordinance declaring the 4th Week of July every year as cleanliness, beautification and tree planting week for Buenavista and appropriating funds thereof.
214	2009	An ordinance prohibiting the use of plastic bags on dry goods and regulating its utilization on wet goods as well as the use of styrofoam for food processing in Buenavista.
216	2009	An ordinance enacting the Municipal Environment Code of Buenavista.



Ordinance No.	Year Passed	Title
<b>JORDAN</b>		
9	1988	An ordinance fixing the rental rates of municipal water within the jurisdiction of Jordan for fish pens and for fish cages.
2	1989	An ordinance requiring all sellers, buyers, owners of firewood, including lime producers to secure a Mayor's permit in addition to the cutting permit issued by the Bureau of Forest Development and providing penalties thereof.
5	1991	An ordinance prohibiting blasting/quarrying/excavating and gathering of rocks in the coastal areas of Jordan and imposing penalties for violation thereof.
6	1992	An ordinance imposing fees and other charges to gatherers of <i>Kapis</i> (Capiz) shells within the municipal waters of Jordan and imposing penalties for violation thereof.
7	1992	An ordinance prohibiting the gathering, harvesting, collecting and/or exporting of corals and providing penalties for violations thereof.
12	1992	An ordinance prohibiting fry <i>bangus</i> catching within 100 meters from the main fishpen gate.
1	1993	An ordinance requiring small fishers within the municipal waters of Jordan to secure a Mayor's permit and providing penalties for violation thereof.
1	1995	An ordinance prohibiting the dumping of waste refuse, garbage, nonbiodegradable objects and other waste materials in any place, in the street and other places not otherwise designated as dumping place and providing penalties thereof.
3	1996	Fisheries ordinance of Jordan
2	1997	An ordinance regulating the use of beaches and the foreshore waters fronting or surrounding said beaches and imposing penalties for violation thereof.
6	1997	An ordinance declaring the marine waters of <i>Sitio</i> Lusay and Ave Maria Islet of Brgy. Lawi, Jordan, as Marine Turtle Refuge and Sanctuary.
2	1999	The Revised Basic Municipal Fishery Ordinance of Jordan.
4	2003	An ordinance enacting the Environmental Code of Jordan.
19	2005	An ordinance amending Ordinance No. 2005-013 otherwise known as an Ordinance regulating the licensing and accreditation of tourism-related establishments in Jordan.
<b>NUEVA VALENCIA</b>		
Presidential Proclamation No. 525		Declaration of Taklong Island National Marine Reserve (TINMAR)
3	1994	An ordinance declaring "Toyo Reef" as Fish Sanctuary and regulating its protection, exploitation and utilization.
6	2005	An ordinance providing for the sustainable management, conservation and development of coastal and fishery resources of Nueva Valencia, amending for such purpose the existing Fishery Ordinances No. 03, Series of 1993 and other Fishery Ordinances of the Municipality.
4	2009	An ordinance amending provisions on Section 4C.02; Chapter IV, Article D Section D.10, Chapter IV, Article G, section, section 4G.01; Chapter VI, article A, section 6A.01, D-1; Chapter VI, Article A, Section 6A.01 N and Chapter VII, Section 7.01 of the Municipal Fishery Ordinance of Nueva Valencia.
5	2009	Establishment of the Igang Bay Marine Sanctuary.
<b>SAN LORENZO</b>		
5	1999	An ordinance declaring Tumulintinan Point as Fish Sanctuary and regulating its projection, exploitation and utilization.
1	1995	An ordinance declaring the coastal barangays of San Lorenzo as tourism zones.
2	1995	An ordinance prohibiting the entry of all mangoes.
4	1995	An ordinance regulating fishing/or fisheries in San Lorenzo.
2	1996	An ordinance implementing the Clean and Green Program in San Lorenzo.
2	1997	An ordinance requiring all fish vendors operating in the Municipality of San Lorenzo to secure a Mayor's permit to operate and providing penalties for violations thereof.
3	1997	An ordinance regulating the cutting of trees within the jurisdiction of the municipality and providing penalties for violations thereof.



Ordinance No.	Year Passed	Title
4	1997	An ordinance regulating the cutting of coconut trees and providing penalties for violations thereof.
5	1997	An ordinance regulating the hunting and/or capture of birds, animals and other wildlife and prescribing penalties for violation thereof and also to be the Wildlife Conservation Ordinance of San Lorenzo.
6	1997	An ordinance prohibiting the dumping of waste refuse, garbage, nonbiodegradable objects and other waste materials in any place in the roads and other places not otherwise designated as dumping place and providing penalties thereof.
7	1997	An ordinance requiring owners of all public utility vehicles plying any route within San Lorenzo to provide waste cans inside their respective units.
8	1997	An ordinance prohibiting smoking inside public places, all land and water transportation facilities and providing penalties for violation thereof.
5	1997	An ordinance declaring Tumulintinan Point as Fish Sanctuary and regulating its projection, exploitation and utilization.
3	2000	An ordinance regulating fishing and/or fisheries in San Lorenzo, and for other purposes.
7	2001	An ordinance prohibiting the drying of <i>palay</i> , fish, copra and legumes in all roads and highways within San Lorenzo.
5	2002	An ordinance establishing the Municipal Ecological Park in San Lorenzo.
4	2003	An ordinance declaring the branches of trees or any kind of vegetation which are touching or about to touch the power lines as public hazard.
4	2006	An ordinance amending Ordinance No. 4, series of 2003 declaring the branches of trees or any kind of vegetation which are touching or about to touch the power lines as public hazard.
5	2007	An ordinance amending certain provisions of the Municipal Fishery Ordinance, series of 2000 and providing penalties for violations thereof.
1	2009	An ordinance adopting the Municipality of San Lorenzo Solid Waste Management Code and providing penalties for violations thereof, subject to all laws and existing rules and regulations.
<b>SIBUNAG</b>		
7	1995	An ordinance prohibiting the throwing/dumping of waste reuse, garbage, nonbiodegradable objects and other waste materials in any public place, public conveyances in the streets, creeks, rivers, seashores and other place and providing penalties for violation thereof.
6	1996	An ordinance regulating the extraction/utilization of sand and gravel and other quarry resources in this municipality and fixing regulatory fees and penalties for violation thereof.
9	1996	An ordinance requiring all households in Sibunag to put a sanitary toilet subject for inspection and providing penalties for violation thereof.
10	1996	The Revised Municipal Fishing Ordinance of 1996 of Sibunag regulating fishing and/or fisheries and other purposes.
15	1997	The rules and regulations governing the issuance of license/lease for pearl gathering and culture in the Municipality of Sibunag providing funds for its development and operation.
21	1997	An ordinance creating the Municipal Fisheries and Aquatic Resources Management Council in waters in bays of Sibunag, providing funds for its development and operation.
35	2003	An ordinance banning the use of compressor as breathing apparatus in all forms of fishing activities.
36	2003	An ordinance specifying the meets and bounds of the Municipal Fish Sanctuary of the Municipality of Sibunag and prescribing penalties for violation thereof.
39	2005	An ordinance creating the Municipal and Barangay Fisheries and Aquatic Resources Management Council (FARMC) of Sibunag and providing funds thereof.
42	2006	An ordinance enacting the Fishery and Aquatic Resource Management Code of Sibunag.
43	2006	An ordinance amending Municipal Ordinance No. 042-2006, the Fishery and Aquatic Resource Management Code of Sibunag.
1	2007	An ordinance regulating the operation and registration of fishing boats that are three (3) gross tons and below in the municipal waters of Sibunag and providing penalties for violations thereof.



Ordinance No.	Year Passed	Title
<b>PROVINCIAL ORDINANCES</b>		
3	1994	An ordinance regulating smoking of cigars and cigarettes in public places, public utility vehicles and public offices within the Provincial Capitol Site.
4	1994	An ordinance regulating the extraction of quarry resources within the private and public land in Guimaras and providing penalties thereof.
6	1994	An ordinance regulating the cutting of trees within the private and public lands in Guimaras.
7	1994	An ordinance regulating the cutting, felling, destruction or otherwise deliberately killing of coconut trees as processing thereof into lumber, logs, or any end or use products, including sales.
5	1995	An ordinance prohibiting the gathering of corals within the territorial waters of Guimaras.
7	1995	An ordinance establishing the Blue and Green Police in Guimaras.
6	1996	An ordinance requiring owners of dump trucks, stake trucks, cargo trucks and other carriers in the delivery of sand, gravel, white rocks, boulders, and other mineral products to provide cover for their vehicles when travelling fro and to any point in Guimaras and providing penalties, fines and imprisonment for violation thereof.
3	1997	An ordinance banning the possession and operation of unlicensed chain saws in Guimaras.
1	1999	An ordinance known as the small-scale Mining Code of Guimaras.
1	2002	An ordinance establishing the Provincial Tree Park of Guimaras.
2	2005	An ordinance enacting the Environment Code of Guimaras.
4	2005	An ordinance prescribing safety measures to users of beach inland and island resorts in Guimaras.

## Implications and Recommendations



Session of the Municipal Development Council (*Sangguniang Bayan*) of San Lorenzo.

Guimaras has passed legislations and ordinances that address governance and aspects of sustainable development sectorally. There are separate ordinances for example, on the utilization of coastal resources, on fisheries management, on the establishment of protected areas, on waste management, etc. Although these ordinances support ICM goals and objectives, there is recognition that some laws and ordinances are overlapping and that harmonization is necessary and should be nested within a broader governance structure to ensure their effective implementation and enforcement.

Public participation and consultation process in the development of ordinances in Guimaras is well established, which clarifies the rights, obligations and responsibilities of the stakeholders and the enforcing authorities. As Guimaras gains more experience in ICM implementation, putting in place an ICM legislation that serves as an umbrella legislation to harmonize existing regulations and provides an institutional framework for its implementation is necessary. The public consultation process can serve as a platform for resolving issues and constraints in implementation and enforcement as well as discussing the need for a comprehensive legislation that mandates public participation, budgetary allocations, capacity building and monitoring.

## References

- Guimaras Environment Code. 2005.
- Office of Sangguniang Panlalawigan Archives, Province of Guimaras.
- Sangguniang Bayan Office Archives, MAO Year End Accomplishment Report, Municipality of Buenavista.
- Sangguniang Bayan Office Archives, MAO Year End Accomplishment Report, Municipality of Jordan.
- Sangguniang Bayan Office Archives, OMAS Year End Accomplishment Report, Municipality of Nueva Valencia.
- Sangguniang Bayan Office Archives, OMA Year End Accomplishment Report, Municipality of San Lorenzo.
- Sangguniang Bayan Office Archives, MAO Year End Accomplishment Report, Municipality of Sibunag.



## Legislation

### 007 Administration and monitoring of compliance to legislation

#### Description

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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

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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

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- Types of environmental compliance monitoring/ inspection (i.e., 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

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The conduct of inspections, including frequency, varies from the type of activity being controlled or monitored. Economic activities in the province are commonly controlled

or regulated through the issuance of permits from concerned offices and/or agencies.



MacArthur's Wharf at Buenavista.

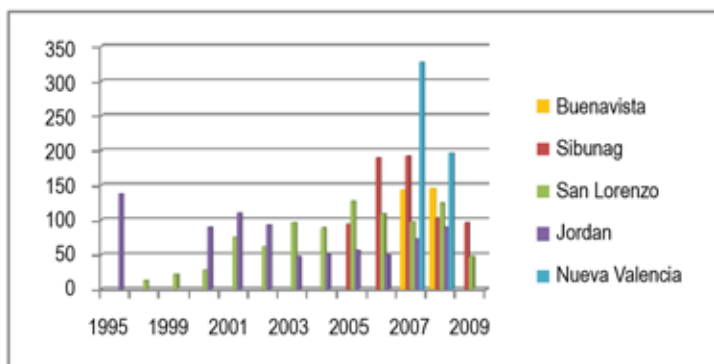
Inspections of manufacturing establishments, coastal tourism establishments, and ports and water transportation are conducted prior to the issuance of municipal permits. Inspections of coastal polluting establishments (e.g., piggery), and groundwater extraction, on the other hand, are conducted only when the need arises or when there are complaints, while for coastal/sea-borne patrolling, inspections are conducted on a regular basis.

The municipality of Jordan, as the market center of the province, conducts quarterly market inspections for fishery products.

Fishing and other extraction-related activities are also being monitored and controlled through the issuance of permits. Since 1995, a total of 3,162 fishing permits were issued in the five municipalities (Figure 6). Except in Nueva Valencia where the peak of fishing permits issuance was recorded in 2007, the highest recorded fishing permits issuance in the four municipalities was in 2008.



Figure 6. Total number of permits issued for fisheries.





The small-scale miners of Guimaras rehabilitate mining sites by planting forest and fruit trees.

Table 7 shows the number of approved permits for other extraction activities. In terms of small-scale mining, the provincial government has approved one small-scale

mining permit on 2007 situated at the Municipality of San Lorenzo. To date, there are 95 permits issued for commercial sand and gravel and quarrying in the province since 2003.

Table 7. Number of extraction permits approved by the Provincial Government.

Location	2003	2004	2005	2006	2007	2008	2009
<b>Mining</b>							
San Lorenzo (SSMP)	-	1	-	-	-	-	-
<b>Commercial sand and gravel</b>							
Jordan	2	-	2	-	1	-	1
Nueva Valencia	2	3	3	3	2	5	3
San Lorenzo	2	-	2	-	1	-	1
Sibunag	4	3	4	6	2	6	2
<b>Quarrying</b>							
Buenavista	4	5	6	3	3	4	9
Nueva Valencia		1	-	-	-	-	-
<b>Total</b>	<b>14</b>	<b>13</b>	<b>17</b>	<b>12</b>	<b>9</b>	<b>15</b>	<b>16</b>



From 2004 to 2007, a total of 821 business/commercial and industrial establishments have been recorded in the province, with the most number of establishments recorded in Jordan and the least in Sibunag (Figure 7).

A total of 634 permits have been issued in Jordan, Nueva Valencia and Sibunag for building structures, including aquaculture structures in the coastal areas since 1999 (Figure 8).

Figure 7. Number of establishments in Guimaras (2004-2007).

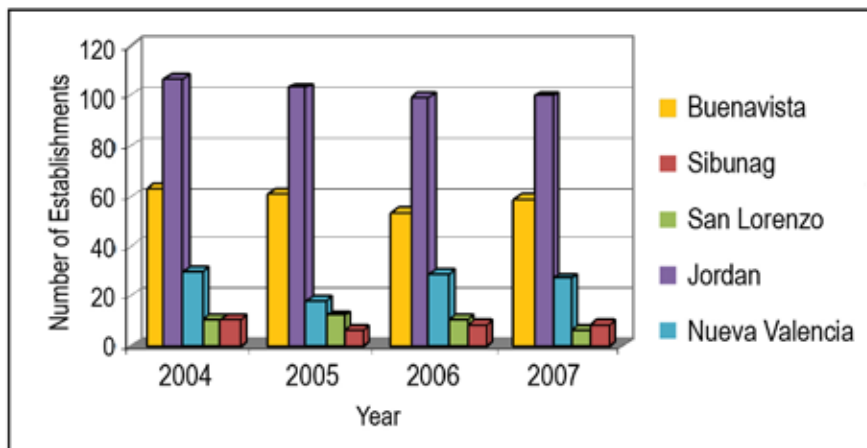
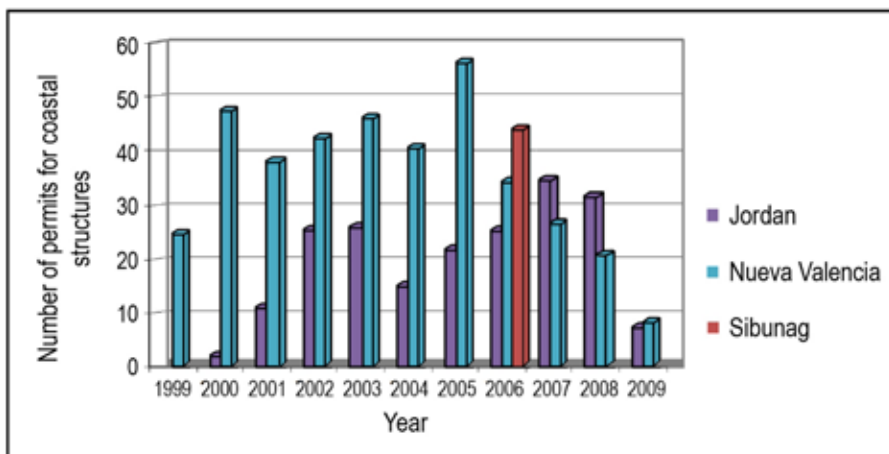


Figure 8. Number of permits issued for building structures in the coastal areas.



The control of other economic activities are within the jurisdiction of national government agencies such as the DENR, which issues permits for foreshore lease and industries, and the Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR), which controls fishpond operations.

The DENR has accepted a total of 322 foreshore lease agreements covering a total area of 103.93 ha, which is subject for appraisal and further verification. It has also issued 12 operating permits for industries as of December 2009 (Table 8).



**Table 8. Number of operating permits issued by DENR (as of December 2009).**

Municipality	Foreshore lease agreements (including revocable permits)		Air-pollutive firms	Water-pollutive firms
	Number	Area (m <sup>2</sup> )		
Buenavista	59	218,171	1. Alfredo L. Hilado Lime Factory (Mabini)	
			2. John Bordman, Ltd., of Iloilo Inc. (Salvacion)	
			3. Mabini Limers and Farmers MPC (Dagsaan)	
			4. Ren-ni Rice Mill (Salvacion)	
Jordan	81	547,480	1. Galanto Rice Mill (San Miguel)	Uswag Guimaras Foundation Inc. (Buluangan) (piggery)
			2. Trans-Asia Oil and Energy Development Corp. (San Miguel)	
			3. ABS-CBN Relay Station (Alaguisoc)	
			4. Intercontinental Broadcasting Corp. (IBC-TV) (Alaguisoc)	
			5. Espinosa Rice Mill (Poblacion)	
Nueva Valencia	178	210,360	Golden Harvest Rice Mill (Salvacion)	Raymen Beach Resort
San Lorenzo	4	63,284		
Sibunag				
<b>TOTAL</b>	<b>322</b>	<b>1,039,295</b>	<b>10</b>	<b>2</b>

Note: There are still 23 air pollutive-firms operating in Guimaras that are in the process of renewing their permits to operate.

The DA-BFAR on one hand has issued 122 fishpond lease agreements (FLAs) as of December 2009 covering an area of more than 936 ha (Table 9). Most of the FLAs were issued in Nueva Valencia while the least number of agreements issued

were in Jordan. As a way of monitoring the FLAs, the owners of fishponds are required to submit production reports semi-annually to DA-BFAR.

**Table 9. Fish pond lease agreements issued by BFAR.**

Municipality	Fish Pond Lease Agreement	
	No.	Area (ha)
Buenavista	9	26.61
Jordan	2	4.65
Nueva Valencia	103	886.04
San Lorenzo	4	19.03
Sibunag	4	19.81
<b>Total</b>	<b>122</b>	<b>956.14</b>

Source: Consolidated data from FRMD BFAR 6.



## Implications and Recommendations

There are enough ordinances and regulations passed in Guimaras to address aspects of sustainable development. Enforcement and compliance monitoring/inspection are in place; however, their effectiveness can be still considered a continuing issue. This can be attributed to a number of administrative and operational factors, including the overlapping role of national agencies in permit issuance and licensing, overlapping ordinances, limited capacity of relevant authorities such as the *Bantay Dagat* (Sea Patrol) in law

enforcement and lack of personnel, adequate budget and equipment to conduct regular monitoring and surveillance.

Training in law enforcement should be step up to build the capacity of local authorities in monitoring and enforcement. Streamlining of the current licensing and permitting system among national agencies and the local government to address the overlaps is also necessary.

## References

- Business, Names and Registration Certificates, Summary of Registered Companies, DTI-Guimaras. Consolidated data from FRMD BFAR 6.
- DENR Foreshore lease agreement applications accepted by DENR and number of air-pollutive firms issued by DENR as of December 2009.
- Jordan List of Building Permits Approved (1999-2009).
- List of Fishpond Operators, OMAS Nueva Valencia Annual Accomplishment Reports (2007-2009).
- List of SAG Permittees (2003-2009), List of Quarry Permittees (2003-2009) Mineral Resource Management Section, GENRO.
- Nueva Valencia Local Government Annual Report (1999-2009).
- Nueva Valencia OMAS Accomplishment Report (2006-2009).
- Nueva Valencia MEO Total Number of Permits for Building Structures (1990-2009).
- Sibunag MEO 2006 Building Permits Issued.

## Legislation

### 008 Environmental cases filed/resolved

#### Description

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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

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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

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- 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

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**Table 10** presents the number of violations, including number of violations penalized and amount of fines collected from 2000-2009. An increasing number of violations were recorded in San Lorenzo and Sibunag while decreasing number of violations were recorded in Nueva Valencia and Buenavista.

The recorded violations in Jordan did not show a distinct trend. Except for the recorded violations at the provincial level related to the gathering of charcoal and firewood, violations recorded at the municipal level are related to non-compliance of fishery-related regulations.



Illegal fishing activities are being curbed through strict enforcement of Municipal Fishery Ordinances.

Legislation



Environmental cases filed/resolved

**Table 10. Number of violations and amount of fines collected.**

	No. of Violations	No. of Violations Penalized	Amount of Fines Collected (PhP)
<b>Nueva Valencia</b>	2007 - 158 2008 - 202 2009 - 252	2007 - 158 2008 - 202 2009 - 252	2007 – PhP 340,000 2008 – PhP 569,500 2009 – PhP 1,050,500 Utilized as Intelligence Fund and General Fund OMAS Accomplishment Report (2007, 2008, 2009)
<b>San Lorenzo</b>	1998 - 68 1999 - 79 2000 - 24 2001 - 26 2002 - 29 2003 - 9 2004 - 14 2005 - 17 2006 - 5 2007 - 19 2008 - 6 2009 - 7	1998 - 68 1999 - 79 2000 - 24 2001 - 26 2002 - 29 2003 - 9 2004 - 14 2005 - 17 2006 - 5 2007 - 19 2008 - 6 2009 - 7	1998 – PhP 168,200 1999 – PhP 238,900 2000 – PhP 128,700 2001 – PhP 195,300 2002 – PhP 30,000 2003 – PhP 21,000 2004 – PhP 101,500 2005 – PhP 45,000 2006 – PhP 43,000 2007 – PhP 59,000 2008 – PhP 26,500 2009 – PhP 20,000
<b>Sibunag</b>	2005 - 116 2007 - 5 2008 - 3 2009 - 9	2005 - 64 2007 - 5 2008 - 3 2009 - 9	2005 – PhP 102,000 2007 – PhP 30,500 2008 – PhP 8,500 2009 – PhP 42,500 Utilized by <i>Bantay Dagat</i> through supplemental budget
<b>Jordan</b>	1999 - 2 2000 - 1 2001 - 1 2002 - 1 2005 - 2 2006 - 3 2007 - 1 2008 - 1	1999 - 2 2000 - 1 2001 - 1 2002 - 1 2005 - 2 2006 - 3 2007 - 1 2008 - 1	1999 – PhP 16,000 2000 – PhP 6,000 2001 – PhP 4,000 2002 – PhP 18,000 2005 elevated to MCTC 2006 – PhP 40,000 2007 – PhP 6,000 2008 – PhP 8,000
<b>Buenavista</b>	2008 - 23 2009 - 39	2008 - 23 2009 - 39	2008 – PhP 210,000 2009 – PhP 466,000 Utilized as: 40% incentives and 60% Municipal Fund
<b>Province</b>	5 (no permit for transport of charcoal and firewood) - 2005	2005 - 5	2005 – PhP 25,000



## Implications and Recommendations

The number of cases filed and penalized reflected the commitment of authorities and the effectiveness of mechanisms to enforce regulations in the area. It is important that proper documentation and/or a systematic approach for recording and monitoring of violations and resulting legal actions are adopted in order to have an assessment of enforcement effectiveness through time and as input for planning and management.

Considering that more of the violations incurred in the municipalities are fishery-related, it is necessary to strengthen enforcement of fishery-related legislations. The five municipalities should also consider adopting a unified fishery ordinance and endeavor to effectively implement it.



**Bantay Dagat (Sea Patrol) of the Municipality of Jordan.**

## References

- Jordan PNP Cases Reported, Status of Cases (1999-2009).  
 MAO Sibunag, Annual Reports 2005-2009.  
 MAO Buenavista, Annual Reports 2008-2009.  
 OMAS Nueva Valencia Annual Reports, 2007-2009.  
 OMA San Lorenzo, Annual Reports 1998-2009.  
 Provincial Law Enforcement and Public Safety Taskforce Apprehension Reports.  
 Year End Accomplishment Reports, GENRO.



## Information and Public Awareness

### 009 Public education and awareness

#### Description

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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

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Easy access to information can promote awareness of stakeholders. Public education promotes increased awareness of the value of the coastal and marine resources,

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

#### Data Requirements

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- Communication plan available
- Budget and staff allocation for implementation of communication plan
- Local governments have facilities for public access of information
- Local awareness programs
- Frequency of community participation activity
- Number of participants in community participation activity

#### Results

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Despite the absence of communication plans in the province and in all the municipalities, regular public awareness activities are being conducted to inform the public of the environmental issues including the management responses being undertaken. Several mechanisms are being employed by the municipal LGUs to keep the public well-informed.

In the municipalities of Buenavista, Jordan and Nueva Valencia, library and Internet facilities are available for the public to facilitate access to information related to coastal and marine management.



Monthly public awareness campaigns are being conducted in Nueva Valencia, including regular assembly of the fishers group in the area. The fishers group serves as partner of the municipality in disseminating information related to coastal and marine management. Other public awareness activities in Nueva Valencia included a series of consultations conducted in coastal barangays during the development of the CRM Plans (e.g., Tando, La Paz, Igdarapdap, Pandaraonan, Dolores) and the conduct of farmers' field school on organic farming (OMAS). The municipality in partnership with the John B. Lacson Foundation Maritime University conducted an activity to launch the establishment of the Igang Bay Marine Sanctuary (Ordinance 05, 2009).



Forums are conducted and billboards are posted to increase public awareness on coastal management.

In Buenavista, a series of meetings, orientation and public hearings were conducted at the different barangays and elementary schools in the formulation of the Environmental Code. The Code gives emphasis on ecological solid waste management, climate change adaptation and mitigation and other environmental concerns of the municipality.





In Jordan, coastal cleanups, tree planting, yearly fishing boat and gears licensing, FARMC regular meetings with film showings on climate change, annual fish conservation week, and the annual *“Ganda at Galing Sa Basura Paskua Festival”* (Beauty and Creativity from Solid Waste Christmas Festival) are being conducted as part of the municipality’s regular local awareness activities. Information campaigns related to solid

waste management during Barangay Development Council meetings and in public elementary schools are also being conducted.

Community members were mobilized during the deployment of marker buoys and the putting up of permanent signages for the Jordan Marine Reserve and Sanctuary in Barangay Lawi.



**Buoys, markers and signs are deployed and posted at the marine sanctuary.**

Monthly public awareness campaigns in San Lorenzo included regular assembly of fishers in the area. The fishers group serves as partner of the municipality in its public awareness campaign. The municipality also has a tripartite agreement with DepEd and DENR VI to conduct mangrove planting in six coastal barangays involving Grade 5 and 6 students.

In Sibunag, regular mobilization of stakeholders for coastal cleanups, and conduct of series of consultations for the establishment of MPAs and implementation of fishing ordinances, seaweeds culture area and zoning plan are being undertaken. Municipal Ordinance No. 035, series of 2002, also known as Zoning Ordinance of Sibunag was passed, which stipulates the Zoning Regulations of the Municipality and providing for its administration and enforcement.



**Mangrove planting at San Lorenzo.**

For the province, coastal cleanups and treeplanting are part of the regular local awareness activities. The province also conducts a regular mangrove planting activity to celebrate the annual Earth Day in April, beginning in 2004. An upland annual treeplanting activity during the “*Kasadyahan sa Kabukiran*” (Mountain Festival) is being conducted every

June and this activity has been ongoing since 1995. An annual coastal cleanup is also being conducted every October 25 (since 1996 until 2005). Such activities involved various provincial agencies, the municipalities and communities where the activities were conducted.



Coastal cleanup in Jordan.

## Implications and Recommendations

A well-informed public is essential for the successful implementation of an ICM program. It builds the awareness of the stakeholders on the values and threats in the coastal environment, including emerging issues like climate change, thus building appreciation on the management interventions being undertaken. Such appreciation will promote active

stakeholder participation on environmental programs, thus creating ownership and sustaining support for the program.

The Guimaras project has successfully achieved this objective.

## References

Compilation of Year End Accomplishment Reports, MPDOs.  
GENRO Annual Accomplishment Reports.  
Municipality of Sibunag M.O.# 35 Series of 2002.



## 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

Nongovernment, civil society and people's organizations are essential partners of the local governments in carrying out activities to support the ICM program. The list of active civil society and NGOs in the province with programs and activities that support environmental protection and management is given in **Table 11**, including number of membership and schedule of regular meetings. Environment-related activities range from community resource protection and management (e.g., artificial reef establishment, mangrove nursery establishment and

reforestation, etc.), livelihood enhancement on agriculture and fisheries (e.g., seaweed production and trading, etc.), entrepreneurship, civic and health assistance, gender issues, community organizing and development, disaster management, cottage industries, coastal cleanup, waste management (e.g., waste recycling, composting, etc.), agri-tourism activities (e.g., cashew treeplanting, organic farming, vermicompost production, etc.), and capacity building.



Table 11. Active civil society and nongovernmental organizations (NGOs) in Guimaras Province.

NGOs/POs	No. of Members	Schedule of Meetings	Total number of civil society and NGOs per municipality
<b>NUEVA VALENCIA</b>			
Brgy. Tando Fisherfolks Association	201	Last Saturday of the Month	47
Cabalagnan Small Fisherfolks Association	22	As need arises	
Calaya Small Fisherfolks Association	110	As need arises	
Canhawan Farmers/Fishermen Association	28	As need arises	
Guiwanon Small Fishermen Association	120	As need arises	
Igang Small Farmers and Fisherfolks Association (ISFFA)	46	Every end of the Month	
<i>Katilingban sang Magagmay nga Mangingisda sa Dolores (KAMAMADO)</i>	64	Last Sunday of the Month	
La Paz Fisherfolks Aquatic Resource and Management Association (LAFARMA)	15	Annual meeting-3rd Saturday of December	
Laktawan-Tabunan Small Fishermen Association	40	As need arises	
Lucmayan Small Fishermen Association	40	As need arises	
Magamay Small Fishermen Association	48	As need arises	
Pandaraonan Small Fisherfolk Association	126	4th Sunday of the Month	
Panobolon Seaweed Growers and Traders Association	36	3rd Thursday of the Month	
Samahan ng Mahihirap na Mangingisda	114	3rd Sunday of the Month	
Samahan ng Maliliit na Mangingisda sa San Antonio	107	1st Sunday of the Month	
San Roque Coastal Environment Programs Association, Inc.	50	Annual – 3rd Saturday of November	
Small Fisherfolks Association of Sitio Unisan	132	As need arises	
Sto. Domingo Fisherfolks Association	50	15th of the Month	
Tamsik Seaweed Planters Association	20	2nd week of the quarter	
Tubod-Igdarapdap Fisherfolks Neighborhood Association	45		
Calaya AFDP Beneficiaries Association	23	Last Friday of the Month	
Sitio Ubog-Lanipe AFDP Beneficiaries Association	20	1st Thursday of the Month	
<i>Taos Puso Foundation, Inc</i>			
Nueva Valencia Coco Farmers Development Cooperative			
Iloilo Caucus Development NGOs, Inc.			
Creative Community Foundation			
Nueva Valencia Mango Growers/Producers Association, Inc.	53	3rd Wednesday of the Month	
Association of People with Disabilities (PWDs)-Nueva Valencia, Guimaras			
Association of Barangay Health Workers Nueva Valencia, Guimaras, Inc.			
Nueva Valencia North Public School Teachers and Employees Association			
Nueva Valencia Poultry and Livestock Producers Association, Inc.			
Sta. Ana Guimaras Motorcycle and Tricycle Owners and Drivers Association (SAGMATODA)			
Guimaras Multi-purpose Cooperative			
Association of Senior Citizens			
Nueva Valencia Central School General Parents Teachers and Community Association (PTCA)			



NGOs/POs	No. of Members	Schedule of Meetings	Total number of civil society and NGOs per municipality
Nueva Valencia Multi-purpose Cooperative			
Guimaras Resort Association			
Taytay sa Kauswagan, Inc.			
Nueva Valencia Association of Fisherfolks			
Teachers and Employees Welfare Association, Nueva Valencia, Guimaras			
Nueva Valencia South Teachers Association			
Tourism Transport Guimaras, Inc.			
Negros Center for People Empowerment and Rural Development (NCPERD)			
Panobolon Seaweed Growers and Traders Association			
Federation of Magamay, Sto. Domingo Pandaraonan Waterworks Association			
Guardians Brotherhood Inc.			
Guimaras People's Economic Foundation, Inc.			
<b>SIBUNAG</b>			
Guimaras People's Economic Council (GPEFI)			15
Iloilo Code NGOs Inc.			
Taos Puso Foundation Inc.			
Creative Community Foundation			
Dasal-Sibunag Vegetable Growers Association	30	Last Friday of the month	
Philippine Business for Social Progress (PBSP)			
Guimaras Multi-Purpose Cooperative-National Confederation of Cooperatives Network (NATCCO)			
Sibunag Seaweeds Growers and Traders Association Inc.	275	31st of the Month	
Sibunag L300/PUJ Operators and Drivers Association (SILPODA)	37	Quarterly	
Day Care Workers Association	24	3rd Friday of the Month	
Pag-asa Youth Association of the Philippines (PYAP)	160	Quarterly	
Sibunag Ati Community Development Cooperative (SACDEC)	27		
Last Saturday of the Month			
Sebaste AFDP Agri-Fishery Development Program Beneficiaries Association	24	1st Tuesday of the Month	
Association of Person with Disabilities (PWDs)	36	As need arises	
Association of Barangay Health Workers of Sibunag	72	1st Monday of the Month	
<b>JORDAN</b>			
Igbantang Tabuk-Suba Small Farmers Association	15	3rd Wednesday of the Month	57
Tocdo Kuripao Farmers Association	29	3rd Wednesday of the Month	
Hoskyn Fisherfolks Association	38	3rd Thursday of the Month	
Ambak-Tubig Multi-Purpose Cooperative	23	1st Monday of the Month	
Parreño Estate Bugnay Agri-Fishery Bens. Association (PEBABEA)	21	2nd Thursday of the Month	
Bugnay Farmers Association	74	Last Wednesday of the Month	
Dumalagdag Small Farmers Association	21	2nd Wednesday of the Month	
Mangkas Small Farmers Association	15	3rd Friday of the Month	
Sta. Teresa Pigbank Association	35	Last Friday of the Month	

NGOs/POs	No. of Members	Schedule of Meetings	Total number of civil society and NGOs per municipality
Bulan-Bulan Sur Tarawis Farmers Association	18	3rd Thursday of the Month	
Jordan Kasoy Producers and Traders Association	35 (Still accepting members)	1st Thursday of the Quarter	
Lutong Small Farmers Association	16	2nd Friday of the Month	
Epo Small Farmers Association	15	3rd Thursday of the Month	
Bucao Small Farmers Association	21	2nd Thursday of the Month	
Bucao-Tarog Cluster Farmers Association	55	2nd Friday of the Month (am)	
Balcon Maravilla Vegetable Growers Association	20	Last Wednesday of the Month (pm)	
Barosbos-Esperanza Small Farmers Association	15	2nd Tuesday of the Month (pm)	
Balcon Maravilla BALMAR Rice Cluster Association	30	3rd Tuesday of the Month (am)	
Sitio Odyong San Miguel Farmers Association	18	2nd Wednesday of the Month	
Sitio Kapitungan Small Farmers Association	15	2nd Thursday of the Month	
San Miguel Rice Cluster	30	Last Friday of the Month	
Alaguisoc Rice Cluster (ARC)	85	Last Wednesday of the Month	
Sinapsapan Fisherfolks Association	67	1st Thursday of the Month	
Barangay Lawi Fisherfolks Association	52	1st Tuesday of 2nd month of the quarter	
Municipal Day Care Workers Association	28	3rd Friday of the Month	
Sinapsapan KALIPI (Kalipunan ng Liping Pilipina)	20	Monthly	
San Miguel KALIPI	20	Monthly	
Rizal KALIPI	20	Monthly	
Poblacion KALIPI	20	Monthly	
Balcon Maravilla KALIPI	20	Monthly	
Balcon Melliza KALIPI	20	Monthly	
Alaguisoc KALIPI	20	Monthly	
Morobuan KALIPI	20	Monthly	
Buluangan KALIPI	20	Monthly	
Lawi KALIPI	20	Monthly	
Bugnay KALIPI	20	Monthly	
Sta. Teresa KALIPI	20	Monthly	
Hoskyn KALIPI	20	Monthly	
Espinosa KALIPI	20	Monthly	
Jordan Youth Movement PYAP (Pag-asa Youth Association of the Philippines) Jordan Chapter	39	Monthly	
Association of Persons with Disabilities, Jordan Guimaras Inc	262	Bi Monthly	
Federation of Senior Citizens Affairs of the Phil., Jordan Chapter	1949	Bi Monthly	
Sta. Teresa SEA-K Self Employment Assistance-Kaunlaran Association	25	Weekly	
ABS SEA K Association (San Miguel)	30	Weekly	
Reformed Balcon Maravilla Fisherfolks SEA K Association	30	Weekly	
Buluangan Vendors and Fishing SEA –Kaunlaran Association.	30	Weekly	
Morobuan Vendors SEA K Association	30	Weekly	
Jordan Municipal Officials and Employees MPC	114	Within 1st Quarter with special meetings	
Jordan Motor Banca Association, Inc.	48		



NGOs/POs	No. of Members	Schedule of Meetings	Total number of civil society and NGOs per municipality
Jordan Jeepney Owners and Drivers MPC (JOJODMULCO)	50	Monthly	
Jordan Tricycle Owners and Drivers Association (JOTODA)			
San Miguel Tricycle Owners and Drivers Association (SMTODA)	150	As need arises (Emergency Meetings)	
Sta. Teresa-San Miguel Tricycle Owners and Drivers Association (SSTODA)	54	As need arises (Emergency Meetings)	
Guimaras Cutflower and Ornamental Producers Federation	39	Last Friday of the Month	
Guimaras Mango Growers and Producers Development Coop.	48	1st Friday of the Month	
Jordan Sectors Association	280		
Guimaras Employess Multi-Purpose Cooperative	585		
<b>BUENAVISTA</b>			
Buenavista Cultural Heritage Foundation			15
<i>Katilingban Sang Magagmay nga Mangingisda sang Buenavista</i>	132	Last Friday of the Month	
Avila Fisherfolk Organization		Last Friday of the Month	
Avila – Umilig Farmers Association		Last Friday of the Month	
Dag-saan Fisherfolk Association			
Wayang Farmers Association	22	First Saturday of the Month	
Buenavista Organic Growers Association			
Buenavista Garden Club			
San Nicolas AFDP Beneficiaries Association	27	Last Wednesday of the Month	
San Pedro - Supang Farmer's Association			
Buenavista Sailors Association			
Mabini Limers and Farmers Multi-Purpose Cooperative	240	2nd Wednesday of the Month	
Bana-ag Recycler's Association			
Bayong Maker's Association	20	Last Saturday of the Month	
Association of Buenavista Ferry's Service Provider Inc.	35	Last Sunday of the Month	
<b>SAN LORENZO</b>			
Tangaw-Cabano AFDP Beneficiaries Association	23	2nd Tuesday of the Month	22
Nadulao Is. Fisher folks Association	42	1st Wednesday of the Month	
Igcabano-Balabago Farmers/Fisher folks Association	36	Last Thursday of the Month	
Balayong Strive and Curipao Builders Association	17	2nd Wednesday of the Month	
Igcawayan Fisher folks Association	60	1st Wednesday of the Month	
Badyang Youth Movement Association	17	Last Sunday of the Month	
M. Chavez Himakas Farmers and Fisher folks Association	22	2nd Thursday of the Month	
Union of Christians for Environment and Progress Inc.	21	1st Friday of the Month (am)	
Eleven Street Farmers/Fisher folks Association	22	1st Friday of the Month (pm)	
SPDA Sitio. Paglanutan Development Association	18	2nd Wednesday of the Month	
MALLFA Matagsing Langab Laborers and Farmers Association	22	2nd Friday of the Month	
Sebario Association of Farmers, Fisher folks and Entrepreneurs	40	Last Friday of the Month	

NGOs/POs	No. of Members	Schedule of Meetings	Total number of civil society and NGOs per municipality
Bangkiling Neighborhood Association	24	2nd Monday of the Month	
Salt Makers Association	63	Last Friday of the Month	
Lebas Fisherfolks Association	26	1st Friday of the Month (pm)	
Cabano Fisherfolk Association	26	Every 30th of the Month	
Cabano Irrigators Association (Fishery Sector)	18	1st Friday of the Month	
Suclaran Rice Cluster	76	3rd Friday of the Month	
Igcawayan Rice Farmers Association	43	3rd Friday of the Month	
San Lorenzo Salt Producers Corp.	18	2nd Friday of the Month	
San Lorenzo Kasoy for Life Association	20	Quarterly	
Bubog Organic Farmers Association	20	3rd Friday of the Month	

### Implications and Recommendations

The province and the municipalities have the advantage of having established and organized civil society and NGOs as partners. These groups can be mobilized and tapped to support the implementation of ICM-related activities.

Strengthening the partnerships of the local government with these groups is therefore essential to encourage and sustain their support to the ICM program.



Annual Fish Conservation Week Celebration is actively participated in by FARMCs.

### References

MAO Lists of POs and NGOs files. Municipality of Buenavista.  
 MAO Lists of POs and NGOs files. Municipality of Jordan.  
 MAO Lists of POs and NGOs files. Municipality of Sibunag.  
 OMAS Lists of POs and NGOs files. Municipality of Nueva Valencia.  
 OMA Lists of POs and NGOs files. Municipality of San Lorenzo.



## 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

At the provincial level, eight staff which include four full-time staff are assigned at the PMO office for the coordination of ICM program implementation in Guimaras. At the municipal level, staff assignment for ICM implementation ranges from 4-8 (Table 12).

Nueva Valencia has allocated PhP 150,000 (approximately US\$ 3,333) in 2009 for capacity building programs for its MFARMC. The rest of the municipalities (e.g., Jordan, Buenavista, Sibunag and San Lorenzo) also have regular annual allocations for trainings and seminars related to coastal management.



There are universities and research institutions in the area which can be tapped to provide scientific and technical support for coastal management-related activities such as the National Marine Research Development Center, UPV, SEAFDEC, Guimaras State College and the UP Biological Station in Taklong Island.



Capacity development for Marine Sanctuary Establishment and Management Training Workshop.

Table 12. Staff allocation for coordination of ICM program implementation.

	Number of Staff for ICM
Buenavista	4
Jordan	7
Nueva Valencia	4
San Lorenzo	8
Sibunag	7
Guimaras Province (GENRO)	8

## Implications and Recommendations

Strengthening the technical and management skills of the PMO and local personnel at the provincial and municipal levels is essential for ensuring effective implementation of the ICM program. With the necessary capacity in place, the ICM program will continue to be implemented even after the technical assistance provided by other entities will end.

The presence of universities and research institutions in the province is an advantage for the ICM program. Strengthening the collaboration and linkages between the LGUs and these institutions, including other stakeholders (e.g., NGAs, OGAs, NGOs, POs) as well as encouraging their participation in the activities of the ICM program will not only improve the skills and technical know-how of local personnel but it also builds their confidence in implementing the ICM program.



ICM-PMO "Lakbay Aral" at the Bataan ICM Parallel Site.

## References

ICM-PMO GENRO Files.  
OMAS Year End Accomplishment Report. Municipality of Nueva Valencia.



## Capacity Development

### 012 Human resource capacity

#### Description

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

#### Rationale

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

#### Data Requirements

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- 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

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Building the capacity of local chief executives and local personnel is integral for effective implementation of an ICM program. The ICM-related trainings attended by local chief executives and personnel of the province are listed in

**Table 13.** **Tables 14** and **15**, on the other hand, identify the trainings needed, including the proposed number of personnel at the provincial and municipal levels that need to be trained.



Training workshop on ICM Course 1 – Understanding ICM, organized by DENR VI and PEMSEA.

Table 13. Trainings related to coastal management attended by local government staff.

Year	Training	Organization that conducted the training	No. of personnel trained
August 6-10, 2007	Integrated Coastal Zone and Risk Management	DENR	2
September 4-8, 2007	PNLG Forum, Danang, Vietnam	PNLG	2
March 31-April 4, 2008	Study Tour in Batangas and Bataan, Philippines	PG-ENRO - Batangas; PG-ENRO - Bataan	7
November 2008	PNLG Forum, Sihanoukville, Cambodia	PNLG	8
November 3-7, 2009	2009 XWOW Xiamen, PR China	Xiamen Municipality	6
November 2009	PNLG Forum, Bataan, Philippines	PNLG	13
November 2009	Training on Novel Technologies, Manila, Philippines	Marine Environment Research and Innovative Technologies (MERIT) and PEMSEA	1
November 2009	Coastal Use Zoning, Manila, Philippines	PEMSEA	1
November 2009	East Asian Seas Congress 2009, Manila, Philippines	PEMSEA and DENR	13
December 15-19, 2008	Integrated Information Management System Training Workshop, Guimaras	PEMSEA	35
December 15-19, 2008	State of the Coast Training, Guimaras	PEMSEA	35
November 18-21, 2009	4th National Agroforestry Congress	Philippine Agro-Forestry Education and Research Network/University of the Philippines Los Baños/Institute of Agro-Forestry-Misamis Oriental State College Agriculture and Technology (PAFERN/UPLB/IA-MOSCAT)	2
2008	Socioeconomic Survey of Fisheries Communities in Guimaras	UPV	4
2008	Fish Catch in Selected Areas in Guimaras	UP-IESM	4
2008	Beach Fauna Indicators of Environment Change in Guimaras	UP-IESM	1
2008	Enzyme Biomarkers as Indicators of Environmental Contamination	UP-IESM	1
2008	Growth Profiles of Seagrasses and Mangroves along Oil Impact Gradient	UP-IESM	2
November 26-28, 2008	Visayas Environmental Congress	Philippine Federation for Environmental Concern and Guiuan Development Foundation	1



Year	Training	Organization that conducted the training	No. of personnel trained
<b>NUEVA VALENCIA</b>			
2009	Local Research Assistants Training	Zoological Society of London	1
2009	Training Course on Mangrove Biology	Zoological Society of London	1
2009	Seminar on Coastal Laws	GENRO, NAMRIA, Philippine Coast Guard and PNP Maritime Group	1
2009	Leadership Training	Zoological Society of London	1
2009	Orientation Seafood Products Safety from Aquaculture Production Systems	BFAR	2
2009	Training on Toyo Reef Fish Sanctuary Management	BFAR	4
2009	Updates on Aquaculture and Fisheries Financing Program	Agricultural Training Institute	4
2008	Seagrass Monitoring Training/Workshop	John B. Lacson Foundation Maritime University and New Hampshire University	2
2008	Orientation on Good Aquaculture Practices	BFAR	3
2008	Training on Biodiversity Monitoring System	DENR	2
2008	Orientation on Registration of Aquaculture Farms	BFAR	3
2008	Workshop on Shrimp and <i>Gracilaria</i> Culture	SEAFDEC-Aquaculture Department	4
2008	Participatory Coastal Resource Assessment Workshop	BFAR	2
2008	Capability Building for GMA Fisheries Implementers	DA-RFU 6	4
2008	Training/Seminar on the Establishment of <i>Eucheuma</i> and <i>Kappaphycus</i> Seedling Bank in the Municipality on Nueva Valencia	MCPI Corporation and DOST 6	2
<b>SIBUNAG</b>			
2007	Seaweeds Investment Forum	BFAR - Regional Field Training Center	2
2007	Training on Value Adding in Seaweed Products (Bathsoap Making)	BFAR - Regional Field Training Center	3
2007	Enhancement Course on Extension Delivery System for Agricultural Extension Workers	DA-RFU and Agricultural Training Institute Regional Training Center VI	3
2008	Business Plan Preparation Seminar Workshop	DTI	1
2008	Training Course on Abalone Cage Culture and Management	BFAR - Regional Field Training Center	4
2008	On-Site Lecture Forum on <i>Kappaphycus cottonii</i> : Distribution, Bio-ecology, Farming, Crop Management (Diseases and Epiphytism), Post-harvest, Marketing and Product Applications	NC State University United States Agency for International Development (USAID)/Southeast Asian Fisheries Development Center (SEAFDEC) Aquaculture Department	3
2009	Public Forum on Fisheries and Climate Change	DENR	7
2009	Training on Deep Sea Seaweeds Culture	BFAR - Regional Field Training Center	2
2009	Orientation Seminar on the Establishment of a Fish Sanctuary	POAS, BFAR	1
2009	Orientation on Safety for Aquaculture Production System	BFAR - Regional Field Training Center	2
2009	Seaweeds Production Training	BFAR - Regional Field Training Center	2
2009	Training Course on Food Processing in Fishery Product Development	BFAR - Regional Field Training Center	3

Year	Training	Organization that conducted the training	No. of personnel trained
<b>JORDAN</b>			
2008	Training on Biodiversity Monitoring System	PAWCZMS, DENR Region 6	1
2008	ICM Consultation	PEMSEA, ICM PMO Guimaras	1
2008	Workshop on the Filternet/Lift Net Fisheries in Iloilo Strait	SEAFDEC	5
2009	Habitat Survey on Marine Turtle & Dugong Conservation, Awareness & Education Campaign	Pawikan Conservation Project	3
<b>SAN LORENZO</b>			
2006	CRM Planning and Municipal Fishery Ordinance Preparation Training	BFAR Region 6	2
2006	Water Quality Monitoring	DENR and BFAR Region 6	1
2007	Coastal Hazard Management, Local Workshop	SSPA/DENR Region 6	1
2009	Training on Organic Fertilizer Production	DA-RFU 6	1
<b>BUENA VISTA</b>			
September 20-21, 2005	Training on Mangrove Rehabilitation and Management	DENR/BFAR	2
July 2005	Marine Sanctuary Establishment and Management Training Workshop	PAWCZMS-DENR	2
November 2006	Seminar Workshop on Post Harvest Technology on Mycotoxin Prevention and Control on Maize	DA	2
April 2007	Regional Training on Hatchery Operation Management And Grow Out Culture of Ulang	BFAR	2
August 2007	Fishery Law Enforcement and Enhancement Training	BFAR	2
July 2008	Biodiversity Monitoring System	DENR	2
April 2008	Training on Induced Breeding and Culture of Catfish		2
February 2007	Coastal Hazard Management	SSPA/DENR	2
August 2007	Integrated Coastal Zone and Disaster Risk Management for LGU Guimaras		2
2007	Training on Value Adding in Seaweed Products (Bathsoap Making)	BFAR- Regional Field Training Center	3
	Training on Semi-Intensive Culture on <i>Tilapia</i>	MAO/BFAR/POAS/DTI	1
	Training on Semi-Intensive Culture on <i>Hito</i>	MAO/BFAR/POAS/DTI	2
	Training on Seaweeds Culture	MAO/BFAR/POAS/DTI	2
	Training on Organic farming	MAO/BFAR/POAS/DTI	1
	IPM-FFS on Vegetables/Palay and Mango	MAO/BFAR/POAS/DTI	2
	Organic Fertilizer Training (Bokashi, Vermicomposting)	MAO/BFAR/POAS/DTI	2
	Capability-building Training	MAO/BFAR/POAS/DTI	2
2009	Pawikan Conservation Awareness	PAWCZMS DENR	2
2009-2010	Palay Check Farmers Field School	MAO and POAS	



**Table 14. Expertise and number of provincial personnel to be trained based on the results of the capacity building survey conducted by PEMSEA in 2009.**

Expertise	Level of priority	Number of personnel to be trained
Development planning and management	Most needed	1
ICM	Most needed	1
Ocean governance	Most needed	1
Ecosystem-based management	Most needed	1
Ocean policy	Most needed	1
Conflict resolution	Most needed	1
Resource valuation	Most needed	1
Risk assessment	Most needed	10
Marine and coastal ecology	Most needed	1
Coastal and marine pollution	Most needed	1
Law of the Sea	Needed	1
Fishery and aquaculture management	Most needed	10
Port and marine transport management	Needed	1
EIA	Needed	1
Integrated or strategic EIA	Needed	1
Social science	Most needed	1
Communication	Most needed	10
Information management (IIMS)	Most needed	1
Ecotourism	Most needed	1
Climate change	Most needed	1
Water resource management	Most needed	1
ICM tools	Most needed	1



**Table 15. Training requirements, including number of personnel to be trained as identified by municipal level personnel.**

Trainings needed related to coastal management	No. of personnel to be trained
<b>SIBUNAG</b>	
1. Manual of Operation for Marine Protected Area	7
2. Formulation of 5-Year Integrated Coastal Resource Management Plan	5
<b>JORDAN</b>	
1. Mangrove Nursery Establishment	3
2. Assessment/Survey/Rehabilitation of Coral Reefs, Seagrass Beds, etc.	3
3. Formulation of Coastal Management Plan (Municipal Level)	3
<b>SAN LORENZO</b>	
1. CRM Plan Preparation	5
2. Coastal Resource Assessment	5
3. Training on the Establishment of Marine Reserve	5
4. Preparation of Municipal Fishery Ordinance Training	5
5. Training on the Preservation/Rehabilitation of Habitats: Seagrass, Corals, Mangroves	6
6. Technical Training on Coastal Resource Management	5
<b>BUENAVISTA</b>	
1. Training on Sanctuary Establishment	3
2. Mangrove Nursery/Rehabilitation Training	3
3. Stock Assessment	3
4. Coastal Land and Sea Use Zoning	3
<b>NUEVA VALENCIA</b>	
1. Planning Workshop on Effective Implementation of Fishery Ordinance and Other Fishery Laws	48
2. Technical Training on Coastal Resource Management	5





**Representatives of the Guimaras ICM Program during the 2009 East Asian Seas Congress in Manila, Philippines.**

## Implications and Recommendations

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Capacity development provides program implementers the needed knowledge and skills to plan and manage effectively their coastal and marine resources and environment.

Building awareness and capacity development are integral components of an ICM program. As such, it should span

from the local communities to the local chief executives and politicians. Education and training activities associated with ICM must be in accordance with the identified capacity needs as well as the existing capacity and role that the stakeholders play in the ICM program.

## References

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Five Municipalities Coastal Management Trainings, Municipal Planning and Development Office and Municipal Agriculture Office.  
ICM PMO-GENRO.



## Financing Mechanisms

### 013 Budget for integrated coastal management

#### Description

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

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

#### Rationale

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

#### Data Requirements

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- 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

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The commitment of local governments to manage the coastal and marine areas can be gleaned by the regular allocation of financial resources for its coastal management programs.

**Table 16** presents the financial allocation for ICM implementation at the provincial and municipal levels for the years 2008 and 2009.

**Table 16. Financial allocation for coastal management in Guimaras.**

	Amount requested for coastal management (PhP)		Amount allocated for coastal management (PhP)		Amount spent for coastal management (PhP)	
	2008	2009	2008	2009	2008	2009
<b>Guimaras Province</b>	2.6 M	1.5 M	2.6 M	1.5 M	2,376,967.99	1,244,519.29
<b>Buenavista</b>	150,000	3,740,000	150,000	3,740,000	150,000	3,740,000
<b>Nueva Valencia</b>		1,460,787		1,460,787		1,125,195
<b>Jordan</b>	290,000	330,000	290,000	330,000	290,000	330,000
<b>San Lorenzo</b>	565,000	280,000	565,000	630,000	565,000	418,088 (continuing funds)
<b>Sibunag</b>	150,000	235,000	150,000	235,000	118, 893.20	142,280.00
<b>TOTAL</b>	<b>3,755,000</b>	<b>7,545,000</b>	<b>3,755,000</b>	<b>7,895,787</b>	<b>3,381,967.99</b>	<b>6,857,802.29</b>

Other sources of funding include a loan availed from the Land Bank of the Philippines to finance the alternative livelihood program (e.g., seaweed farming) in Sibunag. A seaweed expansion project is also being funded by the

Agricultural Credit Policy Council of DA-BFAR under the Fisheries Financing Program through the Land Bank of the Philippines in the amount of PhP 5.2M.

### Implications and Recommendations

The Local Government Code of 1991 and Executive Order 533 promote the strengthening of local coastal governance and devolved the primary responsibility to the LGUs in managing the marine and coastal resources under their jurisdiction. The LGUs are given the legal authority to impose new taxes and fees in the generation of management revenues, although internal revenue allotments are still the primary source of local revenue. This provides the LGUs flexibility in exploring means to generate funds for coastal management such as the implementation of an environmental user fee system.



**Seaweed culture is one of the leading coastal industries in Sibunag.**

### References

- GENRO ICM Program 2008 and 2009, 20 percent Development Fund.  
 MPDO 2008 and 2009, 20 percent Internal Revenue Allotment Projects, Municipality of Buenavista.  
 MPDO 2008 and 2009, 20 percent Internal Revenue Allotment Projects, Municipality of Jordan.  
 MPDO 2008 and 2009, 20 percent Internal Revenue Allotment Projects, Municipality of San Lorenzo.  
 OMA 2008 and 2009, 20 percent Internal Revenue Allotment Projects, Municipality of Nueva Valencia.  
 OMA 2008 and 2009, 20 percent Internal Revenue Allotment Projects, Municipality of Sibunag.



## 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 environment-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

The standard Philippine Government process is being followed for procurement processes and the province is authorized to engage in PPP. As of 2009, numerous PPP arrangements and other financing instruments are being implemented to support other sectors in the province. The Provincial Government has been a “*Gawad Galing Pook*” awardee in Public-Private Partnership in Tourism

Development. Petron Foundation provided Internet connectivity to the province’s 17 public high schools in partnership with Smart Communications, Philippine Long Distance Telephone Company (PLDT) and Microsoft Philippines, the Department of Education and the Provincial Government. However, PPP for environmental management programs have yet to be developed.



In Buenavista, public and private partnership was undertaken from 2005-2008 together with the German Technical Cooperation (now the German International Cooperation or GIZ) on solid waste management. Technical assistance was provided in composting, recycling, and capacity development of relevant stakeholders. A shredder was provided by GIZ while the establishment of a disposal facility was the counterpart provision of the municipality.

Public and private partnership between the municipality of Nueva Valencia and Petron Foundation was initiated after the August 11, 2006 oil spill. Several rehabilitation and alternative livelihood programs were undertaken such as mariculture, seaweed production for organized groups, and alternative livelihood projects and skills training in partnership with TESDA, DTI and DOST. Other partners included the Zoological Society of London which provided assistance in the rehabilitation of mangroves in Basyaw Cove. The John B. Lacson Foundation Maritime University facilitated the establishment of the Igang Bay Marine Sanctuary and the Iloilo Caucus of Development, which funded the *Halad sa Guimaras* Project for the oil spill-affected fisherfolks of Brgy. La Paz.

The Municipal Government of Sibunag established the Sibunag Seaweeds Growers and Traders Association Inc. (SSGTAI) in partnership with national government agencies, the Provincial Government and the private sector. The private sector partners of Sibunag included Trans-Asia/PHINMA Group of Companies, Angelo King Foundation and Mercury Drug through the Philippine Business for Social Progress (PBSP) and the Peace and Equity Foundation, Inc., through the World Bank. A number of projects were financed, including a multi-purpose building, potable water system project, warehouse with buying station and drying platform, and several enhancements training assistance.



Seaweed culture in Barangay Sabang, Sibunag managed by the Sibunag Seaweeds Growers and Traders Association, Inc.

## Implications and Recommendations

It is essential to ensure that the ICM program becomes an integral part of local governance, and that ICM program formulation and implementation, which requires identification of sustainable financing mechanisms are incorporated into the government's planning process. Mobilizing private

sector financial resources and expertise in addressing environmental problems is a wise step. The province should endeavour to encourage and engage the private sector in the implementation of its coastal management program.

## References

- Chua, Thia-Eng. "Developing Sustainable Financing Mechanisms for Coastal and Marine Environmental Management." Presentation. MOA between GTZ and DENR VI (Municipality of Buenavista as one of the recipients).  
OMAS Sibunag. "The Emergence of Seaweeds Industry in Sibunag, Guimaras."  
Petron Foundation. "An Update on the Rehabilitation and Alternative Livelihood Program."



### Natural and Man-made Hazard Prevention and Management

#### 015 Level of preparedness for disasters

##### Description

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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

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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

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- Availability of natural/man-made disaster/environmental emergency response plan
- 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

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The Provincial Disaster Coordinating Council (now the Provincial Disaster Risk Reduction and Management Council) has developed the Provincial Disaster Preparedness Plan for Guimaras which covers emergency and response plans for floods, earthquakes and landslides.

Except for San Lorenzo, the rest of the municipalities (e.g., Buenavista, Jordan, Nueva Valencia and Sibunag) have also developed their respective Municipal Disaster Response Plans. The scope and coverage years of the municipal

disaster plans are given in **Table 17**. The implementation of the disaster response plans are being instituted through the disaster coordinating councils at the barangay, municipal and provincial levels. Buenavista, Jordan and Nueva Valencia indicated that there is no specific budget allocation for disaster response but are mainly taken from the Calamity Fund allocated for the municipality. For example, in 2008, Buenavista had PhP 718,000 (i.e., PhP 713,000 from 20 percent of the MDF and PhP 5,000 from the calamity fund) for disaster response (MDCC Preparedness Plan, 2008).

Table 17. Disaster Response Plans of municipalities in Guimaras.

Scope of the Plan	Coverage Years
<b>Nueva Valencia</b> Drought/El Niño, typhoons, flashfloods, landslides, earthquakes, oil spills, and epidemic diseases.	2007-2009
<b>Buenavista</b> Drought/El Niño, typhoons, flashfloods, fires, landslides, earthquakes, tsunamis.	2008
<b>Jordan</b> All types of disasters and calamities	2009
<b>Sibunag</b> Drought/El Niño, typhoons, flashfloods, landslides, earthquakes, oil spills, epidemics; all types of natural and man-made disasters	2007-2009
<b>San Lorenzo</b>	No plan

### Implications and Recommendations

Although the benefits of the disaster response plans can only be realized when disaster happens, the readiness to respond to natural calamities and man-made disasters (e.g., oil spill) is an important aspect that should be considered by the local government. Developing a preparedness plan is therefore a key undertaking. The allocation of resources is also necessary to realize the plan as well as in building awareness among local people on disaster preparedness and response, including the capacity of local personnel to respond in a timely manner in the event that a disaster happens.

Strengthening the linkages and promoting collaboration among government agencies on disaster response should be considered.



One of the oil spill affected areas in Nueva Valencia.

### References

- MDCC Preparedness Plan 2008, Buenavista.
- MDCC and Rescue Operation Plan 2009, Jordan.
- Municipal Disaster Plan 2007-2009, Sibunag.
- Nueva Valencia 2007-2009 Disaster Preparedness Plan, MPDO.
- PDCC Provincial Disaster Preparedness Plan.



## Natural and Man-made Hazard Prevention and Management

### 016 Degree of vulnerability to disasters

#### Description

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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

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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

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- Availability of multihazard (landslides, storms, floods, etc.) map
- Number of people located in hazard-prone areas
- Number of people relocated or moved away from hazard-prone areas

#### Results

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Typhoons, occasional occurrences of flooding and landslides in some areas are the common natural hazards in the province. A list of barangays in each of the municipalities that are vulnerable to various types of natural disasters is available from the Provincial Disaster Risk Reduction and Management Council (**Table 18**). There are also

existing hazard maps (**Figures 9-11**), including locations of environmentally constrained areas and tsunami-prone areas that may be considered in planning for development programs and disaster management activities. A geo-hazard map of the province is also currently being updated by the DENR-Mines and Geosciences Bureau.

Table 18. Disaster-prone areas in Guimaras (PDRRMC).

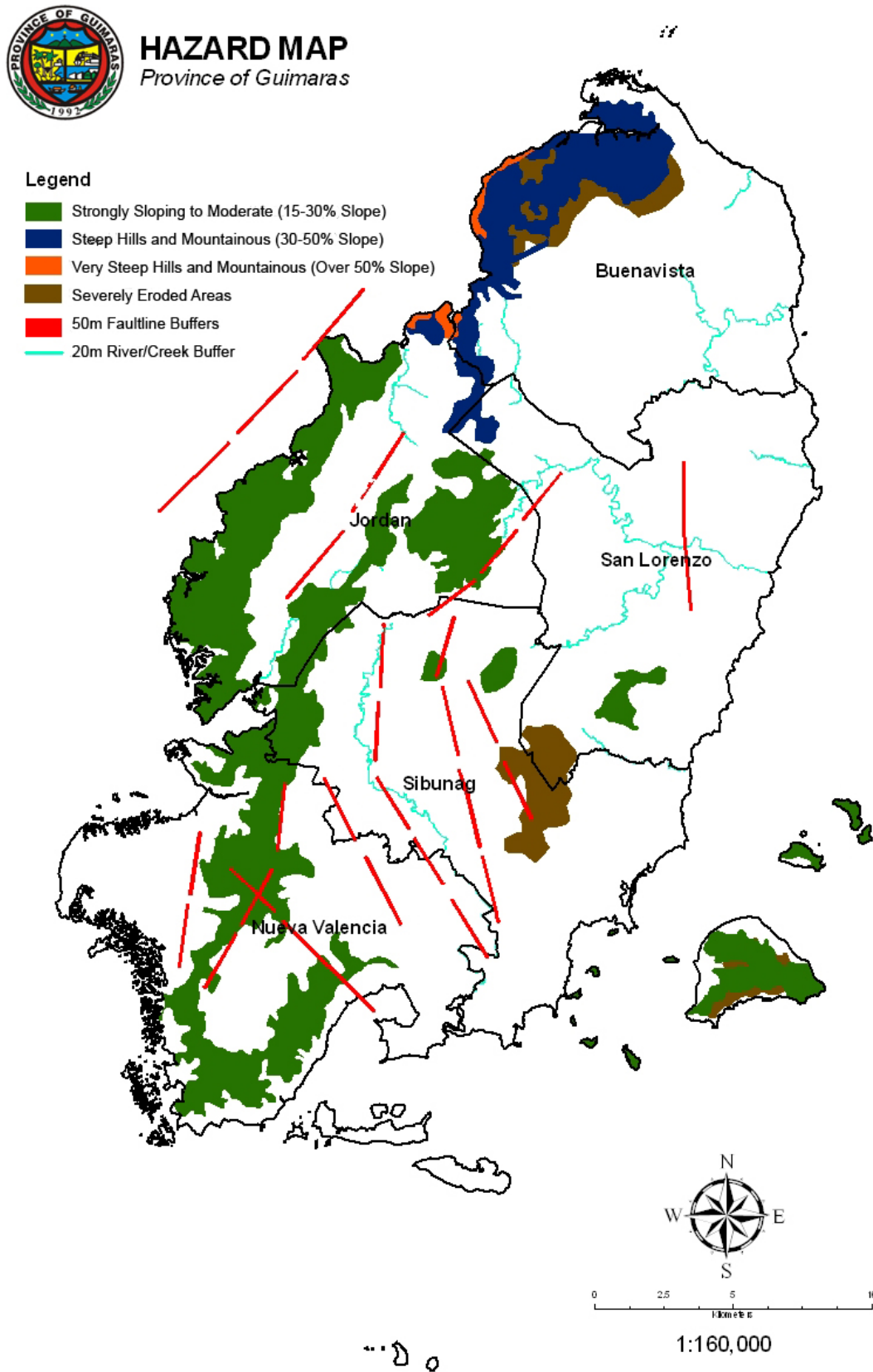
BUENAVISTA	JORDAN	NUEVA VALENCIA	SIBUNAG	SAN LORENZO
<b>FLOODS</b>				
Mabini	Rizal	Cabalagnan	Millan	Sebario
Mclain	Poblacion	Canhawan	Maabay	M. Chavez
Tastasan	Hoskyn	Dolores	Dasal	Cabano
Salvacion	Balcon Melliza	Tando	San Isidro	San Enrique (Lebas)
Poblacion	Morobuan	Lucmayan	Alegria	
Sto. Rosario	Espinosa	San Roque	Bubog	
Old Poblacion	Sinapsapan	Salvacion	Sabang	
Tacay	Buluangan	Igdarapdap	Sebaste	
Taminla	Bugnay	San Antonio	Ravina	
	Lawi	Lanipe	Ayangan	
		Sto. Domingo		
		Igang		
<b>LANDSLIDES</b>				
Dagsaan	Hoskyn	San Roque	Ayangan	Sapal
Salvacion	Buluangan	Lapaz		
Magsaysay	Poblacion	Cabalagnan		
Sto. Rosario	Rizal	Igdarapdap		
Mabini				
Montpiller				
Agsanayan				
Rizal				
Sawang				
<b>STORM SURGES</b>				
San Miguel	Hosky	Panobolon	Sebaste	Sebario
Navalas	Poblacion	Guiwanon	Bubog	San Enrique (Lebas)
Bavjao	Espinosa	San Antonio	Sabang	Suclaran
Tacay	Morobuan	Igdarapdap	Alegria	M. Chavez
Umilig	Rizal	Canhawan	San Isidro	Igcawayan
Sawang		Cabalagnan		
Sto. Rosario		La Paz		
Montpiller		San Roque		
Magsaysay		Lucmayan		
Zaldivar		Tando		
Tanag		Dolores		
Rizal		Pandaraonan		
		Magamay		
		Sto. Domingo		
		Igang		
		Poblacion		



<b>BUENAVISTA</b>	<b>JORDAN</b>	<b>NUEVA VALENCIA</b>	<b>SIBUNAG</b>	<b>SAN LORENZO</b>
<b>DROUGHTS</b>				
Supang	Sta. Teresa	Dolores	Concordia Sur	Cabano
Getulio	Bugnay	Panobolon	Ravina	M. Chavez
Umilig	Sinapsapan	Pandaraonan	Sabang	Suclaran
Banban		San Roque	Millan	
Navalas		Lucmayan		
Taminla				
San Roque				
Nazaret				
Agsanayan				
San Nicolas				
Bacjao				
Mabini				
<b>TSUNAMIS</b>				
		Dolores	Alegria	Igcawayan
		Tando	San Isidro	Sebario
		Lucmayan	Naoway	Cabano
		San Roque	Sabang	
		La Paz	Bubog	
		Cabalagnan	Sebaste	
		Canhawan		
		Igdarapdap		
		San Antonio		
		Panobolon		
		Guiwanon		



Figure 9. Hazard map of Guimaras.



Natural and Man-made Hazard Prevention and Management

Degree of vulnerability to disasters

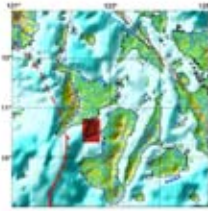


Figure 10. Tsunami-hazard map.

# TSUNAMI HAZARD MAP

## Earthquake Parameters

Used in Modeling:  
 Source - Negros Trench  
 Magnitude - 8.2/7.3

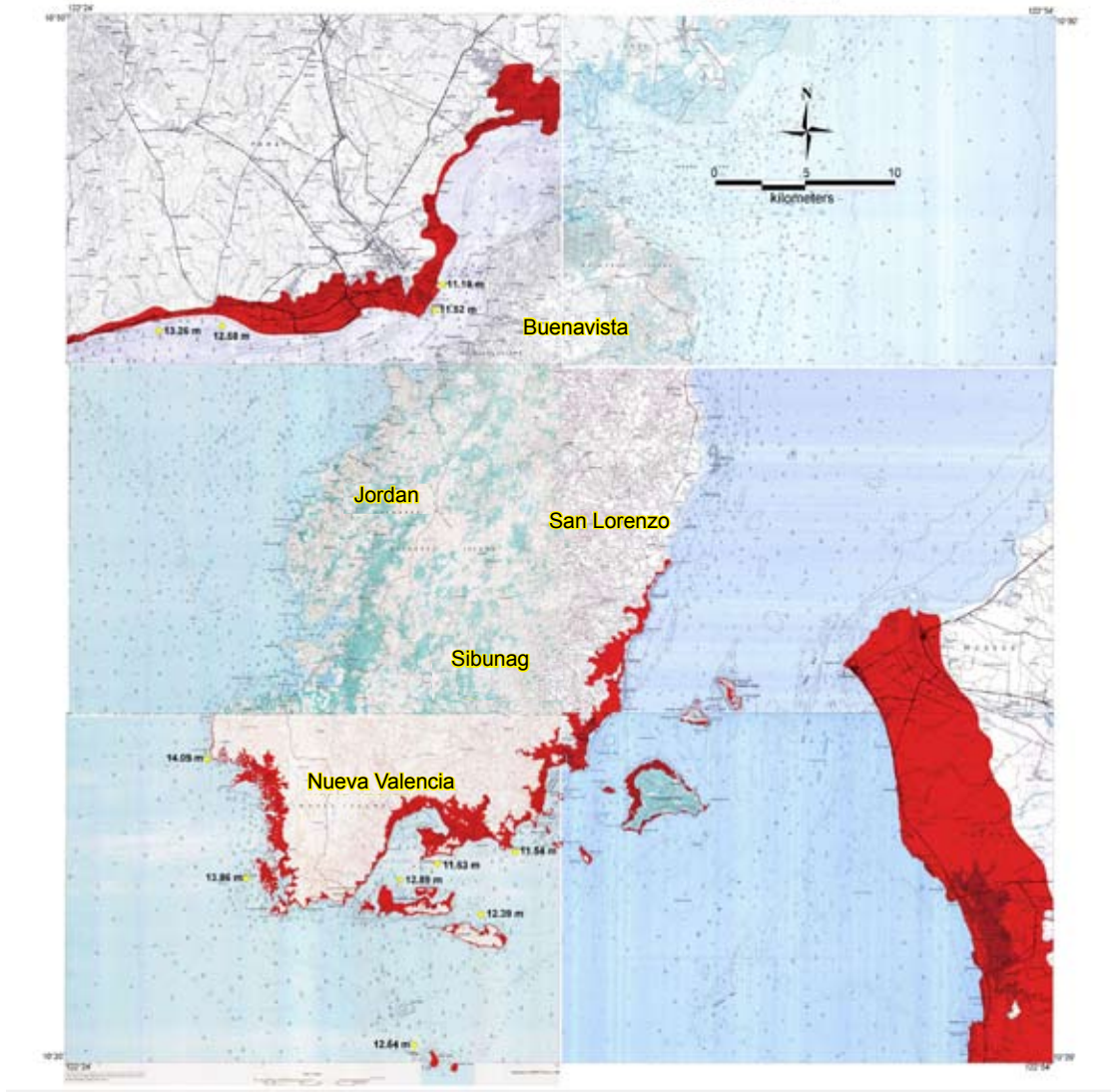


- Tsunami Inundation Area
- Tsunami Wave Height at Coastline

### Data Source:

Modeling results using REDAS  
 Software based on empirical equations of Abe (1989), Hall and Watt (1953), Prist (1995) and Hills and Mader (1999)

1:50,000 topographic map (Pulupandan Sheet - 3551 I, Pontevedra Sheet- 355 II, Cabalaganan Sheet - 3551 III, Nueva Valencia Sheet - 3551 IV, Dumangas Sheet - 3552 II, Iloilo Sheet - 3552 III; 1993-reprint, NAMRIA)



### Map Prepared By:

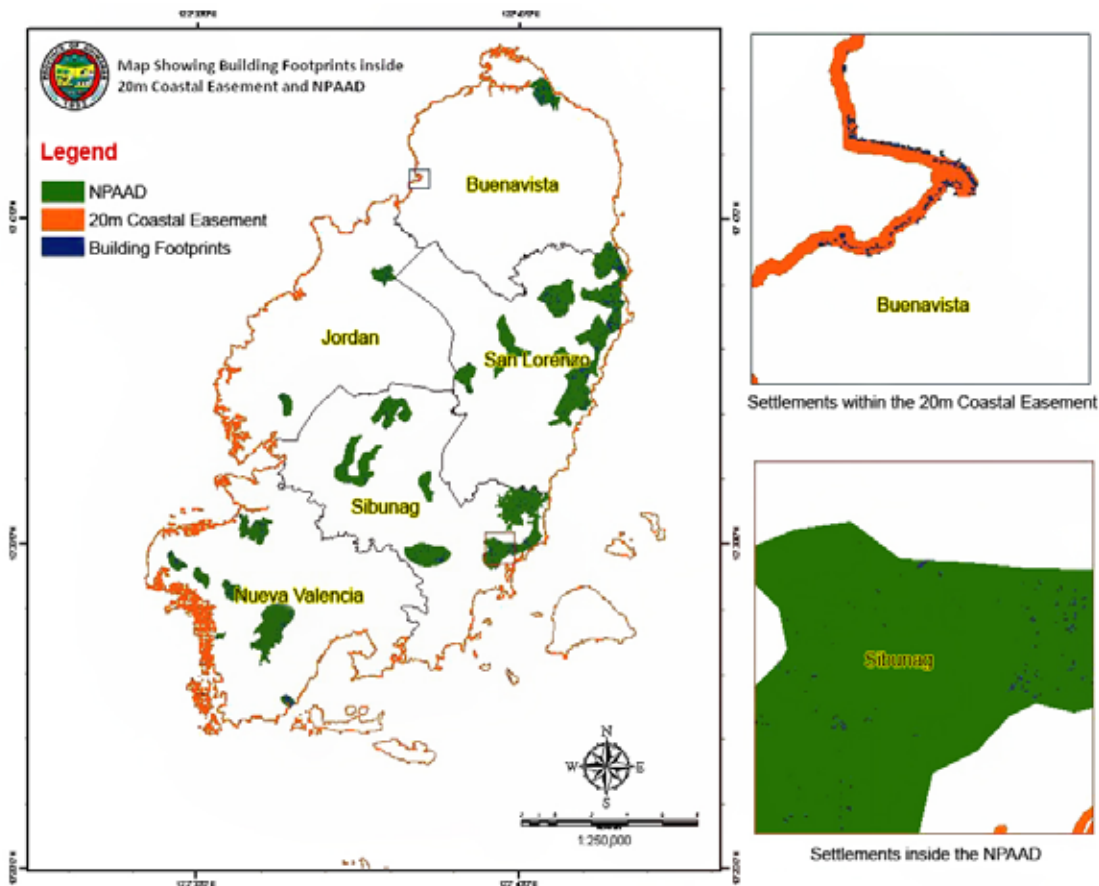
Philippine Institute of Volcanology and Seismology (PHIVOLCS) - Department of Science and Technology (DOST) Under the DOST-GIA Program December 2007



### Explanation:

This indicative map is based on maximum computed wave height and inundation using worst case scenario earthquakes from major offshore source zones. The indicated wave height decreases away from the shoreline.

Figure 11. Locations of coastal easement zones.



The province is also vulnerable to oil spills due to the presence of navigational and shipping lanes along the Guimaras Strait. Operational discharges from fishing vessels also serve as additional sources of oil spills. Although an oil spill sensitivity map and contingency plan are yet to be developed, the province in collaboration with experts from academic and research institutions (UPIESM and UPV) endeavored to determine the impacts of oil spills to the

marine and coastal areas and resources which can be considered for planning and management. The oil spill incident in 2006 has provided a window of opportunity for the province to adopt an integrated approach to management, which provides the framework and processes for the holistic management of the coastal and marine areas of the province, including addressing threats of oil spills.

### Implications and Recommendations

It is important to have information on areas that are vulnerable to various types of disasters. This will allow the local government to integrate such information in their development plans as well as disaster risk reduction and management plans. This will also allow the local government to identify the areas and communities, including number of

people and infrastructure that will be most likely affected. The PDPFP of Guimaras specifies that this information should be considered in disaster risk management and should be considered in the expansion of built-up areas and the development of residential subdivisions.

### References

Bureau of Soils and Water Management, Department of Agriculture.  
Provincial Disaster Risk Reduction and Management Council, Guimaras Province GIS.



## 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

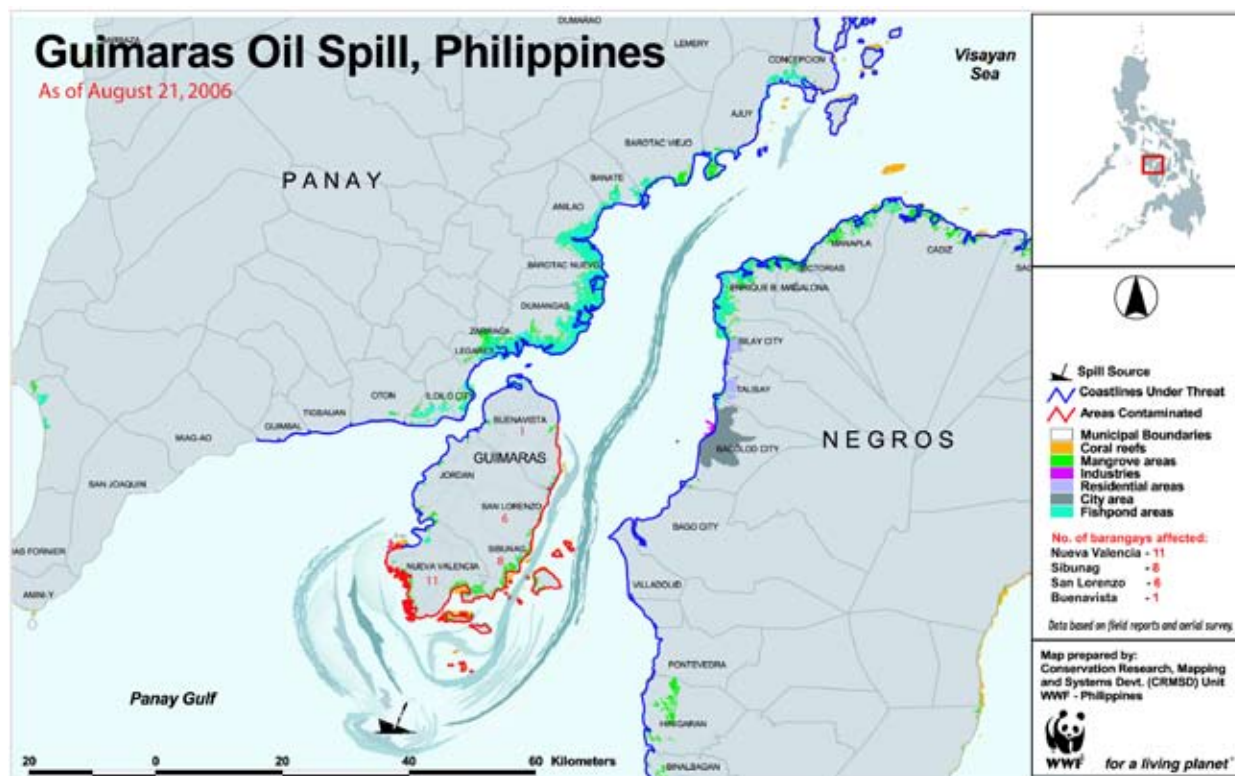
One of the biggest disasters which hit the province in recent years was the bunker oil spill incident in August 2006 (**Figure 12**). The spill affected about 69,152 individuals and 13,917 households, or about 47 percent of the total population (PDCC, 2006).

In the municipality of Sibunag alone, six coastal and four inland barangays were affected by the spill or about 43

percent of the total households in the municipality (**Table 19**). In Nueva Valencia, there were about 223 families or 1,017 individuals evacuated as a consequence of the oil spill incident and about 5,594 families were directly or indirectly affected by the spill. The total amount of losses brought about by the oil spill incident in Nueva Valencia was estimated at PhP 237 million.



Figure 12. The trajectory of the oil spill in Guimaras in August 2006.



Natural and Man-made Hazard Prevention and Management

Social and economic losses due to disasters



Table 19. Summary of households affected by oil spill in Sibunag.

Barangay	Number of Households	Number of Households Affected	Percentage of Household Members Affected	Occupation							
				Fishing	Fish Vendors	Seaweed Growers	Saltmakers	Fish Pond Owners	Fish Pond Caretakers	Resort Owners	Resort Workers
Alegria	308	161	52	130	15	8		7	15		
Ayangan	270	1	0.37			1					
Bubog	148	108	72.97	85	6	18	29	9	7	1	1
Dasal	290	78	26.89	70	5	7		1			
Inampulugan Island	72	72	100	41						1	60
Maabay	381	16	4.19	3	13	1					
Naoway Island	99	99	100	84	5	1				1	2
Sabang	323	153	47	128	10	19	1	1	6	1	
San Isidro	299	266	76	152	10	7	64	9	10		
Sebaste	416	213	51.2	158	18	55	103	2	3		
<b>TOTAL</b>	<b>2,606</b>	<b>1,167</b>	<b>43</b>	<b>851</b>	<b>82</b>	<b>117</b>	<b>197</b>	<b>29</b>	<b>41</b>	<b>4</b>	<b>63</b>

In terms of natural disasters, the province experiences a maximum of 15 weather disturbances annually, consisting of monsoons, low pressure areas, tropical depressions, storm surges and typhoons. The province recorded a total of 148 people that were severely affected by typhoons and flooding in 2008, and the losses were estimated at PhP 4.3 million. In Nueva Valencia, Typhoon Frank which hit the province in 2008 affected about 1,343 people, causing damages in their houses and other properties (Table 20).

In 2009, eight weather disturbances occurred in the province. Only seven people were reported to be severely affected by the typhoons and flooding. Jordan, San Lorenzo and Buenavista reported no direct exposure to natural disasters in their area in recent years.



The road in front of Jordan Municipal Hall is a flood-prone area.

Table 20. Occurrences of natural disasters in Guimaras.

	Year	Type of disaster	Number of people severely affected	Number of deaths	Total amount of disaster losses (PhP)
Nueva Valencia	2001	Typhoon	428		237M
	2006	Oil spill			
	2008	Typhoon			
Sibunag	2006	Oil spill	23		
San Lorenzo					
Jordan					
Buenavista					
Guimaras Province	2008	Typhoon and flooding	148	1	4.3M
	2009	Typhoon and flooding	7		
		Lightning			





## Implications and Recommendations

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Although the province is not exposed to natural hazards, it is tantamount that preparedness and response planning should still be considered by the local government. Because of the vulnerability of the province to oil spills, it is important

to integrate man-made hazards into its response and contingency planning mechanisms. It is also important that disaster incidences, including social and economic losses should be systematically recorded for future trends analysis.

## References

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Municipality of Sibunag. MDCC Report.  
Master List of Families Evacuated — Oil Spill Victims (October 2006). Municipality of Nueva Valencia.  
PDCC. 2006. Living Standard Survey.  
Province of Guimaras. 2009. PDCC Report.

### 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

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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

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

##### Results

---

Various activities related to habitat protection, restoration and management have been incorporated in the work programs of the municipalities despite the lack of a habitat management plan. The coastal municipalities are implementing programs ranging from establishment of artificial reefs, mangrove reserve zones and coral gardens, rehabilitation of threatened species and habitats, and establishment of mangrove nurseries for reforestation purposes.

Similarly, agencies at the provincial level are also implementing programs on habitat management including resource enhancement; stocking and disposal of abalone in Lawi, Jordan; establishment of concrete artificial reef in the Lawi Buffer Zone, Jordan; establishment of bamboo artificial reefs in 17 coastal barangays in Buenavista; mangrove reforestation, and the establishment of a coral garden in Dolores, Nueva Valencia and Lawi, Jordan (**Table 21**).

Table 21. Habitat management programs in Guimaras.

<b>Buenavista</b>	<ul style="list-style-type: none"> <li>• <i>Bantay Dagat</i> program</li> <li>• Mangrove reforestation program</li> <li>• Establishment of marine sanctuary</li> <li>• Artificial reef</li> </ul>
<b>Jordan</b>	<ul style="list-style-type: none"> <li>• Establishment of mangrove reserve zone</li> <li>• Marine Turtle Sanctuary</li> <li>• Pawikan caring and feeding station</li> <li>• <i>Bantay Dagat</i> program</li> <li>• Strengthening of MFARMC</li> <li>• Establishment of coral garden</li> <li>• Regular conduct of coastal cleanup</li> <li>• Resource enhancement – stocking of abalone</li> <li>• Concrete artificial reef and buoys</li> </ul>
<b>Nueva Valencia</b>	<ul style="list-style-type: none"> <li>• Establishment of fish sanctuary and marine sanctuary</li> <li>• Operationalization of Fisheries and Aquatic Resource Management Section including <i>Bantay Dagat</i> operation</li> <li>• Conducted training/orientation for rehabilitation of fish sanctuary</li> <li>• Strengthening of MFARMC</li> <li>• Conduct of CRM planning workshops for coastal barangays</li> <li>• Deputization of fish wardens</li> <li>• Establishment of coral garden</li> <li>• Mangrove reforestation</li> <li>• Rehabilitation of habitat and threatened species</li> </ul>
<b>Sibunag</b>	<ul style="list-style-type: none"> <li>• Mangrove reforestation project</li> <li>• Seaweeds production project</li> <li>• Abalone culture</li> <li>• Seaweeds nursery project</li> <li>• Fish cage culture</li> <li>• Coastal cleanup</li> <li>• Establishment of fish sanctuary</li> </ul>
<b>San Lorenzo</b>	<ul style="list-style-type: none"> <li>• Mangrove reforestation project</li> <li>• Seaweeds production project</li> <li>• Fish sanctuary</li> <li>• Abalone stock enhancement</li> <li>• <i>Bantay Dagat</i> program</li> <li>• Operationalization of FARMCs</li> </ul>
<b>Guimaras Province</b>	<ul style="list-style-type: none"> <li>• Resource enhancement, stocking and disposal of abalone, Lawi, Jordan</li> <li>• Concrete artificial reef at the Lawi Buffer Zone, Jordan</li> <li>• Bamboo artificial reefs in 17 coastal barangays of Buenavista</li> <li>• Mangrove reforestation project <ul style="list-style-type: none"> <li>- Nueva Valencia – 43.56 ha</li> <li>- Jordan – 5 ha</li> <li>- Sibunag – 7.5 ha</li> </ul> </li> </ul> <p>Mangrove Stewardship Agreement issued by DENR  Jordan – 6.776 ha  Nueva Valencia – 30.52 ha  Sibunag – 58.8323 ha  Buenavista – 7.367 ha</p> <p>Coral garden – Dolores, Nueva Valencia, Lawi, Jordan</p> <p>Earth Day Celebration (mangrove planting) – 2006-2009: PhP 50,000/yr</p>



## Implications and Recommendations

Coastal habitats provide goods and services that benefit the coastal communities and other stakeholders (e.g., food, medicines, shoreline protection, etc.). The management and protection of these habitats is therefore essential to

ensure the continuous delivery of the goods and services. The formulation of coastal habitat management plans by the municipalities must be considered to ensure effective management of these habitats, including wildlife.

## References

- Annual Development Plan 2009, Buenavista.  
Listing of Habitat Management Programs, Municipal Agriculture Office, Jordan.  
OMAS Nueva Valencia Municipal Fisheries Profile (1998-2007).

### 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

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- Total area (km<sup>2</sup>) of coastal habitats (coral reef, seagrass, mangrove, natural beach, forest (excluding mangroves), and urban “green” area)

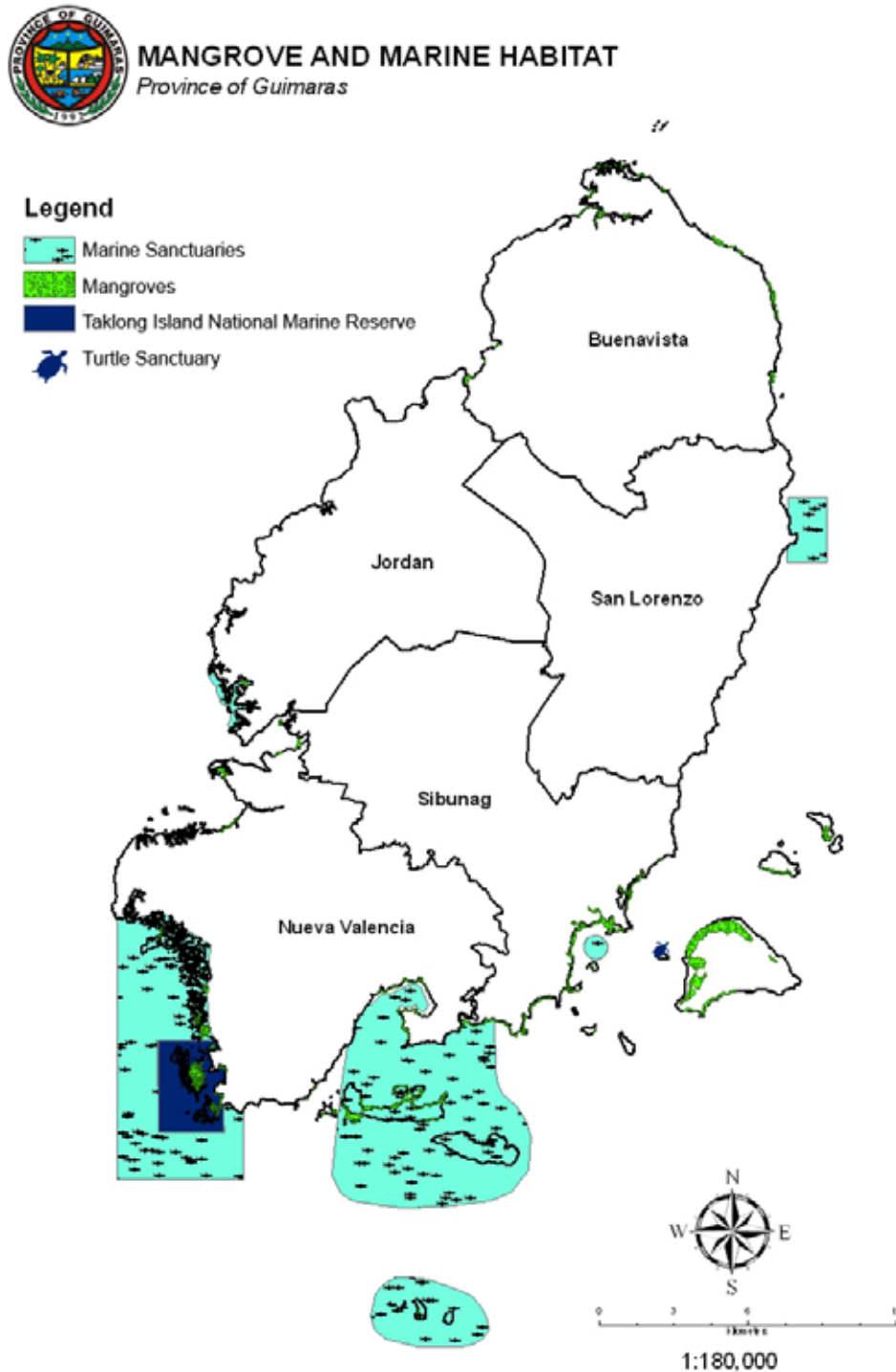
##### Results

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The coastal habitats of the province consist of coral reefs, seagrass beds, mangroves and natural beaches (**Figure 13**). Some municipalities, however, have no actual data on coastal habitats. Coral reefs in the province are located in Jordan and San Lorenzo, covering an area of 76.5 ha. About 209 ha of seagrass beds can be found in Buenavista, Jordan, Nueva Valencia and San Lorenzo. Mangrove areas cover

about 823 ha in the five municipalities. From the recent GIS-generated protection map, the total mangrove and mangrove reforestation areas in the province cover about 520 ha (Provincial Comprehensive Land Use Plan 2005-2035). Natural beaches located in Buenavista, Jordan, Nueva Valencia and San Lorenzo cover about 624 ha (**Table 22**).

Figure 13. Coastal habitats in Guimaras.



A rapid appraisal study on coastal habitats of Guimaras conducted in 1996 (Babaran and Ingles, 1996) revealed that for the coral reefs in the Province, 25.6 percent were in poor condition, 24.3 percent were in fair condition, 33.6 percent were in good condition and 16.5 percent were in excellent condition. For seagrasses, 52.5 percent had poor cover, 22.8

percent were with sparse cover, 9.8 percent were with moderate cover, 10.6 percent were with good cover, and only 4.1 percent had excellent cover. The decline in mangrove areas was also reflected in the study indicating that in 1956, mangrove areas was about 1,743.1 hectares and had significantly decreased to about 395.6 hectares in 1995.



Apart from its coastal habitats, the province has natural forests covering an area of 2,835 ha. The province has

endeavored to rehabilitate its mangrove and upland forests and thus far has rehabilitated about 163 ha.



One of the sites of “*Kasadyahan sa Kabukiran*,” an annual treeplanting activity celebration organized by the Provincial Government and participated in by different stakeholders.

Table 22. Area of coastal habitats in Guimaras (2010).

	Coral reef (ha)	Seagrass (ha)	Mangrove (ha)	Natural beach (ha)	Natural forest (excluding mangrove area) (ha)	Urban green area (ha)	Natural area rehabilitated (ha)
Buenavista		22	49.47	44.6	2,816.37		
Jordan	66	30.07	4.93	8			
Nueva Valencia		148	147.71	28.85	19		
San Lorenzo	10.5	9	20.25		543	3	3
Sibunag			297.96				
<b>Total</b>	<b>76.5</b>	<b>209.7</b>	<b>520.32</b>	<b>81.45</b>	<b>3,378.37</b>	<b>3</b>	<b>3</b>



## Implications and Recommendations

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Information on the geographic extent of coastal habitats, including assessment of their condition is an essential input to management. A comprehensive assessment of the habitats in the province was conducted 15 years ago. The current condition of the habitats considering the impacts of human activities over the past 15 years, as well as emerging concerns like climate change, including the

results of management interventions, need to be determined. The province may initiate or explore opportunities for partnerships with academic institutions, national government agencies, NGOs and the private sector to undertake habitat assessment and monitoring in order to update the information and facilitate the identification of appropriate management interventions.

## References

---

Babaran and Ingles. 1996. Philippine Coastal Marine Habitats at Risk: A Case Study of Guimaras Island. Provincial Comprehensive Land Use Plan 2005-2035.



## 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

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- 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 (km<sup>2</sup>)

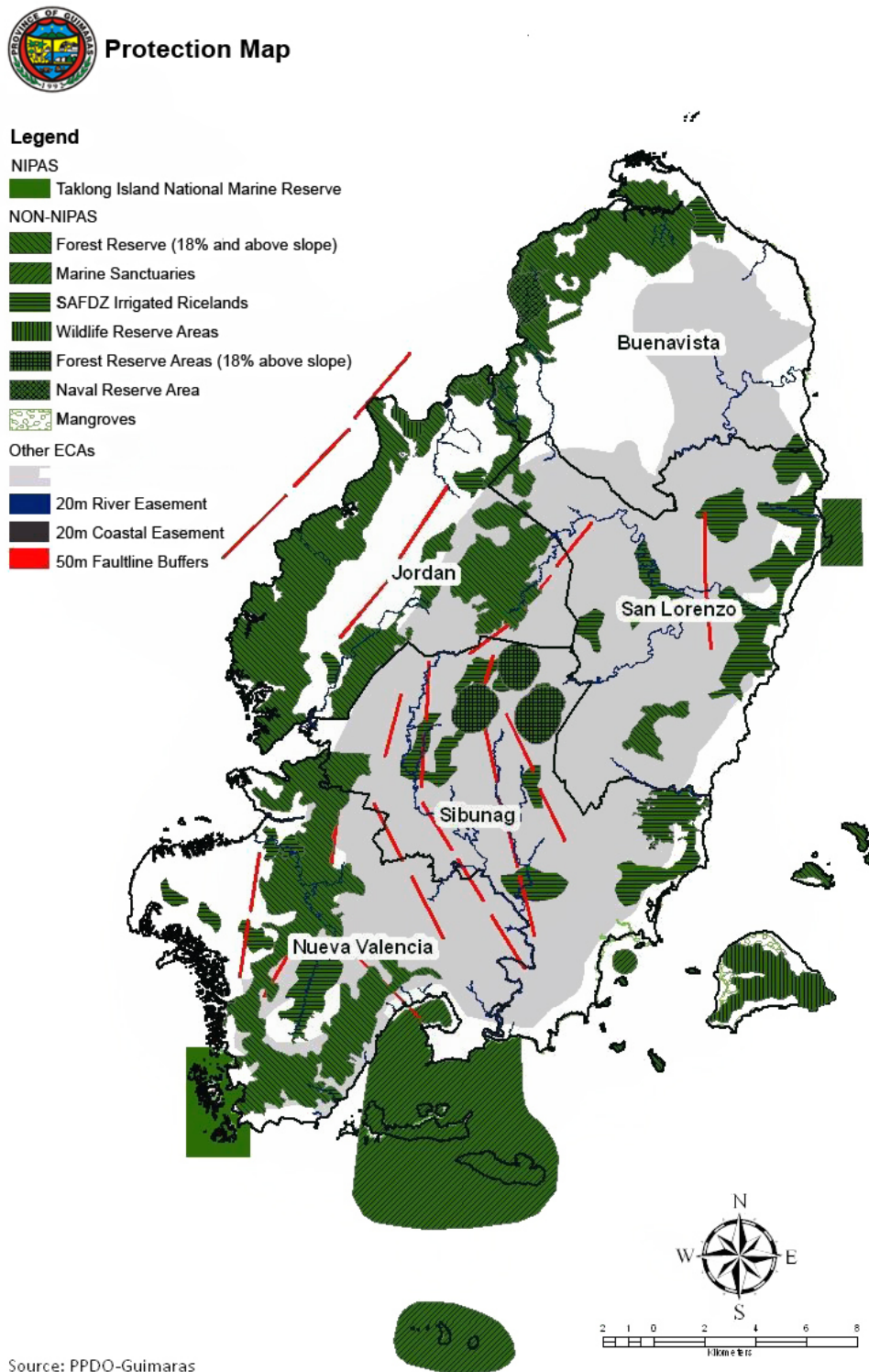
#### Results

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There are five declared marine protected areas (MPAs) in Guimaras, located in Jordan, Nueva Valencia and San Lorenzo, covering a total area of 2,484.586 ha. The Taklong Island National Marine Reserve located in Brigs. La Paz and San Roque in Nueva Valencia was established through Presidential Proclamation No. 525 (1990). Also in Nueva Valencia, Toyo Reef and Igang Bay Marine Sanctuary were established through Ordinances No. 03 (1994) and No. 5 (2009), respectively. Tumulintinan Point in San Lorenzo was established as a fish sanctuary through Ordinance No. 99-005 (1999).

The management effectiveness of the implementation of the MPAs in the Province is rated at 60 percent (PCLUP) which signifies that there are some management aspects that are not efficiently implemented due to some problems. The most common problems encountered are unsustainable human practices, weak law enforcement, and less efficient monitoring and evaluation mechanism. A marine turtle sanctuary located in Lawi, Jordan, under Municipal Ordinance No. 97 (2006) was also established in the province for the conservation of marine turtles. **Figure 14** shows the location of protected areas in Guimaras.

Figure 14. Protected areas in Guimaras Province.



Source: PPDO-Guimaras

Habitat Protection, Restoration and Management  
Protected areas for coastal habitats and heritage



The Guisi Lighthouse located in Guisi, Dolores in Nueva Valencia was declared as a coastal heritage through House Bill 3962.





Signage put up by the municipal government of Jordan on their marine protected area.

### Implications and Recommendations

The local government should promote and support the establishment of MPAs within the broader framework of the ICM program since impacts of activities beyond the boundaries of the MPAs may be present. The management effectiveness and sustainability of MPAs can be influenced by the active participation of the community and other

stakeholders. This can be facilitated by informing them of the objectives and benefits of effectively-managed MPAs. This will promote better understanding why certain areas need to be protected and will enhance their interest and commitment to participate in the monitoring and guarding of the MPAs against the occurrence of illegal and destructive activities.

### References

Provincial Comprehensive Land Use Plan (2005-2035).



### 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

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

##### Results

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The coastal municipalities of Jordan, Buenavista and Sibunag identified port expansion as one of the main reasons for the reclamation activities in the area. The reclamation projects in Jordan and Buenavista for port and wharf expansion cover 1,800 m<sup>2</sup> and 5,700 m<sup>2</sup>, respectively.

In the Municipality of Sibunag, Sebaste Wharf which covers an area of 3,953 m<sup>2</sup> was improved and developed by the Philippine Ports Authority. The reclamation activity identified in Nueva Valencia for the construction of the fish landing site in Cabalagnan, on the other hand, covers an area of 2,400 m<sup>2</sup>.





Jordan Wharf.

### Implications and Recommendations

The expansion of ports and wharves supports the economic development of the province by improving access and facilitating faster economic trade. The balance between economic development and environmental sustainability, however, should always be taken into consideration. Conversion and reclamation activities have varying degrees of ecological impacts on the environment. A careful assessment of the economic contribution and ecological impact should be considered in relation to future development activities.

There are some areas in the Province which showed evidence of coastal erosion. Although it still needs to be validated whether this is due to human activities, coastal developments or natural causes, this should be considered for any future coastal developments. An ongoing study in collaboration with UP MSI is being conducted to determine the extent of coastal erosion in the province.

### References

Construction of Cabalagnan Wharf Phase 1, National Calamity Fund Cash for Work (2007-2008).  
Guimaras-Iloilo Ferry Terminal System (GIFTS) Project, Jordan.  
Sibunag Port Improvement Project, Philippine Ports Authority (PPA).



### Water use, 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

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

### Results

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The province has currently no water conservation and management plan. Several programs, however, are being implemented. **Table 23** shows some of the management

programs being implemented at the provincial and municipal level, including budget allocations.



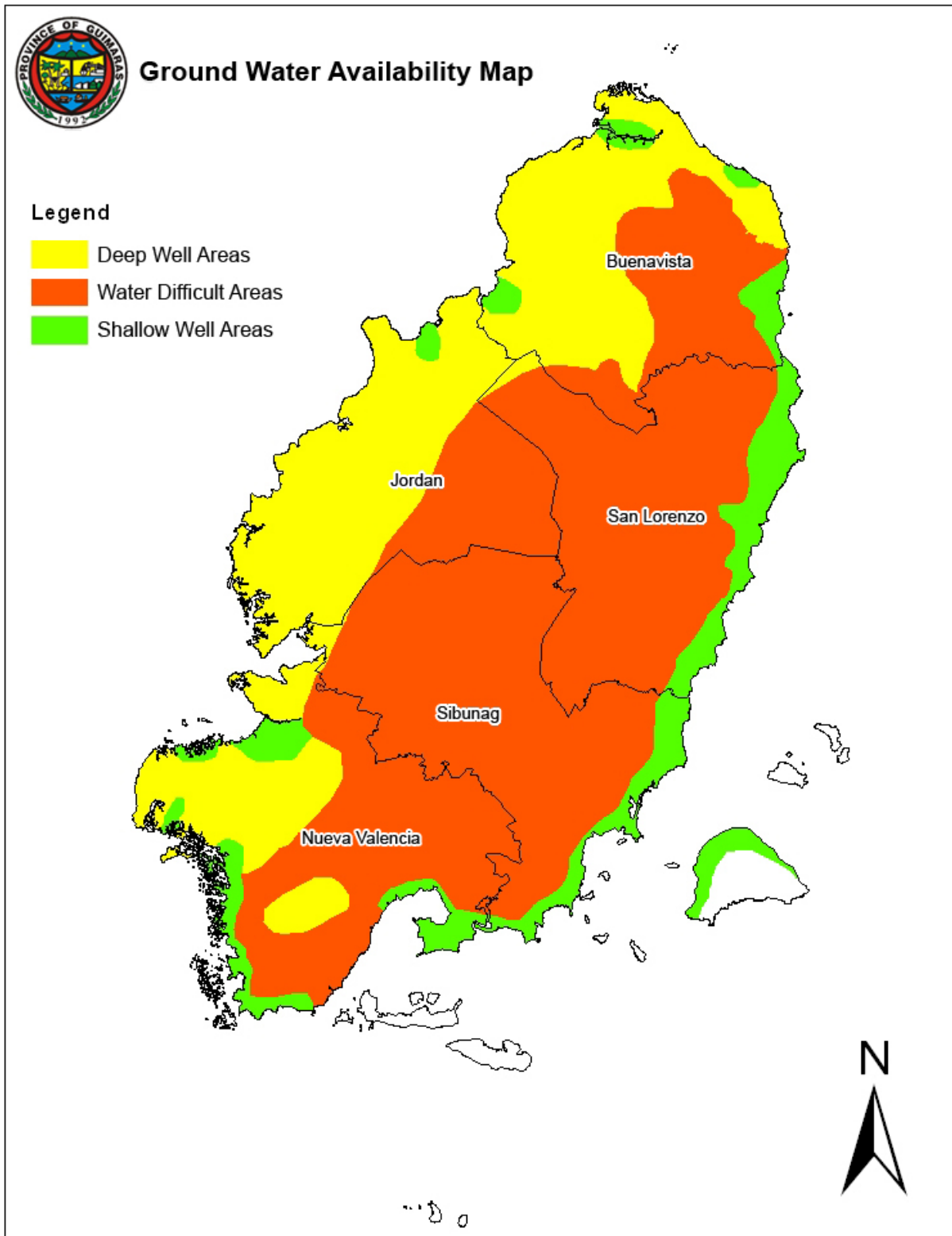
Provincial Tree Nursery Park.

Table 23. Watershed conservation programs.

Municipality	Watershed Conservation Programs	Budget Allocation (PhP)
Buenavista	<ul style="list-style-type: none"> <li>Maintenance of municipal nursery and tree planting</li> <li>Maintenance of small water farm reservoir</li> </ul>	2008 – PhP 50,000
		2009 – PhP 100,000
Jordan	<ul style="list-style-type: none"> <li>Development of watershed areas</li> </ul>	2009 – PhP 10,000
Nueva Valencia	<ul style="list-style-type: none"> <li>Establishment of municipal seed bank</li> <li>Forest and fruit trees planting program</li> <li>Forest trees planting on areas with springs and wells</li> </ul>	2008 – PhP 100,000
		2009 – PhP 150,000
Sibunag	<ul style="list-style-type: none"> <li>Tree planting and watershed reforestation</li> <li>Seedling Production in Support of Agro-forestry Projects of the Barangay</li> </ul>	2003 – PhP 100,000
		2005 – PhP 50,000
		2006 – PhP 40,000
		2007 – PhP 20,000
		2008 – PhP 70,000
		2009 – PhP 20,000
Province	<ul style="list-style-type: none"> <li>Sibunag Watershed Characterization</li> <li><i>Kasadyahan sa Kabukiran</i> (treeplanting)</li> <li>Provincial Tree Nursery</li> </ul>	2009 – PhP 463, 000
		2006-2009: PhP 50,000/yr
		2008 – present



Figure 15. Groundwater availability map.







## Implications and Recommendations

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It is important that a strategic plan is developed for the long-term management of the freshwater resources of the province. The groundwater availability map (**Figure 15**) indicates that a significant portion of the province may experience difficulty in accessing freshwater resources. This must be addressed in the development of a water

conservation and management strategy. An ongoing study is jointly being undertaken by the Provincial Government and UPIESM to assess the carrying capacity of the watersheds and to identify measures for the long-term sustainability of the water resources in the province.

## References

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- Buenavista Annual Development Plan (2008 and 2009).
- GENRO Annual Accomplishment Report (2006-2009).
- Jordan Approved Project Proposals
- Nueva Valencia, OMAS Year End Accomplishment Report (2008-2009).
- OMA Sibunag Annual Reports (2003, 2005-2009).
- PENRO-DENR Sibunag Watershed Characterization Project, 2009.
- Province of Guimaras G.O. ICT-GIS Section.

### Water use, supply management

#### 023 Access to improved water source

##### Description

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

##### Rationale

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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

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- Households with access to improved water sources
- Volume produced from piped water sources
- Water pricing per cubic meter

##### Results

---

Access to improved water source in the province has significantly increased since 2005 up to the present. In 2005, about 83.23 percent of the population had access to freshwater sources. In Sibunag, only 59.25 percent of the households had access to safe drinking water.

In 2007, the Provincial Health Office Report showed that among the 32,621 households provincewide, 29,193 (89.49 percent) had access to drinking water, of which 18.3 percent were served by Level III system/facilities, which are served by Local Water Utilities Administration (LWUA) mostly in the

urban areas, 4.67 percent by Level II (a communal faucet system/facilities) and 66.52 percent by Level I or point sources. Nueva Valencia had the highest (99.69 percent) while Sibunag has the lowest (71 percent) proportion of households with access to safe drinking water. This means that 3,248 households, or 10.51 percent, still have no access to safe water and these are mostly located in remote rural areas (PDPFP 2008-2013).

The proportion of population with access to improved water sources in 2009 is given in **Table 24**.



**Table 24. Access to improved water source (2009).**

Year	Safe Sources						Unsafe Sources	No Access
	Level I		Level II		Level III			
	Percentage	No. of households served (PPDO, 2009)	Percentage	No. of households served (PPDO, 2009)	Percentage	No. of households served (PPDO, 2009)		
<b>Guimaras Province</b>	69.42	24,427	4.09	1,439	17.85	6,280	8.64	-
<b>Buenavista</b>	58.46		2.68		37.37		1.49	-
<b>Jordan</b>	66.95		10.70		14.97		7.38	-
<b>Nueva Valencia</b>	80.98		2.82		16.11		0.09	-
<b>San Lorenzo</b>	75.67		0.62		5.93		18.90	-
<b>Sibunag</b>	71.33		3.11		1.13		24.43	-

Source: PHO Guimaras, 2009.

**Table 25** reflects the number of Level III water systems in the province, including the number of barangays served as compared to the total number of barangays in the municipal LGUs.

The municipalities of Buenavista and Jordan both have one water district each, producing 558,265 m<sup>3</sup> and 100,000 m<sup>3</sup> of

water per year, respectively. The water district of Buenavista served 12,036 people in nine barangays (27 percent of its population) while the water district in Jordan supplied water to 3,000 people in three barangays (9 percent of its population) (PHO, Guimaras, 2009). In Sibunag, 290 people in 2 barangays (1.6 percent of its population) were served by Level III sources (Alegria and Ravina).

**Table 25. Number of Level III water system in Guimaras (2009).**

Municipality	No. of water system (Level III) (2009, PHO Guimaras)	Total No. of Barangays	No. of Barangays served			No. of households served
			Urban	Rural	Total	
<b>Buenavista</b>	15	36	4	13	17	9,831
<b>Jordan</b>	4	14	2	3	5	3,878
<b>Nueva Valencia</b>	5	22	1	7	8	4,735
<b>San Lorenzo</b>	4	14		1	1	311
<b>Sibunag</b>	1	14		2	2	106
<b>Provincial Total</b>	29	100	7	26	33	18,861

## Implications and Recommendations

The province has significantly progressed in increasing the proportion of households with access to improved water sources since 2005. However, 10 percent of the households in the province still use unsafe water sources. Considering also the results of the post-oil spill studies conducted on

heavy metal contamination in drinking water, monitoring studies on the potability and safeness of drinking water sources should be continued. The province should also continue its management efforts to provide safe and clean water to the whole population.

## References

Environmental Sanitation Service Report 2009.  
 Provincial Development and Physical Framework Plan (2008-2013).  
 Provincial Health Office. Province of Guimaras. 2009.



### Water use, 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

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

##### Results

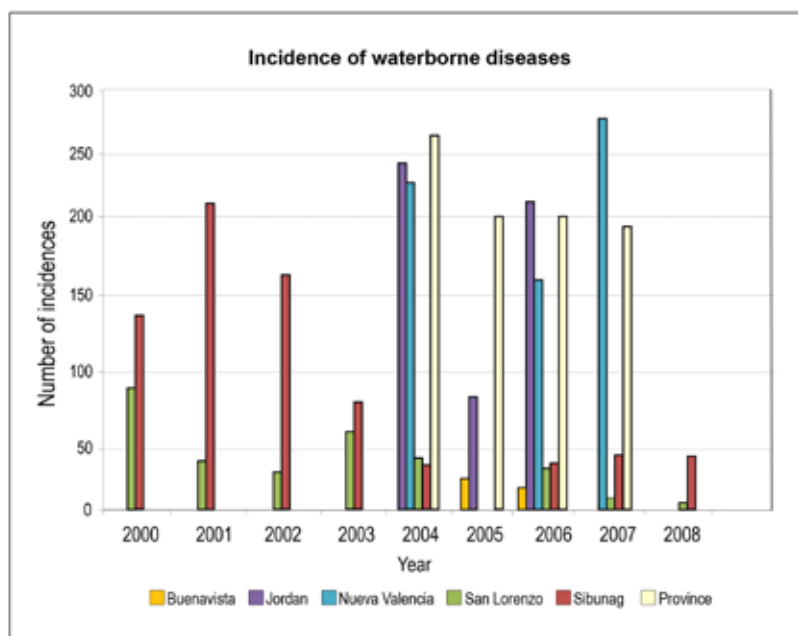
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A decline in the incidence of waterborne diseases was recorded in the municipalities of Buenavista, San Lorenzo and Sibunag from 2000-2008 (**Figure 16**). In San Lorenzo, the number of incidences in 2008 was 93 percent lower than what was recorded in 2000. In Sibunag, a 69 percent decline was reported in the number of incidences in 2008 as compared to records in 2000, while a 29 percent decline was observed

in Buenavista for the years 2005 and 2006. Data from the Provincial Health Office (reflected here as province data) also showed a decline in the number of incidences.

The recorded incidence of waterborne diseases in Jordan and Nueva Valencia, however, showed no clear trends for the period covered.

Figure 16. Incidence of waterborne diseases.



\*\*Number of incidences of waterborne diseases account for the total incidence of diarrhea and parasitism. Province data accounts for those admitted in the Provincial Health Office but were not disaggregated at the municipal level.

## Implications and Recommendations

Despite the general decline in the number of waterborne diseases recorded in some areas of the province, other areas still recorded an increasing number of incidences. The PDPFP (2008-2013) also identified the frequent outbreak of waterborne diseases (e.g., diarrhea) as one of the leading causes of morbidity. Additional investments in infrastructure, and public education and awareness are necessary to substantially reduce, if not totally eliminate these diseases.

Some program initiatives that can be considered include:  
(a) an education and awareness program for food handlers,

new mothers and school children; (b) strengthening the enforcement of local laws concerning garbage handling and disposal, disposal of domestic sewage, and 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.

## References

Five Municipal Health Offices, Rural Health Units Reports on Morbidity and Mortality Rate.  
Provincial Development and Physical Framework Plan (2008-2013).



### 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

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

##### Results

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Fishery management programs and activities are integrated into the annual work plans of the Municipal Agriculture Offices (MAOs). The Bureau of Fisheries and Aquatic Resources (BFAR) Region IV is also implementing fishery management

activities in coordination with the municipal LGUs. Some of the fishery management programs being undertaken in the province are given in **Table 26**.



Capacity development of FARMCs on marine sanctuary establishment and management.

There are 21 staff and about 3 to 11 staff assigned for fishery management at the province and municipalities, respectively (**Table 27**). In 2009, the province has allocated about

PhP 1.45M while municipal annual budget allocations ranged from PhP 150,000 to PhP 850,000 for fishery management programs.



**Table 26. Fishery management programs being implemented in the Province**

Municipality	Fishery management programs
Sibunag	<ul style="list-style-type: none"> <li>• Establishment of fish sanctuary, capacity building for coastal law enforcement, activation of FARMC, and fish catch monitoring               <ol style="list-style-type: none"> <li>1. Three thousand (3,000) sexually matured abalone were dispersed for Abalone Stock Enhancement Project at the Proposed Sibunag Fish Sanctuary (<i>Pamankulan Area</i>).</li> <li>2. Assistance and support to Sibunag Fish Sanctuary Establishment</li> </ol>               Source: FRMD, BFAR6             </li> </ul>
Jordan	<ul style="list-style-type: none"> <li>• Establishment of fish sanctuary, strengthening of <i>Bantay Dagat</i>, organization of BFARMC (PhP 210,000) (CLUP); 2007: PhP 110,000 (Proposed projects for 20 percent IRA)               <ol style="list-style-type: none"> <li>1. Abalone juvenile stock enhancement (8,000 pcs) in Ave Maria, Lawi.</li> <li>2. <i>Hito</i> and <i>Tilapia</i> fingerlings distributed to 18 beneficiaries</li> <li>3. Milkfish fingerlings, distributed to four beneficiaries</li> <li>4. Strengthening of Municipal Marine Reserve Management Board (MMRMB)</li> <li>5. Monitoring of transients and illegal fishers</li> <li>6. Fish catch monitoring</li> <li>7. Mangrove monitoring and reforestation</li> </ol>               Source: MPDO, Jordan             </li> <li>• Provision of marker buoys to Jordan Marine Turtle Sanctuary</li> <li>• Deployment of 100 units of box-type artificial reef</li> </ul> Source: FRMD, BFAR6
Buenavista	<ul style="list-style-type: none"> <li>• Coastal Resource Management               <ol style="list-style-type: none"> <li>1. <i>Bantay Dagat</i> Program (PhP 200,000)</li> <li>2. Mangrove reforestation (PhP 150,000)</li> <li>3. Establishment of marine reserve/sanctuary</li> </ol> </li> <li>• Inland Fishing Development Project               <ol style="list-style-type: none"> <li>1. Creek Impounding (PhP 500,000)</li> <li>2. Procurement of fingerlings (PhP 50,000)</li> </ol> </li> <li>• Establishment of marine reserve, installation of artificial reef, mangrove reforestation, strengthening of <i>Bantay Dagat</i>, IECs, and strengthening FARMCs.</li> </ul> Source: MAO
Nueva Valencia	<ul style="list-style-type: none"> <li>• Establishment of fish sanctuary and marine sanctuary</li> <li>• Operationalization of Fisheries and Aquatic Resources Management Section (to include <i>Bantay Dagat</i> Operation) (Approved budget for 2009 – PhP 750,000; budget for 2010 – PhP 900,000)</li> <li>• Conducted Training/Orientation for the rehabilitation of fish sanctuary (2009)</li> <li>• Strengthening of MFARMC (2009 – PhP 150,000)</li> <li>• Conduct of CRM planning workshops</li> <li>• Deputization of fish wardens</li> <li>• Establishment of coral garden (Brgy. Dolores – 100 units box-type concrete artificial reefs) 2008</li> <li>• Mangrove reforestation</li> <li>• Rehabilitation of habitat of threatened species (Tabon Bird, Wild Duck, etc.)</li> </ul> Project duration – three years, 2009-2011 Budget: PhP 495,000 20,689 endemic species of fruit and forest trees to be planted.
San Lorenzo	<ul style="list-style-type: none"> <li>• PhP 10,000 annual allocation for agri-fishery management</li> </ul>



Table 27. Staff and annual budget allocation for fishery management programs in Guimaras.

Fishery Management	Number of Staff Allocated	Budget Allocation
Province	21	Php 1,451,800 (2009)
Jordan	3	Php 330,000
Buenavista	2	PhP 800,000 (2009) PhP 150,000 (2008)
Nueva Valencia	11	PhP 850,000 (2007-2009)
Sibunag	7	PhP 235,000
San Lorenzo	7	PhP 535,000 (2009)

### Implications and Recommendations

A successful fishery management plan and its implementation must adopt a multisector approach. Such programs must have sufficient support from the national and local governments and its partners, and a strong level of acceptance among the resource-dependent communities.

A province-wide resource management plan and unified fishery ordinance can be developed and implemented to ensure consistency in the provisions and goals of the plans and the supporting ordinances across the municipalities.

### References

FRMD, BFAR 6.  
 MPDO Jordan 2009 Annual Report.  
 MAO Buenavista Annual (2008-2009).  
 MPDO San Lorenzo (2009).  
 OMAS Nueva Valencia Annual Report (2008-2009).  
 OMA Sibunag.  
 Provincial Task Force and Governor's Office (2009).



### Food security and livelihood management

## 026 Fisheries Production

### Description

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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

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

### Data Requirements

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

### Results

---

Fishing is one of the major sources of livelihood in the province. From the 1998 report of Babaran and Ingles, there were about 3,667 fishers in Guimaras, 45 percent of which were recorded in Nueva Valencia (**Table 28**). The fisheries survey conducted by UPV and UPIESM showed that the

number of fishers in the province tripled in 2009 compared to the baseline data in 1998. It is difficult to discern, however, whether the increase in number of fishers indicates greater dependence in fishery resources or it simply means that many of the fishers in 1998 were not registered.

In 1998, fisheries production in the province was about 4,446 MT with the largest amount of production recorded in Nueva Valencia. However, recent data on provincial fishery production was not available hence the current status of fishery resources in the province cannot be determined. Although individual municipal fishery production was reported by the municipalities, data were scattered in different years and limited for some municipalities, hence provincial

aggregate data cannot be determined (**Table 28**). Fisheries production is limited to municipal fishing. No commercial fishing was reported in the province.

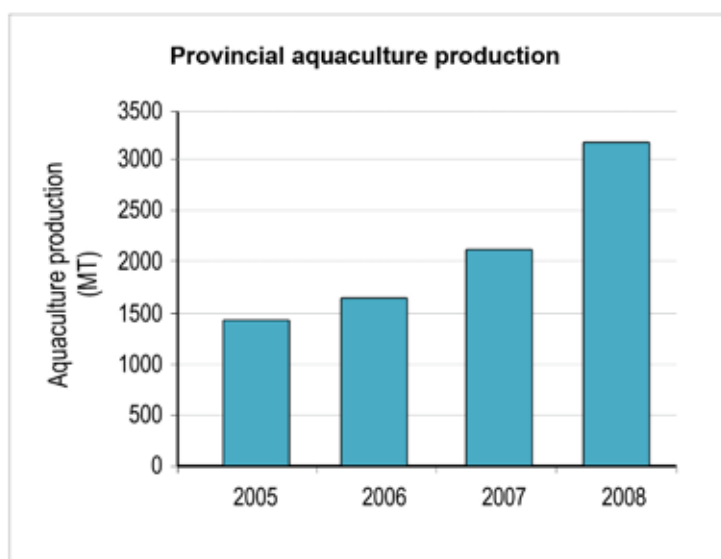
An increasing aquaculture production was recorded in the province since 2005 (**Figure 17**). Aquaculture production recorded in 2008 was twice the production recorded in 2005.

**Table 28. Fisheries data in Guimaras (1998).**

	Guimaras		Buenavista		Jordan		Nueva Valencia		San Lorenzo		Sibunag	
	1998	2009	1998	2009	1998	2009	1998	2009	1998	2009	1998	2009
<b>No. of fishers</b>	3,667	10,481	528	1,370	700	800	1,640	6,177	389	613	410	1,521
<b>Non-motorized fishing craft</b>	797	1,289	249	332	142	350	160	440	56	112	190	55
<b>Motorized fishing craft</b>	805	1,405	57	249	218	260	280	503	170	239	80	154
<b>Total fishing crafts</b>	1,602	2,694	306	581	360	610	440	943	226	351	270	209
<b>Production (MT)</b>	4,446	No data available	200	No data available	450	No data available	3,655	No data available	40	No data available	101	No data available



**Figure 17. Aquaculture production in Guimaras Province (2005-2008).**



The municipalities of Nueva Valencia, San Lorenzo and Sibunag reported seaweed production as another source for livelihood in their areas. From available data, the three

municipalities have produced a total of 302 MT of fresh seaweed and 175 MT of dried seaweed since 2000 (Table 29).

**Table 29. Fishery production data in Guimaras.**

	Year	Municipal fishery production (MT)	Seaweed production (fresh) (MT)	Seaweed production (dried) (MT)
<b>Buenavista</b>		No Data		
<b>Jordan</b>		2008 – 62.41 MT 2009 – 46.81 MT		
<b>Nueva Valencia</b>	2000 2008 2009	1,984.67	78.6 28.8	19 13.6
<b>San Lorenzo</b>	2001 2003 2004 2005 2006 2007 2008 2009	213.76 201.96  40	15 30 70 23 6 5.5 25	4.3 10
<b>Sibunag</b>	2008 2009	12.74	10.46 9.20	60.95 67.18



**Milkfish cage culture is one of the activities under the Alternative Livelihood Program.**

### Implications and Recommendations

Despite the insufficient data to determine the current status of fisheries resources in the province, the available data are still useful as baseline information upon which changes over time can be compared. It is therefore important that data and information be collected regularly and these should be systematically stored and updated.

Local ordinances related to fishery have also been legislated in the municipalities. Enforcement of these laws is key for the protection and management of the fishery resources.

### References

- Aragonez, L. Assessment of the Municipal Fisheries in Guimaras (2008-2009).  
 BFAR 6 Provincial Aquaculture Production (2005-2008).  
 Babaran, R. and Ingles, J. January 1998. "Managing the Fisheries Resources of Guimaras Province".  
 Jordan MPDO Report (2008-2009).  
 Raw Data of NSAP-BFAR Region 6 – Sibunag.  
 Reports of POAS and GFARMC 2003.  
 San Lorenzo MAO. 2001-2009 Annual Reports.



### Food security and livelihood management

#### 027 Malnutrition rate

##### Description

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This indicator measures the proportion of 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

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- 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

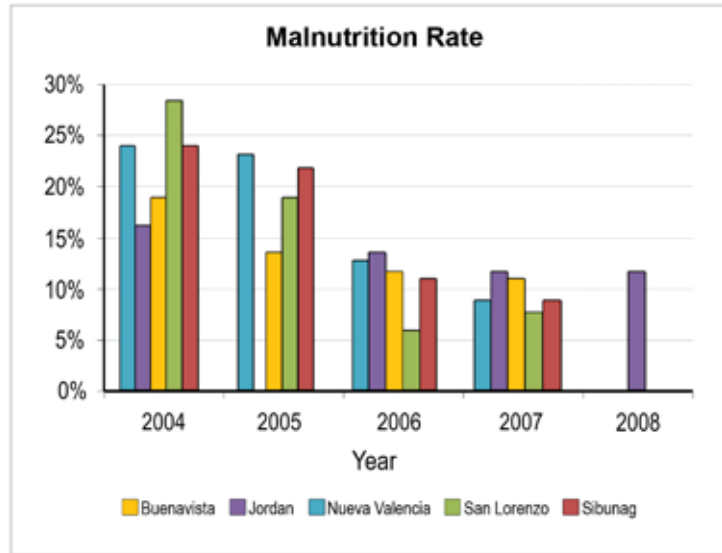
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There has been a decreasing trend in the proportion of children under six years old who are malnourished since 2005. In 2005, San Lorenzo had the highest malnutrition rate (about 27 percent) but declined significantly to less than 10

percent in 2007 (**Figure 18**). Similarly, the other municipalities have progressed in decreasing the proportion of undernourished children in their area.



Figure 18. Malnutrition rate in Guimaras (2004-2008).



The Provincial Government undertakes a Supplemental Feeding Program and has significantly reduced malnutrition rates for children under six years old.

### Implications and Recommendations

The local government has significantly reduced the rate of malnutrition for children under six years old. This can be largely attributed to the various programs, projects and activities that have been implemented by the LGUs and

actively supported by the communities. Such programs have encouraged the communities to improve their family health practices and lifestyles.

### References

PHO-Guimaras, Operation "Timbang" Baseline, Prevalence of underweight children (0-71 months) by Municipality Comparative Data. Provincial Comprehensive Land Use Plan (2005-2035).



### Food security and livelihood management

## 028 Poverty, education and employment

### Description

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

### Rationale

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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

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- Poverty threshold
- Poverty incidence
- Income per capita (male/female)
- Total employment (male/female)
- Education; proportion of population (male/female; primary/secondary/tertiary)
- Budget allocation for livelihood programs

### Results

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Since 1990, Guimaras has had a high literacy rate (94.97 percent), of which there were more female literates than males.

On average, Jordan (94.4 percent) has the highest net enrollment in elementary education while Buenavista

(86.6 percent) has the highest proportion of students completing Grades 1 to 5 (primary completion rate). About 6 to 15 percent of children in the province were not able to enroll in primary schools (**Figure 19**).

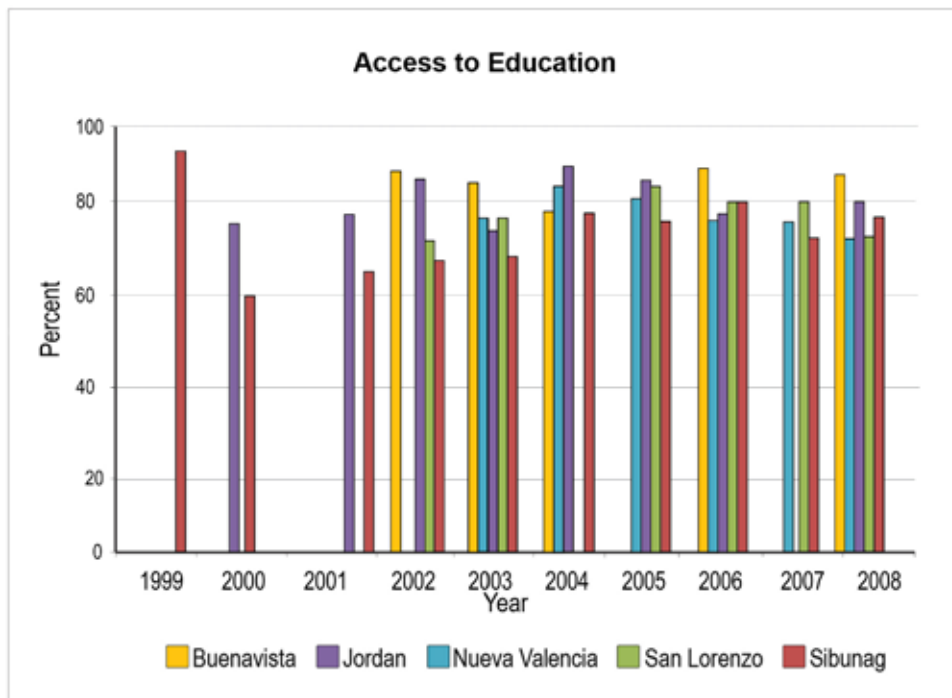


Figure 19. Proportion of population with access to primary schools.

Buenavista and Nueva Valencia reported 37 percent and 40 percent poverty incidence in 2005, respectively. There were no data gathered on poverty incidence rates in other municipalities.

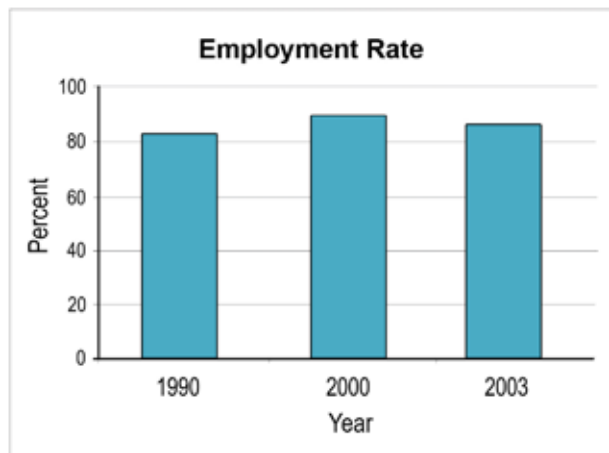


Figure 20. Provincial employment rate.

The employment rate in Guimaras increased from 1990 to 2000. However, it decreased by 1.5 percent from 2000 to 2003. The provincial employment rate of 92.30 percent in

2000 was higher compared to regional (Region 6 at 89 percent) and national (Philippines at 90 percent) rates (Figure 20).





**Manggahan Festival every April is also a one-stop shop and job fair.**



Tourism is a growing industry in the province. The visitor arrivals showed an increasing trend from 2000 until 2005 with an average annual growth rate of 25 percent. However, with the oil spill incident in 2006, visitor arrivals decreased by 7.3 percent in the succeeding two years.

The 2005-2007 visitor arrivals totaling 511,323 contributed an annual average of PhP 170 million tourist receipts to the provincial economy (**Figure 21**).

Figure 21. Number of tourist arrivals (1993-2009) and revenue from tourism (2000-2009).



### Implications and Recommendations

Socioeconomic monitoring (e.g., poverty rates, access to education, employment rates, etc.) provides government planners, policymakers and local leaders with data and information on which to base their social and economic development plans and programs. The information can also

be used to guide the implementation as well as continuing assessment of the effectiveness of policies and programs, so that timely action can be taken to address the weaknesses/problems detected.

### Reference

Provincial Comprehensive Land Use Plan (2005-2035).

### Food security and livelihood management

#### 029 Livelihood programs

##### Description

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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

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

##### Results

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**Table 30** provides the various livelihood programs of the five municipalities including those being implemented by relevant provincial agencies. Staff allocation for livelihood management ranges from 3 to 7 staff for the municipalities and 7 to 11 staff for the province. The level of financial

allocation varies annually for each of the municipalities, including the types of livelihood programs being implemented. The beneficiaries of the livelihood programs include women, fishers, farmers and other organized groups and heads of families.



Table 30. Livelihood management programs in Guimaras.

Municipality	Staff allocation	Budget allocation (PhP)	Livelihood programs	Beneficiaries
Nueva Valencia	3 (includes Agriculture Technician)	5,364,500 (2006; oil spill incident)	Fishing, farming, managing <i>sari-sari</i> store, buy and sell, food vending, dressmaking	2007: 38 POs under Self Employment Assistance Kaunlaran (SEA-K) Heads of families, women
Jordan	5 Agriculturist 1 MSWDO	2.5 M (1998-2008) 300,000 (2000) 6M (2006)	Alternative livelihood Establish seaweed farming	Fishers Lawi Under SEA-K; fishers, women
Sibunag	7 Staff	200,000 (2008) 2.5M (2009) 30,000 (2009) 72,000 (2009)	Seaweed farming Seaweed farming Abalone culture Fish cage culture	Fishers, farmers and organized groups
San Lorenzo	5 (OMAS staff) (MAO)	30,000 (1999) 250,000 (2002) 60,000 (2003) 100,000 (2004) 200,000 (2008) 560,000 (2009) 440,000 (2010) (MPDO)	Seaweed farming, fishing, salt production, sweet potato production, livestock production Food sufficiency, organic fertilizer assistance, fishing	Farmers, fishers group, livestock raisers Organized groups, Fisher folks
Buenavista	4	505,000	Inland fishing development project Goat raising and swine fattening	PO/Organized group
<b>Province:</b> <b>1. PSWDO</b>		381,675 (2008)	Early Childhood Care and Development (ECCD) - Poultry raising	Parents of malnourished children of five (5) municipalities
<b>2. PEDO</b> <b>Source: Trade and Investment Sec. PEDO</b>	7	296,516 (2010) 600,000 (2003) 250,000 (2004)	- Meat processing and polvoron-making <i>cum</i> production - Rehabilitation of oil mill - Salt production and marketing	70 families of Five (5) municipalities Guimaras Small Coconut Farmers MPC M. Chavez Himakas Farmers and Fisherfolks Association
<b>3. POAS</b> <b>Source: Trade and Investment Sec. PEDO</b>	11	100,000 (2004) 150,000 (2004) 1,509,000 (2000) 1,776,000 (2001) 1,803,000 (2002) 5,073,000 (2008) 7,864,500 (2008) 4,736,125 (2008) 200,000 (2004) 298,000 (2005) 259,714 (2005) 165,000 (2005) 60,000 (2006) 1,000,000 (2006)	- Poultry and livestock supply trading - Rehabilitation of water services at Magamay, Pandaraonan, and Sto. Domingo - Livelihood program for Guimaras Agri-Environmental Productivity Initiative (GAEPI) and Jordan Association of Persons With Disability Vegetable production Goat production Swine fattening Anthurium-growing project Capture fisheries project Non-conventional salt production Swine breeding project Native chicken production Goat raising project	Nueva Valencia Poultry and Livestock Raisers Association Magamay Water Works Association. Igdarapdap Multi-Purpose Coop., Sebaste MPC, Guiwanon MPC, Sapal MPC, Espinosa MPC, Jordan APWD Oil spill-affected fishers and farmers of Guimaras PO/Organized group





**The Agri-fishery Development Program includes a Swine Breeding Project.**

The post-oil spill rehabilitation program also implemented livelihood programs to provide assistance to families affected by the oil spill. **Table 31** shows the types of livelihood programs that benefited about 4,040 people in the five municipalities.

The Department of Social Welfare and Development (DSWD) through the SEA-K project has also provided assistance for livelihood programs amounting to PHP 9,172,000, distributed in the five municipalities.

Table 31. Livelihood programs implemented under the Oil Spill Rehabilitation Program.

Municipality	POAS Livelihood Program			DSWD Fund provided to the municipalities for SEA-K Projects (PHP)
	No. of Beneficiaries for Swine Fattening	No. of Beneficiaries for Goat Raising	No. of Beneficiaries for Vegetable Production	
Buenavista	120	360	400	690,000
Jordan	120	120	400	367,500
Nueva Valencia	170	170	600	5,364,500
San Lorenzo	120	120	400	1,316,000
Sibunag	170	170	600	1,434,000
<b>Total</b>	<b>700</b>	<b>940</b>	<b>2,400</b>	<b>9,172,000</b>

### Implications and Recommendations

Several livelihood programs are already being initiated and implemented in the province, which benefited different sectors including communities. However, the sustainability as

well as the effectiveness of these livelihood programs should be reviewed and considered in future planning.

### References

Jordan MSWDO, Listings of SEA-K Projects (2007-2009).  
 MSWDO, Buenavista Approved Project Proposals, SEA-K Projects (2008-2009).  
 MSWDO, Nueva Valencia SEA-K Projects.  
 MSWDO, San Lorenzo SEA-K Project.  
 MSWDO Self Employment Assistance Kaunlaran Project (SEA-K).



## Pollution reduction and waste management

### 030 Management plans

#### Description

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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

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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

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- Availability of 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

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A water quality monitoring program in the province, in collaboration with the DENR-EMB Region VI and the GENRO, has been in place since 2003. An annual safety, health and environment monitoring is also being conducted by a multi-partite monitoring team (MGB and DENR) to monitor the compliance of small-scale mining permit holders particularly their discharges into the environment. Likewise, environmentally critical projects (ECP) or projects operating within environmental critical areas (ECA) are required to secure Environmental Compliance Certificate (ECC) in compliance to Presidential Decree (PD) 1586 of 1978, Establishing an Environmental Impact Statement System.

For solid waste management, all four municipalities have developed their 10-year Solid Waste Management Plans and have been approved by their respective Municipal Development Councils (SB) except for the municipality of San Lorenzo. The municipalities of Buenavista, Jordan and Nueva Valencia also have their functional Solid Waste Management Boards (PDPFP, 2008-2013). With support from the GTZ, a materials recovery facility (MRF) was established in Buenavista.

The annual allocation for pollution management in each of the municipalities and at the provincial level is given in

**Table 32.** The focus of pollution management programs in the municipalities is solid waste management.

**Table 32. Staff and budget allocation for pollution management.**

	Staff Allocation**	Budget Allocation (PhP)
<b>Guimaras Province</b>	13	2008: PhP 500,000 2009: PhP 900,000 Solid waste management 2006: PhP 225,500 2007: PhP 225,500 2008: PhP 225,500 2009: PhP 225,500
<b>Buenavista</b>	23	2005: PhP 100,000 2006: PhP 75,000 2007: PhP 150,000 2008: PhP 363,000 2009: PhP 370,000 (Garbage collection, maintenance of composting facility, training)
<b>Jordan</b>	12	1999: PhP 300,000 2000: PhP 300,000 2003: PhP 750,000 2004: PhP 200,000 2005: PhP 196,750 2007: PhP 550,000 2008: PhP 620,000 2009: PhP 580,000
<b>Nueva Valencia</b>	4	2008: PhP 240,000 2009: PhP 150,000 (Solid waste management)
<b>San Lorenzo</b>	31	2003: PhP 120,000 2004: PhP 100,000 2005: PhP 80,000 2007: PhP 80,000 2008: PhP 160,000 2009: PhP 305,425
<b>Sibunag</b>	5	2006: PhP 140,000 2007: PhP 160,000 2008: PhP 200,000 2009: PhP 200,000 (Solid waste management)

\*\*Includes technical and support staff for waste management.

## Implications and Recommendations

The province has allocated financial and human resources to implement pollution management programs particularly on solid waste. It is, however, important that a comprehensive management plan is developed to guide the local governments in managing both land- and sea-based sources of pollution. In the course of developing the plan,

available scientific information should be utilized in identifying appropriate management strategies and interventions. Relevant stakeholders must be involved throughout the planning and implementation phases to promote participation in the implementation of the plan as well as in ensuring that their concerns are properly addressed.

## References

GENRO Annual Accomplishment Reports (2006-2009).  
Municipal Agriculture Office. Buenavista.  
Municipal Planning and Development Office. Nueva Valencia.  
Municipality of San Lorenzo, 20 percent MDF for 2003-2005 and 2007-2009 Environment Sector.  
Sibunag Annual Development Plan.

Pollution reduction 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

- Changes (temporal/spatial) in water transparency (secchi depth/total suspended solids) (marine/river/beach)
- Changes (temporal/spatial) in dissolved oxygen (DO) concentrations (marine/river/beach)
- Changes (temporal/spatial) in total/fecal coliform counts (marine/river/beach)

Secondary parameters

- Changes (temporal/spatial) in chlorophyll concentrations (marine/river/beach)
- Changes (temporal/spatial) in nutrient (nitrates, phosphates) concentrations (marine/river/beach)
- Changes (temporal/spatial) in biochemical oxygen demand (BOD) concentrations (marine/river/beach)
- Groundwater quality (nitrates and heavy metals)

Results

Water quality monitoring in the Guimaras and Iloilo Straits was initiated in 2003 in collaboration with DENR-EMB Region VI. Pursuant to DENR Administrative Order (DAO) No. 34, Series of 1990 (**Annex 3**). In accordance with the Manual of Procedure for Water Classification, the water bodies of Iloilo and Guimaras Straits are officially classified under DENR Memorandum Circular No. 13 Series 2004 as Class SB and SC, respectively. The water quality monitoring, which measures dissolved oxygen (DO), pH, temperature, fecal and total coliform, was conducted on a monthly basis in 2003 for the establishment of baseline data for water classification.

In 2004, the monitoring was conducted every quarter, based on the recommended frequency in the DENR Ambient Water Quality Monitoring Manual Volume 1 (February 2008 edition). Trend monitoring is recommended to be done quarterly or at least in 10 consecutive months.

The DO values in the Guimaras and Iloilo Straits are still within the set criteria of 5 mg/L. Likewise, results of analyses for both straits in terms of the physical and chemical characteristics, such as pH and temperature complied with both Class SB and SC water requirements.





One of the 12 sampling stations with quarterly monitoring of coastal water quality.

The values of fecal coliform showed an increasing trend with values exceeding the 200 MPN/100 mL criteria for class SB waters in both Straits. Similarly, an increasing trend in total coliform values was also observed, as indicated in **Figure 25**, with values in Iloilo Strait exceeding the criteria since 2004. The increase in the coliform values may be due to the increase in settlements in the area and domestic wastes may have been discharged directly into the receiving waters. The total coliform measured in 2004, 2005 and 2009 in the Guimaras and Iloilo Straits exceeded the standards for some of the 12 sampling stations, which may be attributed to the increase in settlements and influx of numerous activities near the sampling stations. Laboratory results in 2009 showed that Station 5 in Iloilo Strait, located at *Sitio* Lactawan, Poblacion, Nueva Valencia, which is adjacent to Barangay Igang, a thickly populated area, had significantly exceeded the water quality criteria for Class SB water with an annual average of 13,375 MPN/100 mL as compared to the set standard of 1000 MPN/100 mL (DAO 97-23).

Overall, the results of the water quality monitoring in Iloilo Strait showed that only Stations 3 and 4 complied with the Class SB standards. Class SB is a set category for bodies of water that are safe for bathing and other recreational activities. In the Guimaras Strait, only Station 1 has the

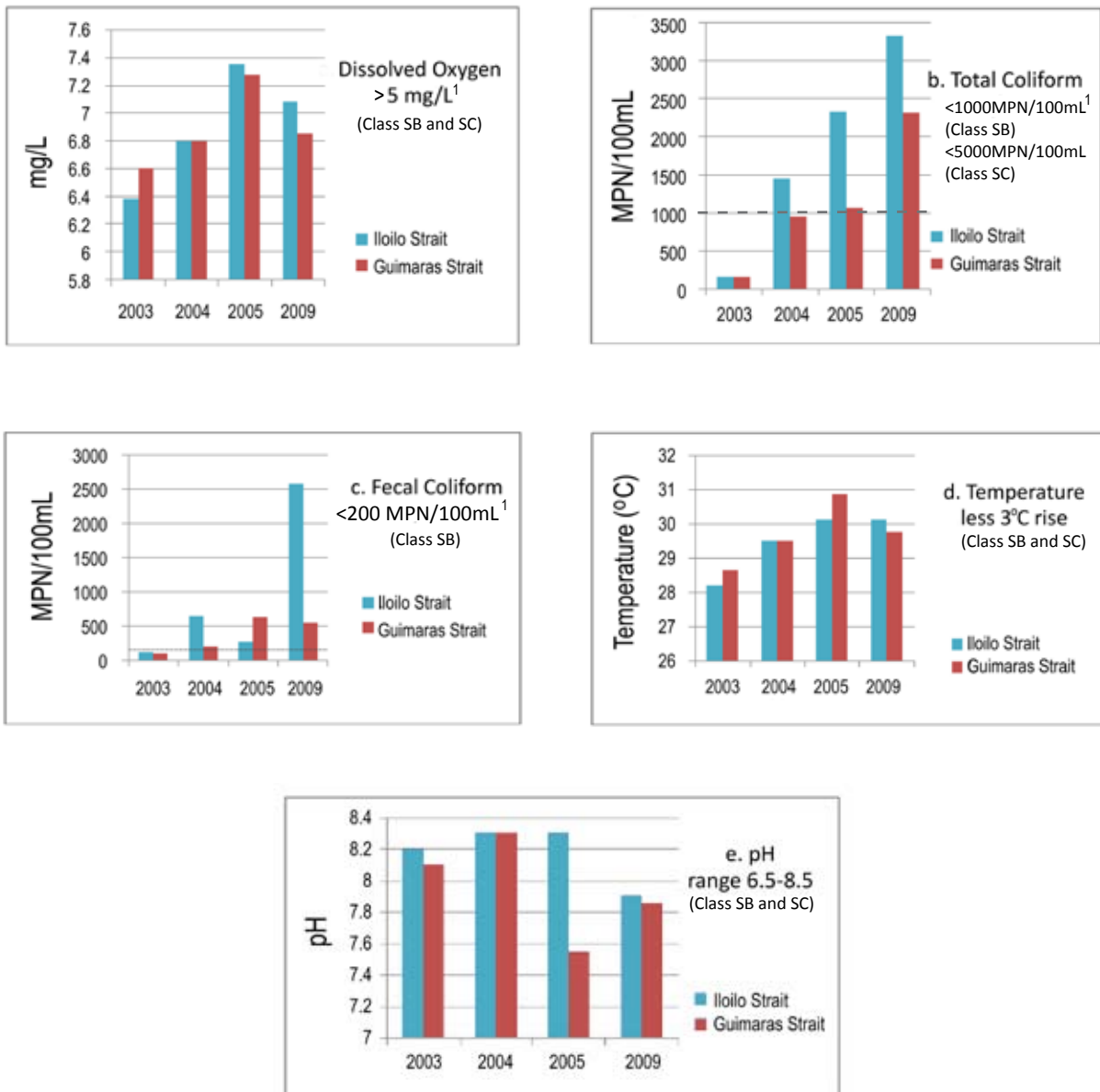


GENRO Staff do the actual water sample collection and gather field data on DO, pH and temperature.

lowest annual fecal coliform average of 258 MPN/100 mL. For total coliform, the entire stretch of Guimaras Strait complied with Class SC standards. The annual averages of DO, fecal and total coliform, pH and temperature in Iloilo Strait and Guimaras Strait from 2003-2009 are shown in **Figure 22**.



Figure 22. Annual averages of: (a) dissolved oxygen; (b) total coliform; (c) fecal coliform; (d) temperature; and (e) pH in Iloilo and Guimaras Straits (2003-2009).



The results of a one-time assessment of the baseline water quality condition of Sibunag River is shown in **Figure 23**. Under DENR Memorandum Circular No. 2007-10 Series of 2007, Sibunag River is in the List of Classified Waters in 2006. Being the longest river in the province, Sibunag River has many uses such as fishing, irrigation, bathing and other domestic purposes. The water quality of the entire reaches of Sibunag River based on the results of monitoring activities

showed that the physical and chemical characteristics conform to the allowable Standard Values set forth for Class A classification. This indicates that the beneficial use is for Public Water Supply under Class II. This class is intended for sources of water supply that require complete treatment (e.g., coagulation, sedimentation, filtration and disinfection) in order to meet the National Standards for Drinking Water of the Philippines.

<sup>1</sup> Iloilo Strait–Class SB; Guimaras Strait –Class SC. Water quality criteria, DAO 34-1990.

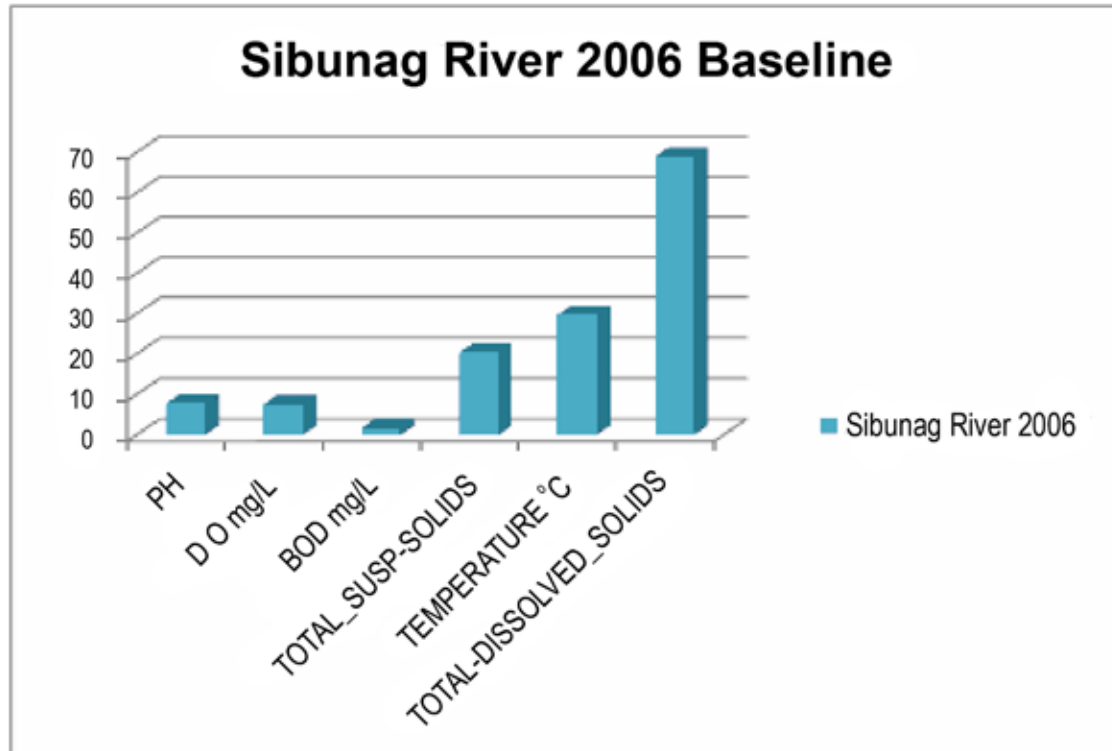


Figure 23. Baseline water quality condition of Sibunag River (2006).

As part of the post-oil spill monitoring and research being conducted in the province, levels of PAHs, lead and nickel in drinking water, sediment and tissue samples from crabs and gastropods were determined from the oil spill-affected areas (e.g., Nueva Valencia and Sibunag) covering the period September and October, 2006; December 2007, and January and April 2008, and in 2009. Results presented in 2009 showed no detectable levels of PAHs in drinking water, some traceable amounts in sediment samples from La Paz and Cabalagnan in 2008 and about 4.92-283.11  $\mu\text{g/g}$  of PAHs in crab samples collected in Tando, Nueva Valencia in

2006. Moreover, monitoring results in August 2008 showed levels of nickel and lead in gastropods in Tando, Nueva Valencia. The research team recommended a followthrough study to validate the monitoring results (DOH, UP-NPMCC and UP-IESM, 2009). PAH levels in drinking water were not detected in three consecutive follow-up monitorings conducted.

**Table 33** shows the concentrations of nickel and lead in drinking wells sampled in Nueva Valencia and Sibunag.



Pollution reduction and waste management

Table 33. Analysis of drinking water samples (2006-2009).

Area	Ni (mg/L) (September 2006)	Ni (mg/L) (October 2006)	Ni (mg/L) (December 2007)	Ni (mg/L) (April 2008)	Ni (mg/L) (2009)	Maximum Level (Ni, mg/L) <sup>1</sup>	Pb (mg/L) (2009)	Maximum Level (Pb, mg/L)
Alubihod		210			0.02	0.02	0.005	0.01
Cabalagnan 3		90	ND					
Cabalagnan 4				ND				
Cabalagnan 2		70						
Canhawan		10		ND				
Dolores		150						
Guiwanon				ND				
Igdarapdap		ND	ND	ND				
Lucmayan			ND		0.02		0.005	
Panobolon				ND				
San Antonio				ND	0.02		0.0085	
Sitio Budhian, San Antonio			ND					
Tando Proper	40	110						
Tigcalayo, La Paz			ND		0.02		0.0053	
Sumirib, La Paz		120			0.02		0.0067	
Luzaran, La Paz		160			0.02		0.005	
Unisan Island				ND				

<sup>1</sup>Standard Values for Inorganic Chemical Constituents with Health Significance.  
Source: UPNSRI



## Implications and Recommendations

The DO levels in the surrounding waters of Guimaras indicated that the quality is still within standards. The total and fecal coliform levels showed increasing trend but the levels in the Guimaras Strait are still within standards. The coliform levels in the Iloilo Strait showed exceedance with the water quality criteria for Class SB waters. The increasing trend in coliform levels suggests that this is an emerging concern that needs to be addressed by the local governments. It was noted that due to scarcity of land for human settlements, less privileged people in the province tend to build their houses within the vicinity of the coastal areas. They also tend to rely on the coastal waters for their living (e.g., aquaculture). The domestic wastes from the settlement areas are discharged directly into the adjacent coastal waters. Similarly, the wastes coming from aquaculture activities are not regulated.

The local governments should endeavor to address the situation through the provision of sanitation services and

strengthening the implementation and enforcement of pollution-related ordinances and laws. The proliferation of fish pens, which contribute to the degradation of the water quality of water bodies, should also be regulated.

Information, education and communication (IEC) activities should be stepped up to raise awareness and appreciation of the benefits of effective implementation of key legislations, such as RA 9003 or the Ecological Solid Waste Management Act of 2000; the advantages of relocating informal settlers that dwell along waterways and near the coastal areas and regular monitoring of water quality should be determined.

The results of water classification shall serve as tool in the evaluation of the effectiveness of the regulatory measures being implemented in the area. Moreover, the classification will not only establish water quality but it will also provide relevant information to the government planners for future developments in the area.

## References

- 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.
- DOH, UP-NPMCC and UP-IESM. 2009. Environmental Sampling Results. Province of Guimaras (2006-2009). Presented during the Oil Spill Anniversary 2009.
- GENRO Report on the Classification of Guimaras and Iloilo Straits for CY 2003.
- List of Classified/Reclassified Water Bodies in 2003, DENR MC No. 13 Series of 2004.
- List of Classified Water Bodies in 2006, DENR MC No. 2007-10 Series of 2007.
- UP Natural Sciences Research Institute Laboratory Results for Lead and Nickel in Drinking Water.
- Water Quality Assessment Reports of Guimaras and Iloilo Straits Coastal Water for CYs 2004, 2005, 2009.
- Water Body Classification Report Sibunag River (2005-2006).

### Pollution reduction and waste management

#### 032 Air quality

##### Description

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

##### Rationale

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Air pollution is harmful to human health and the quality of the environment.

##### Data Requirements

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- Changes in concentration of total suspended particulates (TSP)
- Changes in concentration of other air pollutants (particulate matter, sulfur oxide, nitrogen oxide, carbon oxide, volatile organic carbon)

##### Results

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Data on air quality is currently not available in the province. In general, air pollution is not yet considered an environmental concern in Guimaras.

Through the post-oil spill support, the province has acquired an air quality monitoring equipment that is yet to be operationalized.



### Implications and Recommendations

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The local government should endeavor to initiate air quality monitoring by utilizing the available equipment acquired. The portable handheld device, although designed to monitor organic vapors for workers in hazardous environments, can provide additional information that complements the

information gathered by national monitoring networks.

The Provincial Government intends to establish ambient air quality baseline data in the province.

### Pollution reduction and waste management

## 033 Sanitation and domestic sewerage

### Description

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

### Rationale

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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 (MDGs) targets for environmental sustainability.

### Data Requirements

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- 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

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As of 2007, 86.41 percent of the total number of households in the province had access to sanitary toilets. This is lower by 0.08 percent from the 2006 coverage (PDPFP, 2008-2013). In 2009, the proportion of households with access to sanitary toilets was 86.72 percent, where Buenavista (96 percent) had the highest number of households with access to

sanitary toilets while San Lorenzo (78 percent) had the lowest (**Table 34**).

To date, there is no existing centralized sewerage system in the province. Households are generally connected to septic tanks.

**Table 34. Proportion of households with access to sanitary toilets.**

Municipality	Year	Households with sanitary toilets (Percentage)
San Lorenzo	2009	77.65%
Nueva Valencia	2009	86.04%
Buenavista	2009	96.00%
Jordan	2009	88.16%
Sibunag	2009	85.74%
Guimaras Province	2009	86.72%

### Implications and Recommendations

From 2007 to date, the proportion of households with access to sanitary toilets has not significantly increased. The province should endeavor to provide this basic service to the remaining 14 percent of the population.

Adequate sanitation and sewage treatment and disposal are essential for protecting the environment and maintaining the health of the communities. The increasing trend in coliform levels, as indicated in the water quality monitoring in the province, indicated that the lack of access to sanitation

may have a negative impact on the bodies of water where untreated domestic sewage are discharged and ultimately on the health of the communities.

Smaller, inexpensive but efficient sewage disposal systems may be identified and adopted for use at the urban areas of the province. The province can also explore potential partnerships with the private sector for the establishment of a wastewater treatment facility in the area.

### References

Field Health Services Information System Report, Province of Guimaras, Provincial Health Office.  
Municipal Health Office of the Five Municipalities.  
PDPFP (2008-2013).



### Pollution reduction and waste management

## 034 Municipal solid waste

### Description

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

### Rationale

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Improper waste management have negative impact on human and ecological health as well as the aesthetic and recreational values of coastal areas.

### Data Requirements

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

### Results

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The four municipalities have developed their 10-year Solid Waste Management Plans that have been approved by their respective Municipal Development Councils (SB) except for the municipality of San Lorenzo. The municipalities of Buenavista, Jordan and Nueva Valencia have also established their functional Solid Waste Management Boards (PDPFP, 2008-2013).

The province has two controlled disposal facilities, the four-hectare dumpsite located in Barangay Bugnay in Jordan and in Barangay Piña, Buenavista. The three other municipalities have their own open dumpsites. Waste collection is done daily in Jordan and Buenavista. The other municipalities manage their garbage within their own

households by composting of biodegradable wastes and open pit for non-biodegradable wastes. With support from the GIZ, a materials recovery facility (MRF) was established in Buenavista and junk shops are being organized for solid waste management.

**Table 35** shows the results of waste characterization conducted in the province in 2008-2009. The highest daily generation of waste was recorded in Buenavista (17.36 T/day) while the lowest generation of waste was recorded in San Lorenzo (6.27 T/day). The bulk of wastes collected in Jordan, San Lorenzo and Sibunag were from households while in Nueva Valencia and Buenavista, the wastes were from commercial establishments and the public market respectively.

Table 35. Solid waste characterization in Guimaras (2007-2008).

Municipality	Waste Generation (T/day)	Waste Source	Waste Generation (kg/day)	Percentage Share	Waste composition (percentage)			
					Compostable	Recyclable	Residuals	Special
Buena Vista (2008)	17.36	Household (45)	404.93	20.58	14.22	52.69	32.55	0.86
		Institution (11)	385.80	19.61	20.85	5.87	18.92	0.52
		Commercial (19)	396.10	20.13	20.95	26.11	16.08	
		Public Market (2)	781.00	39.68	43.98	15.33	32.45	
		<b>Total (77)</b>	<b>1,967.83</b>	<b>100.00</b>				
Jordan (2007)	11.41	Household (100)	1,291.86	65.64	53.13	76.17	86.65	1.00
		Institution (5)	52.5	2.67	2.52	3.28	2.83	
		Commercial (5)	52.69	2.68	1.56	8.97	3.40	
		Public Market (2)	571.05	29.01	42.79	11.58	7.12	
		<b>Total (112)</b>	<b>1,968.10</b>	<b>100.00</b>				
Nueva Valencia (2007)	10.78	Household (30)	219.60	29.85	34.35	49.40	17.25	2.2
		Institution (5)	184.90	25.08	23.54	10.06	31.01	1.5
		Commercial (10)	271.05	36.85	32.52	32.02	45.33	
		Public Market (3)	61.55	8.37	9.59	8.52	6.41	
		<b>Total (48)</b>	<b>737.10</b>	<b>100.00</b>				
San Lorenzo (2008)	6.27	Household (27)	184.09	50.93	55.99	19.44	7.79	0.74
		Institution (7)	37.73	10.44	66.53	14.50	54.92	0.74
		Commercial (6)	112.86	31.22	52.01	24.61	7.80	0.54
		Public Market (2)	26.81	7.41	61.62	17.12	25.66	0.15
		<b>Total (42)</b>	<b>361.49</b>	<b>100.00</b>				
Sibunag (2007)	6.75	Household (26)	192.07	42.88	65.24	9.79	23.93	1.04
		Institution (6)	147.54	32.94	40.02	37.35	21.62	0.34
		Commercial (11)	59.50	13.28	47.06	20.84	29.75	2.35
		Public Market (1)	48.8	10.90	44.26	21.11	34.63	
		<b>Total (44)</b>	<b>447.91</b>	<b>100.00</b>				

Note: Number in parentheses represent sampling size.



From the waste characterization study conducted in Buenavista in 2008, it was estimated that the municipality produced 13,000 tons of agricultural solid waste annually, of which 30 percent is being composted and used as organic fertilizer (Table 36). The remaining proportion of the

agricultural wastes is disposed in a controlled dumpsite. Data on agricultural solid wastes is not available for the municipalities of Jordan, Nueva Valencia, San Lorenzo and Sibunag.

**Table 36. Amount of agricultural wastes generated and recycled in Buenavista (2008).**

	Agricultural solid waste generated (2008)	Agricultural solid waste recycled or reused (2008)
Buenavista	13,000 tons/yr	4,060 ton/yr

Source: WACS, MAO



**Agricultural solid wastes are composted and used as organic fertilizer.**





## Implications and Recommendations

The local governments also need to strengthen the information base in terms of the amount of waste generated, including amount recycled and the residuals as input to planning for the collection, processing and disposal of solid wastes. The province may also consider the establishment of MRFs and construction of a sanitary landfill for final disposal of residuals as the most viable strategy for solid waste management.

A community-based ecological solid waste management initiative in remote areas can also be promoted. The lack of environment-friendly, sustainable and affordable waste

management has led to the widespread practices of open dumping and open burning of solid waste in rural areas. The municipalities should work towards the implementation of an ecological solid waste management program, which aims at adequately managing solid waste using simple, sustainable systems that minimize the impact to the environment. Components of the program may include public awareness campaigns, composting of biodegradable waste, recovery and resale of recyclable waste, and disposal of residual waste through a communal sanitary landfill.

## References

- Five Municipalities (Buenavista, Jordan, Nueva Valencia, San Lorenzo, Sibunag).  
GENRO 2008-2009 Annual Accomplishment Reports.  
Waste Assessment Characterization Survey (WACS) conducted by EMB-DENR, Provincial Government of Guimaras and Municipal Local Government Units.  
Waste Assessment Characterization Survey (WACS) supported by GIZ - MAO Buenavista.

### Pollution reduction and waste management

#### 035 Industrial, agricultural and hazardous waste

##### Description

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

##### Rationale

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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

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

##### Results

---

Seven entities operating in the province were registered with the DENR as hazardous waste generators (**Table 37**). However, data on the amount of hazardous wastes

generated from the listed establishments was not available during the preparation of this report.

**Table 37. Registered hazardous waste generators by DENR (as of December 2009).**

Municipality	Hazardous Waste Generator	Location
Buenvista	Oro Verde Holdings and Development Corp.	Piña
	Sea Oil Petroleum Corp.	Dagsaan
Jordan	Fuerte Petron Gasoline Station	San Miguel
	Guimaras Provincial Hospital	San Miguel
	Gaitan Shell Station	San Miguel
Nueva Valencia	J. Flores Solivio Funeral Homes	Concordia
San Lorenzo	LH Arenal Merchandizing and Filling Station	Cabano

Source: Consolidated data of EMB-DENR IV.

## Implications and Recommendations

Agricultural, industrial and other types of hazardous wastes should be considered as a priority environmental concern. It is essential that the province strengthens its monitoring of the amount of hazardous waste generated as basis for planning and identification of appropriate management actions.

The proper disposal of hazardous materials and substances helps to ensure that these are properly handled and sent for

recycling or disposal at special facilities. The province currently does not have such types of disposal facilities to manage hazardous wastes. The province, however, can explore simple and cost-effective means of handling hazardous wastes. Mechanisms to reduce the generation of hazardous wastes can also be explored. Strengthening linkages with the private sector, which has the technical and financial capacity, can also be considered.

## References

EMB-DENR Region 6 registered hazardous waste generators - PENRO Guimaras.





# Annexes



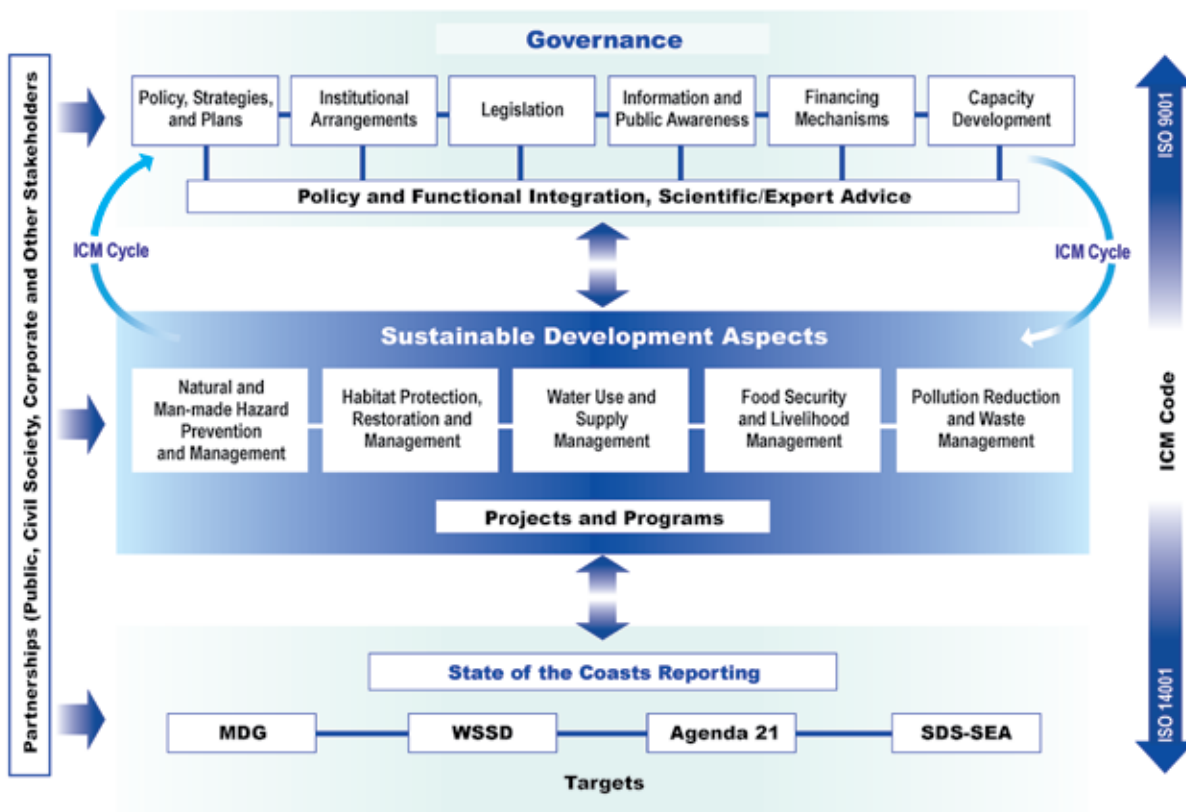


## Annex 1. Framework for the Sustainable Development of Coastal Areas thru ICM.\*

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

increasing the vegetation coverage in urban centers, are developed and implemented to provide adequate protection, conservation and restoration of natural environmental assets such as coral reefs, mangroves, seagrass beds, and other wetlands.

- 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.

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 2. Sustainable development targets (Philippines).

### Sustainable Development Targets

Indicator	National Target by 2015	MDG Target
<b>Eradicate extreme poverty and hunger</b>		
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
<b>Achieve universal primary education</b>		
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	
<b>Ensure environmental sustainability</b>		
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	
<b>Improve maternal health</b>		
Maternal mortality ratio	52.2	Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio
<b>Reduce child mortality</b>		
Under 5-mortality rate (per 1,000 live births)	26.7	Reduce by two-thirds, between 1990 and 2015, the under-five 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.

### Annex 3. Marine water quality criteria (Philippines).<sup>1</sup>

#### Marine water quality

Description	Water Quality Criteria	Source
<b>Priority parameters</b>		
Temperature (maximum rise in °C)	3, 3, 3, 3	DAO 34 (Classes SA, SB, SC, SD) <sup>2</sup>
pH (range)	6.5-8.5, 6.0-8.5, 6.0-8.5, 6.0-9.0	DAO 34 (Classes SA, SB, SC, SD)
Dissolved oxygen (Minimum, mg/L)	5, 5, 5, 2	DAO 34 (Classes SA, SB, SC, SD)
Fecal coliform (MPN/100mL)	nil, 200, __, __	DAO 34 (Classes SA, SB, SC, SD)
Total coliform (MPN/100 mL)	70, 1000, 5000, __	DAO 34 (Classes SA, SB, SC, SD)
Total suspended solids	50	Malaysia
<b>Secondary parameters</b>		
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 (unionized)	Quality Criteria)
Phosphate (mg/L)	0.015-0.045 (coastal - estuaries)	

<sup>1</sup> Unless otherwise noted by source.

<sup>2</sup> **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

- 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.

