Glass Half Full

Poverty Diagnostic of Water Supply, Sanitation, and Hygiene Conditions in Tajikistan

OVERVIEW
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Overview
This publication is the overview from the Water Supply, Sanitation, and Hygiene (WASH) Poverty Diagnostic, *Glass Half Full: Poverty Diagnostic of Water Supply, Sanitation, and Hygiene Conditions in Tajikistan*. The full-length report is available at https://openknowledge.worldbank.org/handle/10986/27830. Please use the full report for citation, reproduction, and adaptation purposes.

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Overview

Tajikistan, a landlocked country located on the western tip of the Himalayas, is among the poorest nations in Central Asia. While monetary poverty has fallen fairly rapidly in the past 15 years—with the poverty headcount declining from 72 to 49 percent (2003–09) and then from 37 to 31 percent of the population (2012–15)—poverty remains high by global standards. Some 2.6 million of the country’s 8.6 million residents live under the national poverty line. Poverty is also unequally distributed, with poverty most severe in remote and mountainous settlements, and with 76 percent of the poor living in rural areas. Multidimensional poverty (which accounts for demographics, labor, education, and access to services), at 64 percent, is much higher than monetary poverty. The country is heavily dependent on remittances and two-thirds of the working population is employed in low-productivity agriculture. Poverty varies greatly across and within regions, with deep pockets of poverty in the Gorno-Badakhshan Autonomous Oblast (GBAO), Khatlon, and the Districts of Republican Subordination (DRS).

Access to improved drinking water sources, and to sanitation connected to a functioning sewerage system, are among the most severely limited and unequally distributed services in the country. Tajikistan has abundant fresh water resources, with lakes containing 20 km³ of water resources, and glaciers holding an additional 845 km³. However, outside the capital of Dushanbe, the availability and quality of water supply, sanitation, and hygiene (WASH) services remain poor. Much of the existing drinking water and sewerage infrastructure was built before the 1980s and has not been updated since the fall of the Soviet Union. It is either in poor condition or absent, especially in rural areas and small towns.

It is increasingly recognized that WASH conditions pose a major development challenge and the Government of Tajikistan has taken concrete steps in this area in recent years. The government has adopted more than 15 programs, strategies, and plans of actions, and passed a series of legislation to address poor WASH conditions across the country. These efforts were accompanied with public and donor-funded investments focusing on the rehabilitation of urban water systems, and on the installation of latrines, boreholes, pumps, and small-scale water systems in rural areas and small towns. At the global policy level, Tajikistan is a member of the High-Level Panel on Water launched by the World Bank and the United Nations, and has announced its commitment to the Sustainable Development Goal (SDG-6) to “Ensure availability and sustainable management of water and sanitation for all.” Tajikistan has also made significant attempts to improve access to WASH and address the various well-being impacts, such as on health and nutrition outcomes for children, through its National Development Strategy.

This report presents a diagnostic of WASH conditions in Tajikistan and documents the characteristics, realities, and priorities of the country’s WASH-deprived population. The report is structured around four core questions that go beyond issues of “access” to WASH services and incorporate a wider range of contextual factors that collectively determine WASH conditions on the ground, such as affordability, service quality, and accountability of service providers. The core questions are compatible with the recently established WASH targets under the Sustainable Development Goals (SDGs). Thus, the report not only addresses country-level issues, but the data it collected will contribute to efforts to monitor the global SDG targets. The report uses a combination of qualitative and quantitative data sources and methods:

- It generated new primary data through two nationally representative surveys carried out for this study: the Household WASH Survey and the School WASH Survey. These surveys fill gaps and constitute some of the most comprehensive data collection efforts on WASH issues in Tajikistan.
• The report also draws on preexisting data sources that include information on WASH conditions in Tajikistan (the 2015 Household Budget Survey, the 2010 Population and Housing Census, and the 2009 Tajikistan Living Standards Survey, as well as the 2000 and 2005 Multiple Indicator Cluster Survey and the 2012 Demographic and Health Survey), and a monthly phone survey, Listening to Tajikistan.

• The primary qualitative data were collected through focus group discussions, key informant interviews, and mini case studies in 15 research sites covering regional (oblast) centers, district (raion) centers, and rural villages. The qualitative data illustrate consumer experiences across contrasting research sites; capture hard-to-measure impacts; and provide information on institutional constraints for service delivery.

• The report also draws on information from case studies of eight water and sanitation schemes that experimented with various WASH service delivery models across Tajikistan. The case studies were supplemented with a desk review of broader institutional issues in WASH service delivery.

Drinking Water Conditions

The findings show that although Tajikistan has made progress in access to improved drinking water sources since 2000 (figure O.1), it failed to reach the Millennium Development Goal (MDG) on drinking water, and large inequalities persist across the country (map O.1). Improvements since 2000 have occurred in the lowest tiers of service and have varied by rural-urban locale. Access to improved/basic water increased from 45 to 71 percent of the rural population from 2000 to 2016, but this was driven mainly by replacement of surface water with water from public standpipes and neighbors. Private piped connections reach only limited segments of the rural population. In contrast, over 80 percent of the population in urban areas has piped water connections in their dwelling or premise. Taking into consideration the amount of time that households spend on collecting water, measures of access to improved water sources decline almost everywhere in Tajikistan.

Even when households have access to water, there are significant challenges in the availability and continuity of water supplies. One in four households in Tajikistan does not have access to sufficient quantities of water when needed. Service is interrupted for long periods because of breakdowns in water supply infrastructure. Rural residents experience more instances of major service interruptions that last a week or more. Water outages increase in frequency and length during winter months, mainly because of frozen water sources, frozen pipes, or electricity outages. Only 15 percent of water connections nationally, and only 5 percent in rural areas, are metered. Thus, it is likely that households do not use water efficiently and underpay for the amount of water they consume. Given the unreliability of the main drinking water sources, many households rely on multiple sources throughout the year, particularly in rural areas. In winter, households compensate for service interruptions in piped water supply with other (nonpiped) improved water sources. In summer, households must turn to unimproved water sources in the face of heightened water scarcity and increased demand.

Drinking water in Tajikistan contains high levels of coliform bacteria and has low palatability, but low E. coli rates suggest that fecal contamination is not a major concern. Because open and unprotected water sources are more commonly used in rural areas, coliforms are more commonly detected in water sources used by rural households (58 percent) than by urban households (49 percent). Despite the high presence of bacteria, only a few incidences of E. coli presence are detected in drinking water. This can partly be explained by the fact that less than 1 percent of the population practices open defecation. Access to safely managed water sources (those that are improved, available when needed, and free of fecal contamination) varies, however. While 57 percent of urban households have access to safely managed water, only 31 percent of rural households do. Furthermore, the chlorine concentration in drinking water is dangerously low and does not comply with national or
Figure O.1: Trends in Multi-Tier Levels for Household Access to Main Water Source, 2000–12 (Percent of Households)


Note: For the 2016 data point, tier 1 + 2 shows improved water. WASH = water supply, sanitation, and hygiene.

Map O.1: Number of People Whose Main Source of Drinking Water Is Open Water or an Improved or Unimproved Well, as Reported in Census 2010

Source: Census 2010 with welfare estimates from TLSS 2009.

Note: The reported water and sanitation variables are directly observed in the census. Estimated monetary poverty are generated via multiple imputation. Purple circles indicate the number of people with this water condition in a district. Background color is the poverty rate, with the darker brown indicating high poverty. TLSS = Tajikistan Living Standards Survey.
global health guidelines. Chlorine remains unavailable in local markets. Thus, the population is overly dependent on boiling as their main water treatment method.

Schools rely on the same water sources as households, and thus face similar conditions in terms of access, availability, and quality of drinking water services. Most schools in Tajikistan have access to piped water sources in their yard, but a significant proportion rely on open drinking water sources that may pose a health risk for children. A greater proportion of schools in urban areas (74 percent) have access to water piped into the compound or yard as their main source of drinking water than schools in rural areas (50 percent). Moreover, a larger proportion of primary schools (grades 1-4), which younger children attend, use open water as their main source of drinking water than basic schools (grades 5-9). The chemical quality of the drinking water is lower in rural areas. Thus, rural students are more likely to consume water with higher concentrations of inorganic salts, organic matter, and traces of heavy metals. The average free and total chlorine concentrations are alarmingly low and may pose a significant health risk for children.

**Sanitation and Hygiene Conditions**

Access to sanitation has improved, particularly over the last decade, but Tajikistan continues to have some of the poorest conditions in Central Asia. The share of the population that does not have access to a sanitation facility has steadily declined. Open defecation in Tajikistan has all but vanished, falling from 6 percent in 2005 to less than 3 percent in 2012 to just below 1 percent in 2016 (figure O.2). GBAO has the largest share of people without toilets, although in absolute terms the largest populations without toilets live in selected districts of Khatlon, Sughd, and DRS (map O.2). This overall decline was accompanied by an increase in access to flush/pour toilets and pit latrines with slab. In urban areas, the majority of the population has access to flush toilets connected to a sewage system. By 2016, this proportion had increased to 60 percent. In rural areas, the share of the population using unimproved sanitation facilities has declined, while improved sanitation has increased to 41 percent of the rural population. That said, access to flush toilets connected to a sewer system in rural areas is chronically low, at only 1.7 percent. Inequalities in access to improved sanitation are even more pronounced across regions. Dushanbe accounts for more than four-fifths of all sewer connections.

Spatial inequality in sanitation conditions is high and suggests a possible association with poverty (map O.2). In rural areas, particularly in remote and mountainous settlements,
the availability and affordability of the materials required for building improved latrines are constrained, reinforcing wealth-based inequalities. Because of the high cost of building and maintaining permanent sanitation facilities, pit latrines in rural areas are usually replaced with new pits dug in yards. Many latrines are located outside the house, making access difficult for certain household members, such as the elderly and people with disabilities. In urban areas, where sewage connections are more common, 5 percent of urban households still rely on shared sanitation facilities because of the poor condition of the sewer system and discontinuities in water supply. Many latrines also fail to meet basic hygiene standards because they are poorly constructed or have no running water supply. Household sanitation facilities, including those that are considered improved facilities, typically do not have protective lids or running

Note: The response categories are slightly different for the 2000 data point, where flush to pipe sewer does not exclude flush to septic tank. Improved and unimproved latrine types that constitute less than 1 percent of responses are not shown. WASH = water supply, sanitation, and hygiene.

Photo O.3: Unimproved Pit Latrine (Rudaki Raion, DRS)

Photo O.4: Unimproved Pit Latrine (Farkhor Raion, Khatlon)
water. In addition, only a few latrines are equipped with hygienic cleansing material or disinfectants, largely because these items are costly in local markets. Limited water supply also makes it difficult to practice hand washing regularly.

Sanitation facilities are generally available on site for schools in Tajikistan, but the availability and quality of improved facilities is significantly lower in rural areas. Pit latrines with slabs are by far the most common sanitation facilities across all regions, except for Dushanbe. In most schools, separate sanitation facilities exist for girls and boys, but only a few schools have special facilities for younger students or for students with disabilities. Availability of soap is generally limited—a problem that is least common in Dushanbe and most common in Sughd. About 45 percent of schools in urban areas report not having soap, compared to 31 percent of schools in rural areas.

**Well-Being Costs and Consumer Experiences in Meeting WASH Needs**

Poor WASH conditions overlap with the risk factors for diarrhea, stunting, and childhood mortality, resulting in significant health costs for the population, especially children. Overall disease risk is negatively associated with wealth and largely driven by exposure factors (WASH-related parameters considered to influence the risk of disease), as opposed to susceptibility factors (parameters that increase a child’s ability to cope with the adverse impacts of disease). Children in poorer households carry 55 percent of the cumulative share of exposure risk and overall disease risk. The 40 percent of children suffering the highest risk shoulder 95 percent of the overall risk in urban settings and 75 percent of the overall risk in rural areas. This supports the pattern that higher risk is often found in the
poorest and most vulnerable communities. Exposure and susceptibility are positively associated, suggesting that children with access to poor WASH conditions are likely to also suffer from poor access to health care and adequate nutrition. This relationship is further exacerbated by disparities in wealth. Children in rural communities are more vulnerable to exposure and overall risk, whereas children in urban areas are subject to a slightly higher susceptibility risk.

Childhood stunting is strongly associated with deprivations relating to access to adequate drinking water and sanitation, food deprivation, and care practices. Access to “adequate water and sanitation” reduces the relative risk of stunting by about 29 percent; “adequate care” reduces it by 35 percent; and “sufficient daily calories” reduces it by about 37 percent. Children living in Dushanbe and GBAO are at significantly lower risk of stunting, after controlling for other risk factors, than children living in Khatlon. As has been found in other countries, the results suggest significant synergies among dimensions of adequate food, child care, environmental factors, and health with respect to reduced stunting risk. Better targeting the determinants of stunting could lead to more rapid improvement. This is particularly important because stunting not only affects the well-being of the current population but can have significant and irreversible impacts on the well-being of the next generation.

Beyond the adverse health impacts on children, households in Tajikistan incur a range of monetary and nonmonetary costs related to their main drinking water supply. Among households that report that they pay for water, expenditures on cold water supply make up 5 percent of their total annual expenditure. Households in the bottom 40 percent and households living in rural areas and in the regions of GBAO incur even higher expenditures. Households that pay for nonpiped water services also incur higher per unit costs than households with piped connections. Typically, households also pay for the costs of repairs, water treatment, and water transportation. Time costs are also significant. Households spend an average of 17.4 minutes to reach their water source, collect water, and return home. Considering that households average 4.19 trips per day, the amount of time spent on water collection quickly adds up (figure O.3). Over 80 percent of these trips take place on foot and include carrying heavy buckets of water from long distances, making water collection a physically demanding experience. For example, 21 percent of the Household WASH Survey respondents reported having back pain and 12 percent of respondents reported having musculoskeletal problems because of carrying water.
Institutional and Service Delivery Constraints

As in many post-Soviet contexts, water utility tariffs are below cost-recovery, and the relationship between service providers and water users can be improved. About 75 percent of surveyed households connected to a piped water supply did not know their tariff rate, while 90 percent stated that they did not know how the tariffs are determined. Generally, consumers do not have a favorable view of service providers; they consider them to be unresponsive or unable to resolve drinking water problems. About 54 percent of households that had recently interacted with their service providers stated that this interaction was related to water outages. The role of local leaders and civil society organizations in facilitating the interaction between communities and service providers is not fully utilized. Partly because of limited consumer engagement and partly because of affordability, more than one-third of rural respondents and nearly half of urban households are not willing to pay any price for water connection or the higher tariff this connection would require. The same holds for sanitation services. Those who are willing to pay, on the other hand, report being willing to pay lower amounts than what the services would require.

The complex institutional structure of the drinking water and sanitation sector—a reflection of Tajikistan’s centralized yet fragmented governance structure—serves as a barrier to service improvements. After the collapse of the Soviet Union, most state farms were reorganized into smaller units, with little clarity on transfer of responsibilities over collectively owned social infrastructure. The ownership, regulation, and operation responsibilities for drinking water services in Tajikistan are collected under a single agency. However, the sector is characterized by a plethora of stakeholders operating at the national, regional, and district levels. The State Unitary Enterprise (SUE) Khojagii Manziliyu Kommunali (KMK)—the government agency for public utilities, including water supply—is the main actor with the largest range of assets, but it coordinates with at least seven other ministries and agencies (figure O.4). The lack of explicit boundaries between the regulatory functions of state authorities has resulted in widespread duplication of responsibilities and led to a pattern of inefficient resource management. The direct conflicts of interest that evolve from the dual nature of SUE KMK as a public governor and a for-profit entity deprive the sector of a robust accountability structure.
Recently, attempts have been made to address these issues through a reform program, spearheaded by the government and assisted by other development partners. While it is too soon to assess the effectiveness of the program, at the outset the process runs the risk of establishing duplicative structures to the existing formal institutional arrangements. Implementation of reforms has proven to be challenging due to political economy considerations. Moreover, the sanitation sector is almost entirely missing from the reform discussions. The limitations in asset acquisition and scheme privatization continue to stymie potential for investor engagement.

The identified gaps in the administrative, policy, and regulatory spheres can be addressed by greater collaboration between government and development partners in the drinking water sector. The identified gaps in the administrative, policy, and regulatory spheres can be addressed by greater collaboration between government and development partners in the drinking water sector.
supply and sanitation sector. An example is collaboration between the government of Tajikistan and the European Bank for Reconstruction and Development (EBRD) on the implementation of the current sector reform program. Development partners can assist government efforts to define and draft the roles and responsibilities of the regional utility companies that are being set up as subsidiary branches of KMK. At the same time, development partners can play a critical role in assembling dedicated funding, creating incentives for hitting targets, and providing technical assistance and capacity building for service providers at the national and regional levels. Civil society groups can be meaningfully engaged for information sharing on local needs and social mobilization, which is evidently lacking in this sector.

As the future of the sector reform is being determined in collaboration with the government, stand-alone schemes can provide an effective means to alleviate deprivation of WASH services across Tajikistan, particularly in rural settlements. This report examined three delivery models: community-led, public, and private schemes. The schemes reviewed offer compelling lessons on the value of stand-alone schemes in overcoming institutional barriers in order to provide services to rural communities that are disconnected from central water supply networks. Involving communities early, in the design state, and continuing that involvement, seems particularly effective. Communities' involvement could reduce financial costs, strengthen the sense of ownership, and increase willingness to pay cost-recovery tariff levels. Local government and community leaders can assist the service provider in conducting feasibility studies; providing a better understanding of the local context; appealing to donors, central government agencies, and vendors; and engaging community members in decision-making processes.

In the design and implementation of stand-alone schemes, sector realities at the macro level, as well as local service conditions and population characteristics at the local level, need to be properly taken into consideration. For example, future projects can consider underlying issues such as population growth, seasonal variations in demand, dependence on the reliability of local electricity, abundance of water treatment resources, availability of water testing expertise, and the ability of metered water to minimize overconsumption of limited water supplies. In addition, rural schemes also tend to face issues of low payment collection rates, a lack of external sources of funding, and tariffs that are lower than cost-recovery rates. Available evidence indicates that these considerations are often overlooked, but play a critical role in the sustainability of water supply and sanitation schemes, as well as in building community ownership and satisfaction with the delivered services. This calls for upstream feasibility studies and preparation activities that not only address technical aspects of the infrastructure of the water schemes, but also attempt to understand the social characteristics of the local populations in order accommodate their needs and perspectives through a community-centered approach.

**Implications for the Way Ahead**

The diverse evidence synthesized in this report can inspire the government, civil society, and the international community to accelerate their actions toward addressing severe deprivation of WASH services in Tajikistan. At the policy level, the report can inform the ongoing sector reform discussions, which aim to address the complexities of sector governance through greater regionalization of certain service delivery functions. The regional companies are envisaged to support their affiliate utilities by providing technical back-up, engineering support, and enhanced financial management. Each of these components can be informed by the legal and regulatory gaps identified in this report. The findings on consumer engagement and perceptions regarding service providers can be used to build capacity and enhance the skills of staff in the newly created regional branches. The prioritization of regional utility companies that are being created can be informed by the detailed spatial analysis, which highlights the intersection of population density and most severely deprived population groups that would benefit the most from service improvements.
As the reform process continues at the macro level, the findings of this report can also inform the targeting, design, and monitoring of future investments in the WASH sector in Tajikistan. In a complex institutional reform environment, a two-pronged approach that promotes stand-alone investments across rural Tajikistan alongside the macro-level reform discussions is necessary. Stand-alone WASH schemes, in this context, can provide much-needed service improvements to remote areas that are otherwise unlikely to see service improvements in near future. They can also provide an impetus toward challenging the status quo, which is characterized by only a few investments in the most severely deprived areas of Tajikistan (such as GBAO region), as well as low cost recovery (by service providers) and low affordability (among consumers). Because of the population density in Khatlon and Sughd, these two regions remain as the priority locations for large-scale stand-alone investments. These investments would be the most efficient in terms of cost per beneficiary. The sparsely populated and remotely located GBAO region, on the other hand, is the priority location for smaller, decentralized, and community-based WASH schemes.

Future investments, whether small or large, can build on the lessons learned from the stand-alone schemes studied in this report. These lessons pertain to strengthening the legal status and ownership of schemes; ensuring affordability of services by consumers and recovery of costs by service providers; and utilizing the resources of communities in the design, construction, operation and maintenance stages. Across the three service delivery models identified in this report—public enterprises, private enterprises, and water user associations (WUAs)—mobilizing local authorities and communities early on, in the design stage, and sustaining their involvement in the construction and operation of these decentralized schemes, seems particularly effective for the sustainability of stand-alone schemes in rural areas. Local government and community leaders can assist the service providers. The early and continued involvement of communities could reduce financial costs, increase the sense of ownership, and increase willingness to pay cost-recovery tariff levels for services. The interaction between communities and service providers can be enhanced through feedback loops that allow consumers to report infrastructure breakdowns, receive up-to-date information about service interruptions, and demand information about tariffs and other costs.

In the short term, there are immediate measures that the government, civil society, and the international community can take to improve the availability and quality of drinking water across Tajikistan. The analysis has shown that even in the capital Dushanbe, the majority of the population does not have water meters. This results in inefficient use of water resources by consumers, interruptions in water availability (especially in summer months), and difficulties in fee collection by service providers. Installation of water meters in areas where water supply networks already exist can lower the rate of overconsumption and water waste. Water meters can help increase the rate of fee collection, which can contribute to cost recovery by the local water utilities, Vodokanals, and improve the accuracy of water bills received by the consumers. Another relatively straightforward intervention that can yield quick results relates to water treatment methods. According to the results of the water quality tests conducted for this study, even though drinking water in Tajikistan is not contaminated with *E. coli*, it contains other types of bacteria and has low concentrations of chlorine. The most common water treatment method used by the households (boiling water) further reduces chlorine concentration in drinking water, which can impair public health. Therefore, providing sufficient quantities of chlorine to Vodokanals, schools, and health facilities across Tajikistan, as well as promoting the supply of bleach and water filters in local markets, can significantly improve the quality of water consumed by the population. Experience shows that such interventions are most effective when they are supplemented with information campaigns on safe and affordable water treatment methods, not only among water users, but also among service providers.

Several sanitation and hygiene interventions can also yield results in the short term, particularly in rural areas, schools, and health clinics where facilities tend to be in poor condition.
At the household and community level, awareness campaigns can promote the construction of safe sanitation facilities that minimize contact with human excreta and promote personal hygiene. These efforts need to be complemented with measures that promote availability and affordability of latrine materials in local markets, as well as those that underscore the interdependent nature of total sanitation measures among community members. In urban areas, where public toilets and shared facilities are common, establishing sanitation zones and sanitation zone management committees that work with the city and regional governments (hukumat) and local service providers, can help improve the condition of shared facilities and prevent the spread of disease. Finally, donor and government resources can be directed toward provision of soap, materials to practice safe menstrual hygiene, and other hygiene materials in schools and health clinics, as well as in rural markets, where a significant share of the population does not have access to personal hygiene.

The extensive data sources collected for this study can be used for additional research to inform evidence-based decision making and interventions in the WASH sector. While the findings presented in this report provide a diagnostic of key issues across the WASH sector, various data sources can inform specific interventions on a range of subtopics. For example, one of the unique features of the Household WASH Survey is the availability of detailed information on WASH conditions for people with disabilities. Future research agenda can also focus on the integrated nature of the various data sources. For instance, future research can exploit the integration of the Household WASH Survey and the School WASH Survey to analyze the link between availability and quality of WASH services in schools and households, as well as how these services relate to observed health, education, and other well-being outcomes of children. Similarly, the integration of the Household WASH Survey and the UNICEF Nutrition Survey can be analyzed further to explore the synergies among WASH conditions, nutrition, and care, particularly for infants and children under the age of five. Household-level data can be examined in relation to the division of labor within the household with regard to treatment methods and related water quality results. The extensive qualitative data and case studies can provide additional information to inform the design of future programs. Together, these data sources can provide a solid analytical foundation for future interventions in WASH sector in Tajikistan.

Reference

Located on the western tip of the Himalayas, Tajikistan has abundant fresh water resources in its rivers, lakes, and glaciers. Yet, access to improved drinking water, and to sanitation connected to a functioning sewerage system, are among the most severe and unequally distributed services in the country. Unsafe water, sanitation, and hygiene (WASH) conditions have significant adverse effects on well-being, particularly for rural residents, the poor, and children.

*Poverty Diagnostic of Water Supply, Sanitation and Hygiene Conditions in Tajikistan* documents the realities, characteristics, and priorities of Tajikistan’s WASH-deprived population. It presents new, comprehensive evidence on the coverage and quality of WASH service conditions, along with their diverse well-being impacts. It also identifies institutional gaps and service delivery models that can inform future policies and investments in the WASH sector. The findings communicate a sense of urgency that should inspire the government, civil society, and the international community to accelerate their actions toward addressing WASH deprivation in Tajikistan.