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Resources and Markets Branch**

**Pricing Reforms for Sustainable Water Use
and Management in Vietnam**

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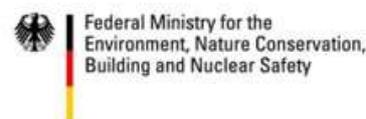
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On behalf of:



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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. IWMI's headquarters are in Colombo, Sri Lanka, 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

GIZ	<i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i> , international cooperation agency of Germany
IWMI	International Water Management Institute
PDP7	Power Development Plan 7
PES	Payment for ecosystem services
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 22,600 VND/USD rate of exchange.
VND	Vietnamese Dong (currency). Any references to dong in this report refer to the Vietnamese currency (in 2017), unless otherwise stated, and any USD equivalents have been estimated using the 22,600 VND/USD rate of exchange.

Executive Summary

For Vietnam, the opportunity to pursue green growth through sustainable investments in the water supply and sanitation sectors offers a promising development pathway toward achievement of Sustainable Development Goals. For government, the reform of water pricing and related fiscal policies, coupled with improvements to governance, regulation and the use of development finance provide a means to scale-up financial resources, to internalize environmental externalities and to shift patterns of behaviour. In turn, these efforts can contribute to increased productivity, reduced poverty, and improved social equity while managing water sustainably for all.

This study provides guidance on pricing policy reform to promote sustainable and socially inclusive water use and management in Vietnam. The study considers investment needs in the water sector, and reviews alternative approaches to water pricing that are likely to generate much-needed financial capital. Importantly, these changes can also motivate changes in behaviour by utilities and consumers to increase the efficiency and effectiveness of water resource use.

There are a number of reforms relating to Vietnam's water supply and wastewater services that could improve the effectiveness of current practices, especially as related to the ability to attract and deploy capital investment. The main reform options to consider fall into four areas: pricing, other fiscal policies, investment financing, and regulation. Each of these options is considered in the report and discussed briefly below.

Like many low and middle-income countries in Southeast Asia, Vietnam prices its water supply following an increasing-block-rate design. This means the price per unit of water supplied is larger for households who consume more each month. As in many of these countries, the average price levels charged do not generate enough revenue to sustain the physical infrastructure or to provide financial capacity to expand the system. Wastewater services, where available, are priced in a similar manner. Unlike the large majority of similar countries using this price design, Vietnam does not use a two-part pricing approach that also incorporates a fixed monthly fee. The limitations and shortfalls of the current approach to pricing include poor targeting of subsidies and service to needy households, and a missed opportunity to increase efficiency through influence on consumption levels and utilities' behaviour. Below-cost pricing and excessive subsidies have been further aggravating water scarcity and supply in Vietnam. There are potential environmental gains from promoting water conservation and re-use, such as through pricing reforms.

Key reform options include raising average prices. This could be done in a manner that preserves affordability for lower-income households by changing the rate structure. A recommended alternative is to move to two-part pricing with a uniform volumetric charge based on the seasonal, social marginal cost of supply. Even without a uniform volumetric charge, the increasing-block-rates could be modified to ensure more households face the opportunity cost of the resources they use. Measures to address affordability for the poor could include a rebate or subsidy built into the monthly water bill or could be delivered through some other public assistance program targeted at these households, similar to Vietnam's electricity cash subsidy program. To achieve the most efficient and cost-effective use of scarce water resources and of the physical infrastructure, any of these reforms should encourage a change in consumers' behaviour by providing a clear and timely price signal based on measurement and metering. Such changes would also encourage utility companies to invest in leak detection and would discourage investment in excess capacity.

These same reform options can apply for wastewater treatment and for irrigation water services, subject to some adjustments. Wastewater is not usually measured and so measured water supply can serve as a proxy. Irrigation uses should be measured. However, if this is not possible or is not

cost effective, then pricing can be based upon other proxies related to crops, seasons, irrigation methods and location in order also to guide favourable user responses.

If effective pricing reforms were to be adopted, utilities and water purveyors could be assured of a revenue base sufficient to meet customer needs and performance standards. Turning to fiscal instruments, there might then be less need, if any, for the complicated and multi-faceted system of tax preferences, subsidies and tax expenditures that have been directed at water and sanitation in recent years. Financial assistance to ensure affordability for low-income households could be decoupled from the water prices themselves to achieve better targeting of those supports. The government has committed to holding an equity position in most water and sanitation utilities, necessitating continuing expenditure and revenue flows to and from the public treasury. There could be an opportunity for greater scrutiny of the effectiveness and need for public expenditures for water supply and sanitation if the financial supports offered to utilities and consumers were subject to the annual budgeting process. At present, many of these supports are built into diverse pricing, subsidy and tax policies without full transparency to policy makers and taxpayers.

Investment financing reforms already underway focus on equitization or the partial privatization and conversion of state-owned enterprises into new joint stock companies. This is typically accomplished through the sale of a minority equity position to private investors, most often from inside the country. A recent, published examination of this process provides detailed recommendations and options about how to improve the selection and financing process. Proposed reforms could increase the attractiveness of these investments to prospective bidders and to customers alike.

With respect to debt finance from domestic and international lenders, including those who would provide concessional loans as part of official development assistance, there may be untapped opportunities to accelerate sector lending through creation or development of a blended finance facility. The effect of such a facility could be to increase loan amounts and effectiveness by reducing transaction costs and risks. The effect would be to increase risk-adjusted returns to prospective lenders. Such reform options are synergistic with pricing reform, since without adequate revenue streams these borrowers could not service their debt obligations in a reliable manner.

Vietnam does not have an independent regulator for the water supply and sanitation service sector, even though it has created a number of joint-stock service monopolies that are, for the first time, now operating with a profit motive. Increasing the levels of financial investment without providing a clear and supportive framework to ensure effective performance might cause potential productivity gains to be missed. Key options here include creation of an independent regulator; establishment of performance standards that are tied to consumers' willingness and ability to pay; and provision of oversight with respect to financial and operational commitments. Where price-setting processes currently engage the Provincial Peoples Committees and the utility operators, there is an option to introduce an independent regulator into the process, with capacity and authority to approve and monitor new performance contracts.

Other regulatory options include actions increasing the coverage of urban and rural water supply and sanitation services to under-served communities; rationalizing the scope and boundaries of service areas to achieve cost savings; and providing clearer support to ensure industrial wastewater is treated prior to discharge and that discharge processes become fully compliant.

For a country that is already in the midst of a public-to-private service transition, maintaining historical practices or the status quo may no longer be an option. There may be numerous legislative, jurisdictional, and political challenges associated with any substantive program of policy reform that affects such a large population. Programs of information sharing, public education and

capacity building can lessen some of these challenges. Some of these actions can be staged or phased according to the sector's capacity to adjust.

This study identifies clear opportunities to reform current policies and practices on pricing, fiscal instruments, investment finance, regulation and governance. There are evident synergies when these are addressed together. However, the study does not provide findings and conclusions that prescribe any one, specific way forward. A range of options is presented.

The suggestions and interventions presented should interest governments, but so too will they have relevance for water and sanitation users and suppliers, national and international investors, donors and bankers, as well as civil society organizations and the public at large. Their views and participation can inform a process of change, guiding a series of choices that lead steadfastly to implementation of a coordinated program of legislative and regulatory reforms. These steps would support more socially inclusive and sustainable water use and management in Vietnam.

Pricing Reforms for Sustainable Water Use and Management in Vietnam

1. Introduction

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

Fiscal instruments and pricing policies are recognised as essential water governance mechanisms that may contribute to broader development goals. 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. Of these, SDG 6 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 requires a number of activities: 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 transition to a green economy through policy reforms and green investment is a key process to enable countries to meet their SDGs at the national level (UNEP, 2014). Fiscal policies and water pricing reforms represent a central component of this economic restructuring. Their support of the transition to a green economy via the water sector relies upon specific tools that scale-up the use of domestic public resources, internalize environmental externalities and shift patterns of behaviour. In turn, this 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 solutions, and improving policy coherence across other relevant sectors. Many of these measures apply in the context of Vietnam.

1.2 National policy context

Set against the global policy setting, Vietnam has recently approved a National Action Plan to implement the *2030 Agenda for Sustainable Development* [Decision 622/QĐ-TTg; May 10, 2017]. This plan includes establishing targets and indicators for SDG 6, separately for 2017-2020 and for 2021-2030. Vietnam has already introduced broad environmental plans that may be conducive to socially inclusive and sustainable water management. These commitments provide the national context within which to examine a greater role for fiscal instruments and water pricing policy.

The government of Vietnam approved the National Green Growth Strategy for the period of 2011-2020, with a vision to 2050. The overall objective of this strategy is outlined as follows:

Green growth, as a means to achieve a low carbon economy and to enrich natural capital, will become the principal direction in sustainable economic development; reduction of greenhouse gas emissions and increased capability to absorb greenhouse gas are gradually becoming compulsory and important indicators in socio-economic development (Vietnam Office of the Prime Minister, 2012).

The strategy contains three specific objectives, including restructuring the economy and institutions and greening existing and nascent sectors. Within these objectives are a suite of tasks and solutions, several of which refer to water. Water use, infrastructure for irrigation and water, urbanisation,

water supply and sanitation² all feature as topics of special interest within the broader green economy agenda. In 2015, Vietnam prepared its Intended Nationally Determined Contribution toward climate change that communicates efforts to promote adaptation with a priority to be given to, among others, food and water security (Vietnam MONRE, 2015).

In Vietnam, the Power Development Plan 7 (PDP7) represents an additional effort to promote more sustainable development in the energy sector. The adjusted 'PDP7' runs from 2016 until 2030 and lays out a 'stronger emphasis on renewable energy development and power market liberalization,' thus signalling the introduction of new fiscal policies for environmental objectives (GIZ, 2016). The plan concentrates on rural and mountainous areas, but eschews the idea of larger-scale pumped storage hydro power as an energy solution, since it has historically been associated with negative environmental impacts in the region (Arias *et al.*, 2014).

The green underpinnings of PDP7 link to the National Strategy on Climate Change, which also has direct implications for the water sector. As a country vulnerable to natural disasters, particularly coastal flooding, Vietnam's climate change adaptation plans are concerned with early warning and risk management (Mekong River Commission, 2014). Task 2 of the Strategy specifically addresses food security and water resources, while Task 10 seeks to diversify financial resources and investments on climate change. The latter task is consistent with Vietnam's broader economic transition from predominantly public provision of many goods and services to privatisation and greater use of various public-private partnerships (ERIA, 2014).

Economic reforms in Vietnam have promoted a greater role for the private sector in delivering goods and services that state agencies formerly delivered. These reforms have also shaped the water policy environment and, by extension, the investment trends and needs in the water sector. In 2009, the country's water supply was partially privatised, followed by an updated Law on Water Resources in 2013 (see Figure 1.1). In addition to the overarching environmental and green economy plans, Vietnam has a relatively comprehensive framework of strategies specific to water management (FAO, 2012). These include the Water Vision for 2025 and the National Rural Water Supply and Sanitation Strategy, which further commit to promoting the role of the private sector, especially in the rural economy and water supply schemes (ODI, 2015).

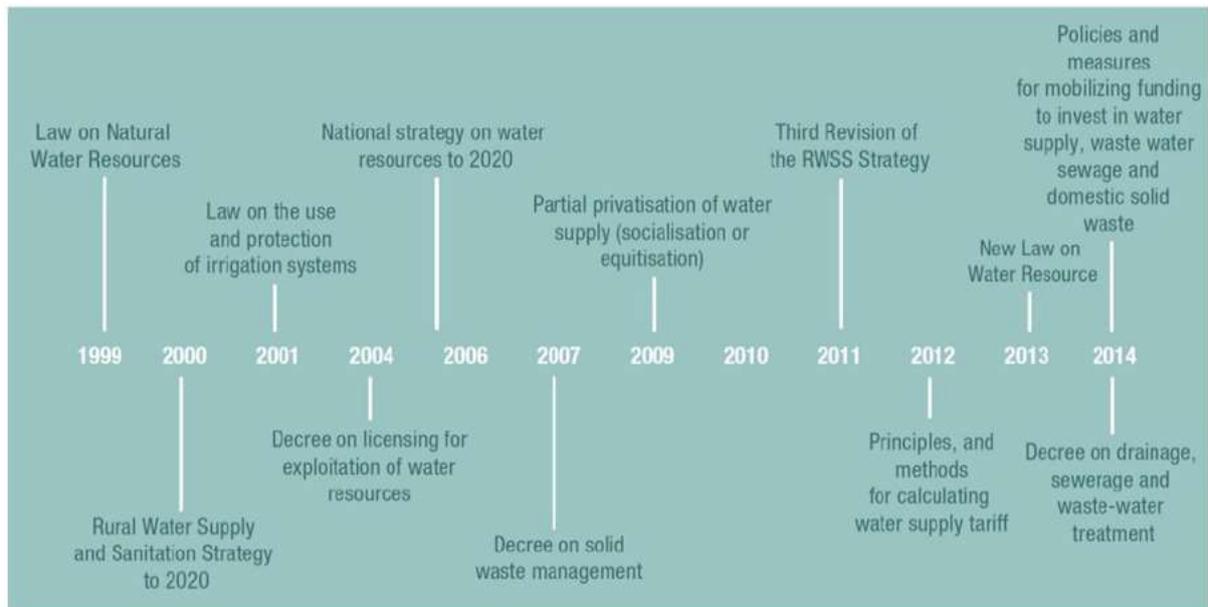
These changes in the domestic policy environment have been buttressed by international community initiatives in favour of decentralisation and private sector participation. For example, in 2010 the government initiated a facility for public-private partnerships with the active support of the UK Department for International Development and the World Bank (ODI, 2015).

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 Vietnam. 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.

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.

Figure 1.1: Timeline of water policy reforms in Vietnam, 1999-2014



Source: ODI (2015)

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? Can various fiscal instruments be used more effectively, such as: efficient taxes or charges on water abstraction, emissions and/or pollution; regulatory levies; 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?
2. What is the scope for greater use of charges, tariffs or prices for raw water, treated water and for sewage and wastewater emissions from industry?
3. How can water policies and reforms support 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 Vietnam on the status of fiscal instruments and water pricing policies. Through policy analysis, this work provides guidance on fiscal and pricing policy reform to ensure sustainable and socially inclusive water in Vietnam. In this way, it can support achievement of SDG6 and other relevant SDGs in Vietnam. The study provides information, advice and support to the government and related stakeholders for consideration when reforming fiscal 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 Vietnam's water goals. Subsequent presentation of preliminary options and alternatives to a forum of invited stakeholders provided another opportunity to gain valuable advice and feedback.

2. Key issues and challenges in the water sector in Vietnam

The distribution of water resources in Vietnam is highly variable both seasonally and geographically. This variability, coupled with the fact that almost 60% of the country's water resources are generated outside of its borders, creates an unstable resource base and associated management challenges (FAO, 2011).

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 effectively 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. Some regional economies of size may be missed when each of the 63 sub-national jurisdictions acts in isolation. Monitoring and enforcement actions for the existing regulations appear to be inadequate at many levels.

Many areas or sub-populations remain unserved or under-served, especially for improved sanitation. There may not be sufficient incentives or mechanisms currently in place for privatized services to reach out to these clients if they are seen as unprofitable or risky for potential service providers. In some cases, public (or private) wastewater infrastructure has been provided, but there is insufficient incentive for private householders to connect to it. Instead, these households add to the growing environmental and public health damage from discharge of untreated sewage. In some rural areas, basic systems of improved water supply have been provided, but these appear to be unsustainable and at risk of failure, due to insufficient management capacity and investment, compounded by growth pressures on usage levels, and increasing weather variability.

2.1 Key issues in the water sector

Water scarcity and supply

Water shortage during the dry season is an acute issue, especially in basins where demand is high. To measure stress in a given river basin, it is possible to calculate the percentage of the average annual discharge that is extracted from rivers (ADB, 2009). During the dry season, six of the 16 basins in Vietnam are classified as 'moderately stressed' (in the 20% to 40% range). A further four basins are classified as 'highly stressed' (the Ma, South East Rivers Cluster, Huong and Dong Nai), with the South East Rivers Cluster and Ma basins at 75% and almost 80% extraction rates respectively in the dry season (ADB, 2009).

Almost two-thirds of the population inhabit the three main river basins (Red, Mekong Delta and Dong Nai), representing a high concentration of people in a densely populated country (see Table 2.1). Increasing urbanisation presents further water supply pressures, with growing demands for infrastructure and water for industrial use. Although the proportion of urban dwellers has increased, there also remains a heavy demand on water resources from agriculture. Irrigated agriculture uses the most water, accounting for about 95% of total water withdrawals in Vietnam (domestic use 1.5%; industry 3.7% (FAO, 2012)). These withdrawals are predominantly from surface water, while groundwater is mostly used for water supply in urban areas. Associated with this competition for water use, there is a lack of water coverage for certain areas of the country³ and for some identifiable sub-groups of the population, such as in areas populated by ethnic minority groups and in remote communities.

³ The government has targeted 62 remote and poor districts in a recent phase of priority setting for expansion of coverage (World Bank, 2014c).

Table 2.1: Demographic and water coverage indicators in Southeast Asia

Country	Year	Population density (people per square km of land area) ^a	Urban population (% of total) ^a	Water coverage (%) ^b
Cambodia	2013	85	20.3	91.5
Lao PDR	2008	26	30.8	86.5
Malaysia	2007	81	68.4	94.2
Philippines	2009	307	45.5	77.4
Vietnam	2014	293	33.0	76.3

*No comparable data are available for Indonesia, Myanmar and Thailand.

Sources: World Bank (2017)^a and International Benchmarking Network for Water and Sanitation Utilities (2017)^b

As a means of serving the combined demands for water, energy and flood regulation, Vietnam has one of the largest networks of dams in the world. Over 7,000 dams are spread across the country. However, most were built in the 1960s and 1980s and were designed inadequately with limited technical investigations, meaning many have deteriorated and now place reservoirs at risk (World Bank, 2014a).

Water quality

As a result of natural causes and human actions, poor water quality characterizes surface water, groundwater and coastal waters across Vietnam. As with water use issues, water quality issues are also concentrated on river water. Pollution is particularly severe in downstream sections of rivers. For example, water pollution is at critical levels in the Cau and Nhue-Day river basins, and coastal interactions further impact water quality due to floods and saline water intrusion (UN-Water, 2013). In urban areas, there is growing environmental and public health damage from discharge of untreated wastewater. The main source of pollution remains untreated industrial wastewater. Although the quality of groundwater is higher than that of surface water, there are pockets of groundwater contamination from septic tanks and other effluents in the larger cities and in the Mekong River Delta (FAO, 2011). In addition, while wastewater infrastructure has been provided in some locations, there are insufficient incentives for householders to connect to it. Instead, many households continue to add to the growing impacts from untreated sewage.

In Vietnam, there has been an organized effort to locate much industrial production away from urban centers, and therefore away from urban wastewater treatment systems, where available. By 2012, there were 174 industrial zones active in food processing, chemicals, textiles, leather, pulp and paper production and automobile repair. In 2012, about 40% of these zones were non-compliant, so that about 1 million cubic meters per day of untreated wastewater was being discharged to water bodies. An additional loading is associated with some 2,800 trade villages that specialize in such activities as mining and paper production, where the majority do not treat their wastewater effluent (ODI, 2015).

Pricing and subsidies

Below-cost pricing and excessive subsidies have been further aggravating water scarcity and supply in Vietnam. Vietnam has comparatively low prices and tariffs for water-related services, and hence generates low revenues across the water sector. Various reports claim that these prices are low in relation to the full costs of the services provided; low in relation to prices charged in comparable countries; and low in relation to willingness to pay (for good or better service levels) (ADB, 2010; ODI, 2015; WHO *et al.*, 2012). Although such views are widely reported, there is an absence of publicly available data about revenues, costs and subsidies that support and verify these claims. Another challenge appears to be an absence of data from utilities that expend the full amounts

necessary to cover operations, maintenance and depreciation and that also keep and share their detailed accounts.

The World Bank (2014b) reports that for the water utilities that it studied in Vietnam, the ratio of the approved tariff to the tariff required by the water utility was 87%. (Privately-operated utilities were at 94%, state-owned utilities were at 87% and equitized utilities were at 85%.) Presumably the amounts “required by the water utility” in these estimates include all expenditures on operations and maintenance, as conducted. It is not clear whether these ratios reflect a full and complete program of infrastructure maintenance, or whether they reflect capital (and depreciation) costs of publicly- or privately-owned infrastructure.

There is abundant supporting and anecdotal evidence that prices for water supply and wastewater treatment often do not cover full costs. These include situations where wastewater treatment plants sit idle for lack of funds to cover operating expenses. Or situations where a technical assistance programs such as the Wastewater Management Programme run by GIZ have recommended a ten-fold increase in wastewater charges to some of the utilities participating in the program (GIZ, 2014). Box 2.1 offers selected examples of how other authors have characterized the prevailing mismatch between prices charged and costs incurred.

A key feature of water pricing is the irrigation fee waiver that was introduced in 2008. Through the 1990s and 2000s, Vietnam presented a rare example of a country where users were paying for the full cost of irrigation service operation and maintenance (Cook *et al.*, 2013). However, in 2008, the government issued Decree 115/2008/ND-CP essentially providing a national subsidy to cover irrigation service fees. The fact that farmers no longer pay for the water used has proved to be controversial, with both positive and negative effects of the policy noted by observers. While the waiver has been accompanied by an increase in irrigated areas and rice production, and has provided support for farmers in disadvantaged areas, it has also created problems including reduced incentives to conserve water (Cook *et al.*, 2013).

Historically, irrigation prices were expressed in VND/hectare/season, for each of three irrigation seasons per year. After converting to US dollars, the FAO (2012) reports that irrigation and drainage fees for pumping irrigation services in the Red River Delta formerly ranged from \$33/hectare to \$50/hectare in the spring, and from \$30/ hectare to \$47/hectare in the summer. As an illustration, one can extrapolate such prices to the entire country, where total annual irrigated agriculture was about seven million hectares in 2012 (with three million hectares in winter-spring, two million hectares in summer-autumn, and two million hectares the wet season). The result is an annual revenue foregone of about \$250 million. This amount could be variously characterized as a revenue shortfall, as a subsidy, or as a support to industry. Of course, the irrigated area in 2012 under a fee waiver could be much larger than if fees were to be charged at their former or higher levels. Some agencies may not have the capacity to collect all of these fees even if they were charged.

A draft Law on Irrigation introduced in 2017, calls for market-based irrigation service pricing. Some emphasis is placed on the role of these prices in changing users’ perceptions and encouraging investment. As presented in the draft, numerous irrigation uses are exempted from paying these prices (e.g., irrigation by poor households, households living just above the poverty line, ethnic minority people, and people living in mountainous areas, on islands and in areas with extremely difficult socio-economic conditions). The Ministry of Finance will determine the structure of these prices and the associated maximum levels.

Box 2.1: Selected quotations about water sector pricing levels and subsidy supports

Financially, water supply sustainability has been hampered by low tariffs. Legislation enables water supply companies and local government to increase tariffs, but local political considerations often prevent the timely application of tariff adjustments. Affordability and willingness-to-pay surveys have indicated that consumers are prepared to pay for improved services. Water bills on average are 1.1% of urban household income. Most water supply companies recover at least operation and maintenance costs, with an average working ratio close to 0.7. However, few if any companies achieve full cost recovery, if depreciation, replacement and financing costs are included. Urban water supply systems are therefore still subsidized to a large measure by their respective governments, on a non-targeted default basis (ADB, 2010, p. 7).

The tariffs are set at a low level as it is perceived, though not documented, that a water tariff at the level of full cost recovery would not be affordable in Viet Nam Our interviewees also pointed out that, given the lack of an independent economic regulator for the sub-sector, tariffs have been established below a level that guarantees full cost recovery. In spite of these perceptions, there have been some increases in water supply tariffs through specific projects such as the Asian Development Bank-financed Water Sector Investment Program 2011-2020, where a 70% tariff increase was phased in for HCMC over five years and a one-off price increase of 85% was implemented in Da Nang This demonstrates there is willingness to pay for improved water supply services, particularly in peri-urban areas, and the challenge for full cost recovery may be around an unwillingness to charge (risk of political unpopularity) as opposed to an unwillingness to pay ... (ODI, 2015, p. 15).

Decree No 88/2007/ND-CP stipulated the necessity of collecting drainage fee from households to cover operation and maintenance cost of the drainage systems. However, drainage fee at present is commonly regulated as 10% additional of drinking water bill under supervision of the City People Committees. In general, this drainage fee only meets 10-20% of operation and maintenance cost for wastewater collection system, not covering sufficiently cost for operation and maintenance for wastewater treatment station (if any) and annual depreciation cost. Only does Hai Phong City collect drainage fee at the level of 15% of water tariff and it is planned to increase this fee up to 45% of water tariff in 2015 as mentioned in the roadmap (WHO et al., 2012, p. 15).

When there is a gap between the range indicated by the Ministry of Finance and that proposed by the service provider (company), the local government is responsible for filling the gap between the tariff and the price set by the company in order to enable cost recovery (for all services except those provided through [Build-Operate-Transfer] contracts). In many cases, this represents a significant subsidy provided to companies to enable cost recovery, and the central government in Viet Nam is looking for opportunities to increase the water supply tariff (Decision 1196/2014), to be able to remove all subsidies linked to the provision of clean water by 2020. There is currently no information available on the full scale of these subsidies in Viet Nam (ODI, 2015, p. 21).

In the absence of tariffs to create the necessary incentives for investment, tax deductions and exemptions from corporate income tax and land use fees are the main economic instruments for attracting private investment in the sector, particularly for wastewater and solid waste treatment (ODI, 2015, p. 25).

Accompanying below-cost pricing, Vietnam has high levels of public subsidy for most services in the water sector. In rural areas, subsidised loans and grants have been provided for clean piped water and sanitation facilities. Other forms of public support to suppliers and consumers are given in-kind or through tax concessions, as examples. There is no clear aggregate estimate of the magnitude of annual subsidy to water supply and sanitation in Vietnam (World Bank, 2014c; ODI, 2015).

Kochhar *et al.* (2015) at the International Monetary Fund have prepared estimates of the average levels of subsidy associated with water supply and wastewater services provided by utilities in developing countries in Asia. Their methodology defines a subsidy as the gap between the price a utility would require to cover the full costs of operations, maintenance and capital depreciation and the average price actually received by utilities, accounting as well for non-revenue water. With this focus on water utilities, this methodology might provide an underestimate of public support, since it would not capture any subsidy related to the 95% of surface water used for irrigation, and would not include environmental costs or other costs passed on to downstream users. It might over-estimate public support to some degree where it treats underfunded maintenance as necessarily giving rise to a public subsidy. In practice, with underfunding, the physical state of the infrastructure is often allowed to deteriorate, and the cost appears not as a public subsidy but is borne by customers as a consequent decline in service levels. For 2012, the average subsidy estimate for utilities in developing countries in Asia is 1.6% of GDP, which is almost three times as large as the global average (0.6%) (Kochhar *et al.*, 2015).

Table 2.2 supports the view that these subsidies enable a higher level of use of improved drinking water sources relative to some neighbouring countries; although the use of improved sanitation facilities in rural areas still lags behind urban and national percentages (70% of the rural population uses improved sanitation facilities). In some cases, the systems of improved water supply provided are also still basic and prone to failure due to insufficient management capacity and investment levels.

Table 2.2: Water service and sanitation usage in Southeast Asia

Country	Use of improved sanitation facilities (% of population, 2015)			Use of improved drinking water sources (% of population, 2015)		
	Urban	Rural	National	Urban	Rural	National
Cambodia	88	30	42	100	69	76
Lao PDR	94	56	71	86	69	76
Malaysia	96	96	96	100	93	98
Philippines	78	71	74	94	90	92
Thailand	90	96	93	98	98	98
Vietnam	94	70	78	99	97	98

*No comparable data are available for Indonesia and Myanmar

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

2.2 Key obstacles to more sustainable water management and use

In order to achieve more sustainable and socially inclusive water use and management, there may be a number of institutional challenges to overcome. Vietnam faces several such obstacles in addition to its biophysical limitations.

Financing

In a country with high historical levels of public expenditure and public water provision, there are well-defined public plans for water-related finances in Vietnam. However, as Table 2.3 shows, plans and budgets exist conceptually, and may be agreed upon formally, but are often not sufficiently

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 available for Indonesia and Myanmar

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

implemented. Budgets for drinking water in rural areas form one exception; Vietnam performs favourably by this metric compared with other countries in the region. However, the implementation of government financing plans appears to be lacking at the urban and national scales, and public finances do not meet the sector requirements.

With increasing public debt, Vietnam has set in motion a variety of processes to fulfil investment needs with private capital. Central to this transition is the ongoing policy of equitization (partial privatisation), which aims to provide incentives for international and domestic enterprises to invest in priority environmental programs, including those in the water sector (World Bank, 2014b). Equitization has not been as comprehensive as anticipated, with 23 of the 79 water and wastewater utilities having been equitized as of 2014. ODI (2015) reports that there is no evidence in Vietnam so far to suggest that equitization has resulted in improvements in financing and service quality. This is due to a variety of contextual obstacles. First, many utilities are viewed as unattractive to investors, because of their small size and location in poor and remote areas. As such, there are insufficient incentives to invest in risky and potentially unprofitable ventures. In some instances, Vietnam can be considered a difficult environment for foreign direct investment, as well as for investment of domestic savings (ERIA, 2014). This can be attributed to a number of regulatory and institutional challenges outlined below.

Management and regulation

Ineffective management and regulation remain a barrier to effective water use among competing users, and limit the national investment environment. To achieve more effective water use, UN-Water (2013) highlights the need to apply relevant management tools, including licensing and sanctioning, while ERIA (2014) underlines the negative impacts of red tape and bureaucratic delays, and the inadequacy of monitoring mechanisms at many levels. Fundamental to these obstacles is often the lack of awareness and knowledge of appropriate sustainable water management practices, and a shortage of appropriate human resources to communicate and administer appropriate tools. These issues transcend numerous sectors beyond water supply and sanitation (Pincus, 2015).

Institutional coordination

In a situation with jurisdictional fragmentation, there are gaps and overlap that are not effectively coordinated under a common water policy, agency or ministry. The current strategy is sub-sectoral, rather than national or even regional or basin-level. 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. When each of the 63 sub-national jurisdictions acts in isolation the country may fail to capture some regional economies of size. In addition, although data are available for sanitation and drinking water, they are not sufficiently used for decision making due to various institutional inefficiencies (UN-Water and WHO, 2017).

Box 2.2: World Bank review of practices affecting the sustainability of rural water supply

A 2017 study by the World Bank (2017b) emphasizes that global progress toward the SDG 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 affecting the sustainability of rural water supply, the study sets out five building blocks for sustainability: institutional capacity, financing, asset management, water resources management, and monitoring and regulatory oversight. The authors apply a numerical scoring system at the national level for each of these five components to award Vietnam a national rating of moderate progress overall and on each of these criteria individually. This rating signifies that some elements within each building block have been addressed, but more still needs to be done to address challenges, or that there has been mixed progress

As elaborated further in AguaConsult (2016), on an eight-point scale, Vietnam scored five points each for financing and water resources management; four points for asset management; and three points each for institutional capacity and monitoring and regulatory oversight. The resulting total (20 of a possible 40 points) can be compared within Asia to scores for Bangladesh (10), Nepal (14), Indonesia (18), India (24) and China (28).

3. Investment trends and needs in the water sector in Vietnam

3.1 Investment trends and estimated investment needs in the water sector

Over the past twenty years, there has been a decline in government expenditures on water-related activities as a proportion of the overall national budget (less than 10% of overall budget) (FAO, 2012). Table 3.1 shows that between 2002 and 2011, the government invested an average of \$1,140 million (in constant 2010 USD) per year on water-related programmes including infrastructure projects (UN-Water, 2013). Hydroelectric power plants received by far the largest proportion of government expenditure (50.6%) in the period, indicating their dominance in recent history. Water supply and sanitation followed as a government expenditure priority (27.8%, sum of rows 3 and 4), with agricultural water resources then making up 17.3% of expenditure in the water domain. Also for the period between 2002 and 2011, official development assistance amounted to an average of \$240 million per year. Official development assistance disbursement shares reflect considerably different investment priorities, with almost half going to water supply and sanitation.

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

No.	Users	Annual average government expenditure (million constant 2010 US\$)*	Percentage (%)	Annual average official development assistance gross disbursements (million constant 2010 US\$)	Percentage (%)
1	Hydroelectric power plants	577.63	50.6	29.54	12.3
2	Agricultural water resources	197.54	17.3	37.29	15.5
3	Basic drinking water supply and basic sanitation	172.12	15.1	31.92	13.3
4	Water supply and sanitation in large systems	144.97	12.7	80.54	33.5
5	Disaster prevention and preparedness	31.00	2.7	24.36	10.1
6	Water resources policy and administrative management	11.15	1.0	12.79	5.3
7	Water resources protection	6.16	0.6	9.02	3.7
8	River development	0.00	0.0	15.06	6.3
	Total annual average	1140.57	100	240.52	100

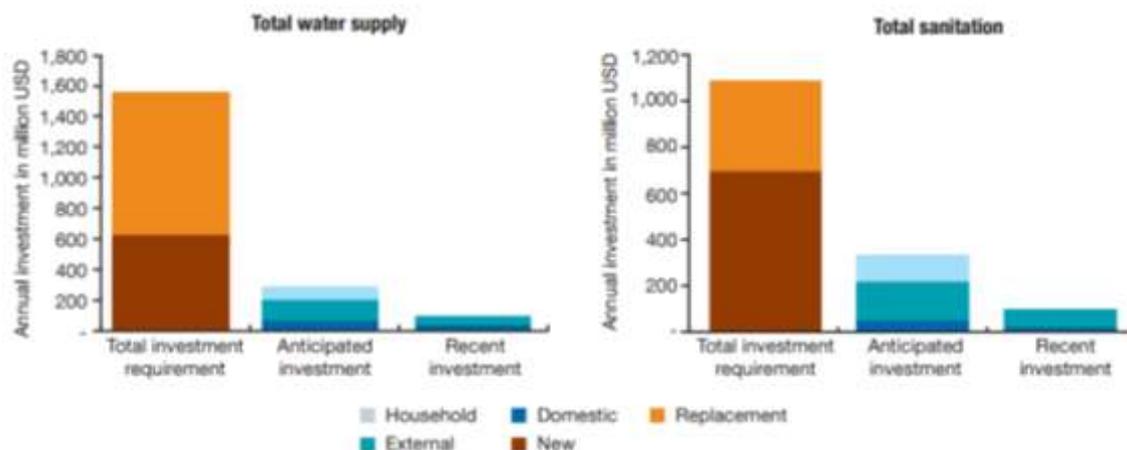
*Government expenditure includes some Official Development Assistance (ODA). It was not possible to separate funds from government sources and ODA.

Source: UN-Water (2013)

Figure 3.1 summarises the required investments versus anticipated and recent investment levels, highlighting a substantial deficit and the need for larger capital flows. Meeting national targets proposed for 2020 requires around \$1.6 billion per year for water supply and \$1.1 billion annually for sanitation, based on a 2014 assessment by the World Bank (2014c). These coverage targets include: (i) 85% of urban households having access to a public piped water supply; (ii) 75% of rural households having access to drinking water that meets health standards; (iii) 45% of urban wastewater being treated; and (iv) 85% of rural households having sanitation usage at least as good

as a hygienic latrine that meets ministry standards. The majority of this capital (87%) is required to expand water and sanitation systems further in urban areas. This includes replacement of existing assets. The same World Bank study estimates that these water supply investments are required for 3.7 million people (half in rural areas and half in urban areas), while 1.6 million people in urban areas are in need of access to water, and two million latrines are required in rural areas by 2020. The Ministry of Construction identified urban sewage investment needs for the 2016-2020 period to be \$3.2 billion (ODI, 2015).

Figure 3.1: Required, anticipated and recent expenditures for water supply and sanitation in Vietnam



Source: World Bank (2014c)

3.2 Main sources of investment in the water sector

Historically, public forms of investment have dominated the water sector in Vietnam. Table 3.1 provides a breakdown of water-related public expenditure in recent years. However, with rising public debt and numerous competing investment demands, recent policy emphasizes meeting investment needs with private capital. This shift is further necessitated by Vietnam’s new-found status as a middle-income country. In future, official development assistance flows to Vietnam are expected to fall relative to when national income was lower. Inefficiency or ineffectiveness in mobilisation of private investment may be a serious cause for concern once it is no longer feasible to rely as heavily on official development assistance.

Examining the broader breakdown of investment sources in Vietnam, as of 2014, the sources of investment funds in all forms of infrastructure were split relatively equally among the government (28%), the private sector (35%) and official development assistance (37%) (ERIA, 2014). While most private investors in the water sector at large are domestic enterprises, the main sources of external funding include the Asian Development Bank, the World Bank, the Japan International Cooperation Agency and the French Development Agency, along with the governments of Finland, Denmark, Netherlands and South Korea, in particular (ERIA, 2014). Figure 3.2 illustrates the historical patterns by which different sources and forms of capital have been deployed across the water and sanitation sectors in Vietnam.

Figure 3.3 depicts the number of private investment projects in the water and sewerage sector between 1994 and 2010 relative to other major sectors of the economy. It shows that water and sanitation attracted fewer private investment projects than other sectors (despite it being a priority sector by legislation), owing to several obstacles and inefficiencies described in section 2.2.

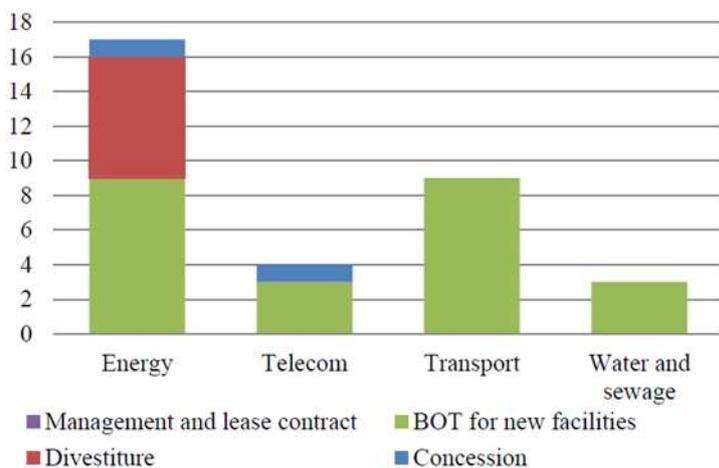
Figure 3.2: Sources and forms of capital in the water sector in Vietnam

Level of private investment		Established	Emerging			Limited	
Sub-sector/source of capital		Urban water supply (large) ¹	Urban water supply (small) ²	Solid waste collection and treatment ^{3,4}	Wastewater collection and treatment ⁵	Rural water supply and sanitation ^{6,7}	Irrigation and flood control
Grants (private – including philanthropy and CSR)	Public	Domestic (national and local) International (ODA, Australia, Japan, Korea, Norway, Denmark, France, Finland, Belgium, US, Italy)	Domestic (SARAO) International (ODA, Australia, Denmark, Finland, UK, Netherlands, Belgium, Germany, Italy)	Domestic (national and local) International (ODA, Germany, Norway, Japan, France, Switzerland, US)	Domestic (national and local) International (SARAO, Australia, AFD, ODA, UK, New Zealand, Germany, Norway, UNICEF)	Domestic (NTP and local – People's Charities) International (SARAO, AUSAID and DFID, ODA, UK, New Zealand, Germany, Norway, UNICEF)	Domestic (MARD, GARD) International (AEC, WB)
	Private		International (Bill & Melinda Gates Foundation)		International (Bill & Melinda Gates Foundation)		
Debt (private – including DTC, market traded, microfinance etc)	Public	International (ODA, Japan, France, WB, ICA, WI, ADB)	International (ODA, Japan, WB, ICA, Germany, Korea, ADB Special Funds, France, Korea, Italy)	International (FMO, Sweden, DEG, Finland, ODA, WB, ICA, ADB Special Funds, France, Japan)	International (WB, ICA, DANIDA)	Domestic (NTP and Vietnam Bank for Social Policies via credit groups) International (WB, ADB)	International (WB, ADB)
	Private	International (Malaysia)					
Equity (direct and indirect, including balance sheet finance)	Public	Domestic (Joint Stock Companies)	Domestic (Joint Stock Companies)	Domestic (Joint Stock Companies)	Domestic (Joint Stock Companies)		
	Private	Domestic (Joint Stock Companies) International (Philippines)	Domestic (Joint Stock Companies and households)	Domestic (Joint Stock Companies) International (US)	Domestic (Joint Stock Companies)	Domestic (households)	Domestic International (Norway)
Guarantees (including loan insurance)	Public	Domestic (VGD see Section 4.2.4)					
	Private						

¹ Information for ODA is for the categories "water supply & sanitation – large systems" and "water supply – large systems" in the OECD DAC Database
² Information for ODA is for the category "basic drinking water supply and basic sanitation" in the OECD DAC Database
³ Information for ODA is for the categories "sanitation – large systems" in the OECD DAC Database
⁴ Information for ODA is for the categories "basic sanitation" in the OECD DAC Database

Source: ODI (2015)

Figure 3.3: Number of private investment projects in Vietnam by sector, 1994-2010



Source: ERIA (2014)

The general situation presented here is one of transition from relatively high reliance on public investment in public provision toward encouragement of some degree of private investment. This transition has been accompanied by the transition from state-owned enterprises to new forms of private operation and management. For a country facing the challenges of increasing public debt levels and having numerous competing investment demands, recent policy emphasis has been on meeting a share of the investment needs with private capital, mostly from domestic investors. At work here are various models of public-private partnerships, equitization, privatization and socialization, most often with a continuing, sometimes controlling role to be played by the state-owned enterprises that historically managed these assets and services.

3.3 Assessing the state of investment flows to the water sector

To assess the state of investment flows into the water sector in Vietnam, one can focus on issues that influence the levels of private funding, and factors that determine the effectiveness of those investments, especially the process by which those investments are governed and regulated. These two aspects of the funding situation are highly inter-related in their bearing on current practice and on opportunities for further reforms. Each of them is addressed next.

Section 2.2 highlighted that the water sector has historically been funded from public funds and official development assistance, with relatively little capital raised from tariffs or from private investors. Since 2002, the process of equitization has been available for state owned enterprises in the water sector, and in practice, since 2007, has resulted in some amount of new private sector investment.

Equitization and public-private partnerships

The process of equitization involves transforming a public, state-owned enterprise into a so-called joint stock company by selling an equity position to one or more private investors. The effect is to introduce private financial capital into the water supply or sanitation sector, expanding opportunities and freeing up public capital for use elsewhere. In Vietnam, the government chooses to continue to own a majority position in the newly created firms but typically allows the minority investors to exercise (some) control over operations. The process may provide other benefits, such as gains from improved management and technology that the new investors bring to new firm, or from greater operational flexibility associated with the joint stock company organizational structure.

As of 2014, 23 of 79 water supply companies in the Vietnam Ministry of Construction Water Database had been fully equitized. Twenty had been equitized between 2017 and 2011, with three more of these investments taking place between 2011 and 2014. Ten of these 23 companies offer both water supply and wastewater services. Among the other companies in the database, 51 were state owned and operated, and five were characterized as private companies created through some extended form of private stock ownership (World Bank, 2014b). Most of the equity capital coming from the private sector into equitized firms in the water sector is of Vietnamese origin (domestic private finance). The limited investment of international equity (from the Philippines) has targeted large urban water supply (ODI, 2015).

With private equity investments in equitized firms, there is no apparent process or requirement to report publicly the financial magnitudes or other terms of the specific equitization investments that are made in each case. Government policy on equitization varies by sector, with a target set in 2011 for the state to continue to hold 51-65% of the share capital in equitized firms in the water supply and sanitation sector (ODI, 2015). In the ten water supply companies that were first equitized, some of the state ownership levels were reportedly in the 75-95% range (World Bank, 2014b), and it is not

clear whether these companies will be made to comply with the revised and expanded target for private share capital.

There are potentially a number of challenges to prospective investors presented by these equitization opportunities, such as the difficulties for the private investors to work productively with the government as a mandatory business partner (World Bank, 2014b). Other concerns include a lack of transparency in the choice of equitization investors, and uncertainty about the regulatory and policy environment that will govern future operations. In some cases, ownership of public assets and liabilities passes to the new joint stock company, raising concerns about the methodology and the accuracy attending these valuations. In other cases, the joint stock company may not acquire ownership of the asset base but gains responsibility to manage and operate the existing publicly owned assets and infrastructure. With or without legal ownership of the infrastructure, under a regime where approved prices are insufficient to allow full maintenance and reinvestment in the capital stock, the equitized firm's "assets" can quickly become liabilities for the shareholders.

An outcome to be avoided is one in which, through equitization, some new private investors might find that the most profitable operating strategy for their shareholders would be to dis-invest passively, intentionally allowing the capital stock to deteriorate or depreciate. Especially where the approved tariffs are insufficient to cover all of the necessary operational and maintenance expenses, the new managers may be challenged to perform adequate ongoing re-investment and maintenance that could sustain or enlarge their investment. Although such disinvestment is inconsistent with promoting the long-term future value of the equitized firm, this strategy could be privately advantageous to the shareholders of the private equity partner. From the perspective of private shareholders, any opportunity to move cash flows to the private firm (in such forms as wages, management fees, dividends, and so on) might offer a higher (short-term) return than investing in the infrastructure base.

If ongoing changes in the levels of investment in equitized infrastructure are low or negative, then there is a risk that, at some future date, the equitized firm will demand substantial (perhaps unforeseen) price increases and/or publicly provided capital grants to put investment back on track. Such a request might be made necessary by an emergent crisis such as when there is some 'unexpected' operating failure of the service. Under such a scenario, these funding requests could be accompanied by the credible threat that (without new funding) the private operator would leave the industry, placing the responsibility for resolution of operational problems back on government. Harris *et al.* (2003) reviewed a series of privatizations from the 1990s, and found that the water sector had the second highest rate of project cancellations (3.5%) across all sectors, and these included cancellations in China, Malaysia, Africa and South America. These cancellations were attributed to an inability on the part of private operators in the water sector to generate and collect sufficient revenue.

If the operations of equitized firms in Vietnam were to be made subject to mandatory regulatory oversight in future, then this issue would presumably be an important target of such monitoring. A regulator could act to minimize the prospect that equitization would result in disinvestment in the productive asset base. Regular review and approval of tariff structures would include independent examination of investment practices—relative to the ongoing costs of maintaining the infrastructure asset base—along with significant measures of coverage and operating performance.

The process for the creation of public-private partnerships—legally distinct from equitized firms—has been used far less than the process for equitization in the water and sanitation sector. The nationally determined procedures for creation of public-private partnerships include a more open and transparent process for recruiting and selecting investment partners, and for prescribing future

roles and responsibilities. The contracts that establish a public-private partnership place specific performance and behavioural obligations on the private investors that may be more demanding on them than if the equitization approach to investment were to be followed (World Bank, 2014b).

Historically, utilities have had the legal ability or authorization to borrow directly from financial markets through loans or from the sale of bonds or debentures. This has been the case for those operated as state-owned enterprises as well as for public-private partnerships and equitized firms. In practice, this form of financing has not been used much in Vietnam, since commercial investors are concerned about investment risk and would prefer to see state guarantees of repayment. In the case of concessional lenders, including foreign donors, direct lending to utilities has been used, but is less a market investment transaction than a coordinated allocation of the official development assistance currently available (ODI, 2015).

According to the World Bank (2014c), it is difficult for most water and sanitation companies to access commercial finance. The perceived risks remain too high. As ODI explains:

There is limited access to domestic or international debt finance within the sector. Although concessional finance and guarantees are available to public and private investors for the development of water supply and domestic solid waste facilities, these are provided only through Viet Nam Development Bank's specific pilot credit lines, which are supported by donor finance rather than by the commercial banking sector (2015, p. 25).

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 not only upon the levels of investment, but on the supporting regulatory environment and its influence on the effectiveness of the capital that is invested. The governance and regulation of the water sector includes both the legal framework that establishes responsibilities and accountabilities as well as the active implementation role played by public agencies to monitor, guide and oversee activity in the sector (OECD, 2015b). 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 the customer base take on special importance, and 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 Vietnam, 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, 2014b). 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 it is that one is investing in and whether it meets apparent needs.

The documentary record and discussions with stakeholders suggest that Vietnam has been able to achieve relatively low levels of service at relatively low cost, but that there are discrepancies between the bundles of services that customers receive and what they would be willing to pay for. Much of the evidence points to plans to improve levels of service, but it is not clear that there is any mechanism to encourage the types of investment that will make those gains possible. Without having a clear statement about the preferred levels of service—both for the present and for the longer term—there may be no specific basis upon which to judge whether or not equitization or other investment practices are succeeding in terms of achieving intended results (ADB, 2010; World Bank, 2014b).

An apparent feature of both equitized and state-owned utilities operating in Vietnam is that the regulated prices they charge, and thus the revenues that they receive are based to a large degree on notions of historical capital costs and operating costs. This gives rise to the problems of ‘path dependency’ and ‘multiple equilibria’ in the level of services to be provided. For instance, many jurisdictions have previously had low rates of investment with a small capital base and have offered low levels of service as measured by continuity of service, water quality, spatial coverage and so on. Given this low capital stock, the operators are awarded relatively low approved tariffs that cannot support, and do not encourage, increases in the level of investment. These utilities and their customers are trapped in a financial and regulatory trap at a low level of service, even where there may be substantial willingness to pay among the customer base for better service. Conversely, other jurisdictions have historically had higher capitalization that is supported, in turn, by higher approved prices. Their customers pay for and enjoy relatively better service levels. There does not appear to be any clear regulatory process or policy guidance that encourages and supports public or private operators in either jurisdiction to move away from their historical levels and patterns of investment to one that matches the identifiable needs of the current market.⁴ Said differently, even if there were relatively high rates of investment in infrastructure, for example, the current governance approach may support a system where the ongoing quality of service does not meet customers’ needs.

While these levels of service are important considerations for the effectiveness of any investment plan, 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 (within a single utility organization) one or more systems that are large enough to take advantage of various types of cost savings.

In Vietnam, some steps of the equitization process have broken apart larger service units into smaller utilities. This appears to have been done without full attention to the effect this could have on the ability to achieve cost savings through appropriate choice or design of technology in the long

⁴ According to World Bank (2014b, p. iv), “Decree 117 (Water Decree) requires the establishment of a contractual relationship between local state governments and the water supply companies, and Article 31 of this Decree includes specific content covering these particular issues. Decree 117 has not yet been implemented.”

run. In some cases, water production has been severed organizationally from water distribution, or water distribution has been divided up spatially into separate operating units (World Bank, 2014b). In some cases, utilities might be able to operate more efficiently if they could combine customers across existing municipal or provincial 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 government's intention to provide water and wastewater services to people living in newly urbanized areas. At the national level, some responsibilities for urban versus rural water are split between the Ministry of Construction and the Ministry of Agriculture and Rural Development, respectively. Migration will create pressure to adjust their jurisdictional authority to changing definitions of "urban" and "rural." At the local level, the service areas of some equitized firms have excluded peri-urban areas. In some cases, these areas represent under-served populations, sometimes with lower income levels or with higher cost of service due to lower housing density. 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 where the investment process is able to support a high average level of the continuity of service over the course of each week, it is 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. 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. Currently in Vietnam, it is not uncommon to experience significant water supply interruptions due to exceptional events. At present, there is no clear process in place 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, 2014b).

Recent public policy changes (e.g., equitization) have created a number of private monopolies with large markets, and this is now accompanied by a commensurate need for public oversight. In general, in the water and sanitation sectors of Vietnam investment processes appear to lack independent and objective oversight. In some cases, agencies such as the Provincial Peoples Committees, exercise important regulatory and oversight functions at the same time as these Committees are sharing financially the investment and operating risks of some of the services that they regulate, such as through the operation of their water supply companies (World Bank, 2014b). This arrangement places the regulators in an apparent conflict of interest that can impede their effectiveness.

Regulatory capacity is also important when exploring new forms of legal organization and alternative models of service delivery. In some cases, the oversight of newly equitized firms or public-private partnerships is a relatively new regulatory role for some of the 63 sub-national jurisdictions, and they may lack the full capacity to play this role effectively.

As an example, in the wastewater sector, there is a move to the use of performance contracts. These contracts would define the role of either a public or equitized 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. Historically, these wastewater services were provided by state-owned enterprises under an annual budget allocation from the Provincial Peoples Committee. These budgets were based on a process that largely reflected the cost of labour services (GIZ, 2014).

For these utilities, a more comprehensive approach to budgeting for all maintenance and operation activities—especially in an era with private investors—is based on a model or framework that depends on a full inventory of the infrastructure asset base for each service provider, and on the annual activities and upgrades required to keep those assets operational at the desired level. Recent processes to develop such models and cost estimates have included the participation of City Peoples Committees, the Provincial Peoples Committees, the national ministries of Finance and Construction, the service companies, stakeholder groups and others. The German donor, GIZ, has been guiding the implementation of such approaches in at least nine provinces through its Wastewater Management Programme (GIZ, 2014).

In some cases, there are insufficient historical data available for that exercise. Commitments to gather new data going forward can improve the quality of the budgets to be prepared. For example, when there is agreement to use an approach that covers operations, maintenance, plus reinvestment to match depreciation, one of the results is a more careful (and cost-saving) determination of labour force size so that funds can be targeted to other needs. In some cases, the recently estimated budgets that include operations, maintenance plus an allowance for depreciation and a rate of return on private investment are orders of magnitude higher than what has been allocated historically. As it becomes accepted practice to base price-setting on the use of norms and benchmarks for operating costs, there will be a chance to learn and to compare across jurisdictions. Especially in the early stages, there may be little exact or precise information to calibrate the process, and there is room for multi-party comparison and negotiation of approaches and estimates used in costing. In this evolving environment, there could be a valuable role for an arm's-length, independent regulator to assess and monitor the data, assumptions, methods and results upon which all of these pricing and investment decisions will rely.

4. Analysis of fiscal and pricing policy framework for water

4.1 Existing fiscal and pricing measures in the water sector

In Vietnam, as elsewhere, the significant role of the state in regulating and supplying water and wastewater services makes necessary certain patterns of public expenditure, facilitated by the design and use of various fiscal instruments. It also provides opportunities to raise revenues from these activities. Some of these expenditures appear in government budgets (at national, provincial or local levels) in order to fund the continuing water-related operations of government agencies. Public funds might also be budgeted to invest in publicly owned infrastructure, or to make transfers and subsidies to other private and state-owned enterprises who have assumed responsibility for service delivery. Public collection of various forms of fees, taxes and charges is one way to mobilize domestic revenues for public use. In cases where private funds are invested in water and wastewater services, authorizing the tariffs under which private firms collect revenue streams from customers offers a means to promote responsible management and operation of the infrastructure asset base and to encourage productive investments. Of course, for governments, charging fees or providing subsidies can also have important effects on the behaviour of suppliers and their customers. It can influence overall performance of the water sector and the efficiency of resource use.

Some 63 sub-national jurisdictions (58 provinces and 5 municipalities) play an official role in approving or regulating water prices and wastewater fees and charges, subject to some oversight from national government authorities (Nguyen, 2013). Specifically, in each province, the Provincial Peoples Committee adjudicates water pricing decisions but is guided in that process by water pricing directives set at the national level by Ministry of Finance. For instance, the Ministry of Finance prescribes a process for setting the prices that apply for domestic water use and sets lower and upper bounds on what these prices may be. The price of water for business uses is then capped at three times the ceiling price for domestic water use. Self-supply for household use from groundwater or surface water is free.

In practice, there has been a rigid adherence to increasing block rate water tariff structures for domestic water supply. The approved prices are further increased by the 5% value-added tax. There is considerable observed variation in the levels of tariffs, and in the sizes of the increasing rate blocks established over recent years across the country. These differences 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 according to the type of business activity being operated. For water supply to non-domestic users (common categories include administrative agencies, public service organizations, and state-owned production units), water prices per unit are often constant across monthly usage levels (i.e., they follow a uniform volumetric rate design and not the increasing block rate design used for households).

Historically, sanitation charges, referred to as 'environmental protection fees,' have been levied as a supplementary fixed percentage (typically 10%) added to water supply prices in some jurisdictions. More recently, a price-determination process for sanitation has been introduced in a few jurisdictions. This process incorporates the specific cost of providing domestic wastewater service into the fees that may be charged. In those jurisdictions, the wastewater price is charged instead of the environmental protection fee.

For industrial wastewater discharge, from 2017 a wastewater discharge fee has been introduced for specified industries that has a two-part fee structure.⁵ Specifically, firms in these industries pay a fixed annual fee plus variable charges that are based on the concentrations (milligrams/litre) in the discharged effluent of six listed contaminants or water quality parameters (mercury, lead, arsenic, cadmium, chemical oxygen demand and total suspended solids). Note that, conceptually, this fee plays a different role than a price for wastewater treatment. The firms are responsible for treating their own discharges, and the quality sensitivity of the effluent fee is intended to encourage firms to improve the quality of the effluent (via better treatment prior to discharge) in order to qualify for a lower fee.

Some jurisdictions provide explicit or implicit subsidies from public funds to address their specific concerns about affordability of water supply and wastewater treatment by poor households. One observed approach is to set specific tariffs that apply to all users in a low-income region or area, such as in Bình Thuận province. There, domestic users in the ethnic minority upland area face a price for the first 10m³ per month that is about one-third less than the price charged in other areas of the province. Similarly, in Da Nang, rural users face a price schedule that is about 25% lower than for urban areas. In some provinces, the first 4m³ per month are provided free to all users, or in some cases only to patriots and war families. Another approach is for the Provincial Peoples Committee, which regulates water supply prices, to authorize a water tariff that is less than what a utility has requested or proposed based on notions of cost recovery (ODI, 2015). In such cases, the Provincial Peoples Committee may commit simultaneously to filling the expected revenue shortfall from other public funds. (As will be seen in Section 4.2 for the cases of Chile and Colombia, unless the targeting of subsidies is done with considerably greater precision than described here, one should expect to see considerable “leakage” of subsidy funds to households in the upper deciles of the income distribution.)

As a specific example of a water supply tariff, Table 4.1 shows the current prices charged for water supply in Hanoi. Under these tariffs, there is no fixed monthly fee that is payable in addition to these volumetric amounts. For households, the monthly bill is calculated by charging 5,973 VND/m³ for all units of metered consumption up to 10m³/month, then adding a charge of 7,052 VND/m³ for all units of metered consumption above 10m³ and up to 20m³/month, and so on, to which the 5% value-added tax and the environmental protection fees are added. The (non-taxable) environmental protection fees are 10% of the calculated monthly water supply charge before adding the value-added tax. In the two-year period from 2013 to 2015, prices in the first three tiers rose by about 43%, and in the highest tier and for non-domestic users, prices increased 50% or more. There was no price increase in 2016.

Table 4.2 shows the current prices charged for water supply in Ho Chi Minh City, where prices have not increased since 2013. Notable differences observed in Ho Chi Minh City relative to Hanoi are: (i) the definition of prices and price blocks in units of m³/person/month and (ii) a difference in the number and size of the increasing price blocks for household users. Since not all households in Ho Chi Minh City have the same number of residents, it would not be possible to compare the two cities’ tariffs directly, except on an average household basis.

Notice that if two or more families (or a larger, extended single family) share a single water meter in Hanoi, then relative to a smaller, nuclear single family in Hanoi, they are more likely to face a higher marginal (and average) price per cubic meter for their water consumption. This is because some of

⁵ As provided in Decree No. 154/2016/ND, some of the entities that are subject to these fees include facilities producing fertilizer, chemicals, pharmaceutical products, pesticides, building materials, office stationery, household utensils; metallurgical and mechanic facilities, manufacturers of metal, machinery and spare parts; electronic and electrical component and device manufacture facilities, and so on.

Table 4.1: Water tariff for Hanoi

Water consumption (m ³ /month)	Price after 10/2013 (VND/m ³)	Price after 10/2014 (VND/m ³)	Price after 10/2015 (VND/m ³)
Households			
The first 10m ³	4,172	5,020	5,973
From 10m ³ to 20m ³	4,930	5,930	7,052
From 20m ³ to 30m ³	6,068	7,313	8,669
Above 30m ³	10,619	13,377	15,929
Other users (constant price per m ³ for all units consumed)			
Administrative and public service organizations/units	6,450	8,381	9,955
Material production	7,668	9,796	11,615
Businesses and service units	14,137	18,342	22,068

Source: Based upon Decision Numbers 38/2013/QD-UBND and 39/2013/QD-UBND.

Table 4.2: Water tariff for Ho Chi Minh City

Water consumption (m ³ /person/month)	Price after 2011 (VND/m ³)	Price after 2012 (VND/m ³)	Price after 2013 (VND/m ³)
Households			
The first 4m ³ /person	4,400	4,800	5,300
From 4m ³ to 6m ³ /person	8,300	9,200	10,200
Above 6m ³ /person	10,500	11,000	11,400
Other users (constant price per m ³ for all units consumed)			
Administrative agencies and mass organizations/units	8,100	9,300	10,300
Production units	7,400	8,200	9,600
Businesses and service units	13,500	15,200	16,900

Source: Based upon Decision Number 103/2009/QD-UBND. Decision Number 24/2016/QD-UBND authorized collection of the environmental protection fee for domestic wastewater in Ho Chi Minh City from 2016.

their consumption is likely to fall in higher price blocks. Conversely, in Ho Chi Minh City, two households of different sizes but with the same levels of water usage per person would pay the same price per cubic meter of water. In Hanoi, as in many other cities, the inter-household difference in prices paid per cubic meter does not reflect any difference in the cost of supplying the water. This price difference is only due to the difference in the size/composition of the household or in the households' access to additional meters or water-service supply points (in the case of households sharing a single meter connection). Indeed, if the utility company were to provide additional meters or service points under the Hanoi (m³/month) tariff structure, then, with unchanged consumption levels, their revenues would fall with additional expenses incurred. (Vietnam has a policy of providing free water supply connections to everyone, but budgetary allocations for that purpose fall short of evident needs (World Bank, 2014b)). Across Vietnam, but not in Ho Chi Minh City, this common feature of the current tariff may discourage the upgrading of communal water access points to provide private household service connections and may financially penalize larger households and those with collective or communal access to metered sources.

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 Vietnamese cities. Based on these data, Table 4.3 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 average rates charged are five to six times higher than in the countries with the lowest rates, and Vietnam's rates appear slightly below the average for the group.

Table 4.3: 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)

In Vietnam, as in many other countries, agricultural demand for irrigation water is the largest consumptive use of water. In 2008, the government of Vietnam established a policy reform that waived or removed the collection of most irrigation service fees. These amounts had previously been payable by irrigators to irrigation and drainage management companies and to water-user organizations. This policy reform was motivated by concern about the low levels of income among many farmers, about low collection rates for the prevailing fees, and about levels of indebtedness of the irrigation and drainage management companies to their energy suppliers (Cook *et al.*, 2013).

After the 2008 policy reform, there was an increase in rice production and in farmers' incomes.⁶ The irrigation and drainage management companies benefited from a reliable flow of income (directly

⁶ There is no specific attribution of these ensuing changes to the price waiver itself.

Box 4.1: Payment for ecosystem services schemes in Vietnam

Payment for ecosystem services (PES) schemes provide financial incentives and other forms of rewards to land users to maintain or improve the delivery of valuable environmental services (FAO, 2013). Rewards include capacity development, knowledge sharing and risk alleviation, while services include preservation of biodiversity habitats, carbon sequestration and protection of watersheds (i.e., public goods). PES schemes are often considered an innovative way to finance an improvement in natural resource management, while simultaneously providing opportunities to enhance incomes and livelihoods (Suhardiman *et al.*, 2013). However, the success of PES schemes globally has been mixed.

Vietnam was the first country in Southeast Asia to introduce a national PES law, with the aim of protecting forests. Under the country's PES scheme, water utilities and tourism industries buy services from farmers and households on allocated forest land. The scheme is deemed successful insofar as it has provided a source of revenue for the state for forest protection, but there are several concerns regarding high transaction costs, distribution, and the legal status of communities involved in the scheme (To *et al.*, 2012; Suhardiman *et al.*, 2013; de Silva, 2014).

In many cases, income does not necessarily reach the poor since companies pay the fees to the government rather than to the service provider. Subsequent disbursements are determined by the state, and may be prone to elite capture (To *et al.*, 2012). In addition, under the scheme, communities are not recognised as legal entities, so do not have forest land transfer, lease and mortgage rights in practice. The Vietnam experience therefore cautions about specific potential pitfalls to the use of this economic tool.

from government) that allowed them to increase maintenance and other core activities. At the same time, there were concerns about the sustainability of adequate funding of irrigation activities solely from public budgets. There also was concern that removal of the fee payment mechanisms would reduce the irrigators' accountability to use water efficiently and might reduce the accountability of the irrigation and drainage management companies to the irrigators they serve. Subsequent discussion among international donors has renewed calls to reinstate some form of irrigation fees, if only to cover costs of operations and maintenance, with infrastructure expansion and renewal to continue to be financed publicly as at present (Cook *et al.*, 2013). These suggestions appear to be in line with the 2017 draft law to reinstate irrigation fees described in Section 2.1.

Subsidies represent another fiscal instrument that is used to support the water sector, such as when expected shortfalls in revenue from pricing are met explicitly from other budgetary sources, such as from Provincial Peoples Committees. Another form of subsidization occurs through so-called tax expenditures, when governments provide an exemption from taxes that would otherwise be payable. For example, Decree number 124/2011/ND-CP provides an explicit exemption to water supply units from land use fees and land rent for water supply works, where these works are defined broadly also to include premises used for administration, management and other activities. Some water supply companies have been exempted from paying corporate tax, and there are exemptions or reductions on the import taxes that would otherwise be payable on some equipment and materials. There are programs of concessional loans and loan guarantees for construction of wastewater treatment facilities, and grants and loans to rural households to encourage their adoption of safe water supplies and sanitation (ODI, 2015).

The revenues collected for water supply service 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. Environmental protection fees are directed to provincial budgets and are earmarked for use in environmental management and resource protection.

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 plus environmental protection fees) 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.

Among the range of fiscal instruments in use in Vietnam as elsewhere, is a mechanism referred to as payments for ecosystem services. The most direct connection to water supply and sanitation is the role that such financing can play to support the preservation and protection of upland watersheds in their role as a water source for diverse uses. That is, funds spent here can potentially represent a cost-effective investment in water supply and in water quality improvement. Any additional effect of these payments to increase rural incomes can also support rural communities' abilities to become effective demanders of water supplies and sanitation services, especially under user-pay type systems. See Box 4.1 for a brief overview of the use of this approach in Vietnam.

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 Vietnam. Section 2.1 presented views and evidence that the revenues raised are too low to cover operating and maintenance costs in many instances, and fall short of covering capital costs and/or the user cost of the water resources themselves. In some sectors, such as irrigation, historical public policies have set some of these fees at zero, although reforms to that policy have been proposed. In the sanitation sector, some treatment plants have been taken out of operation due to budgetary shortfalls (ODI, 2015).

Various types of fees, prices and taxes are charged at numerous market levels motivated by competing, and sometimes conflicting, pricing objectives and principles. When examining these payments, it can be constructive to distinguish among water tariffs or prices (paid to a public, private, or equitized utility for the water or wastewater service received); abstraction charges (paid to government for the privilege of withdrawing raw water from its source); pollution charges (paid to government in relation to discharge of wastewater, whether or not it has been treated); and taxes (paid to government for use as general or consolidated revenue, or as earmarked in advance for specific public purposes).

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, must logically compare that system to one or more alternatives. A comparison of water pricing systems or approaches 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, 2016). In general, water consumption levels will be more responsive to price changes in the long run than in the short run. It is significant that Vietnam already has almost universal 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 4.2 offers examples of what these pricing targets might look like when raising revenue is the objective and Box 4.3 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 commonly practiced in Vietnam 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). 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

Box 4.2: Illustration of revenue raising purposes and targets in choosing water price levels

1. Partial Recovery of Costs: Water is priced to provide sufficient revenue to cover only a specified (relatively small) share of the public 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 4.3: 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. The Minister who introduced Vietnam's draft Law on Irrigation (2017) said it would change people's perceptions, even though it proposed major exemptions in the application of irrigation service pricing.

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 efficient⁷ use (or non-use) by influencing the water use behaviour of all users.

Users' 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., prevention of saline intrusion in the Mekong River Delta). 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 though (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

⁷ 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 economic efficiency that are sometimes used in economic analysis.

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.⁸

An example with two behavioural targets could be an attempt to influence customers' decisions with respect to both the quantity and quality of wastewater effluents. Notice how some of the wastewater discharge fees established in Vietnam follow a two-part pricing structure with a periodic fee plus a variable component that depends upon specific aspects of water quality (rather than water quantity). Varying these wastewater discharge payments also based on (estimated or measured) discharge volumes per month would make this a three-part price, and could provide further beneficial behavioural incentives that are not present under the current approach.

Consider 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 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 Vietnam, either nationally, or province by province. It is not true that a pricing policy that cannot cover the full costs of services provided is necessarily inefficient or "wrong."

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.

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.⁹ 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.

Increasing block rate and two-part pricing

One of the prominent features of water supply pricing in Vietnam is the use of the increasing block rate pricing structure for domestic water supply. For much of the country, the environmental protection fees 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—that is thought to be affordable even for the poor. The use of progressively higher prices for subsequent blocks of water is often expected to have an overall pro-poor effect and to encourage water conservation. Recent research shows that if the

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

⁹ 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.

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; Global Water Partnership, 2016).

Vietnam's current approach to water pricing is similar, but not identical, to what many other countries do. Those countries' practices have also been widely examined and indeed, criticized. Whittington *et al.* (2015) reports 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-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 Vietnam's current practices appear in line with other countries', this is not so. Vietnam is in the minority of this group since utilities in Vietnam 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.

Economists and other policy analysts have long established the problems with the increasing-block-rate pricing approach, yet this tariff structure remains 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, 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 and on the infrastructure capacity needed to deliver it. Utilities 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. Households without a connection are left further behind in relative terms (Whittington *et al.*, 2015).

These 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 largely support the views expressed here about increasing-block-rate tariffs.

In Vietnam, the value-added tax also plays a role in water allocation. This tax is assessed on goods and services with rates of 0%, 5% or 10%. The rate that applies to household water use is currently 5%. One could imagine an alternative arrangement where a 10% or higher rate would be levied on these services. In the absence of other pricing reforms, such a change would increase the share of

revenue available for public use, also providing a stronger conservation signal to all consumers (since current pricing is volumetric).

Impacts and effectiveness in Vietnam

Turning again to the impacts and effects that historical water pricing approaches have had in Vietnam, 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 removal of water pricing has 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, 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. 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 Vietnam's water pricing regimes, the absence of specific guidance and public commitment to the purposes or targets of water pricing presents a challenge in assessing whether those targets are being met. Various official decrees and circulars address the topic of water pricing and provide some guidance on Vietnam's water pricing objectives. For example, Article 51 of the Decree on Clean Water Production, Supply and Consumption (No. 117/2007/ND-CP, 2007) provides principles for the calculation of water prices. These include: recovery of production costs; sustainability of quality service; thrifty (efficient) use of water resources; support for the poor; suitability of local water sources; the desirability of phasing out any implicit or explicit cross-subsidization among customer groups; boosting water production; and increasing the competitiveness of water supply units. Article 52 prescribes grounds for formulation and adjustment of water prices. Article 52 suggests that the principles in Article 51 need to be considered in light of socio-economic conditions including regional and national incomes, ability to pay, water supply and demand balance, notions of service quality standards, production costs and reasonable levels of profit in the presence of technological change and other changes in state policies. Taken together, these Articles offer more than 15 principles, considerations or objectives that compete for the attention and the priority of those who set prices.

Key national ministries have responsibility for formulating compliant price schemes that are then passed to the Provincial Peoples Committees who approve specific tariffs. The current process appears to require the balancing and trading-off of the various types of revenue and behavioural targets mentioned in Box 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. Dozens of these Peoples Committees weigh and balance these factors to reflect their local circumstances when the Committees approve the prices that consumers will pay. When viewing the prices that are charged, it may not be clear to anyone which factors dominate in any specific decision.

To restate, Vietnam has a multiplicity of competing goals and objectives for water pricing. Without one or two clear targets to aim for, there is little prospect of effective implementation and little basis upon which to gauge progress in any objective manner. Do the current water pricing practices meet all of these objectives? None could.

5. Identification and assessment of potential reform options

5.1 Policy reform options

The review of current practices and challenges relating to pricing and regulation of water supply and wastewater suggests a number of policy reforms that could improve the effectiveness of current practices, especially as related to the ability to attract and deploy capital investment. The following sections introduce some reform options in the area of pricing, taxation and subsidies, financing and regulation.

Pricing of Water Supply and Sanitation

For water supply and sanitation, the principal pricing options available to Vietnam include two-part pricing (with a uniform volumetric charge) or some modified form of increasing-block rates. To be effective at promoting efficiency of water use, either approach should be based on full and effective metering of water usage, and should ask all users to pay the social marginal cost of each additional unit they consume. This price should vary to reflect local and seasonal differences. Users should pay a uniform volumetric charge that reflects the social cost of supply, with neither discounts nor surcharges for different classes or types of users. Affordability concerns can be met through a means-tested subsidy, rebate or monthly charge paid from the public treasury or from larger fixed charges on other users. See, for example, the monthly cash transfer for electricity—an operational example of such programming in Vietnam (Kidd *et al.*, 2016).¹⁰

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.

One available reform approach is to focus the pricing on one or more specific goals or objectives, and then to choose the pricing structure and levels of pricing accordingly. As an example, suppose there are (only two) objectives, which are to raise enough revenue to cover operations and maintenance charges, or to cover capital costs as well, simultaneously with encouraging consumers to use water efficiently.¹¹ With two goals for pricing to achieve, a two-part pricing structure would establish a (uniform) volumetric charge equal to the social marginal cost of water supply and a monthly fixed fee sufficient to meet the revenue target.¹² If some households are offered an income-tested special low tariff, that reduction only comes out of their fixed monthly amount. A commensurate increase in the monthly fee paid by others could make that aspect of the cross-subsidy transparently evident while continuing to meet the overall revenue target.

¹⁰ Vietnam subsidizes oil, coal, gas and electricity by lowering the market price faced by all consumers, with an aggregate public expenditure of \$3.45 billion in 2012 (reflecting 2.2% of GDP) (Kidd *et al.*, 2016). Electricity is further subsidized by a means-tested cash transfer program. Affordability of water and sanitation services could be met, as at present, by maintaining a low market price that everyone pays (not targeted). A means-tested approach—the current approach for part of the electricity support—would be more efficient.

¹¹ Here, efficiently means in the specific economic sense where if any change in the level of water use provides more social benefits than costs it proceeds, but otherwise it does not. These social benefits and costs will often include beneficial effects on the environment, on people’s health, and so on.

¹² In this context, a “uniform” charge means one that stays the same per unit for all units of water consumed in a month. Uniform rates might vary across the country and can be varied with the season, for example.

Under some form of two-part pricing, one of the available options is to use the fixed portion of the monthly water charge as a redistributive device to help poor consumers. For example, low-income consumers might be encouraged to apply for a special tariff that is needs tested or geared to their verifiable income level in some way. If accepted as eligible, then as part of their monthly water bill, these households could receive a positive subsidy per month that does not depend upon their consumption level. Such households would continue to pay a volumetric fee that reflects the full (marginal) cost of the water they consume. As an example, the subsidy portion could be calibrated to ensure these households get the first four m³/month for free. This is done by setting the monthly subsidy value equal to the volumetric charge corresponding to that target consumption level. The major advantage is that these households would face the same financial incentive to conserve water as do all other consumers. Indeed, if their actual consumption were to approach zero in a given month, they would become net financial beneficiaries of the water supply system, retaining the fixed subsidy as a transfer to the household but paying a negligible volumetric charge.

There are opportunities for Vietnam to learn from other countries that have taken a lead in implementing some of these approaches. Sometimes these approaches are used in either the water sector or for other services. Pricing structures that redistribute benefits within the economy have been little used globally for water supply but have received increasing attention for policy reform since at least 2000. The use of these pricing approaches is somewhat more common for electricity and some telecommunications services. Boland and Whittington (2000) stop short of recommending a fully functional two-part price for water. However, they propose the alternative of a targeted monthly lump-sum subsidy that accompanies a uniform volumetric charge for all units of water consumed.

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. In the other case, it was tied to the housing standards of the neighbourhood in which the household was located. In those distinct schemes, there was a follow-up analysis of distributional effects. The results show that the water subsidy component was not targeted especially well in either country. 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.

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 5.1 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.

If an increasing-block-rate structure is retained in Vietnam, then the block sizes, number of blocks, and/or the volumetric rates should be changed so that a large majority of users face the (seasonally- and regionally-specific) social marginal cost of water in their consumption choices. In the absence of a monthly fixed charge, address affordability concerns with a means-tested rebate feature on the water bill or through other publicly funded income-support initiatives. A dated estimate for Vietnam suggests that water bills represent 1.1% of household income (ADB, 2010), where globally, water and sanitation are considered to be affordable even if above 5% of household income, as a crude rule of thumb (GWP, 2016). In countries where it becomes desirable to provide specific and targeted financial assistance to raise the incomes of households, there are almost always cheaper and more effective ways to deliver such assistance than to tie its delivery to consumption of each cubic meter of treated and delivered water.

Box 5.1: 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 could be provided with readily accessible means to do so.
- h) Flexibility: If there are environmental or other changes, can changes to water pricing 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

Under these policy reforms, utilities can earn sufficient revenue to serve both lower-income and higher-income customers and to maintain and expand their capital base, all in a way that is consistent with meeting specific performance standards in the presence of climate change, rural-to-urban migration and population growth. If pricing levels do not meet full cost recovery, then utilities should receive public transfers that target the shortfall.

Considerable efforts have already been made in Vietnam at developing cost norms and cost models for water supply and sanitation at both the national level (ministries of Finance and Construction), at the level of Provincial and City Peoples Committees and by the water service providers themselves. These approaches provide data and evidence to support current tariffs and proposed reforms. To make these processes more effective will require clear articulation of which categories of costs are meant to be covered. These processes would benefit from continued expansion of data sharing and new transparency around these processes and values. Independent regulatory oversight can guide and promote these efforts.

A recent wastewater pricing reform was carried out with financial support from the World Bank in the cities of Nha Trang, Quy Nhon, and Dong Hoi (World Bank, 2015). Investments were made in sewage collection, sewage treatment, household connections and operational efficiency. By exception to common practice elsewhere in the country, wastewater prices were phased in so as to cover the (newly rationalized) operating and maintenance costs, as well as capital replacement costs. These prices are uniform volumetric charges that do not follow an increasing block rate design. Over the period from 2008 to 2013, the wastewater tariffs (VND/m³) moved from 250 to 1,350 (Nha Trang); 350 to 1,500 (Quy Nhon); and 420 to 1,600 (Dong Hoi). Recent assessments showed that the combined costs to households of water supply, wastewater, and solid waste charges in 2013 accounted for 3.1 - 3.4 percent of the monthly income of poor households in the three cities, well below the suggested five percent affordability target (World Bank, 2015). This example establishes a practical precedent and demonstrates the feasibility of similar reforms for more widespread adoption in other cities.

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. 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.

It is only possible to assist low-income households via some adjustment to the water tariff if they have been successful in gaining access to piped water or sanitation service in the first place. Where there are households in unserved or under-served areas, these households might require direct financial assistance to afford access to targeted levels of water of sufficient quality. Even where there is no connection fee, a loan to the prospective customer at commercial rates may have the incentive effect of a subsidy and, with favourable amortization terms, can be repaid as an add-on to regular service bills. Other options to increase access include legislating or mandating customer connections (where available), especially in the case of sanitation, where the absence of a connection can impose environmental costs or risks on others. One can impose specific coverage targets and expansion schedules on utilities as part of their regulated standards of service

It may be that, in some locations from time to time, a low water price is proposed by local government as an incentive to attract the establishment of new industrial or business ventures. Depending upon available alternatives, such a form of subsidization might not be the most cost-effective means that government has at its disposal, nor conform to national or international

protocols.¹³ In these circumstances, using the fixed portion of the two-part fee to deliver the intended financial incentive but ensuring all water consumption decisions reflect the social marginal cost (in the volumetric charge), would have the virtue of not encouraging wasteful or inefficient uses of water. Further, consider an approach where the local government is required to budget for and report upon the subsidies being paid whenever it uses low water pricing as an inducement, perhaps with a sunset clause or expiry date for any program of subsidization. The degree of transparency so offered might provide its own incentive for public officials to reassess the need or desirability for continuing such practices in the future.

Pricing of Irrigation Water

Irrigation represents the country's largest use of water, and almost certainly the largest source of potential revenue for water sector operation and investment. As reported in Table 3.1, government has been spending about \$200 million per year on agricultural water resources, accompanied by more than \$35 million per year in official development assistance for this purpose. Presuming that there are investment needs or opportunities available in the sector that exceed these historical expenditure amounts, these values represent the lower bound revenue target if that pricing reform were to be based upon full-cost recovery. There is a history of using various forms of pricing for irrigation, mostly a flat rate per hectare per season, although most irrigation service fees have been waived for nearly a decade. As with the urban water sector, rural water policy reform should start with careful consideration of what the purpose or objective would be for using water pricing, and then should decide which pricing structure and level of pricing would be most appropriate.

Although approaches and technologies for metering the use of irrigation water are becoming more accessible (and with lower cost), a volumetric charge may be difficult to implement in all instances. In this case, other approaches, such as charging for water on the basis of 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.¹⁴ 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.

For irrigation, efficiency 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, revised 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 occur when such

¹³ Vietnam was admitted to the World Trade Organization in 2007. It is a violation of specific international trading rules, including those of the World Trade Organization, for governments to provide certain forms of subsidies to exporting firms. Between 1997 and 2013, Vietnam was the subject of five anti-subsidy investigations (Vietnam, 2013).

¹⁴ Command irrigation systems commonly employ diverse strategies to limit on water withdrawals, such as scheduling the times when specific users may draw water, or limiting the times when canals are filled, especially in times or places where rationing has become necessary. Where electric pumping is common, some countries ration the electricity supplied to the pumps.

pricing influences farmers' qualitative choices with respect to season, location, crop choice and irrigation method, but not through providing a within-season incentive to reduce the volume of water used.

If a fixed (non-volumetric) annual water price per hectare were to be charged, then there would be little scope for that pricing approach to encourage irrigators to realize substantial efficiency gains in water use. While the revenue raised could contribute to policy targets for cost recovery, such a policy reform is not necessarily beneficial for the country, especially if alternative revenue sources have a lower marginal social cost of raising funds.

If there is a policy intent to support the low incomes of irrigators, then a means-tested approach can be more cost-effective than applying preferred treatment to all irrigators. That was the policy intent of the irrigation price waiver introduced in 2008 (Cook *et al.*, 2013). In 2017, the draft Law on Irrigation proposes to reinstate irrigation water pricing but offers sweeping reductions or exemptions to irrigators with low incomes, to specific ethnic groups and for specific areas or regions. It is too early to learn whether the new price levels, on average, will be higher or lower (allowing for inflation in the intervening ten years) than those they replaced.

As part of its characterization of rural water service sustainability, the World Bank (2017) presents five hallmarks of financing practices associated with an advanced level of sectoral development. These include:

- financing mechanisms enable full life-cycle costs to be met, especially capital maintenance and post-construction support;
- clear tariff policy and guidelines in place, including subsidy mechanisms to protect poorest;
- revenues from tariff enable full operational cost-recovery, plus capital maintenance and increasing share of capital replacement, tailored to local conditions;
- public funds used in a targeted manner to attract private finance; and
- service providers have access to commercial loans and private equity is mobilized.

These criteria may offer constructive guidance in assessing how far to go with specific reform proposals in Vietnam.

Reforms to Taxation and Subsidies

Unlike the water and sanitation prices to be charged by some mix of state owned enterprises, equitized firms, private suppliers and others, the use of taxes and subsidies can have a more direct effect on the national and provincial budgets.

Conventional advice is that available tax and subsidy instruments should be used purposefully and consistently. Historically, in water supply and sanitation in Vietnam, a wide variety of approaches has been used, and the pattern and rationale for choosing them is not always clear. These tax instruments have included so-called tax-expenditures (or subsidies), such as import-duty remissions and tax holidays. Also included here are the application of value-added taxation and the collection of environmental protection fees. These environmental fees are analogous in their effects to a sales tax when levied broadly as a surcharge on volumetric water prices paid to utilities.

Since each of these tax instruments may have a specific effect on utilities and a specific social cost, rationalization of these approaches could result in gains to economic efficiency as well as to program effectiveness. Rationalization of the use of these taxes means using less of those taxes with a high cost and relying more upon other taxes with a low cost.

Section 4.2 observed that value-added taxation is a tool that is under the control of the national government, and that brings revenue to the national treasury. Water pricing levels are determined through a process that involves both the national government and the Provincial Peoples Committees, and these revenues go to water utilities that might be state-owned, equitized or private. Part of the process of rationalization of tax rates would involve asking if there is a better rate of value-added taxation to apply to the water sector than the current 5%. In the event, for whatever reason, that water prices could not be increased to preferred levels as a direct route to policy reform—then raising the value-added tax rate might represent an available policy alternative.

The approach to rationalization of diverse subsidy approaches is similar to that of taxation. Each way of delivering a subsidy benefit can be associated with an extra social (efficiency) cost per unit of subsidy paid. Historically, in water supply and sanitation, subsidies have included grants, low-interest loans, loan guarantees, in-kind support (e.g., land use without payment, below-value asset transfers), tax expenditures and so on (ODI, 2015). The effect of these payments may be to decrease economic efficiency such as by distorting resource use decisions and by increasing the treasury's social cost of raising funds. Where continuing subsidies appear warranted, an option is to convert them to annual budgetary amounts. This can encourage ongoing review of any continuing need for their use and promote greater transparency regarding amounts, recipients and effectiveness.

As with pricing decisions, any assessment of the preferred degree of cost recovery should also consider the relative social cost of funds from alternative sources.¹⁵ Where subsidies are motivated by concern for the poor, means testing and ex post monitoring can be used to increase effectiveness, as in the water supply examples from Chile and Colombia (Gómez-Lobo and Contreras, 2003).

Reforms to Debt and Equity Financing and to the Use of Official Development Assistance

A 2014 World Bank review identifies a number of potential roadblocks to attracting domestic and foreign investors to opportunities in the water supply and sanitation sectors, especially through the equitization model that has been favoured recently (World Bank, 2014b). As general findings, the review highlights problems with governance, management, structure and with apparent lack of autonomy of the equitized firms from the Provincial Peoples Committees. These issues, unless addressed through other reforms, may be limiting widespread private investment at the national scale.

The current approach to equitization appears to limit fair competition among potential bidders, yet appears to offer strong incentives to a selected few. This approach could possibly exclude some potential bidders with the greatest ability to operate effectively in the sector. In a (monopolized) sector where there will not be competitive rivalry among operating companies serving the same customer base, the value of channelling competitive forces in bid selection can be especially high.

Anecdotal evidence suggests that, despite the identified roadblocks, some equitization opportunities have attracted keen interest from a few competing investors. In these cases, other potential bidders have apparently been frustrated by the lack of transparency when available opportunities are closed off to them. Frustrated potential bidders see the successful acceptance of bids of rival investors without any clear and transparent investment offering, prospectus, or public adjudication of rival bids (if any). Potential concerns from the public or social perspective include the possibilities that assets are being transferred to private ownership at values that are too low; are being transferred to less-qualified operators; or are being transferred in selective “bundles,” designed to capture

¹⁵ Some analysts consider the selling of a service at any price below that required to achieve full-cost recovery to be a subsidy, but this definition is not adopted universally. Under this definition, the choice of a pricing policy target for the extent of cost recovery in each sector would be considered a decision about subsidization.

preferred segments of the customer base for the new enterprise, leaving unprofitable segments in public hands (World Bank, 2014b; ODI, 2015).

There is an apparent inconsistency between (i) concerns about the slow rate of equitization and about barriers to private investors (World Bank, 2014b), and (ii) other anecdotal suggestions that some state-owned assets have been snapped up quickly. Both behaviours can be supported by the claim that there is insufficient governance and oversight in place. This situation can give rise to specific opportunities for private profit for some investors but, in general, can also reduce the attractiveness and the return from the aggregate portfolio of potential offerings.

In the past, concessional lenders were able to contribute to the capital investments in the sector via government-to-government official development assistance. With the transition to equitized service providers, the eligibility for government-to-government lending will end in many cases, since some concessional lenders see the proposed loans to be private investments. In such cases, the lending terms, such as acceptable credit ratings, adequate collateral requirements or sought-after third-party guarantees can much reduce the ability to place these loans. In some cases, equitized Vietnamese firms are choosing to borrow on domestic capital markets on commercial terms in preference to dealing with (foreign) concessional lenders. This raises the suggestion of competition among different types of lenders for the very best water sector lending opportunities, and the risk that some domestic financing might continue to be crowded out by continuing lending activities of foreign donors (for those borrowers not yet using commercial loans).

A preferred option might be to create or develop a facility for blended finance (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.” For example, following a cascade approach, a specialized capital fund could be created at the national level with the specific purpose of making loans, for example, to equitized firms in the water supply and wastewater sector of the country (OECD, 2017). The fund would be segmented into separate pools of capital that could offer investors different profiles of risk and return, loan maturity, duration, and so on. Donor and concessional lenders might backstop some of the riskiest investments while commercial and private investors, both domestic and international, could participate in the less risky pools, albeit with lower expected rates of return. Key features of such a debt-funding approach include its ability to strategically leverage use of the donor finance to draw in the private finance, where the status quo alternative may crowd it out.¹⁶

Other policy options to consider for financing reforms include promoting such efforts as:

- reducing transactions costs for borrowers and lenders to identify and assess scalable investment opportunities;
- rationalizing the use of loan guarantees; and
- increasing the attractiveness of utility investments through better governance, regulation and commitments to transparency in the financial and water and sanitation sectors.

The promotion of blended finance presents a specific opportunity to direct the role that official development assistance can play to promote investments in the water sector, but there are other

¹⁶ According to the OECD (2017), between 2000 and 2014, about 140 blended finance facilities were created globally. All of them included some measure of concessional support, and together they amassed assets of about \$30 billion. The primary lending sectors for these facilities were infrastructure and the financial sector, absorbing almost two thirds of total assets under management. Blended finance can also incorporate and encourage finance in the form of equity. Depending upon the source of funds, the creation of public-private partnerships in some cases is a specific form of blended finance.

policy options to consider. The national government should target or re-direct official development assistance funding strategically to meet priority needs. Its use should be rationalized across donors to achieve greatest effect; building on synergies and avoiding wasteful competition or duplication of efforts.

The State Bank of Vietnam is currently developing targeted and preferential green credit lines to facilitate green finance availability in Vietnam. A draft Green Project Catalogue has been developed to support commercial banks in the identification of investment project eligible for preferential lending. This draft Green Project Catalogue also includes sections on investment projects targeting wastewater and the efficient use of water in agricultural production. Together with other instruments, this programming could facilitate additional private or public-private investments into wastewater treatment or more efficient “green” irrigation systems and other water-related innovations (Krakowski, 2016).

Regulatory Reform Options

The central importance of regulation in a monopolized sector is to make sure that the greatest social benefit is achieved from the scarce investment funds that are available. The regulator’s challenge is also to ensure that investors get a sufficient (expected, risk-adjusted) return to maintain the needed investments. Ideally, utilities’ operations would be monitored and regulated in a holistic fashion to ensure:

... 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, 2014b).

In addition, the regulator has a key role in overseeing sustainable tariffs and funding structures; formal business planning; asset management and development; financial planning; and capital investment. Many of these elements could be strengthened relative to recent business practice in this sector in Vietnam.

Much of the foregoing discussion has centered on alternatives for increasing the rates (and effectiveness) of public and private investments in water supply and sanitation. The value of effective regulation may be to reduce or rationalize the amount of investments that might be required, such as through “right sizing” the targeted investments, through increasing operational efficiency and reducing sources of waste, such as in non-revenue water.¹⁷

The reference here to performance standards again 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 obvious consequences for the tariff and pricing decisions needed to support those actions.

The World Bank has recommended the establishment of an autonomous national water regulatory authority, envisioned on a model with many similarities to the current Electricity Regulatory Authority of Vietnam (2014b). Key roles of the regulator would include: standard setting, monitoring

¹⁷ The OECD (2015a) presents a broad survey of current practices in regulation of the water sector globally, a number of which address these points.

costs and performance, reviews of business plans and price setting, customer consultation, dispute resolution and oversight of low-income community policy. An important part of the regulatory approach would be the establishment and supervision of performance contracts with water supply facilities. These contracts would be between a Provincial Peoples Committee and a utility. The presence of the national regulator as an advisor, overseer and adjudicator of these contracts could go a long way toward ensuring that there are sufficient resources and capacity brought to the contracting and reporting processes. The regulator's presence could help correct any potential imbalance in technical capacity between specific Provincial Peoples Committees and more experienced commercial interests.

Another regulatory issue that can promote the effectiveness of wastewater investments occurs in the case of expansion of sewerage systems capable of connecting to individual households. As in the case of water supply connections, 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 that is claimed 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 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 legislative support if required) can promote the available connections.

The discharge of industrial wastewater and effluents deserves special mention as a regulatory concern, since in many cases the responsibility for processing and treatment rests with the industrial firms themselves, or in some cases with the operators of the industrial estates in which the firms are located. As in the case of domestic wastewater, there may be an opportunity to increase the level and effectiveness of capital investments made for this purpose. Given the technical complexity of some of these installations, pricing and operator education cannot be expected to cover the range of potential harms and contaminants. Governments can support these measures with clear environmental standards that are backed by monitoring and enforcement efforts that are appropriately trained and staffed.

6. Policy recommendations and reform roadmap

6.1 Summary of key findings and roadmap for policy reform

The focus of the reform options identified here is on 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 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, the levels of pricing are too low to achieve cost recovery. 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 Global Water Partnership proposes for eliminating the use of increasing block rate tariffs.

Since pricing has been waived for most irrigation uses, and since irrigation is the largest consumptive user of water in the country, the reform of irrigation water pricing to a volumetric basis could bring significant increases in water revenue and cost recovery. The preliminary evidence on wastewater treatment is that current budgets are well below those required to sustain the infrastructure base with desired levels of service. In some parts of the country, there is no specific determination of wastewater prices based on cost of service, defaulting instead to an “environmental protection fee” set at up to 10% of the water supply price.

With respect to equitization, there is enough experience with the process to identify needed reforms. Key reforms include establishing the central importance of performance standards and contracts, along with more open and transparent processes for establishing equitization investments (World Bank, 2014b).

The World Bank (2014b) 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). Substantive extensions to those proposals include adding targets and standards related to system resilience and reliability, especially in this era of increasing climate volatility.

There may be significant opportunities to expand funding in the water sector through development of blended finance. Especially since there is already active participation by both concessional and commercial lenders in the same sector, blended financing may provide an important route to create and capture investment synergies that lenders and donors could not access independently.

For the government of Vietnam, investment and support to the sector is fragmented. Current public approaches rely upon a diverse set of fiscal instruments including subsidies, tax expenditures, duty remission, loans, grants, performance guarantees, asset transfers and so on. The beneficiaries include private and public-sector customers and public, private and equitized managers of both publicly- and privately-owned infrastructure assets. It would present a considerable analytical challenge to estimate in a comparable and comprehensive fashion the actual cost of the support and investments that are underway, or their effects on the efficiency of resource use.

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

<p>Goal: To mobilize more investment capital into the water and sanitation sectors of Vietnam in order to meet SDG targets and social objectives in a manner that respects constrained public fiscal resources in these and other sectors</p>	
<p>Challenges</p> <p>1. To encourage greater mobilization and more effective use of domestic revenue from the water and sanitation sectors, from public funds, debt and equity finance, and from official development assistance</p>	
<p>Policy Options</p>	<p>Key Features to Consider</p>
<p>Reform pricing of water supply and sanitation services (domestic and commercial) in urban and rural areas</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. Address affordability concerns with a means-tested rebate or through publicly funded income support. • Set (and revise periodically) the policy targets for the extent of cost recovery in each sector. • Allow utilities sufficient revenue to serve customers and to maintain their capital base consistent with meeting specific performance standards in the presence of climate change, rural-to-urban migration and population growth. • 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. • Promote water conservation efforts by providing understandable and timely information about current volumetric charges for water and sanitation services, including billing information and information about technical and behavioural alternatives to reduce water consumption and waste.
<p>Reform pricing of irrigation water supply</p>	<ul style="list-style-type: none"> • Efficiency in the agricultural use of water would be promoted by exposing irrigators to the (seasonally- and regionally-specific) social marginal cost of the water they use. • In cases where the cost of measuring (metering) or estimating actual irrigation water usage is higher than the potential gains, a pricing approach based upon other proxies for water intensity might still promote some efficiency gains in water use. • If there is a pricing policy intent to support the low incomes of irrigators, then consider a means-tested approach. • If a fixed (non-volumetric) water price per hectare per season were to be charged, then there would be little scope for substantial efficiency gains and such pricing could cause welfare and national income to decrease.

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

Policy Options	Key Features to Consider
Reform taxation and subsidy policies as they apply to the water supply and sanitation sectors	<ul style="list-style-type: none"> • Available tax instruments should be used purposefully and consistently. Historically in Vietnam, in water supply and sanitation these tax instruments have included so-called tax-expenditures (or subsidies) such as import-duty remissions, loan guarantees and tax holidays. Since each of these tax instruments may have a specific effect on utilities and a specific social cost, rationalization of these approaches could result in gains to economic efficiency as well as to program effectiveness. • The effect of various subsidy payments may be to decrease economic efficiency by distorting resource use decisions and by incurring the social cost of raising the funds. • There is no clear pattern of means testing, even where subsidies are motivated by concern for the poor. • 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.
Reform the use of debt financing in the water supply and sanitation sectors	<ul style="list-style-type: none"> • Develop the use of blended finance facilities, supporting and leveraging the use of concessional and commercial loans from both domestic and foreign lenders. • Reduce transactions costs for borrowers and lenders to identify scalable investment opportunities. • Increase the attractiveness of utility investments through better governance, regulation and commitments to transparency.
Reform the use of equity financing in the water supply and sanitation sectors	<ul style="list-style-type: none"> • Improve processes and effectiveness of equitization and public-private partnerships. Require open and transparent selection processes and subject all utilities to independent regulatory oversight.
Reform the process for allocating official development assistance	<ul style="list-style-type: none"> • Target investments strategically to address priority needs, rationalizing across donors to achieve greatest effect. • Avoid any wasteful competition or duplication of efforts.
Institute better governance and regulation of public and private utilities	<ul style="list-style-type: none"> • Introduce performance standards and an independent national regulator with appropriate staffing and investment in regulatory capacity, monitoring and enforcement.

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

<p>Challenges</p> <p>2. To extend services to under-served sub-populations at rates they can afford</p>	
<p>Policy Options</p> <p>Reform pricing, taxation and subsidy policies</p> <p>Prescribe/mandate sewerage connections by all users where available.</p>	<p>Key Features to Consider</p> <ul style="list-style-type: none"> • Make these customers “profitable” to utilities, while ensuring that services remain affordable to consumers. • Subsidize part or all of the customer’s cost of new water and sewerage connections. • Even where there is no connection fee, a loan to the prospective customer at commercial rates may have the effect of a subsidy and with favourable amortization terms can be repaid as an add-on to regular service bills. • Legislate or regulate customer connections (where available) where their absence imposes environmental costs or risks on others. • Impose specific coverage targets and expansion schedules on utilities as part of their regulated standards of service.
<p>Challenges</p> <p>3. To extend coverage of industrial wastewater treatment and reduce the environmental risks from the quality of discharged effluents</p>	
<p>Policy Options</p> <p>Reform pricing, taxation and subsidy policies</p>	<p>Key Features to Consider</p> <ul style="list-style-type: none"> • Current approaches to setting effluent charges are based on (some attributes of) the quality of the effluent but not necessarily on the <u>quantity</u> of effluent. Factors that may be region-specific or seasonal and that influence the social cost of treating and/or discharging the waste are not included in these charges, where these could promote beneficial changes in firms’ behaviour. • Require industries to bear the (seasonally- and regionally-specific) social marginal abatement cost of the waste they discharge, whether treated by the firms or others. The use of these effluent charges could lead to benefits from firms’ decisions about revised production methods and wastewater treatment methods and processes, choices of where to situate specific facilities, when to operate, and so on. • Effluent charges and operator education cannot be expected to cover the range of potential harms and contaminants. Support these measures with clear and effective environmental standards backed by monitoring and enforcement efforts that are appropriately trained and staffed.

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

Challenges	
4. Currently, some utilities are unattractive investments (from all funding sources), due to low revenue potential and/or high cost of service	
Policy Options	Key Features to Consider
Reform pricing, taxation and subsidy policies	<ul style="list-style-type: none"> • Employ these tools to make these customers “profitable” to utilities, while ensuring that services remain affordable to consumers.
Realign utility boundaries and/or services offered, where appropriate, to capture all available economies of size and scope	<ul style="list-style-type: none"> • Identify opportunities at the rural-urban fringe where increasing population density in future may allow lower-cost provision of service. • Pay special attention to situations where earlier equitization processes have segregated or stranded part of the customer base that could more efficiently be served by a single provider.
Institute better governance and regulation of public and private utilities	<ul style="list-style-type: none"> • In those jurisdictions where state-owned enterprises continue as the service providers, apply the same, progressive regulatory approaches (including pricing and financial reviews, pursuit of efficiency enhancements) as apply to private firms, equitized firms, and public-private partnerships

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: Global Water Partnership, 2016

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

Design and establishment of the regulatory framework

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

Design and establishment of regulatory authority

1. Consultation 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 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. Consultations on performance standards and targets for different service levels (with stakeholders including Provincial Peoples Committees, utilities and consumer groups)
2. Communication campaign to explain and engage on reforms and obligations of different stakeholders
3. Introduce performance contracts and work with Provincial Peoples Committees (and utilities) to introduce a tariff setting methodology based on cost recovery
4. Assist utilities and Provincial Peoples Committees to understand and implement performance based contracts, collect data and meet reporting requirements
5. Collate data and start disseminating it to other agencies and the public
6. Coordinate with Ministry of Finance and Ministry of Construction on tariff setting, and Ministry of Construction / Ministry of Finance / Ministry of Planning and Investment on tariffs, subsidies and development of a funding plan or framework for the water sector.

Source: (World Bank, 2014b, pp. 48-49)

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

Many of the reform options presented here will represent a considerable change from current practice, and numerous stakeholders in the process may resist these reforms. Not only does change place new stresses or demands on individuals and organizations, it is possible that some stakeholders are sufficiently well served as to be “comfortable” with the status quo. There could be many “winners” from proposed reforms, but some “losers” too.

However, as Whittington (2016) points out, the status quo may not be an option. Even without climate change, population growth and rural-to-urban migration, the status quo may not be sustainable. Vietnam is already in a state of transition from state-operated utilities to equitized ones. The risk of continuing decline and deterioration in the stock of the physical infrastructure for water supply and sanitation creates a new impetus to make additional productive investments. It is apparent that investments on the scale required by commitments to the Sustainable Development Goals could not be made from public funds alone, even if that were seen as a desirable option.

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 new means-tested or pro-poor pricing features will need to be explained carefully.

The environmental gains 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 can sell themselves.

A specific suggestion is 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.¹⁸

Time-tested approaches to such policy reforms include, in many cases, the benefits from starting gradually (but cohesively). This can include 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 of, and ready access to timely data and information about levels and trends in key performance indicators, both with and without the introduced reforms. Good measurement supports good management.

¹⁸ 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.

6.3 The way forward

This study has not provided findings and conclusions that present or prescribe a specific or unique view of the way forward. Where possible, a range of options is presented, touching on numerous aspects of pricing, fiscal instruments, 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 recommendations made here may be of interest at various levels of government and to various departments and ministries 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 including implementation of a program of legislative and regulatory reforms. Ideally, the best choices would be informed by the views and insights of all of these potential participants. These are impactful choices that Vietnam will soon need to make in its pursuit of socially inclusive and sustainable development.

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ANNEX A – Participants in introductory fact-finding meetings

Date	Name and title
February 27, 2017	Dr. Nguyen Manh Hai Director, Research Department for Public Service Policies Central Institute for Economic Management Ministry of Planning and Investment
February 28, 2017	Mr. Satoshi Ishii Senior Urban Development Specialist Urban Development and Water Division Viet Nam Resident Mission, Southeast Asia Department, Asian Development Bank
	Dr. Cuong Vu Hoang Water Supply and Sanitation Program Advisor Viet Nam Resident Mission, Southeast Asia Department Asian Development Bank
	Mr. Phạm Quang Tien National Water Supply and Sanitation Specialist Viet Nam Resident Mission, Southeast Asia Department Asian Development Bank
	Dr. Lương Văn Anh Director National Centre for Rural Water Supply and Environmental Sanitation Ministry of Agriculture and Rural Development
	Mr. Pham Kien Quoc, M.Sc. Chief of Science, Technology and International Cooperation Section National Centre for Rural Water Supply and Environmental Sanitation Ministry of Agriculture and Rural Development
March 1, 2017	Ms. Le Thi Ha Lien Deputy Director Center for Agricultural Policy Institute of Policy and Strategy for Agriculture and Rural Development Ministry of Agriculture and Rural Development
	Mr. Pham Ngoc Thach Head of Division of Charges and Fees Policies Ministry of Finance
	Mr. Iain Menzies Senior Regional Water & Sanitation Specialist, East Asia & the Pacific World Bank Group, Water
	Mr. Nguyen Hong Tien Director General Administration of Technical Infrastructure Department Ministry of Construction
	Mr. Nguyen Minh Duc Head of Water Supply Management Division Administration of Technical Infrastructure Department Ministry of Construction
	Ms. Nguyen Thi Hong Khanh Deputy Head of Water Supply Management Division Administration of Technical Infrastructure Department Ministry of Construction

March 2, 2017	<p>Ms. Le Thi Dieu Thuong Deputy Director Division of Price for Capital Goods Department of Price Management Ministry of Finance</p>
	<p>Mr. Nguyen Duc Tu Water and Wetland Coordinator International Union for Conservation of Nature Viet Nam Country Office</p>
	<p>Mr. Vu Quang Cac Director General Department of Planning Management Ministry of Planning and Investment</p>
March 3, 2017	<p>Mrs. Nguyen Thanh Phuong Appraisal and EIA Department Industrial Safety Techniques and Environment Agency Ministry of Industry and Trade</p>
	<p>Dr. Nguyen The Chinh Director General Institute of Strategy and Policy on Natural Resources and Environment Ministry of Natural Resources and Environment</p>
	<p>Ms. Phung Thi Cham Vietnam Support Unit Coordinator, CEP Phase II Institute of Strategy and Policy on Natural Resources and Environment Ministry of Natural Resources and Environment</p>
	<p>Dr. Tim McGrath Technical Advisor, Policy Advisory Team Leader, Wastewater Management Programme, Flood Proofing Programme for Adaptation to Climate Change Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH</p>
	<p>Mr. Nguyen Hong Hieu Head Water Resource Planning and Survey Division Department of Water Resource Management Ministry of Natural Resources and Environment</p>