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MDG 7: ENVIRONMENTAL SUSTAINABILITY

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Introduction

Oceans with declining fish yields or producing unsafe fish; lands that have become unproductive; polluted streams that could no longer provide safe drinking waters; degraded ecosystems unfit for residential and other purposes - these are the major causes of impoverishment, natural disasters, hungers and diseases (WSSD Report, Johannesburg, 2002). The bedrock of human survival and economic development therefore, is a sustainable environment.

Philippine population can grow to 128M by 2025. The government will continue to have serious economic and environmental problems arising from rapid population growth and its accompanying or consequential environmental and other problems. Environment, population and development are very much inter-related.

This paper is a synthesis of the country's efforts in relation to MDG 7 (Environmental Sustainability) that were gathered through the National Academy of Science and Technology (NAST) series of roundtable discussions (RTDs) on the topic.

Objectives:

1. To present the status of the Philippine environment from available data and information as basis for evaluation of its sustainability;
2. To assess Philippine progress towards the achievement of the goal and indicators of MDG 7 (Environment Sustainability); and
3. To recommend actions that could enhance achievement of MDG 7 and as needed, additional goals and indicators relevant to MDG 7 and other related MDGs.

Methods

Since the "Environment" is a large and complex unit, the review of its status was divided into three sectors, namely: 1) The Upland/Agriculture and Forest Ecosystems; 2) Urban and Industrial Ecosystems; and 3) Aquatic (Freshwater and Marine) Ecosystem.

Roundtable discussions (RTDs) were held for each of the three ecosystems wherein invited speakers and discussants presented papers on

the review of the status of these environments and the relevant MDGs and indicators. Representatives from various sectors, i.e., academe, appropriate guest agencies, DENR, DA-BFAR, DOST, DILG and NGOs, such as Conservation International, participated in these RTDs.

Availability of data and applicability of the MDG 7 indicators in environmental sustainability were also considered in these RTDs in order to assess how far the Philippines had continually addressed/achieved these goals/indicators. Specific recommendations were made to further enhance the achievement of these goals and indicators.

The synthesis of the outputs of the abovementioned RTDs on MDG 7 has been made by the authors and additional data and information have been included in order to address some gaps and to critically assess the Philippine MDG 7 indicators and achievements.

Status of the Philippine Environment and Key Problems/Issues

A. Forest Ecosystem

The country's total forest cover is about 7.168M has. based on estimates in 2003, 6.52M has. of which are in forestland and 0.64M has. in private lands, while 0.329M has. are in plantations. In 2007, about 1.85M has. were declared protected areas. About 6.0M has. of forestlands were titled as CADT/CALT. Growing stock decreased from 1,446M m^3 in the year 2000 to 1,248M m^3 in 2005. Commercial growing stock also decreased from 446M m^3 in 2000 to 387M m^3 in 2005. About 500,000 has. are critical watersheds that need to be rehabilitated (Table 1).

Table 1.**State of Forestry**

Forestlands titled as CADT/CALT	6.0M ha
Total area under production status	7.809M ha (under various tenure-holders)
Growing stock	1446M m^3 (2000), 1248M m^3 (2005)
Commercial growing stock	446M m^3 (2000), 387M m^3 (2005)
Estimate of critical watersheds that need rehabilitation	About 500,000 ha
Estimated forest cover	5.932M ha (2001), 7.168M ha (2003)
Forest cover in forestlands	6.52M ha
Forest cover in private lands	0.64M ha
Estimated plantations	0.329M ha (2003)
Proclaimed protected areas	77 (covering 1.85M ha)

Source: Tesoro, F.O. 2010. Philippine Forestry Outlook Study 2010.

Forests serve as sources of water and have recreational/tourism functions. Products from the forest include log, wood, herbal medicines and body care. About 8.142M households in the Philippines use wood for cooking with an average annual consumption of 1.804 kg per family of 6 members per family or 0.6 m^3 per capita. Rural household per capita annual consumption of wood as energy source is 380 kg; while urban household per capita consumption is 339 kg (Table 2.).

Table 2.**Wood as energy source.**

Total number of households that use wood for cooking	8.142M
Average annual consumption per family	1.804 kg (at 6 per family)
Average consumption per capita	0.6m^3
Average annual total consumption of fuelwood	29.38M m^3
Rural household per capita annual consumption	380 kg
Urban household per capita annual consumption	339 kg
Potential fuel/wood supply	26.38M m^3 (10.00M m^3 from forest, 15.00M m^3 from agricultural areas, 1.2M m^3 from wood wastes)

Source: Tesoro, F.O. 2010, op.cit.

According to Cruz (2010), "the sustainability of upland areas is a major pillar of the sustainability of lowland areas, particularly agricultural areas, together with coastal and marine ecosystems, and therefore, underpins not only the protection of the environment but also food security, livelihood security, human health and in general, human well-being." (Figure 1)

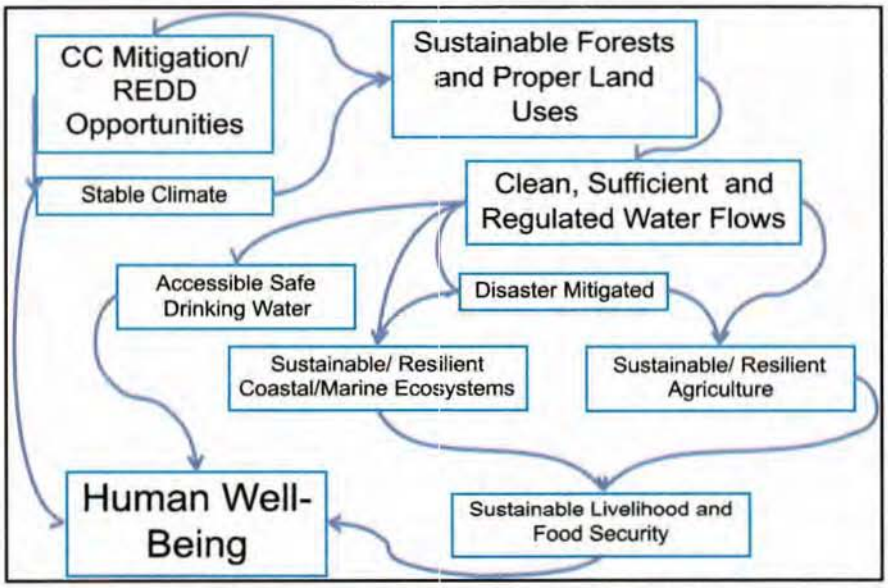


Figure 1. **Downstream Benefits of Sustainable Forests.**
Source: Cruz, R.T.D. 2010.

Cruz (2010), maintains that while the role of deforestation has slowed down somewhat since 1996, the threat of deforestation in the country's remaining forests continues to be a serious concern in promoting the sustainability of the land and other forest resources.

Impacts of Forest Cover Loss: Cruz (2010) lists the impacts of decline in forest cover as: (1) increase loss could easily amount to a conservative $ 28 billion; (2) biodiversity loss – the Philippines is regarded as one of the critical hotspots with more than 800 of its plants and animals species threatened with extinction; and (3) soil loss – 21 percent of agricultural lands and 6 percent of non-agricultural lands throughout the country assessed as moderately or severely eroded.

Key issues/problems in Forestry include: 1) continued poaching and illegal logging; 2) limited government support for rehabilitation of watersheds; 3) conflict, in land-use; 4) poor management of protected areas and forests in ancestral lands; 5) imbalance between forest production and protection; and 6) fast-tracking of forest plantation needs to meet the continued increasing demand for environmental goods and services, e.g.,

water, conservation of biodiversity, recreation and ecotourism. Aside from having action plans to address climate change impacts on the forest, priorities for strategic actions are: 1) passage of the Sustainable Forest Management Act; 2) develop effective governance in the sector including improvement of investment climate in the sector; 3) paradigm shift in the perception of DENR of the forest from regulatory to development, harmonized with conservation efforts.

Agricultural Lands

The most important crop in the Philippines is rice which is a staple food. Estimates made for Philippine agricultural area where "palay" has been farmed and harvested from 1994 to 2006 show that there was almost the same harvest from 3.5M has. to 4.0M has. with a minor decrease in 1998 of about 3.0M has. (Fig 2.). Rice yield for the same period was also almost steady at 3.50 metric ton/ha per year (Fig 3.). Data on rice supply, consumption, and importation from 1990 to 2006 reveal that there has been a parallel increase of consumption and importation, i.e., from 6.0M metric tons to 10.0 M tons and 12.0M metric tons, respectively, in 2008 (Fig. 4.). Recent claims that there was over-importation are contrary to the government's earlier decision (i.e., during 2008-2009) to import huge amounts of rice to meet the global problem of rice shortage and to have buffer stocks for the long El Niño event in 2009-2010.

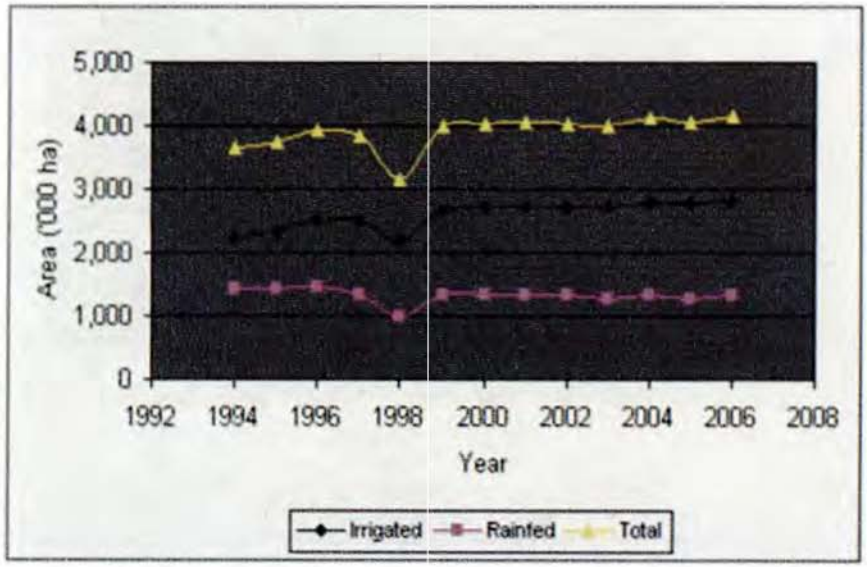


Figure 2.**Philippines Palay Harvested ('000 ha): 1994 to 2006.**
Source: Angeles, D.E. 2010.

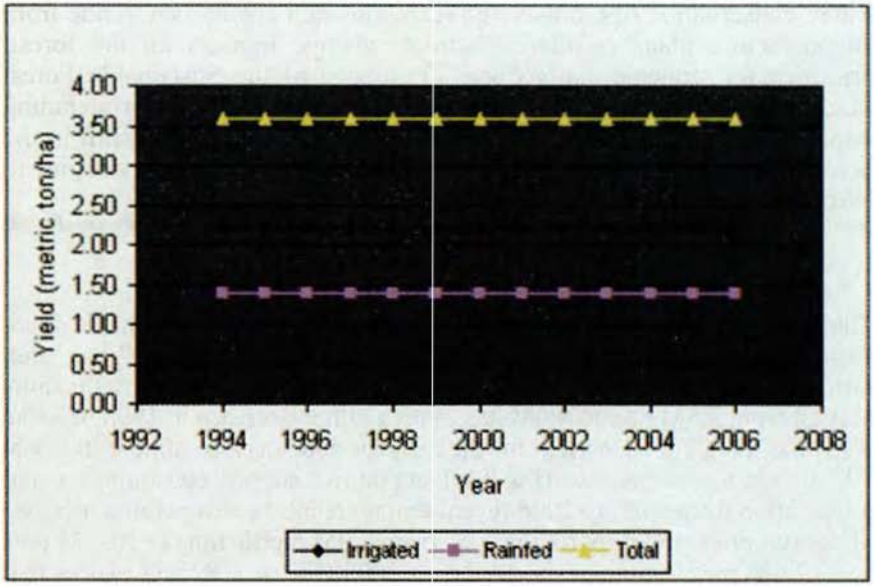


Figure 3.**Philippine rice yield (metric ton/ha): 1994 to 2006.**
Source: Angeles, D.E. 2010.op. cit.

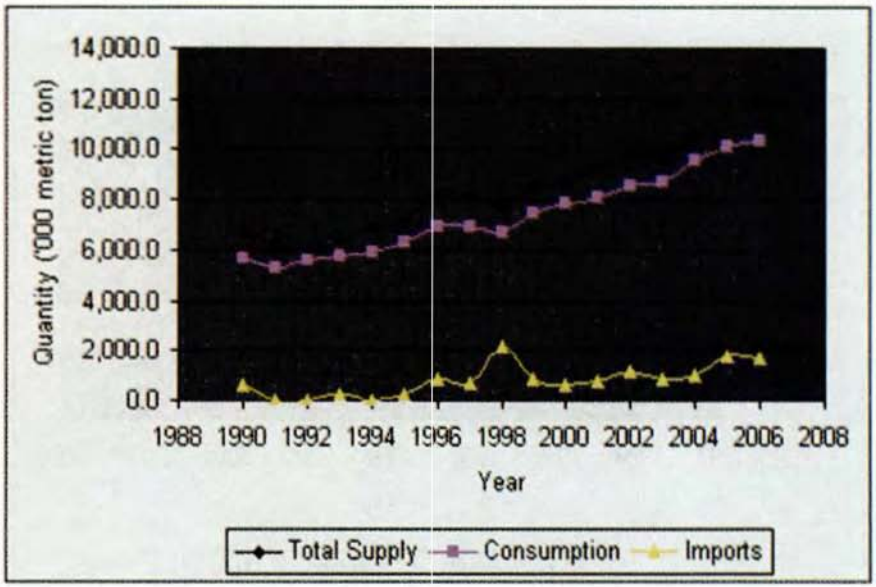


Figure 4.**Philippine rice supply, consumption and importation ('000 metric ton): 1990 to 2006**
Source: Angeles, D.E. 2010.op. cit.

The major concerns/problems in Philippine Agriculture particularly in rice production are:

1. Land Use/Urbanization
   - Reduction in the number of farms in 2000 by about 289,000 has. of rice lands that had been legally and illegally converted to residential (37%) and mixed residential areas (31%) out of the total 43,141 has in 2004.
2. Low productivity
   - Brought about by intertwining technical, social, political and environmental factors including climate change – According to the DA, in 2010, about PhP 10B was lost from prolonged El Niño, and 5.5B and 45.3M, respectively, due to typhoons Ondoy and Pepeng.
3. Environmental degradation
   - Due to increasing population, land conversion to residential and intensive agriculture lead to infertile soil, prolonged dry season due to El Niño and too excessive rainfall during the La Niña event that followed.
4. Poor infrastructure/Lack of Irrigation
   - Present status shows that 1.53M has. have not been irrigated and 1.6 M ha. need rehabilitation.
5. Low R &D investment particularly on rice variety development, and on post-harvest facilities. Further, weak extension work should be addressed to help farmers with their problems.
6. Graying of farmers (the Filipino farmer's average age is 56 years) and declining interest in agriculture education (as shown by low enrolment in agriculture degree programs).

Strategies for Improved Agriculture/Rice Production

For Philippine food security, it is estimated that by 2025, 21M tons of "palay" are needed to feed 128M Filipinos; hence, 6.65M has. need to produce 4 metric tons/ha (4 metric tons/ha to produce 6 m tons per ha) in order to attain national self-sufficiency (Angeles, 2009). How could this food security be possibly attained? Foremost among the approaches recommended are: 1) to support agriculture R & D and extension and encourage the pursuit of college agricultural education to increase local manpower/expertise on local problems/needs; 2) address pest and disease problems affecting agricultural productivity including those attributed to climate change; 3) expand area for rice production, and review and put on

hold land conversion; 4) promote product diversification; and 5) approve and implement the proposed "Sustainable Agriculture Act". On the social aspect, population size/growth should be addressed because it is the primary factor influencing food security (Angeles, 2010).

Issues

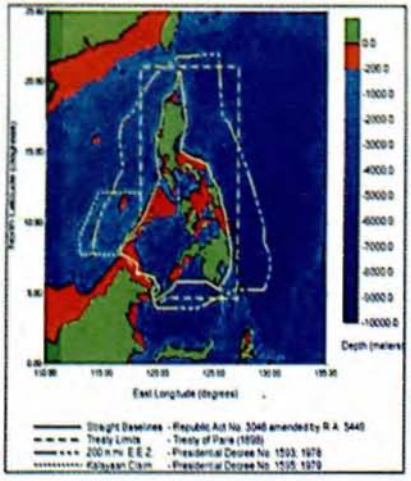
In sum, the following issues (Cruz, 2010) are critical to the sustainability of the country's land and other natural resources.

1. Absence of an integrated national agenda for sustainable development;
2. Absence of a comprehensive national land use policy;
3. Unrealistic land classification system;
4. Inadequate resources to manage all forestlands;
5. Need to reform the property rights system;
6. Imperfections in the devolution of forestlands to government agencies;
7. Unrealistic watershed protection strategies;
8. Absence of adequate database and information system;
9. Absence of a clearly defined boundary of permanent forestlands;
10. Inadequate participation of key stakeholders in land use planning; and
11. Ineffective forestland use planning due to the absence of specific policies.

Coastal/Marine Ecosystem

The Philippines has about 17,460 kms coastline with a territorial sea (up to 12 nautical miles) of 679,800 km^2; including the Exclusive Economic Zone (**EEZ**) the territorial water is 2.2M km2; the coastal waters is 266,000 km^2 and oceanic water is 1.394M km^2; about 66 of the provinces are coastal where 55M (2007) people live (Fig.5).

Fish provides 67 percent of protein requirements for Filipinos; hence, adequate and sustained supply (or alternatives could be provided) as shown in Figure 6 especially for the nearshore communities. Other services and goods from the sea include marine natural products, recreation and ecotourism, transport and renewable energy. It is quite sad that the 2006 official poverty statistics showed that fishermen, farmers and children comprised the poorest three sectors in 2006 (Fig. 7).



Resource Category	Quantity
Total Land Area	300,000 km^2
Number of Islands	7,107 Islands
Length of Coastline	17,460 km
Territorial Sea (up to 12 nautical miles)	679,800 km^2
Territorial waters incl. EEZ	2.2 million km^2
Coastal waters	266,000 km^2
Oceanic waters	1.384 million km^2
Shelf area (depth 200m)	184,600 km^2
Coastal provinces	66 or 82% (out of 81)
Coastal municipalities	822 (out of 1,502)
Total Population	94.01 million (2010)
Total coastal population	55 million (2007)
Coral Reefs	27,000 km^2
Sea Grass Beds	978 km^2
Swamplands (brackish and freshwater)	2,460.63 km^2
Existing Fishpond (brackishwater)	2,393.23 km^2
Lakes and Reservoirs	2,190 km^2
Rivers	310 km^2
Flora & Fauna in Wetlands	1,616 (flora); 3,308 (fauna)
Diversity in Marine Ecosystem	17,281 species (flora and fauna)

Figure 5.**Aquatic resource profile of the Philippines**
Source: Philippine Environment Monitor 2005, http://www.bfar.da.gov.ph/styles/Publications3/f_resources (07).htm.

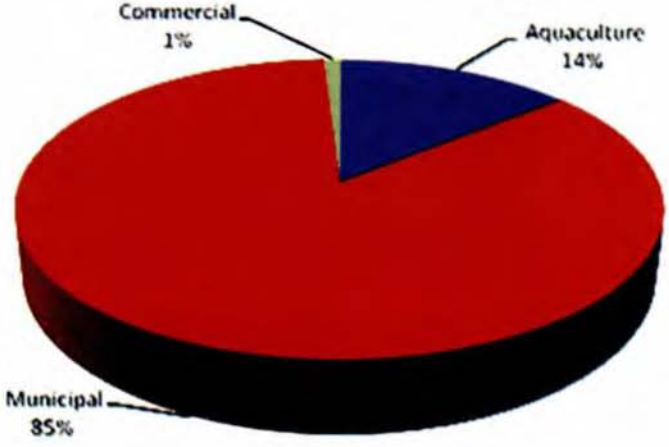


Figure 6.**Consumption to employment per fishery sector**
Source: Census of Fisheries, 2002.Preliminary results.

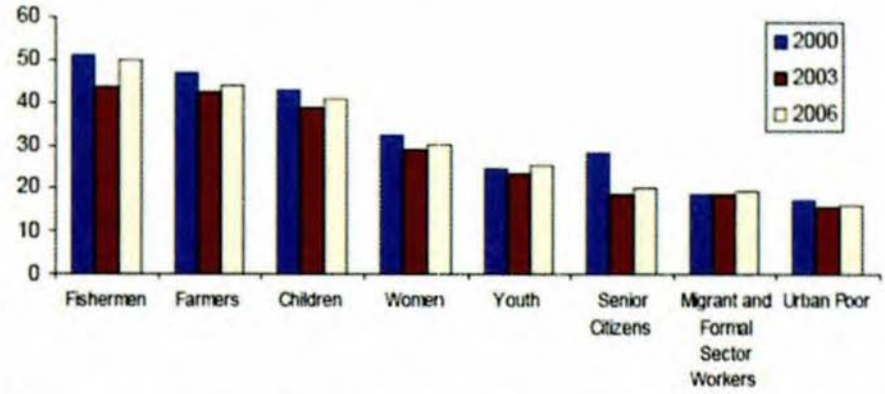


Figure 7. **Poverty incidence among the basic sectors: 2000, 2003 and 2006**
Source: National Statistical Coordination Board, User's Forum in: Castro, 2009.

Data on Philippine Fisheries Production (BAS, 2010) show that from 1998 to 2009, commercial and municipal fisheries stayed at one million metric tons while aquaculture rose from 1.0 to 2.5M in 2009 (Fig. 8). Nearshore waters of the country were heavily exploited as indicated by data from 1980 to 2000 (Edralin et al,. 1987; Green et al., 2003). This is not surprising since fishing is the major source of food security and livelihood of the coastal people. About 85 percent of the labor force is involved in municipal fisheries.

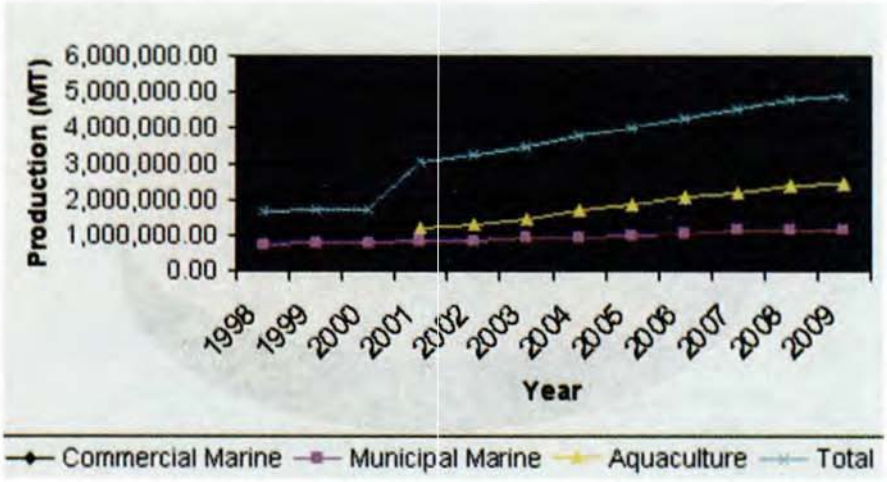


Figure 8.**Philippine fisheries production, by type**
Source: Bureau of Agricultural Statistics, 2010.

The Philippines has an adequate legal and policy framework to protect its aquatic resources and promote sustainable development (Juinio-Menez and Toribio, 2010). As depicted in Figure 9, Philippine laws and policies on the environment, described by GEF (2008), are well-developed comprehensive and generally up-to-date. The Philippine Constitution has specific provisions on natural resources conservation and protection reflecting both the ecological and equity goals.

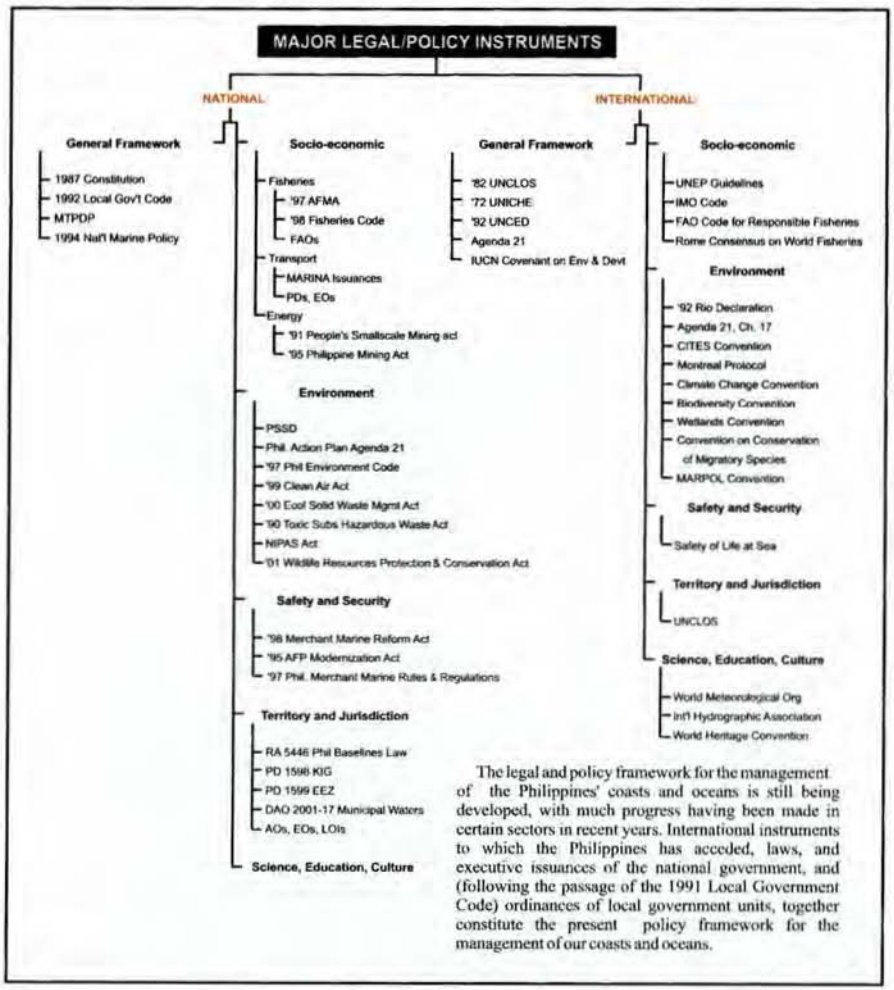


Figure 9. **Major legal/policy instruments covering the coastal and marine and other aquatic ecosystems in the Philippines.**
Source: Junio-Menez, Marie Antonette and Maria ZitaToribio, 2010.

Major threats to ensuring sustainability of aquatic ecosystems (cited by Juinio-Menez and Toribio, 2010) include:

1. Climate change;
2. Invasive alien species;
3. Improper and unsustainable freshwater and mariculture practices; and
4. Increasing population, urbanization and unregulated coastal development.

The 2005 Philippine report of the Biodiversity Indicators for National Use (BINU) indicates a declining trend in the state of most Philippine coastal and marine ecosystems, echoed by the World Bank in its assessment published in the Environment Monitor 2005. A summary of the status, challenges, and opportunities is provided in Table 3 for each of the MDG 7 targets and indicators.

Table 3.**Challenges and opportunities in meeting MDG 7 on aquatic sustainability**

Status	Challenges	Opportunities
Target 7a: Integrate the rinciples of sustainable development into country policies and programmes; reverse loss of environmental resources		
Target 7b: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss		
• sufficient policies and programmes • country accession to/ ratification of pertinent multilateral environment agreements (e.g. CBD)	• insufficient budget and trained manpower • weak capacity & system for threats and biodiversity monitoring • decline in external funding • weak governance of ENR sector • overlapping and conflicting mandates • increasing poverty & population growth	• increasing initiatives by LGUs and stakeholders • increasing number of LGU alliances and multisectoral network support • increasing effort to provide institutional mechanism • Increasing working models in aquatic management
Indicator 7.1 Proportion of land area covered by forest (mangrove)		
• increase in cover starting 2005	• widespread improper planting practices • monitoring and review system for FLAs • reversion of idle /underutilized fish pond to mangrove areas	• multi-sectoral mangrove reforestation initiatives

Indicator 7.4 Proportion of fish stocks within safe biological limits		
• stocks generally heavily/over exploited • increase in fish biomass inside marine protected areas and adjacent area • reported increase in gear/species catch in specific	• reliable stock assessment and monitoring (finfish and invertebrates) • poor implementation of fishery laws	• emerging good fisheries management approaches & practices within integrated CZM
Indicator 7.6 Proportion of terrestrial and marine areas protected		
• coastal and marine areas degraded • increasing marine areas declared under NIPAS • increasing number and size in local initiatives on MPAs	• NIPAS PAs cover less than 50% of scientifically identified conservation priorities/current system covers many non-priority areas • low percentage of effectively managed declared protected area (national and local)	Established national data bases, publications on MPAs monitoring programs multi-sectoral MPA initiatives (e.g. MPA networks)

Source: Juinio-Menez, M.A. and M. Z.Toribio, 2010.op. cit.

Integrated coastal management is the national strategy for the sustainable development of the country's coastal and marine environment and resources; interlinks among watersheds, estuaries and coastal seas by all relevant national and local agencies, civil society and private sectors (Custodio, 2010). It includes the establishment of Marine Protected Areas (MPAs) to increase fish stock and prevent overfishing. As of 2007, about 1169 MPAs were existing and 164 are proposed, compared to 10 years ago (439 existing and 139 proposed). The size of MPAs has also increased from 11 to 100 has. Management effectiveness of MPAs has increased to 30 percent in 2007 from 10-15 percent in 2000 (Arceo et al., 2008). Various conservation strategies/framework for different communities/groups (seagrass, corals, pawikan) have been drawn but need full implementation and monitoring. Ecotourism development has been fast-tracked, for example – the Palawan Council for sustainable development and Tubbataha Reef Protected Area Management Bureau have been established and are functional.

Specific Concerns

1. Biodiversity data gaps in many coastal and marine ecosystems should be addressed; including poor implementation of laws and policies on species and ecosystem diversity;
2. Enhance LGU capacity to implement and monitor ICM plan;
3. Capacity building for ecotourism adaptation to climate change;

4. Efficient and effective information dissemination; and
5. Harmonization of efforts on sustained management intervention and stakeholders support – a ridge-to-reef framework, i.e., upland to lowland-coastal interaction

Inland (Fresh) Water Ecosystem

The country's inland waters (surface and ground) consist mostly of lakes (200,000 has), rivers (about 21,000 has) and swamps (106,328 has) for a total of 337,328 has or 44 percent inland waters (Table 3). These freshwater bodies have major social importance (domestic water supply, cultural usage for recreation). Their economic importance includes water being used as energy source and for navigational, agricultural, aquacultural and industrial purposes. Environmentally, fresh water bodies are carbon sinks and link between the land and marine waters; and generally act as catch basins in the land environment. There are lesser known freshwater bodies where appreciation and information are lacking (e.g., peat lands, etc.).

Table 4. **Proportion of surface natural freshwater bodies in the Philippines.**

Freshwater bodies	Hectares (has)
Lakes	200,000
Rivers	31,000
Swamps	106,328
Total	200,000 (44% of inland waters)

Source: Guerrero, R. 2010. *Philippines Lakes and other Natural Freshwater Bodies: Status, Gaps and Recommendations.* Paper presented at the March RTD on MDG 7.

The major environmental concerns in these inland freshwater bodies are: 1) loss of biodiversity from natural and anthropogenic causes; 2) pollution from domestic, agricultural, and industrial run-off; 3) sedimentation; and 4) conflict of use from weak governance. Recent great floods in Metro Manila and environs brought about by typhoons were said to be partly due to untimely release of waters from the dams/ fresh water bodies.

The Protected Areas and Wildlife Bureau (PAWB) reports (2010) that conservation efforts which include clean-up or dismantling of illegal structures, watershed rehabilitation, etc., "Sagip Ilog" projects have been implemented in 19 priority river basins. The Candaba swamp, for example, has been declared as a bird sanctuary and is being protected for its ecological role and biodiversity.

Due to lack of national integrated data and regular monitoring (lack of capacity of LGUs); inconsistent policies; there is a need to formulate a national Wetland Action Plan.

Urban areas

Urban areas in the country are generally overpopulated with solid waste management problems and air pollution that affect the health of the people. The air quality measured in 2004 in eight Air operating stations in Metro Manila (NCR, parts of Region III and IV) showed that ambient air quality was within the standard of Nitrogen oxide (NO_2), Carbon monoxide (CO), Sulfur dioxide (SO_2) and ozone. Total suspended particulates (TSP) in 2003 air quality, however, were not within standards. There is an increasing trend of air pollution by 2010. Natural and man-made disasters like floods exist in urban areas. Flooding is aggravated by encroachment of water ways by informal settlers. Existing waterways need to be replaced/rehabilitated. Water exits lack the capacity to meet the challenges of recent strong typhoons that bring heavy rainfall.

Pollution and Waste

Pollution, however, remains a problem in the country's major urban centers (Matias, 2010). It is projected that the volume of air pollutants will continue to increase due to greater industrial activity, heavy traffic and the large number of vehicles plying the streets, many of which are smoke-belching public utility vehicles.

An average Filipino generates 0.3 and 0.5 kg. of garbage daily in rural and urban areas. This means that every person living in the metropolis generates a half kilo of waste per day. With an estimated population of 10.5 million, the total waste generated in Metro Manila alone could run up to 5,250 metric tons per day.

Access to Safe Drinking Water and Basic Sanitation

According to the 2004 Annual Poverty Indicators Survey, at least eight out of 10 Filipino families meet the minimum basic needs (MBN) for survival which, in this survey, is measured by access to safe drinking water, presence of electricity at home, and use of sanitary toilet (Matias. 2010).

Data from surveys conducted by NSO suggest that access to safe drinking water and access to sanitary toilet facilities had slightly improved over the years.

Eighty percent of the total families in the Philippines have access to safe drinking water, 86 percent have sanitary toilets, and 80 percent have electricity in their homes.

Non-poor families have better access to safe drinking water (86%) and more likely to have a sanitary toilet at home (93%) as compared to 65 percent and 70 percent, respectively, among poor families.

The MDG target for 2015 is to ensure that 86.8 percent of the population will have access to safe water and 83.8 percent will have access to a sanitary toilet facility. Given the current trend, there is a high probability that the targets will be achieved.

Based on the 2004 APIS, the target for access to sanitary toilet facility, which is at 83.8 percent, has been achieved.

The MTPDP 2004-2010 had actually set a target higher than the 2015 MDG targets. These were 92 percent to 96 percent for safe drinking water and 86 percent to 91 percent for sanitary toilet facilities.

In 2006, it was estimated that 96 percent of the population had access to safe drinking water.

Significant Improvement in the lives of Slum Dwellers by 2020

In 2004, the informal settler families (squatters) nationwide were estimated to number 675,000, 14.6 percent higher than the 2002 figure (588,853 families) as gleamed by Matias (2010) from a UNDP Report. More than half of these informal settlers (51.8%) were located in the NCR, Region 6, CALABARZON and Region 5. The regions with the least number of informal settlers were Region 1, CAR and MIMAROPA.

In pursuit of the MDG targets, the Philippine government and the private sector had provided security of tenure (e.g., house and lot, house only or lot only) to 710,203 households from 2000 to 2006.

Concerns/Issues

1. Full implementation of national strategy and action plan for water supply and sanitation.
2. Monitoring and sustained implementation of Ecological Solid Waste Management Act.
3. Streamlining of EIS for the development of eco-friendly industries
4. Efficient and effective implementation of "Polluters/ Users Pay" policies and guidelines.

Philippine Biodiversity

The Philippines is one of the world's mega-diversity centers resulting from its insular and tropical nature. There are diverse microhabitats in land and water ecosystems. Biodiversity must be conserved and well managed in order that the goods and services from the environment can be sustained. One major mechanism of doing this is through the National Protected Area System (NIPAS) under the overall management of the DENR and local management of LGUs. As of 2010, a total of 109 areas have been "protected" under NIPAS, with 2.92M hectares of the total 30M hectares of land and about 1.61M hectares of marine areas. Most of the marine areas are in Bohol, Cebu, Negros Oriental, Samar, Leyte, and Antique. The marine reserves, however, fall short of the required 25 to 35 percent of our 25,000 km^2 of coral reef areas that need to be protected to get meaningful and faster results to protect/ stabilize biodiversity and enhance productivity of these areas. Functionality of these protected areas has not been well determined except for those in the Visayas (Alcala *et al.*, 2008).

Endemism which is quite high for the country has been threatened by various natural and man-made activities resulting in loss of their natural habitats and illegal collection for local and international trade. The country, therefore, is on a "hot spot' list because of the continued rise in the number of threatened endemic and other species (IUCN Red List).

Present MDG 7 Targets and Indicators

This section attempts to summarize available information and data on the Philippine targets and indicators relating to MDG 7.

> **Target 7a.** "Integrate the principles of sustainable development into country policies and programs, reverse loss of environmental resources".

MDG targets 7a and 7b have been tightly integrated into the Medium Term Development Plan of the Philippines (MTDPP) – 2004 to 2010 – with "Philippine Agenda 21" as guiding document (Table 5).

Table 5. **National targets and indicators for UNDP MDG 7 under Philippine Agenda 21.***

Goal 7. Ensure Environmental Sustainability from Agenda 21				
		1990	**2006**	**2010**
Target 9	Principles of Sustainable Development Integrated into country policies and programs to revised the loss of environmental resources			
pIndicator 25	Proportion of land areas covered by forest	**20.5**	**52.6(?)**	-
Indicator 26	Ratio of protected to maintain biological diversity to surface area	**8.5**	**12.7(?)**	-
Indicator 27	Energy use (kg oil equivalent) per $ GDP	-	-	-
Indicator 28	Carbon dioxide emission (per capita) and consumption of ozone-depleting CFCs	**2981**	**681(?)**	-
Indicator 29	Proportion of population using solid fuels	**66.2**	**42.1(?)**	-
Target 10	Halve by 2015, the proportion of population without sustainable access to safe drinking water and improved sanitation			
Indicator 30	Proportion of the population with sustainable access to safe water source urban and rural	**73.0**	**86.5(?)**	-
Indicator 31	Proportion of household with sanitary toilet facility	**67.6**	**83.8(?)**	-
Target 11	By 2020 have achieved significant improvement in the living 100 million slum dwellers			
Indicator 32	Proportion of household with access to secure tenure	**91.0**	**81.2(?)**	-

**Data from National Statistical Coordination Board (NSCB), 2009, MDG Watch: Philippines' Progress based on the MDG Indicators, <http://www.nscb.gov.ph/mdg>.*

Table 5 shows Philippine Agenda 21 national targets and indicators for MDG 7. The present authors have reservations on the data by placing question marks (?) beside them. There is a need to further review these data and to revise indicators to show exactly what the data reveal or mean as in indicators 25 and 26 in the table.

Target 7c. Reduce by half the proportion of people without sustainable access to safe drinking water and basic sanitation

7.9 Proportion of population using improvised drinking water source = NSO data suggest that 80 percent (high) has so far been achieved but again doubts could be raised because these might not include those in rural and far flung areas. Also the quality of the water available should be a government concern.

7.10 Proportion of population using an improvised sanitation facility = NSO data show 86 percent with sanitary toilets; percent with electricity (high). The present authors also raise concern on these data because even in the metropolis informal settlers do not have access to sanitary toilets.

It was also mentioned in the MTDPP - 2004-2010-2015 - report that higher targets were set for 2015 which are 92 to 96 percent for safe drinking water and 86 to 91 percent for sanitary toilets.

Target 7d. Achieve significant improvement in the lives of at least 100 million slum dwellers by 2020

7.11 Proportion of urban poor living in slums

In the Philippines from 2000 to 2006 about 710,203 urban poor are mostly found in NCR, Region 1, Region 5, CALABARZON (Region 4a) and MIMAROPA (Region 4b). Data are lacking on whether the urban poor in these areas have been relocated and given security of tenure (i.e., house and lot, house only, or lot only)

Table 6 shows the available and unavailable data to the present author.

Table 6. **Target 7b corresponding to Goal 7 of Philippine Agenda 21.***

UNDP Target 7b. Reduce biodiversity loss achieving by 2010, a significant reduction to the rate of loss.	
7.1 Proportion of land area covered by Forest	7.168 M ha in 2003 from 5.392 M Ha in 2001
7.2. Carbon dioxide emissions, total per capita and per GDP$	no data
7.3 Consumption of ozone depleting substances	no data
7.4 Proportion of stocks within safe biological limits	no sufficient/accurate data
7.5 Proportion of total water resources used	no sufficient/accurate data
7.6 Proportion of terrestrial and marine areas protected	Terrestrial- 2.92 M Ha out of 30 M Ha of land (9.7%) Marine-1.61 M Ha
7.7 Proportion of species threatened with extinction	no sufficient/accurate data but for 111 amphibian species, ca 20% (Stuart *et al.* 2004; Stuart *et al.*, 2008)
7.8 Proportion of population using solid fuels	53%

**Data from United Nations Development Programme Philippines (UNDP Philippines), 2007. The Millennium Development Goals (MDGs), Goal 7: Environmental Sustainability, <http://www.undp.org.ph>.*

Recommendations for MDGs 1 to 6 Related to MDG 7: Environmental Sustainability

MDG 1

Target 1: The poor in the Philippines have limited/no access to environmental resources and services from which they hope to benefit for survival and livelihood. Often, they occupy areas which are subject to erosion, flood and other forms of degradation. They are the downstream recipients of externalities of other sectors. The Filipino poor demographically are in coastal areas (IV-B-MIMAROPA and ARMM); and the poorest are the fishermen and farmers

Target 2: Population density problem is of prime consideration to address hunger and food security. Undernourished mothers and children are prevalent in coastal communities. Population stresses on coastal and other ecosystems (and resources) also negatively impact food production.

Aquaculture and agriculture should be managed so as not to negatively interfere with the natural functions of the ecosystem, particularly biodiversity, which primarily is the basis of life support for the poor.

MDG 2: Primary education should include comprehensive and relevant modules/concepts of environmental sustainability (also as antipoverty mechanism).

MDG 3. Women could be excluded as equal beneficiaries of Biodiversity, especially in food collection efforts. In coastal (and forest) environments they have been marginalized or have lesser access to commercializable species and regulated to low quality/small size and quantity (species and biomass). Stewardship of land and water resources/utilization of services should be awarded to women.

MDGs 4, 5, 6: Reduction in child mortality and improvement of maternal health.

Number of underweight children in overfished coastal areas is high(IV-A, CALABARZON, Region IV-B MIMAROPA, IX: Zamboanga) and breastfeeding mothers are at high risk in IV-B and ARMM

Working conditions in the field should be improved /suited for pregnant and breastfeeding mothers.

Additional Targets/ Indicators for Philippine MDG 7

Additional Indicators for MDG and Philippine Biodiversity Targets
Rehabilitation or Enhanced Management of Identified Priority Areas to reverse degradation

Target 1: Halt and review land conversion from forest or agricultural to residential or mixed-residential to attain food/rice security by 2020

Indicator 1: Area of utilizable land for rice/food production
Indicator 2: Implementation of the Forest Management Act
Indicator 3: Inclusion of Eco-governance in LGU good governance

Target 2: Implementation of localized science-based mitigation for natural and man-made disasters

Indicator 1: Percent of aquaculture and agriculture areas where

carrying capacity estimates have been done/completed/ implemented

Indicator 2: Percent completion of National Geohazard Assessment and other hazard and risk assessments

Indicator 3: Number of LGUs with disaster mitigation and adaptation action plans

Indicator 4: Number of LGUs with adequate training and equipment for disaster mitigation

Summary and Conclusion

While advances have been made on biodiversity conservation and establishment of protected areas, much still has to be done for the sustainability of the Philippine environment. The "Philippine Agenda 21" initially planned a national program/path for 'harmonious integration of sound and viable economy, responsible governance, social progress and ecosystem integrity to ensure that development is a life enhancing process should be continued and sustained'.

Environment sustainability, the bedrock for economic development/sustainability, should be a major issue/agenda of the national and local government; and national strategies should provide many entry points for concerned civil society and business groups. "Buhayin ang Ilog Pasig" is one concrete example; however, harmonization and synchronization with other efforts and an audit should be done on these programs for transparency and efficiency.

Conservation plan must be dynamic, must be continually revised/updated as warranted by influx of information (Chua, 2007) and the changes in the environment – adaptive management where interventions are evaluated as to their appropriateness and effectiveness.

Philippine food security can be met by managing the environment to minimize or prevent population pressure on the environment (food production, etc.) - an ecosystem approach to agriculture and aquaculture- to restore ecosystem balance and optimize interactions between different plants and animal species for food and space (FAO, 2002).

Climate change that can cause a rise in temperature (by 0.8 to 2.6 °C), seawater surface temperature (0.5 to 3.2°C) changes lead to high frequency of extreme weathers (storms, heavy rainfall, droughts) that then can cause floods, forest fires, coral bleaching, red tides/fish kills, etc., should be

addressed through the implementation of science-based action plans at local and national levels. The government could mainstream "Climate Change Mitigation and Adaptation" in the "Philippine Development Agenda" especially for the poor whose plight is aggravated by degraded natural and man-made resource bases giving rise to widespread poverty.

Support for long term energy research and development should consider cleaner fuels, non-fossil energy and accelerated technological developments for greater energy efficiency, storage technology and development with serious consideration of environmental costs and impacts.

Priority areas and targets for ecosystem rehabilitation like reforestation should be set in consideration of the carrying capacity and interaction among resources/species in aquaculture and agriculture development.

Coastal/marine ecosystems should be integrated in both formal and non-formal education including sustainable environmental management for poverty alleviation.

Lastly, the initiatives and achievement of the country in relation to MDG goals and indicators can only be assessed well and enhanced further if sufficient and reliable data are available.

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