CHAPTE R

12

Water Supply & Sanitation

12.1  12.2  12.3

Context  Assessing the Quality of Spending  Recommendations to Improve the Quality of Spending

This chapter is part of the World Bank’s 2020 Public Expenditure Review for Indonesia.

CHAPTER AUTHORS
Fook Chuan Eng
Irma Magdalena Setiono
Risyana Sukarma

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The government targets universal access for water supply and sanitation (WSS).

Meeting these targets will require higher levels of expenditure but, given the current disconnect between government expenditure and the quality of outcomes, the immediate priority should be to improve efficiency in the WSS sector.

On water supply, underlying issues fall on both the supply and demand sides:

- Lack of co-ordination between central and local governments, and poor prioritization of local government capital expenditure, mean that expenditure has led to relatively small increases in the number of homes connected, while idle capacity has also increased significantly.
- Insufficient incentives for households to utilize piped water as the primary source for drinking water, even when they do have access to this service.

On sanitation, the main issues that drive the poor performance cover the whole sanitation chain:

- The majority of septic tanks that are being used are of poor quality; and
- Sludge treatment plant facilities exist, but most are in poor condition and not used optimally. Most cities do not have adequate sanitation management.

Further key reading


- Water Supply Improve the Quality of Life, PAMSIMAS Report (MoPWH, 2012)

- MoPWH Annual Performance Evaluation Reports (Laporan Akuntabilitas Kinerja Instansi Pemerintah, LAKIP)

- MoPWH Strategic Plan (Renstra) 2015-2019

Summary of Recommendations

- Improve institutional arrangement and strengthen fund management mechanisms to encourage the efficient expansion of the piped-water supply:
  - Align central government investments with local governments’ needs and investment plans, and ensure that adequate budget, institutions and arrangements for O&M is allocated in local governments’ budget documents prior to the implementation of construction; and
  - Reform the regulatory environment of the PDAM to enhance their financial sustainability, and enforce relevant regulations.

- Increase demand for the piped-water supply:
  - Change incentives to discourage the use of groundwater and enforce regulations to limit groundwater exploitation; and
  - Improve regulation and enforcement on the quality of water supply services.

- Promote a comprehensive urban sanitation system, as well as increase the capacity of local governments to design and implement plans appropriate to their cities, which could involve a mixture of both centralized and good quality decentralized systems.

- Provide support for sustainable community-based rural water supply and sanitation development.
Chapter 12

Context

Indonesia has made considerable progress in the water supply and sanitation (WSS) sector over the past two decades. As of 2018, 73 percent of households in Indonesia had access to improved drinking water and 69 percent to improved sanitation facilities. This situation is a significant improvement on 1994, when only 38 and 28 percent of Indonesian households had access to these services, respectively. This achievement has been largely driven by progress in rural areas, where access to safe drinking water increased two to three times faster than the increase in urban areas.

However, Indonesia lags other emerging market peers in providing these basic services to its population. Other countries in the region, such as China, the Philippines, Vietnam, Thailand and Malaysia, have higher shares of the population with access to safe drinking water and sanitation services (Figure 12.1 and Figure 12.2). The comparison with Vietnam and the Philippines is particularly striking, given that these countries have lower income per capita than Indonesia.

National averages hide large income-related disparities in access to clean drinking water. The use of bottled water, for example, varies substantially across income segments. More than half of those in the richest quintile of Indonesian households rely on bottled water, while only 8 percent of the poorest quintile in rural areas use bottled water (Figure 12.3). The reliance on bottled water for drinking is particularly prevalent in the richest quintile, indicating that affordability is a key determinant of access to this water source. While bottled water has become a popular source of drinking water in general, the main users remain only those who can afford it. Poorer households still depend on traditional sources of water, both in urban and rural areas.

Similarly, disparities in access to improved sanitation across both income and geographic differences remain. Only 49 percent of Indonesians in the lowest-expenditure quintile have access to improved sanitation facilities, compared with 87 percent in the top quintile (Figure 12.4). Significant differences between urban and rural areas also remain: in 2017, 91 percent of the richest urban population had access to improved sanitation, compared with 74 percent in the richest rural population. Similarly, 64 percent of the poorest urban population had access to this service, versus 41 percent in the richest population quintile.

Beyond basic service provision, Indonesia specifically needs to catch up in improving access to piped water, and wastewater collection and treatment. Currently, only about 10 percent of the population uses the piped-water supply for drinking purposes, far from the Ministry of Public Works and Housing’s (MoPWH) target of 60 percent. Access to much-needed formal sanitation services is still very low, with only 1 percent of wastewater in urban areas collected and treated properly. For sanitation, improvements beyond basic services include centralized or decentralized sewerage systems and on-site sanitation with improved fecal waste management (FWM).

Source: Calculations based on data from WHO/UNICEF Joint Monitoring Program for other countries and National Socioeconomic Survey (Susenas) for Indonesia.
FIGURE 12.3. Household primary access to drinking water by income and area, 2017

Note: Safe drinking water includes bottled (blue), pump/protected well/spring >= 10 meter (orange) and piped (purple).
Source: World Bank staff estimates based on Susenas data, BPS.

FIGURE 12.4. Household access to sanitation by income quintile, 2017

Source: World Bank staff estimates based on Susenas data, BPS.
This status quo is far from the target of universal provision of clean water and sanitation in the National Medium-Term Development Plan (RPJMN) 2015-2019. According to the MoPWH’s target, which is known as the “100-0-100 program”, Indonesia aims to achieve 100 percent access to clean drinking water, 0 percent of the population living in slums, and 100 percent access to improved sanitation services (including an end to open defecation) by 2019. These targets appear to be ahead of United Nations Sustainable Development Goal (SDG) 6, which envisions similar targets by 2030. However, the RPJMN 2015-2019 (and the 100-0-100 program) focused more on MDG-related goals, which use a less stringent definition than the SDGs’ targets. In any case, Indonesia’s progress remains far from the 100-0-100 target as of 2019.

Achieving the RPJMN target of “100-0-100” requires additional investments in WSS infrastructure of around IDR 253 trillion (US$20 billion) over 2015-19. The GoI envisioned having to build 16 million additional pipe-water supply connections and increase the national total clean water production capacity by 32 percent, from about 125,000 liters per second to about 165,000 liters per second over the period 2015-19. To achieve the SDG targets, even greater investment will be required, not only to build new infrastructure but also to include adequate O&M of existing systems, as well as additional investment for non-structural measures to provide sustainable drinking water sources, piped and non-piped. For sanitation, achieving the RPJMN targets will require building of additional 409 septic treatment facilities, and for 438 cities and districts to be provided with city, area, and community scale sewerage. To achieve the SDG targets, additional investment will be required to ensure improvement in the overall sanitation service chain (centralized and decentralized sewerage, and good quality standard on-site systems with improved FSM).

From the estimated required investment to meet the RPJMN 2015-2019, the largest share of investment to meet the water supply infrastructure requirement of US$20 billion over 2015-19 was expected to come from local governments, and over 20 percent was expected to come from the private sector and bank financing (Figure 12.6). These estimated and anticipated portions of funding in the RPJMN were projections based on historical figures and actual project plans available when the RPJMN was prepared, combined with the expectation of the various initiatives to invite other sources to contribute to closing the gap to reach the target of universal coverage by 2019. However, with delays in implementation of the various initiatives in private sector participation and bank financing, the expected investment has not been materialized and the financing gap has not been filled; and with current data limitations it is difficult to track the actual investment from local governments. Meanwhile, the central government’s budget has been decreasing over the past two years, aligned with the continuing decentralization.

Responsibility for basic service delivery, including WSS, has been decentralized, but in practice a clear unambiguous division of roles has yet to be achieved (see Box 12.1). For example, local government-owned enterprises, Perusahaan Daerah Air Minum (PDAM), are mandated to hold, operate and manage the local water system, but lack the legal authority to make efficient reinvestment decisions. Therefore,

**FIGURE 12.5.** Largest share of water supply investment will come from local governments...

**FIGURE 12.6.** Anticipated sources of funding throughout 2015-19 for wastewater subsectors (percent of total)

<table>
<thead>
<tr>
<th>Source of Funding</th>
<th>2015-19 Total</th>
<th>2015-19 Wastewater</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local governments</td>
<td>47%</td>
<td>53%</td>
</tr>
<tr>
<td>MPWH DG Human Settlements</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Bank Loan</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>PPP and B2B Schemes</td>
<td>8%</td>
<td>7%</td>
</tr>
<tr>
<td>MPWH DGWR</td>
<td>17%</td>
<td>21%</td>
</tr>
<tr>
<td>PDAM</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>Corporate Social Responsibilities</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>Dana Alokasi Khusus</td>
<td>6%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Source: MoPWH, from Infrastructure Sector Assessment Program (World Bank, 2018, forthcoming).

313 The Government target is to achieve universal access to water supply and sanitation, comprising of 85 percent of population with access to water supply services that meet the 4Ks principle (quantity, quality, continuity and accessibility) through piped and non-piped systems, and 85 percent of the population can access the service standard of sanitation (onsite and centralized system), and 15 percent with access to services that meet basic needs.

314 Especially Goal 6.1 (“universal and equitable access to safe and affordable drinking water for all”) and Goal 6.2 (“access to adequate and equitable sanitation and hygiene for all and end open defecation”).

315 Infrastructure Sector Assessment Program (World Bank, 2018), page 41.
even when there is a surplus, the current financial structure does not enable the PDAM to make commercial decisions that could improve their services—from water intake, treatment, transmission, to distribution. Thus, many PDAM prefer to keep the revenues they collect in reserve and place greater priority on contributing to local government revenues rather than reinvesting to further expand and improve their services. Government Regulation No. 54/2017 on Local Government-owned Enterprise (BUMD), which also covers PDAM, includes additional objectives of contributing to economic development and generating revenue or profit, and provisioning for reinvestment. It also includes guidelines on whether the BUMD will be a PERUSDA (that will allow multiple shareholders, including private sector and investment from the capital market), or PE-RUMDA (local government as the sole shareholder) and description of the differences.

Furthermore, most PDAM do not have adequate capacity to invest in new infrastructure. More than half of all the PDAM (263 out of 378 PDAM) were loss-making in 2017, while accumulated losses remain persistent even among profit-making PDAM. A tariff that is below the full cost recovery level is a major reason behind the inability of PDAM to be profitable, even for those PDAM that are categorized as healthy. The recently completed debt restructuring has helped to improve the financial situation of those that were facing debt arrears, but this improved situation will not last. Although the MoHA has issued two regulations regarding tariffs and subsidies (MoHA Regulations Nos. 71/2016 and 70/2016), implementation of these regulations has not been enforced or monitored. Meanwhile, the actual levels of non-revenue water (NRW) are far higher than standard levels (20 percent) in many PDAM, and this exacerbates the issues created by the low tariff levels in meeting full cost recovery. Moreover, although some PDAM receive capital injections from local governments, these are mostly used for operations rather than investment.

The water sector faces unique socio-political and commercial characteristics that justify a prominent role for the public sector, but the private sector can complement this by bringing increased efficiency and additional financing. Positive externalities arising from water, sanitation and hygiene (WASH) services are often not captured in what consumers are willing to pay for the service. WASH is a basic need and its infrastructure usually caters to a localized population (confined markets) that may not offer the full magnitude of revenues required to cover operations and capital development costs. While the required role of the public sector is clear, the private sector can bring about operational efficiency and commercial financing under the right conditions.

Improving the efficiency and effectiveness of spending in the WSS sector can help the GoI to improve access to these services for all Indonesians. Although public investments alone cannot close the infrastructure gap in the WSS sector, ensuring that existing public spending translates into meaningful improvements in access is critical to leverage private investments. This needs to occur both at the central and local-government levels, as both of these are responsible for financing, delivering and operating investments in different aspects of WSS (see Box 12.1). This is critical considering that local governments were expected to contribute most of the required investments to achieve the 2015-2019 RPJMN targets.

According to Law No. 5/1962 on Local Enterprises, the objectives of PDAM objectives include delivering public services, collecting revenues for those services, and holding assets that have been separated and assigned from local governments. However, there is no clear provision on reinvestments.
Institutionally, water supply service is a devolved function with concurrent responsibility between local, provincial, and national governments, as provided in the 2014 Decentralization Law and described further in Government Regulation No. 122/2015 and shown in the figure below. The central government is responsible for policy development, regulation, providing investment support, and monitoring, while local governments are responsible for ensuring water supply services provision. Local governments have the primary responsibility for service provision that are solely operated and provided within their respective boundaries, while cross-boundary operations and services come under the appropriate higher level of (i.e., provincial and central) government.

This is often translated by dividing the investment between the central and local governments based on the aspect or component, i.e., central government will invest and build the bulk supply (water resources, transmission lines, treatment plants, and some parts of the main distribution network) with the hope that local governments’ investments in distribution network and house connections will follow. Most urban water supply is delivered through local government-owned PDAM. In addition to 391 PDAM, there are 30 private entities developed as part of specific housing or industrial areas, and 26 other legal entities including UPTD (technical departments), BLUD (local service bodies), or BPAM (local water service bodies).

Although the responsibility to ensure water service provision lies with the local governments, the central government, mainly through the MoPWH, continues to provide investment support through special government programs, e.g., special mandated investment in bulk water supply in regional systems, grant programs targeting lagging provinces and remote areas, of special areas of national importance, etc.

With continuing decentralization, the central government ministries’ budget for infrastructure investment will be more limited, presenting the central government with a challenge in allocating resources equitably and better leveraging central government programs.

Similarly, the responsibility to provide basic sanitation services is primarily devolved to local governments, which are responsible for the development of sewerage, wastewater, and septage management services. Meanwhile, the central government has the concurrent responsibility to support local governments by providing financing for infrastructure development. Outside the public sector, business entities are also expected to provide their own means of treating wastewater before disposal. That said, in contrast to water supply services, only a few local governments designated institutions to deliver environmental infrastructure services. Most local governments implement sanitation programs, operate, and manage sanitation infrastructure through units (UPTD or BLUD) under their environment, public works, or housing and settlements departments, while a few local governments established local government-owned enterprises for wastewater (PDPAL) or incorporate the responsibilities into PDAM.

With the unclear institutional set-up at the local government level, very often the investments made by the central government are not followed by provision of adequate budget by local governments for O&M of the built infrastructure (often local governments then refuse to take over O&M after the infrastructure has been built), and further downstream investments (e.g., sewer connections and/or collection systems) for optimal utilization of the treatment.

The need for non-public financing is recognized and private sector involvement is encouraged but with limited scope. Following the annulment of Law No. 7/2004 on Water, Law No. 11/1974 on Irrigation has been reinstated and two Government Regulations (No. 121/2015 on Water Resources and No. 122/2015 on Water Supply Provision) have been issued to be bridging regulations prior to the issuance of a new law (the draft is currently under discussion at the House of Representatives). The two government regulations were prepared based on the six principles, as follow: (i) exploitation of water should not interfere, let alone negate, people’s right to water; (ii) the state should fulfill people’s right to water; (iii) environmental sustainability; (iv) the state’s supervision and control over water is absolute; (v) the main priority for the exploitation of water should be given to state or local government-owned enterprises; and (vi) only when all the requirements have been fulfilled, it is possible for the GoI to issue a permit to the private sector to exploit water with specific requirements and stringent monitoring. Under Government Regulation No. 122/2015, water abstraction rights remain with a state or local government enterprise, and service provision to the poor needs to be guaranteed, while private investment is permitted subject to state or local government enterprise supervision. The role of the Development Board for Water Supply (BPSPAM), which previously included advising on private sector cooperation, has been revised to focus instead on improving the capacity and performance of the PDAM.

Source: Authors.
Assessing the Quality of Spending

A

Overall Trends: Is Spending Adequate?

How Efficient Is Public Spending in the Sector?

How Effective Is Public Spending in the Sector?

Public expenditure on the WSS sector has increased threefold in real terms over 2001-16. This translates into almost 8 percent growth per year (Figure 12.8). The increase was mostly driven by an increase in central government spending. The proportion of central government contribution in the sector has also increased from 18 percent in 2001 to an average of 45 percent throughout 2011-15, primarily through the MoPWH executing large infrastructure development projects.

However, compared with other countries and relative to its development needs, Indonesia spends very little on the WSS sector (Figure 12.9). Indonesia is among the countries with the lowest spending on WSS, together with the Republic of Congo and the Central Africa Republic, at only 0.2 percent of GDP. WSS expenditure as a share of national spending also remained mostly at 0.8 percent throughout 2001-14. Overall, the level of WSS spending is still far below the amount that is required to meet the GoI’s targets. Implementing the RPJMN requires a public investment of around IDR 253 trillion (US$20 billion) over five years.
or IDR 55.5 trillion annually. This indicates a financing gap of IDR 43.4 trillion compared with the current level of investment in the sector.

In general, data on WSS spending is limited across all levels of government, especially at the subnational level. It is not possible to split WSS spending at the central government level before 2005. At the subnational level, it is not possible to identify even aggregate WSS spending after 2010 (see Box 12.2).

**FIGURE 12.9.** Indonesia’s WSS spending as a share of GDP is small compared with peer countries

<table>
<thead>
<tr>
<th>Percent of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
</tr>
<tr>
<td>Virus Coast (0.07)</td>
</tr>
</tbody>
</table>

Source: Various countries’ PER, WDI, various years (footnote 319)

**BOX 12.2.** Data on water supply and sanitation are limited at the central and subnational levels

**Central Government (CG) Estimation**
Between 2001 and 2005, WSS spending is taken from the Environment Subsector under the Environment and Spatial Planning Sector. However, this classification cannot be split into WSS. The change in the central government budget to functional classification since 2005 gives an advantage in recording WSS expenditure. After 2005, water supply spending is classified as the Drinking Water Supply Sub-function under the Housing and Public Facilities Function, while sanitation spending is classified as the Waste Water and Waste Management Sub-function under the Environment Function.

**Subnational Governments (SNGs) Estimation**
WSS budget classification at the SNG level varies across districts and provinces. It cannot also be identified directly. For example, in some districts WSS programs are conducted by Dinas Public Works, while in other districts they are conducted under Dinas Human Settlement. Moreover, detailed data availability is also limited. Detailed data with programs and activities breakdown are available only between 2008 and 2010. Therefore, WSS spending at the SNG level is estimated as follows:

- **2001-04:** Development spending is generated from the Housing and Settlement Subsector, while routine spending is from Dinas Human Settlement (Cipta Karya) under the Public Works Sector.
- **2005-07:** The historical (2001-04 average) WSS spending share of total expenditure is applied to total SNGs’ realized expenditure.
- **2008-10:** Because detailed spending data are available, WSS spending is estimated using selective keywords from the program and Dinas classification, i.e., filtering out activities that are related to water and sanitation programs.
- **2011-16:** The historical (2008-10 average) WSS spending share of total expenditure is applied to total SNGs’ expenditure, where realized expenditure is used until 2014, and planned expenditure for 2015-16.

**FIGURE 12.10.** Estimation of average share of total expenditure on subnational WSS spending

<table>
<thead>
<tr>
<th>Percent of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
</tr>
<tr>
<td>2001</td>
</tr>
</tbody>
</table>

At the central level, the water supply subsector receives more allocation than sanitation (Figure 12.11). Within the water supply subsector, the vast majority of central government expenditure goes into programs aimed at increasing piped-water access, including through large infrastructure projects. In the sanitation subsector, the vast majority of central government expenditure is supposed to be on the construction of septic treatment plants, wastewater treatment plants and sewerage systems. However, given the complexity of wastewater treatment plants and sewerage systems construction projects, combined with the fact that these are only implemented in a few cities, this reduces the capacity of central government to implement these programs, leading to lower expenditure than for the water supply subsector. This trend is reversed at the local level, where governments tend to spend more for sanitation, as water supply provision is primarily delegated to the PDAM (Figure 12.12). Local government spending in the provision of water supply is mostly as indirect spending, as PDAM receive investment support from their respective local government in the form of equity contributions.

Due to the lack of coordination across different government levels, the growing central government infrastructure investment is often not complemented by local government investment in complementary infrastructure. Therefore, when projects are later handed over to the local entities, they are often not immediately operational due to lacking necessary investment such as local distribution networks. This indicates a lack of coordination across government levels, as well as the central government’s limited pre-allocation assessment of local governments’ existing capacity and development priorities. The central government needs to ensure that its investment is aligned with local governments’ needs and investment plans, as stated in the local governments’ budget and planning documents (i.e., water supply master plan or Rencana Induk Sistem Panyedaan Air Minum [RIS-PAM], PDAM business plans and city sanitation strategies), and ensuring that local governments include the provision of adequate budget and institution arrangements for O&M in their budget documents prior to commencing with construction.

Note: 2018 using central government budget data. Detailed data before 2005 are not available.
Source: World Bank estimates based on data from APBN, MoF.

**FIGURE 12.11.** More of the central government spending is allocated toward water supply...

**FIGURE 12.12.** More of the central government spending is allocated toward water supply...

**FIGURE 12.13.** Increase in spending on water supply has not been commensurate with increases in piped-water connections

Note: Detailed data to update the calculation beyond 2013 are not available.
Source: World Bank estimates based on data from APBD/SIKD, MoF.

Source: World Bank Staff estimate using Susenas, various years, BPS and MoF.

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320 This is demonstrated by the insignificant increase in the number of connections and the additional length of distribution network (which is responsibility of local governments) despite the increase investment from central government for construction of new water treatment plant and main distribution network.
As a result, despite the threefold real increase in spending on water supply between 2001 and 2016, the number of additional households with access to piped water has been insignificant and has not been able to cope with urban population growth. The statistics suggest that there were increases in the number of households with access to piped water in the period 2001-16. However, these increases were insignificant, and inadequate in coping with urban population growth, and thus the percentage decreased. Meanwhile, central government investments in the construction of new water treatment plants, which have not been followed by complementary investments by local governments on the distribution network and house connections, have resulted in increased idle capacity. Based on data from BPPSPAM, there was a total 54,846 liter/second of idle capacity, or about 27 percent of the total installed production capacity from 378 PDAM.

In sanitation, the fourfold real increase in spending has been followed by a steady increase of number of households with access to improved sanitation. However, this masks significant problems with the handling and disposal of waste. A joint 2013 World Bank and AusAID report estimated that just 5 percent of urban waste was collected and disposed of safely (Figure 12.14). Despite the focus of central government spending on urban sanitation being on connecting households to the piped-sewerage system (centralized and decentralized systems), less than 1 percent of the urban population were connected in 2012. While the share of improved sanitation increased both in urban and rural areas, more than 40 percent of the rural population do not yet have access to improved sanitation and around 17 percent still rely on open defecation.

Furthermore, across subsectors and government levels, there are insufficient allocations for O&M, and regulatory and monitoring functions. In 2010, the last year for which data were available, roughly 80 percent of the overall budget was allocated toward capital spending, with spending on O&M included in the 16 percent spending on goods and services. This disproportionate allocation creates...
inefficiency, especially with regards to ensuring the long-term durability of purchased capital. Currently, the central government has not included O&M capacity of local governments and PDAM in prioritizing investment of new assets.

On average, local government spending on enhancing administrative and apparatus facilities (46 percent) is almost as much as local government spending on infrastructure development (48 percent). A large proportion of the expenditure is allocated toward activities such as training, the purchase of office supplies, and building improvements, which are not directly linked to increasing the number of households connected to WSS services (). The recent influx of large infrastructure investment by the central government might have arguably deprioritized additional investment from local governments toward infrastructure development.

While the number of piped-water connections has increased (although falling as share of the urban population), usage of piped water for drinking has been falling (Figure 12.15), as there are not enough incentives for the population to increase the utilization of piped water for drinking purposes. There is a very low community awareness on the benefits of piped water and, combined with perceived lower cost of groundwater, this is the main reasons why utilization of piped water is low, even when households have access. People’s perception of the better quality of bottled water and concerns over the reliability of piped water are likely to be an important driver of usage of bottled water for drinking. In addition, the perceived lower cost of groundwater and the lack of regulations (including lack of or non-enforcement of abstraction charges) likely explain why some households choose not to use piped water as their primary drinking water source.

The decline in the use of improved water sources for drinking water is accompanied by a very large increase in the usage of bottled water for drinking purposes. The shift to bottled water for drinking purposes is particularly stark in urban areas, although since 2007 bottled usage has increased rapidly in rural areas as well, albeit from a low base. Although the usage of bottled water means that an increase number of citizens able to access “safe” drinking water, bottled water is not a sustainable source given the significant problems attached to it, as follows: (i) affordability – bottled water is much more expensive than piped water; (ii) reliability – bottled water requires regular purchase of new bottles, leaving households vulnerable to supply problems; (iii) quality – the majority of bottled usage is through refilled bottles of which refilling stations are unregulated and the quality of the water they provide is therefore unknown; and (iv) adequate quantity – all households that use bottled water as their primary drinking water source also require an alternative source for cleaning purposes.
Groundwater usage, especially for cleaning purposes, has been increasing at a higher rate than piped-water usage. Households persist in using groundwater through pumps and wells that have been installed as part of the original housing equipment at the time of construction or install new pumps/wells. The persistent use of groundwater without proper government control raises serious concerns in the following areas, and is an issue that requires policy attention, particularly in congested urban environments.

1. Health risks: Groundwater is exposed to the risk of contamination from various sources. Poorly designed and managed sanitation facilities will leak bacteria, viruses, and other contaminants into the surrounding groundwater. Current government regulations and controls on these potential causes of water contamination do not appear to be well developed, while at the same time it is unrealistic to expect individual households to check their groundwater quality on a regular basis.

2. Negative effects from over-exploitation: Exploitation of groundwater will lead to a lowering of the aquifer if the pace of exploitation exceeds the rate at which water returns through precipitation. This can further lead to land subsidence, which in turn creates an increased risk of flooding and also causes damage to buildings and other infrastructure.

Similarly, despite a steady increase in the number of households with access to improved sanitation, the quality of septic tanks and standards in the overall sanitation value chain remain poor. The majority of septic tanks being used are of poor quality (not designed and constructed to the proper standard, for example not properly sealed and using only one chamber instead of two chambers). A World Bank assessment of households that would count as “improved sanitation” against the government’s measure found that only 8 percent had adequate, multi-chamber and sealed septic tanks. There is a real concern that the rest of the sewage could leak out into groundwater, and this risk is exacerbated by the lack of septage collection. The utilization of wastewater facilities is low, and some facilities are even totally unused by the population in certain areas.

Most cities do not have adequate sanitation management and, while sludge treatment plant facilities do exist, most are in poor condition and not used optimally. The central government sees its role principally as a provider of major infrastructure (predominantly standalone septage/sludge treatment plants), which are handed over to local governments to be responsible for O&M. However, in many cases, there is lack of local government ownership and maintenance, and a lack of local septage collection and transport to the plants. As the results, although there are 150 sludge treatment plants, 90 percent of them are not fully operational, and sludge does not appear to be collected and treated as a matter of course.

**FIGURE 12.14.** Real increase in government sanitation spending, 2001-17

![Graph showing increase in government sanitation spending from 2001 to 2017](image-url)

Source: World Bank staff estimates based on APBN and SIKD MoF, APBD data USAID, and Susenas BPS. The 2008 Susenas data are not reliable.
Recommendations to Improve the Quality of Spending

While there is evidence that meeting the WSS sector’s objectives will require an increase in government expenditure, the immediate priority should be to improve efficiency and effectiveness. Given the current disconnect between government spending and the quality of outcomes in the WSS sector, the GoI could focus on identifying opportunities for efficiency gains and strengthened impacts. This section provides some of the steps that the GoI could consider taking to address this, before increasing its expenditure.

In general, the central government needs to broaden its role from only being the infrastructure provider to also being the regulator, and standards enforcer, as well as a collaborator with local governments in delivering services. The central government could consider a wider range of instruments such as technical assistance, regulation, as well as the use of incentives principles, e.g., performance-based grants and transfers, to achieve the sector’s targets and objectives, while allowing local governments to take on more leadership and ownership in service provision. Incentives and cross-conditionality principles should be utilized to encourage and ensure that all actors invest in their respective parts of the service provision infrastructure and O&M chain. Overall, the focus should be directed toward improving WSS services quality, and groundwater management, as well as improving household and service-provider behavior. Direct provision of infrastructure by the central government should only be necessary in a small number of low-capacity areas and areas where water sources are scarce, thus requiring higher capital investment. A clear investment and service improvement framework should be provided and implemented through national platform programs, to allow gradual and sustainable improvement of PDAM and local government capacity to take a leading role in WSS development, with supporting guidance and oversight by the central government.

- Improve institutional arrangements and strengthen the mechanism for fund management to encourage the efficient expansion of the piped-water supply
- Create incentives to use piped water as the primary source of drinking water and limit the use of groundwater
- Promote a comprehensive urban sanitation system
- Create the enabling environment that raises the effectiveness and sustainability of community-based rural water supply and sanitation development
That said, due to the limited availability of public financing, achieving development targets will also require the participation of the private sector and the utilization of commercial financing. Local governments should support their PDAM to access different financing sources for (especially medium- and large-scale) capital investment by improving their performance and creditworthiness. MoHA regulations and guidelines on full cost recovery tariffs should be enforced to ensure that there is adequate revenue for O&M, in addition to small capital investments. Meanwhile, central government investment should be utilized as incentives for local governments and PDAM to continue improving their performance. To leverage non-public financing, public funding should be targeted toward the provision of services for the poor through targeted subsidies, such as house connections development.

Overall Trends: Is Spending Adequate?

An improved coordination and fund channeling mechanism between different government levels is needed to ensure that expenditure leads to increased levels of service. Achieving the GoI’s targets for the WSS sector requires a coordinated approach between central and local governments. Local governments should be enabled to increase their own investment in, and support of, their PDAM to be able to obtain enough revenue to cover their O&M costs, and to invest in improved and expanded services. Increased awareness and establishment of incentives to encourage private sector participation and commercial financing will be required to fill the financing gap. This will require clarity on the scope and confirmation of the legal framework for private sector involvement in the water supply subsector.

In the short term, the central government needs to place safeguards to ensure that its investment will improve the quality, quantity, and continuity of piped-water supply prior to undertaking major investment. In areas where the central government provides investment support for upstream infrastructure (water resources, intake, water treatment plants, transmission mains, etc.), it should propose a binding agreement with the local government to fund adequate complementary investment for downstream infrastructure, such as tertiary pipes and connections. The central government also needs to ensure that its investment is aligned with local governments’ needs and investment plans, and that there will be adequate budget, institutions and arrangements for O&M allocated in local governments’ budget documents prior to commencing construction. In situations where a local government’s poor financial health makes this impossible, the central government should consider whether to fund the whole project or not, based on its overall economic value. However, if the local government can afford to pay its share, but chooses not to, the central government should not proceed with a partial upgrade to the system unless there are sufficient benefits from doing just this element alone. Meanwhile, resources from the central government will also likely be needed to facilitate rehabilitation and optimization of existing facilities, especially for low-capacity local governments and PDAM, although this is primarily the responsibility of local governments.

In anticipation of increased SNG spending, expenditure rationalization is required to create fiscal space for the WSS sector. Gradual rechanneling of funds from central government to local governments should be accompanied by better targeting of expenditure to ensure that it will have a material impact on improving outcomes for citizens. Efficiency gains could be achieved within the local government budget by shifting allocations from administrative and apparatus facilities toward service delivery, and reprioritization within the funds already allocated to the WSS sector. That said, greater fiscal space for WSS can only be achieved through overall expenditure rationalization by local governments, including on personnel and general administration spending. This will require development of better and clearer guidelines on budget planning, as well as guidelines on the classification of types of expenditures for local governments and their prioritization by local governments. With the issuance of the government regulation on the minimum service standards (MSSs) and the relevant MoHA implementing guidelines, the MoPWH should collaborate and coordinate with the MoHA to ensure that local governments include provision of adequate budget for MSS achievement (including for WSS) in their budgeting and planning documents. The MoHA’s plan to include MSS achieve-
“An improved coordination & fund channeling mechanism between different government levels is needed to ensure that expenditure leads to increased levels of service.”

In the medium term, financing arrangements should be modified to ensure that local governments/PDAM play their part in developing network facilities. Financing arrangement through performance-based grants could be considered as one of the mechanisms to channel funds. One option is by expanding the Water Hibah model, which provides reimbursements to local governments once they have completed their own investments, to include other indicators linked to improved efficiency and performance. Alternatively, resources for the entire project could be channeled through an enhanced version of DAK, which requires co-funding from the local government, where funding is based on specific performance indicators. Other options could include establishing incentive-based structure support to encourage PDAM and local governments to increase their investments, as well as to encourage them to utilize non-public financing. All these options will require a reliable M&E system with credible data and enforceable penalties for non-performing local governments.

Infrastructure investment programs should be integrated with an effective capacity-building program for local governments and PDAM. Currently, investment and capacity-building programs are planned and implemented separately by different agencies/programs, and for different recipients. The MoPWH provides technical assistance and capacity-building programs to PDAM through the Directorate General of Drinking Water Supply Development (through the Center of Excellence program and through training programs implemented in its training center) and through BPPSPAM. The association of water utilities (PERPAMSI) implements several training programs through its education foundation, as well as through its Water Operator Partnership program. More effective coordination between these programs could ensure more sustainable O&M for the infrastructure.

Reforming the regulatory environment for PDAM may enhance their financial sustainability. Government Regulation No. 54/2017 on Local Government-owned Enterprises (BUMD) has provided clarity on the profit-generating function of BUMD. However, it does not specifically address underlying issues causing poor piped-water performance in urban areas, such as PDAM in financial difficulties and therefore their inability to invest. The regulations (or lack thereof) preventing PDAM from both achieving full cost recovery and from reinvesting profits should be reformed. For example, a regulation on dividend payments obligations needs to be issued soon to provide further clarity and enforcement in support of Law No. 23/2014, which allows PDAM to retain their profits for reinvestment toward new infrastructure with the approval from the mayor/bupati. That said, the tariff structure for PDAM should still take into consideration affordability to avoid further reducing incentives to use piped water. The MoHA’s regulations on tariffs and subsidies (MoHA Regulations No. 71/2016 and No. 70/2016) need to be enforced and implementation needs to be monitored and evaluated. To implement this, the MoPWH should start measuring their non-revenue water (NRW) rates (i.e., produced water that is lost before it reaches the customer through leaks or metering inaccuracies) as the basis to calculate the real full cost recovery tariff level, including the subsidy that might be required to ensure affordability. Given that the average NRW rate of PDAM is far in excess of the 20 percent standard stipulated in the tariff guidelines, the MoHA and the MoPWH should modify the current requirement, otherwise it will cause local governments to set tariffs that are below actual cost recovery.

At the same time, local governments should ensure that their PDAM develop multi-year business plans that include strategy and action plans to improve their performance in order to escape from reliance on subsidies. Many PDAM still do not have a realistic and good quality business plans aligned to the RPJMD and other local government planning documents, such as the master plan for water supply development (RISPAM). Many PDAM still prepare business plans only to fulfill readiness criteria for projects and/or just because it is required by regulation, and many of these business plans are prepared by consultants without involvement of the PDAM. As a result, most business plans are not being utilized or updated. PDAM should prepare realistic business plans that include strategy and action plans to improve their performance that are discussed and approved by local governments, and hence align to the local development plans. Local governments should also monitor and evaluate the implementation of these business plans and ensure that PDAM review and update them on an annual basis. To improve PDAM governance, the MoHA should provide technical assistance and capacity building to local governments, especially to Board members of the local government supervisory PDAM body (Dewan Pengawas).

Central government should undertake stronger measures to discourage proliferation of PDAM, as well as to encourage the merger of PDAM that are below an economically viable size. The poor performance of PDAM is particularly noticeable among small-sized entities. When PDAM are too small, they will not be able to generate adequate revenue to cover their O&M costs. Therefore, further proliferation of PDAM is likely to have a negative impact on national water supply development.
Create incentives to use piped water as the primary source of drinking water and limit the use of groundwater

Change incentives to discourage the use of groundwater and enforce regulations to limit groundwater exploitation, such as taxing the usage of deep wells where piped alternatives are available. Even when piped water is available, households often opt for groundwater sources that are perceived to be cheaper and more reliable. Meanwhile, the quality of groundwater sources is largely unknown as there is a significant risk of contamination causing health concerns due to inadequate and unregulated abstraction in the infrastructure (e.g., borewells not sealed properly, close proximity to septic tanks). In addition, the overexploitation of groundwater causes land subsidence and sea water intrusion. The GoI should regulate groundwater prices to reflect the negative environmental externalities from its usage. However, taxing or regulating groundwater usage will be very challenging to monitor due to scale. Hence, the GoI could start by focusing on large commercial or industrial groundwater users with deep wells, such as through metering and charging groundwater use, or regulating those where piped alternatives are available. This approach has been applied in big cities such as Jakarta, but strong enforcement is still required. In the long term, all households could be charged for groundwater usage to reflect externalities and promote piped-water usage, but this will only be possible once alternative sources, such as piped water, are widely available.

Alternatively, effective groundwater use could be promoted through restrictions on the digging of new wells, restrictions on the volumes pumped, and norms for the design of equipment and the siting of wells. International experience suggests that community management of groundwater is a viable and effective approach, in which community institutions, covering both households and commercial entities, as the primary custodians take the initiative in designing, implementing and monitoring groundwater usage. Knowledge dissemination activities, such as on the impact of groundwater use, as well as comparison of quality test results between groundwater and piped water, are also important.

The GoI should integrate the management of surface and groundwater to ensure the comprehensive management of water resources. Groundwater management currently remains under the responsibility of the Ministry of Energy and Mineral Resources (MEMR), while surface water management remains under the MoPWH through the river basin authorities. The revision of Law No. 7/2004 provides an opportunity to address the issue of having integrated management of ground and surface water resources. The transfer of groundwater management responsibility to the river basin authorities could be considered to implement the integrated management of water resource development.

Increasing demand for piped-water services for drinking purposes will also require providing a high-quality service that is consistently safe to drink through regulatory improvements and the improved enforcement of quality standards. Although piped-water quality standards have been set, they are poorly enforced and, in practice, standards are often not met. There is a strong case for central government to play an enhanced regulatory role under the Ministry of Health (MoH), through setting appropriate standards for water quality, and actively enforcing them. This will require the MoH to improve the capacity of health departments at the local government level, and the MoPWH to enhance technical and operational guidelines and procedures for PDAM in conducting appropriate water quality sampling and testing, and to publish the water quality data to improve their social accountability.

Once quality is achieved, a communication campaign to convince the public will need to be endorsed, supported by accurate and transparent monitoring of water quality. Given that it may be impractical to deliver high water quality levels across the country immediately, a phased-in approach that could start with the more technically and financially capable or the larger PDAM should be adopted. Government output targets for the subsector should be changed to only include those households whose connection to the network meets the MSS for quality and reliability.

There are 106 River Basin Organizations and 2 River Basin Corporations with responsibility for 135 river basins. See Water Resources Management chapter.
Promote a comprehensive urban sanitation system

Given the multi-dimensional nature of issues in the WSS sector, the focus needs to be expanded to include both centralized and decentralized systems, making up a comprehensive view of the urban sanitation system, i.e., promote the principles of citywide inclusive sanitation. While centralized systems are inevitably part of the long-term solution for urban areas, wastewater management involves different processes that include containment (installation of septic tanks), collection (desludging), transportation, treatment and safe disposal of sludge. Capacity and system development to effectively manage the whole system is as important as infrastructure development and, given the current poor performance, are areas that need addressing urgently. Therefore, spending should be allocated properly across the following items so that all segments of the sanitation chain can function effectively:

1. Enabling environment (policy and regulatory framework, planning, M&E);
2. Infrastructure (septic tanks, desludging trucks, sludge treatment plants); and
3. Advisory activities (advocacy for the installment of septic tanks, capacity and system development, and policy analysis).

In practice, this means a reprioritization away from the current RPJMN plan of major infrastructure investment to focus on a wider range of services. This is likely to require the central government’s transfer of resources to local governments to undertake their duties to ensure the safe disposal of wastewater. Central government should monitor the performance of local governments in maintaining and utilizing sludge treatment plants and using a funding mechanism that allows them to take resources away from those local governments that are not using them effectively. An incentive mechanism or performance-based grants could be considered as a fund transfer mechanism.

The GoI should improve the legal and policy framework for sanitation services. There is currently no national sanitation management policy to guide local governments. Given the poor performance in this area, SNGs should strengthen the sanitation management agenda with appropriate budget allocations. The MoPWH is currently preparing a ministerial regulation for sanitation with guidelines on sludge treatment plants (IPLT) and is also revising the technical standards for septic tanks.
Create the enabling environment that raises the effectiveness & sustainability of community-based rural water supply & sanitation development

Enhance community-led development for rural WSS through technical support, appropriate M&E, and broader stakeholder involvement. Community-led WSS development continues to be a promising approach for rural areas, with high connections to water supply, in particular, being achieved at relatively low cost. However, there are a number of under-performing systems and concerns about the capacity of local areas to maintain these new assets. Meanwhile, there have been cases of community-based organizations receiving funding from private banks and/or building partnerships with the private sector through corporate social responsibility (CSR) initiatives. The GoI could also contribute to these initiatives in the areas of policy development and liaising activities, in addition to its own funding in targeted areas. Low provision of affordable toilets is another concern for the rural poor and here the GoI could consider enhancing policies for market development in this area through private sector providers.