

STRATEGY FOR ECO-EFFICIENT WATER INFRASTRUCTURE DEVELOPMENT IN THE PHILIPPINES (Draft)

I. Introduction

Water is essential for life – it is indispensable for human wealth, health and well-being. It is crucial for sustainable development, including the alleviation of poverty and hunger and the preservation of the natural environment. Thus, it is imperative that government’s socio-economic development strategies should take into consideration the efficient and sustainable use, protection and conservation of water resources.

A. Purpose of the Strategy

The strategy is aimed at introducing the eco-efficient approach and integrating eco efficient dimensions into to government policies and plans for the development of water infrastructure in Philippines .

B. Framework for the Development of the Strategy

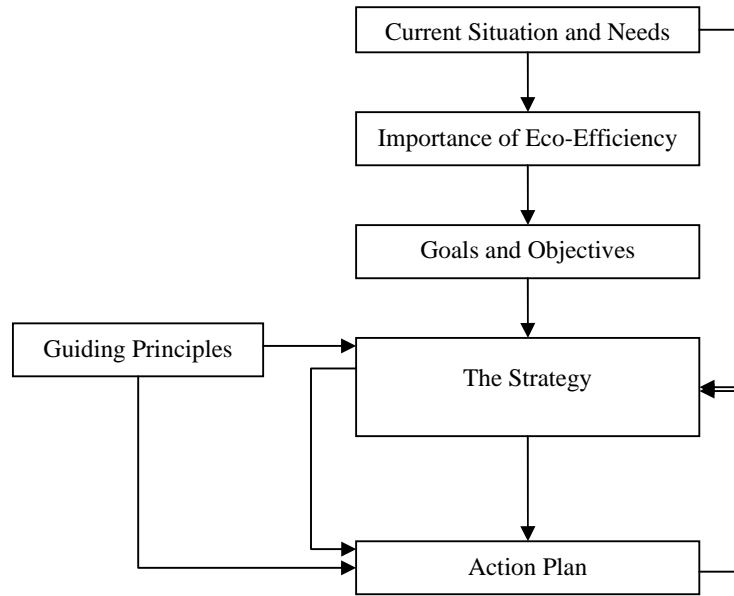
Since the eco-efficiency concept is new in terms of the socio-economic development process, the integration of the new concept will need a new development planning paradigm, which must be driven from a top-down approach and guided by the development of a new “shared vision”. The framework for the development of such strategy may take a form similar to the development of the water sector for an eco-city adopted by the Baguio City. Such a framework may need the following components aiming at different stakeholders:

1. Policy makers component will need the following elements:
Current situation and needs
Importance of eco-efficiency
Development of a vision on eco-efficiency
2. Other stakeholders component will need the following elements:
Public awareness programme
Development of a “shared vision”
3. The strategy
Goals and objectives
Guiding principles and mechanisms for integration in water subsectors (institutional frameworks)
Action plan
Monitoring and evaluation

To ensure that its individual components are derived in a logical and sequential manner, the national strategy is designed according to a framework that begins with a thorough analysis of the current situation, moves on to development of a strategy, and ends with a schedule for implementation.

The framework for the development of the strategy is shown below:

Figure 1: Framework for Strategy Development



The logic loops indicate conceptual processes embodied in the development of the strategy. Much of the consultation discussion of the viability of various actions contributed through feedback to the development of a feasible strategy.

The elements of the framework are:

Current Situation and Needs Assessment. These are conditions that require that action be taken and the factors that facilitate or constrain them.

Importance of Eco-efficiency. This provides the rationale for how the eco-efficient approach to water infrastructure development can address some of the factors that constrain the sector.

Goals and Objectives. The goals provide the definition of the ultimate mission of the strategy. The objectives are more specific aims toward which actions can be directed and satisfaction of which will achieve the overall goals.

The Strategy. The strategy defines the policies and procedures by which the goals and objectives are to be met. It involves a range of persons and organizations.

Guiding Principles. These are the principles that will guide the development of the strategy as well as the action plan.

Action Plan. This defines the actions, particularly immediate actions, needed to initiate the program to put the strategy into effect. It includes time schedules for major actions and expenditures and sets out key decision points and risks.

Further, the development of the strategy is governed by the policies of government as espoused in national development plans, legal issuances and sector plans and roadmaps. In general, the formulation process will be guided by the government policy to pursue sustainable development and, in particular, adopt the integrated water resources management (IWRM) approach in the water sector.

Sustainable development is development that meets the needs of present generations without jeopardizing the ability of future generations to meet their own needs. Sustainable development ties together concern for the carrying capacity of natural systems with the social challenges facing humanity. It puts forward an idea of progress that integrates immediate and longer-term objectives, and regards social, economic and environmental issues as inseparable and inter-reliant components of human progress.

IWRM is defined as the '*coordinated development and management of water, land and related resources to optimize economic and social welfare without compromising the sustainability of vital*

environmental systems'. A river basin approach involves water resources planning covering the hydrological boundary of the basin, followed by preparation and implementation of coordinated investment projects within an appropriate regulatory framework. Cross-sectoral issues and concerns are better addressed under such an approach as compared to the traditional individual sectoral approach to investment planning.

Both discourses must be taken up by society at large as a principle guiding the many choices each citizen makes every day, as well as the big political and economic decisions that are made. This requires profound changes in thinking, in economic and social structures and in consumption and production patterns.

C. Structure of the Report/Paper

The report is structured such that there is a logical flow in coming up with the strategy and its corresponding action plan. The report first provides an overview of the current state of the Philippine water sector, which sets out relevant information on the state of the water resource in general, and on the institutional framework, policies, infrastructure and current situation in the water supply, sewerage and sanitation (WSSS) in particular. The report then describes the key issues and constraints that hinder the sustainable development in the sector. Based on said assessment, the paper then situates the need for the application/adoption of the eco-efficient approach to address some of these challenges, briefly followed by an introduction of the eco-efficient strategy - goals, objectives and guiding principles.

A presentation of the recommended strategy to incorporate eco-efficiency in water infrastructure development at the national and local levels is presented. This will be followed by an action plan on how to kick off implementation/introduction of the strategy, including the timelines and budgetary requirements.

II. Overview of the Philippine Water Sector: Current Situation and Needs

This section provides an overview of the current situation and the needs of the Philippine water sector to provide the context within which the strategy is being proposed and the recommended reforms, policies and action plans are being based on.

A. Review of the Existing Situation

✓ Philippine Water Resources

The Philippines is rich in raw water resources, which is composed of 421 major river basins in 119 proclaimed watersheds. Together with 61 major lakes, these accumulate runoffs from rains averaging 2,400 millimeters annually. The country's groundwater reservoirs are estimated to cover about 50,000 square kilometers, while its reliable surface water supply is estimated at 833 million cubic meters per day. Based on the reported 479 billion cubic meters of Internal Renewable Water Resource for the country, 6,093 cubic meters is available per capita.

Water availability varies from island to island due to the diverse topography and geology, the uneven rainfall patterns and the quality of the natural resource environment that determines the water holding capacity of watersheds. Population distribution also affects the availability of water throughout the country, with more populous areas, particularly major urban centers like Metro Manila and Cebu City, exhibiting scarcity of supply due to the pressures of demand on the resources.

Water extraction in the country had reached 77.45 billion cubic meters per year in 2003. Water allocation is greatest for the agriculture sector at around 88%, with domestic use accounting for 8% and the industrial sector for 4%.

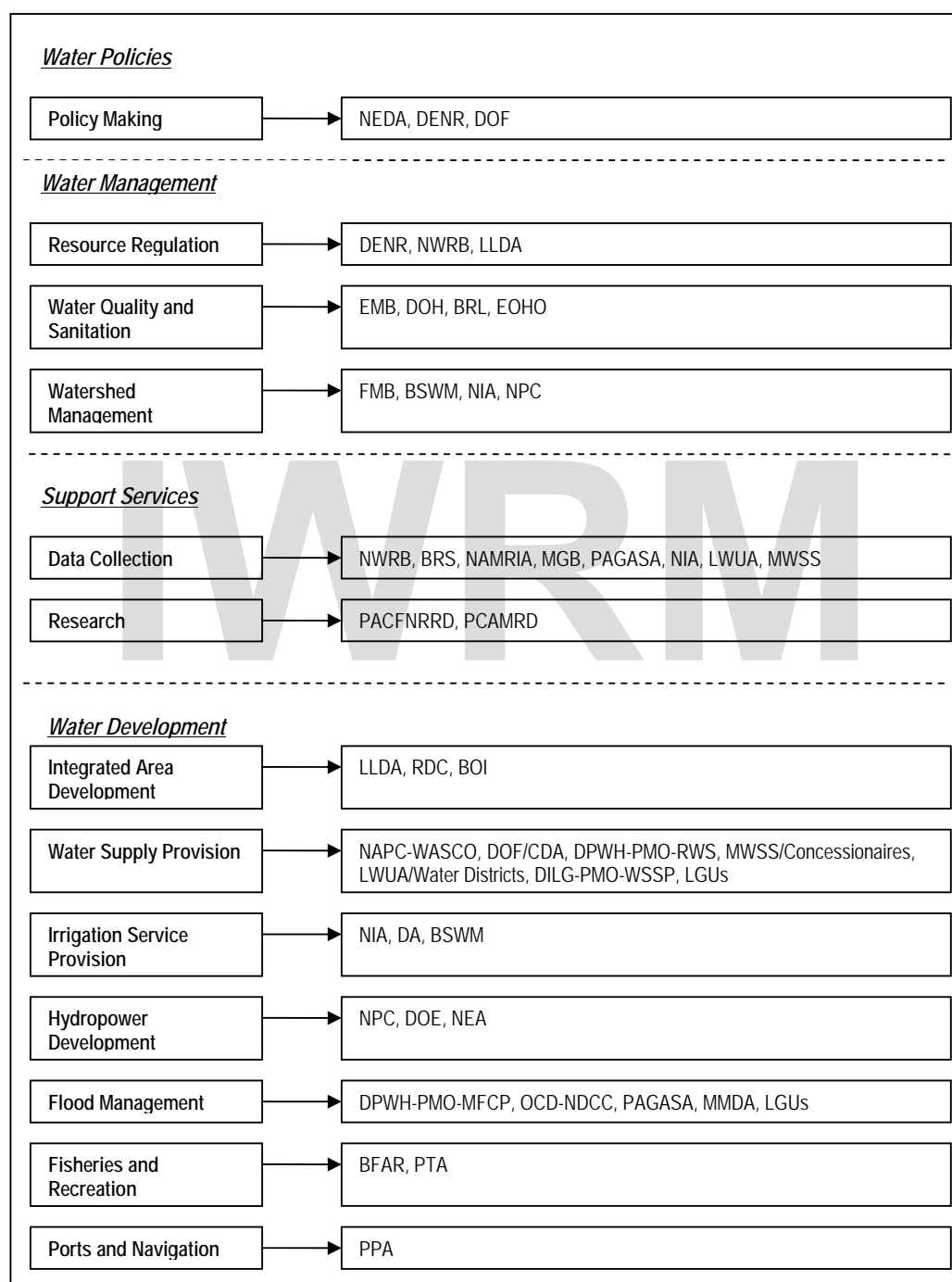
Currently, however, the country's water resources are under extreme stress due to a number of man-made and natural factors. Growing populations and rapid urbanization and industrialization increase the extraction and exploitation of the country's water resources. The increasing demand for water supply for domestic use and economic production necessitates the development of more raw water sources. Inadequate water and sanitation infrastructure often result to inefficiencies in water use and pollution of waters. Generally, prevailing views and attitudes that water is free breed excessive and indiscriminate use of water. Degradation of the environment for economic activities or due to poor management, particularly in the watershed areas, also impacts negatively on the continuing availability of water resources. Meanwhile, the variable and changing climate is exacerbating the pressure on the resource, with the greatest impact felt during the onslaught of the El Nino phenomenon.

In terms of the beneficial use of water for water supply, sewerage and sanitation (WSSS) provision, despite the relative abundance of the resource, a significant portion of the population does not have adequate and sustained access to potable water supply. In addition, despite the outpour of investments for water supply in major urban centers, there is still scarcity in these areas. This is attributed to some of the problems mentioned above that are prevailing in the sector, including excessive and wasteful use, pollution of sources, illegal connections and inefficiencies in the distribution system.

✓ Institutional Arrangement

There are more than 40 government agencies involved in the water resources sector as depicted in the following diagram. Separate agencies exist to deal with water supply, irrigation, hydropower, flood control, pollution, and watershed management among other concerns.

Figure 2: Government Agencies in the WSSS Sector



Due to the range of functions, the water sector is inherently fragmented and some overlaps of responsibility and conflicts exist among agencies.

Some of the key national agencies involved specifically in the WSSS sector are the following:

1. National Economic Development Authority (NEDA)
 NEDA is the Philippines' social and economic development planning and policy coordinating body. Policies concerning the development of the WSSS sector are contained in the Medium-Term Philippine Development Plan (MTPDP) formulated with NEDA at the helm. As embodied in the MTPDP, the government shall pursue the provision of potable water to the

entire country by 2010 through public and private investment, with priority given to areas with poor water supply coverage.

2. National Water Resources Board (NWRB)

Formerly known as the National Water Resources Council (NWRC)¹, which was created in 1974 by virtue of PD 424 to coordinate and integrate all activities related to source development and management and conferred in 1976 with the power to regulate water resources under the Water Code of the Philippines (Presidential Decree or PD 1067), NWRB is the primary water resource regulator in the country.

By virtue of PD 1206, NWRB's functions are now expanded to include economic regulation of waterworks operators, except those falling under the jurisdiction of the Metropolitan Waterworks and Sewerage System (MWSS) and the Local Water Utilities Administration (LWUA). Executive Order (EO) 123 transferred from LWUA to NWRB the economic regulation of water districts.

3. Department of Environment and Natural Resources (DENR)

DENR is mandated to be the primary agency responsible for the conservation, management, development, and proper use of the country's environment and natural resources, including water resources. As such, DENR is designated as the primary government agency responsible for the implementation and enforcement of the Clean Water Act, which aims to promote economic growth in a manner consistent with the protection, preservation and revival of the quality of our fresh, brackish and marine waters.

As lead agency, DENR is tasked to, among others:

- a. Prepare a National Water Quality Status Report and thereafter an Integrated Water Quality Management Framework;
- b. Prepare a ten (10) year Water Quality Management Area Action Plan for each designated water management area;
- c. Prepare and publish a national a national groundwater vulnerability map incorporating prevailing standards and methodologies;
- d. Enforce, review and revise water quality guidelines after due consultation with the concerned stakeholder sectors;
- e. Review and set effluent standards;
- f. Categorize point and non-point sources of water pollution;
- g. Classify groundwater sources, and classify or reclassify all water bodies according to their beneficial usages;
- h. Exercise jurisdiction over all aspects of water pollution, determine its location, magnitude, extent, severity, causes, effects and other pertinent information on pollution, and to take measures, using available methods and technologies to prevent and abate such pollution;
- i. Exercise supervision and control over all aspects of water quality management;
- j. Establish a cooperative effort in partnership with the government, LGUs, academic institutions, civil society and the private sector to attain the objectives of this Act;
- k. Disseminate information and conduct educational awareness and value formation programs and campaigns;
- l. Report, on an annual basis, to Congress the, quality status of water bodies and other pertinent information and recommend possible legislation, policies and programs for environmental management and water pollution control;
- m. Issue rules and regulations for the effective implementation of the provisions of the Act; and
- n. Issue permits, clearances and similar instruments pursuant to the Act.

4. Department of Finance (DOF)

DOF is responsible for the (i) formulation, institutionalization and administration of fiscal policies in coordination with other concerned subdivisions, agencies and instrumentalities of the government; (ii) general and management of the financial resources of government; (iii) supervision of the revenue operations of all LGUs; (iv) review, approval and management of all public sector debt, domestic or foreign; and (v) rationalization, privatization and public accountability of corporations and assets owned, controlled or acquired by the government.

¹ In 1987, renaming of NWRC to National water Resources Board (NWRB) under Executive Order (EO) No. 124.

In particular for the water supply sector, DOF chairs the Oversight Committee for Executive Order 279 which aims to institute reforms in the financing policies for the water supply and sewerage sector, including rationalization in the allocation of scarce financial resources in the water supply and sewerage sector through classification and graduation initiatives; stimulation of improved service and creation of financial self-sustainability for water service providers; grant of incentives for the improvement and graduation of water service providers; and education of consumers towards treating water as a scarce economic good.

5. Department of Health
National standards for drinking water quality as well as standards concerning sanitation and sewerage collection are set by DOH.
6. Department of Public Works and Highways (DPWH)
DPWH provides technical support to LGUs upon request especially in the development of water supply systems.

Under the Clean Water Act, DPWH, in coordination with DENR, LGUs and other concerned agencies is tasked to prepare a national program on sewerage and septage management. Such program shall include a priority listing of sewerage, septage and combined sewerage-septage projects for LGUs based on population density and growth, degradation of water resources, topography, geology, vegetation, program/projects for the rehabilitation of existing facilities and such other factors deemed relevant to the protection of water quality. On the basis of such national listing, the national government may allot, on an annual basis, funds for the construction and rehabilitation of required facilities.

7. National Anti-Poverty Commission (NAPC)
The NAPC - Water Supply Coordination Office (NAPC-WASCO) was created as the central coordinating unit for the implementation of the President's Priority Program on Water (P3W), which is the government's flagship program for the provision of water supply to "waterless" areas outside of Metro Manila. Waterless areas are those whose coverage is less than 50% of the population. Prioritization of the provision of water to these waterless areas is provided for under the MTPDP 2004-2010.
8. Local Water Utilities Administration (LWUA) and the Water Districts (WDs)
LWUA was created under PD 198 as a specialized lending institution to assist WDs, the formation of which was also conferred under the same legislation on a local option basis to provide water supply services. WDs are considered government owned and controlled corporation (GOCC) and are usually organized in provincial centers or urban areas, where financial viability is better.

Traditionally, LWUA provided financial and technical support only to WDs. Technical support included training, organizational development and technical support such as feasibility studies, design and organization and maintenance (O&M). With EO 279, the technical support role of the LWUA has been expanded to include all water supply providers (including LGU-run utilities).

Although not established primarily as an economic regulator, LWUA had assumed a de-facto regulatory role given its functions and mandate expressly provided in PD 198 such as issuing standards for materials and operations, reviewing and approving water rates, and monitoring and evaluating performances of WDs. While EO 123 transferred LWUA's tariff-setting functions to NWRB, it continues to do so in the interim that NWRB lacks the capacity for the same.

9. Metropolitan Waterworks and Sewerage System (MWSS)
Created under Republic Act (RA) 6234, MWSS assumed jurisdiction, supervision and control over all waterworks and sewerage system in Metro Manila as well as the province of Rizal and some municipalities in the neighboring provinces of Bulacan and Cavite.

Prompted by the water crisis in 1995, the MWSS operational and investment functions in water and sewerage services were later privatized. Two (2) water and sanitation concessions were created in 1997. The residual MWSS- Corporate Offices was tasked to administer and

manage retained assets, administer existing loans, provide bulk water, and develop new water sources.

10. Local Government Units (LGUs)

With the decentralization in 1991, as provided for under the Local Government Code of the Philippines, public services including water supply and sanitation services that were performed by national government were transferred to LGUs. At the barangay level, especially in non-viable areas, barangay water services associations (BWSAs), rural water supply associations (RWSAs) and cooperatives act as service providers in lieu of water districts.

LGUs have the authority to regulate all forms of economic activities within their domain; hence their requirements for business permits, building design approval, health inspections, etc and legislative resolutions. Tariffs of LGU-run systems are approved by the LGU's legislative bodies. However, specifying levels of service and formulation of technical and operating standards are seldom, if ever, done by LGUs. Some LGUs have subjected themselves to regulation by NWRB.²

Further, the Clean Water Act also provides for the gradual devolution to LGUs, and to the governing boards the authority to administer some aspects of water quality management and regulation, including, but not limited to, permit issuance, monitoring and imposition of administrative penalties, when the LGU or the governing board has demonstrated readiness and technical capability to undertake such functions.

With respect to the implementation of the priority listing of sewerage, septage and combined sewerage-septage projects for LGUs provided for under the Act, LGUs are required to appropriate the necessary land, including the required rights-of-way/road access to the land for the construction of the sewage and/or septage treatment facilities, as well as to raise funds to subsidize necessary expenses for the operation and maintenance of sewerage treatment or septage facility servicing their area of jurisdiction through local property taxes and enforcement of a service fee system.

11. Department of Interior and Local Government (DILG)

DILG, through its Water Supply and Sanitation Project Monitoring Office (WSSPMO), is tasked to assist LGUs undertake the additional responsibilities bestowed to them under the Local Government Code of 1991 as the national government's partner in attaining national goals, particularly in providing basic services to their constituents. DILG's assistance comes mainly in the form of capacity building for LGUs in terms of planning, implementation, monitoring, performance targeting, management, operation and maintenance, and in some cases, economic regulation, of WSSS systems. While gains have been made in some LGUs, most either do not have the capacity or are constrained by their political environment to perform economic regulation functions. Specifying levels of service and formulation of technical and operating standards are seldom, if ever, done by LGUs.

DILG also embarks on Official Development Assistance (ODA)-assisted WSSS programs that provide water supply facilities, in addition to capacity building/training, for LGUs.

12. Small-Scale Independent Providers (SSIPs)

SSIPs of various forms operate in some localities complementing the efforts of government in the delivery of water supply services.

✓ Water Resources Plans and Policies

Policies that govern the development and management of the water resources, in general, and the WSSS sector, in particular, are embodied in different plans and legislative and executive issuances.

1. Medium Term Philippine Development Plan (MTPDP)

The MTPDP contains policies and general strategies concerning the socio-economic development of the country, including those in the WSSS sector. The MTPDP formulation, spearheaded by NEDA, entails consultations with major actors in the sector in the

² As of end of 2007, six LGUs have submitted tariffs to NWRB for approval.

identification of priority interventions, which is acknowledged to be crucial, not only in ensuring ownership and sustainability, but also proper targeting and allocation of government's limited financial resources. The consultation process for the MTPDP adopts a combination of top-bottom and bottom-up approach to planning and programming. In the formulation of the MTPDP, the national thrusts and priorities are formulated at the national level at the start of the planning period, with the participation of concerned government agencies, people's organizations (POs), non-government organizations (NGOs), and the academe. Coming into the consultations, the government agencies bring into the table inputs that are based on consolidated issues/problems and needs identified at the regional and local levels. At the same time, regional and local priorities are firmed up and integrated into higher level plans. Regional consultations towards the end of the planning period serve as the venue by which national, regional and local concerns are discussed for subsequent integration into the national plan. The strategies/targets under the approved MTPDP are translated into projects and programs under the Medium Term Public Investment Plan (MTPIP).

The MTPDP 2004-2010 calls for the adoption of the Integrated Water Resources Management (IWRM) approach to water resources planning and development. Along this line, it stipulates the need to (i) identify/establish river basin organizations (RBOs) while strengthening existing RBOs to promote devolution of decision-making processes to the lowest appropriate levels capable of handling such tasks, normally to local government and community-based institutions; (ii) price of raw water to effect efficient resource allocation and conservation; (iii) maintain and sustain data collection and database for water resources (i.e. rainfall, stream flow, groundwater and water quality, etc.); and (iv) conduct water assessment in terms of availability and demand for prioritized water constrained areas.

The MTPDP enumerates the following specific strategies for the WSSS sector:

- a. Pursue the provision of potable water to the entire country by 2010 through public and private investment, with focus given to areas with poor water supply coverage;
- b. Ensure that all barangays/municipalities that will be provided with water supply services have the corresponding sanitation facilities for proper disposal of wastewater/septage;
- c. Continue provision of capacity building programs and technical assistance on WSSS planning, management and project implementation for all water service providers;
- d. Develop technology options for water supply (e.g. solar desalination for isolated islands, windmill technology, etc.);
- e. Complete the groundwater resource inventory/assessment in major urban areas and surface water in rural areas, control extraction through moratorium/stringent requirements in the grant of water permits in water-deficient areas and complete registration of all water pumps, metering of water pumps, etc.; and
- f. Improve water quality through close and regular monitoring of 18 priority rivers nationwide.

2. Philippine Water Supply Sector Roadmap (PWSSR)

The recently completed PWSSR, undertaken with NEDA and NWRB in the lead, is the blueprint towards the country's addressing the sector's challenges and achieving the intended objectives in the sector for 2010 as embodied in the MTPDP 2004-2010 and the country's international commitments to achieving the 2015 Millennium Development Goals (particularly the reduction by half the population without access to water supply). The PWSSR also lays the groundwork for the sector's long-term vision of sustainable water for all through policies and strategies that will ensure the adequate long-term availability and accessibility of potable water and sustainable management of wastewater.

The PWSSR has been prepared using the Strategic Planning and Management (SPM) tool promoted by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). This tool allows straightforward identification of problems and generation of proposed solutions. It also allows identification of issues at the lowest level through stakeholder participation and mobilization of local experts. Formulation of the roadmap went through a step by step process of input-sharing by stakeholders from within and outside government, all involved in the rigorous sectoral assessment and analysis process.

The PWSSR has three main strategies, which are inter-linked and mutually supportive and aggregately support national development goals as embodied in the government's commitments. These are:

- a. **Institutional Strengthening** stands on two assumptions: one, that there is a multiplicity of institutions operating within and outside the water supply and sanitation sector; and two, that these institutions are fragmented due to lack of harmony in policy settings. Hence, the most appropriate strategy for realizing the goal or the future scenario in the institutional arena is that institutional strengthening.
- b. **Capacity Development** is founded on the logic that change processes cannot move forward without adequate human, technical and financial resources and capacities. The present scenario indicates a general lack of capacity in the sector in terms of technical and managerial skills, finance and capital and new technologies. While there are pockets of high capacity in the variety of public and private utilities, domestic financing institutions, administrative and regulatory agencies and planning agencies, these relative concentrations are pulled down by the broader need for capacity building.
- c. **Strategic Alliance Building** is built on the logic that processes needed to carry out the two preceding strategies require strategic alliances between executive and legislative champions, between the public and private sector and between government agencies, civil society organizations and user groups and communities.

3. Water Code of the Philippines

The 1976 National Water Code establishes the basic principles and framework relating to the ownership, appropriation, utilization, exploitation, development, control, conservation and protection of water resources to achieve the optimum development and rational utilization of these resources. The Code is basically governed by the following principles:

- a. All waters belong to the State.
- b. All waters that belong to the State can not be the subject to acquisitive prescription.
- c. The State may allow the use or development of waters by administrative concession.
- d. The utilization, exploitation, development, conservation and protection of water resources shall be subject to the control and regulation of the government through the National Water Resources Council, hereinafter referred to as the Council.
- e. Preference in the use and development of waters shall consider current usages and be responsive to the changing needs of the country.

4. Clean Water Act of the Philippines

Republic Act (RA) No. 9275 (Philippine Clean Water Act of 2004) provided for the comprehensive water quality management in the country. The Act declares the following policies with respect to water quality management as part of the framework for sustainable development:

- a. Promote environmental strategies, use of appropriate economic instruments and of control mechanisms for the protection of water resources;
- b. Formulate a holistic national program of water quality management that recognizes that water quality management issues cannot be separated from concerns about water sources and ecological protection, water supply, public health and quality of life;
- c. Formulate an integrated water quality management framework through proper delegation and effective coordination of functions and activities;
- d. Promote commercial and industrial processes and products that are environment friendly and energy efficient;
- e. Provide for a comprehensive management program for water pollution focusing on pollution prevention;
- f. Promote public information and education and to encourage the participation of an informed and active public in water quality management and monitoring;
- g. Formulate and enforce a system of accountability for short and long-term adverse environmental impact of a project, program or activity; and
- h. Encourage civil society and other sectors, particularly labor, the academe and businesses to organize, educate and motivate the people in addressing pertinent environmental issues and problems at the local and national levels.

5. Executive Order (EO) 279
EO 279, which was issued in 2004, seeks to gain substantial reforms in the financing policies for water supply and sanitation service providers. Specifically, it aims to veer creditworthy water districts to seek financing from government and private financial institutions (GFIs and PFIs) while those classified as pre-, semi- and non-creditworthy utilities will be provided with technical and financial assistance by LWUA to facilitate their “graduation” to being creditworthy.
6. Regional Development Plans (RDPs)
RDPs, consistent with the general policies and strategies in the sector as espoused under the MTPDP, are developed for each of the 16 regions of the country. Coordination for RDP formulation rests with the NEDA Regional Offices. Similar to the formulation of the MTPDP, the RDP process involves consultations of stakeholders at the regional level, taking into consideration inputs from more localized levels (provincial, municipal, etc.).

Each RDP contains WSSS policies and strategies that are more focused on the specific region’s priorities determined based on the assessment of needs at the regional level.

7. Provincial Water Supply, Sewerage and Sanitation Sector Plans (PW4SPs)
In line with the Local Government Code of 1991, PW4SPs are the responsibility of LGUs. This is to effect a substantial decentralization of responsibility in the project implementation and planning. The thrust of the government is to further promote the involvement of local stakeholders in the entire process of development. The Provincial Planning and Development Office (PPDO) of each provincial government is designated as the focal point for this responsibility.

Each PW4SP aims to (i) formulate a long-term provincial development plan for the WSSS sector up to the year 2015; (ii) propose a 5-year medium-term sector investment plan based on the long-term development plan; (iii) provide training and equipment necessary for the PPDO to enable them to carry-out the long-term planning and review of implementation, operations and maintenance as well as updating of PW4SP; and (iv) promote better coordination and inter-agency relations among government agencies in sector development from national to local levels.

✓ Water Supply and Sanitation Situation

There is currently no consolidated data existing to describe the WSSS situation in the country. Various and inconsistent figures have been reported. The MTPDP 2004-2010 estimates that the total population served by potable water in the Philippines is about 80%. According to the World Health Organization (WHO) and the United Nations Children Fund (UNICEF), overall access to improved water services in the Philippines has declined from 87% in 1990 to 85% by 2002. Also, survey data shown in the Filipino Report Card on Pro-Poor Services published in 2001 indicates that only 64% of the population had access to formal service providers as of 2000. In another recent web-based data and statistics report by the World Bank (WB), access to improved water source is estimated at 93% for the Philippines.³

For sanitation, the PWSSR assessment indicates that access to sanitary toilets has declined from 74.9% in 1999 to 74.2% in 2000 and that only 4% of households are connected to sewer systems. Meanwhile, the most recent data and statistics from the WB website report that access to improved sanitation in the Philippines is at 78%.

These inconsistencies stem from the fragmented institutional framework in the sector, where various agencies have sometimes duplicating mandates. The development, operation and delivery of potable water in the Philippines are carried out by various agencies and water utilities operated by both the government and the private sector as a result of evolving government policies. The delineation of responsibility is divided into two areas, the populous Metropolitan Manila area, and the provinces outside of Metro Manila.

1. Metro Manila and adjacent areas

³<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTWAT/0,,contentMDK:21733368--menuPK:4602430--pagePK:148956--piPK:216618--theSitePK:4602123,00.html>

MWSS, through its mandate, is responsible for supplying water and providing wastewater services in the metropolitan area, the province of Rizal and some municipalities in the neighboring provinces of Bulacan and Cavite. In 1997, MWSS entered into a 25-year concession contract with the Manila Water Company Inc. (MWCI) – east zone and Maynilad Water Services, Inc. (MWSI) – west zone, thereby transferring operational and capital development responsibilities to the two concessionaires.

Water supply coverage in Metro Manila has improved since privatization in 1997, albeit modestly. Total connections to MWSS have increased by around 49.5%⁴ from 792,732 in 1997 to 1,184,896 in 2004. The privately served population is around 1,940,006⁵ (based on data from NWRB).

Table 1: MWSS Service Coverage

Year	Population Projections based on Concessionaire Submissions	Total Service Connections ⁶	Population Served by MWSS Concessionaires ⁷	Privately Served Population	Total Served Population	% Coverage
1997	11,763,112	792,732	7,293,134	1,940,006	9,233,140	78.49%
1998	12,055,753	808,682	7,439,874	1,940,006	9,379,880	77.80%
1999	12,350,804	908,748	8,360,482	1,940,006	10,300,488	83.40%
2000	12,648,337	980,175	9,017,610	1,940,006	10,957,616	86.63%
2002	12,875,056	1,068,838	9,833,310	1,940,006	11,773,316	91.44%
2003	13,122,254	1,127,070	9,129,267	1,940,006	11,069,273	84.35%
2004	13,372,056	1,184,896	9,597,658	1,940,006	11,537,664	86.28%

While total connections and population served have increased, the improvement in terms of coverage in Metro Manila has remained modest at a computed annual average of about 1.4%. This is attributed to the rapid rise in demand. The population of the capital grows at an annual rate of 2.2 per cent, resulting in an increase in domestic water consumption and therefore, the production of wastewater as well.

However, the provision of sanitation and wastewater treatment and disposal has been lagging. Since 1997, when sanitation coverage was still nil, coverage in Metro Manila has increased to a mere 12 percent by 2006. Covered areas included Makati, Mandaluyong, Marikina, Quezon City, San Juan, Taguig, Pateros, Pasig, Cainta, Antipolo, Pasig, Mandaluyong, Malabon, Parañaque, and Valenzuela. Sewer coverage, meanwhile, has increased from 8 percent in 1997 to only 11 percent in 2006 covering only Makati, Manila, Malabon, Quezon City, Taguig, Pasig, and Mandaluyong. Around 85% have septic tanks, the majority of which were constructed without adequate leaching fields and are rarely maintained or desludged. Most residents rely only on drains, many of which are open, to receive the effluent from their septic tank. Only a relative few, high-quality developments have constructed separate sewers and small sewage treatment plants.

2. Provincial areas

Since 1972, water districts (WDs) have been created/formed at the option of LGUs to operate, maintain and improve water system facilities to service provincial urban centers. Presently, there are about 500 operational WDs operating throughout the country.

The remaining provincial rural areas are being served primarily by local government units (LGUs), water cooperatives and other private companies. With the decentralization in 1991, as provided for under the Local Government Code of the Philippines, public services including water supply and sanitation services that were performed by the national government (NG) were transferred to LGUs. At the barangay level, especially in non-viable areas, barangay water services associations (BWSAs), rural water supply associations (RWSAs) and cooperatives act as service providers in lieu of water districts. Some small-scale independent

⁴ Based on MWSS service area, which includes areas outside of Metro Manila.

⁵ Due to lack of available updated data, the privately served data is assumed to remain constant.

⁶ Total Connections = Official Connections (per records of the MWSS Concessionaires) + Private Meters (for subdivisions and condominiums).

⁷ Population served = Total connections * 9.2 persons/connection (Yr. 1997-2002)
= Total connections * 8.1 persons/connection (Yr. 2003-2004)

The multiplier (persons/connection) is currently under review by MWSS-RO and the concessionaires to determine the appropriate multiplier.

providers (SSIPs) of various forms also operate in some localities complementing the efforts of government in the delivery of water supply services.

Households without direct access to any service providers either drill individual wells (shallow wells and deep wells).

The extent of coverage of the abovementioned systems, however, is limited, with many water systems experiencing a variety of problems ranging from highly fragmented planning, insufficiency of funds to finance new capital investments, poor operation and maintenance, inadequate institutional capacity and lack of skilled manpower resources, to name a few, thus leaving many Filipinos still without access to clean and affordable water.

As of 2005, there are more than 6,000 registered water service providers (WSPs) nationwide consisting of water districts, LGU-run utilities, RWSAs, BWSAs, cooperatives, private utilities and still-undetermined number of SSIPs

Table 2: Water Supply Providers, 2005

Type of Provider	Estimated Number
Water Districts	580 ⁸
Local Government Units	1,000
RWSAs	500
BWSAs	3,100
Cooperatives	200
Private	900
TOTAL	6,280

Based on the recent assessment conducted for the PWSSR, estimates on the extent of water supply coverage and population access to safe drinking water and sanitation are still yet to be fully ascertained due to varying estimates from different government agencies such as the National Statistics Office (NSO), DILG, and LWUA.

Table 3: Coverage Outside of Metro Manila

NSO	In 2000, 46.13% of households had access to Level I ⁹ and Level II ¹⁰ water supply systems
DILG	In 2007, 21.6% of households had access to Level I, Level II, and Level II water systems based on Provincial Water Supply Sector and Sanitation Sector Master Plans (PW4SPs)
LWUA	In 2007, 24.15% of households had access to Level II water supply systems of water districts

Meanwhile, in terms of sewerage and sanitation, only around 3% of the urban population outside Metro Manila is served with some form of sewerage facility while others simply rely on onsite sanitation treatment such as septic tanks.

✓ Water Infrastructure

The existing water infrastructure in the system is categorized broadly into three classifications – Level I, Level II and Level III.

Level I (point source) systems include a protected well or a developed spring with an outlet but without a distribution system. These systems are generally adaptable for rural areas where the houses are thinly scattered. A Level I facility normally serves an average of 15 households. Access to water supply for the farthest user is not more than 250 meters from the point source. With

⁸ 127 were considered non-operational.

⁹ As per NEDA Board Resolution No. 12 (s. 1995), Level I water system is defined as the category of water supply facility where access to the water supply for the farthest user is not more than 250 meters from the point source. With respect to adequacy of service, Level I refers to those with access to safe water in accordance the rate of consumption of at least 20/liters/capita/day.

¹⁰ As per NEDA Board Resolution No. 12 (s. 1995), Level II water system is defined as the category of water supply facility where access to the water supply for the farthest user is not more than 25 meters from the point source. With respect to adequacy of service, Level II refers to those with access to safe water in accordance the rate of consumption of at least 60 liters/capita/day.

respect to adequacy of service, Level I refers to those with access to safe water in accordance with the rate of consumption of at least 20/liters/capita/day.

Level II (communal faucet system or standpost) systems are composed of a source, a reservoir, a piped distribution network, and 2 or more communal faucets. One faucet typically caters to 4 to 6 households. Access to the water supply for the farthest user is not more than 25 meters from the point source/faucet. With respect to adequacy of service, Level II refers to those with access to safe water in accordance the rate of consumption of at least 60 liters/capita/day. These systems are generally suitable for rural and urban fringe areas where houses are clustered densely to justify a simple piped system.

Level III (waterworks systems or individual household connections) systems are systems with a source, a reservoir, a piped distribution network and household taps. It is generally suited for populated areas.

The MWSS system is a Level III system supplying water to about 12 million people. The MWSS water distribution system is categorized into service – (i) the Central Distribution System (CDS), supplied mainly by surface water, and (ii) Local Networks, supplied by ground water from MWSS deepwells, which serve fringe areas and other areas in the CDS not connected to the surface supply system.

The main components of the CDS include:

- Angat Reservoir. The reservoir impounds water from the Angat River in Bulacan, which supplies 97% of MWSS's water requirements.
- Conveyance and raw water storage facilities. Downstream of Angat Reservoir, water is conveyed from Ipo Dam via 3 tunnels to the Bicti headworks, which in turn is connected by 5 aqueducts to a 36 billion liter facility in Novaliches, Quezon City. Raw water is stored either at the La Mesa reservoir (located immediately downstream of the Novaliches facility) prior to treatment in Balara or conveyed directly through 2 open channels from Novaliches prior to treatment in La Mesa.
- Raw water treatment facilities. Water is treated either at the 2 plants in La Mesa (total capacity of 2,400 MLD) or the 2 Balara plants (total capacity of 1,600 MLD). The treatment process basically involves (i) screening, (ii) mixing, (3) flocculation, (4) sedimentation, (5) filtration and (6) chlorination.
- Distribution pipelines/system. Treated water is distributed via complex primary, secondary and tertiary mains. There are 16 reservoirs within the system together with 18 pump stations. Total length of pipelines in the distribution system is approximately 12,000 kilometers. Total number of valves is estimated at 20,000.

The surface source of water supply is supplemented by groundwater supply from 258 MWSS-owned deepwells and 3,000 privately owned wells which serve the fringe areas not connected to the CDS. Groundwater is chlorinated and then pumped either to elevated tanks for distribution or directly sent into the distribution system. Average groundwater supply from MWSS deepwells has been in the range of 70 to 90 MLD.

Non-revenue water (NRW) is a major issue in Metro Manila, particularly in the west concession. It drives up system costs and impacts negatively on the resource. About 50% of the 4,000 MLD currently supplied for Metro Manila is NRW. In the East Zone, the Manila Water Company, Inc. (MWCI) has achieved a 20% NRW level. The NRW level in the West Zone, however, is much higher at 60%.

Meantime, majority of Metro Manila's population (about 90%) is served by individual septic tanks, and about 11% is connected to the MWSS's sewerage system, which was first constructed in 1904 covering a service area of 1,800 hectares. It comprises of 1 wastewater treatment plant, 7 lift stations, 1 pump station, main sewers and 390 kilometers sewer pipelines (laterals and interceptors). The system, however, has reached its maximum capacity because of rapid urbanization. Moreover, illegal direct connections and deteriorated condition of the pipelines cause flow of wastewater into the drainage system resulting to sewer overflows and blockages.

Outside of Metro Manila, only three cities (Baguio, Vigan and Zamboanga) have sewer systems serving less than 3% of their service area populations. Effluent from poorly designed and lined septic tanks drain into uncovered drainage systems, which often leaves the urban population exposed to raw sewerage. Low-cost decentralized technologies and incremental strategies are not that well-known and the limited activities in the sector over the last 20-30 years show that these have not been tried and remain not widely disseminated.

✓ Current Initiatives

1. *Raw Water Pricing: Philippines Project*

Recognizing that water is not a free resource, the study was conducted to improve supervision and environmentally sound management of raw water resources starting in 2 pilot sites. It involved (i) a methodical review and selection of a tariff alternative for raw water pricing, (ii) support in the restructuring of NWRB into a regulatory body, (iii) testing and introduction of a raw water tariff in 2 pilot sites, and (iv) provision of assistance in instituting raw water pricing. Success of introducing raw water pricing is still undetermined to date as the piloting is still ongoing.

2. *Sewerage, Septage and Sanitation Initiatives*

There are current efforts on improving sanitation in the country. Under the Sustainable Sanitation in East Asia (SuSEA) Philippines Program, local sustainable sanitation plans in 6 municipalities in the country. The plans were formulated with the active participation of the local stakeholders and with commitment and support from the local chief executives. The plans included information, education and communication plans and materials that were designed taking into consideration the cultural and social background, priority needs and target audiences as determined by the local people.

There is also a move to develop sustainable sanitation education programs in the country. The undertaking will develop a new or enhanced formal curriculum and non-formal training programs on sustainable sanitation, and will initiate the formation of a consortium of academic/training institutions to implement the curriculum. Initial consultations indicated the commitment from government agencies, academic institutions (including the best engineering and public health schools in the country), civil society and local sanitary inspectors for the project.

In Metro Manila, implementation of the Manila Third Sewerage Project is ongoing. The project aims to reduce the pollution of Metro Manila waterways and Manila Bay, reduce the health hazards associated with human exposure to sewage, and establish a gradual low-cost improvement of sewerage services in Metro Manila by expanding the MWSS septage management program. It involves the construction of sewage and septage treatment plants and communal septic tanks, rehabilitation/upgrading of drainage system, installation of interceptor sewers, inspection and repair of defective sewer lines and preparation of information and education campaign, feasibility and design studies and other special studies on sewerage and sanitation.

3. *Creation of the NEDA Board Committee on Infrastructure–Subcommittee on Water Resources*

In August 2008, the Subcommittee on Infrastructure was formally created initially to oversee the implementation of policies and strategies in the water supply sector within the context of integrated water resources management. Its composition not includes major players in the water supply sector but also representatives from other sectors that utilize water resources such as irrigation (e.g., Department of Agriculture), power (e.g., Department of Energy) and flood management (e.g., Department of Public Works and Highways).

4. *Millennium Development Goal Fund (MDG-F) on Enhancing Access to and Provision of Water Supply Services with the Active Participation of the Poor*

Consistent with recent findings that the “soft” component of water supply provision is as important as the hard infrastructure component, the study aims to contribute to the provision of more accessible, efficient, affordable, and quality water supply to rural areas, particularly waterless areas, through the provision of the necessary soft component that will ensure the maximization of benefits from and sustainability of infrastructure investments provided under the P3W, as well as establish support mechanisms that will facilitate further investments for expansion. It will involve the mobilization of community stakeholders in 36 depressed

communities nationwide to organize themselves into community-based water associations which will take the lead in the planning, identification, design, implementation and operation of water supply facilities in the community. Local and traditional knowledge and skills shall be mobilized to maximize the contribution of local partners in the Programme. The private sector and local institutions and the academe shall be mobilized to ensure continuing development and dissemination of knowledge on the utilities management.

5. *MDG-F on Climate Change Adaptation*

The program will: i.) determine the vulnerability of critical sectors (including water supply) of the Philippines to climate change and strengthen the country’s adaptive capacity by enhancing the policy development, planning, programming and implementation capacities of key stakeholders, particularly the responsible national government agencies; ii.) endeavor to contribute to the Philippines’ achievement of its MDG targets by enhancing socioeconomic development through reduced vulnerabilities of key affected sectors and the target stakeholders in 43++ provinces; (iii) facilitate partnerships among participating local government units primarily from the 43++ provinces in the most natural disaster prone eastern seaboard of the country and the corresponding local higher educational institutions to anchor future scientific and capacity building needs of vulnerable communities; and (iv) showcase innovative and document best practices on climate change adaptation providing selected communities with the opportunity to develop and test coping systems which have significant potential for further up-scaling and replication across the country. These demonstration projects are expected to be of sufficient ‘scale’ and generate best practices to ensure impact and increased capacity.

6. *President’s Priority Program on Water (P3W)*

Under the President’s Priority Program on Water (P³W), NAPC and DPWH have provided assistance to 406 waterless municipalities outside Metro Manila, 90 of which have already graduated from the waterless classification or have attained water supply coverage of at least 50 %.

In terms of the number of projects implemented and the number of households served, the P³W has already completed 1,368 out of the target 2,021 Level I and Level II water system facilities aimed to serve a total of 174,645 households from 2005 to 2007 costing PhP500 Million annually.

In addition to efforts under the P³W, LWUA has completed water supply projects in 59 “waterless” municipalities (73% of its target of 81) served by water districts since 2004. A total of 1.97 Million people (102% of 1.93 Million target) have been directly served with potable water in these municipalities.

With respect to the provision of water to waterless communities in Metro Manila, a total of 111,799 households in 119 waterless communities have been covered through the Patubig Program, which is being implemented by the two concessionaires accomplishing 43% of the target 274 communities with 186,185 households. The table below shows the breakdown of the project’s accomplishment.

Table 4: Status of Service Provision for Waterless Areas in Metro Manila

2004 - 2010								
LOCATION	TARGET		COMPLETED			BALANCE		
	Sitios/ Communities	Households	Sitios/ Communities	Households	% Acc.	Sitios/ Communities	Households	%
East Zone Area	47	66,817	46	58,697	98%	1	8,120	2%
West Zone Area	227	119,368	73	53,102	32%	73	53,102	68%
TOTAL	274	186,185	119	111,799	43%	74	61,222	57%

B. Issues and Challenges

✓ Water Scarcity and Climate Change

Climate determines water supply. Climate is a fundamental driver of the water cycle. It determines how much water is available (supply) and how much water we need (demand) in the short and long term. In the short and medium term, weather patterns determine variability in water supply

and demand on a day-to-day and season-to-season basis – the weather one year may be drier or wetter than the last. In the long term climate, that is the average of the weather over a period, differs from decade to decade. This alters our perception of what we regard as the normal climate.

In addition to natural variability, increased concentrations of greenhouse gases are leading to climate change, inducing a long term trend which superimposes on the natural variability. The sustainability of water systems is dependent on climate variability and their future viability may be threatened by climate change. As flow patterns and water levels respond to the changing climate, our water supplies will be affected.

Diminishing surface-water and groundwater supplies, coupled with increasing demands for these resources, would challenge all aspects of water resource management. It is difficult to predict future changes in the availability of freshwater. Some of the most vulnerable regions of the country with respect to the impact of climate change on water resources are those that are already under stress, with demand approaching or exceeding supply.

In the Philippines, despite the high average rainfall, the country is estimated to have second to the lowest per capita freshwater in Asia, as of 2000. The supply of freshwater is diminishing due to over extraction of groundwater, water pollution, denuded forests/watersheds and inefficient water infrastructure and, occasionally, the El Niño phenomenon. In fact, Metro Manila experienced a shortage of water in January to July 2004 due to the low water level in the Angat Dam in Bulacan, as a result of lack of rains in the area in 2003. This brought about conflicts as to the prioritization of water allocation from Angat for Metro Manila's water supply and Bulacan province's irrigation water needs.

Changes in water quantity and water quality are inextricably linked. Lower water levels tend to lead to higher pollutant concentrations, whereas high flow events and flooding increase turbidity and the flushing of contaminants into the water system. Water quality would suffer from the projected impacts of climate change. Poor water quality effectively diminishes the availability of potable water, and increases the costs associated with rendering water suitable for use.

While climate change is likely to increase rainfall and flood risk in some regions but decrease rainfall in many areas prone to drought, the associated costs are generally calculated using average temperature changes over areas of continental size. Such calculations do not account for the impacts of changes in extreme rainfall on flood damage and water supply, or the small geographic scales over which these changes often occur. To plan effective adaptation options, assessments of impacts are needed that account for the spatial variability of changes and the potential for rapid or extreme change.

At the same time, pollution is decreasing the primary productivity of many water bodies. Heavy loads of inorganic pollutants have made water increasingly a threat to life. Various types of water-borne diseases are expected to increase as water quality further deteriorates. Furthermore, the scarcity of quality water sources has increased the development of new water sources to supply Metro Manila's water supply needs.

The DENR regulates discharges from commercial, industrial and municipal sewage treatment plants to receiving water bodies, while the DOH regulates the use of sanitation installations in domestic premises. However, these departments' capacity to effectively monitor compliance and enforce rules is severely constrained.

In addition, weak enforcement of the Sanitation and Plumbing Codes is evidenced by the poor construction and maintenance of existing septic tanks. In practice, construction inspection is not diligently carried out. Thus, subsurface absorption fields, which are required by regulation, mostly do not exist; regular desludging is not undertaken and disposal, in many cases, is done by overflow into the municipal drains, creating opportunity for direct contact by humans.

In sanitation, operational sustainability is hindered by a lack of skilled and experienced staff dedicated to the running of sewers and sewage management systems, and the generally lower willingness to pay for sanitation services, which are much more costly and perceived less valuable, than water supply services. Mainly, the notion that "water is a free and infinite resource," the lack of awareness of the importance and low prioritization of sewerage and sanitation and the

struggling economy have brought about low percentages of tariff collection thus making it difficult to even recover operations and maintenance costs.

Protection and conservation of the country's water resources should be given equal priority as water supply provision. Along this line, demand management strategies (including implementation of raw water pricing) and innovative water policies/mechanisms (e.g., rainwater harvesting complemented by incentives). Wastewater management and sanitation services have to be attended to. A crucial component of this would be the formulation of technical options that are cost-efficient and socially acceptable, and financing arrangements that are responsive to the needs and capacities of different utilities. Awareness building on the benefits of sanitation and wastewater management facilities is another critical component of service provision to increase willingness to pay and ensure ownership and utilization.

✓ Institutions

The institutional set-up for the water supply sector is characterized as weak and fragmented, with a multitude of actors playing uncoordinated and sometimes overlapping roles. There is no one single coordinating government body/agency that will coordinate the efforts in the sector or champion the water supply cause. There are about 30 agencies which are in one way or another involved in the water supply sector. As a result, planning and monitoring for the sector is undertaken in a piecemeal fashion. There is no single entity accountable for translating government's policies, strategies and goals into a comprehensive water program.

Further, some of these agencies have overlapping functions, hampering the creation of an environment that is conducive to investments. For instance, economic regulation is the core-function of NWRB. However, the same function is performed by LWUA, MWSS, the Subic Bay Water Regulatory Board for the Subic Bay Freeport providers, and LGUs (for LGU-run utilities). Meanwhile, the Department of Environment and Natural Resources (DENR) and LGUs both have resource regulatory functions.

Notwithstanding the above, economic regulation must provide incentives to water service providers to improve efficiency and promote fair pricing, while ensuring that benefits are passed on to the consumers.

However, fair and transparent strategies for performance evaluation across the different types of providers and strategies for possible integration have not been established to date, nor is data available to support such monitoring, evaluation and decision-making. For the MWSS, regulation is lodged with the regulatory office created under the contract. The National Water Resources Board (NWRB) exercises regulation over MWSS when the latter's decision is challenged either by the concessionaires or the customers. On the other hand, regulation of small-scale independent providers (SSIPs) is a concern as there is no institutional body that monitors and maintains the quality of service provided by such.

Moreover, reliable and publicly available benchmarking information on the sector is lacking. The absence of consistent sector data and baseline figures on the extent and quality of coverage not only undermines the credibility of the regulatory process but also hampers any efforts for improved sector planning and strengthening accountability of national government agencies in the sector.

On the other hand, a key element in nurturing accountability is transparency and decentralization. The former requires a framework for disclosure of information and mechanisms for monitoring and evaluation. The latter requires devolution of functions and authority at the lowest level possible combined with capacity development. The accountability system in water governance involves the synergy between the obligation of government to respect, protect and fulfill the human right to water and the right of citizens to demand such accountability. Social accountability extends to all other water supply providers by which the government should be able to exercise its regulatory authority. Within government, there should be a clear accountability system between national and local agencies and units governed by clear rules and procedures.

LGUs, through the Provincial/Municipal Water and Sanitation (WATSAN) Development Councils, are responsible for the planning and implementation of water supply and sanitation programs, and monitoring of local sector performance. Water service providers, including water user associations/community-based organizations, are in charge of the management of local water

supply facilities. Recent consultations, however, indicated that these local level actors are more often than not unable to perform satisfactorily as they do not have the capacity to undertake the functions that are expected of them. As a result, the utilities are not able to sustain the operation and maintenance of the system and expand service coverage.

In view of the issues identified above, improvements in the institutional set-up are needed. A water champion has to be identified to translate policies and strategies in the sector into more concrete and coordinated actions. A single regulatory entity should be institutionalized to give credibility to investors. Programming and financing policies have to be leveraged with greater responsibility and accountability from beneficiaries.

✓ Finance

Water supply services should be financially sustainable and socially acceptable. Past failure to recognize the economic value of water has led to wasteful and environmentally damaging uses of the resource. Water scarcity and decline in quality have produced price signals and induced increasing marginal costs that, in turn, trigger mixed perceptions and conflicting behavior among supply providers and users. While the government promotes the policy of cost-recovery for sustainable water supply services, this has to be balanced by capacity to pay in order to ensure economic accessibility by all consumers.

Financing of the sector comes from a multitude of sources including NG funds, GOCC (e.g., water districts) revenues, official development assistance (ODA), commercial loans, government financial institution (GFI) loans, private sector capital and local government funds.

Water supply and sanitation agencies and utilities are chronically under financed. For example, MWSS is in financial distress. Operations of the Department of Health (DOH) and the Department of the Interior and Local Government - Water Supply and Sanitation Project Management Office that are principally responsible to assist local governments in securing delivery of water supply and sanitation services also suffer because of budget constraints.

The NG spends a small fraction of its budget for water supply. In 2007, for instance, only 0.84% of the PhP 442.3 billion expenditure on infrastructure went to water supply. The President's Priority Program on Water (P3W) allocates PhP500 million a year from 2005-2010 to fund investments in waterless areas, particularly outside Metro Manila. Various ODA-funded programs and projects provide grant financing, especially in the rural areas. Loans, coursed through NG agencies (e.g., Department of Interior and Local Government or DILG, Department of Agrarian Reform or DAR) and GFIs (e.g., LWUA, Development Bank of the Philippines, Land Bank of the Philippines) are also provided.

Funds from the NG and ODA programs/projects often require LGU counterpart funds to increase ownership and accountability. NG-LGU cost-sharing arrangements have been formulated based on the income class of LGUs.

The NG's fiscal position has put more emphasis on the need for the private sector to fill in the investment gap in the sector. However, private sector participation is not as robust as anticipated mainly due to the non-viability of smaller utilities which usually service rural communities. Nonetheless, BOT and JV projects have been implemented (e.g., MWSS, Subic). Recently, a Philippine Water Revolving Fund (PWRF) was launched. The PWRF provides a sustainable loan facility that leverages private capital with public funds for water supply. Consistent with EO 279, it is made available to viable water utilities.

Experience with privatization has been mixed – the Manila Water Company, Inc. (MWCI) concession in the east has been successful. It has in large part met (and in some cases exceeded) its concession targets, is in good financial health, and the standards and coverage of WSS services have increased significantly since privatization. On the other hand, Maynilad Water Services, Inc. (MWSI), the concessionaire for the west zone, has encountered significant problems. MWSI's heavy debt burden, exacerbated by the Asian Financial Crisis and multiple devaluations of the Philippine peso, and its less successful (relative to MWCI) strategies for service expansion, caused MWSI to suspend payment of its concession fee since 2002 and to enter into arbitration with MWSS. Consequently, the west zone has been bid out and MWSI is currently under new management. With the new management, the much needed development of new bulk water sources to impede the looming water shortage problem in Metro Manila can push through.

Consistent with the policy of encouraging private sector participation, amendments to the implementing rules and regulations (IRR) of the BOT Law were undertaken since December 2004 to accommodate a range of measures, as recommended by various private sector groups, individuals as well as government agencies, designed to improve private sector participation in the provision of public infrastructure.

Among the important changes made, in consideration of the concerns identified by both the public and private sectors, are: i) unclear policies on setting of reasonable rate of return, grant of incentives and government undertakings, contract amendment, risk allocation, etc.; ii) protracted/unclear framework process and requirements; iii) transparency and competition in procurement; iv) enforcement of contracts; and v) automatic grant of franchise, among others. The amended IRR can be viewed at www.botcenter.gov.ph.

Consistent with the Presidential directive authorizing agencies to approve contracts amounting to less than PhP 500 million, except for BOT, without going through the National Economic and Development Authority – Investment Coordination Committee (NEDA-ICC) process [provided that the Department of Budget and Management (DBM) can certify the availability of funds), ICC revised its guidelines and procedures to accommodate the same to fast-track the processing of proposed government projects costing below PhP 500 million. The ICC guidelines can be viewed at www.neda.gov.ph.

✓ Planning

Sustainable and efficient water management to provide adequate, quality and affordable water to satisfy development needs is the vision for the sector. The operationalization of the IWRM framework as well as its institutionalization in the operation of implementing agencies remains to be the general strategy in managing the country's water resources.

Water resource planning for the different regions of the country is based on the following principles: (i) water is a limited resource that must be conserved and managed efficiently; and (ii) water has an economic value in all its competing uses and shall be treated as an economic good.

Thus, the strategy for the water resources sector includes:

- Promotion of an integrated approach to link social and economic development with protection of natural water resources and ecosystems that is decentralized, participatory, community-based and conducted at the most appropriate level
- Implementation of policies through decentralized operations within a national framework cognizant of the policy of devolution and community-based approaches in water management; and in parallel, addressing the need for capacity building and training at the local levels in development planning, operation and maintenance.
- Support for the creation of river basin authorities to effect IWRM.
- Promotion of market-based incentives for water conservation.
- Strengthening forest protection efforts including reforestation activities through community-based projects.
- Development and implementation of a pricing mechanism that takes into consideration full cost recovery and other externalities while balancing the same with the public's capacity and willingness to pay.
- Developing an extensive information, education and communication campaign to raise awareness that water is a limited resource and an economic good that has a corresponding price.
- Rationalization and institutionalization of a coordinated data collection system for efficient and effective flow of information for decision-making.
- Strict enforcement of environmental laws, rules and regulations and adopting stiffer penalties for violations.
- Continued research and development on applicable, appropriate and cost-efficient technologies for water conservation and wastewater disposal, sanitation and pollution control.
- Encouraging rainwater harvesting and impounding, and prioritizing the development of surface water to relieve stress and pressures on groundwater.
- Integration of climate change adaptation measures in river basin and sector planning.

Notwithstanding the above, the current water sector planning approach tends to dichotomize rural and urban areas instead of considering the whole local government coverage area as the planning unit. As it is, the division of roles and responsibilities is clear for national agencies and local government units, which should theoretically erase any gap in the planning area responsibility. And yet, small-scale independent providers (SSIPs) have had to fill in for the shortcomings of public utilities in urban areas. The case is worse for rural areas where a comprehensive program guiding water supply development is either lacking or weak.

The existing institutional fragmentation and policy inefficiencies make possible for these gaps to persist and even widen.

Planning at all levels is hampered by lack of reliable data and the absence of a systematic and regular monitoring of sector activities at the LGU level. Many of the earlier provincial master plans and investment plans for Level I and II systems are based on decades-old designs without updated information on hydro-geologic and water resource conditions in the planning area. Furthermore, demand for Level III systems is growing given that existing facilities provide access to only 44% of the population in their franchise areas.

The public sector's capacity to expand services cannot keep pace with the growing demand for water and corresponding demand for quality services. The gaps can only be adequately filled-in through private sector participation. However, privatization and public-private partnership arrangements tend to generate public anxiety over affordability of access to water. There is a need to formulate the best feasible arrangement that both induce private sector participation and social acceptability.

C. The Need for a Strategy for Eco-Efficient Water Infrastructure Development

The preceding review of the current situation in the Philippines makes it clear that the country's water resources are under severe stress due to inefficient use, inefficient infrastructure and pollution which result from the lack of a coordinated plan to address the inadequate water management policies and/or enforcement thereof, as well as the fragmented institutional framework for planning, decision-making and program implementation. Without a coordinated plan, the assistance in capital accumulation needed to finance water infrastructure development improvements would not be available. Further, in the absence of a strategy to identify priority needs, to maximize benefits for every peso spent in meeting those needs, and to mobilize funds in new and creative ways, full dependence on donor and central grant funding will remain and significant advance in the developing the sector at the least cost to the environment is not likely to occur.

Water is essential for life – it is indispensable for human wealth, health and well-being. It is crucial for sustainable development, including the alleviation of poverty and hunger and the preservation of the natural environment. It is imperative that government's socio-economic development strategies should take into consideration the efficient and sustainable use, protection and conservation of water resources. Thus, there is a need to introduce and streamline eco-efficiency in the development of water supply and sanitation infrastructure in the Philippines.

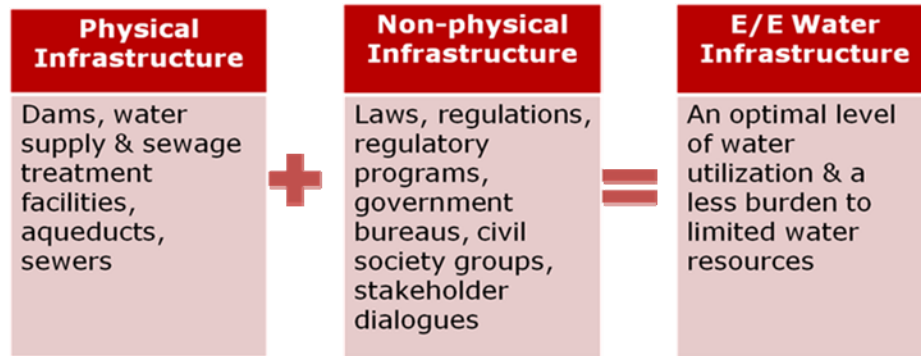
✓ What is eco-efficient water infrastructure?

The concept of eco-efficiency was first coined by the Business Council on Sustainable Development (now the World Business Council on Sustainable Development – WBCSD) in 1991. WBCSD defines eco-efficiency as 'the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impact and resource intensity throughout the life cycle to a level at least in the line with the earth's carrying capacity'. Simply put, eco-efficiency is "more value with less impact on the environment." It promotes innovation and a paradigm shift from market-based efficiency to eco-efficiency, "eco" meaning both economic and ecological, resulting in resource-saving and efficient use in order to achieve decoupling economic well-being with natural resource use. Eco-efficiency puts emphasis on the monitoring of material and energy flows of stocks and life cycle assessment.

While eco-efficiency has been successfully integrated in industrial and business processes, its application in water infrastructure development will be more difficult. Eco-efficient water infrastructure indicates physical infrastructures in water and sanitation services that adopt the sustainable processes of design, construction, operation and maintenance with less environmental impacts. It is recognized, however, that it takes more than dealing with the physical or technical

aspects of water infrastructure to successfully implement eco-efficiency. Infrastructure development cannot be separated from the soft component of infrastructure provision. The non-physical dimensions of infrastructure development, which include, among others, such as the institutional arrangements and policy measures (e.g., legal, economic and regulatory instruments) that support WSSS provision to effect an optimal level of utilization with less impact on the resource in particular and the environment in general should be given equal importance as the physical aspects.

Figure 3: Concept of Eco-Efficient Water Infrastructure



✓ Benefits to the Philippine Setting

Eco-efficiency is seen to entail a lot of benefits to the Philippines, particularly in terms of (i) ensuring adequate water resources to sustain the basic and economic needs of the people, (ii) protecting public health; and (iii) promoting inclusive growth.

Despite the relative abundance of the Philippines' water resources, increasing demand brought about by growing populations and urbanization, continued pollution of water bodies due to mismanagement of wastewater effluents, and the impacts of climate change result to mounting stress on the resource which threaten the sustained availability of water to support the social and economic development of the country.

The Philippine economy remains extremely dependent on natural resources. The rural sector employs some 11.2 million people through agriculture, fisheries and forestry-based industries. Eco-tourism has also been a major contributor to the economy, not only in terms of foreign exchange, but also of employment growth. Approximately 20 million people reside in and around forest, and 60 million live within 100 kilometers of the Philippine coastline. Anecdotal evidence suggests that poor people, and those whose income and welfare are more tightly linked with environmental and natural resources, are disproportionately affected by the continuing declines in environmental quality.

The poor also bear the brunt, in terms of income losses due to sickness related to water and air pollution. Nearly 6000 people die prematurely each year from water pollution and poor sanitation and hygiene. Seventeen percent of reported disease cases and one and a half percent of reported deaths in the country each year can be attributed to water pollution, sanitation conditions and hygiene practices. Among them, diarrhea is the third leading cause of disease in the country. Typhoid and schistosomiasis and other diseases also are significant, but together account for less than one percent of all reported disease cases.

The economic losses caused by water pollution are estimated at PhP67 billion. These include PhP3 billion for health, PhP17 billion for fisheries production, and PhP47 billion for tourism.

To achieve inclusive growth, it is therefore imperative for the Philippine government to ensure that any economic activity, which may entail putting up physical infrastructure, does not add pressure and stress on the environment. This includes water supply infrastructure that efficiently uses water resources and does not lead to further detriment to various natural resources.

A strategy on promoting eco-efficiency in water infrastructure development will result to huge economic gains to the country.

1. Efficient use of water for water supply, coupled with appropriate wastewater management practices, will forestall the development of new sources (whether nearby or distant from point of consumption) which entails higher fees for consumers.
2. Eco-efficient WSSS systems will also ensure availability of water for other competing uses (e.g., agriculture).
3. Eco-efficient WSSS systems that protect the environment, in particular, various water bodies, will result in economic gains (minimum of PhP67 billion a year) in the areas of health, fisheries production, and eco-tourism.

✓ **Enabling conditions or international best practices**

Effecting eco-efficiency in water infrastructure development is not an easy task. This is because, as previously pointed out, eco-efficient water infrastructure development is not only a matter of making available physical infrastructure technologies, but rather is a process that entails a long and hard look at the current institutional and policy framework that affects the delivery of the infrastructure.

An enabling environment should be present to successfully implement eco-efficiency water infrastructure development. Based on international experience, some of the “must haves” for eco-efficiency are:

1. In general, a society willing to cooperate and share responsibilities towards a common vision of sustainable development.
2. Strong political will/commitment to introduce and implement policy reforms.
3. Active involvement of civil society, People’s Organizations (POs) and non-governmental organizations (NGOs) to advocate/lobby for eco-efficiency in Congress and to the public.
4. A populace that is sufficiently aware of the impacts of a deteriorating natural environment, the benefits of implementing eco-efficiency, and their roles in the success of developing eco-efficient water infrastructure.
5. A business/private sector community committed to the social responsibility to provide services while fostering resource conservation and environmental protection.

III. Goals, Objectives and Guiding Principles of the Strategy

A. Goal

The goal of the strategy is to improve the quality of life of every Filipino for generations to come through the sustainable provision of basic services such as water supply and sanitation while maintaining the longer-term integrity of the natural environment.

B. Objectives

The objectives of the strategy are aims that, when realized, will result in achievement of the overall goal as stated above. The objectives are as follows:

1. To mainstream the eco-efficient approach in the planning, policy-making and decision-making relative to the development of water infrastructure;
2. To develop institutional capacities at both the national and local levels and in the private sector to plan, implement and manage eco-efficient water infrastructure;
3. To develop suitable financing arrangements for eco-efficient water infrastructure;
4. To raise awareness at the national and local levels on the benefits of the eco-efficient approach to water infrastructure;
5. To mobilize public support for eco-efficient water infrastructure; and
6. To utilize user-approved technologies that provide affordable improvement of water infrastructure.

C. Guiding Principles for the Development of the Strategy

✓ Integration

The first step to effecting sustainable development of the water resources sector which integrates the concept of eco-efficient water infrastructure is to consider an integrated approach to water management issues. As water is a finite resource, with competing demands for water supply, wastewater management, irrigation, power generation, aquaculture, recreation and environmental preservation, its development, allocation, and utilization should be undertaken in a holistic approach that promotes equity, sustainability and efficiency.

The IWRM approach is useful in establishing eco-efficient water infrastructure as it enfolded varied and diverse sectors, systems and aspects in water policy-making and implementation. The implementation of IWRM enhances the eco-efficient approach to water infrastructure, since IWRM delves into social aspects which eco-efficient water infrastructure does not include. According to the Global Water Partnership (2000), IWRM is ‘a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems’ (GWP, 2000). Such definition implies that IWRM puts an emphasis on the harmony between economy, society and the environment in terms of water management, considering not only water resources but also land and other related resources. IWRM also promotes the maximization of the economic, social and environmental benefits, which is closely linked with the spirit of eco-efficient water infrastructure.

The IWRM process integrates both natural and human systems. The natural system includes: 1) freshwater and coastal zone; 2) land and water resources; 3) surface and ground water; 4) water quality and quantity; and 5) upstream and downstream. The human system, meanwhile, include: 1) all policies considering impacts on water; 2) integrated with economic, food, energy policies; 3) stakeholder participation in policy planning and decision process; 4) water supply and wastewater services; and 5) public-private partnerships.

Table 5: Integrating the Natural System

Natural System	Description
Freshwater & coastal zone	<ul style="list-style-type: none"> ● Reflecting the continuum of freshwater and coastal waters ● Freshwater systems, important determinants of conditions in the coastal zone
Land & water resources	<ul style="list-style-type: none"> ● Reflecting the hydrological cycle between the compartments air, soil, vegetation, surface and groundwater sources ● Land use developments and vegetation cover, influencing the physical distribution and quality of water ● Water, a key determinant of the character and health of all ecosystems ● Catchment and basin level management, imperative in managing

	the relationships between quantity and quality and between upstream and downstream water interests
Surface & ground water	<ul style="list-style-type: none"> ● Surface water recharging groundwater ● A number of people rely on groundwater for water supply ● The use of agro-chemicals and pollution from other Non-Point Sources (NPS), threats to groundwater quality
Quality & quantity	<ul style="list-style-type: none"> ● Adequate water supply with appropriate water quality ● Deterioration of water quality in upstream, a negative impact on downstream users
Upstream & downstream	<ul style="list-style-type: none"> ● An identification of conflicts of interests between upstream and downstream users ● Water volume, pollution loads, flood control measures carefully considered ● Recognition of downstream vulnerability to upstream activities

Source: GWP (2000), p23-26.

Table 6: Integrating the Human System

Human System	Description
All policies considering impacts on water	<ul style="list-style-type: none"> ● Governmental policies, financial priorities and planning (physical, economic and social) ● Encouraging the private sector players to opt for technological, production and consumption choices based on eco-efficiency ● Facilitating stakeholder participation in water resource allocation decisions, conflict resolution and trade-off issues
Integrated with economic, food, energy policies	<ul style="list-style-type: none"> ● Integration between water policy and national economic, food, energy policies ● Cross-sectoral information exchange and coordination procedures and techniques for the evaluation of individual projects regarding their implications for the water resources and society included in water policy
Stakeholder participation in policy planning & decision process	<ul style="list-style-type: none"> ● A key element in achievement of a balanced and sustainable utilization of water ● Being useful for conflict management and resolution as well as for the evaluation of trade-offs between different objectives, plans and actions
Water & wastewater services	<ul style="list-style-type: none"> ● Wastewater, a useful addition to resource flows or water supply ● No coordinated management, reducing effective supplies by impairing water quality and increasing future costs of water supply
Public-private partnerships	<ul style="list-style-type: none"> ● A lack of advanced technology, management skills, and financial resources in the public sector ● Contribution from the private sector, beneficial for enhancement of water supply and sanitation services ● Adequate sets of regulatory framework for private operators, prerequisites for the partnership

Source: modified based on GWP (2000), p26-31.

✓ Decentralization

Decentralization is a critical consideration of the eco-efficient strategy. Experience has shown that the top-down approach to planning and decision-making has been ineffective as oftentimes such processes are not well informed of the real needs at the local level. It is in this light that most governments are now going the direction of decentralization.

Decentralization is based on the concept of 'subsidiarity' which is closely associated with devolution in the decision-making process. Subsidiarity upholds the principle of participation as it requires that all stakeholders and diverse opinions, particularly those at the local level, should input and influence decisions made at the regional and national levels. This is seen as more effective than the centralized approach it can promote development policies and strategies deemed most appropriate for local social, economic and environmental conditions.

✓ Participation

Understanding the social construction of an issue and identifying the many ways in which the problem may be framed is crucial to the formulation and implementation of appropriate policies and projects. Different people and groups may interpret an issue in varied ways and this in turn,

influences their views of the means by which it is addressed. Thus, in a complex issue such as water resources management, participation by as many stakeholders as possible in the planning, policy-making and decision-making processes is imperative.

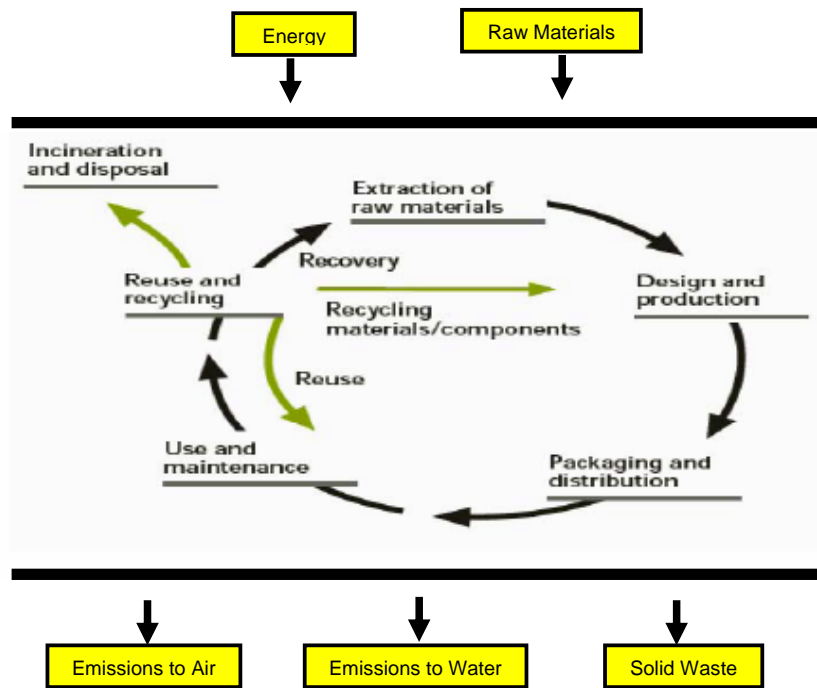
Broad participation can result in: 1) embarking on debates for new ideas and information; 2) identifying issues that should be addressed; 3) clarifying the capabilities necessary to address them; and 4) reaching a consensus on the need for action that spawns effective implementation. The government may play a key role, however, much more crucial element is an establishment of multi-stakeholder processes. The processes should include decentralized authorities, the private sector, civil society and the marginalized. Good communication and information mechanisms should be accompanied together with transparency and accountability.

✓ **Life Cycle**

Life Cycle Assessment (LCA) is a methodological framework for assessing the environmental impacts of products, services and systems at all stages of its life from cradle to grave. In relation to water resources management, the design, construction, operation and management of the eco-efficient water infrastructure should consider the life cycle of structural and non-structural measures.

In the application of LCA, policy-making and implementation should also consider the 'rebound effects', which can be referred to as 'a reduction in environmental impact in one part of the system can lead to unplanned increases in environmental impact in another part of the system' (Dixon and McManus, 2006). Examples of rebound effects in water infrastructure are: 1) direct rebound effect – installing a water efficient shower and eventually spending longer showering because it uses less water; 2) indirect rebound effect – spent less on the water bill and spent more on further consumption, such as taking a long distant holiday; and 3) general equilibrium effects – engaging producers and consumers and showing the result of several adjustments of supply and demand in all sectors (Dixon and McManus, 2006). Such rebound effects are difficult to predict and assess but their outcomes can be acute and require serious considerations. This brings to fore the importance of taking into account a variety of aspects including socio-economic, political and environmental impacts when establishing eco-efficient water infrastructure.

Figure 5: Flows of energy and materials and emissions considered in an LCA



✓ **Preservation of Ecological Soundness**

Policy-makers in water management should consider strategies on how to achieve ecological soundness in water environments. Water bodies include a variety of freshwater resources, such as rivers, lakes, and groundwater sources.

The government should ensure the integrity of its water bodies, and therefore, ecological sound practices and policies for eco-efficient water infrastructure have to accommodate sustainable approaches as well as preserve ecosystems. It should be pointed out that whereas human beings might be able to survive without some ecosystems, ecosystems can fade away without some ecosystems. Given the interdependence of human systems with natural systems, destroying or at the very least disrupting ecosystems can have adverse impacts on the economic and social welfare of the population.

D. Basis for the Strategy

The basis for the proposed strategy for the development of eco-efficient water infrastructure is presented in terms of eight broad areas, which relate closely to the issues and challenges discussed in the Section II and the ways in which organizational responsibilities are assigned in the Philippine setting.

The eight domains that form the basis for the strategy include:

✓ **Demand for Services**

Identifying and then giving full consideration to the demand for WSSS services in each community is a fundamental component of the strategy. Communities exhibiting a strong demand for the services are likely to successfully implement the strategy and program and to sustain the services over a long period of time.

Demand can be measured in several ways including the conduct of willingness to pay (WTP) surveys in which respondents are questioned concerning the monetary value that they would place on improved access to such services. The demand concept also includes the demand exhibited by a local governing body which makes judgments concerning the needs and desires of the populace, commerce and industry. Environmentalists also express a form of demand as they promote private and public actions to protect and conserve water resources. Thus, it is the collective demand for services by the broadly defined community that the strategy embraces.

The strategy also recognizes that demand is not static. Economic growth and development, for example, can stimulate interest in WSSS as more households have piped water connections which result in increased wastewater flows, and real increases in incomes make the costs of improvements easier to absorb. Advances in education and specific health education programs can also stimulate the demand for services. Thus, over time, demand can be expected to steadily increase.

✓ **Institutions**

The strategy will depend on the active participation of many institutions – both national agencies and local governments – in its implementation. It should also take into consideration the need to rationalize the functions of agencies at the national level down to the local level.

An important consideration in the formulation of the strategy would also be the experiences and capacities of these players.

A champion will also be crucial to the raising the strategy to the consciousness of all stakeholders and decision-makers.

The dispersed and varied nature of communities in the Philippines makes success more likely if non-government organizations (both private sector and voluntary) support national agency promotional, education, training and technical assistance efforts.

✓ **Finance**

Because of the limited financial capacity at the national government level, any use of national funds should be focused on targeted priority objectives. The proposed strategy is based on the

assumption that under conditions of severe financial constraint, choices must be made among options on the basis of priority of demand, likelihood of success, and environmental improvement.

It is also recognized that local governments have limited financial capacity. External assistance will have to be provided but this should be tied with commitment from local governments to prepare local plans and implement programs on eco-efficient water infrastructure.

✓ Technologies

New technologies and innovations to enhance existing ones will be crucial to the successful provision of eco-efficient water infrastructure. Criteria for technology selection should include:

1. Effectiveness and operability;
2. Affordability and cost-recovery possibility;
3. Acceptability to users;
4. Availability of trained personnel for operation and maintenance;
5. Sustainability; and
6. Eco-efficiency.

The basis for the technological strategy is to make available information on a wide range of beneficial technologies and their costs and assist in evaluating them so that appropriate decisions can be made by the users and their local government representatives.

✓ Sustainability

The strategy seeks to establish a comprehensive range of conditions which will serve as a basis for sustainability. Sustainable services are achieved when they address an identified demand, employ an appropriate level of technology, are managed by a well-trained and motivated staff and are financed through revenues derived at least in part from fees and charges levied on the direct beneficiaries of the services. These elements of sustainability are in fact derived from other basic strategy components, but when taken together produce a synergistic positive effect on the provision of reliable services over the longer run.

✓ Planning

The MTPDP, the PWSSR and other plans, policies and programs recognize the need to provide sewerage and/or sanitation services together with water supply nationwide, with priority given to the poorest communities. Said plans, however, stresses that such interventions should be made within the context of IWRM and sustainable development.

Planning and policy-making should also be based on the real needs of the local people and should consider the diverse ideas and perspectives on a given issue. Participation therefore should be a major undertaking in the planning and policy-making processes.

✓ Criteria for Investments

On the assumption that there are more applicants for participation than can be accommodated under the financing constraints, it will be necessary to establish a priority ranking system, which will be rooted in the assessment of overall demand and the likelihood that sustainable services can be established. Appraisal should be based on feasibility studies which cover the technical, financial/economic and institutional aspects of each proposal. Technical studies should demonstrate that a suitable variety of options has been considered, that a practical, efficient and effective technical approach has been recommended and that consumer demand and satisfaction have been addressed.

Financial studies should emphasize local revenue generation, maximization of private sector funding and cost recovery from user fees whenever possible. Financial and economic rates of return should be adequate to assure sustainability, but should also reflect an appreciation of the limited resources of the lower-income households. Institutional arrangements should be clearly identified and reflect a coordinated and collaborative effort among key participants.

✓ Laws and Regulations

A basic principle of the strategy is that it should function as far as possible within existing national legislation and national agency jurisdictional arrangements in such areas as channeling or approval of funds or responsibilities for existing functions related to WSSS.

National building, plumbing and sanitary codes should reflect the eco-efficiency concept. The strategy should also take into consideration the importance of local governments to establish ordinances or regulations as necessary to support and implement the policy.

E. Key Factors for Success

A strategy is a plan to achieve goals and objectives by mobilizing, deploying and managing resources to maximize benefits in light of known obstacles and constraints. The most successful strategies are based on a clear purpose and designed for an experienced institution committed to self-interested implementation. The ideal institution to implement a strategy is one with a clear, existing mandate and strong leadership committed to achieving it. Once the institution's leadership endorses the strategy and allocates the resources needed to implement it, prospects for success are high.

Strategies become more difficult to define and implement – and have a higher risk of low achievement – when the goals and objectives are abstract, when the resources are limited, and when many institutions, none of which has a high degree of self-interest, are involved. In such a situation, the strategy itself must provide a mechanism for promoting the proposed goals and objectives as worthy ends, for allocating time and resources to create a constituency, and for building institutional and human resource capacity to serve it. The strategy then needs to take maximum advantage of existing programs in order to use resources wisely.

This is the situation in which the strategy for the development of eco-efficient water infrastructure is being proposed. Implementing the strategy in this situation is an enormous challenge, but in light of the need to address the social, environment and development problems with respect to water resources, it is a worthy undertaking. It will require a focused working partnership between the national government and local governments. At the national level, cooperation and coordination among several national agencies are critical to success. At the local level, where there is limited experience in eco-efficient water infrastructure, capacity building in parallel with planning and program design will be essential.

The process will depend on a clear expression of the will of the national government that the program to implement the strategy is to proceed and, at least in the early years, on the establishment of an effective entity with the mission and means to guide and coordinate it.

IV. The Strategy

A. Strategy Statement

The strategy is to encourage and facilitate informed decision-making by national and local authorities on WSSS programs that are based on the eco-efficient approach, and to provide programmatic, technical and financial support for the implementation of such policy and the corresponding programs and projects.

The strategy will have a strong focus on technological and social innovation, accountability and transparency, as well as on cooperation with other parts of society with a view to achieving the set objectives.

B. Strategy for Eco-efficient Water Infrastructure

The strategy for eco-efficient water infrastructure highlights the need to strengthen enabling framework conditions that support WSSS investment and innovation, and promote institutional capacity building for local authorities, regulators and communities.

✓ Planning and Programming Process

Water challenges should be addressed through an integrated approach that also take into account development priorities and needs, social conditions and aspirations, trade rules, environmental policies, innovation opportunities, technology transfer policies and water efficiency.

Re-engineering processes to reduce consumption of resources, to reduce pollution and to avoid risks, while at the same time saving costs; redesigning goods and products to be more cost-efficient; and re-thinking markets and re-shaping demand and supply to meet both economic and ecological needs provide opportunities to implement eco-efficiency. This is where policies are crucial in creating an enabling framework which allows society to become more eco-efficient.

At present, the ability of various players from public and private sector players to deliver their full contribution to addressing environmental challenges related to water resources development through technology research and development, innovation and investment is constrained by the inadequacy and lack of enabling frameworks.

The government has an important role to play in creating these conditions by formulating and enforcing policies which fosters economic growth and favors reduction in resource use and the avoidance of pollution. Such policies should target not only government agencies providing WSSS services but also private sector businesses. Policy measures would include:

1. Identifying and eliminating perverse subsidies such as cross subsidies in the water tariffs between classes of users.
2. Internalizing environmental externalities by integrating environmental costs into the viability analysis of programs and projects.
3. Shifting tax from labor and profit to resource use and pollution.
4. Developing and implementing economic instruments.
5. Promoting water efficiency initiatives and partnerships.

Policies that promote eco-efficiency, such as those cited above, should be embodied in national and local plans, and implemented through programs and projects. It is the responsibility of the governments to come up – in transparent dialogue with civil society and business and industry – with these plans and frameworks.

The MTPDP, the regional development plans, and the local plans (provincial and municipal) should be revisited to incorporate the concept of preserving the environment in the delivery of economic and social goods and services. Similarly, sectoral plans, particularly in the water resources and WSSS sectors, should reflect the concept of more value with less impact.

Programming processes of national and local governments, as well as investment decisions of private sector should also comply with the above policies, as espoused in national and local development plans. At the national level, investment appraisal criteria should include eco-efficiency indicators, or at the very least should integrate environmental externalities in the evaluation of project viability – financial, economic and technical.

✓ Laws and Regulations

The Water Code of the Philippines, in itself, provides the basic framework for the management of the country's water resources. The Clean Water Act, meantime, provides the framework for water quality management within the watershed context. There is, however, a need to revisit the penalties for violation of the provisions of both laws to make them more responsive to environmental protection by making the penalties based on the economic value of water. The Water Code, in particular, should also be reviewed in terms of regulation of groundwater extraction for various uses.

Both laws and other pertinent laws should also provide for additional resources – financial, manpower, and technical capacities – for the government agencies responsible for overseeing the implementation of the provisions of the law (e.g., DENR, NWRB) to make enforcement effective.

National building, plumbing and sanitary codes should also be revisited to ensure promotion of the eco-efficiency concept. Eco-efficiency can be reflected in such measures as providing for rainwater collection and reuse, protection of groundwater through proper design of septic tanks, etc.

Such laws and regulations should be accompanied by local ordinances or regulations as necessary to support and implement the policy.

✓ Institutional Arrangement

While many local governments have competent personnel and generic planning and management systems, they lack the experience necessary to carry out the statutory mandate contained in the Local Government Code and to achieve the overall strategic objectives of providing and managing eco-efficient WSSS services without substantial support and direction by the national government.

The multiple functions to be performed at the national level, even though actual service provision takes place at the local level, cut across the interests and jurisdictions of several existing agencies, whose continued interest in and promotion of the program are vital to its success. To provide the necessary energy, impetus, national-level coordination, and guidance and support of local activities, the INFRACOM SCWR may be tapped to oversee and manage the strategy.

The INFRACOM SCWR will perform the following major functions relative to the strategy:

1. Promote and coordinate the work of national agencies and, through the appropriate agencies (e.g., DILG, DENR), provincial/basin-based agencies;
2. Approve and update the annual work plan to implement the strategy including prioritization of activities;
3. Facilitate and/or support conduct of regulatory and administrative researches such as on effluent standards, revisions to the building and sanitation and plumbing codes; land use regulation, etc.
4. Facilitate the provision of institutional and technical support to national government agencies and local governments;
5. Carry out program/strategy monitoring activities including tracking the status, progress and performance of each agency and achievements against the work plan; and
6. Update the strategy as may be necessary.

Notwithstanding, several national government agencies, which are also represented in the SCWR, will perform, in accordance with their mandates, key roles, to wit:

NEDA – to ensure the integration of eco-efficient water infrastructure development in national and sectoral development policies and plans, and of eco-efficiency in major national development programs and projects.

DENR – to lead the setting of effluent standards, conduct of policy studies on overall natural resources management, assessment/regulation of the environmental impacts of developmental projects, monitoring of the overall environmental situation of the country.

NWRB – to lead the conduct of policy studies on water resources management, regulation of water resources, and economic regulation of water utilities (interim), and maintenance of a database on water resources supply and allocations.

DOH – to lead the regulation of drinking water quality standards, and drive efforts in the sanitation sector.

DILG – to lead the capacity building of local governments in terms of planning, designing and implementing eco-efficient water infrastructure.

DPWH and LWUA – to provide technical support in the design and implementation of eco-efficient water infrastructure.

✓ Partnerships

The private sector or business group is also crucial to the successful implementation of eco-efficient water infrastructure. Cleaner production, management systems, technological innovation and voluntary approaches and partnerships all offer opportunities for continuous improvement and capacity building towards increased and sustained eco-efficiency in industrial and business operations. Government should:

7. Encourage businesses and other downstream users to factor water efficiency into investment decisions.
8. Encourage business groups and sectoral associations to work through supply- and value- chain partnerships to improve environmental and water performance.
9. Encourage business groups to promote technological cooperation and capacity building in environmental management systems and other good practices.
10. Work with businesses to establish voluntary eco-efficiency targets for products and equipment to promote and enhance eco-efficiency along the value chain.
11. Encourage companies to report eco-efficiency and sustainability performance openly to stakeholders.
12. Use environmental management systems and other management tools in small and medium sized enterprises (SMEs).

Successful partnerships allow the strengths and areas of expertise of those involved to be combined for practical and visible results.

Governments should support partnerships by:

- Participating in partnerships and offering local expertise as well as financial resources and infrastructure,
- Establishing a regulatory environment that supports the formation of partnerships, and
- Supporting individual stakeholders in finding suitable partners.

Governments, business and civil society should work in partnership to leverage business resources to provide training on knowledge and skills, share more eco-efficient water technologies and cooperate to accelerate their dissemination. Partnerships could also be an avenue to assist SMEs to build local capacity to improve water access and use.

Water users require capacity-building to improve community water management. Particular emphasis should be given to the involvement of women, who are often responsible for domestic water and sanitation management. Governments, donors and civil society should ensure that they support WSSS solutions that are both efficient and acceptable to the local community.

✓ Finance

Sustained financing and investments that balances market-based instruments with social/cross subsidies supported by a clear NG-LGU cost-sharing arrangement, counterpart and incentive mechanisms is the vision for the WSSS sector. In addition, adequate tariffs that are based on sound economics and determined using performance-based regulatory mechanisms are seen crucial to the sustainability of WSSS services.

Nevertheless, there is a need to incorporate eco-efficiency parameters in the prioritization of water infrastructure projects for implementation.

Maintaining, growing and delivering the WSSS infrastructure required to meet future demand sustainably will require significant investment, much of which will come from the private sector. Governments and donor agencies should emphasize that access to financial resources goes hand in

hand with good governance by creating environments favorable to private investment, reducing investment risks, and providing credit support through grants, loans and/or guarantees.

However, governments should promote and enable investments in WSSS by leveraging official development assistance (ODA), promoting technological cooperation and exploring other innovative financing arrangements that would prioritize and support eco-efficient water infrastructure.

In addition, financial institutions have to be strengthened and capacity building activities undertaken to ensure transparency and effectiveness.

✓ Technical Support and Capacity Building

Discussion among civil society, business and governments on the most promising technologies and systems to support eco-efficient infrastructure development, and how those options can be commercialized and disseminated through partnerships is necessary.

Development and utilization of both existing and new, cost-effective, efficient WSSS technologies with low environmental impacts throughout their life cycle is an effective way to improve access to WSSS services, to promote eco-efficiency and to support sustainable development. This can best be facilitated through a variety of approaches including, for example, research and development incentives, market-oriented measures, and steps to promote technology transfer and eliminate existing barriers that inhibit more widespread use and transfer of existing efficient technology.

Government should conduct awareness campaigns on how to pragmatically meet the longer-term challenges of water resources management and sustainable development so that all stakeholders will better understand the implications for research, innovation, technology diffusion and transfer, and investment decisions that must be made now, in particular for equipment and infrastructure with long lifetimes. Significant funds have to be made available to finance ongoing technology innovation and its deployment.

Governments should support technological development and deployment activities by (i) funding research and development activities directly and indirectly through the funding of research centres and universities, (ii) supporting research and development and technology transfer across borders by lowering tariffs, maintaining strong intellectual property right protection and establishing trade agreements, (iii) providing a research and development friendly environment by guaranteeing intellectual property rights and the presence of a workable effective patent system, and (iv) engaging in an open and transparent dialogue with all major groups on the advancement of innovation and new technologies.

In addition, assistance in terms of capacity building for all decision-makers and project implementers is also a necessary step towards the effective dispersal, adoption and implementation of eco-efficient technologies and practices. Adopting the status quo, which is characterized by low and skewed coverage, weak local capacity in policy formulation, planning, monitoring, evaluation and fiscal management, and inadequate resources of national government agencies to sustain support services, will prove detrimental to the strategy. There should be a paradigm shift from national government implementation of programs and projects to decentralization or devolution to the local level. The first step would be to financially and technically capacitate relevant national agencies to perform their mandates (organization and training by DILG, regulation by NWRB, technical assistance by DPWH and LWUA, financing by LWUA, MDFO and GFIs), followed by assistance and capacity building to LGUs and service providers. Ultimately, it is expected that the local level actors will be able to manage their own human resources development or training towards achieving eco-efficiency in the provision of their water infrastructure.

✓ **Social Marketing and Promotion**

If the strategy is to succeed, it must first be adopted as a national policy and then be “sold” to LGUs, the private sector and individual consumers.

All parts of society share the responsibility of eco-efficient progress. While business and governments have each their important part to play and are willing to act and accept the challenge, the rest of society has its role to play. It will take tremendous effort to change the prevailing attitude that the government should provide services at no direct expense to the public, which has led to wasteful practices.

The public should patronize eco-efficient products and services, practice efficiency in the use of water and be willing to pay appropriate tariffs for services rendered. To accomplish this, an effective and well-targeted information, education and communication (IEC) campaign should be developed to build awareness.

Educators should include eco-efficiency and sustainability in high school and university curricula and build it on research and development programs.

Civil society has to encourage consumers to prefer eco-efficient, more sustainable products and services and advocate for political measures to create framework conditions which reward eco-efficiency.

V. Action Plan

A. The Need for Commitment

The strategy proposed in the preceding section will rely on the concerted actions by various actors, including government agencies, civil society, private sector and the public, to promote and support local actions. This will require not only coordination mechanisms such as the INFRACOM SCWR but also a clear policy statement that the government itself supports the strategy. It will also be necessary for LGUs and beneficiaries to understand and support the various elements of the strategy, especially the financing provisions.

It will be necessary to integrate and sustain eco-efficiency in both national and local development plans and investment programs.

B. Implementation Schedule

The time schedules presented in this strategy are based on the assumption that implementation of the initial action plan will be smooth. Given the significant impact of the elections in 2010 that will correspondingly result in change of national and local administrations, it seems logical that a starting point after the elections is more appropriate and realistic. Promoting the enhancements in policies that will render them more responsive to eco-efficiency will have to be re-conducted for new officials at the national level. A new administration will trigger the crafting of new development plans both at the national and local levels

In addition, some of the groundwork for the integration of eco-efficiency in government policies should be done immediately, that is, prior to the orientation or briefing of new officials on the eco-efficiency approach. Studies on such aspects as the (i) updating of the inventory of the country’s water resources and the impact of climate change, (ii) the valuation of the economic impact of un-enhanced water resource management use, and (iii) assessment and consolidation of water demands and WSSS coverage may serve as convincing information/proof to solicit support for eco-efficient initiatives. The conduct of such studies, however, will depend on the availability of funds from both local sources and from the donor community. It is noted, however, that locally, all of the government agencies’ budgets have been allocated for other activities within the fiscal year. Similarly, some donor agencies may already have begun or completed their programming for the next fiscal year.

Notwithstanding, integration of eco-efficiency may be possible already in ongoing initiatives such as the amendments to the Water Code, the study on raw water pricing, the crafting of a National Sewerage and Septage Management Program (NSSMP) and a National Sustainable Sanitation Plan, and the other programs on climate change adaptation and provision of water supply services in waterless areas.

Thus, assuming a July 2010 starting date for implementation, and further assuming the availability of funds, a 2-year time frame for preparatory works/studies is assumed. Integration into development plans can be done simultaneously with some of the groundwork activities. Demonstration projects (say for rainwater harvesting, for water pricing, etc.) in pilot areas may proceed thereafter. Continuous awareness building will be undertaken at the same time.

Changes in legislation and regulations will be the most lengthy, and engaging civil society groups immediately will be crucial.

Overall, a 5-year implementation plan from integration into development plans to implementation in pilot areas, the results of which will hopefully feed into decisions of legislators, is deemed appropriate.

C. Priority Program of Actions

The key actions and activities needed for program initiation are as presented in two figures:

✓ Strategy Initiation Schedule

Figure 6 shows the program initiation schedule that emphasizes the early pre-program institutional preparations, as well as program initiations through activities related to planning and decisions to proceed with implementation.

1. National government executives' and other key actors' (civil society and private sector representatives) approval of the key principles of the strategy and agreement to proceed with implementation.
2. Integration of the eco-efficient approach in ongoing activities including:
 - Amendments to the Water Code;
 - National Sewerage and Septage Management Program;
 - National Sustainable Sanitation Plan;
 - MDG-F 1919: Enhancing Access to and Provision of Water Services with the Active Participation of the Poor;
 - MDG-F 1656: Strengthening the Philippines' Institutional Capacity to Adapt to Climate Change; and
 - Sector Assessment Project.
3. Orientation of new officials after elections to solicit support and approval of the strategy and implementation of the same.
4. Resource assessment for major river basins, as well as assessment of current situation and projection of demand-supply situations including possible impacts of climate change under both status quo and with-strategy scenarios.
5. Valuation of the economic impacts of not implementing eco-efficient approaches to water infrastructure development.
6. Cost-efficiency analysis of different eco-efficient technologies (e.g., rainwater harvesting).
7. Selection of pilot areas for implementation of policies (e.g., raw water pricing) and cost-efficient technologies.
8. Develop IEC materials for awareness building among all stakeholders.
9. Incorporation in the MTPDP of the next administration as well as local plans, including indicators for eco-efficiency performance measurement.

✓ Strategy Implementation Schedule

Figure 7 shows the post-acceptance of the strategy activities and implementation of the policies.

1. Study on appropriate incentives, taxes, and other economic instruments relative to the promotion of eco-efficiency amongst service providers, goods and equipment suppliers, and the public (demand-management).

2. Enhancements to project appraisal guidelines to include eco-efficiency decision parameters.
3. Capacity building for national government agencies and local governments on planning, design, financing and implementation of eco-efficient water infrastructure.
4. Advocacy for changes in legislation and regulations.
5. Incorporation in education curricula.
6. Continued awareness building among local stakeholders and the private sector.
7. Research and development on eco-efficient water infrastructure technologies and innovations.
8. Implementation of demonstration projects in selected pilot areas.

✓ **Demonstration Project Implementation Schedule**

Figure 8 is a typical local program implementation schedule showing management and planning preparations plus facility engineering, construction and startup.

1. Develop local development and sectoral plans that reflect the eco-efficient approach to water infrastructure development, including priority programs and projects based on local needs and resources.
2. Conduct local promotion and education.
3. Adopt local ordinances/codes that will among others, ensure imposing of proper tariffs, public compliance to effluent and sanitation management, etc.
4. Secure technical assistance for feasibility study of priority projects, including comparison of alternatives in terms of, among others, eco-efficiency.
5. Secure financing with guidance from appropriate national government agencies.
6. Implementation of the project.
7. Conduct training of local personnel for sustainability and to avoid perpetual dependence on national government.
8. Ex-post evaluation to ensure feedback of lessons learned into the planning and programming process.

D. External Technical Assistance

Key areas for external technical assistance would be on:

- Resource assessment;
- Economic impact valuation of the eco-efficient approach;
- Research and development on various eco-efficient technologies including cost-efficiency analysis;
- Promotion and education;
- Determination of appropriate economic instruments;
- Capacity building of national and local stakeholders;
- Review of legislation and regulations, and amendments thereto;
- Development of appropriate financing mechanisms;
- Enhancement of existing regulatory methodologies to incorporate eco-efficiency indicators;
- Development of academic curricula;
- Development of local development and sectoral plans;
- Prioritization of programs and projects based on eco-efficient parameters;
- Feasibility study of priority projects; and
- Monitoring and evaluation.

E. Projections of Budgetary Requirements

The projected budgetary requirements hereunder presented are only for the strategy initiation and implementation activities. The budgetary requirements for the pilot demonstration activities will largely depend on the needs of the pilot areas.

• Soliciting support and approval of the strategy (meetings/workshops/conferences)	PhP	600,000.00
• Technical Assistance		
○ Resource assessment (18 major river basins)	PhP	180,000,000.00
○ Economic impact valuation of eco-efficient approach	PhP	5,000,000.00
○ Research and development	PhP	25,000,000.00
○ Determination of appropriate economic instruments	PhP	10,000,000.00
○ Review of legislation and regulations	PhP	3,000,000.00
○ Development of academic curricula	PhP	5,000,000.00
○ Enhancement of existing regulatory methodologies	PhP	5,000,000.00
○ Development of appropriate financing mechanisms	PhP	15,000,000.00
• Promotion and education for 5 years (including development of IEC materials)	PhP	50,000,000.00
• Capacity building	PhP	100,000,000.00
• Advocacy for changes in legislation and regulations	PhP	1,000,000.00
• Monitoring and evaluation (framework development only)	PhP	2,000,000.00
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TOTAL		PhP 401,600,000.00

F. Constraints and Risks

There are major risks and constraints to the successful implementation of the strategy.

Decentralization depends upon a clarification of the roles of local, regional, and national level institutions and the setup of efficient local level institutions for planning and decision-making. Without these foundations, there are several risks that might result in jeopardizing the decentralized system, such as the reinforcement of local elite groups, anti-government movements in different ethnic and interest groups, the marginalization of less dynamic regions and the fragmentation of national unity.

The importance of public participation in water policy-making and implementation has been widely discussed and accepted in the international water community. But it is still rare to find an adequate institutionalization of public participation in decision-making and implementation. One reason for this is the conventional thinking of bureaucrats that more engagement of the public might slow policy decision-making and implementation with unnecessary comments and interventions, which can cause an increase of transaction costs.

Decisions with respect to policy formulation and implementation are hinged upon the availability and quality of data. Currently, updating of information needed for decision-making (such as WSSS coverage, availability of water) is yet to be undertaken/completed. Delayed implementation/completion of said undertaking may also derail decision-making with respect to integration and implementation of the eco-efficient approach in water infrastructure development.

Availability of financial resources to fund the strategy initiation activities is a major risk to implementation of the strategy. As earlier pointed out, the activities should be timed with the planning for the fiscal year of the country, and as government resources alone will not be sufficient to fund these activities, the fiscal year of donor agencies, particularly those which give priority to the WSSS sector.

G. Opportunities for Success

The current initiatives and policies in the sector can offer opportunities for success of the strategy. The country's commitment to sustainable development and the IWRM concept will not render the concept of eco-efficiency new.

Similarly, some of the activities proposed for implementation of the eco-efficiency approach will be consistent with the strategies as espoused in the MTPDP and the PWSSR.

Despite the potential delays that may arise from the conduct of national elections in 2010, the strategy can take off from ongoing activities such as the (i) Raw Water Pricing: Philippines Project, (ii) NSSMP

and NSSP, (iii) MDG-F 1919 and 1656, and (iv) Sector Assessment Project. Similarly, relevant agencies have commenced preparation of proposals for some of the requisite activities to the strategy such as Resource Assessment for Critical River Basins.

Lastly, the newly created INFRACOM-SCWR can coordinate all activities with respect to the initial implementation of the strategy.