Chapter 4
Domestic Water Supply

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Abstract The legal framework on domestic household water use and sanitation specifically mandates the Metropolitan Waterworks and Sewerage System to engage in capital infrastructure and water distribution in Metro Manila. On the other hand, the water districts and municipal-government-administered water works play a key role in the supply, distribution, and management at the local level. Historically, these water institutions have paid less attention to sanitation and have focused more on water provisioning. Insufficient public investments and mismanagement have led to serious gaps in performance. The patterns of water use in the domestic household sector follow the country's demographic distribution where urban and town centers are favored infrastructure-wise over rural and urbanizing areas. This chapter identifies the inefficiencies, the gaps in access by the poor, and the poor participation by consumers in water district schemes in urban areas. It also describes the challenges of rural villages distant from town centers that remain underserved or with crude water provisioning schemes. Urbanizing areas suffer from competing uses between households and small-scale industries and the attendant pollution arising from unregulated wastewater-dumping activities. Incipient attempts at reform either at the community or local government level toward improving domestic household water use and sanitation are mapped out.

Keywords Domestic water • Water service provider • Water district • Local government-run utility • Sanitation

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4.1 Sources of Domestic Water Supply

The Philippines obtains its water supply from rainfall, surface water resources (i.e. rivers, lakes, and reservoirs), and groundwater resources. It has 18 major river basins and 421 principal river basins as defined by the National Water Resources Board. Theoretically, the freshwater storage capacity and the high rate of precipitation assure the country an adequate supply of water for its agricultural, industrial, and domestic requirements. However, seasonal variations are considerable and geographic distribution is biased, often resulting in water shortages in highly populated areas, especially during the dry season.

Metro Manila is being served primarily by the Metropolitan Waterworks and Sewerage System (MWSS) through its two private concessionaires, the Maynilad Water Services, Inc. (MWSI) and the Manila Water Company (MWCI), and by some private companies serving subdivisions. The MWSS water supply comes mainly from surface water.

There are around 500 operational water districts (WDs) that mainly serve the towns and cities outside Metro Manila. In addition, about 1200 piped water systems are operated by municipal governments. Rural areas not covered by the WDs and municipal water systems are served by community-based organizations (CBOs) – e.g., rural water service associations (RWSAs), barangay water service associations (BWSAs) or village-level water systems, and water service cooperatives – or are not served at all (Manahan 2012).

Most utilities outside Metro Manila utilize groundwater (wells and springs). Only large utilities with more than 20,000 connections utilize surface water (rivers, lakes). Almost all community based utilities and LGU-operated systems, due to their small size, use groundwater sources.

4.2 Sector Framework

4.2.1 Sector Institutions and Their Roles

Institutions dealing with domestic water supply can be divided into water service providers (WSPs), regulators, sector planners at the national and local levels, program implementers at the local levels, funding institutions, and water-resource-related agencies.

There are a number of institutions with regulatory responsibilities in the domestic water supply sector. These include three primary regulatory agencies – the National Water Resources Board (NWRB), Local Water Utilities Administration (LWUA), local government units (LGUs) – and special regulatory units such as the Subic Bay Water Regulatory Board (SBWRB) created by the Subic Bay Metropolitan Authority (SBMA) and the MWSS Regulatory Office, which operates on contract-based regulation. All these existing regulatory structures have different regulatory

Table 4.1 Different regulatory practices for domestic water

Regulatory body	Regulatee/s	Tariff methodology	Monitoring system
NWRB	Private utilities and CBOs	Return on assets	Annual reports from utilities
LWUA	Water districts, RWSAs	Cash flows	Annual reports plus visits
LGU	LGU utilities	Cash and political considerations	Public complaints
MWSS-RO	2 private concessionaires of MWSS	Return on investment with appropriate discount rate	Monthly reports plus visits
Subic Bay Regulatory Board	One private utility	Return on equity	Monthly reports plus visits

Source: NEDA (National Economic and Development Authority) (2010)

practices, processes, and fees with cases of overlapping functions or jurisdictions. This environment suggests a fragmented regulatory framework and lack of coordination. Regulation of WSPs by these institutions is weak (ADB 2013). A summary of the different regulatory practices of these regulatory bodies is shown in Table 4.1.

4.2.2 Service Providers

Several types of WSPs exist nationwide, consisting of water districts; LGU utilities; CBOs such as rural water and sanitation associations (RWSAs), barangay water and sanitation associations (BWSAs), homeowners associations, and cooperatives); and private utilities. Only MWSS and the water districts are government corporations.

(a) *Water districts (WDs):* government-owned and -controlled water utility corporations created by LGUs in accordance with the law (PD 198). Water districts operate piped water systems.
(b) *LGU-operated systems*: directly owned and managed by an LGU. The LGU could be a province, city, town, or barangay. The LGU system may operate levels II or III systems or a combination of both.
(c) *Community-based organizations (CBOs):* groups of people who have banded together to own and operate water systems. CBOs are considered "private" and fall into three major categories:

- RWSAs/BWSAs: water systems run by a non-profit, non-stock association usually covering one or more barangays
- Water cooperatives (Coops): owned and managed by a cooperative whose members contribute to the cooperative equity base
- Homeowner associations (HOAs): owned and operated by associations of residents within gated communities

(d) *Private firms:* privately owned water systems operating within a given franchise area. Examples are the two Metro Manila concessionaires, Primewater, Balibago Waterworks, and systems still operated by subdivision developers.

Past sector studies have differed in terms of reported number of WSPs in the country. A World Bank report has an estimate of the entire range of WSPs (World Bank 2013a, b). However, a 2015 project called the "Listahang Tubig" of the NWRB gives the following number of utilities providing level III services.[1]

4.2.3 Service Levels

There are three domestic water service levels in the country (NEDA 2010):

Level I is a protected well or a developed spring with an outlet but without a distribution system, generally adaptable for rural areas where houses are thinly scattered.

Level II is a piped system with communal or public faucets usually serving 4–6 households within a 25-m distance.

Level III is a fully reticulated system with individual house connection.

Community-based organizations comprise the majority of WSPs in the Philippines, while LGU-run water utilities come to a close second. The number of CBOs decreased dramatically from 2003 to 2013, with the largest cut seen in BWSAs. In contrast, the number of LGU-run utilities increased by more than 20%, implying that, perhaps, the municipal governments took over the BWSAs (which are at the village level) that stopped operating (see Table 4.2). Table 4.3 provides estimates of Level **III** coverage in urban and rural areas. The urban bias in Level III

Table 4.2 Comparison of water supply providers (level III systems)

Type of WSP	2003	2013
Water districts	455	507
LGU utilities	1000	1277
MWSS	1	1
Community-based organizations (CBOs)	3800	2072
RWSAs	500	667
BWSAs	3100	1021
Cooperatives/HOAs	200	349
Unclassified	–	35
Private	900	863
Total	6156	4720

Sources: for 2003 data, World Bank (2013b); for 2013 data, NWRB (2015)

[1] This "list of water systems" is derived from a national survey (water register) of all WSPs covering all service levels in 2015. Data given as of 2013. NWRB gives the number of utilities providing level III services.

Table 4.3 Estimated level III water service coverage in the Philippines

	Population (million)(2010 Census)	Est. % of total population	Est. Level III coverage (% of total households)	Water supply provider(s)
Urban-NCR	11.9	13	88	Manila Water, Maynilad
Urban Outside NCR	33.0	36	50–65	Water districts LGUs Private operators
Rural	47.4	51	25	Coops, BWSAs, RWSAs
Total	92.3	100	42–48	

Sources: ADB (2013: 7)
BWSAs barangay water and sanitation associations, *est* estimated, *LGU* Local Government Unit, *NCR* National Capital Region, *RWSAs* rural waterworks and sanitation associations

Table 4.4 Consumption patterns (lpcd)

Utility model	2003	2013
Water districts	120	108
Private sector	144	129
CBOs	127	86
LGU systems	96	99

Source: NWRB (2015)

provisioning is self-evident; urban areas have three times more coverage than rural areas, which are mostly served by CBOs such as cooperatives, BWSAs, and RWSAs.

Planning bodies in the country advocate a design consumption of 20 liters per capita per day (lpcd) for Level I service and 40 lpcd for Level II. Since 1955, formal utilities have adopted a block consumption pattern as basis for designing water tariffs for Level III systems (MDGF-UNDP 2011).[2] Payment for water consumption is composed of a "minimum" charge and a "commodity" charge for each successive block. Since 1960s, the lifeline consumption or minimum volume had been set at 10 m^3 per month for a domestic connection by almost all formal utilities.

In 2014–2015, the NWRB, in coordination with the World Bank, started a national survey of all utilities in the country, including their 2013 operational performance metrics. The results for consumption patterns per person are shown in Table 4.4.

Consumption patterns dropped over time, attributed mainly to an increase in water tariffs. LGU systems hardly changed their tariffs and this is apparent in Table 4.4.

[2] Boracay, Subic Freeport, Clark, Baguio, Zamboanga, and Metro Manila.

4.3 Sector Performance Assessment

This section assesses the water and sanitation services in the country and presents its institutional strategy and its strengths and weaknesses in providing domestic water services to various sectors.

4.3.1 Institutional Strategy

Since the country's independence from America in 1946, the responsibility for waterworks, both urban and rural, was borne by the various LGUs. The provincial populace relied on springs and shallow wells as sources of water. Over time, the water supply situation did not improve and assistance had to be sought from the national government.

1. In 1955, the National Waterworks and Sewerage Authority (NAWASA) was established. This came about from the transformation of the Manila Waterworks Authority (created in 1878 to serve Manila) into a national facility with responsibilities for the entire country in cooperation with the LGUs. However, in 1971, the government discovered that the provincial urban systems (both LGU- and NAWASA-operated) were not able to keep up with demand and that the systems were in poor condition. The government then decided to return the management of the provincial water utilities to the LGUs and created three national offices for the water and sanitation sector. The NAWASA was transformed into the MWSS to service Metro Manila only.
2. The LWUA was formed in 1973 to assist LGUs create WDs in the provincial urban areas and to provide technical, financial, and institutional development assistance and regulations to them. The WD, a new management model for urban water supply, had a corporation-like organizational structure with a board distinct from the management team.
3. The Rural Water and Development Corporation (RWDC) was established (1980) to provide assistance to areas where neither WDs nor MWSS operates. The RWDC created RWSAs in order to construct, operate, and maintain their own water supply systems. In 1987, LWUA took over the work of the RWDC, which had been abolished.

Due to decreased central government funding for rural water supply, the new generation of rural projects tried to secure commitment and ensure sustainability by requiring capital contributions from communities and local governments as well as investing in "soft" components, such as institutional strengthening, capacity building, community-based planning, and health and hygiene promotion. In these projects, the national government typically provided grants equal to 90–100% of the total project cost. The remainder was provided by the community, through its water user association, in the form of voluntary labor, donated land, or cash contributions. Any costs associated with expanded levels of service were borne wholly by the community.

Responsibilities became more decentralized under the framework of the Local Government Code (LGC), which was promulgated in 1991 (Official Gazette 1991). This Code gave LGUs more power and more funding from the central government using national revenues. The LGC transferred powers and responsibilities from the central government to the LGUs, including the primary responsibility for developing water supply and sanitation services. The LGUs were required to share the installation costs for rural water supply systems, while the responsibility for system implementation was transferred from the central agencies to the LGUs.

This strategy also espoused the use of public-private partnership in various infrastructure undertakings of the government, including waterworks. The scope for private sector participation following the passage of the Water Crisis Act of 1995 and a Supreme Court resolution is reflected in the policy that WDs do not have exclusive franchises in their coverage areas where water service is still unavailable. These opened the door for private firms and CBOs, especially in areas of high demand.

The previously mentioned "Listahang Tubig"[3] gave a total of 863 private utilities operating in the country, composed of 742 private companies, 38 industrial locators, 63 real estate developers, and 20 peddlers. It does not mean that there are 863 companies involved inasmuch as one company may have more than one utility being operated. The private sector actively seeks opportunities to invest in domestic water provisioning mainly through the public-private partnership framework (Ndaw 2016). Private water companies are able to put forward proposals to provide water supply and sanitation services to local governments and local water utilities directly through PPP or joint venture schemes. This development signals the private sector's capability to professionalize the service and improve the level of service. More and more government agencies are turning to the private sector for performance improvement and/or efficiency gain.

4.3.2 Operational Performance

How well are the various utility models performing? Table 4.5 shows the performance of the utility models over time.

The WDs have relatively maintained their performance efficiency over time. Only the collection period has been lengthened. Although tariffs have increased by 26% over the last 10 years, this is less than the annual inflation rate.[4]

[3] Listahang Tubig is an ongoing study and results may differ from month to month due to the number of samples already included and tabulated. Except for WD and private firms, data from other WSPs have yet to be validated. Data listed herein are as of Feb 2017.

[4] San Fernando, La Union; Baliwag, San Jose del Monte, and Meycauyan, Bulacan; Cabanatuan, Nueva Ecija; Naga City, Camarines Sur, Dumaguete City, Bayawan, Negro Occidental: Cebu City; Malalag, Davao Sur; and five towns in Sarangani.

Table 4.5 Operational performance of various utility models

	Water districts		LGU systems		Private		CBOs	
Utility model year	2003	2013	2003	2013	2003	2013	2003	2013
Non-Revenue Water (%)	27	25	–	23.0	–	25	–	18.3
Collection period (mo)	1.2	2.06	2.1	1.73	1.7	2.22	2.3	2.31
Service hours/day	23	22.5	18.4	19.19	21.9	18.2	20	18.20
Average tariff (PhP/m^3)	17.82	26.0	7.22	13.0	15.37	22.7	7.99	13.1
Operating ratio	0.70	0.72	1.18	0.94	0.74	0.73	0.87	0.85

The LGU systems have shown improvements in their collection periods, service hours, and operating ratio. Tariffs have risen by only 12% over 10 years, the lowest among the four models; hence their operating ratio is still precariously high.

The private systems are good performers, given their NRW, collection period, and operating ratio performance. Although tariffs have risen by 23% over 10 years, just like the WDs, their operating ratio has gone down, indicating good control of expenditures.

The CBOs have also done well. Despite only a 14% increase in tariff, their operating ratio has gone down.

4.3.3 Sector Accomplishments

4.3.3.1 Piped Water Supply Coverage

The Philippine Water Supply and Sanitation Roadmap (PWSSR) states that, in 2000, 46.1% of the population had access to level II and III services. In 2003, the coverage of piped water had increased to 54% or 44.3 million (Table 4.6) (World Bank 2013b: 17).

A demand gap analysis for levels II and III was performed in 2011 for the Department of Public Works and Highways (DPWH) and the results indicated a 42.7% coverage of level III facilities. Although the percentage may have gone down, the population served has gone up due to a larger population base. To confirm this seeming reduction, the Joint Monitoring Program (JMP) figure of 40% piped coverage as of 2010 (Table 4.7) comes very close. The Joint Monitoring Programme (JMP) for Water Supply and Sanitation by WHO and UNICEF is the official United Nations mechanism that monitors progress towards the Millennium Development Goal (MDG) Target 7c, that of halving by 2015 the proportion of people without sustainable access to safe drinking water (and basic sanitation)

The JMP table also verifies that the Philippines may have already met said Target.

Table 4.6 Market share, by type of provider, 2003

Access to formal service levels: 79%					No access: 21%
Level III 44% (36.1)			**Level II** 10% (8.2)	**Level I** 25%	Private wells Tankered Vended water-
WDs 14% (11.5)	Private 10% (8.2)	LGUs/CBOs 20% (16.4)	LGUs/CBOs 35%		SSIPs and/or self-provision by households
Complementary service provided by SSIPs or self-provision					

Source: World Bank (2005)
Note: Figures in parentheses are added by the authors to reflect the population served (in million) as of 2003
SSIP Small scale independent providers. Most are real estate developers, homeowners' associations, local entrepreneurs, and mobile water truckers and haulers

Table 4.7 Estimates of JMP coverage (%)

Year	Total improved	Piped onto premises	Other unimproved	Surface water
1990	84	25	12	4
1995	85	29	11	4
2000	87	33	9	4
2005	89	36	8	3
2010	90	40	7	3
2015	92	43	5	3

Source: WHO-UNICEF (2015)

4.3.4 Sector Challenges

General policies in the water and sanitation sector concern issues such as decentralization of water supply provision, use of public-private partnership and meeting coverage targets. NEDA, in its Medium-Term Philippine Development Plan for 2011–2016, aimed to extend coverage of potable water, increase coverage of both level III and 24/7 services, with priority given to 400 barangays with poor water supply coverage (NEDA 2004).

4.3.4.1 WSP Service Performance

Results of a benchmark survey conducted by ADB/DILG covering 45 utilities revealed that performance of most utilities still fell under industry standards (NEDA 2010: 7). Among the WSPs covered, the LGUs had the most dismal performance.

The slow expansion and low quality of services and the inefficient operation of water utilities are attributed to the sector's weak regulatory and financing framework,

lack of technical and managerial capacity, lack of access to financing for water and sanitation development, and dependence on subsidies for the majority of service providers. Thus, regulatory, financing, and utility reforms are imperative to improve WSP service performance.

Several constraints at the local level need to be urgently addressed: low LGU awareness and political will, inadequate information dissemination and development of human resources, low multistakeholder involvement, and inadequate financing schemes. These problems are exacerbated by the lack of local policies and programs on water supply and sanitation,resulting in low prioritization of water- and sanitation-related projects (specially sanitation and hygiene) and creating an upsurge in the incidence of diarrhea and other waterborne diseases in the community.

4.3.4.2 Regulation

The NWRB, by virtue of RA 2677 (Public Service Law), regulates private water providers. Despite its already extended regulatory mandate, in 2002, Executive Order 213 was issued, which transferred the regulation of WDs from LWUA to NWRB. This mandate was never carried out due to NWRB's lack of resources. In 2010, Executive Order 806 was issued transferring the administration of NWRB from the Office of the President to DENR.

Previously, LWUA was stripped of its regulatory functions over WDs; as a unit, it was transferred to the Office of the President, and then to DPWH (along with MWSS). This regulatory task (over WDs) was restored in 2010 and extended to include RWSAs.

Even with these regulatory mandates, LWUA's focus on financing means that RWSAs and other CBOs were ignored because of high transaction costs associated with these small water providers. Some regulation is extended over to other types of WSPs by other government agencies. Water cooperatives, for instance, register their existence as an organization with CDA, but the latter has to remit with respect to water fees collected and other management concerns. The DILG presumably has supervisory functions on LGU-run utilities and BWSAs, but these are not exercised at all in the absence of mechanisms. Technically speaking, NWRB regulates these WSPs by default, but the lack of resources and capacity, notably local presence, in effect means no regulation at all.

The sector's inability to respond to the water and sanitation needs of the population and derivative problems is rooted in the fragmented institutional environment, weak regulatory framework, and inadequate support for service providers and utilities, resulting in poor performance, limited access to financing and investments, low tariff and cost recovery, inadequate support for rural water supply, and lack of reliable and updated sector information needed for sector planning.

4.4 Sanitation Aspects

4.4.1 Public Health and Sanitation

Sanitation refers to a wide range of services and arrangements pertaining to the hygienic and proper management of human excreta (feces and urine) and community liquid wastes to safeguard the health of individuals and communities. It is concerned with preventing diseases by hindering pathogens or disease-causing organisms found in excreta and sewage from entering the environment and coming into contact with people and communities (DOH 2010). In a 2015 report, annual economic loss due to poor sanitation is about PhP 78 billion (L. Claudio, DENR, pers.commun.).

Fragmented institutional arrangements with no strong administrative mechanisms to guide policy implementation and to coordinate local program implementation show inadequate attention accorded to sanitation. Institutions mandated to construct, operate, and maintain sanitation and sewerage systems include MWSS for Metro Manila, the WDs, and LGUs for areas outside Metro Manila. The Clean Water Act of 2004 requires LGUs and WDs to create septage management programs in areas without sewerage systems. Four national agencies were given specific sanitation roles:

DPWH: administers the national government share through a National Sewerage and Septage Management Program (NSSMP) Office
DILG/DOH/DPWH: provides capacity building programs and assistance in developing local and regional plans and projects
DOH: sets guidelines and standards and issues environmental sanitation clearances
DENR: promulgates and enforces water and wastewater standards

In general, low priority has been given to sanitation at both national and local government levels. Most of the investments in sanitation have come from private investments in household toilets, housing estate wastewater treatment, and on-site wastewater treatment among commercial, industrial, and institutional establishments. Unfortunately, there has been little control or regulation of these private facilities and some are poorly designed and constructed.

The predominant sanitation technology in urban Philippines is the septic tank. According to a 2010 report, 84% of urban households discharge wastewater to a septic tank with another 10% with improved sanitation using other options (World Bank 2013a: 2). While several codes provide standards for design and construction of septic tanks, these are not often enforced. All too often, poorly maintained septic tanks discharge inadequately treated sewage and effluent directly into storm water drains, waterways, and streets, with serious consequences in terms of both water quality and public health. Usually desludging services are offered by private companies and the sludge is disposed of in local water bodies or solid waste dumpsites since septage treatment plants are relatively rare outside Manila.

Only about six of the 1500 provincial cities and towns in the Philippines contain functioning public sewerage systems.[2] As of 2015, the only LGUs with sewerage treatment facilities are Metro Manila, Zamboanga City, Baguio City, Boracay Island, and the Clark and Subic economic zones. Some LGUs have independent sewerage facilities serving only either housing developments or a small part of their business districts. Bacolod City has a sewerage system for two housing villages.

Few households are therefore connected to a sewerage network (less than 4%, by most estimates). There are reportedly a number of villages and condominiums with small treatment plants, but no national agency has this kind of information. The absence of communal sewer systems in urban areas has meant that storm water drains are frequently also used for wastewater disposal.

Only about 15 LGUs have built septage facilities, although most private malls, industries, and large hotels have their own septage treatment facilities.[3] Most of these LGU septage facilities have a design capacity from 30 to 60 m^3/day.[5]

4.4.2 Sanitation Coverage

In 2009, some 20 million Filipinos did not have access to improved sanitation, about 15 million shared toilets, and 9% still defecated in the open (DOH 2010). However, based on the 2015 WHO-UNICEF Joint Monitoring Program (JMP) report, total households with improved use of sanitation facilities reached 97% in the urban areas and 89% in the rural areas, a combined total of 92%.

The proportion of families with access to sanitary toilets has significantly increased from 71% in 1990 to 92% in 2015. Own toilets, shared toilets, and closed pits are considered sanitary in contrast to open pits, drop/overhang, pail system, and absence of access to a toilet facility (Table 4.8) (NEDA 2014).

Table 4.8 Total sanitation coverage (%) in 2015

	With access to sanitary facilities		No access to sanitary facilities	
Year	Improved	Shared	Other unimproved	Open defecation
1990	57	14	14	15
1995	60	15	11	14
2000	64	16	8	12
2005	67	16	6	11
2010	70	17	4	9
2015	74	18	1	7

Source: WHO-UNICEF (2015)

[5] One m^3/day is sufficient for one household, hence a 30-m^3/day facility can treat the sludge of 30–60 septic tanks daily, depending on the turnaround of the vacuum trucks.

Although there has been considerable progress in providing sanitation facilities in the Philippines from 1990 to 2015, it is also clear that a lot remains to be achieved, with about one-tenth of the population still not being served in 2015.

The government has some initiatives to improve sanitation. For instance, in 2008, a Supreme Court order to Philippine government agencies "*to clean up, rehabilitate, and preserve Manila Bay, and restore and maintain its waters …to make them fit for swimming, skin-diving, and other forms of contact recreation"* triggered an extensive investment program by service providers (DENR 2008). This also opened the entry of private firms into areas not being served.

4.4.2.1 Metro Manila

Prior to the operation of two private concessionaires in 1997, the MWSS was serving only about 3–5% of the population in Metro Manila with sewer connections. In 2007, MWSS decided to privatize its operations via a concession mode to two private firms. The east zone would be serviced by MWCI and the west zone by MWSI.

A Sewerage and Sanitation Master plan prepared in 2005 by MWSS described a strategy that would provide sewerage coverage through combined systems (World Bank 2013a: 10).[6] The plan also envisioned a septage management program in combination with sewerage development. The target is to cover 100% of Metro Manila households by 2037.

In 2012, the sewerage connections and septic tank desludging service coverage was about 50% for MWCI and about 83% for MWSI. Manila Water currently operates a total of 39 septage treatment plants with a combined capacity of 142 million liters per day. A total of 160,860 households in the east zone now have access to full wastewater treatment. Manila Water currently operates two septage treatment plants capable of handling 1400 m^3 of septage daily. The other concessionaire, Maynilad, has a total capacity of 940 million liters per day for treating wastewater.

4.4.2.2 Outside Metro Manila

Before 1955, only two cities (Zamboanga and Vigan) had some limited sewerage facilities built during the 1920–30s by the Americans. From 1955 to 1991, no new sewerage or septage infra were built. The passage of the Local Government Code in 1991 gave more responsibilities to the LGUs with respect to sanitation. The NEDA Board passed several resolutions for the sector, which stated that LGUs shall primarily be the implementers of sanitation/sewerage programs, with the national government providing assistance to develop their capacities in certain areas. Several private proponents were thus able to secure contracts for concessions with some LGUs (Manila concessionaires, Subic, Clark, and Boracay) and were able to develop/improve sewerage facilities.

[6] The storm drainage systems would also be used to convey sewage.

With the passage of the Clean Water Act in 2004, some LGUs paid attention to their sanitation facilities and, consequently, some LGUs and/or their WDs were able to put up either a sewerage system (e.g., Baguio City through a grant from the Japan International Cooperation Agency) or septage facilities. A National Sewerage and Septage Management Program was prepared in 2011 by DPWH, which provided targets for urban cities with some grant funding (maximum of 40%) for sewerage projects. But, as of 2015, no LGUs had availed of the financing schemes offered under the program.

The urban poor generally remain excluded from sanitation services. Sewer networks, if any, do not reach the slum and squatter settlements found in most Philippine cities, and their inhabitants seldom have enough space or cash to construct private facilities such as septic tanks. Communal toilets have been provided in some densely populated low-income areas, but these typically serve small groups of households and are rarely well-managed. Instead, most urban poor rely on unsanitary toilets or people defecate in the open (Robinson 2003).

Non-poor urban households have responded by building their own sanitation facilities. Flush (or pour-flush) toilets are popular in the Philippines, and the majority of urban households have toilets connected to private septic tanks. Many private housing developments now construct small independent sewer networks, which serve those within the development area, and pipe their sewage to a communal septic tank. Whatever the system, be it individual or communal, septic tanks in the Philippines, are seldom de-sludged (Robinson 2003).

While LGUs are mandated to provide essential services for water and sanitation, 97% of the funds earmarked for water and sanitation go to water supply and only 3% for sanitation and wastewater treatment (CEC-Phil 2012; NEDA 2008).

4.4.3 Sanitation Constraints

The 2010 Philippine Sustainable Sanitation Roadmap identifies the lack of an effective national sanitation policy, including the lack of a clear policy on sanitation regulation, as one of the critical gaps in the sector. Policies on sanitation regulation should include national targets, a strategy for eliminating open defecation, and a strategy for facilitating localized sanitation improvement plans and budgets and national investment priorities and plans for sanitation.

4.4.3.1 Institutional Constraints

Due to the low priority given by WDs to sanitation, the main responsibility for sanitation lies largely with the LGUs. While LGUs are in the forefront of implementing, monitoring, and, to some extent, regulating sanitation programs and projects, they are generally not adequately informed about these regulations and standards.

The mandates for rural sanitation are not clearly defined between the LGU and DOH, which has adopted a policy objective to achieve open defecation-free status for all barangays, and universal access to sanitary toilets in cities and municipalities. DOH, thus far, has little or no funding allocated for implementation. While DOH plays a key role in the sector due to the health impacts of poor sanitation, its sanitation mandate is limited to policy formulation and monitoring of laws and policies.

There are also no plans, targets, or monitoring systems in place against which LGUs can be held accountable. Local private-sector providers of sanitation goods and services are neither organized nor regulated.

4.4.3.2 Financial/Sustainability Constraints

The operation of several septage facilities has shown the financial viability of such systems, but these are still not being taken up by many WDs or LGUs due to the political acceptability of tariffs. Even in Metro Manila, the component of the tariff allocated to sewerage and sanitation (20% of water tariff) is unlikely to cover costs, and sanitation and sewerage are effectively subsidized by the water supply component. The tariff collection and cost recovery for Dumaguete City's septage treatment facility could be one example that may be replicated. Under a Memorandum of Agreement between the LGU and the WD in Dumaguete, the LGU enacted the required legislation to obligate households to desludge septic tanks regularly. The WD manages the facility and collects user fees from service connections that are included in monthly water bills. Fees are collected from unconnected households directly. Dumaguete LGU/WD charges PhP 2/m^3 of water consumed, which is more than sufficient to meet operating and debt-servicing costs (PADCO 2006).

An increasing number of decentralized wastewater treatment systems are being constructed in cities to process wastewater from markets, slaughterhouses, hospitals, schools, universities, and housing developments (PADCO 2006).[7] Recurrent costs are part of the LGU or institution budget, but the sustainability of the approach is not clear.

The state of urban sanitation in the Philippines reflects a prolonged lack of activity or investment in the sector. In the last three decades, investment in urban sanitation in the Philippines totals only 1.5% of that spent on urban water supply (Robinson 2003). Sadly, urban sewerage and sanitation do not appear to be a priority of local governments.

4.4.3.3 Social Constraints

When discussing the reasons for the lack of progress in increasing coverage of sanitation and sewerage, all survey respondents point to lack of awareness of the need for sewerage and sanitation systems (Robinson 2003). One of the more important

[7] Use of anaerobic baffled chamber **to gravel filter**? and wetlands.

impediments to progress is the attitude that sanitation practice is a household issue and not the responsibility of government.

4.4.4 Sanitation Initiatives

4.4.4.1 National Sewerage and Septage Management Program

The NSSMP was prepared by DPWH in 2010 in consultation with an interagency steering committee and with technical assistance from the World Bank and Asian Development Bank. The primary focus of the NSSMP is sewerage and septage management infrastructure projects that will help cities/towns manage wastewater, and promote/create a supporting environment needed to make these projects successful. The goal of the NSSMP is to improve water quality and public health in urban areas of the Philippines by 2020.

However, due to the prevalence of septic tanks nationwide and the capital cost of building sewerage infrastructure, the government is increasingly focusing on septage treatment as a near-term sanitation solution. The objective of the NSSMP is for all LGUs to have septage management programs serving their urban barangays, with capital cost ranging from PhP 4 million to PhP71 million per project and per LGU.

For sewerage, NSSMP is initially targeting 17 highly urbanized cities (HUCs) outside Metro Manila, with capital cost estimates averaging P820 million per HUC. The LGUs and/or local WDs are expected to shoulder the cost of all septage management programs, while a 40:60% cost sharing scheme for sewerage systems will be implemented.

4.4.4.2 Philippine Sustainable Sanitation Roadmap

The PSSR consultation process started in 2007 and one of its milestone achievements is the formalization of the NEDA Infracom Sub-committee on Water Resources, which is tasked with oversight and coordination functions over the water supply and sanitation sector. This is an interagency body that monitors the implementation of the PWSSR and whose members are actively engaged as the Technical Working Group of the PSSR (DOH 2010).

The PSSR espouses five general strategies with each developed to address the multifaceted challenges besetting the sanitation sector. This is further translated into a cluster of related priority programs and activities directly supporting a specific policy directive. These programs will pursue the much needed policy reforms to enable sector institutions to perform their mandates effectively, ensuring that sanitation sector goals are achieved.

4.5 Water and Sanitation Sector Challenges

4.5.1 Lack of Centralized Regulatory Agency

There is no centralized economic regulatory agency for the water and sanitation sector. The existing national economic regulator, the NWRB, does not have the authority and resources to do economic regulation on water and sewerage affecting all the WSPs. Some agencies (LWUA, MWSS, and LGUs) have several functions that should not be housed in one agency—i.e. service provision and regulation, financing, supervision, and regulation. There are also no sanctions for government utilities that perform poorly.

There is no agency that sets and monitors coverage targets and operational standards of WSPs. The NWRB, LWUA, and LGU cover different WSPs and many more operate on "contract-based regulation," (MWSS and Subic Bay Water Regulatory Board (SBWRB)). Differences in regulatory practices, processes, and fees and cases of overlapping functions or jurisdictions have been observed.

LGUs have no regulatory capacity, except in granting business permits. LGU-run utilities are not required by any agency to submit regular reports. The DILG, which exercises authority over LGU-run utilities, is unable to monitor the performance of such water utilities mainly because of lack of resources.

No one is clearly accountable for implementing the reforms—there are a multitude of agencies involved in the sector. Each agency has its respective role in the sector and because the reform process cuts across the mandates of all agencies, they must all be involved. This means that all decisions are made by a committee, and the responsibility for implementation is often diluted. This lack of accountability for implementing reforms has affected most reform initiatives in the sector. For example, with respect to reform proposals on sector financing, no single agency has had the responsibility for ensuring that financing was available and that policies are in place to make this a reality.

4.5.2 Low Performance of WSPs

LGU-operated systems have the worst performance among all the utilities benchmarked. Water provision is simply politically motivated; thus, no emphasis is made on skills development, professional buildup, or financial sustainability. Most LGU systems are not ring-fenced so revenue is not linked to expenses. Dole-out mentality still exists. LGUs have also shown little interest in pursuing water supply projects due to leadership uncertainties brought about by the 3-year electoral term.

Water district tariffs are high because all their capital expenditure requirements are all funded from loans, whereas, most of the best performers among the types of utilities benchmarked have low coverage.

Water cooperatives need a lot of technical and financial support as CDA provides only administrative support. Community-based-organizations do not have access to commercial funds for expansion. They also need a lot of technical and financial support as no national agency seems to assist them.

Financing packages tend to cater only to creditworthy utilities with no concessional financing for the non-creditworthy or those still in the process of becoming creditworthy. Subsidy policies for LGU systems are not strictly implemented.

The government cannot possibly provide all the financing requirements. Support from Official Development Assistance, banks, and private sector providers is sorely needed.

4.5.3 Lack of Updated and Reliable Data

Planning at all levels is hampered by lack of reliable data and the absence of systematic and regular monitoring of sector activities at the LGU level. Many of the earlier provincial master plans and investment plans are based on decade-old designs without updated information on hydro-geologic and water resource conditions in the area. There are no updated local master plans; sector information are oftentimes conflicting or just simply missing.

Without data, it is difficult for the government and for users of services to assess critical aspects such as efficiency of services provided and quality of services given. The lack of such vital information makes it hard for the government to formulate policies, track progress over time, or hold agencies and service providers more accountable.

4.6 Policy Recommendations

There is a need to form a dedicated national agency for the water and sanitation sector. The first serious attempt was made in 2012 with the designation of the Secretary of DPWH as the "water czar" and placing MWSS and LWUA under the policy supervision of DPWH. This may be considered an interim step. The water czar has no dedicated unit for the sector within the department, aside from having numerous other duties as DPWH Secretary. Although there have been numerous attempts in the past to enact a law creating a national regulatory body, these have not been successful due to many factors. A draft of an interim body, called the National Water Resources Management Office (NWRMO)[8] had been made, needing only the signature of the President, but the draft has not been signed as of April 2016.

[8] The proposed National Water Resources Management Office (NWRMO) (Tabios and Villaluna 2012) is supposed to be mainly responsible for the management and protection of the country's

Given the 3-year terms of local executives, local governments alone cannot be relied upon to provide satisfactory and sustainable service for water and sanitation. The project cycle of water and sanitation infrastructure usually takes longer than 3 years. Tariff setting for LGU-run utilities also tends to be politically sensitive. As such, LGUs should be tasked with providing the services, but they should only become service providers themselves as a matter of last recourse.

There should be a cap on the percentage that LGUs can use from their IRAs to subsidize the operation of LGU water utilities (Internal revenue allotments (IRAs) are allocations from the national budget to the LGUs). Using IRA funds for this purpose does not motivate LGUs to improve service delivery and collect the proper tariffs. Most of the IRA funds should instead be used for capital expenditure.

There is a need to form a planning and monitoring body at the provincial level to oversee the water and sanitation sector within their boundaries. Having plans made at this local government level allows for nuancing, taking into account the specificities of hydrological conditions. It also brings greater accountability for WSP performance and subsequent decisions on public investments or financing.

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