

Country Report

The Status and Challenges of Water Infrastructure Development in the Philippines

Introduction

The Philippines' water resources may be described as a paradox of abundance and scarcity. The country has 421 major river basins in 119 proclaimed watersheds, which together with 61 major lakes, accumulate runoffs from rains averaging 2,400 millimeters annually. The Philippines has an estimated 50,000 square kilometers of groundwater reservoirs and a reliable surface water supply aggregate of 833 million cubic meters per day. Data from the World Resources Institute for 1977 to 2001 indicates that the Philippines has an internal renewable water resource of 479 billion cubic meters per year and annual per capita availability of 6,093 cubic meters.

Ironically, despite this abundance, a significant number of Filipinos still do not have adequate and sustained access to potable water. It is estimated that around 20% of the population still have no access to improved water services, while overall access is further declining. Survey data shown in the Filipino Report Card on Pro-Poor Services in 2001 estimated that only about 64% of the population had access to improved water services through formal service providers. The 2004 Annual Poverty Indicators Survey, meanwhile, shows that, on average, about 50% of the population does not have access to safe drinking water. Despite the inconsistent figures, one thing is clear - water supply infrastructure development has not kept up with the growing needs of the economy and the population.

Wastewater management in the country paints a bleaker picture. Indiscriminate discharging of untreated wastewater over the years, particularly from domestic sources, has caused major pollution problems especially in highly urbanized areas. Sanitation coverage in Metro Manila has increased to a mere 12% by 2006 from zero in 1997. Sewer coverage, meanwhile, has increased from 8% in 1997 to only 11% in 2006, covering only the more affluent villages in a number of municipalities in the metropolis. Outside Metro Manila, only around 3% of the urban population is served with some form of sewerage facility while others simply rely on onsite sanitation treatment such as septic tanks, which in most cases are not properly designed and/or maintained.

Aside from pollution of sources due to poor wastewater management, prevailing problems of excessive and wasteful use, and inefficiencies in the distribution system, among others, have all contributed to inadequate and inefficient performance in the sector. Combined forces of population growth, poverty, industrialization and climate change further exert tremendous pressure on existing water systems.

Status of Water Infrastructure

Water Resources Policy. Policies concerning the development of the water and sanitation sector are contained in the Medium-Term Philippine Development Plan (MTPDP) 2004-2010, formulated with the National Economic and Development Authority (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.

The 1976 Philippine Water Code, created under Presidential Decree (PD) No. 1067, provided the legal framework for the ownership, appropriation, utilization, exploitation, development,

conservation and protection of water resources in the country. Republic Act (RA) No. 9275 (Philippine Clean Water Act of 2004), meanwhile, provided for the comprehensive water quality management in the country. The Department of Environment and Natural Resources (DENR) is mandated as the lead department for implementing water resources legislation.

The Department of Finance (DOF) takes the lead in the formulation of financing water policies. Executive Order (EO) 279 rationalizes the financing of the sector with concessional loans made available for less credit-worthy utilities and commercial loans for creditworthy and more viable utilities. As much as possible, private sector participation shall be pursued in filling the financing gap for investments in the sector.

Water Supply Provision. 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.

In 1971, RA 6234 abolished the National Waterworks and Sewerage Authority (NWSA) and transferred its functions, business, assets and liabilities as they relate to Metro Manila to the Metropolitan Waterworks and Sewerage System (MWSS) created under the same legislation. 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.

Outside the Metro Manila area, further delineation exists between water supply delivery to urban areas and rural areas. In 1973, PD 198 authorized the formation of water districts, which are considered government owned and controlled corporation (GOCC), on a local option basis to provide water supply services and creating the Local Water Utilities Administration (LWUA) as a specialized lending institution for these water districts, with the power to review their rates. Water districts are usually organized in provincial centers or urban areas, where financial viability is better.

In other major urban areas such as Subic and Tagbilaran, joint ventures (JV) were also formed to broaden private sector participation in the water supply service sector.

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

In 2005, the National Anti-Poverty Commission (NAPC) was given the task to coordinate the implementation of the NG program for waterless areas. Waterless means coverage is less than

50% of the population. The program is in pursuit of the government's policy to prioritize the provision of water supply to these areas as embodied in the MTPDP 2004-2010.

Finally, some households employ their own shallow well and/or deep well either as a substitute (if without access to any formal level of service) or a complement (if with other alternative water supply delivery system).

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.

Water Supply Providers, 2005

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

Regulation. The MWSS-Regulatory Office was created under RA 6234 to monitor and/or enforce the Concession Agreements and perform economic regulation. LWUA currently undertakes the regulation of water districts.

The supervision of private water utilities and consenting LGU-run facilities outside of the jurisdiction of MWSS and LWUA, including the regulation of water tariffs, is undertaken by the National Water Resources Board (NWRB), formerly known as the National Water Resources Council (NWRC)², 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. In 1977, pursuant to PD 1206, the powers and functions of NWRC were expanded to include economic regulation of waterworks operators, except those falling under the jurisdiction of the MWSS and LWUA and the water districts.

National standards for drinking water quality as well as standards concerning sanitation and sewerage collection are set by the Department of Health (DOH).

Financing. 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.

Consistent with the policy of encouraging private sector participation, BOT and JV projects have been implemented (e.g., MWSS, Subic).

The NG spends a small fraction of its budget for water supply. In 2007, for instance, only

¹ 127 were considered non-operational.

² In 1987, renaming of NWRC to National water Resources Board (NWRB) under Executive Order (EO) No. 124.

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 for water supply provision, 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.

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.

Water Supply Infrastructure Facilities.

MWSS system. The Manila water supply system is the oldest such system in Asia. It was constructed back in 1878, when the Philippines was still governed by Spain. Its initial operation covered the delivery of 16 million liters of water daily to 300,000 people. At present, MWSS supplies water to over 1.6 million households or 12.56 million people.

Angat River in Bulacan province provides 97% of MWSS's water supply. Water from the Angat Reservoir³ is withdrawn through the 5 auxiliary turbines of the hydroelectric power plant and is discharged downstream to Ipo dam. Water is conveyed along 3 tunnels and 5 aqueducts, 22 kilometers away to the outskirts of the metropolis. Two sets of interconnecting facilities punctuate the lines: Bicti headworks consist of three basins which connect the tunnels coming from Ipo to the 5 aqueducts, as well as being connected to each other⁴ (Basin 1 and 2 only). Flows from the aqueducts are impounded in a 36-billion liter facility in Novaliches, Quezon City.

Final raw storage and treatment prior to distribution is performed along two routes. The first route, involves raw water storage at La Mesa reservoir (located immediately downstream of Novaliches facility), prior to treatment in the two Balara plants (total capacity of 1,600 million liters per day or MLD), 7 km away. Aqueducts enable either intake from three towers at La Mesa reservoir or by-pass flow direct from Novaliches to Balara. The second route, consists of treatment at the two La Mesa plants (total capacity of 2,400 MLD), located close to La Mesa reservoir, but does not involve raw water storage. Two open channels bring water directly from Novaliches to the plants.

La Mesa raw water reservoir, which acts as regulating point for the production side with its 20-day storage capacity, contributes also to the sources. It is filled by the diversion of Angat river water and is complemented by its own watershed run-off (estimated 36.5 million cubic meter per year) as well as by a 9 meter high diversion dam in Alat (7 million cubic meter). When needed by MWSS, an average of 19 million liters per day (MLD) flows down the Alat-Sapang aqueduct to the reservoir. Its flow is otherwise used for local irrigation.

³ In 1962, NWSA inked an agreement with the National Power Corporation to include a water-supply component in the construction of the Angat Multi-Purpose Dam.

⁴ This permits measurement and control of the flows in case of failure of one of these lines.

The treated water from the La Mesa plants flows by gravity to Bagbag Reservoir, while the bulk of the treated water from Balara plants supplies the San Juan reservoir (capable of holding 40-million liters of water). Water is distributed through the MWSS central distribution system (CDS), which consists 12,000 kilometers of distribution pipes (including 406 km of primary mains), 16 reservoirs, and 18 pump stations.

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.

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.

Water districts. Water districts provide Level III water supply systems within their franchise areas. Level III system is a system with a source, a reservoir, a piped distribution system and individual household taps. It should provide at least 100 liters/capita/day. Water districts follow technical and customer service standards set by LWUA.

Collection of water fees is undertaken by the water district, as mandated by PD 198, based on rates that are reviewed by LWUA.

Rural water systems. Rural water supply systems outside of MWSS and water district franchise areas include some Level III and mostly Levels I and II systems.

A Level I system is a protected well or a developed spring with an outlet but without a distribution system, normally serving 15 households. Its farthest user should be at most 250 meters from the point source and the system should be able to provide at least 20 liters/capita/day.

On the other hand, a Level II system is a system composed of a source, a reservoir, a piped distribution network and 2 or more communal faucets, with each faucet serving 4 to 6 households. The farthest house should not be more than 25 meters from the communal faucet system and the system should provide at least 60 liters/capita/day.

In most cases, water fees are not collected for rural water supply systems especially for those which are run by LGUs. If fees are collected, these are not set at the appropriate level to ensure sustainability of operations.

Constraints in Infrastructure Development

The water supply, including sewerage and sanitation, infrastructure in the Philippines is faced with many challenges, which have to be hurdled before significant headway can be achieved. The most significant of which include institutional fragmentation, financing and lack of

capacity of major players.

Institutional fragmentation. 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.

Financing. Financing remains a big problem for the sector, especially for rural areas. 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.

Lack of capacity. 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.

Necessary Water Infrastructure Scheme Improvements. 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.

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.

Challenging Issues for Eco Efficient Water Infrastructure

Eco-efficient water infrastructure delivers goods and services that respond to the socio-economic needs of the population at the most cost-effective way and at the least cost to the environment.

Water supply provision is important to socio-economic development – a basic need service necessary for human life and for enhancing the quality of life. Water infrastructure should be able to provide adequate and sustainable access to safe drinking water at affordable prices. Adequate access shall be defined by the time of availability of water, the amount and other technical standards (e.g., pressure). Safe drinking water means water that is free of microorganisms or disease-producing bacteria (pathogens). In addition, the water should not possess undesirable tastes, odors, color, levels of radioactivity, turbidity or chemicals and it should pass the standards of the Philippine National Standards for Drinking Water (PNSDW).

Affordability should take into consideration the ability to pay of the beneficiaries. Thus, the selection of how to deliver water supply services should take into account the intensity of the investments and operation and maintenance costs of different alternatives.

At the same time, the provision of water supply should not compromise the quality of the environment for the enjoyment of the current and future generations. Technical alternatives and design should consider the resource intensity of the project from investment to operation to cessation stage (cradle to grave). Protection of raw water sources should be promoted by curbing wasteful consumption practices, minimizing leakages, and integrating wastewater management and sanitation facilities into the system.

Recent efforts to promote eco-efficiency in water infrastructure in the Philippines include:

- *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.
- *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.

- *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).
- *Millenium Development Goal Fund (MDGF) on Water Supply.* 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.
- *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.

A shift towards eco-efficient water infrastructure development is faced with various barriers. Foremost of these would be the additional cost that may go with enhanced designs for environmental efficiency. As it is, poor communities especially, can barely afford the fees necessary to effect full cost recovery of conventionally designed facilities. Further, accessing financing for these potentially more expensive projects will be more difficult.

Another barrier would be political commitment to pursue some of the less popular policies and strategies such as raw water pricing (which is seen to further increase tariffs and the public has been accustomed to regarding water as a free good) and charging sanitation fees at the local level (non-collection of which will impact on the sustainability of system operations). Effective public education and communication on these policies will be crucial.

Priority of Regional Cooperation

Regional cooperation for the promotion of sustainable water infrastructure may focus on:

- Knowledge sharing on best practices on among others financing mechanisms, incentive mechanisms, as well as on less expensive technical options to providing water supply and sewerage and sanitation services.
- How to take advantage of the Clean Development Mechanism specifically for water infrastructure.
- Instituting eco-labeling and regional efficiency standards for goods/equipment used for water supply provision.

Recommendations

Social acceptability is at the heart of success of every intervention. Consultations, with meaningful participation of community stakeholders including women, the poor and other marginalized groups, should be undertaken from planning, project identification, design, implementation and operation of utilities. This will espouse ownership, accountability (on both the utility and customer sides) and transparency.

Capacity building should be undertaken through innovative and proven effective means. In the Philippines, the “godparent” scheme of LWUA for water districts has proven to be more effective than the conventional classroom-type training. Under this mentoring system, a more experienced and larger or more mature water district (the “godparent”) is tapped to impart its knowledge and skills, through hands on training or skills demonstration, to smaller and poorly performing water districts. The assistance can also include the loaning of equipment by the “godparent” for use by the water districts. LWUA reports that the experience has enriched smaller and younger water districts in less expensive means.

The PWRF also presents a good model for a sustainable financing/loan facility particularly in developing countries which are heavily reliant on ODA to fund their infrastructure needs. The use of limited government funds to leverage private sector investment to a) lower interest rates and lengthen maturity of loans; b) avoid further foreign exchange risks associated with foreign borrowings; and c) ensure sustainable use of public funds demonstrates the use of innovative financing tools for the sector.

A sustainable avenue for which such good practices and models may be presented for other countries in the region to draw on and learn from will be very valuable. The mechanism may be in the form of a website accessible to all member countries that will allow knowledge sharing anytime, anywhere.