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**United Nations Environment Programme
Resources and Markets Branch**

**Pricing Reforms for Sustainable Water Use
and Management in the Philippines**

Working Paper

February 2018

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On behalf of:



Federal Ministry for the
Environment, Nature Conservation,
Building and Nuclear Safety

of the Federal Republic of Germany

¹ The International Water Management Institute (IWMI) is a non-profit, scientific research organization focusing on the sustainable use of water and land resources in developing countries. It is a member of CGIAR, a global research partnership for a food-secure future, with headquarters in Colombo, Sri Lanka, and with regional offices across Asia and Africa. IWMI's vision is a water-secure world. IWMI's mission is to provide evidence-based, sustainable water and land management solutions for food security, livelihoods and the environment. See: www.iwmi.org.

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List of Abbreviations

ADB	Asian Development Bank
DMB	Department of the Budget and Management (Philippines)
IWMI	International Water Management Institute
JICA	Japan International Cooperation Agency
NEDA	National Economic and Development Authority (Philippines)
OECD	Organisation for Economic Co-operation and Development
PHP	Philippines Pesos (currency). Any references to pesos (₱) in this report refer to the Philippines currency in 2017, unless otherwise stated, and any USD equivalents have been estimated using the 50 PHP/USD rate of exchange.
SDGs	Sustainable Development Goals; these 17 global goals with 169 targets compose the <i>2030 Agenda for Sustainable Development</i>
USD	United States Dollars (currency). Any references to dollars (\$) in this report refer to the United States currency in 2017, unless otherwise stated, and USD equivalents have been estimated using the 50 PHP/USD rate of exchange.

Executive Summary

In 2017, the Philippines adopted a set of long-term development goals for the country called *AmBisyon Natin 2040*. Developed through a participatory process, these goals provide overall guidance as well as a target for a series of more specific development plans. The *Philippine Development Plan 2017-2022* presents a series of actions and activities that governments will undertake in order to realize this national vision. As described further in this report, water and sanitation initiatives will be significant and enabling components of the Plan.

This study provides guidance on fiscal and pricing policy reform to promote improved water use and management in the Philippines. Where the *Philippine Development Plan 2017-2022* offers a framework and direction, this study explores a range of specific options by which to move the development plan forward. These include consideration of current and future investment needs in the water sector, and policy reform options. In this way, this study can also support achievement of the Sustainable Development Goals and a transition to a green economy in the Philippines. The study provides information, advice and support to the government and other stakeholders for consideration when reforming fiscal, pricing and regulatory policies in the water and sanitation sectors.

The informed use of various systems of water charges, tariffs and prices can empower a government's policy actions in the water and sanitation sector, often implemented alongside various subsidies, infrastructure investments and regulatory directives. Slow progress toward targets for water supply and water quality can be hampered further by inappropriate pricing and subsidy arrangements. Water prices and tariffs are generally low in the Philippines, with substantial subsidies allocated to service providers, so that overall revenues generated across the water sector are low. The low levels of cost recovery are a key problem in the Philippines (NEDA 2010; ADB, 2013; Llanto, 2013).

Pricing reforms can provide a powerful incentive to encourage responsible and efficient consumption behaviour by consumers, and production behaviour by utilities. They can provide an effective way to raise domestic revenue needed to operate, maintain and expand current infrastructure. Pricing can be employed in a manner that ensures services remain affordable to all. Where pricing reflects differences in costs of supply or treatment, it can then send powerful signals about where to locate water-intensive industry, for example, and when to invest in water-saving technologies. So too on the wastewater side. If treatment and disposal of treated wastewater is more expensive in some locations than others, such as due to differences in technology or in the physical setting, and if these differences are reflected in the tariffs charged to customers, then this can provide strong incentives to discharging industries and utilities to adjust business practices accordingly.

In the Philippines, there are issues of jurisdictional fragmentation, gaps and overlap that are not well coordinated under any common water policy, agency or ministry. As a result, scarce resources are not being invested where needed most, and regulatory actions may be hindering rather than promoting national policy objectives.

Water quality issues, including those related to access to sanitation services, present well-known challenges in the Philippines. One of the policy motivations to develop sanitation practices more rapidly and more effectively is a mandamus order from the Supreme Court of the Philippines that imposes targets and deadlines for reduction of environmental loading in Manila Bay.

Ineffective management and regulation act as barriers to effective water use among competing users, and can limit the national environment for water sector investment. In the Philippines, there

is no overarching framework to regulate economic behaviour reliably in the water sector, although there is a current proposal to create an independent water regulatory commission to address this problem (NEDA, 2017a). The current regulatory framework has contributed to, among others, problems of groundwater extraction at unsustainable rates, relative absence of sustainable water management practices, and a lack of accountability of some service providers to users.

Seven priority actions can be distilled from the *Philippines Development Plan 2017-2022* and the *National Budget Memorandum: March 23, 2017* as having special relevance for the purposes of this study. Together they provide a framework for consideration of policy reform options and each is examined separately to identify choices that can move this agenda forward. According to the Plan, the country must act to:

- a) promotion of efficient water utilization;
- b) undertake irrigation sector reforms: abolition of irrigation fees for small farmers; formulation of an irrigation master plan and framework for capital and operations and maintenance financing of irrigation projects; and rationalization of irrigation service fees;
- c) creation of an apex body; amendment of the water code and regulations, strengthening of coordination and linkages, enhancement of organizational capacity;
- d) creation of an independent regulator;
- e) establishment of a unified financing framework;
- f) preparation of a master plan and expansion of (reliable/affordable) sanitation coverage; and
- g) preparation of a master plan and expansion of (reliable/affordable) water supply coverage (NEDA, 2017a; and Philippines DMB, 2017).

With respect to pricing of water supply and sanitation, the large number of service providers and the absence of a centralized database and regulator of pricing make it difficult to assess and restructure current pricing practices to meet national water goals. It appears that the levels of pricing are too low to achieve cost recovery. Incentives to use scarce water resource efficiently and to meet the needs of low-income households are hindered by the widespread application of increasing block rate tariffs.

For some uses, such as irrigation, collection rates are low for irrigation service fees and these fees have recently been waived for many users. In these cases, it is clear that water pricing is not meeting its full potential as a policy instrument that could encourage efficient water use or raise revenues with which to support investment. For sanitation, where there is an apparent need for expansion of wastewater treatment services and infrastructure, well-designed tariffs could play an important supporting role to encourage efficient behaviour and to raise much-needed financial capital.

With respect to the levels and patterns of investment, there appears to be an opportunity to coordinate the use of funds from diverse sources and to target how they are allocated using a unified financing framework. The recent experience with the Philippine Water Revolving Fund provides a good starting point for expanded use of this blended finance approach, including selective use of output-based aid. There are a number of challenges to this approach, but there could be a large payoff in terms of higher investment productivity and returns, and in the ability to pursue coverage targets in regions of greatest need.

Recent studies provide constructive suggestions for creation of a national water sector regulator, outlining the key functions that such an agency could play and providing a roadmap for its establishment. Extensions to those proposals include adding targets and standards related to system resilience and reliability in this era of increasing climate volatility.

In the Philippines, the water supply and sanitation sector is already in a state of transition, as documented in the *Philippine Development Plan 2017-2022*. Preserving the status quo is unlikely to be a viable option. Additional stresses include those from climate change, population growth and rural-to-urban migration. It is not apparent that investments on the scale required by commitments to the Sustainable Development Goals could be made from public funds alone.

Communication and public education should be key components of any reform strategy that is implemented, where that education has to serve not only utility operators and customers, but also prospective customers and the public at large. Key messages will include careful, yet cautious, characterization of the service improvements that will accompany the proposed reforms to regulation and pricing. The design and operation of means-tested or pro-poor pricing features or income redistribution arrangements will need to be explained carefully. There is also an opportunity to create a process that invites ongoing public participation in reform and oversight processes including those that address apparent wastage, inefficiency and corruption.

The environmental gains from more judicious use of water resources and from widespread adoption of effective sanitation can be significant in both urban and rural settings. For commercial and industrial users, there may be financial gains from sharing information about processes, methods and technologies that can save or re-use water resources.

For government agencies that will be asked to implement these and other reforms, there may be benefits from starting gradually. Institutional arrangements and practices will need to be established before proceeding with widespread implementation. A key to adaptive management of these changes will be collection and ready access to timely data and information about levels and trends in key performance indicators, both with and without the introduced reforms. Now would be the best time to plan for collection of baseline statistics on numerous performance criteria. Good measurement supports good management.

This study does not provide findings and conclusions that prescribe a specific or unique view of the way forward. In a number of cases, more than one option is presented, touching on numerous aspects of pricing, investment finance, regulation and governance. In many cases, the prospective synergies among these options are obvious, and so none should be considered in isolation.

The suggestions made here may be of interest at various levels of government and to various ministries and agencies within those governments. But, so too will they have relevance for water and sanitation users and suppliers; for national and international investors, donors and bankers; for civil society organizations; and for the public at large.

The way forward consists of a series of choices among these options leading to implementation of a program of legislative and regulatory reforms. Presented here is a clear and inter-related series of choices, the broad essence of which the Philippines has recently committed to address in its pursuit of socially inclusive and sustainable development.

Pricing Reforms for Sustainable Water Use and Management in the Philippines

1. Introduction

1.1 SDG6 and the role of fiscal and water pricing reforms for delivery

In the Philippines, fulfilment of the nation's commitment to continuing economic and social development will rely in numerous ways upon the country's ability to govern water supply and sanitation.² Key parts of effective water governance include the use of fiscal instruments and pricing policies, especially since they influence the investment process. The United Nations-led *2030 Agenda for Sustainable Development* specifies 17 'Global Goals,' known as the Sustainable Development Goals (SDGs) to be achieved by 2030 (United Nations, 2015). Water and sanitation issues influence a number of the SDGs, but especially SDG 6. It sets out targets for universal and equitable access to safe and affordable drinking water, improved water quality and increased water-use efficiency. Achieving SDG 6 would require a number of actions including the mobilization and effective use of finance from domestic and international sources (public and private) to meet investment needs in the water sector; implementing appropriate regulatory frameworks; improving technology and information tools; introducing capacity-building measures and other broad institutional reforms.

The reform of current policy coupled with judicious use of green investment approaches can assist the transition to a green economy while pursuing the SDGs nationally (UNEP, 2014). The role of the water sector in promoting green growth relies on such actions as providing opportunities for productive investment, internalizing environmental externalities and shifting patterns of household and corporate behaviour to sustainable production and consumption. Such actions can contribute to increased productivity, improved social equity and reduced poverty, while managing water sustainably for all. As played out in the water sector globally, to achieve the SDGs there could be roles for strengthening tax administration systems, establishing appropriate frameworks for private sector participation and effective delivery of international aid, adopting cost-effective infrastructure solutions, and improving policy coherence across other sectors. The Philippines has already committed to a number of these actions.

1.2 National policy context

In 2017, the Philippines adopted a set of long-term development goals for the country called *AmBisyon Natin 2040*. Developed through a participatory process, these goals provide overall guidance as well as a target for a series of more specific development plans. As articulated in two sentences, the life that the country has envisioned for itself is as follows.

In 2040, we will all enjoy a stable and comfortable lifestyle, secure in the knowledge that we have enough for our daily needs and unexpected expenses, that we can plan and prepare for our own and our children's future. Our family lives together in a place of our own, and we have the freedom to go where we desire, protected and enabled by a clean, efficient, and fair government (NEDA, 2017b).

The *Philippine Development Plan 2017-2022* (NEDA, 2017a) provides a framework and a series of actions and activities that governments will undertake in order to realize this national vision, with a view to revising and updating such mid-term plans on a regular basis. This five-year

² In this report, the term sanitation refers to the safe and sustainable management of human excreta, as well as the collection, storage, treatment and disposal of household and commercial grey water and waterborne waste, but excludes issues related to solid waste disposal or re-use.

development plan supports realization of the SDGs by 2030 and the achievement of national development goals by 2040.

As described further in this report, water sector initiatives and developments will be significant and enabling for each of these outcomes. Significant actions will include:

- a) promotion of efficient water utilization;
- b) undertake irrigation sector reforms: abolition of irrigation fees for small farmers; formulation of an irrigation master plan and framework for capital and operations and maintenance financing of irrigation projects; and rationalization of irrigation service fees;
- c) creation of an apex body; amendment of the water code and regulations, strengthening of coordination and linkages, enhancement of organizational capacity;
- d) creation of an independent regulator;
- e) establishment of a unified financing framework;
- f) preparation of a master plan and expansion of (reliable/affordable) sanitation coverage; and
- g) preparation of a master plan and expansion of (reliable/affordable) water supply coverage (NEDA, 2017a; and Philippines DMB, 2017).

1.3 Objectives of the study and approach

The overall objective of the study is to provide guidance on fiscal and pricing policy reform to ensure sustainable and socially inclusive water use and management in the Philippines. The study addresses fiscal instruments and water pricing policies currently in place or under discussion that affect water availability and use. This includes consideration of current and future investment needs in the water sector, and policy reform options for consideration by the government.

Key issues include the following.

1. Are there available reforms that will mobilize resources to support more socially inclusive, sustainable investments in the water sector?
2. Can various fiscal instruments be used more effectively, such as: efficient taxes or charges on water abstraction or emissions; direct budget transfers; and reform of inefficient water subsidies? Is there scope to increase the use of private funds, foreign direct investment and official development assistance, or to use existing funds better?
3. What is the scope for greater use of charges, tariffs and prices for access to raw water, treated water and for discharge of household sewage and wastewater emissions from industry?
4. How can water policies and reforms accommodate national goals with respect to pro-poor growth, socially inclusive access, and competitiveness of water-intensive production processes?

The study contributes to bridging knowledge gaps in the Philippines on the status of fiscal instruments and water pricing policies. This work provides guidance on fiscal and pricing policy reform to promote improved water use and management in the Philippines. Where the *Philippine Development Plan 2017-2022* offers a framework and direction, this study explores specific options by which to move forward. In this way, this study can support achievement of SDG6 and other relevant SDGs in the Philippines. The study provides information, advice and support to the government for consideration when reforming fiscal, pricing and regulatory policies in the water sector.

Although undertaken largely as a program of desk research in the first half of 2017, a series of introductory meetings with officials and experts in key ministries, agencies and research institutions helped to set the scene for this research. See Annex A for a list of individuals who participated. Those discussions identified emerging opportunities and evident challenges to achieving the Philippines' water goals.

2. Key issues and challenges in the water sector

The Philippines is endowed with abundant natural water features, including more than 400 rivers, 50 natural lakes and 100,000 hectares of freshwater swamps (FAO, 2012). In addition, numerous dams and the high levels of precipitation on many islands offer the promise that the large population's water needs can be adequately provided for. Despite this, the Philippines faces acute challenges from climatic variability and in managing water resources to meet competing needs.

This section addresses these and other challenges that face the water sector. In the current policy context, there are issues of jurisdictional fragmentation, gaps and overlap that are not well coordinated under any common water policy, agency or ministry. As a result, there is a risk that scarce resources are not being invested where needed most, or that regulatory actions may be hindering rather than promoting national policy objectives. The national government is now proposing to create a single ministry or agency of government with wide responsibility for water resource issues, and (separately) an independent water regulatory commission (NEDA, 2017a). However, several obstacles remain that impede sustainable and socially inclusive water management across the country.

2.1 Key issues in the water sector

Water scarcity and access

The Philippines' resource base faces growing pressures from rapid socio-economic changes across the islands. High population growth and density, urbanization and industrialization have intensified problems of actual and anticipated water shortage or scarcity, often due to increasing rates of water extraction and exploitation. As a result, significant areas of many of the most populous islands—Luzon, Mindanao and Palawan—are characterised by 'high' or 'extremely high' baseline water stress (UNESCO, 2014). Luzon and Palawan, especially, experience pronounced dry seasons, often limiting water supply for domestic and irrigation purposes.

Nationally, almost 90% of water withdrawals are accounted for by agriculture (FAO, 2012). Surface water from river basins represents the major source of freshwater used, but over-use of the resource combined with ecosystem damage from storms and floods reduces freshwater availability for all sectors including domestic needs. The islands of Luzon and Mindanao are the centres of irrigation development and investment, but Luzon remains vulnerable due to its climate, and is considered a global warming 'hot spot' (FAO, 2012). Rosegrant *et al.* (2016) examine future economy-wide losses to the Philippines associated with climate change. They recommend an immediate acceleration of investment in irrigation infrastructure, an action that could increase competition for water in many areas.

Tables 2.1 and 2.2, along with Figures 2.1 and 2.2, report data from 2015 compiled for the Philippines by the joint monitoring program of the World Health Organization and UNICEF. These data (Table 2.1) show that about 92% of the population have access to drinking water from an improved source, and slightly less than half of these people (43% of the total) have piped water on premises. Piped water coverage is much higher for the urban population (59%) than the rural one (30%)—almost half of the population is considered urban. With a national population in excess of 100 million people, these figures show that more than three million rural people use unimproved surface water as their drinking water supply. Figure 2.1 illustrates the manner in which access to drinking water varies according to wealth. Use of unimproved drinking water sources is much higher

Table 2.1 Estimates of drinking water sources used by rural and urban populations in Southern East Asia countries, 2015

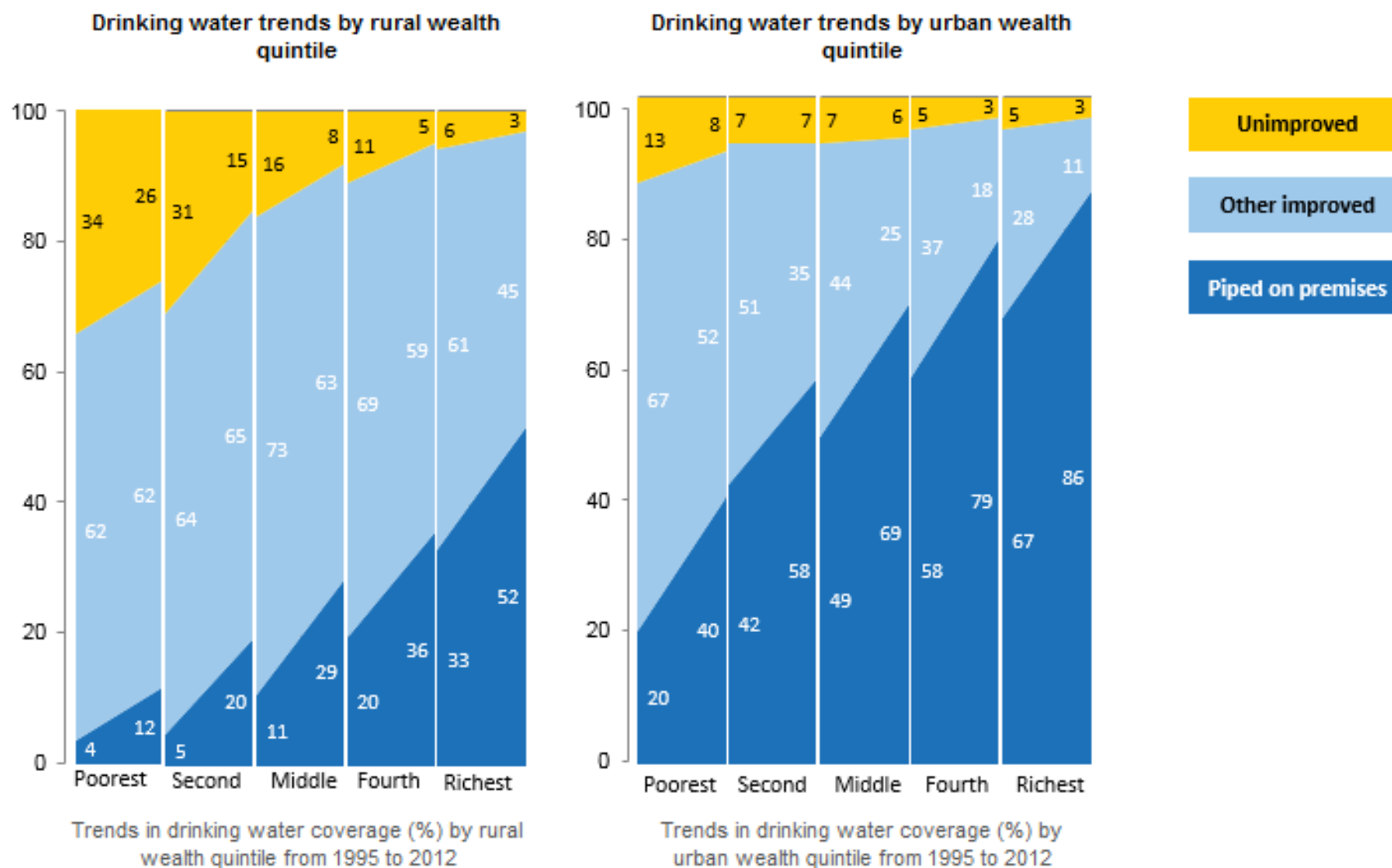
	Urban					Rural					Total				
	Improved ^a			Unimproved		Improved ^a			Unimproved		Improved ^a			Unimproved	
	Total Improved	Piped on Premises	Other Improved	Other Unimproved	Surface Water	Total Improved	Piped on Premises	Other Improved	Other Unimproved	Surface Water	Total Improved	Piped on Premises	Other Improved	Other Unimproved	Surface Water
Cambodia	100	75	25	0	0	69	7	62	16	15	76	51	25	12	12
Indonesia	94	33	61	6	0	79	9	70	18	3	87	22	65	11	2
Lao PDR	86	64	22	14	0	69	6	63	24	7	76	28	48	20	4
Malaysia	100	100	0	0	0	93	86	7	5	2	98	96	2	1	1
Myanmar	93	19	74	7	0	74	3	7	18	8	81	8	73	14	5
Philippines	94	59	35	6	0	90	30	60	6	4	92	43	49	5	3
Singapore	100	100	0	0	0	NA	NA	NA	NA	NA	100	100	0	0	0
Thailand	98	76	22	2	0	98	37	61	2	0	98	57	41	2	0
Timor-Leste	95	47	48	4	1	61	14	47	28	11	72	25	47	20	8
Viet Nam	99	61	38	1	0	97	10	87	2	1	98	27	71	1	1
South-East-ern Asia Region^b	95	51	44	5	0	86	17	69	10	4	90	33	57	8	2

Source: WHO and UNICEF, 2015a

Notes: ^a An improved water source is one for which collection time is not more than 30 minutes for a roundtrip including queuing, and can include: piped water, boreholes or tube wells, protected dug wells, protected springs, rainwater, and packaged or delivered water. Unimproved water sources include unprotected dug wells, unprotected springs and surface water abstraction directly from a river, reservoir, lake, pond, stream, canal or irrigation canal.

^b No estimates were available for Brunei Darussalam, ordinarily reported within the South-Eastern Asia region.

Figure 2.1 Trends in drinking water sources for rural and urban populations in the Philippines according to wealth quintiles, 1995 and 2012



Source: WHO/UNICEF (2015b)

in the lower wealth quintiles than in the upper ones, and is much higher in poorer rural areas than in poorer urban ones. According to the figure, in the period from 1995 to 2012, the rates at which upper-wealth households converted from 'other improved' sources to 'piped water on premises' was higher than the rate at which low-wealth households were able to graduate from unimproved drinking water sources to improved ones.

Table 2.2 shows that in 2015, about 74% of the population had access to improved sanitation facilities, with lower coverage in rural areas (71%) than in urban ones (78%). These data suggest that about five million rural residents do not have access to sanitation facilities and, along with about two million urban residents, practice open defecation. Figure 2.2 traces an improvement in access to sanitation facilities over the years 1995 to 2012, but makes clear that lack of access is correlated with low levels of wealth. The biggest gains over this period have come for poorer households that have gained access to shared toilet facilities. As a continuing policy challenge, it is noteworthy that the progress recorded in the figures is reversible. With growing and regionally migrating populations, there is a risk that the share of the population with access to improved sanitation may decline, and indeed, such future declines are projected (ADB, 2013).

Water quality

As a consequence of increased human activity, the Philippines' water quality has deteriorated and become a serious concern. Pollution in the form of sewage, oil spills, heavy metals, fertilizers and solid waste is growing, affecting an increasing number of the country's waterways. Such pollution has contaminated ground and surface waters, leaving water users exposed to waterborne diseases. In most large urban centres, much of the surface water consists of rivers now deemed to present a public health risk (ADB, 2013). Of the monitored inland rivers, the Meycauayan, Bocaue and Marilao in particular have been found to contain high levels of dangerous metals including cadmium and lead, while mercury and cyanide contamination have historically been a problem in the small-scale mining areas of eastern Mindanao (Greenpeace, 2007).

In the past decade, plans for greater energy independence and for the development of new indigenous sources of energy have led to an increase in wastewater discharge, such as from biofuel plants for example. Some projects have sought to address these links between water and the energy sector, leading to development of wastewater treatment facilities and a waste-to-energy facility (World Bank, 2007). The traditional approach to treating similar forms of industrial wastewater, such as from sugar milling, distilleries and breweries, is to impound the discharges in aerobic lagoons for treatment and delayed release. Where oversight and enforcement is weak, these approaches contribute to environmental harm.

One of the policy motivations to develop sanitation practices, in particular, more rapidly and more effectively is a mandamus order from the Supreme Court that sets targets and deadlines for reduction of environmental loading, and for ambient water quality improvement in Manila Bay. The effect of this court intervention includes the creation and funding of coordinating agencies to assist local authorities to fulfil their expected roles in this process, including their decisions with respect to investments in wastewater treatment.

Pricing and subsidies

Domestic use and sanitation

Challenges surrounding water supply and water quality can be exacerbated by inappropriate pricing and subsidy arrangements. Water prices and tariffs are generally low in the Philippines, with substantial subsidies allocated to service providers, who are dependent upon public funding. Overall revenues generated across the water sector are low. The government of the Philippines highlights

Table 2.2 Estimates of access to sanitation facilities by rural and urban populations in Southern East Asia countries, 2015

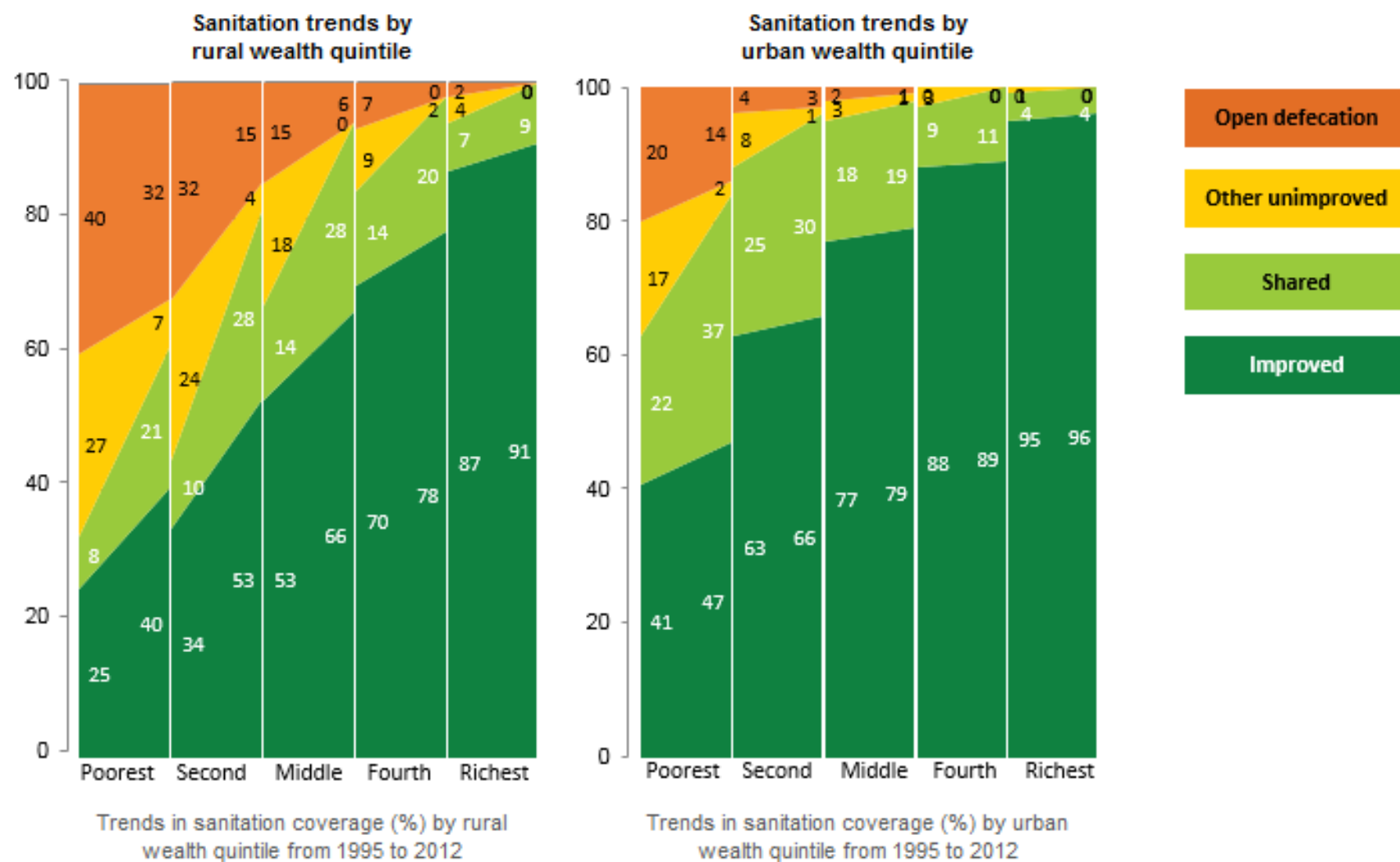
	Popula- tion (1,000s)	Urban				Rural				Total			
		Improved	Unimproved ^a			Improved	Unimproved ^a			Improved	Unimproved ^a		
			Shared	Other Unimproved	Open Defecation		Shared	Other Unimproved	Open Defecation		Shared	Other Unimproved	Open Defecation
Cambodia	15,677	88	12	0	0	30	7	3	60	42	8	3	47
Indonesia	255,709	72	10	5	13	48	12	12	29	61	11	8	20
Lao PDR	7,020	94	4	1	1	56	2	5	37	71	3	3	23
Malaysia	30,651	96	4	0	0	96	4	0	0	96	4	0	0
Myanmar	54,164	84	13	2	1	77	11	6	6	80	12	4	4
Philippines	101,803	78	19	0	3	71	18	1	10	74	18	1	7
Singapore	5,619	100	-	0	0	NA	NA	NA	NA	100	-	0	0
Thailand	67,401	90	10	0	0	96	4	0	0	93	7	0	0
Timor-Leste	1,173	69	17	7	7	27	6	31	36	41	9	24	26
Viet Nam	93,387	94	5	1	0	70	4	25	1	78	5	16	1
South-East- ern Asia Region^b	633,031	81	10	2	7	64	10	10	16	72	10	7	11

Source: WHO and UNICEF, 2015a

Notes: ^a Improved facilities are those not shared between two or more households, and can include: flush and pour-flush to piped sewer systems, septic tanks or pit latrines; ventilated improved pit latrines, composting toilets and pit latrines with slabs.

^b No estimates were available for Brunei Darussalam, ordinarily reported within the South-Eastern Asia region.

Figure 2.2 Trends in access to sanitation for rural and urban populations in the Philippines according to wealth quintiles, 1995 and 2012



Source: WHO/UNICEF (2015b)

low levels of cost recovery as a key problem in the water supply sub-sector. A 2010 publication prepared by the National Economic and Development Authority states, “Tariff levels are not sufficient for the majority of the [Water Service Providers] to recover recurrent costs and accumulate sufficient reserves to fund new capital developments.” There is a “lack of detailed guidelines, guidance and assistance in tariff setting and problems with collection efficiency.” There is a “lack of political will to set and implement tariffs at appropriate levels” (NEDA, 2010, p. 28), suggesting that tariff setting is not, first and foremost, a business decision. Annex C presents additional concerns raised in that report.

Other authors, including Llanto (2013) and ADB (2013), report that tariff levels of the majority of water service providers across regions are not sufficiently high to recover operation and maintenance costs. In the words of UN Water (2017), “The pricing of water and sanitation service provision needs to build in cost recovery to ensure sustainability, attract new investments, and extend service coverage.

In some cases, water utilities run by Local Government Units face considerable political pressure to keep water tariffs at low levels, since tariffs at cost-recovery levels are unpopular. In the absence of effective, external regulation of the water utility, rate increases could jeopardize an incumbent local politician’s prospects at re-election. The prospect of delivering benefits to voters in the form of expanded water service coverage (financed by higher prices) may seem risky or too far into the future to affect the electoral process.

The use of subsidies of various types is common to support service providers and customers in water and sanitation. In some cases, these subsidies are paid from domestic public funds and in other cases they reflect an allocation of official development assistance. Programs are implemented by diverse public agencies represented in Annex B. There are three significant programs that provide capital grants and technical assistance. One is for provision of potable water supply in underserved areas referred to as “*Salintubig*,” (with \$30.3 million budgeted in 2017) (Philippines DILG, 2017). The others are the program “*Water Supply and Sanitation for Poverty Areas and Priority Tourism Sites*” (Philippines DPWH, 2016), and the National Water Supply and Sanitation Program. Where the first two programs can provide up to 100% of funding for eligible projects (subject to a cap and eligibility criteria), the third mainly offers a matching grant approach that is not as attractive or affordable for some local jurisdictions. Other subsidy examples introduced below include one that encourages households to connect to community water supply and sanitation infrastructure (see Menzies and Suardi, 2009).

Irrigation

In recent decades, the government has set targets for irrigation fees that could cover operation and maintenance requirements. However, actual fee collections have lagged behind these targets. Inability or unwillingness to collect tariffs is not unique to the irrigation sector. More than half of Barangay water and sanitation associations have not been collecting revenues as targeted and stipulated (ADB, 2013). These shortfalls are often attributed to the lack of assistance and guidelines offered for carrying out tariff-related tasks. There has been a lack of standardised methodology for tariff structures and tariff setting, explaining the observed variation across sub-sectors and service providers.

In the case of agriculture, subsidies related to water use contribute to a larger pattern of public financial assistance, as explained by Decena.

Due to the importance of the commodity, rice farming has become one of the most subsidized agricultural sub-sectors. Subsidies are in the form of low interest rates for

credit, fertilizers for half their prices, and provision of production and postharvest machineries such as tractors, threshers and dryers to farmer cooperatives and organizations. One of the more important and expensive subsidies for rice is irrigation. This subsidy is extended for almost all types of irrigation systems: irrigation service fees based only on the operations and maintenance costs for the national irrigation systems, interest-free amortizations for the communal irrigation systems, free or subsidized prices for irrigation pumps, and donations/loans for construction of small water impounding systems (Decena, 2016, p. 1).

2.2 Key obstacles to more sustainable water management and use

In order to reform policy and achieve more sustainable and socially inclusive water management, there are a number of institutional challenges to address. The Philippines faces several such obstacles in addition to its biophysical limitations.

Financing

Governments in Southeast Asia have produced relatively comprehensive plans and targets for public expenditure. However, as depicted in Table 2.3, these plans have not been fully implemented in the case of urban and rural sanitation, drinking water and hygiene financing. Despite the apparent lack of political action to reform water pricing, this evidence suggests that there is at least a consensus on the need for financing. By some metrics in Table 2.3, the Philippines does not compare favourably to other countries in the region, although it may surpass Cambodia, Malaysia and Vietnam who do not have agreed financing plans for all of these sub-sectors.

Recent movements to encourage market-based mechanisms for financing represent a significant policy shift from historical practice. Private sector participation has been encouraged to meet investment requirements for infrastructure projects. The development and operation of the Philippines Water Revolving Fund, discussed further in Section 5, was an important step to move past funding obstacles (World Bank, 2016a). This approach to financing has not yet benefited a significant share of water-related services for households in the Philippines. The specific role of the private sector, as funders or operators of water service utilities, is often not clearly defined or understood, and the government finds that small utilities still have difficulty accessing finances for expansion (NEDA, 2010).

Regulation

Ineffective management and regulation act as barriers to effective water use among competing users, and can limit the national investment environment. Much like the variable and localised pattern of service providers described below, the regulatory frameworks that govern them are highly contingent upon contextual factors, including local politics (Hall *et al.*, 2015). There is no overarching framework to regulate economic behaviour reliably in the water and sanitation sector, although there is a current proposal to create an independent water regulatory commission to address this problem (NEDA, 2017a). The current regulatory framework has contributed to, among others, problems of groundwater extraction at unsustainable rates, relative absence of sustainable water management practices, and a lack of accountability of some service providers to users (Porciuncula *et al.*, 2016).

In the specific case of the sustainability of rural water supplies, Box 2.1 describes a recent assessment that categorizes regulation as an area of relative strength for the Philippines, and cites poor management of water and sanitation assets as an area of relative weakness.

Table 2.3: Water financing plans in Southeast Asia

Existence and level of implementation of a government-defined financing plan/budget for the water, sanitation and hygiene (WASH) sector which is published and agreed					
Country	Sanitation		Drinking water		Hygiene
	Urban	Rural	Urban	Rural	National
Cambodia	x	o	x	o	o
Lao PDR	o	o	✓	o	o
Malaysia	o	x	✓	o	x
Philippines	o	o	o	o	o
Thailand	o	o	✓	o	o
Vietnam	o	o	o	✓	X

✓ Agreed and consistently followed

o Agreed but not sufficiently implemented

x No agreed financing plan/budget or in development

*No comparable data are available for Indonesia and Myanmar

Source: adapted from UN-Water and World Health Organization (2017)

Institutional coordination

Annex B outlines the numerous Philippine government agencies with water-related responsibilities. These agencies range from the Department of Agriculture to the Department of Public Works and Highways. The water service providers comprise Local Government Units, Water Districts, Barangay Water and Sanitation Associations, Rural Water and Sanitation Associations, Irrigators Associations, private firms, private-public partnerships, and cooperatives. Some are government bodies (Local Government Units); others are quasi-governmental (Water Districts), and in addition, there are cooperatives and private firms. A central issue—highlighted in several academic, donor and government reports—is the lack of coordination among institutions, both laterally and vertically. In the absence of a central legislation or of a single national institution to govern water supply, a complicated *ad hoc* formation of institutions prevails. This institutional fragmentation has resulted in overlaps among executive and regulatory functions and service provision (World Bank, 2016b).

Data

UN-Water (2013) highlights the challenges presented by the absence of specific types of water-related data for the Philippines.

Data for the Philippines is relatively good when compared to many developing nations. However, the lack of published economic data (e.g. infrastructure costs, operating costs, crop values etc.) in the Philippines makes water-related investment decisions inherently more complex and investments riskier for investors (2013, p. 6).

Llanto (2013) enumerates the key agencies that collect data for the water and sanitation sector in the Philippines, including the National Statistics Office, the Department of the Interior and Local Government, the National Statistical Coordination Board, and the Local Water Utilities Administration. Llanto points to the absence of consolidated and consistent information and data on the actual access and coverage of water supply services in the country, expressing frustration that the available data are often unreliable or not up-to-date. Others point to the lack of appropriate data at the watershed level that can facilitate water planning (Rola *et al.*, 2016).

Box 2.1: Assessing the sustainability of rural water supply

A recent study by the World Bank (2017) emphasizes that global progress toward the Sustainable Development Goals for water will depend not only on reaching unserved population groups and on improving service levels, but also on being able to sustain existing and future water and sanitation services. As part of a sixteen-country review of practices determining the sustainability of rural water supply, the study sets out five building blocks for sustainability: (i) institutional capacity, (ii) financing, (iii) asset management, (iv) water resources management, and (v) monitoring and regulatory oversight.

The authors apply a numerical scoring system at the national level for each of these five components to award the Philippines an aggregated rating of 'Moderate' progress overall (World Bank, 2017). This exercise rates progress on three of the five building blocks to be 'Moderate:' (i) institutional capacity, (ii) financing and (iv) water resources management. A 'Moderate' rating signifies that some elements within each of these building blocks have been addressed, but more still needs to be done to address challenges, or that there has been mixed progress. The building block for (v) monitoring and regulatory oversight is rated 'Strong.' This rating signifies 'Good Progress,' whereby all areas within the building block are being addressed or there are conditions and initiatives in place to address remaining gaps or weaknesses to achieve optimum conditions. With respect to (iii) asset management, the assigned rating is 'Weak.' This signifies 'Limited Progress' with significant challenges, such that more needs to be done across a range of areas to ensure conditions are in place for this building block.

As elaborated further in AguaConsult (2016), using eight-point scales, the Philippines scored as follows: (i) institutional capacity – three points; (ii) financing – four points; (iii) asset management – two points; (iv) water resources management – three points; and (v) monitoring and regulatory oversight – six points. The resulting aggregated sustainability score (18 of a possible 40 points) can be compared within Asia to scores for Bangladesh (10), Kyrgyz Republic (13), Nepal (14), Indonesia (18), Vietnam (20), India (24), and China (28).

Source: Authors

Against this overview of issues and challenges in the water sector overall, the next section turns to issues of trends in capital investments and the degree to which they fall short of projected needs to meet national targets for urban and rural service delivery.

3. Investment trends and needs in the water sector

In the Philippines, there is a wide range of funding models and approaches that supply capital funds to the public, private, and not-for-profit water service providers and cooperatives that deliver water supply and sanitation services. In some cases, the water service providers borrow the necessary funds in domestic capital markets. In other cases they borrow from national government agencies, such as the Local Water Utilities Administration, that offer higher than commercial interest rates but other favourable loan conditions. In other cases, grant funding is available, such as through the operation of targeted public initiatives. Two such programs seek to develop cities with low water supply coverage rates or to develop areas deemed to have tourism potential. These programs are able to offer 100% grant funding from public sources. Alongside loans and grants for capital works, public resources are often offered to assist local utility operators to develop the designs, studies and funding applications necessary to qualify for any form of funding.

In some cases, the receipt of public grant funding is seen by local officials as a reason to suppress future price increases for some time. In other cases, a price freeze can be a condition of that funding. The reasoning seems to be that if a water utility has just been given grants that will cover large portions of its capital base, then why should the utility “exploit” its customers by asking them to pay for the service all over again through new or higher user fees? Such reasoning further hinders the process of increasing low tariffs. Note that a funded expansion of the infrastructure and the capital base may directly increase an operator’s funding needs for ongoing operating and maintenance costs, and/or may signal the need for a sinking fund geared toward capital renewal or replacement in future (Llanto, 2013; Porciuncula *et al.* 2016).

In the Philippines, there has been considerable experience with diverse models of privatization and public private partnerships, but, outside of the large concessionaires serving Metro Manila, these forms of management and ownership still affect a relatively small share of the households that are covered by water supply and/or sanitation services. In some cases, the private sector role is not well understood or managed. For instance, private operation is discouraged in cases where privately managed systems are disqualified from eligibility for public funding. Conversely, the role of private operators is promoted, perhaps excessively, when private operators are granted ownership (below cost) of extensive publicly-funded assets.

Foreign lending and other official development assistance play a significant role in capital investment, but the uses, processes, and beneficiaries of these funds appear to be lender- and donor-specific. These funding opportunities may not necessarily be well integrated with systems of national priorities or with other national programs and actions in the water sector.

3.1 Investment trends and estimated investment needs in the water sector

Table 3.1 shows that between 2002 and 2011, the government invested an average of almost \$480 million (in constant 2010 USD) per year on water-related programmes including infrastructure projects (UN-Water, 2013). Agricultural water resources received by far the largest proportion of government expenditure (48.5%) in the period, followed by river development (32.5%) and disaster risk reduction (10.2%). Water supply and sanitation is the fourth largest category (8.4%; sum of rows 5 and 6). For the same period of years (2002 and 2011), water sector expenditures that were funded with official development assistance averaged an additional \$82 million per year (in constant 2010 USD). The disbursement shares for official development assistance funds reflect somewhat different investment priorities. Although, water supply and sanitation is again the fourth largest category (8.9%; sum of rows 5 and 6), here it follows disaster risk reduction (48.7%), agricultural water resources (19.4%), and hydroelectric power development (11.2%).

Table 3.1: Government expenditure and official development assistance in the water sector in the Philippines, 2002-2011

	Users	Annual average government expenditure (million constant 2010 US\$)^a	Percentage (%)	Annual average official development assistance gross disbursements (million constant 2010 US\$)	Percentage (%)
1	Hydroelectric power plants ^b	[321.9]	-	9.2	11.2
2	Agricultural water resources	232.1	48.5	15.9	19.4
3	River development	155.5	32.5	4.8	5.8
4	Disaster prevention and preparedness/flood protection and control	49.0	10.2	39.9	48.7
5	Water supply and sanitation in larger systems	20.5	4.3	4.5	5.5
6	Basic drinking water supply and basic sanitation	19.8	4.1	2.8	3.4
7	Water resources protection	1.6	0.3	2.7	3.2
8	Water resources policy and administrative management	0.2	0.1	2.3	2.8
	Total annual average	478.7	100%	81.9	100%

Notes: ^a Government expenditure includes some Official Development Assistance (ODA). It was not possible to separate funds from government sources and ODA, as the General Appropriations Act, the law setting the operating budget of the Philippines, combines funds from the national governments and ODA.

^b Hydroelectric power plants are primarily financed through private sector funds, and the annual expenditure estimate shown in line 1 is not included in the government expenditure total (column 3). The portion financed by official development assistance is included in that column total (column 6).

Source: UN-Water (2013)

Figure 3.1 and Table 3.2 provide data from 2015 that estimate what the rate of investment would have to be in order for the country to reach coverage targets that it has set for itself by the year 2025 for water supply and by the year 2028 for sanitation. The estimated shortfall in funding for capital expenditure is \$423 million per year for every year until 2028, which suggests that these service targets are unlikely to be met without a significant change in funding levels and practices (World Bank, 2015). In the absence of more complete data, Table 3.2 provides no estimate of the funding shortfall for operations, maintenance and depreciation of the existing capital bases over the same period of years. Current and future tariffs provide a significant source of funds to support the existing infrastructure. Private (household) funds, not reported in the table, permit the continued operation of water supply and sanitation facilities and structures under household control such as for maintaining toilets, hand pumps, septage storage facilities and so on.

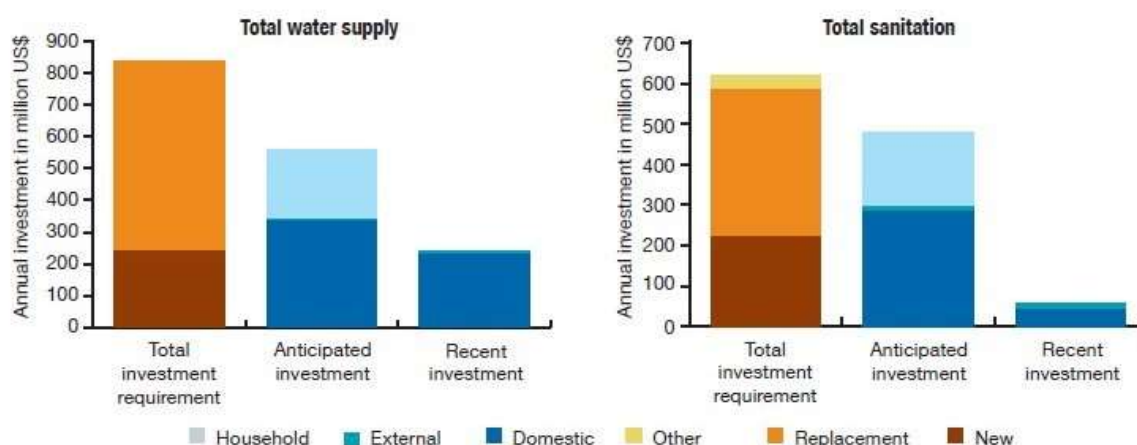
The models and calculations that underlie Table 3.2 support the view that far more funds will be invested in urban settings than rural ones during the next decade. Urban areas are estimated to receive 95% of the public funds allocated to capital expenditure, even though these areas contain only about half of the country's population. Water supply expansion is forecast to cost about 35% more than expansion of sanitation facilities on a per capita basis (World Bank, 2015).

This analysis implicitly relies on a characterization of the current levels of investments for water supply and sanitation, which presents several challenges in the Philippines:

Total investments contributed by different stakeholders are difficult to track as there is no lead agency collating this information. Some [Local Government Units] invest in water enterprises; legislators contribute to water supply projects from the Philippine Development Assistance Fund (more commonly known as pork barrel funds); and further investments are made by the private sector (large, medium and small), water districts, some government-owned and controlled corporations and a number of [Non-Governmental Organizations]. The establishment of a national account for water and sanitation would enable the monitoring of financial flows for water and sanitation programs, projects and investments (World Bank, 2015, p. 14).

The Philippine Revolving Water Fund (PWRF) is considered to be an innovative financing mechanism that was active from 2008 through 2013. Its role was to blend '... public and private resources to offer affordable financing to utilities without distorting market terms' (OECD, 2009). It was essentially a way of managing a transition toward market-based lending (Llanto, 2013). The fund blended loans from the Japan International Cooperation Agency (JICA) with funds from private Philippine banks. The fund's revolving nature came from the longer ten-year grace periods of the JICA loan and the two- to three-year grace periods of the loans to water utilities. Between 2008 and 2013, private banks released more than twenty loans through this facility for water supply and sanitation projects, valued at about \$100 million (World Bank, 2015).

Figure 3.1: Required, anticipated (2012-2014) and recent expenditures (2009-2011) for water supply and sanitation in the Philippines



Source: World Bank (2015)

Table 3.2: Annual estimates^a of required capital and operating expenditures, and resulting investment shortfall (millions of 2012 USD/year)

	Water Supply			Sanitation			Sub-totals		TOTAL
	Urban	Rural	Sub-total	Urban	Rural	Sub-total	Urban	Rural	
Annual Needs for:									
Investment	514	324	838	437	182	619	951	506	1,457
Operation & Maintenance	148	62	210	100	32	132	248	94	342
Total	662	386	1,048	537	214	751	1,199	600	1,799
Expected Capital Investment by Source of Funds:									
Private	194	23	217	163	20	183	357	43	400
Public-domestic	302	29	331	284	1	285	586	30	616
Public-foreign	4	3	7	11	0	11	15	3	18
Total	500	55	555	458	21	479	958	76	1,034
Investment Shortfall ^b	14	269	283	-21	162	141	-7	430	423

Notes: ^a Estimates are based on seeking to meet 100% national coverage targets for Philippine water supply (by 2025) and sanitation (by 2028).

^b In the absence of specific estimates for expected expenditures on operations and maintenance, the estimated annual shortfall reflects the shortfall in capital investment only. The bottom row is the first row minus the second-last row. Some rows and columns do not add up due to rounding.

Source: Based on Tables 2.1 and 2.2 in World Bank (2015)

3.2 Facilitating investment flows to the water sector

To assess the state of investment flows into the water sector in the Philippines, one should look beyond those issues that influence the levels of investment flows to assess also those factors that determine the effectiveness of those investments. A key factor here is the process by which those investments are governed and regulated. These aspects of the funding situation—levels of investment, water governance and regulation of water service providers—are highly inter-related in their bearing on current practice and on opportunities for further reforms.

Regulation and governance to promote the effectiveness of private investment

The overall effect and effectiveness of investments in the water and sanitation sector, broadly defined, will depend on the supporting regulatory environment. The governance and regulation of the water sector includes both the legal framework that establishes responsibilities and accountabilities as well as the active role played by public agencies to monitor, guide and oversee activity in the sector. The effectiveness of governance and regulation activities potentially has a very large effect on the willingness of investors to put capital in the sector and on the productivity of the capital ultimately deployed.

Of the many dimensions of regulatory oversight, decisions about the expected levels of service and how they match the needs and ability to pay of customers take on special importance. This is true for both state-owned enterprises and for companies with some degree of private investment. These decisions influence both the type of system that gets built and the services that it continues to deliver. Other aspects of regulatory choice in the Philippines, such as determining the size and location of service areas, and the expected degree of reliability and resiliency are also explored next.

Other research on this topic has highlighted the potential importance of establishing and enforcing levels of service in water supply and sanitation, and of creating processes for reviewing and adjusting those levels to meet changing conditions in the economy and the environment (World Bank, 2014). As examples, levels of service can refer to:

- (i) the share of households that are covered in the target population;
- (ii) the continuity of the service that is offered over the course of each week;
- (iii) the quality of the water that is delivered (as influenced by treatment and delivery of household water or by the treatment and appropriate disposal of wastewater flows);
- (iv) the water pressure (in the case of water supply);
- (v) the rates of loss and leakage (including the aggregate amounts of non-revenue water that customers and governments are asked to pay for);
- (vi) the ease and timeliness of being able to gain a new connection or service account;
- (vii) the timeliness and comprehensiveness of fee and debt collection;
- (viii) the functionality of customer service and dispute resolution mechanisms; and so on.

Consideration of these factors encourages one to go beyond asking about the magnitude of the investment flows, also to consider what one is investing in and whether it meets apparent needs.

The documentary record and discussions with stakeholders suggest that Metro Manila has a relatively sophisticated regulatory structure and practice related to water supply and sanitation. At the same time, other services areas, such as those offered by Local Government Units may be exempted from any external scrutiny, control and direction on their activities. One approach to reconciling these divergent regulatory contexts is to develop regulatory structures that can align the bundles of services that customers in each service area receive with what they would be willing to pay for. For many especially rural areas and smaller cities in the Philippines, much of the evidence points to plans to improve levels of service, but it is not clear that there is any mechanism to insist upon the types of investment that will make those gains possible. While the Philippines has set targets for the share of households to be covered (i.e., point (i) in the list above), there is no clear

statement about other dimensions of the preferred levels of service—either for the present or for the longer term. Without it, there may be no specific basis upon which to judge whether or not grants, loans and other investment practices are succeeding in terms of achieving intended results (World Bank, 2014).

From a regulatory perspective, there are other “quality” dimensions of the investment program that deserve attention. In numerous aspects of water supply and sanitation, the technologies in use can offer economies of size, such as in the operation of centralized treatment, the management of systems of reservoirs and storage, and the operation of distribution and collection systems, as examples. This means that it can be less costly to design and operate one or more systems that are large enough to take advantage of various types of cost savings within a single utility organization.

In the Philippines, the fragmented pattern by which multiple service providers have become established suggests that some of them are unable to take advantage of economies of size, and might not be financially viable as currently configured (World Bank, 2015). There appears to be an opportunity to generate gains through a regulator giving greater attention to available cost savings through appropriate choice or design of both jurisdictional boundaries and technologies. In some cases, utilities might be able to operate more efficiently if they could combine customers across existing local boundaries, such as when the choice of sites for new sewage treatment facilities in built-up areas does not offer a location that is central to the customer base in any one jurisdiction alone.

A related challenge concerns the jurisdictional ability for service providers to respond to rural-to-urban migration and the imperative to provide water and wastewater services to people living in newly urbanized areas on the urban fringe. At the national level, some responsibilities for urban versus rural water are split between agencies. Continuing rural-to-urban migration will create pressure to adjust jurisdictional authority to changing definitions of “urban” and “rural.” It will be beneficial to provide organizational flexibility to encourage the most effective and timely types of investment for system expansion and operation, whether by existing or additional service providers.

Even if the investment process were able to support the continuity of service over the course of each week—which, in many cases it is not—it would be important to look beyond the number of service hours per week as a service target. In assessing the adequacy of an investment program, one should ask whether sufficient infrastructure is in place to maintain those average levels of service in the event of extreme events. This is a significant challenge for the Philippines, which, historically, has experienced between ten and twenty tropical cyclones per year (UN OCHA, 2017). Addressing system reliability and resiliency would be prudent in anticipation of greater future weather variability. This leads to decisions such as whether to recommend installation of additional capacity, like the twinning of trunk supply lines or expanding storage capacity, in the expectation that these investments will only become operational on an exception basis. Under extreme weather events, it would not be uncommon to experience significant water supply interruptions, for example. Under current regulatory processes, there is no general process in place nationally to ensure that water utilities will be adequately compensated for building or operating additional “reliability,” even where the social gain from so doing far exceeds the social costs. One process to promote or to mandate such investments is to establish a regulatory authority with the power to determine and enforce a preferred degree of system reliability (World Bank, 2014).

The emergence of private-sector operators of water and sanitation facilities has created a number of private local monopolies, giving rise to the need for independent public oversight (ADB, 2013). However, such independent oversight could also be beneficial in cases where elected politicians are wary of setting adequate tariffs for fear of adverse electoral outcomes. Unsupervised rate setting

can place those in charge in an apparent conflict of interest that can impede overall system effectiveness.

Regulatory capacity is also important when exploring new forms of legal organization and alternative models of service delivery. As an example, in the wastewater sector, there is an opportunity to regulate via the use of performance contracts. These contracts would define the role of either a public or privately-operated service company in managing publicly-owned assets to provide wastewater treatment. The costs, budgets and operating rules to be reflected in these contracts should influence the prices that a regulator will allow. These prices will in turn influence whether the intended levels of service can be afforded, and whether investors will earn the rates of return they require to invest in such businesses.

There is also a potentially valuable role for an arm's-length, independent regulator to assess and monitor the data, assumptions, methods and results upon which all of the utilities' pricing and investment decisions will rely. Especially to establish allowable rates of return for private investors, a regulator could establish a comprehensive approach to budgeting for all maintenance and operation activities. This would typically include a full inventory of the infrastructure asset base for each service provider, and of the annual upgrades required to keep those assets operational at the desired level. This can be a data-intensive exercise. Commitments to gather new data going forward can improve the quality of the budgets to be prepared—and of the tariff to be approved—such as through the use of norms and benchmarks for estimating and comparing operating costs.

4. Analysis of fiscal and pricing policy framework for water

4.1 Existing fiscal and pricing measures in the water sector

In the Philippines, relative to historical practice, the national government has considerably reduced its fiscal role in the water and sanitation sector as a direct service provider. This change is associated with the devolution of responsibility and authority to lower levels of government. The actual water service providers are a diverse mix of Local Government Units, Water Districts, Barangay Water and Sanitation Associations, Rural Water and Sanitation Associations, Irrigators Associations, private firms, private-public partnerships, and cooperatives. Some of these providers are government bodies (Local Government Units); others might be categorized as quasi-governmental (Water Districts)³, whereas cooperatives and private firms in some cases have been granted a spatial monopoly that affords them considerable (monopoly pricing) powers.

In practice, national and local governments bear considerable fiscal responsibility for the provision of these services, such as when they guarantee the loans made by water districts or when they provide loans and grants to water service providers. When official development assistance is used in the water sector, this typically reflects an approval decision made by the national government, and these funds almost always have a tangible opportunity cost when being allocated to specific projects or providers.

Other than where the 12% value-added tax applies to these services, the national government generally does not share directly in the revenue from the pricing of water supply and sanitation services.⁴ In the case of irrigation service fees for national irrigation systems, prior to the introduction in 2017 of a fee waiver, the revenue from these fees had been used to fund the National Irrigation Administration. The extension of pricing waivers to these irrigators has a direct budgetary consequence nationally, since the National Irrigation Administration will now have to rely for funding upon a national budgetary appropriation.

Even where government is entitled to no direct share of water sector revenues, government's role in authorizing the tariffs offers a means to promote responsible management and operation of the infrastructure asset base and to encourage productive investments. In those cases where governments have a role in collecting fees (e.g., for some irrigation or local government unit supplies) or providing subsidies, these actions can also have important effects on the behaviour of suppliers and their customers. Fiscal decisions of this sort can influence overall performance of the water sector and the efficiency of resource use.

There is considerable observed variation in the specific pricing approaches that are used for water supply and sanitation services in the Philippines. The general approach appears to follow increasing-block-rate water tariff structures for domestic water supply. In some cases, these tariffs include components that relate to sanitation, even where the user may have no connection to sewerage and may not receive other sanitation services, such as collection and treatment of septage. These prices are further increased by the 12% value-added tax (Navarro and Llanto, 2014). The average levels of tariffs depend upon the prices charged within each rate block, the range of consumption volumes over which each block extends, and the degree of progressivity or graduation by which successive price steps increase.

³ Presidential Decree 198 declared water districts to be private corporations for the public benefit (specifically quasi-public corporations), but water districts bear all of the characteristics of non-stock, government-owned or government-controlled corporations (ADB, 2013).

⁴ No doubt there are exceptions to this general claim, such as when the Local Water Utilities Administration, a national body, chooses to step in and take over operations for a water district under its supervision that is failing financially.

The observed differences in water and sanitation pricing across water service providers may, in part, reflect regional supply-cost differences. Possibly unrelated to supply-cost differences, water supply prices and wastewater charges are differentiated according to the type of end-user. Business users typically pay considerably more than household users, moderated further, in some cases, according to the type of business activity being operated. Self-supply for household use from groundwater or surface water is free.

As explained further below, in Greater Manila, sanitation charges are levied on all users as a supplementary fixed percentage (20%) added to water supply prices. For the subset of business (but not residential) users connected to sewerage, an additional levy of 20% or 30% of the water supply charges is added.

Affordability is addressed in some jurisdictions—albeit selectively since many poor households might not qualify—by the inclusion of a special lower monthly fixed charge for eligible residential water users who consume less than ten cubic meters per month—so-called lifeline customers. If a low-income household exceeds the consumption threshold in any given month, it pays the regular prices for all volumes of water consumed in that month, and not just for the amounts in excess of the threshold.

As a specific example of a water supply tariff, Tables 4.1 and 4.2 show the current prices charged for water supply in Manila by each of the two private concessionaires, as regulated by the Metropolitan Waterworks and Sewerage System. Under these tariffs, there is almost no fixed monthly fee that is payable in addition to these volumetric amounts.⁵ Except for lifeline customers, in the western zone of Metro Manila, the monthly bill is calculated by charging 14.71 ₱/m³ for all units of metered consumption up to 10m³/month, then adding a charge of 17.96 ₱/m³ for all units of metered consumption above 10m³ and up to 20m³/month, and so on. A series of other charges is then added, as shown in Tables 4.1 and 4.2. In the western zone, the lifeline customers pay 118.41 ₱/month (USD\$2.37/month when 1₱=USD\$0.02) inclusive of other charges and value-added tax.

Notice that if two or more families (or a larger, extended single family) share a single water meter in Manila, then relative to a smaller, nuclear single family, they are more likely to face a higher incremental (and average) price per cubic meter for their water consumption. This is because some of their consumption is likely to fall in higher price blocks, and because they cannot qualify for the lifeline customer program collectively, even if each household would qualify individually. In Manila, this type of inter-household difference in prices paid per cubic meter does not reflect any actual difference in the cost of supplying the water, only a difference in the size/composition of the household or in the households' access to additional meters or water-service supply points. This situation also arises when households with a meter sell water to their (unconnected) neighbours. If the utility company were to provide additional meters or service points under this tariff structure, then, with unchanged consumption levels, their revenues could fall with additional ongoing expenses incurred. The supplier's (one-time) cost of providing new connection points can be charged to customers separately, and has been the subject of various subsidy schemes explained further below.

Across the Philippines, this common feature of an increasing-block-rate tariff may discourage the suppliers from upgrading communal water access points to provide private household service

⁵ Residential customers with a one-half inch (13 mm) meter connection pay a fixed monthly fee of 1.5₱ (\$0.03). All of the remaining monthly water supply fees are volumetric, on an increasing block tariff.

Table 4.1: Water tariff for Maynilad Water Service, Inc. (West zone of Greater Manila)

		Residential Customers	
Water consumption (m ³ /month)		Price prior to 04/2017	Price after 04/2017
Lifeline amount if total usage is less than 10m ³ /month		84.70 (₱/month)	86.31 (₱/month)
All others, the first 10m ³		14.44 (₱/ m ³)	14.71 (₱/ m ³)
From 10m ³ to 20m ³		17.63 (₱/ m ³)	17.96 (₱/ m ³)
From 20m ³ to 40m ³		33.52 (₱/ m ³)	34.15 (₱/ m ³)
From 40m ³ to 60m ³		44.02 (₱/ m ³)	44.85 (₱/ m ³)
From 60m ³ to 80m ³		51.42 (₱/ m ³)	52.39 (₱/ m ³)
From 80m ³ to 100m ³		53.77 (₱/ m ³)	54.79 (₱/ m ³)
From 100m ³ to 150m ³		56.23 (₱/ m ³)	57.30 (₱/ m ³)
From 150m ³ to 200m ³		58.74 (₱/ m ³)	59.85 (₱/ m ³)
Above 200m ³		61.22 (₱/ m ³)	62.38 (₱/ m ³)
Other User Classes after 04/2017			
	Semi-business	Business group I	Business group II
The first 10m ³	14.71 (₱/ m ³)	66.85 (₱/ m ³)	72.34 (₱/ m ³)
From 10m ³ to 20m ³	30.14 (₱/ m ³)	67.17 (₱/ m ³)	72.81 (₱/ m ³)
From 20m ³ to 40m ³	37.15 (₱/ m ³)	67.17 (₱/ m ³)	72.81 (₱/ m ³)
From 40m ³ to 60m ³	47.11 (₱/ m ³)	67.17 (₱/ m ³)	72.81 (₱/ m ³)
From 60m ³ to 80m ³	54.79 (₱/ m ³)	67.17 (₱/ m ³)	72.81 (₱/ m ³)
From 80m ³ to 100m ³	57.33 (₱/ m ³)	67.17 (₱/ m ³)	72.81 (₱/ m ³)
From 100m ³ to 150m ³	59.85 (₱/ m ³)	67.35 (₱/ m ³)	73.26 (₱/ m ³)
From 150m ³ to 200m ³	62.38 (₱/ m ³)	67.35 (₱/ m ³)	73.26 (₱/ m ³)
Above 200m ³	64.83 (₱/ m ³)	↓	↓
29 more steps (not shown)		67.56 – 74.57 (₱/ m ³)	73.84 – 87.81 (₱/ m ³)
Above 10,000m ³		74.80 (₱/ m ³)	88.27 (₱/ m ³)
Calculation of Total Monthly Charge: Sum the following six amounts			(₱/ month)
Volumetric water charge from the above columns according to class of user			A
Foreign currency differential adjustment: (0.69% of A =)			B
Environment Charge: (20% of ((A+B) =)			C
Sewerage--only for Business groups I and II, if connected: (20% of (A+B) =)			D
Maintenance Service Charge (fixed charge per month based on size of meter line; ranges from (½") 1.50 ₱/month to (8") 50.00 ₱/month)			E
Value-added tax: (12% of (A+B+C+D+E) =)			F
Total Monthly Charge (₱/ month)			(A+B+C+D+E+F)

Source: Based upon Metropolitan Waterworks and Sewerage System Board of Trustees Resolution Number 2017-037-RO (April 5, 2017).

Table 4.2: Water tariff for Manila Water Company, Inc. (East zone of Greater Manila)

		Residential Customers	
Water consumption (m ³ /month)		Price prior to 04/2017	Price after 04/2017
Lifeline amount if total usage is less than 10m ³ /month		58.31 (₱/month)	58.13 (₱/month)
All others, the first 10m ³		9.718 (₱/ m ³)	9.688 (₱/ m ³)
From 10m ³ to 20m ³		11.85 (₱/ m ³)	11.81 (₱/ m ³)
From 20m ³ to 40m ³		22.47 (₱/ m ³)	22.40 (₱/ m ³)
From 40m ³ to 60m ³		29.60 (₱/ m ³)	29.51 (₱/ m ³)
From 60m ³ to 80m ³		34.58 (₱/ m ³)	34.47 (₱/ m ³)
From 80m ³ to 100m ³		36.23 (₱/ m ³)	36.12 (₱/ m ³)
From 100m ³ to 150m ³		37.85 (₱/ m ³)	37.73 (₱/ m ³)
From 150m ³ to 200m ³		39.47 (₱/ m ³)	39.35 (₱/ m ³)
Above 200m ³		41.10 (₱/ m ³)	40.97 (₱/ m ³)
Other User Classes after 04/2017			
	Semi-business	Business group I	Business group II
The first 10m ³	9.688 (₱/ m ³)	44.03 (₱/ m ³)	47.64 (₱/ m ³)
From 10m ³ to 20m ³	19.78 (₱/ m ³)	44.08 (₱/ m ³)	47.93 (₱/ m ³)
From 20m ³ to 40m ³	24.39 (₱/ m ³)	44.08 (₱/ m ³)	47.93 (₱/ m ³)
From 40m ³ to 60m ³	30.99 (₱/ m ³)	44.08 (₱/ m ³)	47.93 (₱/ m ³)
From 60m ³ to 80m ³	36.12 (₱/ m ³)	44.08 (₱/ m ³)	47.93 (₱/ m ³)
From 80m ³ to 100m ³	37.73 (₱/ m ³)	44.08 (₱/ m ³)	47.93 (₱/ m ³)
From 100m ³ to 150m ³	39.35 (₱/ m ³)	44.32 (₱/ m ³)	48.19 (₱/ m ³)
From 150m ³ to 200m ³	40.97 (₱/ m ³)	44.32 (₱/ m ³)	48.19 (₱/ m ³)
Above 200m ³	42.70 (₱/ m ³)	↓	↓
29 more steps (not shown)		44.46 – 49.05 (₱/ m ³)	48.56 - 57.78 (₱/ m ³)
Above 10,000m ³		49.17 (₱/ m ³)	58.14 (₱/ m ³)
Calculation of Total Monthly Charge: Sum the following six amounts			(₱/ month)
Volumetric water charge from the above columns according to class of user			A
Foreign currency differential adjustment: (2.80% of A =)			B
Environment Charge: (20% of (A+B) =)			C
Sewerage--only for Business groups I and II, if connected: (30% of (A+B) =)			D
Maintenance Service Charge (fixed charge per month based on size of meter line; ranges from (½") 1.50 ₱/month to (8") 50.00 ₱/month)			E
Value-added tax: (12% of (A+B+C+D+E) =)			F
Total Monthly Charge (₱/ month)			(A+B+C+D+E+F)

Source: Based upon Metropolitan Waterworks and Sewerage System Board of Trustees Resolution Number 2017-036-RO (April 5, 2017)

connections. The current tariff structure may financially penalize larger households and those with collective or communal access to metered sources by excluding them from lifeline pricing and by pushing them into higher price blocks in the tariff structure.

These and other features of the Greater Manila water tariffs are evident in Table 4.3, which presents the monthly water charges for some typical customer profiles. Observe these features of the tariffs presented.

- For the hypothetical example of three households sharing a common connection point and common meter in either zone, (third example), the monthly charges for each household are about 75% higher than if each household had its own connection (second example). In the special case where the three households sharing are each using a lifeline amount (e.g., 9 m³/month), the monthly charges for each household are more than 110% higher than if each had its own connection.
- The cost incurred for the incremental unit of water (right column) by a residential household sharing a meter and using 15 m³/month is 250% of the comparable value for a residence with its own meter (West: 60.69/24.30; East: 40.77/16.32).
- Across these five examples, otherwise comparable customers in the west zone pay about 40-50% more per month than customers in the east zone to consume the same volume of water. (Table 4.1 shows that the west zone customers had a slight increase in water charges in 2017, while Table 4.2 shows that those in the east zone had a slight decline.) Differences in the state and extent of the physical infrastructure base between the two zones no doubt contribute to some of these price discrepancies. These figures do not allow any comparison of the quality of the service that customers receive, such as due to differences between zones in continuity of coverage, water pressure, water quality, access to private versus shared connections, reliability and security of water supply, and payment or collection modalities.
- The strongest price incentives that customers receive to conserve water come from the charge that customers associate with the incremental unit consumed. As shown in the right-hand column, and excluding business customers with active sewerage connections (fifth example), these values range from 0 to \$1.82/m³. It is conceivable that there are neighbouring customers at each extreme of that cost range drawing the same water from the same water supply. As explored further below, efficient allocation of the water supply in an economic sense would be promoted by charging each customer the same amount for the incremental unit of water supplied, and basing that charge on the social opportunity cost of supply.
- A structural feature of increasing-block-rate tariffs is that the price of the incremental unit is usually higher than the average price across all units. Tables 4.1 - 4.3 show that this effect is considerably more pronounced for residential customers with higher consumption (third example), than it is for either of the business group examples. This is because the business group tariffs (Tables 4.1 and 4.2) do not exhibit much of an increase in rates as consumption increases. Consider two neighbouring customers, one residential and the other in Business Group II, (in either zone) whose monthly consumption were to make a large increase from 10 m³/month to 99 m³/month. For the residential customer, after the increase the cost of the incremental cubic meter used would be more than three times higher, but for the business customer, the incremental cost per unit would increase by less than 1%. With less than 1% of increase, the business rate structure is more similar to a uniform volumetric rate than to an increasing block rate. In a more extreme example, a move from 10 m³/month to above 10,000 m³/month would increase the incremental business charges per unit by only 22%, as compared to an increase of almost 250% on the residential rate scale.

Table 4.3: Typical water charges in Greater Manila in 2017, varied by customer characteristics

Customer Profile Examples ^a	Zone	Total amount paid per month (including tax)		Average amount paid per unit (m^3) for all units consumed (including tax)		Incremental amount paid for last unit (m^3) consumed (including tax)	
		₱/month	\$/month	₱/ m^3	\$/ m^3	₱/ m^3	\$/ m^3
1. Residence using less than $10m^3$ /month	West	118.48	2.37	12 – 118 ^b	0.24-2.37 ^b	0	0
	East	81.99	1.64	8 – 82 ^b	0.16-1.64 ^b	0	0
2. One residence using $15m^3$ /month	West	322.27	6.45	21.48	0.43	24.30	0.49
	East	217.12	4.34	14.47	0.29	16.32	0.33
3. Per residence charge for three residences sharing a connection at $15m^3$ /month each	West	558.30	11.17	37.22	0.74	60.69	1.21
	East	374.96	7.50	25.00	0.50	40.77	0.82
4. Business Group I without sewerage connection at $50m^3$ /month	West	4,544.00	90.88	90.88	1.82	90.90	1.82
	East	3,047.79	60.96	60.96	1.22	60.90	1.22
5. Business Group II with sewerage connection at $150m^3$ /month	West	17,274.54	345.49	115.16	2.30	115.66	2.31
	East	12,437.36	248.75	82.92	1.66	83.23	1.66

Notes: ^a Tabulated values are based on Tables 4.1 and 4.2, assuming residences use a one-half inch connection and businesses use a one-inch connection, with a rate of exchange of 50 PHP/USD.

^b For these lifeline customers, the average cost per cubic meter will be lower within this range of values, the higher is the household's actual usage between 1 and $10m^3$ /month.

The tariff levels in Greater Manila affect a large number of people. These prices may be of interest given the special role played by the two private concessionaires acting as water service providers there, and the role and influence of the Regulatory Office of the Metropolitan Waterworks and Sewerage System. However, the approach to price setting—and to water regulation more generally—that is followed in Greater Manila does not apply rigidly in other regions of the country.

The Local Water Utilities Administration serves as the regulator of numerous water districts as well as of water utilities operated by some Local Government Units. Table 4.4 shows a ten-year price history for the average of the tariffs charged by more than 450 separate water districts. One feature to note is the use of an increasing-block-rate structure with six price levels (compared to the use of nine residential price blocks in Greater Manila). The values in Table 4.4 apply to customers in the residential and government class. Business and commercial customers are grouped into distinct user sub-classes according to the nature of their business activities. The water supply charges that apply to each commercial class are reached by multiplying the residential rates by a corresponding conversion factor. These rates and conversion factors include:

- Commercial/Industrial: 2.0 e.g., restaurants, hotels, some light industry
- Commercial-A: 1.75 e.g., wholesale and retail vendors
- Commercial-B: 1.50 e.g., some retail and repair
- Commercial-C: 1.25 e.g., Apartments using one central water meter
- Bulk/Wholesale: 3.0 (Local Water Utilities Administration, 2000)

Table 4.4: Philippine water districts average water rates, 2007-2016

Effective Date	Number of Water Districts	Average Consumption <i>m³/month</i>	Minimum Charge for First 10 m ³ <i>₱/month</i>	Unit Cost for 11 - 20 m ³ <i>₱/ m³</i>	Unit Cost for 21 - 30 m ³ <i>₱/ m³</i>	Unit Cost for 31 - 40 m ³ <i>₱/ m³</i>	Unit Cost for 41 - 50 m ³ <i>₱/ m³</i>	Unit Cost above 50 m ³ <i>₱/ m³</i>	Total Monthly Charge ^a with 20 m ³ /month <i>₱/month</i>
12/31/20	499	21.17	198.16	22.38	24.36	27.30	30.24	30.93	422.04
6/30/201	499	21.64	197.98	22.36	24.33	27.27	30.20	30.89	421.64
12/31/20	495	20.99	197.39	22.28	24.24	27.17	30.10	30.80	420.26
6/30/201	491	21.09	196.74	21.89	24.18	27.11	30.04	30.73	415.69
12/31/20	490	20.35	195.95	21.79	24.05	26.97	29.87	30.56	413.85
6/30/201	485	21.34	195.75	21.77	24.04	26.96	29.86	30.55	413.50
12/31/20	481	20.97	195.44	21.73	23.99	26.89	29.78	30.47	412.81
6/30/201	481	21.58	195.20	21.71	23.96	26.87	29.75	30.44	412.32
12/31/20	481	21.37	194.07	21.59	23.83	26.71	29.56	30.25	409.98
6/30/201	478	21.76	193.01	21.48	23.72	26.59	29.45	30.15	407.86
12/31/20	473	21.37	190.99	21.27	23.49	26.34	29.15	29.82	403.77
6/30/201	471	21.71	188.94	21.05	23.25	26.06	28.84	29.52	399.49
12/31/20	469	21.43	184.47	20.59	22.76	25.52	28.24	28.91	390.42
6/30/201	467	22.29	182.45	20.36	22.51	25.24	27.93	28.58	386.09
12/31/20	466	22.04	179.37	20.00	22.10	24.80	27.38	28.03	379.39
6/30/200	464	22.57	177.86	19.83	21.91	24.55	27.08	27.72	376.23
12/31/20	461	21.69	173.99	19.41	21.46	24.08	26.55	27.15	368.12
6/30/200	461	22.80	171.61	19.13	21.17	23.74	26.16	26.76	362.94
12/31/20	460	22.01	166.82	18.62	20.60	23.10	25.45	26.04	353.03
6/30/200	458	23.82	165.00	18.42	20.38	22.87	25.19	25.79	349.21

Notes: Assuming residential use with a one-half-inch connection.

^a Using data from Tables 4.1 and 4.2, the comparable values in 2016 for the west and east zones of Greater Manila would be ₱435.67/month and ₱299.67/month, respectively.

Source: Local Water Utilities Administration (2017)

The website of the International Benchmarking Network for Water and Sanitation Utilities (IBNET, 2017) provides information about the current and historical water tariffs for a number of cities in the Philippines. Based on these data, Table 4.5 presents a standardized comparison of the amounts that households paid for water supply service in 2015 across a small number of countries in East and Southeast Asia for which data were available. For this specific set of comparators, the highest rates charged are five to six times higher than in the countries with the lowest rates. In this comparison, the rates in the Philippines appear to be well above average for the group of countries, but they also appear to be well above rates reported by other information sources for the Philippines.⁶

Table 4.5: International comparison of water supply charges per cubic meter in 2015

Country	Country Average	Minimum	Maximum
	<i>USD/m³</i>		
Cambodia	0.17	0.17	0.17
Indonesia	0.28	0.17	0.35
Malaysia	0.14	0.05	0.21
Papua New Guinea	0.11	0.11	0.11
Philippines	0.70	0.54	0.83
South Korea	0.67	0.43	0.85
Vietnam	0.28	0.24	0.34

Note: Based on monthly household consumption of fifteen cubic meters using the simple average of all entries in each country database, excluding sanitation fee and value-added tax, in USD/m³, as converted by IBNET database at 2015 market exchange rates.

Source: International Benchmarking Network for Water and Sanitation Utilities (IBNET, 2017)

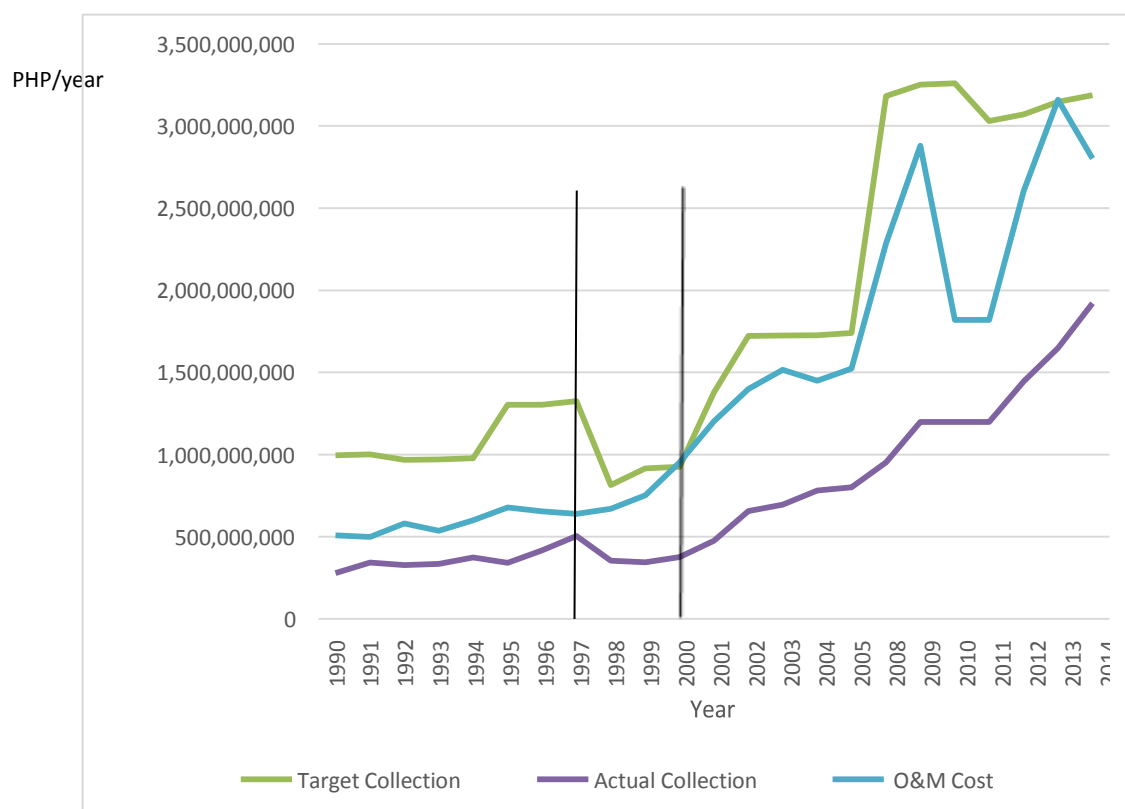
The revenues collected for water supply and wastewater services are directed to the public or private entities that are responsible for water supply or wastewater management in a given location. Where these prices are further subject to a value-added tax, those tax revenues are directed to the national treasury.

Figure 4.1 illustrates the historical range of fees charged, fees collected and operating costs for one component of the country's irrigation water supply, namely the national irrigation systems. Except for two of the years shown, the fees that were charged (upper line) would have covered at least the expense of operation and maintenance (O&M, middle line), plus some of the capital costs, if these fees had all been collected. However, as the figure illustrates, collections (lower line) have fallen far below the amounts that were due. This issue has motivated some of the reform of irrigation pricing discussed in Section 5 (below).

For water supply and sanitation services at the national scale, there is no comprehensive reporting of public revenues (revenue from water prices and sanitation fees plus value-added taxes) or of subsidies that are paid in kind, in cash and through various forms of tax expenditures and tax concessions. Information on numerous categories of expenditure appears in Table 3.1.

⁶ If one were to use the 2016 water prices for Greater Manila reported in Tables 4.1 and 4.2, and to use a 2016 exchange rate (47 ₱/\$), the average (pre-tax, without sanitation fee, 2016) prices paid for water in Greater Manila would be \$0.33/m³ (west zone) and \$0.22/m³ (east zone). Alternatively, using the water district average prices for December 2015 from Table 4.4 (assuming usage of 20 m³ per household per month), with a 2015 exchange rate (45 ₱/\$), generates an average 2015 price of \$0.47/m³. All three of these values are significantly below the minimum reported value (\$0.54/m³) for the Philippines in 2015 in Table 4.5, calling into question the representativeness of these IBNET data.

Figure 4.1 Target and actual irrigation service fees, and operation and maintenance cost, National Irrigation Systems, Philippines, 1990-2014 (PHP/year)



Source: (Decena, 2016)

4.2 Impacts and effects of existing fiscal and pricing measures

This section addresses the impacts of fiscal instruments and pricing policies for both water supply and wastewater as they apply in the Philippines. Section 2.1 presented views and evidence that the revenues raised are too low to cover operating and maintenance costs in many instances. These cash inflows fall well short of covering capital costs and/or the user cost of the water resources themselves. In some sectors, such as irrigation, new public policies introduced in 2017 have set some of these fees at zero, although not all of the details of this revised policy have been publicized. As shown in the tabulated examples (Tables 4.1 - 4.5) various charges, fees and taxes are incorporated into the prices that customers pay. These pricing decisions appear to be motivated by competing, and sometimes conflicting, pricing objectives and principles.

Fiscal policy for the water sectors

Public and quasi-public agencies including Local Government Units, the Local Water Utilities Administration, the Metropolitan Waterworks and Sewerage System, the National Water Resources Board, the National Irrigation Administration and a large number of government ministries connect the budgets, expenditures and revenues of the public sector of the Philippines with the water supply, sanitation and irrigation sectors. As a result, governments in the Philippines have a fiscal stance or position with respect to water use and management, and the revision or reform of many of government's fiscal actions could have important effects on performance and outcomes.

Earlier sections of this report introduced a number of issues and practices related to fiscal policy in the Philippines, such as: the use of public loans, grants, guarantees and subsidies; public ownership;

public-private-partnerships; and the sectoral deployment of official development assistance. Similarly, the role and magnitude of the value-added tax on customer water bills affects the public treasury. Until recently, the operation of the National Irrigation Administration was funded by fees collected from some irrigators, but now this will be funded as part of the national budget.

Despite some significant steps to devolve some aspects of water supply and provision to the private sector, governments are inextricably connected to current water practices to an extent that would be hard to measure numerically. The establishment of a national account for water and sanitation would enable the monitoring of financial flows for water and sanitation programs, projects and investments (World Bank, 2015, p. 14). In the absence of recent published data and analysis about the impacts and effectiveness of any of these fiscal measures, it is hard to estimate how large the potential gains might be from fiscal policy reforms. Chapter 5 identifies a number of alternative fiscal actions that governments can consider as part of a concerted and integrated attempt to meet objectives and commitments in the water sector. Of course, some of these actions are closely inter-related with pricing practices for water supply, sanitation and irrigation.

Approaches to water pricing

Any examination of the effects and effectiveness of a given system of water pricing, whether for water supply or for wastewater services, will benefit from identifying the purpose or purposes for which pricing is being used. There are a number of distinct rationales for choosing water-pricing regimes, and these rationales may not be consistent with one another and may lead to distinctly different patterns of water use.

In general, the pricing of water services can be undertaken: (i) to influence the behaviour of users (i.e., provide incentives to use specific amounts of water in specific ways and to encourage producers to supply those amounts); (ii) to generate public revenue; or both. Within each approach, there are finer variations in pricing that can influence the specific amounts of water to be used and the expected amounts of revenue to be raised. In a qualitative sense, a pricing scheme that changes water users' behaviour will usually raise some revenue (and often vice versa). However, a single price can achieve only a single public policy purpose precisely. For instance, it is rarely the case that setting a single price based on full-cost-recovery principles will result in economically efficient use of the water resources in question.

Although having some form of pricing may encourage conservation of scarce resources and may provide a result that is preferable to unpriced access, the prices charged may be unnecessarily high in some instances and may discourage otherwise-beneficial water uses. If a jurisdiction were to choose a two-part pricing framework, then that jurisdiction could use one part of the pricing formula (i.e., the volumetric charge) to influence behaviour and the other part (a monthly component that does not rely on volume) to meet a specific revenue target. In principle, the two parts of the pricing framework can be calibrated to achieve two specific targets simultaneously.

The responsiveness of consumers to higher prices will depend upon a number of factors including the availability of alternative water sources or water-saving devices, the levels and structure of the pricing tariff in use, and the size of the water bill relative to the household budget. Household awareness of how their behaviour affects the bill they receive is also key (OECD, 2016A). In general, water consumption levels will be more responsive to price changes in the long run than in the short

run.⁷ It is significant that the Philippines already has high coverage of water metering of urban water supply. In order for changing water pricing to have an impact on behaviour, customers need the ability to relate their consumption choices to the amounts they pay, usually through clear and timely billing of individual accounts.

From a pricing design perspective, there are a number of behavioural and revenue targets that one could aim for, and in general, all of them are different. An important property of most economic instruments, such as the use of water pricing, is that, at best, each instrument is capable of achieving a single objective or target. Hitting any one of them precisely would mean missing the others. Box 4.1 offers examples of what these pricing targets might look like when raising revenue is the objective and Box 4.2 looks at behavioural targets.

Pricing can provide a powerful incentive to encourage responsible and efficient consumption behaviour by consumers, just as it can provide an effective way to raise domestic revenue needed to operate, maintain and expand current infrastructure. Pricing can be employed in a manner that ensures services remain affordable to all. Where pricing reflects differences in costs of supply or treatment, then it can send powerful signals about where to locate water-intensive industry, for example, and when to invest in water-saving technologies. So too on the wastewater side. If treatment and disposal of treated wastewater is more expensive in some locations than others, such as due to differences in technology or in the physical setting, and if these differences (in so-called marginal abatement costs) are reflected in the tariffs charged to customers, then this can provide strong incentives to discharging industries and utilities to adjust business practices accordingly.

A jurisdiction could first decide which objectives to pursue, and then whether to do so by choice of a single water price or by the use of multiple pricing instruments together. An option not effectively practiced in the Philippines is to employ water pricing with a two-part or multi-part instrument that is capable of fulfilling two or more objectives simultaneously. An example of a two-part price is one that combines a monthly, seasonal or annual payment (part 1) with a volumetric fee based on use (part 2).⁸ Calibration of the volumetric fee adjusts user behaviour to the desired level, and then adjustment of the fixed amount helps achieve the revenue target. Note that even with a two-part price structure, it might not be possible to pursue, in a consistent fashion, more than one behavioural target or more than one revenue target simultaneously.

Consider for a moment the choice of policy targets for how much cost recovery should be achieved, by design, from the prices charged for water supply and sanitation. For example, the pricing objective might be to cover operating and maintenance costs only, or some or all capital costs, as two popular examples. The choice will influence fairness and affordability of the outcomes, and will also determine what is the social cost to the economy of collecting these amounts. There is no universally “correct” answer, but only some consideration of what is most preferred in the Philippines, either nationally, or region by region. It is not true that a pricing policy that cannot cover the full costs of services provided is necessarily inefficient or “wrong.”

⁷ The relative responsiveness over time of desired consumption levels to price changes is captured by two magnitudes referred to as the (i) short-run and (ii) long-run own-price elasticity of demand. These elasticity values can be estimated numerically from customer accounts data and can guide the tariff reform process. Similarly, the responsiveness of desired levels of water delivery (by service providers) to changes in prices is reflected in the own-price elasticity of supply.

⁸ There are numerous specific formulas that can implement various forms of multi-part pricing, and some of these are reviewed in OECD (2010).

Box 4.1: Illustration of revenue raising purposes and targets in choosing water price levels

1. **Partial Recovery of Costs:** Water prices do not raise sufficient revenue to cover the costs of water administration and management.
2. **Recovery of Recurring Costs:** Water is priced to provide sufficient revenue to cover all of the recurring (monetary operating and maintenance) costs of water administration and management. Annual operating costs are passed to the user community through a system of common or differentiated charges.
3. **Recovery of Operating, Maintenance and Capital Costs:** As above augmented to maintain the stock of infrastructure and physical capital in perpetuity.
4. **Sufficient Funding to Ensure Sustainability:** Water is priced to generate enough budget to ensure the future sustainability of the water resource base and future flows. This larger revenue target includes recovering the recurring and capital costs described above plus additional amounts necessary to sustain and develop the resource base. The funding target here is potentially much larger, especially in a growing or expanding economy. Also included here, could be proactive investments in water supply, distribution and water security, and/or deferred maintenance expenditures that have not necessarily been included in annual recurring cost estimates.
5. **Optimal Revenue Mix:** Water is priced as a low-cost, implicit form of taxation revenue within the government's broader mix of taxes and revenue sources (in those contexts where revenues flow to government and not to independent utilities). Each revenue-raising tax, tariff, royalty and fee charged by a government has, conceptually, an optimal level or rate that defines its place in an optimal revenue mix. In general, for a given revenue target, economic efficiency is promoted—and the optimal rate of tax, tariff or royalty is determined—by equating the marginal social opportunity cost per dollar of funds raised across each such tax, tariff or royalty. In some jurisdictions, the pursuit of this principle might result in higher or lower water rates than would otherwise be the case, offset by efficiency-enhancing gains in other sectors when other tax rates are re-calibrated. Consider the related case of governments that introduce a revenue-neutral carbon tax and then experience other economy-wide gains from lowering personal or corporate income tax rates.
6. **Return on Assets:** Water is priced to provide a competitive return on the value of all water-related assets potentially including the resource base and the infrastructure. Under this approach, public or private ownership of a jurisdiction's resource base is seen to incur an opportunity cost. The magnitude of that cost is based on the risk-adjusted expected return from the value of those assets if they were to be invested or spent in their next highest use. The corresponding revenue target is a form of "dividend," paid for by water users that could be competitive with asset-market rates of return.
7. **Special Projects:** Water is priced to meet the expenditure needs of specific earmarked purposes or projects. For instance, this revenue target could include a defined program of water-related research or infrastructure development. It is distinct from cost-recovery. This earmarking approach might require the use of a revolving fund. For example, in Mexico, the first \$25 million per year of funds raised from the water fee is dedicated for use by a public environmental fund.

Source: Authors

Box 4.2: Illustration of purposes or targets related to changing water consumption behaviour in choosing water price levels

1. **Awareness:** A relatively low level of water prices may help create an awareness or appreciation among water users of the (social) value of water resources. A low price level affects users' knowledge and attitudes but the effect is not sufficient to achieve patterns of water usage that are efficient. Recently in Vietnam, the Minister who introduced the draft Law on Irrigation said it would change people's perceptions, even though it proposed major exemptions in the application of irrigation service pricing (Vietnam Law, 2017).

2. **Strategic Water Management:** Water is priced to address specific water management issues through influencing the water-use behaviour of targeted users. For example, a relatively higher price could be charged when scarce groundwater is the source or to respond temporarily to drought conditions.

3. **Economic Efficiency:** Water is priced to promote its economically efficient⁹ use (or non-use) by influencing the water use behaviour of all consumers.

Water consumers' responses to the water prices charged cause the water to be used in its highest and best uses, including for the provision of environmental benefits in some instances (e.g., recharge of aquifers and meeting environmental flow needs). Water pricing is used as a policy instrument to influence the specific volumes withdrawn by all users; such as to promote the development and adoption of cost-effective technologies, and to promote appropriate water conservation. Fees are based not only on the costs of treating and delivering water but on an opportunity cost associated with using the "raw water" itself. Price signals cause users not to withdraw water for which the expected marginal social benefit from its use is less than the expected marginal social cost.

Using fees to promote efficiency requires attention to whether users are being charged on the basis of their total withdrawals or on their net withdrawals (after allowing for any return flows). Where users are charged on the basis of total withdrawals but have relatively high consumption (e.g., water bottlers), some jurisdictions charge higher fees. The set of countries that has started to implement such approaches, even for some users, is small (e.g., Australia, Canada, Italy, Mexico).

4. **Water Conservation as its own Goal:** Water is priced to promote greater conservation of the resource for conservation's own sake. Water conservation is pursued as a social virtue that takes precedence over the tangible benefits from some water uses. Numerous jurisdictions have historically implemented schemes of water use restrictions that are more severe than those consistent with achieving economic efficiency.

5. **Industrial Policy:** Water is priced to advance specific or general aspects of industrial policy. Preferential pricing is employed to ensure (priority) access to sufficient volumes of water at a price that allows water-intensive businesses in targeted industries or sectors to become or to remain profitable and competitive. A preferential rate structure for agriculture would be one example.

Source: Authors

⁹ This reference to the principle of efficient usage of water is in the sense of **economic efficiency**, based on all of the costs and benefits to society arising from of any given water allocation. In general, achieving economic efficiency will differ from achieving **technical efficiency**, such as when choosing an irrigation method. Water use can be efficient in an economic sense if there is no alternative way to reallocate any of the water that would cause the resulting gains (of those who would be made better off) to exceed the resulting losses (of those who would be made worse off). This "efficient" outcome is referred to as a Potential Pareto Optimum, and it is distinct from other definitions of efficiency that are sometimes used in economic analysis.

From taxation theory, it is well established that if prices (or taxes) are charged in excess of social marginal cost, such as in a market for water supply or sanitation, then they impose a social cost to the economy per unit of revenue raised. This cost is referred to as an efficiency loss or “deadweight burden,” and it lowers the national income or national levels of welfare. For instance, firms that are otherwise in a competitive export position might lose market share (and valuable export earnings) if a water pricing policy asks them to pay more to cross-subsidize low-income households.

In the specific case of a government setting its own revenue targets from water supply and sanitation tariffs, an analogy to taxation may apply. A well-designed tax system will seek to meet its revenue targets while minimizing these efficiency costs, which requires knowledge of whether the cost per additional unit of revenue collected is higher or lower for water prices as compared with taxes in other sectors and as compared with income taxes and excise taxes. If such economy-wide estimates were available, they could guide the choice of policy targets for cost recovery within the water sector. In principle, full cost recovery in the water sector might be a high-cost or low-cost strategy relative to other available revenue-raising options.¹⁰ Whichever the case, there is still a trade-off to be made with affordability and fairness when choosing a cost-recovery target. Some countries believe user-pay pricing approaches are fairer, in principle, than placing all of the cost burden on current and future taxpayers. To those countries, some degree of cost recovery is worth some extra (efficiency) cost.

In the Philippines, some water service providers are public or quasi-public whereas others are privately operated (World Bank, 2016). Motivations to manage water pricing as though it were an extension of the national taxation system would only have relevance where the revenues could be redirected to public uses, as with public and quasi-public providers.

Increasing block rate and two-part pricing

One of the prominent features of water supply pricing in the Philippines is the use of the increasing block rate pricing structure for domestic water supply. For some parts of the country (such as Greater Manila), an environment charge and the value-added taxes are expressed as a share of the water price, and so these payments will also follow the increasing block rate structure. In many countries, the motivation for choosing increasing block rates is the ability to provide a low price for the first units of water consumed each month—a so-called lifeline amount. In practice, a water tariff can offer a lifeline amount and then chose uniform volumetric pricing for all other customers. The use of increasing-block rates is not a prerequisite to offering a lifeline amount for some customers.

The use of progressively higher prices for subsequent blocks of water is often (mistakenly) believed to have an overall pro-poor effect and to encourage water conservation. Recent research shows that if the fees in question do not cover all of the utility’s costs (and so represent a subsidy to water consumers) then the increasing block rate structure is not an effective way to target benefits to the poor, since, in aggregate, the majority of the subsidized benefit accrues to wealthier consumers. That research suggests that support mechanisms other than water price design should be used when the policy purpose is to provide assistance to the poor (Whittington *et al.*, 2015; Fuente *et al.*, 2016; Young and Whittington, 2016).

The current Philippine approach to water pricing is similar, but not identical, to what many other low- and middle-income countries do. Those countries’ practices have also been widely examined and indeed, criticized. Whittington *et al.*, (2015) report on data from 2013 compiled by Global Water Intelligence on the most prevalent water pricing structures used by 162 utilities in low and middle-income countries. About 75% of the utilities favour increasing-block-rate tariffs, with the uniform-

¹⁰ Many low and middle-income countries do not have high-functioning systems of taxation that offer opportunities to generate reliable revenue flows at a low cost per unit.

Box 4.3: Other countries' challenges with the use of water subsidies to target poverty

Concerns about increasing-block rates are borne out by detailed empirical analysis in select cities where there is access to individual water account data and information about household poverty. Fuente *et al.* (2016) find that non-residential customers in Nairobi, Kenya, who make up only 5% of the water accounts, use such large volumes of water that they receive 31% of the subsidy that is reflected in water prices. When the authors focus on only the portions of subsidies going to households, they find that households in the highest 60% of the wealth distribution receive nearly 70% of the total subsidy, with the wealthiest 20% of these households gaining nearly 30% of the total subsidy. Whittington *et al.* (2015) survey and compare the results of about twenty similar studies conducted in the previous 15 years across a wide range of cities, with results that are largely critical of the redistributive effects of increasing-block-rate tariffs.

Both Chile and Colombia implemented means-tested water pricing approaches on a large scale (Gómez-Lobo and Contreras, 2003). The subsidy a household received was based, in one case, on the household's responses to an income assessment survey, and in the other case, it was tied to the housing standards of the neighbourhood in which the household was located. In those distinct schemes, a follow-up analysis of distributional effects shows that the water subsidy component was not targeted especially well in either country. Although many low-income households did receive a benefit, a large part of the subsidy was actually delivered to households that were better off. For instance, in Chile, more than 60 percent of the subsidies went to households that were above the third decile of the income distribution.

Brown *et al.* (2017) point to a number of practical challenges in selectively targeting poor households to receive public transfers. Relatively simple proxies for income status can avoid the time and expense of detailed surveys, but may exclude some of the neediest households.

Source: Authors

volumetric tariff structure being the next most used (22%). It is common for there to be three to eight pricing blocks, and 10 m³/month is the most prevalent size for the initial price step. Although this would appear to make current practices in the Philippines appear in line with other countries', this is not so. The Philippines is in the minority of this group since utilities in the Philippines do not typically have a fixed monthly charge as part of their price structure. In the 2013 data, more than 70% of the 121 utilities that employ increasing-block-rate tariffs do so as part of a two-part pricing approach. The median value of the monthly fixed charge for the utilities in the database from the East Asia Pacific region is about five dollars. Recall, from Table 4.3, that five dollars is about the same as the entire monthly payment for a household in Greater Manila that uses 15 cubic meters per month.

Economists and other policy analysts have long established the problems with the increasing-block-rate pricing approach, yet this tariff structure remains, unjustifiably, the most popular in low and middle-income countries. Increasing-block rates are perceived (incorrectly) as promoting fairness, yet these rates provide greater benefit to middle- and upper-income households in these countries and this constituency might favour the status quo. Common criticisms of increasing-block rates include their ineffectiveness at redistributing toward the poor and their discrimination against households who share a common private connection or who re-sell water to neighbours. As practised, under increasing-block rates, many consumers face inadequate incentive to conserve water, since too many households remain in the lowest price blocks. These consumers demand more water than they would otherwise, putting costly pressures on water resources, the

environment, and on scarce infrastructure capacity. Water service providers receive insufficient revenue to sustain or expand service with appropriate standards of service, and, with low tariffs, see little incentive to invest in leakage reduction. Despite the low price faced by many, those households without a connection are left further behind in relative terms (Whittington *et al.*, 2015).

A pricing approach that presents the consumer with a single price cannot send a clear signal to change consumer behaviour if that signal is partly about revenue raising, partly about water conservation and partly about concern for the poor. Of course, many countries “muddle through” with partially effective pricing policies, but there are other options. To serve multiple objectives effectively, a country can adopt a two-part or multipart pricing structure. If constrained to using a one-part or uniform volumetric price design, then other policy instruments, including taxes, subsidies, and command-and-control limits on water uses and water technologies could address the other goals that are not served by water pricing.

In pursuing any of these approaches to water pricing, the effectiveness of specific choices will be influenced by the process that is used to design, select and implement them, and by the many associated details upon which any program of resource pricing relies. Box 4.4 draws upon a broader literature on public sector pricing and public policy reform to offer additional considerations that can promote the success of water pricing reforms. The sequence by which reforms are introduced can influence their effectiveness. Water users with inadequate levels of service will respond more positively if they can experience quality improvements before being faced with significant tariff increases (Whittington, 2016; Young, 2016).

Impacts and effectiveness in the Philippines

Turning again to the impacts and effects that historical water pricing approaches have had in the Philippines, there are apparently no recent empirical examinations of cause and effect, but there is considerable anecdotal and other evidence about pricing’s role. In irrigation, the historically low collection rates from national irrigation systems have almost certainly raised irrigators’ incomes but at a cost to the public treasury. Since the former irrigation prices were not charged on a volumetric basis, the newly introduced use of the irrigation price waiver might not have affected water usage per hectare, but it almost certainly encouraged more hectares to be irrigated in more seasons. With respect to water supply and sanitation, there are numerous reports that revenues cannot cover costs (NEDA 2010; ADB, 2013; Llanto, 2013). This imbalance has pushed some of those costs onto the public treasury and pushed other costs on to customers who do not receive the levels of service they seek. Some do not get any connection at all.

With respect to the effectiveness of water pricing regimes in the Philippines, a challenge in assessing effectiveness is to clarify the purposes or targets of water pricing as applied in each jurisdiction. For instance, the Local Water Utilities Administration states that full cost recovery should be the guiding principle for water pricing for the utilities that the Administration regulates (LWUA, 2000). Full cost recovery is defined to include a number of component parts: the cost of installing services and meters for new customers; cost of all water deliveries and services performed by the district; annual operating expense of the district; the maintenance of and the repair of the works; a reasonable surplus for replacement, extension and improvements; and payment of interest and principal and provide a sinking fund for payment of debts of the district as they become due and to establish fund for reasonable reserves. However, a number of other constraints are also placed on the rate setting process, so that approved rates should also satisfy:

- a) Adequacy: rates allow for stable revenues sufficient to ensure viability;
- b) Public service: rates must be reasonable in order to serve the public consumption requirements;

- c) **Equitability:** rates equitably distribute the cost of service to all classifications and sizes of connections. Those who use greater quantities of water pay higher unit costs.
- d) **Affordability:** must be affordable to the low-income group defined as residential consumers having the lowest capability to pay for water service. Specifically, the minimum charge for ten cubic meters per month (with a 1/2" residential connection) should not exceed 5% of the average income of the low-income group¹¹ in the service area;
- e) **Enforceability:** rates must be fair, reasonable, acceptable, and subjected to public hearing;
- f) **Water conservation:** rates must encourage broad water usage in order to achieve economies of scale, full utilization of system capacity, and should promote an efficient allocation of water resources, discouraging wasteful usage of water;
- g) **Historical continuity:** rates must reflect a sense of historical continuity, with limits on annual rate increases (LWUA, 2000).

In effect, the Local Water Utilities Administration has asked the water districts to recover all of their costs as well as to achieve seven other associated objectives, following, by convention, an increasing-block rate structure where each successive step applies to a ten cubic meters per month increment. Water districts are also asked to use the prescribed user-class conversion factors for non-residential users. Each water district's specific challenge is to nominate a series of six price levels (such as those in columns 4 - 9 of Table 4.4) that might meet these targets.

Notice here that the implicit definition of what is (c) equitable is based on a user-pay notion of equity and not necessarily on an affordability or pro-poor definition of equitable. There are no explicit protections or considerations for low-income households whose large family size or reliance upon a shared connection pushes them past the ten cubic meter per month threshold. By imposing (at point (c)) the use of increasing-block rates, these criteria are imposing or systematizing the negative distributional consequences of increasing-block-rate structures. On this point, districts might choose to comply with the letter but not the spirit of this requirement by following the example of the rates for business groups in Greater Manila. There the increasing block rates over the first 90 cubic meters per month of consumption increase the unit cost by less than 1%.

There is an explicit inconsistency within these targets and criteria, such as in (f), where water districts are asked to conserve water but also operate at full capacity. It is also inconsistent to expect the efficient use of water (f) within a system that uses increasing-block rates for all users and/or conversion factors across user classes, since both of these requirements cause consumers to face different incremental costs for the same water, encouraging some to consume more than others. Since not all of the criteria can be satisfied, the current process appears to require the balancing and trading-off the various types of targets mentioned in Boxes 4.2 and 4.3. Instead of picking one or two objectives that water pricing should achieve, decision makers are currently required to consider all at the same time.

As exemplified by these procedures for the roughly five hundred water districts regulated by the Local Water Utilities Administration, there appear to be competing goals and objectives for water pricing. Without a clear target to aim for, there is little prospect of fully effective implementation.

¹¹ While the 5% threshold provides clear guidance, the composition and definition of the low-income target group is ambiguous. There is no specific mention of how many deciles of the district's or the country's income (or wealth) distribution are to be included as "low income."

Box 4.4: Guidance for successful water pricing reforms

The effectiveness of any system of water pricing will be influenced by a number of administrative and procedural considerations that should influence any reforms.

- a) Administrative ease: The ease of administration will be greater where programs can rely on readily accessible and verifiable data, such as with universal water metering and system monitoring.
- b) Reduced regulatory burden: Governments should choose options that lower the total costs (to suppliers and users) of compliance with application, monitoring, reporting, billing and so on.
- c) Simplicity: Pricing approaches with numerous categories of uses, regional variations, fee exemptions and thresholds might offer greater targeting but they may be difficult to understand.
- d) Transparency: Users can respond better if they understand how their rates and water bills are determined and if they can see that pricing is consistent across all users.
- e) Predictability: In a predictable pricing framework, users will be able to predict how their rates will change in future, enabling more-effective long-term investments and planning decisions.
- f) Revenue stability: Where revenue raising is a key objective, the level and variability of revenues are both important. Some alternative pricing structures can provide more revenue stability. For example, in Australia, some irrigators pay part of the fee based on the allocated water volume and part based on actual water withdrawals. In years with excessive rainfall, irrigators apply less water. The revenue flow to the state does not fall proportionately, since part of the fee depends upon the allocated water volume and not on the actual level of usage. The state and the users share the revenue risk from weather variability.
- g) Procedural fairness: Users who wish to dispute a decision or an outcome concerning their water charges are provided with readily accessible means to do so.
- h) Flexibility: If there are environmental or other changes, changes to water pricing can be implemented quickly with low transition costs.
- i) Horizontal equity and vertical equity: Horizontal equity refers to charging similar amounts to individuals with a similar ability to pay for the same good or service. Vertical equity refers to the idea that people with a greater ability to pay are charged more. For example, if poorer households are more likely to share a communal water meter, and are thereby pushed into higher price blocks, then this outcome is not vertically equitable. In this example, vertical equity is promoted by defining price blocks based on usage per person per month, not on usage per meter per month.

Among industrial users, if a sector is characterized by many small firms and a few very large ones, and if the large ones enjoy some cost advantage (e.g., economies of size), then treating all of these firms equally under a common pricing policy may not be equitable, even though it promotes efficient use of resources.

Source: Authors

5. Identification and assessment of potential reform options

5.1 Policy reform options

Recalling that the overall objective of this study is to provide guidance on fiscal and pricing policy reform to ensure sustainable and socially inclusive water, it is indeed timely that the *Philippines Development Plan 2017-2022* (NEDA, 2017a) expresses a considerable number of commitments to pursue priorities related to water and sanitation. Table 5.1 presents some of the Plan's proposed actions, divided into proposed legislative reforms and other strategic measures.¹² Further reinforcement of key points is given in the *National Budget Memorandum: March 23, 2017* that instructs departments and agencies on their budget submissions for the 2018 fiscal year. That Memorandum says, in part:

In water resources, the need is to ensure water security by developing new water supply sources; prioritize surface water for water-critical areas; use eco-efficient water infrastructure designs; reduce non-water revenue [*sic*]; provide subsidy for waste treatment projects and the provision of water supply access to poor households; and introduce volumetric and raw water pricing. Accelerate the development of irrigation systems and ensure their sustainability by providing a framework for capital and [operations and maintenance] financing. There is a need to formulate and implement Water Supply, Sanitation and Sewerage Masterplan; Irrigation Masterplans; and a national masterplan for flood and drainage. (Philippines DMB, 2017, p.19)

The following seven priority actions can be distilled from the *Philippines Development Plan 2017-2022* and the *National Budget Memorandum: March 23, 2017* as having special relevance for the purposes of this study. Together they provide a framework for consideration of policy reform options, and each will be examined separately below. They are:

- a) promote efficient water utilization;
- b) irrigation sector reforms: abolish irrigation fees for small farmers; formulate an irrigation master plan¹³ and framework for capital and operations and maintenance financing of irrigation projects; and rationalize irrigation service fees;
- c) create an apex body; amend the water code and regulations, strengthen coordination and linkages, enhance organizational capacity;
- d) create an independent regulator;
- e) establish a unified financing framework;
- f) prepare a master sanitation coverage plan and expand (reliable/affordable); and
- g) prepare a master water supply plan and expand (reliable/affordable) coverage.

¹² An important adjunct to the *Philippines Development Plan 2017-2022* is the *2017-2022 Public Investment Program* that is scheduled for later publication.

¹³ The overall irrigation master plan and framework will aim to: (a) institutionalize a policy providing government subsidy for capital investment and operations and maintenance of irrigation facilities; (b) strengthen the capacity of personnel; (c) strengthen the implementation of the Irrigation Management Transfer Program; (d) review and rationalize irrigation service fees; (e) establish and rehabilitate small-scale and community-based irrigation projects in areas not served by national irrigation systems; (f) prioritize small over large irrigation projects and rehabilitation over construction of facilities; and (g) conduct complete technical work and site validation in the project planning stage to eliminate the causes of delays in project implementation (NEDA, 2017a, p. 305).

Table 5.1: Proposed legislative agenda and strategic measures from the *Philippine Development Plan 2017-2022*

Legislative Agenda	Rationale
Enactment of a law creating an apex body for the water resources subsector	Aims to address the weak and fragmented institutional set-up of the water resources sub-sector with the creation of an Apex Body that will act as the single lead agency to oversee/coordinate overall policy and project/ program implementation (p. 313).
Enactment of a law creating an independent economic or financial regulator for water supply and sanitation	Harmonizes the regulatory practices, processes, fees and standards on water supply and sanitation while addressing the overlapping functions or jurisdictions of existing regulatory entities (p. 314).
Amendment of Water Code	Provide a legal framework for the institutionalization and operationalization of Integrated Water Resources Management to respond to current trends and challenges such as climate variability affecting water supply and availability, as well as address institutional gaps and weaknesses (p. 331).
Abolish the irrigation service fees for small farmers	Waive the irrigation service fees to small farmers as many of them cannot afford to pay the fee imposed by the National Irrigation Administration on its national irrigation system. A minimal fee may be imposed on pump-driven irrigation systems as they have higher operating expenses. Wholesale condonation of past-due irrigation service fees of farmers and corporations with large landholdings (e.g., those owning 5 ha) may have to be restructured under mutually agreed terms and conditions so as not to additionally burden them, but at the same time to be fair to those who religiously paid the required fees (p. 121).
Strategic Measures <ul style="list-style-type: none"> • “... Existing laws and regulations on water resources will be reviewed and strengthened” (p. 304). • “... Measures to promote efficient water utilization will be explored” (p. 304). • “... A unified financing framework with a definite scope and streamlined process will be established to consolidate and make more accessible all available financial resources to support the [water supply, sewerage, and sanitation] projects of all water service providers” (p. 305). • “... Further, a [water supply, sewerage, and sanitation] master plan will be prepared to guide the concerned implementing agencies to attain universal access in the sector” (p. 305). • “... To improve the response from [Local Government Units and Water Districts], plans to broaden the scope of the [National Sewerage and Septage Management Program] will be supported; for example, to include septage projects, expand eligibility to less urbanized cities and municipalities, and allow [water districts] to directly apply for the grant” (p. 305). • “... The government will assist [water districts] in expanding the coverage of reliable water service at affordable rates and reducing [non-revenue water] while ensuring economically viable operations” (p. 305). 	

Source: National Economic and Development Authority (2017a)

Given the wide scope of the *Philippines Development Plan 2017-2022*, there are also proposed reforms in a number of related areas of public-sector funding and service delivery¹⁴ that are likely to create synergy.

a) Promote efficient water utilization

Some of the important policy reforms that could promote the efficient use of water include better use of systems of water allocation; reform of pricing approaches and tariffs for water supply and sanitation; and increased education of water users about water conservation technologies and behaviours. Consider each of these in turn.

In some parts of the Philippines, surface and groundwater is treated like a free, open-access resource, since many users do not possess a permit or authorization to abstract water (Hall *et al.*, 2015). In such situations, ensuring the enforcement of requirements for water users to acquire and conform to valid water use permits can change the way in which water is utilized. These provisions should apply equally to households as users, firms that self-supply, water districts, Local Government Units and so on. Enforcement of these requirements would rely upon monitoring programs, and those programs could simultaneously generate useful information about patterns, trends and potential conflicts in water usage among users over time. Usage of water by businesses and households should be metered, but so too should be the water usage of the water suppliers themselves. A move to introduce raw water pricing, discussed below, would presumably rely upon capacity to identify, monitor, and measure raw water use.

One feature of current water allocation is a system of priorities of uses and users in times of shortage.¹⁵ It is especially in times of shortage that the need to allocate scarce water efficiently may be highest, but such a goal is unlikely to be well served by a system of categorical priorities. While preserving for households some lifeline volume of water per month can be highly effective in meeting households' basic needs, even that volumetric limit needs to be sensitive to household size, season of use, and to the possibility that a given metered connection is used by multiple households. Beyond some per-person limits, to give all further units of desired water consumption by households a higher priority than all other uses can be highly inefficient. The potential for inefficient misallocation increases as one moves down the list of prioritized uses, category by category. There is, in general, no basis for claiming that prioritizing water for all irrigation uses will necessarily be more productive than allocating some of that water to any uses in lower-ranked categories such as power generation, fisheries and industry, for example.

With respect to the reform of water pricing, on efficiency grounds, the main options for the Philippines are to choose from among available schemes to associate the users' volumetric consumption choices with the marginal costs of providing the water to them in each specific season and location. This approach to water pricing could be implemented with a move away from increasing-block-rate tariff structures to use of two-part pricing with a uniform volumetric charge. Alternatively, one could modify the increasing-block-rate structures in an attempt to put the majority of users in a price block where the price for the marginal units reflects its cost.

¹⁴ These include plans to: accelerate construction of disaster- and climate-resilient, small-scale irrigation systems and retrofit existing ones; promote effective and efficient water-saving and management technologies; institutionalize a science-based river basin approach that integrates the principles of integrated water resource management; organize small farmers ... into formal groups and farms ... to create economies of scale; provide capacity building for small farmers ... on value-adding activities; increase the number of small farmers ... that are provided with agricultural insurance and formal credit; enhance capacity of small farmers ... to adopt better and new technologies; strengthen community-based enterprises in upland areas, and so on (NEDA, 2017a).

¹⁵ Domestic water use is assigned a higher priority than abstraction of water for municipal use, irrigation, power generation, fisheries, livestock, industrial uses, recreation and other uses, respectively (Hall *et al.*, 2015).

The *National Budget Memorandum: March 23, 2017* draws attention to the government's interest in introducing raw water pricing (Philippines DMB, 2017, p. 19). Conceptually, such a scheme could apply to all sectors and users (including water suppliers and irrigators) that abstract surface or groundwater for their own use or for use by others. Charges that signal the opportunity cost of the water being consumed can encourage behavioural responses across users and sectors, and can provide outcomes that are more efficient than the use of categorical priority rankings, for example. As in the case of pricing household water supply, the key idea is to choose prices that reflect the social marginal cost of using the water, such as, in this case, the value foregone by other users including environmental uses and instream flows. Determining these values can be challenging, and actual price determination might proceed incrementally. Resulting price levels would almost certainly vary by location, by water sources, and by season of the year.

These raw water prices would then be passed on to customers and final consumers (in the case of fees paid by water service providers), and would increase the challenge of keeping water affordable for the poor. If the main purpose of the raw water prices is to change behaviour (and not to raise public revenue), then the new pricing revenues could form one source of funds that could be used for means-tested income transfers to the least well-off households. Some business users may feel that having to pay for the opportunity cost of raw water would make their business activities uncompetitive or unprofitable, and they may express a need for subsidy and support payments too. Such subsidy scheme or payments should be resisted as ongoing measures, although a phase-in period to the new raw water pricing scheme could allow firms an opportunity to adjust. An expected benefit from raw water pricing is that it causes incumbent firms to use less water. Without such pricing, some firms will use water that is scarce and highly-valued for purposes with low value.

Although affordability of water by those households that are least able to pay is an important concern and can be a basis for modifying tariffs, efficient water use is best served by aligning all consumers' usage decisions with the costs they impose on others. One can then make other "affordability" adjustments, where advisable, in the fixed monthly portion of the water bill, or using some other means-tested income transfer that does not depend upon the volumes of water consumed. Accordingly, the current practice of some utilities to charge higher volumetric rates by class of users (such as semi-business, business group I, business group II, and so on) does not align with efficient use of water resources. Such pricing can reduce or discourage beneficial uses of water, can raise costs artificially, and potentially make some business users become uncompetitive in the markets where their goods and services are sold. It appears that this may be a "reverse affordability" provision that charges a higher price on the expectation that these users have a higher ability to pay. Efficient water use would be promoted by only extracting such payments from them (if at all) through the fixed monthly portion of the water bill, and even then, in a manner that is sensitive to actual ability to pay.

At the other end of the spectrum, some water or sanitation suppliers (or the Local Government Units with which they are associated) may feel there is a benefit in lowering the prices charged in order to attract or to retain some business customers.¹⁶ In considering the efficiency effects of such an approach, the preferred approach is to make sure that all users face the full marginal cost of their volumetric consumption decisions (without any subsidization there) and to deliver any benefit or inducement through an adjustment in the fixed monthly charges. In terms of best fiscal policy and fiscal discipline, any such expenditures should be budgeted by the government unit that has authorized the payments. In this way, such payments become subject to the same transparency, scrutiny and review as any other budgetary expenditures, including ongoing reappraisal of continuing need.

¹⁶ The Philippines is a member of the World Trade Organization whose rules disallow the provision of certain forms of subsidies to exporting firms.

Where users are charged for septage or sewerage, it is not practical to measure these flows volumetrically, and so a common practice is to base the price charged on some or all of the volume of water that is delivered. In general, the marginal cost actually incurred by a utility to provide treatment services will vary by location and perhaps by season of the year. Efficiency of water use is promoted when the fees charged to water users accurately reflect these volumetric treatment costs. Especially in industrial settings, accurate costing can send strong price signals for businesses to install technology that conserves or reuses water, for example, or to locate (or expand operations) in regions where these costs are significantly lower.

Many countries have experience with systems of increased education of water users about water conservation technologies and behaviours, including making householders aware of their own usage levels and how these compare to both social norms and to the levels of use by other households in relevant comparison groups. Where volumetric pricing is employed, sensitizing users to the connection between usage levels and their overall monthly water and sanitation charges is an important step to generating positive behavioural responses (OECD, 2016A). In household and industrial use, there may be a number of water-saving appliances and technologies (e.g., low-flow showers or toilets), and some countries have made a point of disallowing those that do not conform. If household and industrial water use is priced to reflect the opportunity cost of the resource, then there is no further efficiency benefit from creating public programs to subsidize specific technologies, appliances or devices.

b) *Irrigation sector reforms*

The *Philippines Development Plan 2017-2022* communicates a recent policy decision to waive some irrigation fees for some farmers, largely due to concerns about low income and inability to pay (NEDA, 2017a). The other policy reform options in the Development Plan concern how to implement all of the specific parts of this program, such as defining the scope of the fee waiver, and establishing funding mechanisms for future capital, operations and maintenance.

Historically, the tariffs charged for irrigation water from national irrigation systems have varied according to whether the water came from a gravity-fed, run of the river diversion; versus from a pumped supply; or a storage reservoir. For a few years (1998-2000), these tariffs were lower for smaller landholders out of concern for low incomes, so that irrigation service fees increased in steps with the size of the irrigated land area (< 2 hectares; 2-5 hectares; > 5 hectares) (Decena, 2016). According to Table 5.1, under the *Philippine Development Plan*, these fees might continue to be charged to irrigators who are not “small” or who use a pumped supply. Part of the policy reform will involve creating a new fee schedule (for those fees that have not been waived), and there is an expressed need to rationalize irrigation service fees going forward. There are also questions about fairness in waiving or continuing to collect past-due fees that were in arrears at the time the policy change was announced (NEDA, 2017a).

The current policy environment has set a challenge of creating a new set of fees for irrigators who use large volumes, and for those who use a pumped water source. One option is to implement a means-tested definition of small irrigators who will qualify for the fee waiver. Definitions based on land area alone cannot fully reflect differences in the productivity, topography, accessibility and value of some hectares of land versus others. A challenge for any policy reform is the observation that there may not be a unique one-to-one relationship between any parcel of irrigated land and the income status of those who do the farming. That is, under various systems of land tenure such as share-cropping, tenant farming, and farming activities carried out through extended families, it could be very difficult to target the intended subsidy to only the least well off. Even where it could be verified that the fee waiver has been received by a low-income household, it is possible that much of

the extra income could “leak” to landlords, input suppliers, money lenders and other “middlemen” who play key roles in the rural economy, and without whose participation the subsidy could not be received.¹⁷ As well, the historical and somewhat arbitrary approach to subsidize a two hectare plot but not a 2.5 hectare plot may discourage the pursuit of economies of size associated with the government’s attempts to promote the appropriate mechanization of some agricultural activities. With an arbitrary cut-off of two hectares, irrigators’ profits could increase if larger plots are broken up to qualify for a more lucrative irrigation subsidy linked to smaller plots.

For those who will continue to pay, either for the irrigation service fees and/or for the raw water price, efficiency of water use will be promoted by a move to volumetric pricing. Approaches and technologies for metering the use of irrigation water are becoming more accessible (and with lower cost), but a volumetric charge may be difficult to implement in all instances. In this case, other approaches, such as the Philippines’ historical approach of charging for water based on land area per crop type per cropping season are commonly used, but such pricing does not provide irrigators with a clear incentive to use water judiciously. In such cases, it may be desirable or necessary to combine the use of irrigation pricing with other quantitative controls or limits on water volumes used per cropping season. In Australia, some irrigators pay an extra fee associated with the cost of implementing (optional) irrigation water metering systems. Those who do not choose this option and proceed on an area-fee basis are charged a higher amount overall, so that there is a clear financial incentive built into the tariff structure inducing irrigators to move to volumetric metering.

Where volumetric metering and pricing is feasible for irrigators, efficiency of water use would be promoted by exposing irrigators to the (seasonally- and regionally-specific) social marginal cost of the water they use. This pricing could lead to productivity benefits from revised irrigation methods, choices of crops and production methods, seasonality of production, and so on. That is, if producers have to factor in the resource cost of the irrigation water that they are using, they are likely to move to crops and methods that generate more revenue per unit of water applied. In cases where the cost of measuring (metering) or estimating actual irrigation water usage is higher than the potential gains from so doing, the full set of gains from volumetric pricing cannot be realized. A pricing approach based upon other proxies for water intensity—such as prescription of prices based upon some combination of season, location, crop choice and irrigation method—might still promote some efficiency gains in water use. These gains could come about when such pricing influences farmers’ qualitative choices with respect to season, location, crop choice and irrigation method, but not through providing a specific, within-season incentive to reduce the volume of water used.

Under a fixed (non-volumetric) water price per hectare per season, there is little scope for that pricing approach to encourage irrigators to pursue substantial efficiency gains in water use. The revenue raised could contribute to policy targets for cost recovery. As with urban water, the efficiency cost of raising public revenue from irrigators could be either higher or lower than if the funds were raised from other sources and sectors. A policy reform that pursued (full or partial) cost recovery from irrigators without achieving efficiency gains in production is not necessarily beneficial for the country. Such a policy could be welfare decreasing (or increasing) overall, depending upon the relative marginal social cost of funds raised across all alternative revenue sources.

The Philippines’ historical practice of allowing payment of irrigation service fees with physical quantities of un-milled rice, has reportedly caused the treasury to incur an additional expense of 10-

¹⁷ According to the economic reasoning of household production theory and factor markets, a tenant farmer who receives a well-publicized household income support payment is less vulnerable to facing a corresponding farm rent increase in some situations than others. If the payment is received independent of whether or not they irrigate, then upward pressure on land rents will be less than under the alternative situation. That situation is under a program design where the same household only qualifies for income support if they irrigate, since irrigable lands are scarcer resources that give landlords more bargaining power.

15% of gross receipts for storage, handling and resale (Decena, 2016). Without comparative data for the costs that irrigators might incur through other available marketing channels, it is hard to know whether the monetary values incurred here represent a priority use of scarce public funds or not.

The Philippines has endured historically low collection rates of irrigation service fees from national irrigation systems. The collection rates for current accounts (paid either in cash or in-kind) were estimated to be about 33% (1990-1997), 37% (1998-2000) and 38% (2001-2014). These rates increase once collections of past-due amounts are included, but historical aggregate collection rates are thought to have been below 70% of the amounts owing (Decena, 2016). Going forward, any failure to collect irrigations service fees may defeat notions of fairness and might encourage irrigators to treat surface and groundwater as a free, open-access resource, such as when considering an expansion of irrigated area. The move in 2017 to waive some irrigation service fees is motivated by a concern about widespread inability to pay. Introducing means-tested affordability measures sets the stage to invest in greater efforts to collect irrigation fees when they are due, and to employ available legal remedies to collect overdue accounts.

c) Create an apex body; amend the water code and regulations, strengthen coordination and linkages, enhance organizational capacity

The effectiveness of some available policy options, such as those related to the pricing of water and sanitation, and those related to stopping the unmonitored abstraction of water by those without permits, will depend upon having an effective system of water governance in place.

Where a long-term goal is to increase the rates of productive investment that will be made in the water and sanitation sector, then establishing, funding, and supporting improved water governance at all levels is an important enabling step that should be given high priority. The OECD (2015, 2016b) offers a series of practical steps for strengthening governance practices that apply at both the national and local government levels.

d) Create an independent regulator

Effective regulation is central to any program of good water governance. Effective regulation influences both the levels and the productivity of investments made in the water and sanitation sector. The historical experience in the Philippines is that some parts of this sector are highly regulated (e.g., Metropolitan Waterworks and Sewerage System) and others are either unregulated or self-regulated (e.g., many Local Government Units). Under an effective system of economic regulation in this sector, a number of elements of utilities' operations would be monitored and controlled in a holistic fashion. These include ensuring:

... that the utility is complying with its obligations for provision of services to customers in an economic manner, and that agreed policies and plans are being delivered. Performance standards, service and investment obligations and financial commitments have to be clearly defined and met by all parties (World Bank, 2014).

An independent regulator can play a key role in overseeing sustainable tariffs and funding structures; formal business planning; asset management and development; financial planning; and capital investment. In the words of one recent study:

Water utilities are natural monopolies. Effective economic regulation minimizes the scope for monopoly abuse by protecting the public interest [from]: tariffs that are above the reasonable cost of service, quality of service that is below desired levels, or failure to serve less attractive low income households (World Bank, 2014).

The creation of an independent regulator might be specific to the water and sanitation sectors. Alternatively, a (new or existing) regulator with responsibility for other utilities, for other markets, or for competition policy could be charged with this responsibility, provided that it could acquire the necessary technical expertise in such areas as water supply, sanitation and irrigation, among others.

The reference here to performance standards signals the challenging task of defining appropriate levels and standards of service in all of its many dimensions for each water supply and wastewater service provider. Such considerations extend beyond examination of current service levels to address the financial and operational commitments that will be necessary to provide an agreed degree of resilience and reliability under an increasingly volatile climate that is accompanied by population growth and rural-to-urban migration. Where these decisions rely upon investment in some strategic degree of “redundant” capacity, there will be direct consequences for the tariff and pricing decisions needed to support those actions.

The Philippines has a number of water service providers that operate in confined geographic areas with a limited number of customers (NEDA, 2010). Many of these utilities are unlikely to achieve the economies of size that come from having a sufficiently large base of customers, or the economies of scope that come from being able to provide water supply and sanitation services simultaneously to the same base of customer accounts. Given an appropriate legislative mandate, there may be a valuable role for a regulator to identify and then require the consolidation and amalgamation of distinct providers into units that are capable of providing more cost-effective services. Such a role could include identifying and realigning service area boundaries, so that the scarce capital investments in physical treatment plans, for example, are aligned with the customer groups each facility is best situated to serve.

The success of implementing service and pricing reforms will depend upon building and maintaining public support such as by using public information and education efforts, and by establishing and meeting new service commitments. Expect greater public acceptance of pricing reforms where the customers can see that service improvements are occurring prior to being asked to pay more. The public can be invited, as individuals and through water users’ groups, to participate in reform and oversight processes, including those that communicate customer needs and address apparent wastage, inefficiency or corruption.

e) Establish a unified financing framework

According to the *Philippine Development Plan*:

A unified financing framework with a definite scope and streamlined process will be established to consolidate and make more accessible all available financial resources to support the [water supply, sewerage, and sanitation] projects of all water service providers (NEDA, 2017a).

The Plan cites a jointly prepared report that provides some proposals for what a unified financing framework might include and how it might operate (NEDA and World Bank, 2015). Anecdotal evidence suggests that some of the modalities and options proposed in that report were being tested in a series of small pilot studies underway in about eight regions of the Philippines. It is not apparent when either the cited report or specific information about the pilot studies will be released to the public.

The “unified” part of the proposal appears to refer to the notion of having financing proposals for the water and sanitation sector reviewed (if not prepared) by a single public agency using common eligibility criteria, analytical assumptions and funding guidelines. This would represent a change from historical practice where a significant number of public agencies are able to offer grants and loans to pockets of recipients described under each agency’s funding mandate.

From a theoretical perspective, the process of rationalizing grants, loans and other public assistance should try to equate (as nearly as possible) the expected (risk-adjusted) social returns on investment from the marginal funds allocated across funding programs, projects and recipients. When expected returns at the margin in one public program are very high (yet its funds are exhausted) and are much lower in another public program, this is a signal that aggregate economic returns to the country could be increased by moving funds from one program to the other. Putting all the funds in one unified program makes this much easier to do operationally, and increases the likelihood that these opportunities will be identified.

Some of the key decisions to be made in designing and implementing such a unified financing framework are illustrated in a series of questions posed in Box 5.1. Their answers can have profound effects on the effectiveness of the financing in increasing service delivery and on the return on investment.

However these specific questions are eventually answered, there are a small number of related issues and opportunities that also arise in the context of a unified financing framework. These include blended finance and the Philippine Water Revolving Fund; output-based aid; and the use of sovereign guarantees as policy instruments for water financing. Each of these will be considered briefly next.

Currently in the Philippines, water service providers are able to borrow from diverse sources, depending upon their credit worthiness. Some well-established water districts are able to borrow from commercial lenders at commercial terms, whereas others borrow from pools of publicly managed capital such as one operated by the Local Water Utilities Administration (NEDA, 2010). Given the scarcity of public funds, it is beneficial to encourage greater commercial borrowing, but some borrowers lack the capacity or incentive to access commercial loans. Any delay in the “graduation” of credit-worthy water districts from public to commercial borrowing can create undo competition for public funds. This is referred to as the “crowding out” of potential borrowers (i.e., water districts) who are less well-established. The use of blended finance reduces this crowding out by encouraging the co-mingling of funds from public and commercial lenders to increase the extent of loans on offer (OECD, 2017a, 2017b).

The Philippines Water Revolving Fund (World Bank, 2016a) provides a recent example of the use of blended finance to pursue investment financing in the water and sanitation sector (Leigland *et al.*, 2016). The World Economic Forum (2015) defines blended finance to be “the strategic use of development finance and philanthropic funds to mobilize private capital flows to emerging and frontier markets.” Blended finance often features a careful matching of progressively higher-risk investment opportunities with those lenders willing to bear the greater risk in exchange for higher expected returns.

Started in 2008, but discontinued after five years of operation, the Philippines Water Revolving Fund was a mechanism or facility to provide funding to Local Government Units and Water Districts in their roles as water service providers. The Revolving Fund blended official development assistance and domestic public funds with commercial financing to lower borrowing rates. Concessional seed financing from the Japanese government was provided to launch the Revolving Fund, and the Fund accessed a standby line of credit (to protect against liquidity risk) and employed a co-guarantor

Box 5.1: Questions for the design and operation of a unified financing facility

- What criteria other than the expected risk-adjusted returns will be used to allocate available funding, and how will multiple criteria, including poverty and humanitarian goals, for example, be reconciled and implemented along with financial selection criteria?

- What portions of available public funds should be allocated as loans versus grants versus loan guarantees versus equity participation?
- Is there an option to operate the loans portion of the unified financing framework as a blended finance facility?
- What should be the borrowing terms for loans (e.g., interest rates, tenor, minimum credit ratings and collateral requirements, if any)?
- What should be the structure of grants that are made (e.g., capped versus open-ended conditional grants, with or without a specified percentage of matching funds from the recipient)?
- What should be the scope of activities that can be financed by the unified facility (e.g., water supply, sewerage, sanitation, waste recovery and reuse, irrigation, small-scale or large-scale hydroelectric facilities, including those also to be used for irrigation and multiple uses, others)?
- Which types of applicants should be eligible (e.g., Local Government Units, water districts, Barangay Water and Sanitation Associations, Rural Water and Sanitation Associations, Irrigators Associations, private firms, private-public partnerships, cooperatives, and government entities without “ring-fenced” financials be eligible)?
- Does an applicant always have to be registered, credit worthy, and/or compliant with existing regulations (e.g., holder of a valid water permit, Certificate of Public Convenience, and so on) to be eligible for funding? That is, should the funding process be used as a check on other aspects of legislative or regulatory compliance?
- What arrangements will apply in the case of loan default or non-compliance with the conditions of a loan or grant (e.g., If required to do so to enforce repayment and other terms, will the unified financing framework (credibly) propose to push a water service utility into some form of trusteeship or bankruptcy? If the unified financing framework acquires all of the assets and liabilities of an applicant, is it prepared (and does it have the capacity) to step in as the operating entity on an interim or permanent basis?)
- Are public and quasi-public agencies allowed to apply to and accept other sources of loan and grant funding including commercial loans, official development assistance, and other forms of international private aid in addition to any funding received through the unified facility?
- If so, does receipt of financing from these other sources reduce an applicant’s eligibility for assistance through the unified financing framework, and if so, is the reduction dollar-for-dollar?

Source: Authors

credit guarantee (World Bank, 2016a). The elaboration of public lending activities through a unified financing framework should learn from these experiences to adopt the best features of such blended finance models.

Output-based aid is the use of explicit, performance-based subsidies to complement or replace user fees (Trémolet *et al.*, 2010; ADB, 2013). In the case of water supply or sanitation, it can involve the contracting-out of service provision to a private supplier with subsidy payments tied to satisfactory delivery of previously specified outputs (e.g., per new meter or household connection installed). Output based aid can be used to increase access to infrastructure, such as in cases where poor people are being excluded from basic services because they cannot afford to pay the full cost of connection fees.

Coupled with the active role of private service providers in the Philippines, there have been a number of applications of output-based aid in Metro Manila and elsewhere (Yamamoto and Hunt, 2005; Menzies and Suardi, 2009). One of the variations of output-based aid included a subsidy to the private supplier in cases where the private supplier also offered a three-year loan to newly connected households. With such loans, these households could repay their (subsidized) share of the household water supply connection fees as part of their monthly water bills. Although output-based aid might not feature prominently in all applications that are approved through the unified financing framework, this approach may prove to be constructive in specific cases.

A cautionary note in the development of the unified financing framework relates to the use of such fiscal instruments as loan guarantees and letters of undertaking. The current example concerns letters of undertaking that the Philippine government issued in 1997 (and reaffirmed in 2010) to the two water supply and sanitation concessionaires in Metro Manila. These specific letters constitute a form of sovereign financial guarantee indemnifying the private water operators against any losses they might incur, such as from a delay in the implementation of water rate increases. When the concessionaires felt aggrieved as a result of tariff review decisions taken by the regulator in 2013, they sought external arbitration of the dispute. Eventually, the concessionaires presented financial claims for compensation to the Ministry of Finance in relation to these letters of undertaking. In one claimant's case, the claim was for historical losses and, in another claimant's case, the request projected these losses forward for the duration of the concession. The respective monetary amounts sought were in excess of three billion pesos (\$60 million) and 75 billion pesos (\$1.5 billion), respectively (Freedom from Debt Coalition, 2015; Reyes, 2017). Regardless of the outcome or disposition of these specific disputes, the larger lesson is that the use of guarantees and indemnities within a unified financing framework is not without fiscal, financial and legal risks. There exists a potential for significant costs to the public treasury. The use of these and other fiscal instruments should be weighted just as carefully as any loan, grant or expenditure commitment.

f) Prepare a master sanitation plan and expand (reliable/affordable) coverage

The extension of sanitation coverage by diverse service providers in an effective and sustainable manner depends upon at least three preconditions:

- i. the investment of sufficient financial capital to acquire and install appropriate infrastructure capable of meeting current and growing needs;
- ii. assurance that each service provider will receive a sufficiently large stream of annual revenue to undertake regular, programmatic operations and maintenance activities; and
- iii. agreement by householders and other users to connect to the new infrastructure once it becomes available (or to become a subscriber to the service in the case of household septage collection with off-site treatment).

The launch of a unified financing facility and the reform of utility pricing can assist with the first two of these conditions. With such reforms, utilities could earn sufficient revenue to serve both lower-income and higher-income customers. Utilities could maintain and expand their capital base in a manner that is consistent with meeting specific performance standards in the presence of climate change, rural-to-urban migration and population growth.

In regions with a high cost of service provision and low ability to pay, the choice of affordable pricing levels might prevent the utility from achieving full cost recovery. In such cases, which would be identified in the tariff-setting process used by the regulator, utilities would require public transfers that target the shortfall.

In the case where sewerage systems are expanded and are capable of connecting to individual houses, the challenge is to encourage or to require that such connections be made and maintained. There is often a sharing of responsibilities, such as where accessible connection points are provided by the utility close to the customer's property line and the customer then incurs the expense to make an approved connection. This householder's expense may comprise time, materials, construction support and a one-time access fee charged by the utility. Many householders have a much higher willingness to pay to connect to a private piped water supply than to connect to a private sewerage connection, especially where they already have an operational alternative, such as a septage holding tank (Whittington, 2016). As a result, in cases where the aggregate of these private sewerage connection expenses is too large, householders will choose to delay the date of connection or will seek to avoid it altogether. In such cases, the risk of environmental and health harm caused by improper disposal of sewage continues, and the potential returns to investments in sewerage system expansion are not realized. This is a situation where careful application of regulatory authority (with corresponding legislative support) can promote the available connections. As in the case of water supply, a program of output-based aid (potentially including loans from the service providers to customers) can also help the service provider to achieve performance targets for new connections.

g) Prepare a master water supply plan and expand (reliable/affordable) coverage

The policy options here are similar to those for the extension of sanitation coverage, except that with water supply, some of the margins of adjustment might be different. Instead of targeting households with no existing service (as in the case of some sanitation investments), households may already have a shared connection and be seeking a private connection for their house. From the water service provider's perspective, such investments can bring significant additional cost without a commensurate gain in revenue.¹⁸ Menzies and Suardi (2009) observed that providing a private water connection without also providing wastewater treatment facilities and additional plumbing (e.g., a sink and toilet), did not have much effect on household water consumption levels in the short term.

Where there are households in under-served areas, these households might require direct financial assistance to afford access to an improved water source. Recent experience in the Philippines has used output-based aid where a subsidy is only paid following certification that satisfactory service is being delivered. One program employed a means-tested subsidy (\$131 per household for the connection fee, paid directly to the water service provider) in qualifying low-income neighbourhoods. The connection subsidy was accompanied by a loan facility under which the new customer would borrow at commercial rates to meet other connection expenses and repay as an add-on to regular service bills (Menzies and Suardi, 2009). Other options to increase access include imposing specific coverage targets and expansion schedules on utilities as part of their regulated standards of service.

¹⁸ Based on cost data and exchange rates from 2007, the up-front expenses to customers of accepting a new water supply for low-income households in an area served by the Manila Water Company was US\$167 (₱7,530), comprised of the meter deposit (\$23), the guarantee deposit (\$13), and the connection fee itself (\$131) (Menzies and Suardi, 2009). Other expenses for plumbing would then be incurred within the home. Hutton and Varughese (2016) estimate the average capital cost per person served with various types of water supply and sanitation services for both urban and rural areas in 2015 in the Philippines.

6. Policy recommendations and reform roadmap

6.1 Summary of key findings and roadmap for policy reform

The reform options identified here mainly cover pricing, the investment process and regulation. These three areas play a key role in guiding the scale of investments to be made in the water sector and the resulting productivity of the capital that is invested. A large number of policy options are re-stated in point form in Table 6.1, providing a consolidated summary for potential reform efforts.

With respect to pricing of water supply and sanitation, the large number of service providers nationally (more than 5,000) and the absence of a centralized database or regulator of pricing make it difficult to assess the adequacy of current price levels to meet national water goals. It appears that the levels of pricing are too low to achieve cost recovery (NEDA, 2010). In those instances in the Philippines where the volumetric or unit charge for water is below the social marginal cost of supply, this invites socially wasteful uses of water. See Box 6.1 for a roadmap that the Young and Whittington (2016) propose for eliminating the use of increasing block rate tariffs.

Collection rates are low for irrigation service fees and these fees have recently been waived for many users. In these cases, it is clear that water pricing is not meeting its full potential as a policy instrument that could encourage efficient water use or raise revenues with which to support investment. For sanitation, where there is an apparent need for expansion of wastewater treatment services and infrastructure, well-designed tariffs could play an important supporting role to encourage efficient behaviour and to raise much-needed financial capital.

With respect to the levels and patterns of investment, there appears to be an opportunity to coordinate the use of funds from diverse sources and to target how they are allocated using a unified financing framework. The recent experience with the Philippine Water Revolving Fund provides a good starting point for expanded use of blended finance approach, including selective use of output-based aid. As identified here, there are a number of key decisions yet to be faced in implementing such an approach fully, but there could be a large payoff in terms of higher investment productivity and returns, and/or the ability to pursue coverage targets in regions of greatest need.

The World Bank (2014) proposed constructive suggestions for a national water sector regulator, outlining the key functions that such an agency could play and providing a roadmap for its establishment (see Box 6.2). Although this specific guidance was drafted for Vietnam, it can be adapted readily to meet priorities in the Philippines. Extensions to those proposals include adding targets and standards related to system resilience and reliability in this era of increasing climate volatility, since it is not clear that those imperatives are necessarily part of current financing practice.

Table 6.1: A summary of pricing, fiscal policy and other reform options in the water supply and sanitation sectors of the Philippines

Goal: To ensure sustainable and socially inclusive water and meet SDG targets and social objectives through fiscal and pricing policy reform	
Policy Challenge	Key Features to Consider
a) Promote efficient water utilization	<ul style="list-style-type: none"> • Extend, monitor and enforce the use of water permits or other authorizations to abstract surface and groundwater with application to water service providers, Local Government Units, Water Districts, Barangay Water and Sanitation Associations, Rural Water and Sanitation Associations, Irrigators Associations, private firms, private-public partnerships, cooperatives, government entities, firms that self-supply, and so on. • Preserve for households their priority right of access to a lifeline volume of water per month, but discontinue any other use of allocation priority based on general categories of uses or users. • Promote water conservation efforts by providing understandable and timely information about current volumetric charges for water and sanitation services, including billing information, along with information about technical and behavioural alternatives to reduce water consumption and waste. <p>Reform the pricing of raw water and of water supply and sanitation services (domestic and commercial)</p> <ul style="list-style-type: none"> • Replace increasing-block-rate prices with two-part pricing for both water supply and sanitation. Consider a means-tested monthly charge together with a seasonally differentiated uniform volumetric charge that is based upon social marginal cost. • If an increasing-block-rate structure is retained, change the block sizes, number of blocks, and/or the volumetric rates so that the majority of consumers are in a price block where the price for the marginal unit reflects its cost. • Discontinue the current practice charging higher volumetric rates by class of users (such as semi-business, business group I, business group II, government, and so on). • Revise the prices for raw water to reflect the value foregone by other users including environmental uses and instream flows. Actual price determination might proceed incrementally if the policy is phased in. Resulting prices could vary by location, by water source, and by season of the year. • Address affordability concerns with a means-tested rebate or through publicly funded income support. • Build and maintain public support for service and pricing reforms (i) by use of public information and education efforts, (ii) by establishing and meeting new service commitments, and (iii) by inviting public participation in reform and oversight processes including those that address apparent wastage, inefficiency or corruption.

Table 6.1: A summary of pricing, fiscal policy and other reform options in the water supply and sanitation sectors of the Philippines (continued)

Policy Challenge	Key Features to Consider
<p>b) Irrigation sector reforms: Abolish irrigation fees for small farmers; formulate a plan and framework for capital and operations and maintenance financing; and rationalize irrigation service fees</p>	<ul style="list-style-type: none"> • Propose tariffs for irrigators who are not small, and for those who use a pumped water source. • Consider a means-tested definition of small irrigators who will qualify for the fee waiver. Definitions based on land area alone may not be sufficiently informative and may discourage achievement of economies of size. • Once means-tested affordability measures are in place, invest in greater efforts to collect irrigation fees when they are due, and to employ legal remedies to collect overdue accounts. • Promote efficiency in the agricultural use of water by exposing irrigators to the (seasonally- and regionally-specific) social marginal cost of the water they use. • Adopt a pricing approach based upon other proxies for water intensity in cases where the cost of measuring (metering) or estimating actual irrigation water usage is higher than the potential gains. This could promote some efficiency gains in water use. • Examine (and revise if warranted) the cost-effectiveness of the historical practice of allowing payment of irrigation service fees with physical quantities of un-milled rice.
<p>c) Create an apex body; amend the water code and regulations, strengthen coordination and linkages, enhance organizational capacity</p>	<ul style="list-style-type: none"> • Establish, fund, and support improved water governance at all levels. • In those jurisdictions where Local Government Units continue as the service providers, apply the same, progressive regulatory approaches (including pricing and financial reviews, pursuit of efficiency enhancements) as apply to other water service providers. In most cases, this will require segregation of financial accounts (i.e., ring fencing) related to water supply and sanitation.

Table 6.1: A summary of pricing, fiscal policy and other reform options in the water supply and sanitation sectors of the Philippines (continued)

Policy Challenge	Key Features to Consider
d) Create an independent regulator	<ul style="list-style-type: none"> • Endow an independent national regulator with appropriate staffing and resources to undertake regulatory monitoring and enforcement. The regulator should set performance standards, service and investment obligations and financial commitments to be met by all parties. The regulator should oversee sustainable tariffs and funding structures; formal business planning; asset management and development; financial planning; and capital investment. • Identify and then require the consolidation and amalgamation of distinct service providers into units that are large enough to provide more cost-effective services. Realign utility boundaries and/or services offered, where appropriate, to capture all available economies of size and scope. • Allow utilities sufficient revenue to serve customers and to maintain their capital base consistent with meeting specific performance standards, especially in the presence of climate change, rural-to-urban migration and population growth. • Empower the regulator to play a key role in building and maintaining public support such as by using public information and education efforts, and by establishing and enforcing new service commitments. The regulator should invite the public, as individuals and through water users' groups, to participate in reform and oversight processes, including those that communicate customer needs and address apparent wastage, inefficiency or corruption.
e) Establish a unified financing framework	<ul style="list-style-type: none"> • Use a single public agency to review for proposed public funding all relevant proposals for the water and sanitation sector, using common eligibility criteria, analytical assumptions and funding guidelines. • Develop the use of blended finance facilities, supporting and leveraging the coordinated use of concessional and commercial loans from both domestic and foreign lenders. • Reduce transactions costs for borrowers and lenders to identify scalable investment opportunities in the sector. • Increase the attractiveness of utility investments through commitments to transparency. • Improve processes and effectiveness of privatization and public-private partnerships. Require open and transparent selection processes and subject all utilities to independent regulatory oversight. • Identify strategic and priority investments, rationalizing across donors to achieve greatest effect. • Scrutinize carefully the proposed use of guarantees and indemnities as financing tools in order to avoid significant and unanticipated costs to the public treasury. • Avoid any wasteful competition or duplication of efforts among funders.

**Table 6.1: A summary of pricing, fiscal policy and other reform options in the water supply and sanitation sectors of the Philippines
(continued)**

Policy Challenge	Key Features to Consider
f) Prepare a master plan and expand (reliable/affordable) sanitation coverage	<ul style="list-style-type: none"> • Make sure that adding new customers does not require utilities to incur losses, while also ensuring that services remain affordable to consumers. Implement policies on regulation, pricing, and subsidies to allow cost recovery together with attainment of targets for expanded coverage. • For sanitation service, base the price charged on some or all of the volume of water supply that is delivered. Efficiency of water use is promoted when the fees charged to water users accurately reflect volumetric treatment costs. In general, the marginal cost actually incurred by a utility to provide treatment services will vary by location. • Where warranted based on means-testing, subsidize part or all of the customer's cost of new water and sewerage connections. Refine and replicate successful experiences with programs incorporating output-based aid and/or loans to the prospective customer at commercial rates that can be repaid as an add-on to regular service bills. • Impose specific coverage targets and expansion schedules on utilities as part of their regulated standards of service. • Legislate or regulate customer connections (where available) where their absence imposes environmental costs or risks on others. • Where continuing subsidies appear warranted, convert them to annual budgetary amounts to promote ongoing review of the continuing need for them and transparency regarding amounts, recipients and effectiveness
g) Prepare a master plan and expand (reliable/affordable) water supply coverage	<ul style="list-style-type: none"> • Almost all of the considerations noted above for the expansion of sanitation coverage apply equally to water supply coverage, with the exception that there is seldom an equivalent need or rationale to mandate water supply connections. • Identify situations where there is synergy (and increased return on investment) from extending coverage of water supply and sanitation simultaneously.

Box 6.1: A roadmap from the Global Water Partnership for phasing out a system of increasing block rate water tariffs

Phase 1: Establish the ability to implement a sound pricing policy

1. Collect and share information about who wins and loses from the existing tariff regime.
2. Develop a strong case for and public understanding of the case for change.
3. Fix broken meters, reduce leakage, and generally bring integrity to water service provision.
4. Install meters on all private connections.
5. Establish a programme to finance household connection charges.

Phase 2: Establish a transition pathway to a tariff that balances cost recovery, economic efficiency, and equity/fairness objectives

1. Establish an independent regulator, if one does not already exist, and strengthen their understanding of water charging regimes.
2. Begin offering means-tested financial assistance to poor households.
3. Announce the intention to move to a single-tariff system decoupled from the provision of assistance to disadvantaged households.
4. Begin charging industrial water users the full cost of supply and wastewater collection and treatment.
5. Eliminate the discrepancy between industrial and residential water tariffs.
6. Discontinue the use of IBTs.
7. Demonstrably improve the quality of service provision.
8. Set volumetric tariff equal to the marginal cost of service provision.

Source: Young and Whittington, 2016

Box 6.2 A World Bank roadmap for establishing a national regulatory authority for the water sector

Design and establishment of the regulatory framework

1. Study and develop:
 - a. a detailed regulatory framework,
 - b. key statutory provisions/requirements, and
 - c. outline the design for Regulatory Authority and associated resourcing needs.

Design and establishment of regulatory authority

1. Consult with stakeholders to gain consensus on outline design.
2. Develop cost estimates for establishing the Authority and building capacity (at central and local levels).
3. Draft the statute to create the Authority and establish its mandate and powers.
4. Enact the legislation.
5. Secure initial funding from the national budget.
6. Appoint commissioners.
7. Appoint heads of departments (including those for the regional and local offices).
8. Appoint other staff and acquire other resources.
9. Develop a website for the Authority.
10. Identify or establish customer representation organizations.
11. Develop regulations and operating guidelines.

Initial regulatory activities

1. Consult on performance standards and targets for different service levels (with stakeholders including Local Government Units, Water Districts, water service providers and consumer groups).
2. Develop a communication campaign to explain and engage on reforms and obligations of different stakeholders.
3. Introduce performance contracts and work with apex agency and utilities to introduce a tariff-setting methodology based on cost recovery.
4. Assist utilities and Local Government Units to understand and implement performance based contracts, collect data and meet reporting requirements.
5. Collate data and start disseminating them to other agencies and the public.
6. Coordinate with relevant Ministries on tariffs, subsidies and development of a funding plan or framework for the water sector.

Source: Adapted from World Bank, 2014, pp. 48-49

6.2 Key challenges to implementing the proposed reforms and how they can be overcome

Policy change often places new stresses or demands on individuals and organizations. Many of the reform options described here represent a considerable change from current practice, and numerous stakeholders in the process may resist some or all of these reforms. There could be many “winners” from proposed reforms, but some “losers” too. It is possible that some stakeholders are sufficiently well served by, and are “comfortable” with the status quo.

In the Philippines, however, the water supply and sanitation sector is already in a state of transition, as documented in the *Philippine Development Plan 2017-2022*. Preserving the status quo is unlikely to be a viable option. Additional stresses include those from climate change, population growth and rural-to-urban migration. It is not apparent that investments on the scale required by commitments to the Sustainable Development Goals could be made from public funds alone.

Communication and public education should be key components of any reform strategy that is implemented, where that education has to serve not only utility operators and customers, but also prospective customers and the public at large. Key messages will include careful, yet cautious, characterization of the service improvements that will accompany the reforms to regulation and pricing. For those households who face the prospect of gaining a private connection to a water supply and/or sanitation, there are numerous potential benefits related to time saving, improvements in health status and the reduced expense of alternative supply options. The design and operation of means-tested or pro-poor pricing features will need to be explained carefully.

The environmental gains from more judicious use of water resources and from widespread adoption of effective sanitation can be significant in both urban and rural settings. For commercial and industrial users who, perhaps for the first time, start to pay careful attention to their water supply and discharge requirements, there may be gains from sharing information about processes, methods and technologies that can save or re-use water resources. For those firms whose gains come as increased reliability or quality of the services they receive, these changes will sell themselves.

There is also an opportunity to create a process that invites ongoing public participation in reform and oversight processes including those that address apparent wastage, inefficiency or corruption. Coupled with improvements and capacity building in regulatory approaches, empowered members of the public can be put in a good position to be sure that their voices are heard and their needs are both understood and met. Capacity building of regulators and legislators at all levels of government can pay tremendous returns and is already highlighted in the Philippine Development Plan.¹⁹

For government agencies that will be asked to implement these and other reforms, there may be benefits from starting gradually. One could consider phased or timed changes of specific reforms that accommodate the needs of key players to develop systems and staff capacity to perform their new roles effectively. A key to adaptive management of these changes will be collection and ready access to timely data and information about levels and trends in key performance indicators, both with and without the introduced reforms. This would be the best time to plan for collection of baseline statistics on numerous performance criteria. Good measurement supports good management.

6.3 The way forward

¹⁹ There are numerous training programs and resources available, many on line. See for example, the *Body of Knowledge on Infrastructure Regulation* (www.regulationbodyofknowledge.org) that summarizes some of the best thinking on infrastructure policy in a manner that is sensitive to the needs of low- and middle-income countries. New “massive open online courses” such as those recently produced by the University of Manchester (Whittington, 2016) bundle together key publications and resource materials with informative lectures and interviews with global experts.

This study has not provided findings and conclusions that prescribe a specific or unique view of the way forward. In a number of cases, several options are presented, touching on numerous aspects of pricing, investment finance, regulation and governance. In many cases, the prospective synergies among these options are obvious, and so none should be considered in isolation.

The suggestions made here may be of interest at various levels of government and to various ministries and agencies within those governments. But, so too will they have relevance for water and sanitation users and suppliers; for national and international investors, donors and bankers; for civil society organizations; and for the public at large.

The way forward consists of a series of choices among these options leading to implementation of a program of legislative and regulatory reforms. Ideally, a range of potential stakeholders would contribute their views and insights on the best choices. As presented here, one sees a clear and inter-related series of choices, the broad essence of which the Philippines has already committed to address in its pursuit of socially inclusive and sustainable development.

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ANNEX A – Participants in introductory fact-finding meetings

March 6, 2017	Dr. Seville D. David Jr. Executive Director National Water Resources Board Department of Environment and Natural Resources
	Mr. Jorge M. Estioko Deputy Executive Director National Water Resources Board Department of Environment and Natural Resources
	(Ms.) Engr. Isidra D. Peñaranda Chief, Policy and Program Division National Water Resources Board Department of Environment and Natural Resources
	(Mr.) Engr. Luis S. Rongavilla National Water Resources Board Department of Environment and Natural Resources
March 7, 2017	Mr. Reynaldo V. Velasco Administrator Metropolitan Waterworks and Sewerage System
	Mr. Nathaniel C. Santos Senior Deputy Administrator Metropolitan Waterworks and Sewerage System
	Dr. Joel C. Yu Chief Regulator Metropolitan Waterworks and Sewerage System Regulatory Office
	(Ms.) Atty. Kristin San Pedro Head Technical Assistant and Acting Manager of Public Information Department Metropolitan Waterworks and Sewerage System Regulatory Office
	Mr. Andres Ibarra Administrator Local Water Utilities Administration
	Mr. Edgardo C. Demayo Acting Senior Deputy Administrator Local Water Utilities Administration
	Ms. Fe Crisilla M. Banluta Project Manager II Water Supply and Sanitation Program Management Office Office of Project Development Services Department of the Interior and Local Government
	(Mr.) Engr. Bayani P. Ofrecio Manager, Institutional Development Division National Irrigation Authority
March 8, 2017	Mr. Paul Erwen Pareño Planning and Policy Division Department of Environment and Natural Resources
	Ms. Nenita Zabala Planning and Policy Division Department of Environment and Natural Resources

	Ms. Leza Acorda Cuevas Environmental Management Bureau Department of Environment and Natural Resources
	Ms. Llerina Mojica Planning and Policy Division Department of Environment and Natural Resources
	Ms. Alice Castillo Forest Management Bureau Department of Environment and Natural Resources
	Ms. Zoesane Lumbrez Biodiversity Management Bureau Department of Environment and Natural Resources
	Ms. Maria Lourdes Ferrer Executive Director Manila Bay Coordinating Office Department of Environment and Natural Resources
	Ms. Donna Mayor-Gordove Deputy Executive Director River Basin Control Office Department of Environment and Natural Resources
March 9, 2017	(Ms.) Engr. Dolores M. Hipolito Project Manager Department of Public Works and Highways
	Mr. Dindo E. Taberna Department of Public Works and Highways
	Mr. Roderick M. Planta Director, Infrastructure Staff National Development Office National Economic and Development Authority
	Mr. Bryan Coballes National Development Office National Economic and Development Authority
	Ms. Tanya Cortes National Development Office National Economic and Development Authority
	Mr. Jeremy Borlongan National Development Office National Economic and Development Authority
	Mr. Othelo L. Razon Land and Water Resources Project Planning Engineering Department National Irrigation Authority
	Mr. Rowell D. Dula National Irrigation Authority
	Mr. Rowell D. Tarampi National Irrigation Authority
	Mr. Gian Paulo G. Rabacal National Irrigation Authority
	Mr. Hanziel Nonilon U. de Guzman National Irrigation Authority

	Mr. Jayson H. Francisco National Irrigation Authority
	Mr. Arthur Allan B. Abalos National Irrigation Authority
	Mr. Bayani B. Carpio National Irrigation Authority
	Mr. Jeremias Naoe National Irrigation Authority
	Ms. Aida M. Agngarayngay National Irrigation Authority
March 10, 2017	Mr. Philip G. Camara Undersecretary for Field Operations Department of Environment and Natural Resources
	(Ms.) Atty. Michelle Angelica D. Go Assistant Secretary of Policy Planning and International Affairs Department of Environment and Natural Resources

ANNEX B - Government agencies with water resources-related responsibilities

Unit of Government	Line Bureau or Concerned Agency	Responsibilities / Concerns Related to Water
National Economic and Development Authority (NEDA)	Infrastructure Staff	Formulates and recommends for approval policies on water resources
	Regional Development Councils	Set direction of economic and social development in region through which regional development efforts are coordinated
	Investment Coordination Committee / NEDA Board	Evaluates/appraises/approves major development projects and policies
Department of Public Works and Highways	Metropolitan Waterworks and Sewerage System (MWSS)	Constructs, maintains and operates domestic/municipal water supply and sewerage projects in Metro Manila and contiguous areas including watershed management
	Bureau of Research and Standards	Undertakes hydrological surveys and data collection
	PMO-Major Flood Control Projects	Manages the planning, design, construction, organization and maintenance of major flood control projects
	PMO-Small Water Impounding Projects	Manages the planning, design, construction, organization and maintenance of locally-funded and foreign assisted small water impounding projects
Department of Agriculture	National Irrigation Administration	Undertakes program-oriented and comprehensive water resources projects for irrigation purposes, as well as concomitant activities such as flood control, drainage, land reclamation, hydropower development, watershed management, etc.
	Bureau of Soils and Water Management	Undertakes assessment, development and conservation of existing and potential soil and water sources for agriculture; undertakes cloud seeding activities
	Bureau of Fisheries and Aquatic Resources	Formulates plans for the proper management, accelerated development and proper utilization of the country's fisheries and aquatic resources

Unit of Government	Line Bureau or Concerned Agency	Responsibilities / Concerns Related to Water
Department of Energy	National Power Corporation	Develops electric power generation facilities including hydroelectric and geothermal power; constructs dams, reservoirs, diversion facilities and plants and watershed management
	National Electrification Administration	Promotes, encourages and assists public service entities to achieve service objectives; implements mini-hydro projects
	Office of Energy Affairs	Promotes development of indigenous energy resources such as mini-hydro projects
Department of Health	Environmental Health Services	Responsible for water supply and sanitation programs and strategies to forestall environment-related diseases
	Bureau of Research Laboratories	Monitors quality of drinking water
	Local Water Utilities Administration (LWUA)	Specialized lending institution for promoting, developing, regulating and financing water utilities, excluding Metro Manila
Department of Environment and Natural Resources	National Water Resources Board	Coordinates and regulates water activities in the country; supervises and regulates operations of water utilities outside jurisdiction of LWUA and MWSS; formulates and recommends policies on water resources
	Environmental Management Bureau	Formulates environment quality standards for water, air, land, noise and radiation; approves environmental impact statements and issues Environmental Compliance Certificates

Unit of Government	Line Bureau or Concerned Agency	Responsibilities / Concerns Related to Water
Department of Environment and Natural Resources (continued)	Mines and Geo-Science Bureau	Manages, develops and conserves the country's mineral resources; monitors and maps groundwater resources
	Forest Management Bureau	Formulates and recommends policies and programs for the effective protection, development, management and conservation of forest lands and watersheds
	Protected Areas and Wildlife Bureau	Undertakes the protection and conservation of natural wetlands such as lakes, marshes, swamps, etc.
	River Basin Control Office	Plans for the development and management of the country's river basins
	National Mapping and Resources Inventory Authority	Responsible for integrated surveys, mapping, charting, oceanography, land classification, aerial photography, remote sensing, etc.
	Laguna Lake Development Authority	Responsible for regional water resources development and management in the Laguna Lake catchment area
Department of Science and Technology	Philippine Atmospheric, Geophysical and Astronomical Services Administration	Disseminates atmospheric, geophysical and astronomical data for use by economic sectors, the scientific and engineering communities, and the general public
	Philippine Council for Agricultural, Forestry and Natural Resources Research and Development	Formulates national agricultural, forestry, and natural resources research and development programs on multi-disciplinary, inter-agency approach for various commodities including water resources
Department of Interior and Local Government	Water Supply and Sanitation Program Management Office under the Office of Project Development Services	Supports the provision of water supply and sanitation services by local government units

Unit of Government	Line Bureau or Concerned Agency	Responsibilities / Concerns Related to Water
Local Government Units	Provincial Governments	Promote the development of infrastructure including irrigation, water supply, electric power and roads
	Municipal and Barangay Governments	Promote municipal and barangay water supply and sanitation, watershed and other programs
Department of National Defense	Office of Civil Defense (OCD)	Monitors safety of dams and other water resources projects; prepares and supports the general public in emergencies
	Philippine Air Force (PAF)	Undertakes rain enhancement through cloud seeding
Department of Transportation and Communication	Philippine Ports Authority (PPA)	Plans, develops, operates and maintains ports and facilities
Department of Tourism	Philippine Tourism Authority (PTA)	Promotes and develops the recreational use of water resources. Operates Boracay water utility.
Department of Trade and Industry	Board of Investments (BOI)	Proponent of the CALABARZON integrated area study, covering water resources, among others
	Philippine Economic Zone Authority (PEZA)	Responsible for the promotion and management of economic zones including the regulation of water utilities operating within economic zones
Department of Social Welfare and Development (DSWD)		Implements the government's flagship anti-poverty project - Comprehensive and Integrated Delivery of Social Services (KALAH-I-CIDSS) which includes water system construction in priority municipalities.
Department of Agrarian Reform	Foreign Assisted Projects (FAP) Office Support Services Office (SSO)	Lead implementing agency of Comprehensive Agrarian Reform Program (CARP) and orchestrates the delivery of support services to farmer-beneficiaries in the KALAH I ARZones, an expanded agrarian reform community composed of a cluster of contiguous land-reformed barangays,

Source: NEDA, 2010, p. 22

ANNEX C – Summary of issues in the Philippine water supply sector

Water supply sector summary of issues		Defining the Issue
Institutional fragmentation		
Weak, fragmented institutional framework and policies on universal access to [Water and Sanitation] services and cost recovery		Major sector agencies have not changed their paradigm of direct planning and implementation of projects to that of providing support to and developing the capabilities of [Local Government Units] to plan and implement water supply projects.
Uncoordinated sector planning and lack of monitoring		Absence of a national government department that is responsible for translating government's policies, strategies and goals into a comprehensive water supply program
		After the [Local Government Code], not enough changes in government agencies' programs to specifically develop the capabilities of the [Local Government Units] to perform devolved functions (e.g. establishing and operating water utilities, financing capital and [Operations and Maintenance] costs, tariff setting, regulation)
		Outdated [Water and Sanitation] master plans
		Lack of reliable data and absence of a systematic and regular monitoring of sector activities (all levels)
		Little coordination in planning for the urban and rural areas of each municipality or city
Inadequate support to rural water supplies		
Inadequate support to water utilities in technical design criteria, project financing, management, operation and maintenance		Separate planning for urban and rural areas instead of whole [Local Government Unit] as planning unit
Limited sector capacity and mandate (e.g., [Local Water Utilities Administration], [Department of the Interior and Local Government - Water Supply and Sanitation Program Management Office] to provide support services to [Water Service Providers].		Lack of comprehensive program guiding the development of the rural water supply sector
Low tariff and cost-recovery level		
Water utilities are not able to sustain operations and expand coverage.		Tariff levels are not sufficient for the majority of the [Water Service Providers] to recover recurrent costs and accumulate sufficient reserves to fund new capital developments.
Tariff levels, tariff structures and tariff setting methodologies differ across individual service providers.		Lack of detailed guidelines, guidance and assistance in tariff setting and problems with collection efficiency
		Lack of political will to set and implement tariffs at appropriate levels

Water supply sector summary of issues		Defining the Issue
Low performance of water utilities		
Water service providers do not perform satisfactorily.		Slow service expansion and low coverage, high [Non-Revenue Water] levels, and requirements for subsidies by the majority of service providers
		[Rural Water and Sanitation Associations, Barangay Water and Sanitation Associations] and cooperatives suffer from lack of technical and managerial capacity, unable to retain skilled staff and absorb the technical assistance given
		[Local Government Unit] utilities lack technical, financial and management capabilities, and autonomy with regard to political interference in management decisions.
Weak and fragmented regulatory framework		
Lack of transparency as to sector performance and benchmarking information for individual providers make it difficult to hold service providers accountable for service improvement		The need to make water service providers accountable to consumers with expanded access, efficient use of revenues and improved service quality
The lack of sector information at the service provider level impedes effective regulation.		
Sector investment and financing		
Low public and private sector investment in the water supply sector		Small utilities have limited revenue base and find it difficult to access financing for expansion.
Limited access to financing for service expansion of small utilities		
Lack of [water supply and sanitation] sector information		
General lack of sector information and continuous updating of existing information base		The need to continuously update existing provincial water supply and sanitation master plans
Lack of reliable data and the absence of a systematic and regular monitoring of sector activities in the municipalities by the local government units.		

Source: NEDA, 2010, p. 28