

# *Chapter 7*

## ***MANAGEMENT ISSUES AND OPPORTUNITIES***



Malalag Bay and Davao Gulf in general share the same environmental problems and concerns as the rest of Mindanao. In 1995, Mindanao State University (MSU) conducted a Rapid Resource Appraisal (RRA) of Davao Gulf covering Malalag Bay. Table 7.1 presents the various components covered by the RRA showing the major coastal resource management issues and their constraints, the strengths of the various stakeholders, the institutional capabilities of concerned government agencies, and the possible management options that can be explored to resolve the issues. The suggested management options were intended to ease the conflicts in each problem area and to relieve the pressures impinging on all resources in the Gulf and Malalag Bay.

Aside from the issues besetting the coastal resources of the MBA, the following presents crucial issues on the environment, economy, political and institutional arrangements that affect the MBA.

### **ENVIRONMENT**

The environment and forestry sector has long been beset with issues concerning denudation of the upland areas to critical levels due to man's misuse and abuse of forest resources. Not only is denudation a problem in the upland but also in the coastal areas where mangroves are also being destroyed. Coastal erosion and siltation are being aggravated by steep topography, erosion in the upland and poor geological condition. All these subsequently lead to marine resource depletion which is complicated by illegal fishing practices such as dynamite fishing.

**Table 7.1. Major CRM issues and management options identified by the rapid resource appraisal of Davao Gulf.**

Issues/threats	Constraints (C), strengths (S), evidence (E), institutional capability (IC)	Management options
<b>COMMERCIAL FISHERIES</b>		
<p><u>Resource use conflicts</u></p> <p>Commercial fishing boats (&gt;3 GT) operate within municipal waters (15 km from shoreline)</p> <p>Use of modern technology called "superlight" further marginalizes municipal fishermen</p> <p>Monopolies on offshore FADs (<i>payaos</i>)</p>	<p>(C) Dialogue between commercial and municipal fishing sectors is rare or non-existent</p> <p>(C) Large capitalist often controls the fishing sector</p> <p>(C) Lack of data to support allegations against "superlight"</p> <p>(IC) DGMC should explore the possible implementation of FAO 165</p> <p>(IC) This sector is monitored more efficiently</p>	<p>Implement 15 km limit for commercial fishing (RA 165)</p> <p>Ban of large fishing boats (&gt;50 GT) from fishing in the bay</p> <p>Regulate number of <i>payaos</i> owned or operated by a single investor</p> <p>Regulate number of <i>payaos</i> owned or operated by a single investor</p>
<b>MUNICIPAL FISHERIES</b>		
<p><u>Intense fishing pressure</u></p> <p>Unregulated increase in number and type of fishing gear</p> <p>Too many fishermen</p> <p>Unprofitable fishing</p>	<p>(C) Data insufficient to establish growth or recruitment overfishing</p> <p>(E) Low CPUE and low fishermen income</p> <p>(IC) DGMC can provide assistance to fisherfolk</p>	<p>More comprehensive monitoring of fisheries</p> <p>Regulate number of fishermen through limited licensing</p> <p>Restrictions on mesh size and zoning of gear operation</p> <p>Implement TURFs</p> <p>Provision of alternative livelihood to improve income</p> <p>Intensive educational campaign to increase public awareness on consequences of overfishing</p>
<b>AQUACULTURE</b>		
<p>Supply of milkfish fry insufficient to meet local demand</p> <p>Several fishponds remain idle or unproductive</p>	<p>(C) Lack of monitoring of fry production and local fry needs</p> <p>(S) Willingness of fishpond operators to cooperate</p> <p>(C) Mariculture activities limited to a few commodities</p>	<p>Regulate milkfish export from the bay</p> <p>Invest in milkfish hatchery</p> <p>Conversion of idle fishponds to more productive mariculture ventures</p>

continued

Table 7.1. (continued)

Issues/threats	Constraints (C), strengths (S), evidence (E), institutional capability (IC)	Management options
<b>CORAL REEFS</b>		
<p>High siltation</p> <p>Inadequate reef protection and conservation efforts</p> <p>Blast fishing</p> <p>Possible growth and recruitment overfishing</p> <p>Absence of management of artificial reef (AR) projects</p>	<p>(C) Absence of monitoring program probably due to lack of funds</p> <p>(IC) DENR &amp; DA can collaborate on monitoring and implementation of conservation laws</p> <p>(C) Difficulty in assessment of blast fishing</p> <p>(E) High diversity of coral reef fishes monitored in some fish landing areas</p> <p>(C) Cannot evaluate success of AR projects because of absence of monitoring</p> <p>(C) Poor siting of AR projects</p>	<p>Control erosion in upland areas</p> <p>Reduce silt load onto reefs through mangrove reforestation and seagrass bed rehabilitation</p> <p>Declare additional protected areas such as marine parks and sanctuaries (e.g., in Tubalan, Malita; "Coral garden" in Dadatan; Talikod Island)</p> <p>Institute continuous monitoring of protected areas, particularly fish catches from reefs</p> <p>Information drives on importance of coral reef conservation</p> <p>Evaluate AR technology and institute management policies</p>
<b>MANGROVES</b>		
<p>Rapid conversion of mangrove areas into fishponds</p> <p>Poorly managed mangrove reforestation projects</p>	<p>(S) FLAs define the terms of conversion</p> <p>(S) Statutes on mangrove management are available</p> <p>(E) Reduction of mangrove cover by 66 percent since 1988</p> <p>(C) Use of <i>Rhizophora</i> as reforestation organism not appropriate in areas</p> <p>(E) Poor survival of <i>Rhizophora</i> seedlings</p>	<p>Suspend issuance of FLAs</p> <p>Reconserve idle fishponds to reforestation sites</p> <p>Coastal municipalities should implement own reforestation projects (e.g., 5-10 ha)</p> <p>Establish mangrove preservation zones in each province or municipality</p> <p>Utilize endemic mangrove species in reforestation projects</p> <p>DENR should institute more strict evaluation of reforestation projects</p>

continued

Table 7.1. (continued)

Issues/threats	Constraints (C), strengths (S), evidence (E), institutional capability (IC)	Management options
<b>SEaweEDS AND SEagrASSES</b>		
Denudation of seaweed and seagrass beds	(E) Extremely low cover and diversity in many areas  (C) Absence of historical data precludes any explanation for such depauperate condition of reef flat vegetation	Rehabilitate seagrass beds, e.g., by transplantation  Establish seagrass reserve zones (e.g., in Mabini, Davao del Sur)  Cultivate or farm economically important seaweeds
<b>WATERSHED</b>		
Potential decrease in critical water supply	(E) Reduction in forest cover (E) Increased erosion and siltation  (C) Restoration of forest cover requires long-term efforts	DGMC should coordinate with DENR for watershed management  Empower upland communities to conserve their watershed  Strict/militant forest law enforcement
<b>WATER QUALITY</b>		
<u>Degradation of water quality</u> Excessive siltation Pollution from numerous industrial, agricultural, and domestic sources Rapidly increasing beach front use	(E) High sediment loads in rivers (E) Proliferation of several heavy industries (E) Detection of heavy metals (E) High coliform levels in heavily populated areas (C) Occasional sampling failed to detect pesticide residues (E) Increase in number of resorts	Regulate upland mining and agricultural activities Enforce strict penalties for anti-pollution violations DENR should institute regular water quality monitoring program DGMC should review anti-pollution schemes of industries in the Gulf Regular meeting with industry representatives to strengthen cooperation in environmental efforts Strict adherence to and implementation of EIA Government should double efforts on population control esp. in coastal areas Institute proper solid waste disposal Promote ecotourism particularly in island resorts

continued

Table 7.1. (continued)

Issues/threats	Constraints (C), strengths (S), evidence (E), institutional capability (IC)	Management options
<b>INSTITUTIONAL ISSUES</b>		
Weak law enforcement Absence of an integrated coastal management program Lack of institutional capability for monitoring and evaluation Lack of alternative livelihood options for marginal fishermen	(C) Funds are seldom available to LGUs (C) Lack of political will to implement regulation (C) CRM is seldom the priority concern of LGUs (IC) Newly organized DGMC can be a powerful arm of government (S) Fisherfolk are willing to cooperate in CRM efforts (C) Trained manpower is rare (C) Government efforts in this line are not very significant (S) Cooperativism is gaining popularity among fisherfolk	DGMC should develop a funding scheme to support CRM program National mandate to LGUs to put CRM in their priority list Adopt an integrated, community-based approach to management of the Gulf's resources Public environmental education must be a priority program of DECS, CHED, and PIA Tertiary level academic institutions around the Gulf should actively participate in research and public education Create a scientific/assessment pool for continuous monitoring in the Gulf Multisectoral efforts in developing a practical and attractive livelihood program must be pooled Increase investments on post-harvest and other fisheries support facilities

Source: MSU (1996).

Notes:

<i>CHED</i>	<i>Commission on Higher Education</i>
<i>DECS</i>	<i>Department of Education, Culture and Sports</i>
<i>DGMC</i>	<i>Davao Gulf Management Council</i>
<i>EIA</i>	<i>Environmental Impact Assessment</i>
<i>PIA</i>	<i>Philippine Information Agency</i>
<i>TURFs</i>	<i>Territorial Use Rights in Fisheries</i>

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The environment, on the other hand, is being endangered by rampant use of agrochemicals (fertilizers and pesticides). Several incidents of fish poisoning especially during heavy rainfall have allegedly been due to chemical leaching that went through the rivers to Malalag Bay.

Solid waste generation in the absence of disposal sites complicates drainage problems as previously pointed out to cause flooding not only in the MBA but also in the low-lying municipalities of Davao del Sur. The existing drainage in Digos is inadequate to drain water during heavy downpour. The affected municipalities in the MBA are Sta. Maria, Padada, Malalag, and Sulop.

With the identification of the MBA as Provincial Agri-Industrial Centers (PAICs) in 1994, the province of Davao del Sur experienced its first generation of industrialization, which is expected to produce a significant impact on the environment. The influx of big businesses, the construction boom, conversion of land uses, the development of housing projects, and the erection of manufacturing and processing firms will definitely result in rapid extraction of minerals and other natural resources which may go beyond the rate of regeneration. These impacts, if not regulated, will cause problems in the sector.

### **ECONOMIC**

Based on the 1994 Family Income and Expenditure Survey (FIES), around 33 percent of the families in Davao del Sur fall below the poverty threshold. This poverty incidence, however, is about 6 percent better than that of 1991, which was placed at around 39 percent. Nevertheless, this is still a cause for alarm as a large portion of these poor families are living in the rural areas of the province. Accordingly, the poverty threshold of the province was placed at PhP8,163 per family of six per year in 1994.

The poverty groups in the MBA are the landless rural workers, lowland coconut farmers, upland farmers, subsistence fishermen, squatters, and underemployed/unemployed and underpaid workers. The landless rural workers are the *kaingeros*, landless families, and farm laborers. They earn a living by selling labor and/or engaging in slash-and-burn activities. The upland farmers of MBA include coconut and corn farmers. Low crop yields, as well as inaccessibility to markets, contribute to their poverty situation.

Subsistence fishermen are predominant in the MBA. They live in one-room houses made of dilapidated indigenous materials, have low literacy levels, have large families, and are dependent on seasonal municipal fishing activities. In their fishing activities, most use non-motorized boats and traditional fish catching methods, like hook and line.

Squatters who live in agricultural lands can be found in the MBA. They live in temporary dwelling units, subsist on hand-to-mouth existence, and have no regular source of income.

The MBA is endowed with diverse agricultural and natural resources and has the potential to produce more. But agriculture alone cannot sustain the growth and development of the economy as it is constantly hampered by product seasonality, vulnerability to natural calamities, and product inelasticity to income and price change. Aside from low production, the agri-sector is disturbed by the reality of having a market system that exerts a bias against it, thus resulting in low income. Production dips further with inadequate infrastructure support facilities and when the inefficiency and backwardness of current technologies is not addressed.

### **POLITICAL/INSTITUTIONAL**

The biggest challenge for coastal area management is the strict enforcement of laws, rules, and regulations. This challenge is created by 1) jurisdictional overlaps and conflicting interpretations of laws affecting the coastal zone, 2) serious practical difficulties of enforcement, 3) unavailability of vehicles for water pursuit of violators; 4) difficulties of determining and providing boundaries and locations in water, 5) distance of the commission of offense from public scrutiny, 6) lack of communication equipment (e.g., radios) for reporting violations, 7) lack of personnel (e.g., *Bantay Dagat* or PNP), and 8) deputy fish wardens being ill equipped to handle legal issues on arrest, search, seizure, and evidence gathering are just some of the hurdles that an effective fishery law enforcement policy has to solve. Even with the proper evidence and known violators, the sluggishness of courts suggests the development of quasi-judicial means for the swift prosecution and punishment of violators. Furthermore, the sharing of revenues from fines should be rechanneled to improve the provision of personnel or equipment to enforce laws in the MBA.

While enforcement may partially be addressed by strong political will, which will depend on the specific site and individual government officials in the area, public education (e.g., ill effects of illegal fishing methods through cross-site visits) and support can also be very effective and relatively inexpensive. With proper education, local POs may improve the enforcement of laws. On the other hand, it must not be forgotten that some of the worst offenders are industrial polluters whose connections and power, as well as economic benefits to the area, make them difficult to prosecute.

To alleviate the present condition of the environment, the LGUs of the MBA will pursue two major strategies. First is the sustainable management and optimal utilization of forest, marine, and other natural resources to address forest denudation, depletion of marine and coastal resources, and illegal extraction of mineral and natural resources. This objective will be achieved through the implementation of development

projects such as Watershed Protection, Rehabilitation and Development, Marine and Coastal Resource Conservation and Rehabilitation, Urban and Social Forestry, Mineral Resource Development, and Fruit Tree Production and will be pursued through:

- Strengthening/enforcement of environmental laws, policies, rules, and regulations;
- Surveillance of illegal forest and marine resource utilization and mineral extraction;
- Development of an effective information dissemination campaign and education system through training, radio broadcasting, film showing, and fora and symposia;
- Establishment and/or development of effective linkages with NGOs, nongovernment agencies (NGAs), LGUs, and other concerned entities; and
- Encouragement/enhancement of the participation by forest occupants and fisherfolk in their communities in resource rehabilitation, conservation, and efficient utilization.

The second is an attempt to integrate the efforts and programs for the management of Malalag Bay. A number of government agencies are tasked to enforce laws and protect the marine environment. Nonetheless, the same agencies adopt sectoral and fragmented approaches to issues and problems; hence, in spite of efforts in the past, problems continue to persist and even get worse. The launching of the pilot project "Coastal Resources Management" sometime in September 1991 in Malalag has made the major stakeholders of the marine ecosystem realize the extent of damage and degradation of Malalag Bay. The project adopts both regulatory and non-regulatory strategies of solving the problems confronting the marine ecosystem. Among the noteworthy accomplishments are the banning of compressor fishing, establishment of a fish sanctuary in a 50-ha area, mangrove planting, and intensified public information including the enactment of anti-littering ordinance.

***CRMP has assisted the major stakeholders of the marine ecosystem to realize the extent of damage and degradation of Malalag Bay.***

To support the provincial government's emphasis on sustainable agro-industrial development, a strategic plan for the Provincial Agri-Industrial Center (PAIC) of the MBA was completed in June 1994 with funding assistance from the Canadian International Development Agency (CIDA). Relevant programs in support of the establishment of

MBA-PAIC include capability building and entrepreneurial development, agricultural productivity improvement and development, pump-priming rural infrastructure, industry promotion and marketing, credit delivery system, and environmental management and protection. In an effort to reinforce these, several regulatory measures and supportive policies are identified for the local policy makers to enact in order to facilitate the smooth implementation and establishment of the MBA-PAIC. The establishment of the PAIC will be directed towards the attainment of the following development goals:

- The optimum and judicious utilization of resources;
- The provision of additional productive capacity and creation of industrial activities;
- The absorption of surplus manpower and significant reduction of levels of poverty;
- The development of skilled and competent human resources;
- The improvement of purchasing power and redistribution of income and wealth; and
- The achievement of balance between economic growth and environmental management and protection.

Table 7.2 presents the environmental management and protection programs upon the establishment of the PAIC.

Environmental protection is one key contribution of the CRMP to the sustainable use of marine resources in municipal waters. CRMP carries out alternative enterprise development activities under appropriate constraints of the carrying capacity of the water environment. A beneficial component of the activity is the promotion of well-regulated mariculture such as sea farming and ranching and the grow-out of animals in pens and cages.

Malalag Bay has become an area of concern to CRMP because of the observed increasing congestion of floating devices supporting the intensive culture of milkfish by certain entrepreneurs and cooperatives. Since the carrying capacity of the bay has already been surpassed, CRMP assessed the bay considering the impacts of the existing mariculture and pollutants. The study succeeded in determining the health status of Malalag Bay as conditionally suitable for mariculture (pens and cages) activities (Baleña 1998). The analyses indicated that the bay exceeded its environmental limits by about 2.5 times and that an awareness campaign is advisable, precisely to

Table 7.2. 10-Year environmental management and protection program for the MBA.

Project	Immediate concern (1994-1995)	Medium term objectives (1996-2000)	Long term goals (2001-2003)
<b>Municipality of Malalag</b>			
Coastal Resource Management	Established nursery of mangrove and planted at least 3 ha	Expanded mangrove nursery operations Planted at least 6 ha of mangroves	Sustained operations of mangrove nursery Planted 14 ha of mangroves
	Strengthened LGU and fisherfolk partnership in construction and installation of 4 modules of artificial reefs	50 modules of artificial reefs installed	Installed 54 additional modules of artificial reefs (currently banned nationally)
	Acquired patrol boat for surveillance and enforcement of fishery laws and ordinances	Continued surveillance and enforcement of fishery laws and ordinances	Sustained surveillance and enforcement of laws and ordinances
	Developed 50 ha of fish sanctuary	Maintained and upgraded operations of fish sanctuary	Sustained operations of fish sanctuary
	Increased public awareness on CRM and protection	Public should have attained a degree of social responsibility over the coastal resources	Institutionalized public education
	Protect government reservation area for milkfish and other fry	Maintenance	
Upland Rehabilitation	Promote SALT and water and land conservation technologies	Continuous application of SALT and other water and soil conserving technologies	Sustenance
	Coordinate with the DENR for the expansion of Community Reforestation Project	Expanded Community Reforestation Project to 200 ha	Maintenance
	Strengthened organizations of forest occupants		
	Facilitate application and release of Certificates of Stewardship	Facilitate processing of Certificates of Stewardship to those who are interested	Sustenance
	Mobilized <i>barangays</i> , <i>Barangay Advisory Teams</i> for Environment and other NGOs and POs in the watershed establishment per <i>barangay</i>	Rehabilitated 1,424 ha of timberland through the Integrated Social Forestry Project	Sustenance and crop diversification
		Expanded watershed rehabilitation through partnership with the <i>barangays</i> and the people	Rehabilitated at least 300 ha of watershed

continued

Table 7.2. (continued)

Project	Immediate concern (1994-1995)	Medium term objectives (1996-2000)	Long term goals (2001-2003)
Solid Waste Disposal and Management	Formulated solid waste disposal management masterplan	Implemented masterplan for solid waste disposal and management	Sustenance
	Site selection and acquisition of at least 2 ha dumping site	Established and operationalized landfill system	Full operations of landfill system
	Initiated low cost garbage disposal and collection system	Improved system of garbage collection Enforced proper waste disposal in rural <i>barangays</i>	Sustenance
	Acquisition of one garbage truck	Acquisition of additional garbage truck	Sustenance
<b>Municipality of Hagonoy</b>			
Pollution Control	People's awareness and conscientization	People's surveillance and vigilance in abating pollution	Low cost and less pollutive farm chemical inputs
	Farmer's education on hazards of pollution and alternative steps to reduce and minimize effects	Proper use and disposal of farm chemicals (pesticides, weedicides, insecticides, etc.) Propagation of organic fertilizers	Use of organic fertilizers
Coastal Resources Management	Identify and develop potential areas for mangrove development		
	Establish mangrove planting materials nursery Codify integrated fishery ordinance	Develop coastal areas suitable for mangrove planting	Expand when possible planting areas to mangrove
	Deputize coastal <i>barangay</i> officials to enforce fishery laws	Strict enforcement of fishery laws	Acquisition of pump boats for effective and efficient fishery laws enforcement
	Expansion area and laying of additional artificial coral reefs and fish sanctuaries	Municipal policies and strategies formulation and implementation	Maintenance and when possible expansion of coverage
Upland Rehabilitation	Promotion of upland agricultural technologies	Establishment of salt/halt farms in upland <i>barangays</i>	Mobilization of <i>barangays</i> in implementation with technical and other assistance from POs, NGOs, and LGUs
	Promotion of water and soil conservation	Planting and growing of economic trees and bamboos in erosion prone areas	

continued

Table 7.2. (continued)

Project	Immediate concern (1994-1995)	Medium term objectives (1996-2000)	Long term goals (2001-2003)
Solid Waste Disposal and Management	Formulation of solid waste disposal management plan	Implement master plan for solid waste disposal and management	
	Site development for landfill and dumpsite	Operationalize waste landfill	
	Enforcement of Health and Sanitation Code	Enforcement of <i>barangay</i> based waste disposal and sanitation rules	

Source: PSPT (1994).

communicate to stakeholders that Malalag Bay is no longer “healthy” and thus needs to be regulated. To lessen culture intensity by 2.5 times could mean the proportional reduction in area of culture, stocking density, or feeds.

Through CRMP’s participatory planning process, municipal CRM plans in the MBA were completed in 1999. The municipal CRM plans with their objectives, strategies, timeframe, and responsible agencies for its activities are presented in Table 7.3.

In combination with the local community support, the following activities are recommended to lessen the economic pressures placed on the natural resources of Malalag Bay:

- The presence of agricultural plantations in the area is suspected as the source of chemicals detrimental to the sustainability of the fish resources in the area. In order to ensure that the water will be free from toxic effluents, a monitoring station should be operated in the bay.
- To maintain ecological balance and sustainability of resources, mangrove reforestation should be implemented which aims to conserve the soil, water, biodiversity, and other watershed resources for the benefit of upstream and downstream communities and the coastal resources of Malalag Bay.
- The MBA has to be equally prepared for an efficient and responsive solid waste disposal and management as it is already experiencing the ill effects of unregulated solid waste disposal. With the expected urbanization of some *barangays* and the influx of people and industries, it must be able to cope and ably manage the upsurge of garbage and solid wastes.

**Table 7.3. Municipal CRM plans (Year 2000-2004) in the MBA.**

Program/objectives		Strategies	Responsible agencies
<b>Municipality of Hagonoy</b>			
<p><u>Vision</u> A coastal municipality of regenerated resources, environmentally sound and a well managed ecotourism area in the province for the upliftment of the people</p> <p><u>Mission</u> The municipal government and its instrumentalities are committed to develop itself into a responsive and dynamic catalyst of change and promote the regeneration and development of coastal resources and protect them from abuse and illegal exploitation.</p>	<p><u>Fishery Management</u> To increase fishery and marine resource productivity by regulating access and exploitation of municipal waters reserving them for the benefit of municipal fishers while ensuring its natural and sustainable development and management as well as equity and exploitation</p>	<ol style="list-style-type: none"> <li>1. Establishment and management of fish sanctuaries</li> <li>2. Sustainable aquaculture</li> <li>3. Closed seasons</li> <li>4. Licensing and permitting system</li> <li>5. Enforcement of environmental and fishery laws</li> </ol>	<p>MAO, PLGU, DFW, MPDO, SB</p> <p>MLGU, PO, BFARMC, Fishpond Operators, DENR, DTI, DOST, TESDA</p> <p>MLGU, BLGU, FARMCS, BFARMC, BLGU, SB</p> <p>MLGU, FARMC, DFW, MAO, BFARMC, BLGU, SB</p> <p>MAO, PLGU, DA-BFAR, MARINA, MARICOM, MLGU, PLGU, BFARMC, BLGU, MLGU, DFW, DECS, NGOs, DENR, FARMC, PO</p>
	<p><u>Habitat Management</u> To manage, protect, conserve and rehabilitate existing habitat to improve productivity and biodiversity of corals, seagrasses, mangroves and estuaries through community participation</p>	<ol style="list-style-type: none"> <li>1. Identification of potential fish sanctuary</li> <li>2. Community-based mangrove rehabilitation and development</li> <li>3. Linkage with fishpond owner to participate and contribute funds for mangrove planting and development</li> <li>4. Prevention and control of flood, erosion, and siltation</li> </ol>	<p>MAO, DENR, MLGU, NAMRIA, FARMC, DFW, BLGU</p> <p>PLGU, MLGU, NGO, CENRO, MLGU, FARMC, DENR, DFW, PO</p> <p>PENRO, MLGU</p> <p>MLGU, BLGU, DENR, NGO, FARMC, PO, Concessioners, land owners</p>
	<p><u>Coastal Zone Management</u> To delineate zones for specific uses or activities in the municipal waters to eliminate conflict in utilization and regulate zone activities</p>	<ol style="list-style-type: none"> <li>1. Formulation of coastal zonation and management plan</li> </ol>	<p>MLGU, MTWG, FARMC, BLGU, PLGU, SB</p>
	<p><u>Shoreline Management</u> To protect the shoreline from further degradation and destruction, especially erosion and siltation, while providing access and maintaining cleanliness and sanitation while regulating foreshore area</p>	<ol style="list-style-type: none"> <li>1. Pollution control</li> </ol>	<p>MLGU, MTWG, FARMC, BLGU, PLGU</p>
		<ol style="list-style-type: none"> <li>2. Flood, erosion, siltation control</li> </ol>	<p>MLGU, BLGU, DENR, NGO, FARMC, PO, Concessioners, land owners</p>
		<ol style="list-style-type: none"> <li>3. Regulation of foreshore area activities</li> </ol>	<p>MLGU, DENR, BLGU, BFARMC, MLGU, SB, BLGU, MPDO</p>
	<p><u>Coastal Tourism Management</u> To upgrade the existing tourism facilities and services initiated by private investors by providing infrastructure support and ultimately transform the area into an ecotourism destination of the province</p>	<ol style="list-style-type: none"> <li>1. Upgrading of tourism facilities and services</li> </ol>	<p>Resort owners, FARMC, BLGU, MLGU</p>
		<ol style="list-style-type: none"> <li>2. Provision and improvement of infrastructure support facilities and services</li> </ol>	<p>DPWH, BLGU, MLGU, DASURECO</p>
		<ol style="list-style-type: none"> <li>3. Ecotourism development</li> </ol>	<p>MLGU, BLGU, FARMC, DFW, PO, COOPS, NGO</p>

continued

Table 7.3. (continued)

Program/objectives	Strategies	Responsible agencies
<b>Municipality of Hagonoy</b>		
<p><u>Enterprise Development Management</u> To develop environment-friendly alternative sources of income and generate employment opportunities for diverse income of fisherfolk to lessen dependence on fishing</p> <p><u>Waste Management</u> To eliminate or minimize the existing and potential adverse impact and effects of wastes to human and community health</p> <p><u>Legal Arrangements</u> To improve mechanisms, structures, processes, and arrangements for coastal management to enhance community participation and delivery of services and strengthen environmental and fishery law enforcement and networking and linkages</p>	1. Development of environment-friendly alternative source of income	MLGU, MAO, DECS, TESDA, DTI, DOST, LADECO, MBA, PAIC
	2. Employment generation	MLGU, LADECO, MVPI, LSVI, CII, DTI, DOST, LMSTC
	1. Elimination, minimization of existing and potential adverse impacts and effects of waste	MLGU, BLGU, FARMC, DENR, NGO, COOP, PLGU, MTWG, DECS
	1. Institutionalize mechanism, structures, process and arrangement to enhance participation and delivery of services	MLGU, DENR, BLGU
	2. Strengthen environment and fishery law enforcement networking and linkages	MLGU, PLGU, DA-BFAR
	3. Monitoring, control and surveillance (MCS)	MLGU, BLGU, FARMC
<b>Municipality of Malagal</b>		
<p><u>Vision</u> A self-reliant community driven by self-determination and actively pursuing led and sustainable development that will be people-oriented, equity-led and sustainable.</p> <p><u>Mission</u> Implement coastal development that will be people oriented; equity-development programs that will uplift the quality of life of the people and enhance their participation to sustainable management of coastal resources that will ensure food security.</p>	<p><u>Fishery Management</u> To develop monitoring, control and surveillance mechanism and strengthen law enforcement units</p> <p>To regulate the exploitation of fisheries resources and limit fishing effort to sustainable levels</p> <p>To increase productivity of fisheries resources in order to achieve food security</p> <p>To ensure the rational and sustainable development and management of the fishery resources</p>	<p>1. Maintenance/management of fish sanctuary</p> <p>2. Established/organized community-based fish sanctuary management</p> <p>3. Enforcement of environmental and fisheries laws</p> <p>4. Licensing and permitting of fisheries, fishing gear, and fishing boats - Establishment of mariculture units - Establishment of demonstration fish cage - Establishment of 3 units fish shelter - Maintenance of 3 units patrol boat</p>
	FARMC, SB, CRMP, ISFI	
	DFW, FARMC	
	PNP, LGU, DFW, BFARMC, MFARMC	
MAEO, LEEM, OMAD, CRMP, OPAG, BFAR, RFTC, DFW, CG, PNP		

continued

Table 7.3. (continued)

Program/objectives	Strategies	Responsible agencies
<b>Municipality of Malalag</b>		
<p><u>Habitat Management</u> To restore and rehabilitate, conserve and protect the vital ecosystem To improve productivity and biodiversity of corals, seagrass, mangroves, and estuaries To enhance community participation in the management of the habitats</p>	1. Reforest/replant depleted mangrove areas	FARMC, MAEO, PENRO, DENR, DFW, CRMP, MSSD
	2. Legislative measures for FLA relocation of boundaries	
	3. Buy-back of mangrove propagules	FARMC
	4. Establishment of SALT (Contour)	MAEO, KAPWA, ISFI
	5. Establishment of maintenance of protected areas (sanctuary, mangrove)	FARMC, LGU, CRMP, PNP
<p><u>Enterprise and Livelihood Management</u> To develop alternative and supplemental employment to fishers in order to lessen their fishing effort and pressure on the sea To diversify income sources of the fishers to lessen dependence on fishing</p>	1. Networking and linkaging for fund sourcing	MAEO, BFARMC, MSSD
<p><u>Coastal Zone Management</u> To delineate zones for specific uses or activities in the municipal water To eliminate use conflict in the utilization of the municipal water To regulate activities in the different zones</p>	1. Delineation of municipal water boundaries	MLGU, BLGU, MAEO, FARMC, NAMRIA, OPAG, DENR, DFW
	2. Designation of zones for specific uses	
	3. Conduct IEC	
	4. CO	
<p><u>Legal Arrangement and Institutional Development</u> To strengthen environmental and fishery law enforcement To strengthen network and linkage with other LGUs, NGAs, international and local organizations, community and NGOs/POs</p>	1. Strengthening of BFARMC, DFW	FARMC, DFW, OPAG, DENR, PNP, LGU, PENRO, PNP MARINA
	2. MCS	SB, OMM
	3. Monitoring and evaluation of laws and ordinances implementation	LCE, SB, NGO
	4. Fund sourcing and leveraging based on planned programs	MBA-PAIC, MO, SB, MLGU, BLGU
<p><u>Coastal and Upland Greening</u> To rehabilitate upland and coastal vegetative cover</p>	1. Protection and reforestation and upland covers through community participation	DENR, BFAR, MAEO, LGU, FARMC, PENRO

continued

Table 7.3. (continued)

Program/objectives	Strategies	Responsible agencies	
<b>Municipality of Padada</b>			
<p><u>Vision</u> A municipality with a healthy and ecologically-balanced coastal environment with disciplined, empowered, motivated people/ community advocating sustainable management and development of coastal resources.</p> <p><u>Mission</u> To implement coastal resource management with active community participation.</p>	<p><u>Fishery Management</u> To regulate fishing activities to sustainable level in order to increase productivity of fishing resources</p>	1. Management of existing fish sanctuary	SB, MLGU, BLGU, DFW, PNP, FARMC, CRMP
	<p>To strictly implement municipal fishery laws, ordinances, and other related environmental laws by strengthening law enforcement units and developing monitoring, control, and surveillance mechanisms</p>	2. Massive IEC campaign	MAO, NGOs, POs, FARMCs
		3. Licensing, permitting of fisher, gear and boats	BLGU, MLGU, MAO, FARMC, PLGU
		4. Enforcement of environmental and fishery laws	PNP, DFW, FARMC, PNP, MLGU
	<p><u>Legal Arrangement and Institutional Development</u> To strengthen environmental and fishery law enforcement</p>	1. Strengthening of BFARMC, DFW	FARMC, DFW, OPAG, DENR, PNP, LGU, PENRO, PNP MARINA
	<p>To strengthen network and linkage with other LGUs, NGAs, international and local organizations, community and NGOs/POs</p>	2. MCS	SB, OMM
		3. Monitoring and evaluation of laws and ordinances implementation	LCE, SB, NGO
		4. Fund sourcing and leveraging based on planned programs	MBA-PAIC, MO, SB, MLGU, BLGU
	<p><u>Habitat Management</u> To conserve and rehabilitate habitats to improve productivity and bio-diversity and enhance/ strengthen community involvement in the management</p>	1. Establishment of marine sanctuary	
		2. Protection of corals, seagrass, mangroves by regulating fishing activities destructive to the habitat	
		3. Enforcement of environmental and fisheries laws	
		4. Conduct massive IEC campaign	
	<p><u>Shoreline Management</u> To regulate activities in the foreshore area and protect from further degradation due to destructive activities</p>	1. Development of a fisherfolk resettlement	NGAs, PLGUs, NHA, SSS, Pag-ibig
		2. Mangrove rehabilitation	DENR, MLGU
		3. Setting up of setbacks on all coastal development	DENR, MLGU, SB
	<p><u>Coastal Zone Management</u> To delineate zones for specific uses in order to eliminate use conflict in the utilization and regulate activities in the different zones of municipal waters</p>	1. Delineation of municipal water boundaries	
		2. Designation of zones for specific uses (for strict protection, rehabilitation of aquaculture, tourism, trade and navigation, etc.)	MLGU, NAMRIA, BFAR
		3. Regulation of fishing and use of fishing gears in every zone	MLGU
		4. Conduct of massive IEC campaign	MLGU

continued

Table 7.3. (continued)

Program/objectives	Strategies	Responsible agencies
<b>Municipality of Padada</b>		
<p><u>Coastal Tourism</u> To develop local capability in ecotourism projects and provide economic incentives that contribute to better coastal management and community development for the municipality</p> <p><u>Enterprise and Livelihood Management</u> To develop alternative and supplement employment to diversify income source of fishers in order to lessen fishing effort and pressure on the sea</p> <p><u>Waste Management</u> To eliminate or minimize the potential adverse impact of wastes</p>	1. Regulation on the number of tourism facilities and activities	MAO, FARMC, BLGU
	2. Ecotourism product development	PTO
	3. Users fee on appropriate business developed	
	4. Conduct massive IEC campaign	FARMC, POs, BLGU, MAO
	1. Identification and implementation of environment-friendly and economically feasible projects	MAO, FARMC, BLGU, MPDO, PLGU, NGO
	2. Identification of beneficiaries	MAO, FARMC, BLGU, MPDO, PLGU, NGO
	1. Water quality monitoring	DENR, MHO
	2. Domestic and human waste management	BFAR, MLGU
	3. MCS	BFAR, MLGU
	4. Conduct of massive IEC campaign	BFAR, MLGU
<b>Municipality of Sta. Maria</b>		
<p><u>Vision</u> An improved quality of life through empowered coastal communities, benefiting from a well-managed and ecologically-balanced coastal environment.</p> <p><u>Mission</u> Implement development programs aimed to protect, conserve, and manage the coastal resources through partnership of various sectors.</p>	1. Enactment of Municipal Ordinance, regulating fish catch, fishing gear, mesh size, fishing vessels.	LGU, NGA
	2. Implementation of licensing and permitting of fishers, fishing gear, and fishing boats	LGU, NGA
	3. Establishment and management of marine protected areas or fish/marine sanctuaries	LGU, NGA
	4. Enforcement of environmental and fishery laws	LGU, NGA
	5. Conduct of massive IEC campaign	LGU, NGA
	1. Rehabilitation of mangrove areas	LGU, NGA
	2. Establishment of marine reserve	LGU, NGA
	1. Delineation of municipal waters and boundaries	LGU, NGA
	2. Designation of zones for specific uses (for strict protection, rehab. aquaculture, tourism trade, and navigation, etc.)	LGU, NGA

continued

Table 7.3. (continued)

Program/objectives	Strategies	Responsible agencies	
<b>Municipality of Sta. Maria</b>			
	3. Regulation of fishing activities and use of fishing gear in every zone.	LGU, NGA	
	4. Conduct of massive IEC campaign	LGU, NGA	
	5. Community organizing and formation of fishers' organization for protection and conservation	LGU, NGA	
<u>Shoreline Management</u> To regulate activities in the shoreline that would affect the condition of the shore  To protect the shoreline from further degradation due to destructive activities	1. Setting up and maintenance of coastal setback for all development	LGU, NGA	
	2. Development of waste management system	LGU, NGA	
<u>Enterprise and Livelihood Management</u> To diversify income source of the fishers to lessen dependence on fishing  To orient community participants re: proper values related to managing enterprise development projects	1. Identification and implementation of environment-friendly and ecologically-feasible projects	LGU, NGA	
	2. Social preparation and values formation		
<u>Legal Arrangement and Institutional Development</u> Institutionalization of CRM in the LGU  Formation of municipal core group  Strengthening of FARMC, <i>Bantay Dagat</i> and deputized fish warden  To increase awareness on CRM programs  Information on funding institution	1. Establishment of a CRM section under the OMA	LGU	
	2. Creation of a CRM section and assigning personal	LGU	
	3. Organization of a municipality core group that will conduct IEC activities	LGU	
	4. Formulation of incentive and benefit mechanism to the FARMC, BD, and DFW		
	5. Produce CRM IEC materials		
	6. To link with various funding institutions		
<b>Municipality of Sulop</b>			
<u>Vision</u> Sustained, restored and productive coastal and marine resources of Sulop capable of uplifting the socioeconomic condition of the communities through people participation.	<u>Fishery Management</u> To prevent illegal fishing in order to reduce fishing pressure	1. Management of existing fish sanctuary	MTWG, MO, MAO, BFARMC
		2. Licensing and permitting of fishers, fishing gear, and fishing boat	MAO, MO, MTO, BFARMC
		3. Sustainable management of coastal aquaculture	MTWG, MAO, MPDO, CRM, BFARMC
		4. Enforcement of environmental laws and related ordinances	MO, MTWG, PNP, DFW, DOJ, MAO, BFARMC

continued

Table 7.3. (continued)

Program/objectives	Strategies	Responsible agencies
<b>Municipality of Sulop</b>		
<p><u>Mission</u> To evolve and implement development alternatives that would continually regenerate, conserve, and promote wise use of the coastal and marine resources</p>	<p><u>Habitat Management</u> Rejuvenate/rehabilitate resource base</p>	1. Setting up of fisheries monitoring mechanism CRM-PL/MAO, MO, MTWG, PNP, DFW, BFAR
	2. Conduct of massive IEC campaign MAO, MO, CRM-PL, BFARMC	
	3. Enforcement of environmental and fisheries laws MO, DFW, MTWG, PNP, MAO, CRM- PL, BFARMC	
	<p><u>Coastal Zone Management</u> To formulate and implement approved unified fishery code and BLUP in order to avoid conflicting uses of different zones</p>	1. Delineation of municipal water boundaries MO, NLA, CRM-PL, MTO, BFARMC, MAO
	2. Designation of zones for specific uses MAO, MPDO, MTWG, SB, MAO, NIA, MTWG	
	<p><u>Shoreline Management</u> To prevent the establishment of dwelling units within the shoreline</p>	1. Protection and conservation of mangrove areas MAO, CRM-PL, NLA
	2. Fisherfolk's settlement area development MAO, MTO, MPDO, MEO, MSWDO	
	3. Setting up and maintenance of coastal setback for all development MAO, MO, MEO	
	4. Construction and maintenance of seawall MAO, NLA, MAO, CRMP-PL	
	5. Conduct of massive IEC	
	6. Strengthening of fishery organization	
	<p><u>Coastal Tourism Management</u> To develop local capability in ecotourism projects that contribute to better coastal management and community development</p>	1. Conduct of massive IEC MAO/CRM-PL
	2. Identification and development tourist destination area MO, MP/MPDO	
	3. Formulation of tourism promotion brochure MPDO, MO Mun. Tourism Com.	
	4. Promotion of tourist destination area MO, MTO	
	<p><u>Enterprise and Livelihood Management</u> To develop alternative source of livelihood for fisherfolk in order to lessen fishing effort and pressure on the municipal water</p>	1. Identification and implementation of environment-friendly and economically feasible projects MAO, MPDO, MTWG, DTI, SB, CRM-PL, SB
	2. Implementation of oyster production and marketing considered environment-friendly enterprise through cooperative interventions	
	<p><u>Waste Management</u> To minimize adverse impact of wastes to human and environment health</p>	1. Water quality monitoring MAO, NLA, DENR, BFAR, DOH, DA, MHO, MTWG
	2. Waste segregation CRMP-PL, MO, MTWG, MHO, MAO	
	3. MCS MTWG, MHO, CRMP-PL	
4. Conduct of massive IEC on waste management MTWG, CRM-PL		

continued

Table 7.3. (continued)

Program/objectives	Strategies	Responsible agencies
<b>Municipality of Sulop</b>		
<u>Legal Arrangement and Institutional Development</u>  To strengthen environment and fishery law enforcement	1. Community-based IEC	MAO, MTWG, CRM-PL
	2. Strengthening of FARMC, <i>Bantay Dagat</i> and fish wardens	
	3. Monitoring and surveillance	

## Notes:

<i>BFAR</i>	<i>Bureau of Fisheries and Aquatic Resources</i>	<i>MARICOM</i>	<i>Maritime Command</i>
<i>BFARMC</i>	<i>Barangay Fisheries and Aquatic Resource Management Council</i>	<i>MARINA</i>	<i>Maritime Industry Authority</i>
<i>BLGU</i>	<i>Barangay Local Government Unit</i>	<i>MBA-PAIC</i>	<i>Malalag Bay Area-Provincial Agri-Industrial Center</i>
<i>BLUP</i>	<i>Barangay Land Use Plan</i>	<i>MCS</i>	<i>Monitoring, Control and Surveillance</i>
<i>CENRO</i>	<i>Community Environment and Natural Resources Office</i>	<i>MEO</i>	<i>Municipal Engineer's Office</i>
<i>CG</i>	<i>Coast Guard</i>	<i>MFARMC</i>	<i>Municipal Fisheries and Aquatic Resources Management Council</i>
<i>CII</i>	<i>Cocoa Investors, Inc.</i>	<i>MHO</i>	<i>Municipal Health Office</i>
<i>CO</i>	<i>Community Organization</i>	<i>MLGU</i>	<i>municipal local government unit</i>
<i>CRMP</i>	<i>Coastal Resource Management Project</i>	<i>MO</i>	<i>Mayor's Office</i>
<i>CRM-PL</i>	<i>Coastal Resource Management - Practitioners' League</i>	<i>MPDO</i>	<i>Municipal Planning Development Office</i>
<i>DA</i>	<i>Department of Agriculture</i>	<i>MSSDO</i>	<i>Municipal Social Service and Development Office</i>
<i>DASURECO</i>	<i>Davao del Sur Electric Cooperative</i>	<i>MSWDO</i>	<i>Municipal Social Welfare and Development Office</i>
<i>DECS</i>	<i>Department of Education, Culture and Sports</i>	<i>MTO</i>	<i>Municipal Treasurer's Office</i>
<i>DENR</i>	<i>Department of Environment and Natural Resources</i>	<i>MTWG</i>	<i>Multisectoral Technical Working Group</i>
<i>DFW</i>	<i>Deputized Fish Warden</i>	<i>MVPI</i>	<i>Malalag Ventures Plantation, Inc.</i>
<i>DOH</i>	<i>Department of Health</i>	<i>NAMRIA</i>	<i>National Mapping and Resources Information Authority</i>
<i>DOJ</i>	<i>Department of Justice</i>	<i>NGA</i>	<i>national government agency</i>
<i>DOST</i>	<i>Department of Science and Technology</i>	<i>NGO</i>	<i>nongovernment organization</i>
<i>DPWH</i>	<i>Department of Public Works and Highways</i>	<i>NIA</i>	<i>National Irrigation Administration</i>
<i>DTI</i>	<i>Department of Trade and Industry</i>	<i>NLA</i>	<i>national line agency</i>
<i>FARMC</i>	<i>Fisheries and Aquatic Resources Management Council</i>	<i>OMAD</i>	<i>Office of the Municipal Administrator</i>
<i>IEC</i>	<i>information education campaign</i>	<i>OMM</i>	<i>Office of the Municipal Mayor</i>
<i>ISFI</i>	<i>Institute of Small Farms and Industries</i>	<i>OPAG</i>	<i>Office of the Provincial Agriculturist</i>
<i>KAPWA</i>	<i>Kapwa Upliftment Foundation, Inc.</i>	<i>PENRO</i>	<i>Provincial Environment and Natural Resources Office</i>
<i>LADECO</i>	<i>Lapanday Development Corporation</i>	<i>PLGU</i>	<i>provincial local government unit</i>
<i>LCE</i>	<i>Local Chief Executive</i>	<i>PNP</i>	<i>Philippine National Police</i>
<i>LEEM</i>	<i>Local Economic Enterprise Management</i>	<i>PO</i>	<i>people's organization</i>
<i>LGU</i>	<i>local government unit</i>	<i>PTO</i>	<i>Provincial Tourism Office</i>
<i>LSVI</i>	<i>Lorenzo and Sons Ventures Inc.</i>	<i>RFTC</i>	<i>Regional Fishermen's Training Center</i>
<i>LMSTC</i>	<i>Lapanday Manpower Skills Training Center</i>	<i>SB</i>	<i>Sangguniang Bayan</i>
<i>MAEO</i>	<i>Municipal Agriculture and Environment Office</i>	<i>TESDA</i>	<i>Technical Education and Skills Development Authority</i>
<i>MAO</i>	<i>Municipal Agriculture Office</i>		

- To enhance the livelihood of fishers in the area, the port in Malalag should be improved to better serve the community. It should include a fish landing facility, protective structure, additional building for administration, a cold storage, a processing area, and other support facilities. This will help the local fishers in adding value to their produce and help them compete in the open market.
- Fishery development efforts should be divided toward increased production to meet the recommended nutritional requirements of the growing population. Specifically, the objectives shall be the intensified production of brackish and freshwater ponds, increased catch per unit effort of sustenance fishermen, and rehabilitation of depleted marine grounds.
- Existing areas for milkfish and prawn farms should be maintained. The expansion of areas shall not be encouraged considering the alarming condition of mangrove areas.
- The CRMP should be expanded to cover municipalities along the MBA. This program aims to manage multiple and conflicting uses of the coastal zone which is a priority site for ports, industrial facilities, urban development, agriculture and waste disposal as well as tourism and fisheries.
- Post harvest and credit facilities should be provided to support fishery development. Efforts should be made to rehabilitate coral reefs through the construction of artificial coral reefs along the coastal municipalities.
- Strict enforcement of fishery laws should be strengthened to curb dynamite fishing and other illegal fishing practices.
- Since the marine habitat is already experiencing deterioration, reduction of pressure is an urgent need. This means that land-use planning for industrial uses must be focused on areas far from the coastal zone. Policies must regulate the habitation of the foreshores and coastal lands. To curb the rate of siltation of the bay, it is necessary that the community embarks on stream bank stabilization projects that use natural barriers instead of the purely structural approach.

In an effort to support CRM, the five municipalities in the MBA have enacted their individual fishery ordinances. The CRM best practices of each municipality include:

#### Hagonoy

- Functional marine sanctuary
- Organization of FARMCs
- Establishment of municipal and *barangay* tree parks, planting of trees and bamboos in critical land areas, particularly river banks
- Strong and functional linkage with POs and the private sector in the implementation of environmental and development programs and projects
- Continuing in-depth studies on sand and gravel extraction
- Mangrove rehabilitation program implemented in partnership with the provincial LGU and the private sector (Malalag Ventures Plantation, Inc. and Lapanday Development Corporation)

#### Malalag

- Organization of FARMCs and *Bantay Dagat*
- Establishment of fish sanctuary
- Appointment of MBA-PAIC coordinator
- Effective coastal law enforcement program
- Implementation of pollution control and existing ordinances

#### Padada

- Functional marine sanctuary
- Organization of FARMCs, DPW and *Bantay-Dagat*
- Strict implementation of fishery ordinance

#### Sta. Maria

- Enforcement of laws against illegal fishing: dynamite, poisoning, and unprescribed fishing gear
- Engagement of fishermen in aquaculture development (e.g., seaweed project jointly implemented with Regional Fishermen's Training Center)
- Implementation of the clean-and-green program of the government

#### Sulop

- Oyster culture and milkfish production
- Organization of BFARMCs and MFARMCs
- Strict enforcement of fishery laws and ordinances
- Regular patrol boat monitoring operation in Sulop municipal waters

#### **SUMMARY**

Malalag Bay typifies a once-rich ecosystem now ravaged by the misuse and abuse of the people who live and profit from the bounty of the sea. The resource and environmental issues of immediate importance for Malalag Bay management are the incidence of destructive fishing and overfishing. Intense exploitation of marine resources has caused the degradation of the coastal environment of the MBA. Malalag Bay's live corals once covered 1,134 ha — this area has been reduced to a mere 113 ha, primarily because of the prevalence of illegal fishing practices, siltation, deforestation, chemical wastes from agriculture and fishponds, and occasional oil spills from docked vessels and motorized fishing boats. To reverse the trend, the government has imposed a ban on compressors, established a fish sanctuary in a 50-ha area, promoted mangrove planting, and intensified public information including an anti-littering ordinance.

Given the management issues and opportunities as discussed in this chapter and the value of resources at stake, appropriate planning for sustainable management is the only alternative for maintaining the viability of the MBA. The plan shall analyze the important issues, the status of the resources, and management opportunities and synthesize this information into actions necessary to halt the degradation of the MBA and its resources. It should be an integrated plan which can only be effective if management is implemented in an integrated manner with strong political support.

