4 COUNTRY AND REGIONAL ASSESSMENTS

Introduction and Methodology

Water security is central to sustainable development. It supports public health, protects ecosystems, strengthens livelihoods, and underpins economic growth. Although Earth has abundant water, it is not always available where or when it is needed. Natural systems, infrastructure, and governance all influence how water is accessed and managed. As demand rises, ensuring reliable water supply becomes more complex.

Water also plays a critical role in global development goals. While SDG 6 focuses directly on water and sanitation, nearly every SDG depends on safe, sufficient, and well-managed water. Within SDG 6, indicator 6.5.1 tracks how well countries implement IWRM. This is widely used as a measure of water governance capacity.

This assessment explores the link between governance and water security. Five countries Bangladesh, Cambodia, Nepal, Pakistan, and Tajikistan, were examined using AWDO's water security scores and SDG 6.5.1 data. These scores helped identify how governance practices align with water security outcomes across the AWDO framework.

These assessments were designed as a pilot using a light-touch approach. Each review focused on existing data and networks, while beginning to build a clearer picture of each country's water security status and the pressures that shaped it. Future assessments may build on this foundation. Over time, this approach could become a valuable tool to support country-level planning and decision-making.

This chapter includes a regional assessment of the Pacific. From the outset, it was clear that the Pacific context is distinct from the rest of Asia, requiring a different approach to water security assessment. The Pacific study, therefore, explores how an AWDO-style assessment could be applied in the region as a first step toward future country-level assessments. As a result, this chapter differs from the standard country assessments, with its own methods and objectives described in detail within the chapter.

Objectives of Country Assessments

The country assessments were developed with four main objectives:

Methodology of Country Assessments

The Global Water Partnership (GWP) led the assessments, supported by national experts and UNEP-DHI. GWP's global SDG team coordinated the process, drawing on its regional and national networks. Technical guidance and quality assurance were provided by UNEP-DHI throughout.

A consistent methodology was applied in all five countries, involving the following steps (Figure 47):

1 Review of AWDO's Methodology

Experts reviewed how AWDO calculates each of its five Key Dimensions. This included examining data sources, assumptions, and scoring methods to ensure consistency and understanding.

2 Country-Level Analysis of KD Data

Experts analyzed KD and indicator scores for their country. A project data analyst supported this process to validate trends and identify key patterns.

Figure 47. Overview of Country Assessment Method
AWDO = Asian Water Development Outlook, CPS = country partnership strategy, IWRM = Integrated Water Resources Management, KD = Key Dimension. Source: ADB.

To build a clear and up-to-date picture of each country's water security status using the AWDO KDs.

To assess how progress on IWRM, measured by SDG indicator 6.5.1, aligns with improvements in water security.

To contextualize these results with national policies, programs, political changes, and recent events.

To produce practical, evidence-based reports that outline key findings, challenges, and opportunities.

3 Analysis of IWRM Implementation (SDG 6.5.1)

Experts reviewed the 2017, 2020, and 2023 IWRM reports. They examined detailed scores across IWRM components and questions, supplemented by relevant national plans, policies, and stakeholder consultation reports.

4 Country Assessment Grid

Each expert completed a standardized assessment grid that linked AWDO scores to IWRM performance.

- Pressure sections identified key drivers of water stress such as population growth, infrastructure gaps, and climate impacts.
- State sections described the current condition of water systems and their impact on people and ecosystems.

For each IWRM and KD intersection, experts summarized:

- Progress and achievements
- Key barriers or bottlenecks
- Strategic opportunities to strengthen water governance and security

5 Review of ADB CPSs

Experts assessed their country's CPS and engaged with ADB staff to identify ways AWDO findings could inform future CPS development.

6 Stakeholder Consultations

Targeted interviews were held with government officials, GWP partners, and others. While AWDO scores were not shared directly, these discussions explored recent changes in governance and institutional frameworks.

7 Development of Initial Findings:

Experts first prepared PowerPoint presentations using a shared template. These presentations outlined key findings and recommendations, which were presented and refined at the 2025 ADB Water and Urban Development Forum in Manila.

8 Report Drafting

Country experts then drafted the full reports using a common format. Reports blended data analysis with case examples and qualitative insights, highlighting the relationship between governance and outcomes.

9 Final Review and Submission:

Each report was shared with both the central AWDO coordination team and ADB resident missions. Feedback from these teams helped shape the final versions, which are presented in the following sections.

Bangladesh Country Assessment

Summary

Bangladesh's water security assessment provides an overview of progress between 2013 and 2025, alongside water governance performance from 2017 to 2023. It draws on the AWDO framework and SDG indicator 6.5.1 to explore the relationship between governance and water outcomes.

The findings show that while policy frameworks have expanded and some sectoral gains have been achieved, progress remains uneven. Institutional fragmentation, weak financing, and rising climate pressures continue to limit broader water security outcomes.

Rural household water security remains a concern. National programs have improved service access and sanitation, but arsenic contamination, drought, and groundwater overuse still threaten large parts of the country. Local institutions face challenges in service delivery, and coordination between agencies remains limited. Rural water governance lacks the capacity to fully address these overlapping risks.

Economic water security has benefited from new planning frameworks and institutional investments, particularly in agriculture. However, water remains poorly allocated between sectors. The absence of permits, pricing mechanisms, and cross-sectoral water accounting limits both productivity and sustainability. Institutional reforms have begun, but governance tools are not yet fully embedded in practice.

While policy frameworks have expanded and some sectoral **gains** have been achieved, progress remains **uneven**.

People riding a boat to cross a river in Bangladesh (Photo by ADB).

Urban areas continue to experience fragmented water and sanitation services. While infrastructure has expanded in some cities, informal and peri-urban settlements are often left behind. High nonrevenue water, poor wastewater management, and exposure to floods and salinity are persistent challenges. Urban planning has yet to fully integrate water resilience or equitable service delivery.

Environmental water security remains weak. Pollution, declining flows, and wetland degradation are ongoing problems. Institutional mechanisms exist to support ecosystem protection, but they lack funding, real-time data, and enforcement power. Ecosystem needs are not well integrated into basin planning processes.

Water-related disaster resilience shows partial progress. Infrastructure like cyclone shelters and embankments is widespread, but nonstructural tools such as early-warning systems, drought response, and forecast-based financing remain underused.

Across all areas, weak coordination, limited local capacity, and fragmented financing hinder progress. Strengthening cross-sectoral planning, protecting ecosystems, investing in inclusive services, and integrating climate risks into national frameworks are essential steps toward climate-resilient water governance.

Review of Bangladesh's Water Security Score

Rural household water security (KD1) remains a pressing concern with poor water quality widespread throughout the country. Arsenic contamination, seasonal drought, and unsustainable groundwater use affect large areas, particularly the Barind Tract and coastal districts. Over 22 million people still rely on arsenic-contaminated water sources, while changes in rainfall patterns driven by climate change and salinity in coastal areas increase water stress (DPHE 2022; SDG 6.5.1 2023). Limited investment in hygiene at the household level amplifies risks for rural communities.

Between 2013 and 2025, Bangladesh's KD1 score rose from 7.3 to 9.4, moving from the lower to the higher end of *Capable*. The improvement reflects progress under national strategies such as the 2014 National Strategy for Water Supply and Sanitation, and projects led by the Department of Public Health Engineering (DPHE 2022). However, results have been incremental due to gaps in interagency coordination (both vertically and horizontally), fragmented mandates, and limited focus on the most vulnerable areas. The "access to water" indicator remained consistently high, scoring 4 out of 5, while sanitation and hygiene indicators scored between 2 and 3 out of 5, showing slower gains.

Economic water security (KD2) faces growing stress. Competing demands from agriculture, industry, and energy sectors are increasing, while water allocation remains inefficient and poorly regulated. Agricultural production is threatened by saltwater intrusion, declining groundwater levels, and erratic monsoon patterns, particularly in the southwest and northwest (Barind) regions (GED 2018; MOI 2022). Industrial demand is growing rapidly, especially in economic zones and export-oriented sectors like textiles, but regulation is weak.

The KD2 score rose from 10.2 in 2013 to 13.0 in 2025, reflecting improvements in policy and institutional reform. The Bangladesh Delta Plan 2100, the 2022 National Industrial Policy, and the growing role of agencies such as Barind Multipurpose Development Authority (BMDA) all contributed to this progress (GED 2018; MOI 2022). Agriculture and energy indicators reached 4 and 3.3 out of 5 respectively, while industry and broad economy lagged at 3.0 and 2.7 respectively. Bangladesh is also a major exporter of virtual water, especially through rice and textiles. Applying the Fair Water Footprint framework may help align water use with sustainability. However, further gains are limited by the lack of national water permits, tariff systems, and cross-sectoral accounting tools (SDG 6.5.1 2023).

Urban water security (KD3) is under rising pressure. Rapid urbanization, climate shocks, and deteriorating infrastructure affect water supply and sanitation in major cities like Chattogram, Dhaka, and Khulna. Low sanitation coverage, and poor wastewater treatment are common. Informal settlements are especially vulnerable, often lacking connections to public systems and facing service disruptions and poor quality water (DWASA 2022; ADB 2020). Urban flooding and salinity intrusion are also increasing due to climate change and poor drainage.

Bangladesh's KD3 score increased slightly from 9.2 in 2013 to 10.8 in 2025. This reflects limited success from specific interventions such as the Khulna Water Supply Project and modernization by DWASA (DWASA 2022). Despite some progress, most utilities still operate below cost-recovery levels and lack performance monitoring systems.

Environmental water security (KD4) has been stable. Pollution, flow regulation, and land-use change are degrading key river and wetland systems. Major rivers like the Buriganga, Karnaphuli, and Turag remain heavily polluted due to untreated domestic and industrial wastewater. Wetland degradation and rising salinity are harming biodiversity in ecosystems such as the Sundarbans and Haor wetlands (NRCC 2021; MOEFCC 2009). River flows are further reduced by upstream diversions from the Teesta and Ganges.

The KD4 score remained at 11.4 from 2013 to 2025. Institutional arrangements such as the NRCC and the Haor Master Plan are in place, but financing is weak, environmental data is limited, and enforcement of environmental flows is minimal (GED 2018; SDG 6.5.1 2023).

Water-related disaster security (KD5) remains a national priority. Bangladesh experiences frequent floods, cyclones, droughts, and riverbank erosion. While structural investments such as embankments and cyclone shelters have improved resilience, nonstructural measures like early-warning systems, forecast-based financing, and risk-informed planning remain limited (MODMR 2021; ADB 2020). New challenges include more frequent heat waves, urban waterlogging, and flash floods.

KD5 scores rose from 9.4 in 2013 to 10.0 in 2016 and gradually improved to 11.5 by 2025 despite the significant impacts of flash floods, cyclones, and droughts in the northwest. Since 2013, the capacity to manage water-related disasters has more than doubled. National planning frameworks have since improved, including the Standing Orders on Disaster (2019) and the integration of disaster planning in the Delta Plan 2100 (GED 2018; MODMR 2021). The flood indicator remains the lowest at around 1 out of 5, while drought indicators score closer to 4.5. Storm-related indicators vary, depending on infrastructure and preparedness. Integration of slow-onset hazards such as drought and salinity into water planning is still lacking.

Marma women returning home from the village market (Photo by ADB).

State of Bangladesh's Water Governance (SDG indicator 6.5.1)

Between 2017 and 2023, Bangladesh made gradual progress in implementing IWRM, as reflected in its SDG 6.5.1 scores (Figure 48). In 2023, scores were 67% for management instruments, 66% for enabling environment, and 67% for institutions and participation. Finance remained the lowest performing area at 57% (SDG 6.5.1, 2023). The data shows gains in planning tools and monitoring, but ongoing gaps in legal enforcement, institutional coordination, and funding (ADB 2020; SDG 6.5.1 2023).

The enabling environment is built on a sound legal and policy foundation. The Water Act 2013 and the Delta Plan 2100 set a framework for integrated water planning (Government of Bangladesh 2013; GED 2018). Additional policies in sanitation, industry, and disaster risk reduction have strengthened the sector (MOLGRD&C 2020; MOI 2022, MODMR 2021). However, enforcement on recent water-related policies is weak and laws remain poorly aligned. Local authorities lack clarity in their roles and operate with minimal oversight or legal authority (SDG 6.5.1 2023).

Institutional arrangements involve multiple ministries, including the Ministry of Water Resources (MOWR), the Ministry of Local Government, Rural Development and Co-operatives (MOLGRD&C), and the Ministry of Environment, Forest and Climate Change (MOEFCC). Yet, coordination is limited and mechanisms for stakeholder engagement are underdeveloped. Local government institutions and community-based organizations often have little influence, especially in rural areas (SDG 6.5.1 2023). Capacity constraints and the lack of vertical links between national and local institutions are major issues (ADB 2020).

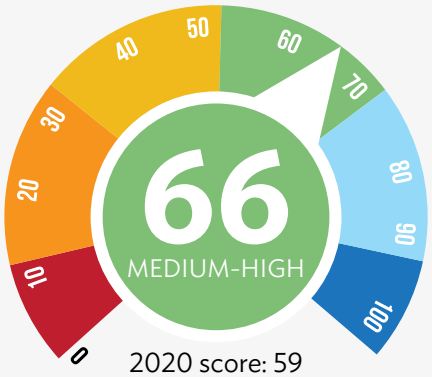
Management instruments have advanced the most. Bangladesh has improved hydrological assessments, water quality monitoring, and disaster risk data (BWDB 2021; MODMR 2021). But gaps remain in real-time data, adaptive management, and cross-sectoral planning. Tools like drought modeling and climate projections exist but are underused (MOEFCC 2009; ADB 2020).

Financing remains a critical constraint. Most infrastructure projects depend on donor support. Domestic financing is low, and economic instruments such as permits and eco-tariffs are not in use (SDG 6.5.1 2023). Opportunities for green finance, public–private partnerships, and fiscal decentralization remain largely untapped (MOLGRD&C 2020).

In summary, Bangladesh has established a robust IWRM framework, but gaps in coordination, enforcement, finance, and local capacity continue to limit implementation.

A tube well installed in a small island in the Karnaphuli River during the first phase of Chittagong Hill Tracts Rural Development Project by ADB (Photo by ADB).

Figure 48. SDG Indicator 6.5.1 and Sub-Components for Bangladesh (2023)



2020 score: 59
2017 score: 50

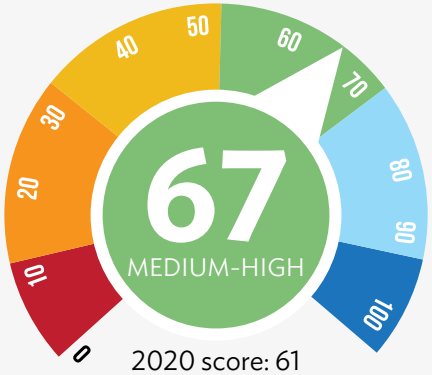
Enabling Environment

Policities, plans and laws to support IWRM

2020 score: 60
2017 score: 49

Institutions and Participation

Capacity, participation and coordination at all levels



2020 score: 61
2017 score: 56

Management Instruments

Instruments to monitor and manage water resources and ecosystems

2020 score: 50
2017 score: 45

Financing

Budgets and revenue raising for IWRM and infrastructure

IWRM = Integrated Water Resources Management, SDG = Sustainable Development Goal.
Source: SDG 6.5.1; 2023.

Relationship Between Bangladesh's Water Security and Water Governance

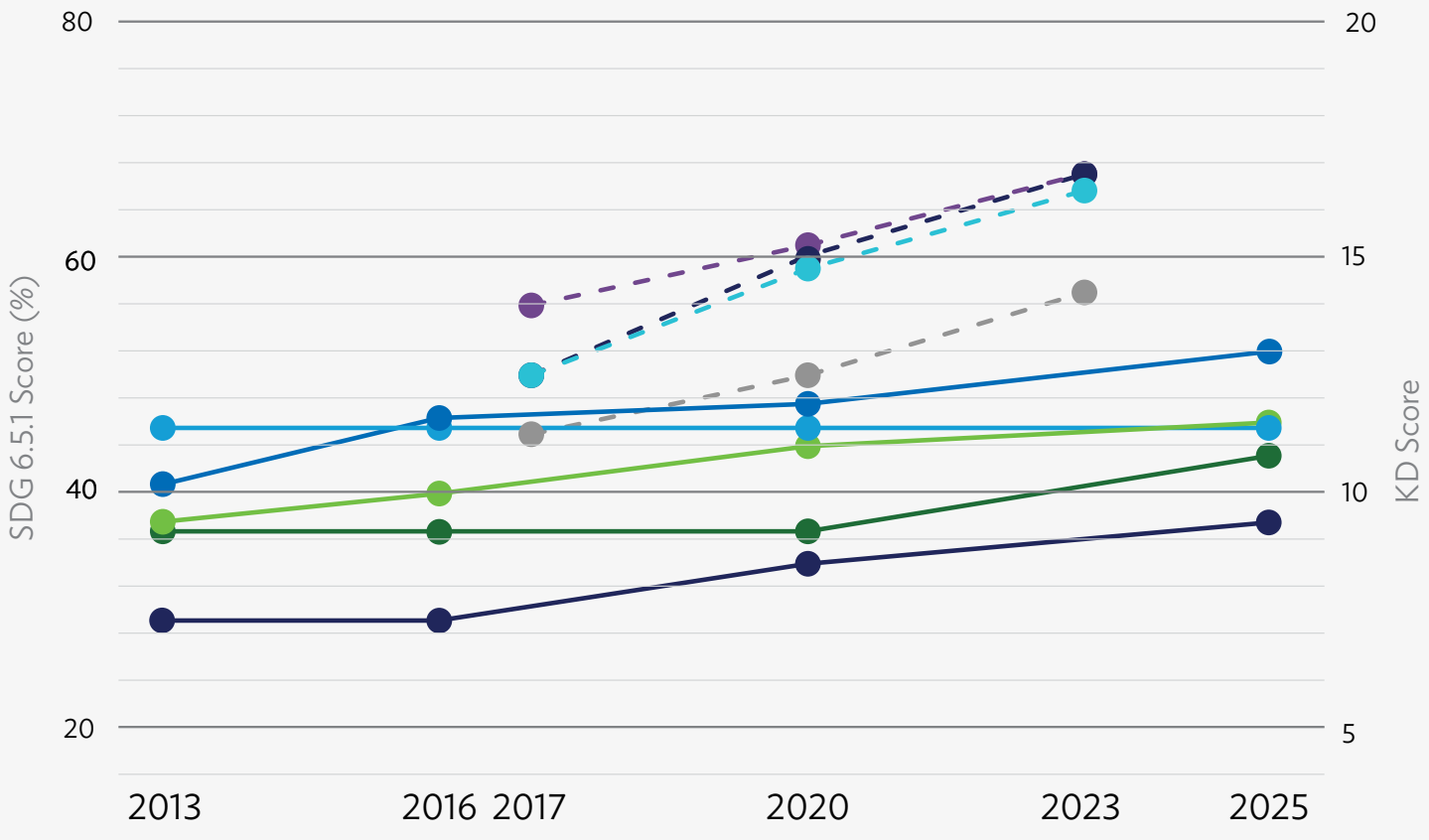
Bangladesh's water security trajectory between 2013 and 2025 aligns with gradual improvements in IWRM (Figure 49). Policy instruments such as the Water Act and the Delta Plan have helped shape national responses, but implementation remains uneven across the five KDs (ADB 2020; SDG 6.5.1 2023). Areas with stronger planning tools show more progress, while dimensions with weak institutional coordination and financial constraints continue to lag (UN-Water 2021).

KD1 improvements reflect targeted service delivery projects. However, weak local governance, limited decentralization, and low community engagement restrict broader adoption of IWRM principles (DPHE 2022; MOLGRD&C 2020). There remains a mismatch between national planning and local capacity.

KD2 gains align with better planning instruments and institutional leadership from agencies like BMDA (GED 2018). However, the lack of economic governance tools such as permits and water pricing systems continues to constrain efficient water use (SDG 6.5.1 2023). Progress remains fragile without structural reforms.

KD3 improved modestly, with further progress limited due to poor integration of IWRM into urban governance. Utilities face technical and financial challenges. Although some IWRM tools, such as urban resilience strategies and climate-adaptive infrastructure plans, have been introduced, their integration into city-level policy remains partial. Weak collaboration between utilities, city planners, and ministries has contributed to poor sanitation and weak resilience planning (DWASA 2022; ADB 2020).

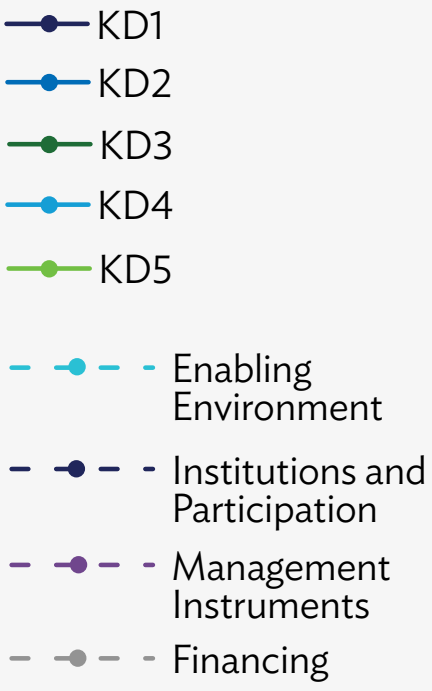
Figure 49. Status of Water Governance vs. Water Security in Bangladesh



KD4 stagnation is tied to weak integration of ecosystem needs. Data gaps, poor interagency coordination, and limited use of green infrastructure prevent progress (MOEFCC 2009; NRCC 2021). Environmental flows are not legally protected or enforced.

KD5 shows some gains, but risk planning is still dominated by infrastructure. Early-warning systems, climate finance, and slow-onset hazards remain under-addressed. Vertical coordination is poor, and data sharing is limited between agencies like the Bangladesh Water Development Board (BWDB), BMDA, and local governments (MODMR 2021; SDG 6.5.1 2023).

Overall, selective progress in water security reflects partial success in IWRM. Embedding IWRM principles across governance levels and sectors is essential to sustain national water security.



KD = Key Dimension.
Source: SDG 6.5.1 and AWDO 2025 data.

Findings and Recommendations

Institutional coordination remains the central weakness in Bangladesh's water security. National frameworks such as the Bangladesh Delta Plan 2100 and the 2013 National Water Act provide a strong foundation, yet responsibilities remain fragmented across ministries and agencies. This separation slows implementation and prevents effective cross-sectoral planning. Strengthening coordination mechanisms at both national and basin levels would help align water, environment, disaster management, and urban development strategies. Anchoring these platforms within the Delta Plan and scaling up initiatives such as ADB's Haor Flood Management and Livelihood Improvement Project could build momentum for IWRM.

Environmental water security continues to deteriorate. Ecologically critical zones such as the Sundarbans and Haor wetlands face pressures from reduced flows, land-use change, and pollution. Legal mechanisms to protect minimum flows are weak and enforcement is limited. Updating monitoring systems and enforcing standards under the Water Act 2013 would provide a path forward. National projects, such as the Dhaka River Restoration Project, offer opportunities to test real-time flow and water quality monitoring and apply lessons more broadly. Strengthening the role of the Bangladesh Water Development Board (BWDB), National River Conservation Commission, and the Department of Environment will be critical for enforcement.

Financing remains a systemic constraint across all dimensions of water security. Bangladesh depends heavily on external donors, while cost recovery and domestic financing remain low. Innovative tools such as eco-tariffs, pollution taxes, blended finance, and green bonds could expand the financing base. Scaling up climate finance from sources such as the Green Climate Fund and Adaptation Fund would help address climate-resilient infrastructure needs. Local governments in peri-urban and informal settlements require stronger financial planning capacities. The PPP Act 2015 also provides a framework to attract private investment, but water utilities will need targeted support to make such partnerships viable.

Urban water systems face growing pressure from flooding, population growth, and aging infrastructure. Cities such as Dhaka and Khulna continue to struggle with high water demand, service gaps, and limited coverage of informal settlements. Frequent disruptions and a lack of resilient infrastructure limit the reliability of services. Addressing these issues will require investments in smart metering and flood-resilient sanitation systems. Expanding public-private partnerships, as piloted in projects such as the Urban Water Supply and Sanitation Project and the Chattogram Water Supply Improvement Project, could accelerate improvements in service delivery.

Bangladesh has made important progress in managing rapid-onset hazards, but gaps remain for slow-onset risks. Large-scale structural investments have improved resilience to floods and cyclones, yet drought, salinity intrusion, and extreme heat are not adequately reflected in disaster planning. These risks are growing with climate change and need to be incorporated into long-term water and disaster management strategies. Promising pilots, such as GIZ's drought preparedness programs and the World Food Programme's climate insurance scheme in Rajshahi, should be integrated into national policies. Forecast-based financing, hazard zoning, and climate insurance can strengthen resilience for rural and water-dependent livelihoods.

Participation and monitoring remain weak, especially at local levels. While planning and monitoring tools have improved under IWRM, implementation remains uneven. Civil society and local governments are often excluded from decision-making, particularly in rural and environmental sectors. Real-time data systems and cross-sectoral budget coordination are limited, which hinders accountability and evidence-based decision-making. Expanding participatory approaches and updating monitoring infrastructure would improve integration and support more effective governance.

In summary, Bangladesh has established strong policy frameworks, but implementation gaps persist. Building coordination platforms, enforcing environmental flow standards, diversifying financing sources, and strengthening urban systems are urgent steps. At the same time, integrating slow-onset hazards into national strategies and expanding participation will be critical to sustain long-term water security. Together, these actions would align Bangladesh's progress with its vision under the Delta Plan 2100 and create a more resilient foundation for development.

Small boats wait for passengers by the riverbank of the Buriganga River in Dhaka City, Bangladesh (Photo by ADB).

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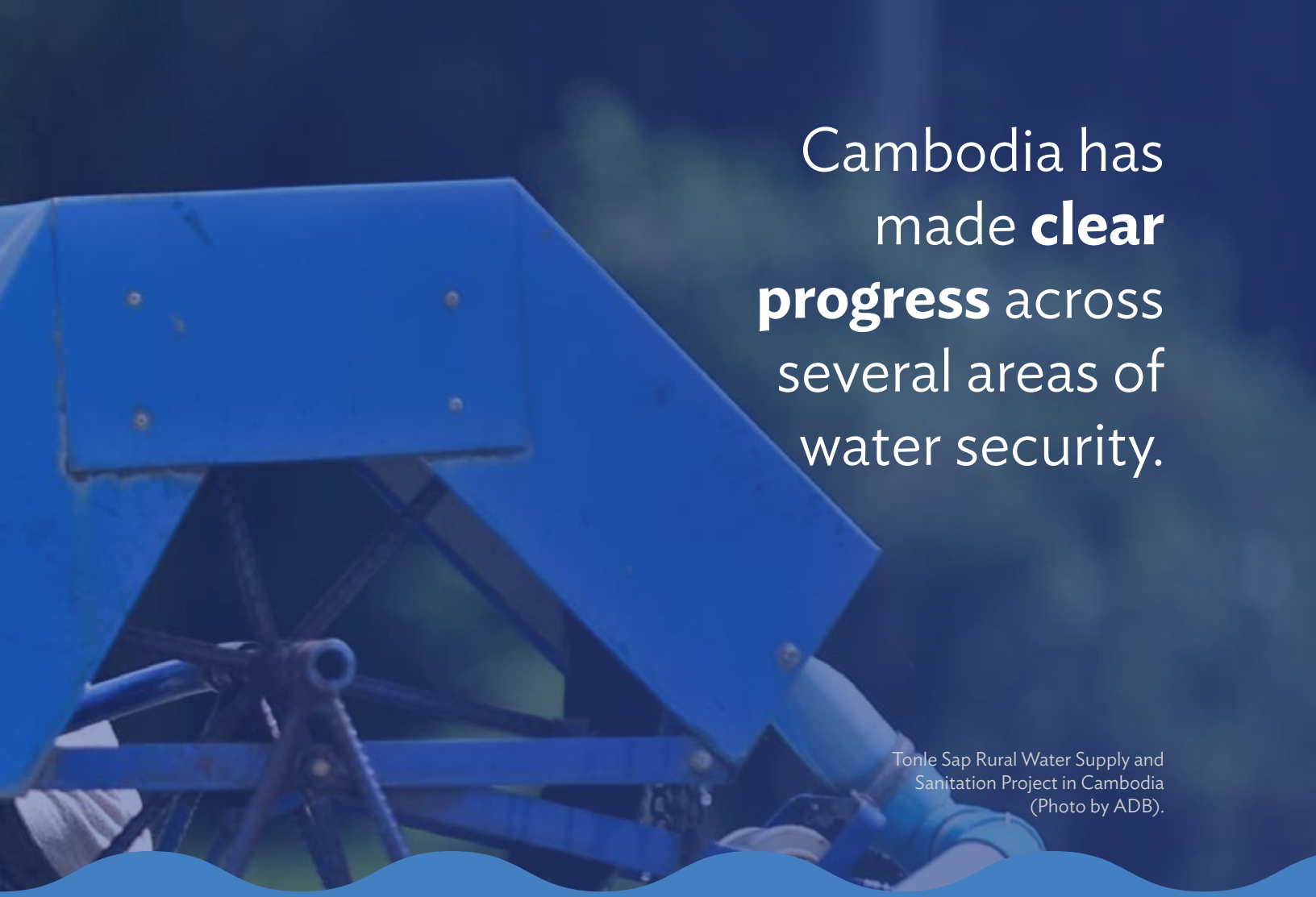
Cambodia Country Assessment

Summary

Cambodia's water security assessment provides an overview of progress between 2013 and 2025, alongside water governance performance from 2017 to 2023. It draws on the AWDO framework and SDG indicator 6.5.1 to explore the relationship between governance and water outcomes.

Cambodia has made clear progress across several areas of water security. Access to WASH has expanded, particularly in urban areas, and efforts to improve disaster risk management have strengthened national and local response capacity. These gains have been supported by improvements in water governance, including new laws and policies, stronger stakeholder engagement, and the gradual rollout of coordination mechanisms. However, progress has not been uniform. Rural services remain vulnerable to climate shocks, economic water security continues to face pressure from weak infrastructure and investment gaps, and environmental conditions show signs of increasing stress.

Governance reforms have improved the enabling environment for water management, but implementation remains inconsistent. While Cambodia has passed important national legislation, some regulatory gaps persist, especially around water licensing and groundwater use. At the same time, coordination across agencies and levels of government remains a challenge. Information systems for water disasters are underdeveloped,



Cambodia has made **clear progress** across several areas of water security.

Tonle Sap Rural Water Supply and Sanitation Project in Cambodia (Photo by ADB).

making it difficult to monitor risks or respond quickly to disruptions. Financial constraints are particularly acute at the subnational level, where investment depends heavily on donor support.

Key pressures on Cambodia's water systems include rapid urbanization, increased water demand, limited wastewater treatment, groundwater overuse, deforestation, and climate-driven extremes such as floods and droughts. These issues threaten both water quality and long-term sustainability, particularly in rural and environmentally sensitive areas.

To address these challenges, the report recommends strengthening coordination between sectors and governance levels; updating the legal framework to include water licensing and groundwater regulation; developing and implementing basin plans; improving data systems; and increasing public investment in water and weather infrastructure. Cambodia's new IWRM Action Plan (MOWRAM 2025) offers a timely opportunity to advance these priorities and align water governance with national development and climate goals.

Review of Cambodia's Water Security Score

Cambodia has made steady progress in expanding WASH services since 2013. However, rural–urban gaps remain significant, and services are increasingly disrupted by drought, heat, and other climate shocks. Without adaptive measures, these risks could reverse recent gains, particularly for vulnerable populations. The government has committed to achieving universal access to safe water for all uses and providing safely managed WASH services for all urban residents and at least half of the rural population by 2030. Financing remains a major barrier. Although the National Strategy for Rural WASH (2011–2025) outlines the cost estimates, its implementation has been only partial. Currently, just 3% of rural WASH financing comes from domestic sources, raising concerns about long-term sustainability (WHO 2022).

Rural household water security (KD1). Cambodia's KD1 score increased from 6.0 in 2013 to 9.1 in 2025. This improvement reflects better access to WASH, along with reduced diarrheal disease burden driven by increased investment. However, rural services remain vulnerable to frequent interruptions caused by droughts, competition with irrigation demands, and groundwater degradation. With 74% of the population living in rural areas in 2024, and rural demand expected to grow, further infrastructure investment and groundwater management will be critical.

Economic water security (KD2). Cambodia's KD2 score declined slightly from 12.0 in 2013 to 11.1 in 2025. Economic water security is under pressure from limited infrastructure, inefficient irrigation, and repeated climate extremes. These conditions have reduced water productivity and affected river flows

during shortages and floods. While there have been improvements in recent years, these have not fully offset earlier declines on water access for agriculture, energy, and industry.

Urban water security (KD3). Cambodia's KD3 score rose significantly from 6.3 in 2013 to 14.6 in 2025, reflecting strong gains in urban water security. This progress has been driven by the government's commitment to 100% coverage of urban water supply, sanitation, and hygiene. However, urban growth is placing increasing pressure on water systems. Water demand has nearly doubled, sewerage remains limited, and flood risks from poor drainage persist. Sustaining these gains will require continued investment in resilient infrastructure and wastewater treatment.

Farmers that lives in Trapeang Prey village (Photo by ADB).

Environmental water security (KD4). Cambodia's KD4 score increased slightly from 13.5 in 2013 to 13.8 in 2025. The score reflects a relatively stable condition of aquatic ecosystems and moderate environmental governance. However, these systems face growing threats from deforestation, groundwater overuse, and wetland encroachment for agriculture. While the CASCI and EGI remain relatively strong, a declining trend in groundwater highlights emerging risks that could undermine environmental water security.

Water-related disaster security (KD5). Cambodia's KD5 score improved from 8.2 in 2013 to 13.3 in 2025, driven by stronger national and community disaster response capacity. The country remains highly exposed to seasonal floods and droughts, particularly across the Mekong, Tonle Sap, and Bassac basins. Infrastructure gaps, arsenic contamination (natural and human sources), and changing upstream hydrology continue to strain disaster resilience. The increase in KD5 reflects efforts led by the National Committee for Disaster Management to improve early-warning systems and local preparedness.

State of Cambodia's Water Governance

Cambodia has made steady progress in implementing IWRM since 2017. According to SDG 6.5.1 data, all four IWRM dimensions improved between 2017 and 2023 (Figure 50). The average score increased from 46% to 62%, with the strongest gains seen in institutional development and stakeholder participation.

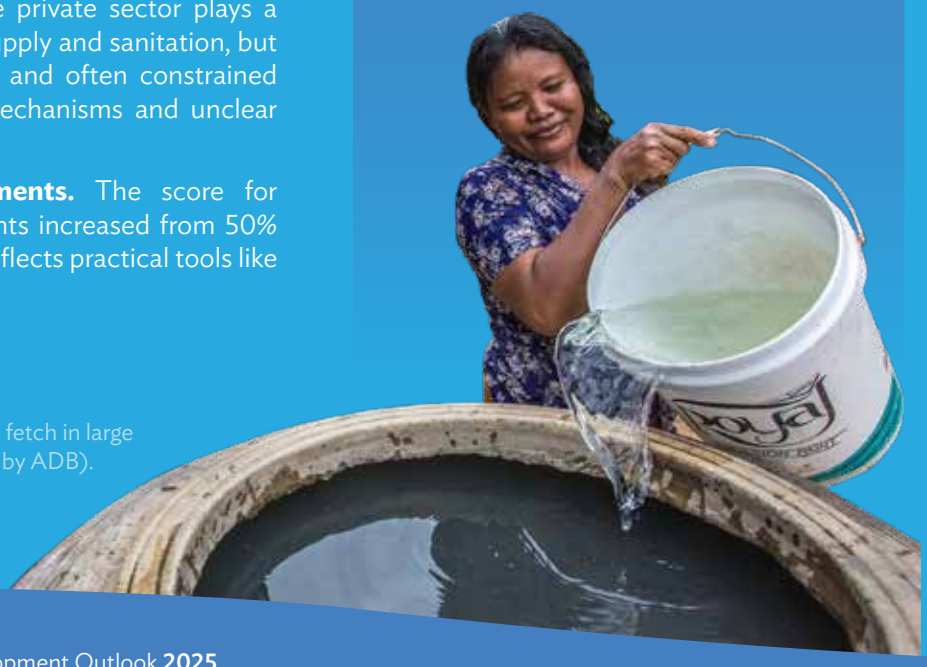
Enabling environment. The enabling environment score rose from 54% in 2017 to 66% in 2023. This reflects the introduction of several key legal instruments, including the 2007 Water Law, the 2023 Environmental and Natural Resource Code, and the 2023 Law on the Management of Clean Water Supply. These frameworks support IWRM principles at both national and subnational levels. However, some critical areas remain underdeveloped. There are still no sub-decrees on water licensing or groundwater regulation, and implementation of the broader framework remains limited. Dissemination and enforcement across sectors and levels of government need further strengthening.

Institutions and participation. Institutional and participation scores rose from 46% to 68% between 2017 and 2023. This progress reflects improvements in coordination among government agencies and wider stakeholder engagement. River basin committees have been established at national and subnational levels, though coordination remains a challenge due to overlapping responsibilities and limited technical capacity. The private sector plays a growing role in water supply and sanitation, but engagement is uneven and often constrained by limited financing mechanisms and unclear regulatory frameworks.

Management instruments. The score for management instruments increased from 50% to 63%. This progress reflects practical tools like cross-subsidies that improve access to water services. For example, investments in central Phnom Penh support lower-income areas through a Social Fund, where 5% of profits are set aside for staff welfare and broader community initiatives, and differential pricing. Despite these efforts, Cambodia still lacks river basin development plans. A 2015 sub-decree on river basin management has yet to be implemented. In addition, water information systems remain underdeveloped, making timely and informed decision-making difficult. Definitions of environmental flows are also unclear and need regulatory attention.

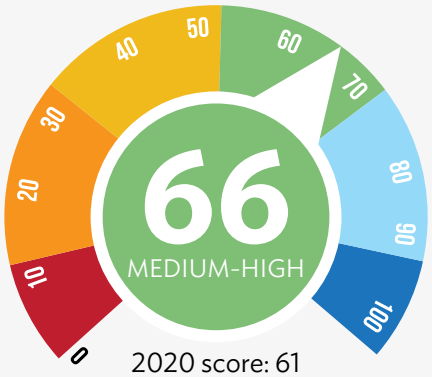
Financing. Cambodia's financing score rose from 37% in 2017 to 52% in 2023 but has not increased since 2020. The national budget for IWRM was rated at 60% in 2023, but subnational budgets and revenue generation remain limited. Low investment productivity and fragmented planning have constrained external financing. Subnational/basin-level financing scored 40%, and IWRM revenue raised scored just 50%. These limitations affect both infrastructure delivery and the broader capacity to implement governance reforms.

The average score increased from 46% to 62%, with the strongest gains seen in institutional development and stakeholder participation.



Farmer stores the water she fetch in large water container jars (Photo by ADB).

Figure 50. SDG Indicator 6.5.1 and Sub-Components for Cambodia (2023)



2020 score: 61
2017 score: 54

Enabling environment

Policies, plans and laws to support IWRM

2020 score: 64
2017 score: 46

Institutions and participation

Capacity, participation and coordination at all levels

2020 score: 58
2017 score: 50

Management instruments

Instruments to monitor and manage water resources and ecosystems

2020 score: 52
2017 score: 32

Financing

Budgets and revenue raising for IWRM and infrastructure

IWRM = Integrated Water Resources Management, SDG = Sustainable Development Goal.
Source: SDG 6.5.1, 2023.

Relationship Between Cambodia's Water Security and Water Governance

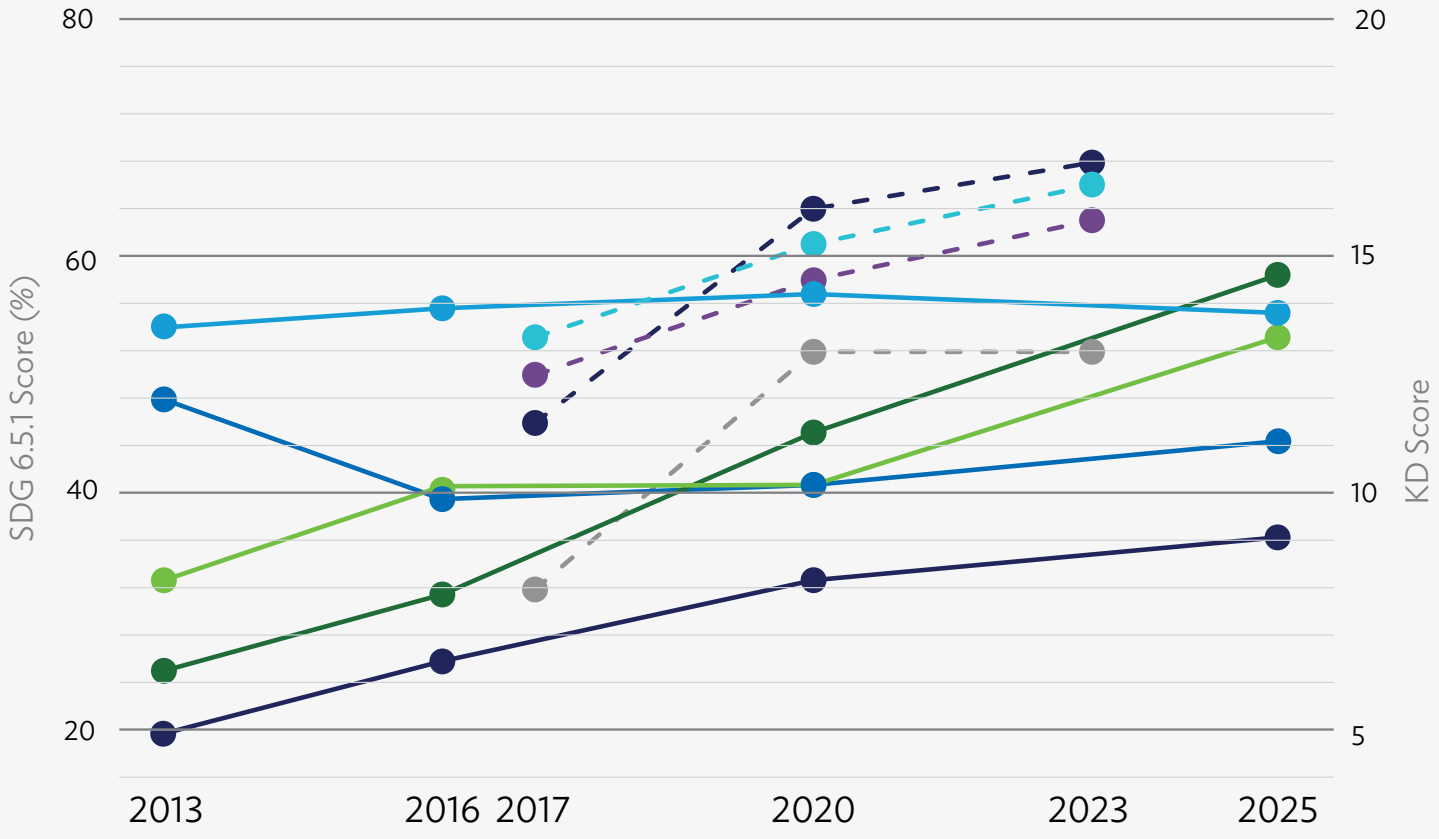
Cambodia has made steady progress in both water governance and water security over the past decade (Figure 51). While gains have varied across different dimensions, a clear relationship can be seen between improved governance structures and stronger performance in several areas of water security. The following analysis highlights these interlinkages, drawing on AWDO and SDG 6.5.1 data and complemented by expert insights.

Rural household water security (KD1) has benefited from improvements in the legal and institutional framework. The expansion of piped water supply, increased coordination across ministries, and broader WASH access all align with a more comprehensive governance approach. These advances reflect stronger policy alignment, better-defined institutional roles, and improved stakeholder engagement. However, challenges remain in financing rural systems and ensuring coordination across government levels, particularly in areas affected by climate-related disruptions.

Economic water security (KD2) shows a more complex relationship with governance. While frameworks for planning and stakeholder participation have strengthened, economic water use continues to be constrained by infrastructure gaps, inefficient irrigation practices, and climate pressures. The limited availability of funding, particularly for agriculture, industry, and energy water systems, has slowed progress. This highlights the need for better integration of governance reforms with targeted investment in both hard infrastructure and institutional capacity.

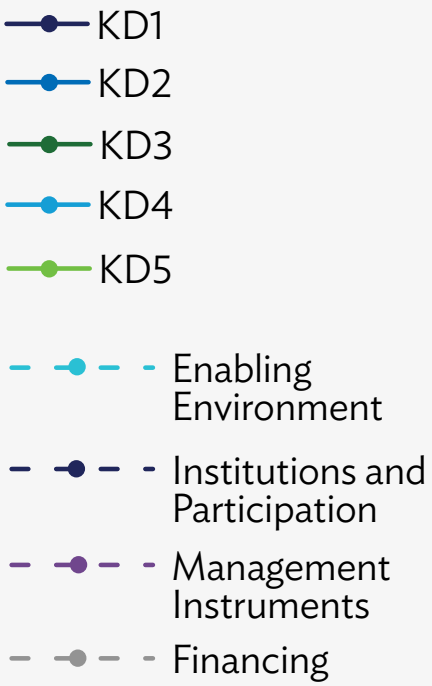
Urban water security (KD3) demonstrates a strong link with improved governance. National legal reforms, centralized water utilities, and increasing private sector involvement have

Figure 51. Status of Water Governance vs. Water Security in Cambodia



helped drive gains in urban service delivery. Innovations such as cross-subsidies and social funds have also expanded access in low-income areas. However, urban resilience still faces regulatory gaps in wastewater management and the absence of regulatory mechanisms like groundwater extraction licenses. These are areas where further governance development could deliver significant gains.

Environmental water security (KD4) has seen only marginal improvement, reflecting weak alignment with governance efforts to date. While legal protections for water resources exist, their enforcement is inconsistent. Environmental goals are not always integrated into planning or regulatory processes. Ongoing threats from land conversion, deforestation, and groundwater extraction point to the need for stronger cross-sectoral coordination and better monitoring systems. Subnational capacity and access to water data remain especially weak, limiting the effectiveness of environmental governance.



Based on SDG 6.5.1 and AWDO 2025 data.
Source: ADB.

Despite improvements, water-related disaster security (KD5) has had limited correlation with IWRM-related governance reforms. Disaster management is led by separate institutions with their own strategies, such as the National Committee for Disaster Management. While strong community networks and early-warning systems have been established, coordination between national and local actors is often fragmented. Communication delays and limited financing further hinder resilience. Aligning disaster risk management more closely with IWRM planning could help bridge this gap and support more effective adaptation.

Cambodia's new IWRM Action Plan for 2026–2030 offers a platform to strengthen the connection between water governance and water security. It identifies key areas for reform, including legal updates, institutional capacity building, and improved data systems. Embedding these priorities into national development planning will be essential for building a more integrated and resilient water governance system.

Findings and Recommendations

Cambodia's main governance challenge is not the absence of frameworks but the gap between law and practice. Legal and institutional structures are largely in place, yet weak enforcement and missing sub-decrees, particularly for groundwater and water licensing, continue to limit progress. Bridging this gap will require stronger accountability mechanisms, targeted capacity building, and improved coordination across sectors and government levels. Horizontal and vertical integration is essential if reforms are to deliver outcomes on the ground.

Legal instruments need to be expanded and enforced to address emerging pressures. The introduction of sub-decrees on water licensing and groundwater management would provide the tools to regulate surface water allocation and avoid overextraction in rapidly growing urban and agricultural zones. These measures would strengthen transparency, reduce risks to water supply, and improve outcomes for both cities and rural households. Similarly, basin-level planning

must be accelerated. Although a sub-decree on river basin management was adopted in 2015, it is yet to be fully implemented. Developing river basin plans at both national and subnational levels, with inclusive, multisector participation, would help operationalize IWRM and ensure governance coherence across all dimensions of water security.

Equity in access has benefited from cross-subsidy mechanisms, which provide lessons for the wider region. Phnom Penh's utility has successfully bundled revenues from higher-income areas to extend services to poorer neighborhoods, complemented by the establishment of a social fund. This model has contributed to measurable gains in both rural and urban water security. Its continued refinement, and potential expansion to other urban centers, could help sustain service delivery while reducing reliance on external financing.

Weak information systems remain a serious constraint to effective water governance. Fragmented and incomplete data limit the ability of institutions to plan, monitor, and respond to risks. The development of the National Water Resources Management Data Center presents an important opportunity to centralize information and improve data sharing across agencies. Once operational, this platform could strengthen drought response, flood forecasting, allocation decisions, and ecosystem protection. Ensuring regular updates and linking the platform with decision-making processes will be critical to its success.

Financing gaps continue to slow progress. Although national allocations to the water sector have grown, they remain well below what is required, particularly at subnational levels where local budgets are highly constrained. Heavy reliance on donors and private actors has filled part of the gap but has not provided long-term stability. Greater public investment is needed, supported by transparent, results-based mechanisms to track outcomes. Scaling local financing capacity would also reduce dependency and build institutional resilience.

Climate and disaster risks require significant additional investment. Cambodia has advanced strategies such as the Cambodia Climate Change Strategic Plan 2024–2033 and participates in regional frameworks under the Mekong River Commission, yet implementation lags. Expanding investment in water and weather infrastructure, aligned with these strategies, will be essential to reduce risks from floods, droughts, and other climate impacts. Embedding monitoring systems to track performance and ensure investments support adaptation goals will help translate plans into tangible resilience.

In summary, Cambodia has built a solid foundation of legal and policy frameworks but continues to face challenges in implementation, enforcement, and financing. Expanding sub-decrees, accelerating basin planning, strengthening data systems, and scaling investment, while building on successes such as cross-subsidies in Phnom Penh, can create the momentum needed to close the implementation gap and advance water security across all five dimensions.

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Nepal Country Assessment

Summary

Nepal's water security assessment provides an overview of progress between 2013 and 2025, alongside water governance performance from 2017 to 2023. It draws on the AWDO framework and SDG indicator 6.5.1 to explore the relationship between governance and water outcomes.

Nepal has made some progress in expanding water supply and sanitation, particularly in rural areas, but systemic challenges continue to undermine overall water security. Water quality remains poor, and infrastructure is often unreliable. Urban systems are under pressure from rapid growth, with limited drainage and near-absent wastewater treatment. Economic water use remains low, and the country has not yet realized the potential of its irrigation or hydropower resources. Environmental conditions are deteriorating due to pollution, weak enforcement, and disrupted flows. Disaster-related risks, including floods, landslides, and GLOFs, are increasing and often exceed local response capacity.

These challenges are rooted in persistent governance gaps. Nepal's transition to a federal system has created overlapping mandates and unclear roles across government levels. IWRM implementation remains limited, with a 2023 score well below the regional average. Most water-related agencies operate in silos, and coordination is ad hoc. Stakeholder participation is limited to service delivery, with few opportunities for meaningful input in planning or policy. Budget allocations for water have declined in real terms, and financing tools for cost recovery or investment remain underdeveloped.

Nepal has made some **progress in expanding water supply and sanitation**, particularly in rural areas.

Villagers collecting drinking water from the community tap (Photo by ADB).

Nepal's enabling environment has improved through new water-related policies and standards, though enforcement remains a challenge. Basin planning efforts have also begun. However, implementation lags, and legal reforms, particularly the passage of the Water Resources Bill, remain stalled. The country's ability to move from planning to action will determine future water security outcomes.

With stronger governance, Nepal can convert its water abundance into a foundation for resilience and development. This requires clarifying institutional roles, empowering local governments, and improving coordination. Capacity building and technical support for water user associations and subnational agencies are essential. Basin-level planning and cross-sectoral decision-making will help address seasonal variability and competing demands. Sustainable practices, including nature-based solutions and pollution control, will improve environmental and disaster resilience. Modern financing approaches, including cost recovery, green bonds, and public-private partnerships, are also needed to sustain progress.

Nepal's IWRM Action Plan (WECS 2022) and Global Water Leadership program provide a path forward. With political commitment and targeted support, these reforms can strengthen water governance and unlock progress across all five dimensions of water security.

Review of Nepal's Water Security Score

Nepal is rich in water resources, with an estimated 225 billion cubic meters of surface water available each year (WECS 2002). Major rivers such as the Gandaki, Karnali, and Koshi originate in the Himalayas and contribute significantly to the Ganges River system. These transboundary rivers hold geopolitical significance for India and Bangladesh. Groundwater is available in the valleys and Terai region, with annual renewable volumes estimated between 8.8 and 14.3 billion cubic meters (Baral 2023).

Despite this natural abundance, water security remains a challenge. Climate change, pollution, increasing urbanization, and underdeveloped infrastructure all place pressure on water systems. Glacial melt is accelerating, increasing the risk of GLOFs. Monsoon patterns have become more erratic, leading to frequent floods and landslides. In urban areas, rivers like the Bagmati are heavily polluted by untreated sewage and industrial waste. Over-pumping in the Kathmandu Valley has depleted aquifers and dried up traditional springs. In the hills and mountains, many springs have declined or disappeared (Adhikari et al. 2021).

In the Terai, shallow aquifers are overused, leading to seasonal water shortages. Naturally occurring arsenic in alluvial sediments contaminates groundwater in some areas, posing serious health risks. Only about 25% of the population has access to fully functional drinking water systems. These pressures have direct impacts across all five Key Dimensions of water security.

Rural household water security (KD1) improved from 4.8 in 2013 to 10.3 in 2025. Over 91% of rural households now use piped or protected sources, yet almost half face contamination. Infrastructure often breaks down and sanitation remains a challenge. Waste frequently pollutes groundwater and rivers. Cost-recovery mechanisms are weak. Most systems charge flat fees per tap without volumetric pricing, and few funds are set aside for maintenance. Nevertheless, recent progress in sanitation and hygiene, supported by post-COVID awareness, has likely contributed to the improved KD1 score.

Boy getting water from the community tap in Darbang, Nepal (Photo by ADB).

Economic water security (KD2) rose slightly from 10.1 in 2013 to 10.5 in 2025. Annual water use remains below 8%, despite significant hydropower and irrigation opportunities (Sharma et al. 2023). Water availability is uneven throughout the year, concentrated in the monsoon season. Irrigation infrastructure covers 1.53 million hectares, but only one-third of this area receives reliable year-round supply (Government of Nepal 2023). Crop productivity and intensity remain low (Baral 2023). Hydropower capacity has increased in recent years, reaching 2,765 MW in 2024 (DOED 2024).

Urban water security (KD3) increased modestly, from 8.3 in 2013 to 11.7 in 2025, but remains under pressure from rapid urbanization and unplanned development. The urban population is growing at more than 4.5% annually, and in cities like Kathmandu, water is supplied intermittently for only 3–4 hours every alternate day. During floods, shutdowns of the Melamchi system reduce supply to approximately 30% of normal levels, leaving many households dependent on costly storage, filtration, or bottled water. Drainage systems remain inadequate, leading to frequent urban flooding, while wastewater treatment is almost absent, with only 2.1% of wastewater and less than 1% of fecal sludge treated. Open drains and clogged networks continue to pose major health risks. Improvements in utility operations through Kathmandu Upatyaka Khanepani Limited have strengthened service delivery capacity, and progress toward regulatory compliance is supported by the Water Supply and Sanitation Tariff Fixation Commission (WSSTFC), which provides oversight of tariff-setting and operational standards.

Environmental water security (KD4) improved slightly, from 12.9 in 2013 to 13.7 in 2025. However, it remains under growing pressure. Hydropower construction, diversions, and weak governance have reduced environmental flows and degraded catchments. Urban pollution, land-use change, and riverbed mining have damaged aquatic ecosystems. CASCI has remained stable overall, with localized degradation in areas like the Roshi Khola catchment, where floods in 2024 caused major damage. EGI has performed better, reflecting widespread terrestrial protection in rural areas. Still, wastewater treatment remains limited.

Water-related disaster security (KD5) improved modestly between 2013 and 2025, from 11.8 to 13.0, reflecting gradual progress in disaster resilience. The 2023 National Disaster Management Policy and expanded early-warning systems contributed to these gains. However, zoning regulations and enforcement remain weak, and coordination between water and disaster institutions is limited. Further improvement will require more integrated planning through the IWRM framework and stronger stakeholder participation.

State of Nepal's Water Governance

Nepal's implementation of IWRM remains in its early stages (Figure 52). In 2023, the SDG 6.5.1 score stood at 37 out of 100, well below the Central and South Asia average of 55. The 2030 global target is 91. Without faster reform, Nepal is unlikely to meet this benchmark.

The country's federal structure, adopted in 2015, introduced seven provincial and 753 local governments. These levels share overlapping mandates on water, which has led to confusion, gaps, and duplication. Water governance is still sectoral, with weak coordination between institutions and limited stakeholder participation.

Enabling environment. Nepal's Constitution guarantees the right to a clean and healthy environment. It also commits the state to manage water resources for multipurpose use, energy, irrigation, and disaster reduction. However, legal frameworks are still catching up with this vision.

The 1992 Water Resources Act remains the main legal instrument, though it is outdated. A new Water Resources Bill is under parliamentary review. If passed and enforced, the bill would mandate IWRM, define roles across government levels, and create basin offices. It also includes strict regulations for water extraction, pollution control, groundwater monitoring, and environmental flows. Until this bill becomes law, many subnational policies remain stalled due to a lack of federal guidance.

Institutions and participation. Many water-related agencies exist at the federal and provincial levels; no single lead agency coordinates IWRM. Interagency collaboration is weak, with limited vertical coordination across levels of government. Communication is ad hoc and often limited to specific projects. Water responsibilities are split across multiple ministries. The Ministry of Energy, Water Resources and Irrigation (MOEWRI) and the Water and Energy Commission Secretariat (WECS) lead at the federal level. Other ministries, including those responsible for agriculture, water supply, environment, urban development, and planning, also have overlapping roles.

Participation in project delivery is stronger than in policy or planning. Community involvement is high in rural water supply and irrigation, but national policymaking remains top-down. Stakeholder mapping and engagement are usually funded through individual projects, not embedded in regular governance systems.

Institutional performance has declined. The institutions and participation score fell from 51 in 2020 to 40 in 2023. Key setbacks include the delay in forming river basin organizations, the dissolution of the Ground Water Resource Development Board, and persistent confusion over responsibilities across government levels.

Management instruments. Nepal's management tools for water are improving slowly. The score under this IWRM dimension rose from 36 in 2020 to 41 in 2023. WECS has developed several river basin plans, although implementation is still limited. Tools such as water audits and integrated planning models remain underdeveloped.

Hydrometeorological data collection has improved, but coverage is sparse. The Department of Hydrology and Meteorology operates over 150 hydrological stations, 330 precipitation stations, and 68 climate stations. However, many seasonal rivers and catchments remain unmonitored. Groundwater monitoring is still mostly manual, with recent pilots using automated systems yet to be scaled up.

Water quality monitoring has received a boost with the 2022 and 2023 standards, but enforcement remains weak. Regulatory action against polluters is rare. Socioeconomic data and risk assessments are also lacking, making it hard to target interventions or assess trade-offs between water uses.

Efforts to promote water efficiency are mostly limited to small-scale projects. Some irrigation schemes use rotational methods or drip systems. Rainwater harvesting and groundwater recharge projects are also underway in parts of the country but lack broad support or funding.

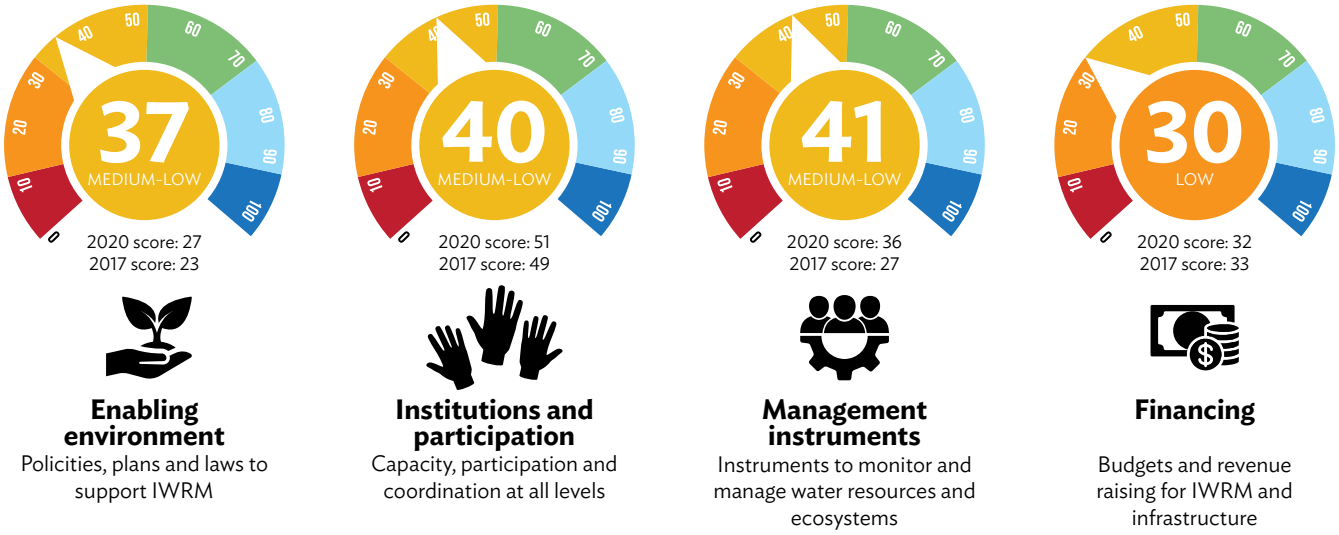
Financing. Financing for water governance and IWRM is a key constraint. This component score dropped from 32 in 2020 to 30 in 2023. Nepal has no dedicated funding mechanism for IWRM. Instead, related projects are funded through public investment or donor grants.

Most water-related infrastructure is publicly funded. Hydropower is the main exception, with some independent producers raising private capital. No user fees are charged for irrigation or drinking water withdrawals. Collection of irrigation service fees is weak and fails to cover operational costs. Sanitation and drainage are bundled with water tariffs where piped services exist. Recreation-based water uses are licensed, but pollution charges are not in place. A surcharge on petroleum products, originally introduced to fund the Budhi Gandaki Hydropower Project, has not yet been used for water infrastructure.

Overall, investment in water has declined in real terms. Budget allocations are insufficient for sustaining operations, especially for local service providers. Education and health spending have increased, but water has not kept pace.

Building Climate Resilience of Watersheds in Mountain Eco-Regions (Photo by ADB).

Figure 52. SDG Indicator 6.5.1 and Sub-Components for Nepal (2023)



IWRM = Integrated Water Resources Management, SDG = Sustainable Development Goal.
Source: SDG 6.5.1. 2023.

Relationship Between Nepal's Water Security Progress and Water Governance

Nepal's water security and governance trends show a gradual but uneven pattern of progress (Figure 53). KD scores improved slightly in rural, economic, and urban dimensions between 2013 and 2025, while environmental gains remained limited and disaster-related security declined. Over the same period, SDG 6.5.1 scores for IWRM remained low, rising only marginally in most dimensions and declining in others. This section explores how water governance gaps continue to constrain improvements in water security.

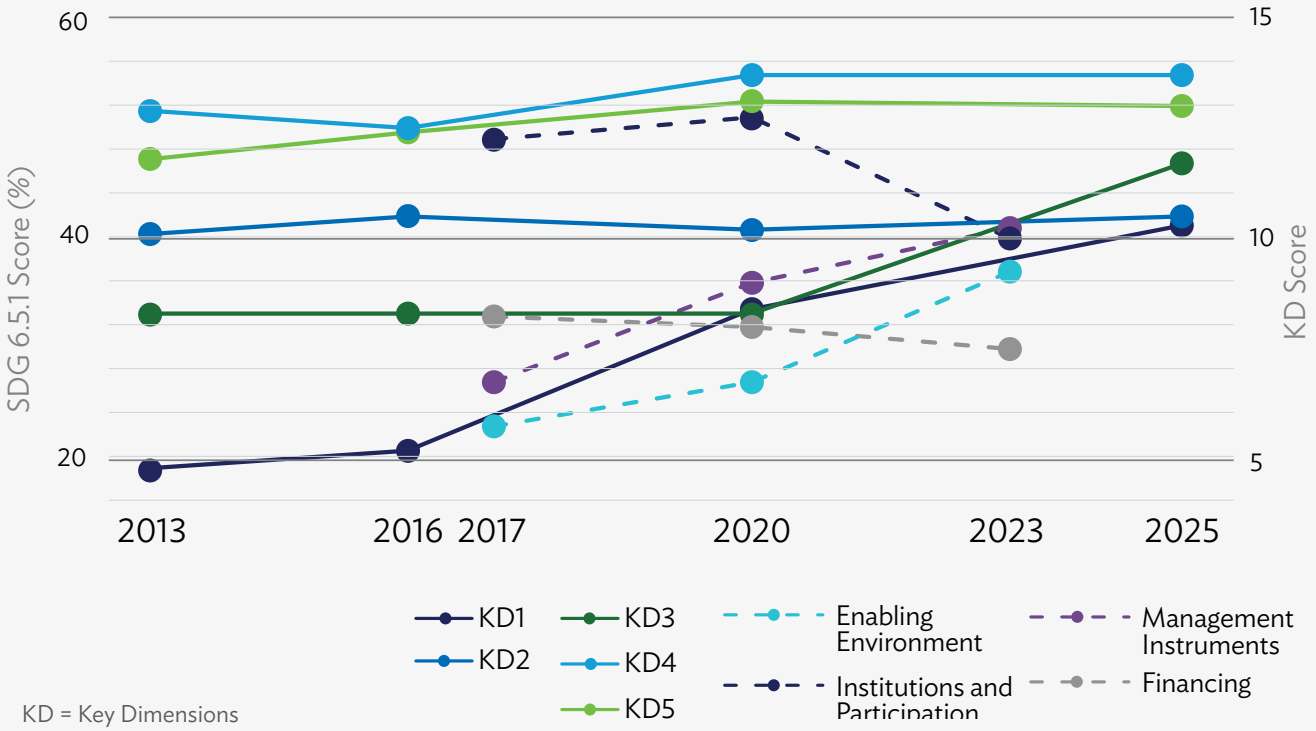
A fragmented governance structure is a major obstacle. Overlapping mandates across federal, provincial, and local governments make service delivery inconsistent. Lack of coordination weakens pollution control, disaster preparedness, and infrastructure maintenance. These challenges point to the importance of legal clarity, strong institutions, and coordinated planning, core elements of IWRM that Nepal is still developing.

Better implementation of IWRM could support more integrated, efficient, and inclusive water management. Basin-level planning and participatory models offer a clear path forward, especially if roles and responsibilities are defined and financing is secured. Nepal's policy progress provides a foundation, but enforcement, coordination, and financing remain weak.

Enabling environment and management instruments appear to support improvements in KD1 and KD3. Legal and policy reforms likely contributed to the expansion of rural water supply and hygiene services, and to modest gains in urban sanitation. However, without institutional capacity and financing, these improvements remain fragile.

KD2 offers a mixed picture. Economic water security improved slightly despite drops in the "institutions and participation" and "financing" dimensions of IWRM. This may reflect the positive influence of legal and planning tools,

Figure 53. KDs and Integrated Water Resources Management SDG 6.5.1 Dimensions for Nepal



KD = Key Dimensions
Source: ADB.

particularly for hydropower development. With better-informed decision-making, Nepal can manage trade-offs across sectors and increase water-related economic returns.

KD4 remains mostly unchanged despite increases in the enabling environment and management instruments. One explanation is that recent improvements are not yet implemented at a scale large enough to affect environmental outcomes. Declines in participation and financing may also be limiting impact. This suggests that environmental water security requires both stronger enforcement and greater investment to make gains visible.

KD5 improved due to disaster management policies like the 2023 National Disaster Management Policy. Early-warning systems have expanded, but zoning regulations and enforcement are still weak. Coordination between disaster and water institutions is limited. Further KD5 improvements will require greater participation and more integrated planning through the IWRM framework.

In summary, Nepal's experience shows that better water governance **can improve** water security, but only if progress occurs **across all four governance pillars**: enabling environment, institutions and participation, management instruments, and financing. Without stronger leadership, clearer mandates, and more consistent funding, future gains in water security may **remain limited**.

Water channel used to irrigate terraced farms in Nepal (Photo by ADB).

Findings and Recommendations

Nepal faces a paradox of abundance and scarcity. Despite plentiful water resources, the country struggles with both shortages and floods. Infrastructure gaps, fragmented governance, and climate pressures limit reliable and equitable access. Water and sanitation services have improved, especially in rural areas, but water quality, seasonal variability, and disaster risks remain persistent concerns.

Weak and unclear governance continues to hinder progress. Federal, provincial, and local actors often share overlapping roles, leaving leadership undefined. Many agencies exist at the federal and provincial levels, but no single lead institution coordinates IWRM. Responsibilities are spread across ministries, including energy, agriculture, water supply, environment, urban development, and planning, which limits both horizontal and vertical coordination. The MOEWRI and the WECS are nominal leaders at the federal level, but collaboration with other agencies remains weak. Institutional performance has also declined in recent years, with delays in forming river basin organizations, the dissolution of the Ground Water Resource Development Board, and continuing uncertainty over roles and mandates. The WSSTFC has provided a degree of regulatory oversight, but its impact remains limited without stronger coordination and enforcement mechanisms. These gaps undermine enforcement, reduce accountability, and prevent the consistent management of extraction, pollution, and ecosystem flows. Strengthening institutional clarity and giving more authority to local governments would improve coordination, responsiveness, and service delivery across all five dimensions of water security.

Implementation of IWRM remains limited. Political support for water has been inconsistent, and the sector still does not command the same policy attention as other infrastructure areas. The IWRM Action Plan (2022) provides a strong framework, but its impact will depend on clarifying mandates, boosting enforcement, and aligning legal and financial tools with water security goals. Building momentum requires greater capacity at local and provincial levels,

where water user associations and government agencies need training, financing, and monitoring systems to improve performance. While some communities engage in irrigation and rural water supply, they are rarely included in long-term planning. Reliable data and accessible tools are needed to enable meaningful engagement in decision-making. Expanding participation within the IWRM process would not only strengthen governance but also improve the resilience of water systems to climate shocks.

Seasonal and regional variability adds to the challenge. Monsoon rains bring heavy flows and flood risks, while winter months leave supplies scarce. Infrastructure to capture and regulate water, such as storage and inter-basin transfers, carries engineering, environmental, and social risks. Basin-wide planning, scenario modeling, and cross-sectoral coordination are essential to balance these trade-offs, reduce conflict, and secure ecosystem needs.

Infrastructure underperformance undermines water security. Irrigation and supply systems frequently break down, wastewater treatment is almost absent in urban areas, and hydropower development remains below potential, forcing electricity imports. Systems lack redundancy and remain vulnerable to shocks. Sustainable financing is critical to reverse these trends. Modern mechanisms such as green bonds, pollution taxes, and public-private partnerships can increase investment in resilient infrastructure. Tariff structures that balance cost recovery with inclusivity for low-income users will also strengthen financial sustainability.

Environmental degradation is worsening. Pollution, deforestation, and river encroachment are threatening biodiversity and ecosystem services. Mandated environmental flows are rarely enforced, and most polluters face no consequences. Climate change further intensifies these pressures by increasing floods, droughts, and landslides. Land-use zoning, flood-risk mapping, pollution control, and nature-based solutions will be essential to protect ecosystems, reduce disaster risks, and strengthen water storage capacity.

Springs and groundwater reserves are in decline, threatening rural water security. Communities dependent on these sources face worsening shortages, with some families relocating due to failing local systems. These losses jeopardize livelihoods, cultural heritage, and social stability. Addressing spring depletion requires integrated watershed management, reforestation, and protection of recharge areas.

In summary, Nepal's water abundance can become a source of resilience and growth if governance and finance gaps are addressed. Strengthening institutions, clarifying roles, empowering local governments, modernizing finance, and embedding IWRM into basin-level planning will allow Nepal to manage variability, safeguard ecosystems, and build inclusive water security for the future.

Elderly drinking water (Photo by ADB).

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Pakistan Country Assessment

Summary

Pakistan's water security assessment provides an overview of progress between 2013 and 2025, alongside water governance performance from 2017 to 2023. It draws on the AWDO framework and SDG indicator 6.5.1 to explore the relationship between governance and water outcomes.

Pakistan's rural household water security remains under pressure due to ineffective service models, limited surveillance, and persistent contamination, though improvements in hygiene and health outcomes have been observed. Economic water security is constrained by falling per capita water availability, insufficient storage, and heavy reliance on poorly monitored groundwater resources for industrial activity. Urban water security has shown only modest gains, with rising demand, untreated wastewater, and urban flooding straining infrastructure and service delivery. Environmental water security has declined slightly, as rapid population growth, industrial activity, and untreated wastewater continue to degrade aquatic ecosystems. Water-related disaster security fell during the early part of the period and has remained stagnant, with Pakistan experiencing major flood and drought events, including GLOFs.

Overall, Pakistan's national water security score improved moderately from 2013 to 2025 by 6.4 points. At the same time, water governance performance, measured through SDG 6.5.1, rose from 50% in 2017 to 63% in 2023. This progress reflects a sound legal and policy foundation, aligned with IWRM principles, but implementation remains weak. Institutional fragmentation, limited coordination, low

Pakistan's national water security score **improved moderately** from 2013 to 2025 by 6.4 points.

Pakistani woman washing the utensils with the water drain coming from the mountains this water is also used in daily life. (Photo by ADB).

technical capacity, and underinvestment continue to restrict progress, especially in light of growing population pressures, climate risks, and systemic inefficiencies in water management.

Water governance and water security outcomes are closely linked. Pakistan's National Water Policy and other frameworks support IWRM, but the gap between planning and implementation has limited impact. Efforts to improve equity, participation, and resilience are underway but require stronger integration across sectors and levels of government. Without more coordinated and well-financed governance, gains in water security will remain uneven and difficult to sustain.

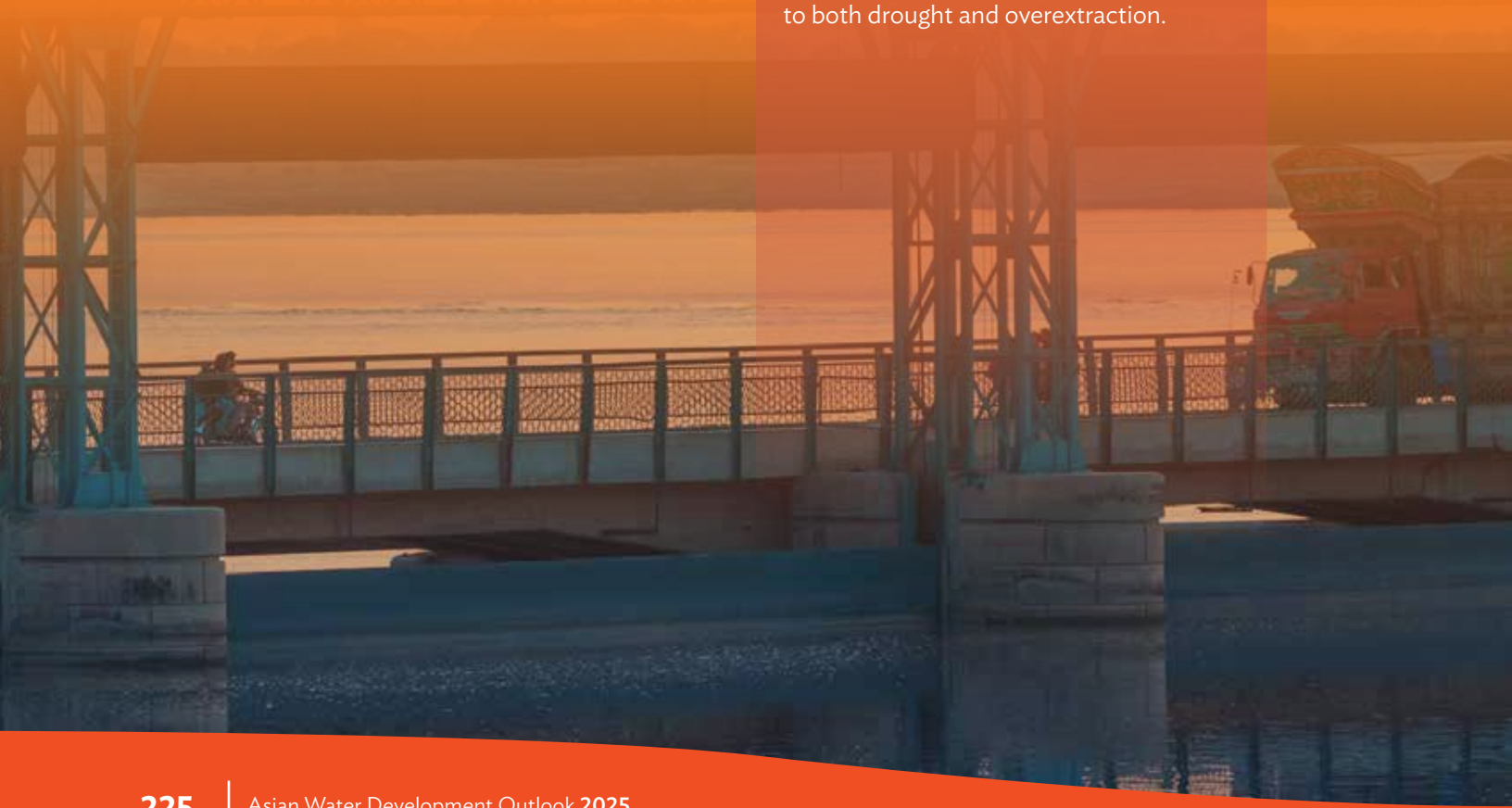
To improve water security, the chapter recommends strengthening institutional coordination under the National Water Council, introducing volumetric pricing to promote efficiency and investment, embedding gender, equity, and social inclusion in decision-making, establishing an independent water quality authority, and expanding environmental regulation and ecosystem protection. These steps will help deliver on the policy foundation already in place and support implementation of ADB's 2026–2030 Country Partnership Strategy for Pakistan.

Review of Pakistan's Water Security Score

Pakistan faces growing pressure on its water resources due to rapid population growth, climate change, and poor water management. Per capita water availability dropped from 3,500 cubic meters (m^3) in 1972 to just 1,100 m^3 in 2020. More than 80% of the population lacks access to safe drinking water, contributing to widespread waterborne diseases. Groundwater overuse in agriculture has led to depletion and arsenic contamination. Climate-related hazards, such as erratic monsoons, glacial melt, and floods, add further strain, with the 2022 floods displacing millions. At the same time, upstream water control and infrastructure challenges continue to threaten the Indus River system, Pakistan's lifeline.

Rural household water security (KD1) improved from 4.1 in 2013 to 7.6 in 2025, but access to basic services remains low. The gains were mainly in hygiene and health outcomes, supported by targeted WASH programs and possibly reinforced by handwashing campaigns during COVID-19. However, rural water supply models remain ineffective, and surveillance is limited. Microbiological and geogenic contamination are widespread, and policies have not kept pace with growing rural demand.

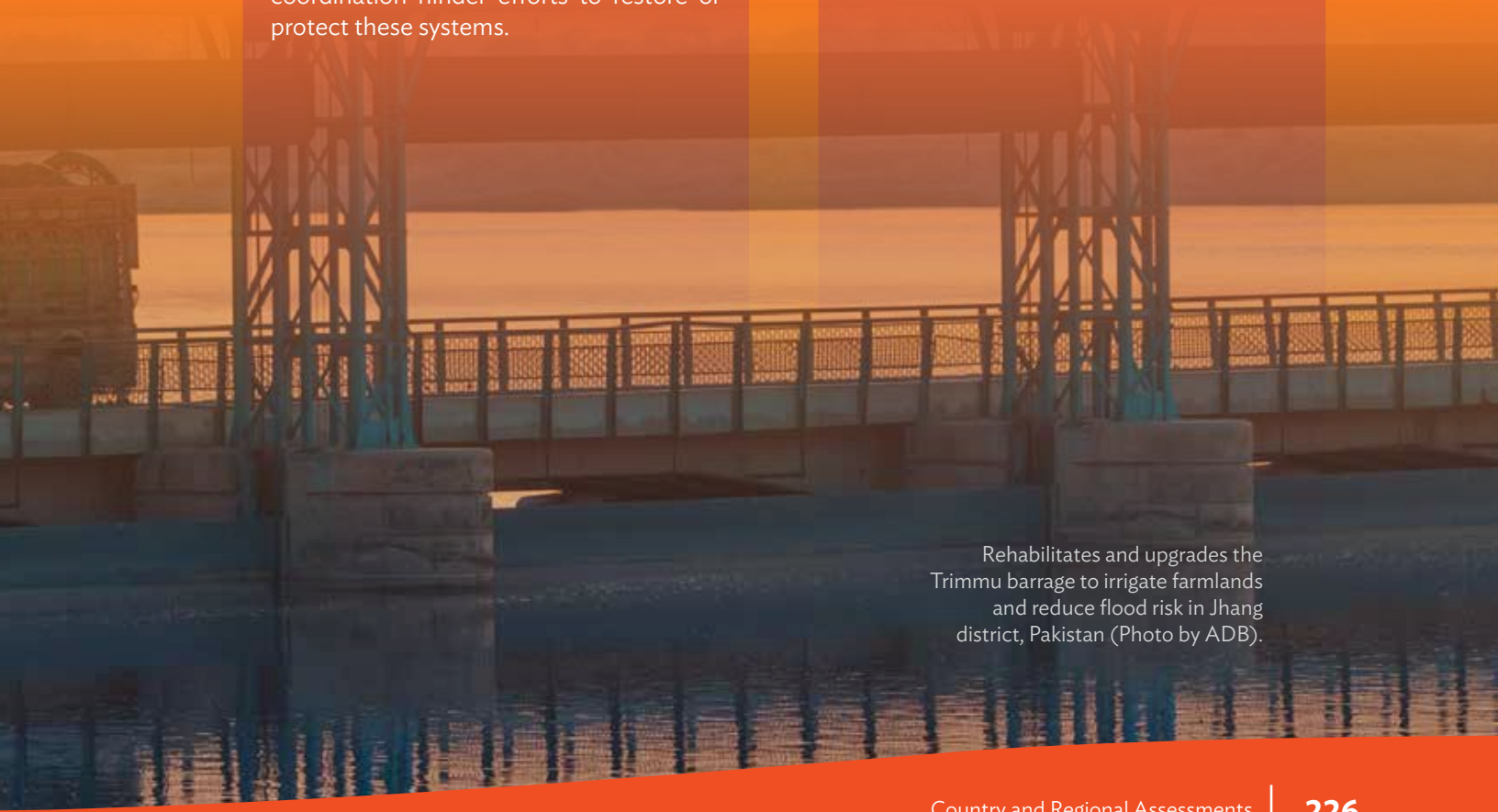
Economic water security (KD2) remained almost unchanged, increasing slightly from 9.1 in 2013 to 10.0 in 2025. Despite some progress in broader economic resilience, gains were offset by water scarcity and inefficient systems. Agriculture, industry, and energy sectors all face water-related constraints. Industrial water use relies almost entirely on groundwater (PCRWR, 2018), while infrastructure gaps and poor surface water quality reduce reliability. Limited storage capacity and outdated irrigation practices compound water stress, leaving economic water users vulnerable to both drought and overextraction.



Urban water security (KD3) showed stronger gains, rising from 7.5 in 2013 to 9.2 in 2025. Access to services improved slowly, and urban utilities remain under pressure from a 10% annual increase in demand. Underlying issues, like weak infrastructure, low tariffs, and poor cost recovery need to be addressed continuously. Untreated wastewater and frequent urban flooding continue to impact health and service delivery. While environmental quality in cities remained stable, resilience remains limited, especially in low-income settlements.

Environmental water security (KD4) declined slightly, dropping from 9.6 in 2013 to 9.2 in 2025. Population growth, urban expansion, and untreated wastewater are placing fresh water ecosystems at risk. Despite stronger legal frameworks, enforcement remains weak. Aquatic ecosystems, including the Indus River, wetlands, and marine zones, face increasing degradation due to pollution and reduced environmental flows. Institutional gaps and weak coordination hinder efforts to restore or protect these systems.

Water-related disaster security (KD5) has improved slightly between 2013 and 2025, rising from 10.8 to 11.5, and crossing into a higher water security step. This modest gain comes despite severe events such as the 2022 floods, which affected over 24 million people and exposed critical gaps in resilience. Early-warning systems have strengthened, but investment in adaptive infrastructure and local risk reduction remains insufficient. Prolonged droughts continue to threaten food security, especially for smallholder farmers.



Rehabilitates and upgrades the Trimmu barrage to irrigate farmlands and reduce flood risk in Jhang district, Pakistan (Photo by ADB).

State of Pakistan's Water Governance

Pakistan has made progress in formalizing its water governance framework, but implementation remains uneven (Figure 54). The country's SDG 6.5.1 score for IWRM improved from 50% in 2017 to 63% in 2023 (SDG 6.5.1, 2023). This reflects a medium-high level of progress. However, all four dimensions of IWRM face persistent challenges.

Enabling environment. Pakistan's enabling environment is legally strong but operationally weak. The 2018 National Water Policy (NWP) promotes basin-scale planning, equitable access, and climate resilience. Other relevant policies include the 2021 National Climate Change Policy and the 2006 National Sanitation Policy. While these frameworks align with IWRM principles, they are rarely implemented in full due to the lack of operational guidelines and clarity (World Bank 2019). Sectoral silos and overlapping mandates limit coordination across water, climate, disaster, and urban sectors. Without integrated planning, the potential of these policies remains unrealized.

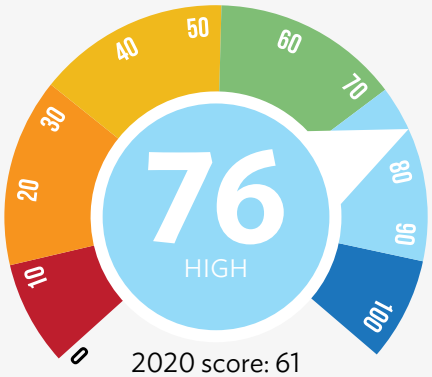
Institutions and participation. Institutional fragmentation undermines effective water governance. At the federal level, responsibilities are split across multiple agencies, including the Ministry of Water Resources (MWR), Ministry of Climate Change (MCC), Indus River System Authority (IRSA), Pakistan Council of Research in Water Resources (PCRWR), National Disaster Management Authority (NDMA). At the provincial level, irrigation departments, water and sanitation agencies, and environmental protection agencies lead implementation. However, coordination is weak and the National Water Council remains underutilized. This has led to duplication, inefficiency, and gaps in service delivery. While development partners and civil society groups have increased their involvement, local communities, women and marginalized groups remain underrepresented in decision-making and lack of technical capacity to influence planning.

Management instruments. Pakistan has introduced a range of management instruments, but their use is fragmented and inconsistent. Key national plans like Vision 2025, the NWP, and the Decade of Dams initiative aim to expand storage, improve agricultural efficiency, and promote basin-level planning. Monitoring tools and early-warning systems are also in place, led by the Pakistan Meteorological Department and NDMA. However, weak technical capacity and poor data sharing reduce their effectiveness. Urban utilities struggle with outdated systems, limited private investment, and high nonrevenue water.

Financing. Financing for water governance remains inadequate and poorly coordinated. While WASH funding increased by 152% between 2019 and 2023, the total allocation under the Public Sector Development Programme (PRs1.5 trillion or $5.3 billion) remains well below the estimated PRs10 trillion–PRs12 trillion ($35 billion - $42 billion) needed over the next decade (WaterAid 2020). Tariffs are set far below cost-recovery levels, especially in urban areas where high water losses and poor billing limit sustainability. Investment tends to favor large infrastructure projects, while institutional reform and climate adaptation remain underfunded. The absence of a coherent national water financing strategy limits the country's ability to build resilient and effective governance systems.

Overall, Pakistan has established the foundations for integrated water governance, but real progress depends on strengthening institutions and implementation. Without improved coordination, technical capacity, and financial planning, the gap between policy and practice will continue to slow gains in water security.

Figure 54. Status of Integrated Water Resources Management Implementation in Pakistan (2023)



2020 score: 61
2017 score: 67

Enabling environment

Policies, plans and laws to support IWRM

2020 score: 60
2017 score: 51

Institutions and participation

Capacity, participation and coordination at all levels

2020 score: 49
2017 score: 41

Management instruments

Instruments to monitor and manage water resources and ecosystems

2020 score: 53
2017 score: 40

Financing

Budgets and revenue raising for IWRM and infrastructure

IWRM = Integrated Water Resources Management, SDG = Sustainable Development Goal.
Source: SDG 6.5.1, 2023.

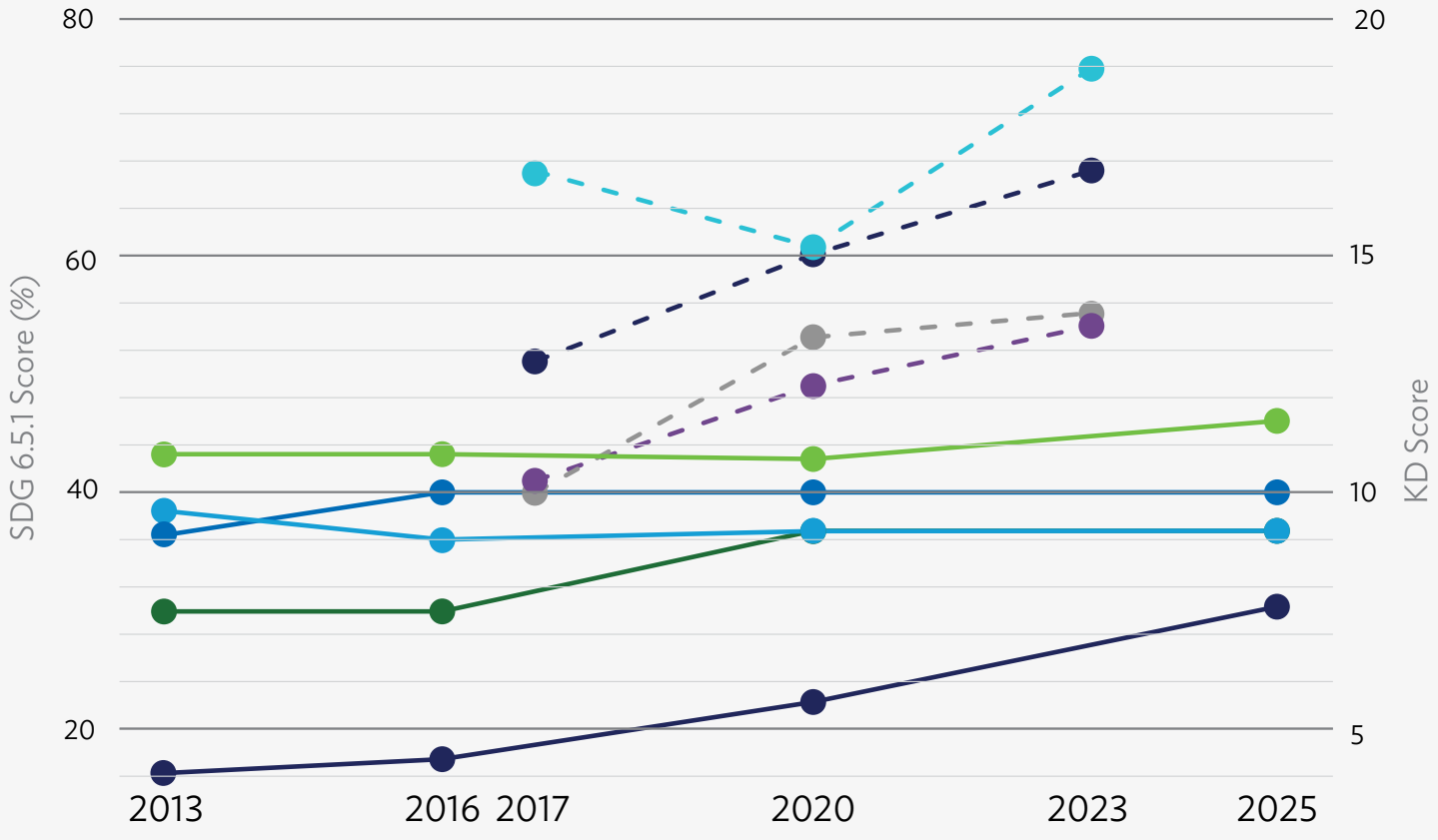
Relationship Between Pakistan's Water Security and Water Governance

Progress in water governance has not yet translated into consistent improvements in water security (Figure 55). Between 2017 and 2023, Pakistan's SDG 6.5.1 score for IWRM rose from 50% to 63% (SDG 6.5.1 2023). This increase reflects stronger policy frameworks, including the National Water Policy and provincial water acts. Yet, implementation remains fragmented. As a result, gains in water governance have produced only modest improvements in key water security dimensions.

Rural household water security (KD1) has benefited from WASH investments but lacks integrated planning. National policies support equitable access and climate resilience, but weak coordination between ministries and low local capacity continue to hinder service delivery. While external partners like UNICEF and the World Bank have supported rural WASH initiatives, local engagement remains limited. Despite a 152% increase in WASH funding between 2019 and 2023, Pakistan still faces a significant gap, falling short of the estimated $12.3 billion needed to meet SDG targets 6.1 and 6.2 (WaterAid 2020). Without stronger institutional frameworks and community participation, rural gains will remain uneven and fragile.

Economic water security (KD2) shows alignment with IWRM on paper but weak follow-through. The National Water Policy and draft National Water Conservation Strategy emphasize cross-sector coordination. Key institutions like IRSA and proposed provincial authorities support more equitable allocation. However, infrastructure remains underdeveloped and distribution systems inefficient. Storage capacity is critically low. Although over PRs1.5 trillion ($5.3 billion) in public funds and PRs200 billion ($700 million) in donor financing have been mobilized, these investments fall well short of long-term needs.

Figure 55. Status of Water Governance vs. Water Security in Pakistan

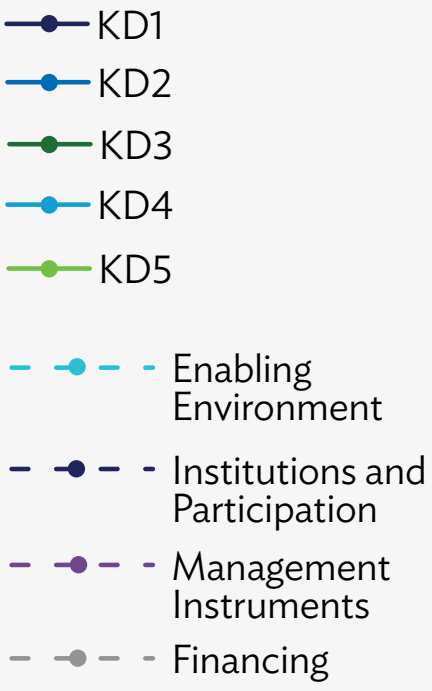


Without reforms in groundwater regulation, irrigation governance, efficiency incentives, and tariff systems, economic water use will continue to strain resources.

Urban water security (KD3) reflects fragmented governance and limited financial sustainability, with low KD3 scores despite relatively strong improvements. The NWP and Clean Green Pakistan campaign promote sustainable urban water services, and tools like the Clean Green Pakistan Index offer performance tracking. However, institutional responsibilities are split across multiple agencies with overlapping mandates and limited accountability. In Khyber Pakhtunkhwa, the creation of Water and Sanitation Services Companies shows potential for localized, utility-based services. Punjab's Aab-e-Pak Authority is another step toward coordinated planning. Yet, most urban utilities still operate under unsustainable financial models, characterized by low tariffs, high nonrevenue water, and aging infrastructure. Households often turn to private vendors, increasing the burden on low-income families. Policy intent exists, but without regulatory reform and cross-sector investment, urban governance will remain a bottleneck.

Environmental water security (KD4) is supported by national policies but constrained by weak enforcement. The NWP and Climate Change Policy both emphasize the importance of environmental flows and ecosystem protection. Institutions like IRSA and provincial irrigation departments are mandated to manage these flows, but coordination is poor and data gaps persist. Restoration initiatives, such as the Living Indus program, show rising engagement from civil society and international actors. However, implementation remains limited. The Environmental Protection Act provides a legal foundation for pollution control, but regulations are weakly enforced, with a wide gap in environmental protection and management. Sustainable financing and river health monitoring systems are still lacking, which limits progress.

Water-related disaster security (KD5) has policy backing but lacks integration with climate and water planning. Pakistan has adopted key instruments like the 2010 National Disaster Management Act, the National Flood Protection Plan, and the NWP. However, technical capacity is stretched, and coordination among NDMA, PDMAs, the Pakistan Meteorological Department, and water agencies remains insufficient. Financing is often reactive and short-term. Local preparedness is limited by poor infrastructure and weak stakeholder engagement. As climate impacts intensify, integrating disaster risk management into broader water governance will be critical to building resilience.



KD = Key Dimension.
Source: SDG 6.5.1 and AWDO 2025 data.

Overall, governance reforms have begun to reshape Pakistan's water management, but outcomes remain constrained by fragmented implementation and systemic underinvestment. Stronger alignment between national policies and subnational delivery, improved institutional capacity, and more inclusive planning will be essential to turning policy frameworks into sustained water security gains.

Findings and Recommendations

Pakistan has built a strong policy foundation, but systemic weaknesses continue to limit progress across all five dimensions of water security. The National Water Policy (2018) introduced IWRM principles and has been reinforced by climate and disaster frameworks. These strategies align with international best practices, covering allocation, resilience, disaster risk, and ecosystems. Yet implementation remains uneven. Responsibilities are fragmented across federal, provincial, and municipal levels, and key institutions often operate in isolation. The absence of a clear coordinating mechanism, particularly in rural service delivery (KD1) and urban water management (KD3), has resulted in low security scores despite improvements in recent years. Establishing a functional coordination platform under the National Water Council, supported by empowered provincial authorities with clear mandates, would improve integration and accelerate reform.

Financing shortfalls continue to constrain water governance. Although public investment has increased, particularly in WASH, funding remains far below the scale required. Urban utilities face low-cost recovery, high nonrevenue water, and limited capacity to maintain infrastructure. Informal settlements in major cities remain underserved, compounding water insecurity. Economic water security (KD2) and urban water management (KD3) are particularly affected, where structural and operational deficits persist. Introducing volumetric water pricing could improve efficiency in agriculture, generate revenues for reinvestment, and strengthen the sustainability of operations across sectors.

Environmental water security is deteriorating despite strong policy recognition. Freshwater and marine ecosystems are under pressure from pollution, flow reductions, and habitat loss. While legal instruments acknowledge ecological needs, enforcement is inconsistent, and monitoring systems are underdeveloped. The absence of dedicated financing further undermines progress. A national river health monitoring system, the implementation of environmental flow standards, and stronger pollution controls would help restore ecological balance. Scaling up coordination among water, environment, and planning agencies will be essential to ensure policy commitments translate into practice.

Water-related disaster security remains highly vulnerable. Pakistan faces repeated floods, and droughts, yet disaster management and water planning remain poorly integrated. Institutional overlap and reactive funding dominate, leaving communities exposed. While risk awareness is increasing, technical capacity and early action remain limited. Forecast-based financing, community preparedness, and integration of water considerations into disaster strategies could help reduce vulnerability.

Water governance needs to become more inclusive. Participation and representation remain limited, particularly for women, minorities, and marginalized groups. Embedding inclusion principles systematically across planning and decision-making would strengthen resilience, align investments with local needs, and reinforce the equity dimensions of water security. IWRM processes provide a clear opportunity to institutionalize this participation.

Independent oversight is required to strengthen accountability and service delivery. Water quality monitoring is uneven, and there is no single authority with the mandate to enforce standards nationally. Establishing an independent federal body for water quality monitoring could assess and regulate the performance of service providers, improve transparency, and build public confidence. Data-driven oversight would particularly strengthen KD1, KD3, and KD4 by ensuring safe drinking water, supporting enforcement, and guiding investment priorities.

In summary, Pakistan's strong policies provide a foundation, but progress depends on turning frameworks into action. Stronger coordination, sustainable financing, inclusive governance, ecological protection, disaster preparedness, and independent oversight are key to translating commitments into measurable improvements across all five dimensions of water security.

Boy refreshing himself from the heat at a community water (Photo by ADB).

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Tajikistan Country Assessment

Summary

Tajikistan's water security assessment provides an overview of progress between 2013 and 2025, alongside water governance performance from 2017 to 2023. It draws on the AWDO framework and SDG indicator 6.5.1 to explore the relationship between governance processes and water outcomes.

Tajikistan has made measurable progress in several dimensions of water security. Notable improvements were observed in rural household, economic, and water-related disaster security. In rural areas, expanded investment in water supply systems has contributed to increased access, though service reliability remains uneven. Economic water security also improved slightly, supported by reforms in basin planning and institutional arrangements. Tajikistan's capacity to manage water-related disasters has strengthened, with enhanced systems for flood and storm response contributing to greater resilience, despite ongoing vulnerability to glacial hazards and extreme weather.

However, progress has been uneven across dimensions. Urban water security has declined over the past decade, largely due to deteriorating infrastructure, high physical losses, and limited investment in operations and maintenance. Despite recent increases in water tariffs, service levels have not yet improved, a lag that often takes several years to resolve. Growing urban populations, coupled with aging systems, place significant pressure on already stretched resources. Environmental water security has also remained largely stagnant. Although regulatory frameworks have improved, ecosystems continue to degrade due to declining water quality, land degradation, and limited enforcement of environmental protections.

Water governance has strengthened since 2020, as reflected in rising scores under SDG indicator 6.5.1. Legal and policy frameworks increasingly reflect IWRM principles, and a national water information system is under development. Institutional coordination has

Tajikistan has made **measurable progress** in several dimensions of water security.

Reservoir for the first level of water liftingat the Khojabakirgan -2 Pump Station (Photo by ADB).

improved, particularly through the establishment of river basin committees, although they remain largely government-dominated and under-resourced. Financing for water infrastructure has increased, with more than $278 million committed across multiple projects. However, funding for governance components, operations, and cross-sectoral integration remains limited, with a continued dependence on development partners.

The relationship between water governance and water security in Tajikistan highlights both progress and gaps. Where governance improvements have been matched with investment and institutional capacity, as in rural water and disaster risk reduction, clear gains have followed. In contrast, urban and environmental dimensions show that legal and policy advances alone are not sufficient. Weak implementation, limited data, and underfunded systems continue to constrain outcomes.

To advance water security, Tajikistan will need to focus on delivering a more effective funding mix, especially in urban and rural supply systems. It will also need to accelerate reforms in agriculture to improve water productivity, invest in smarter technologies to reduce nonrevenue water, and update environmental regulations to better protect water-related ecosystems. Institutionalizing early-warning systems and increasing domestic capacity for disaster risk management will also be critical. Progress will further depend on strengthening transboundary water cooperation, which is vital across Central Asia but currently underdeveloped. In addition, glacial and snow melt, particularly during the summer season, will affect all Key Dimensions of water security and requires integrated planning. With continued commitment and support, Tajikistan can build on its governance reforms to deliver more inclusive, resilient, and sustainable water outcomes.

Review of Tajikistan's Water Security Score

Tajikistan's water security reflects a paradox of abundance and vulnerability. As the upstream source of over 60% of Central Asia's fresh water, the country plays a vital regional role. Yet it faces chronic domestic challenges, including aging infrastructure, limited access to safe drinking water, recurring rural water supply interruptions, and exposure to climate-related hazards. These pressures are compounded by glacial retreat, frequent floods and droughts, and widespread land degradation, threatening both national water security and sustainable development.

Rural household water security (KD1) improved from 6.3 in 2013 to 8.2 in 2025, driven by increased access to drinking water in rural areas and slight improvements in health outcomes. Progress reflects investment in rural water supply programs, although safe sanitation was already high and showed little change. However, weak infrastructure, growing water demand, and energy supply issues continue to limit reliable access in rural regions.

Economic water security (KD2) increased slightly from 9.6 in 2013 to 11.0 in 2025, but challenges persist. Water availability for economic use remains relatively strong, yet agricultural and energy indicators continue to lag. Low profitability, outdated infrastructure, and limited institutional capacity hinder efficient allocation. Fluctuations in the agricultural indicator may reflect climatic variability and shifting levels of project-based support. Industrial water use shows some improvement but remains underdeveloped.

Urban water security (KD3) increased from 12.1 in 2013 to 13.8 in 2025. Tariffs in urban water areas have recently increased. Recent results suggest that this could be a factor in improved urban water services. The Water Sector Strategy and supporting programs have set targets to increase urban service coverage and reduce losses.

Electrician is working at the ANS-2 Pump Station (Photo by ADB).

Environmental water security (KD4) remained largely stable, decreasing slightly from 12.0 in 2013 to 11.8 in 2025. While Tajikistan scores relatively well on environmental governance, fresh water ecosystem health continues to deteriorate. Land degradation, declining water quality, and inadequate protection of aquatic systems are key concerns. The Catchment and Aquatic System Condition Index dropped slightly in 2025, while groundwater quality and connectivity indicators showed no significant improvement.

Water-related disaster security (KD5) showed the most significant improvement, rising from 8.8 in 2013 to 16.2 in 2025. This reflects reduced drought exposure and stronger national-level systems for managing floods and storms. However, Tajikistan's mountainous terrain makes it highly vulnerable to water-related disasters intensified by climate change, including glacial melt, landslides, and riverbank erosion. While national systems are in place, basin-level disaster risk management remains fragmented and heavily reliant on external support.

State of Tajikistan's Water Governance

Tajikistan has made steady progress in implementing IWRM across all four governance dimensions between 2020 and 2023 (Figure 56). According to SDG indicator 6.5.1, the country's overall score improved from 46% in 2020 to 54% in 2023. This progress reflects a broader effort to strengthen the legal, institutional, and financial foundations for water governance, although significant gaps remain in capacity, coordination, and enforcement.

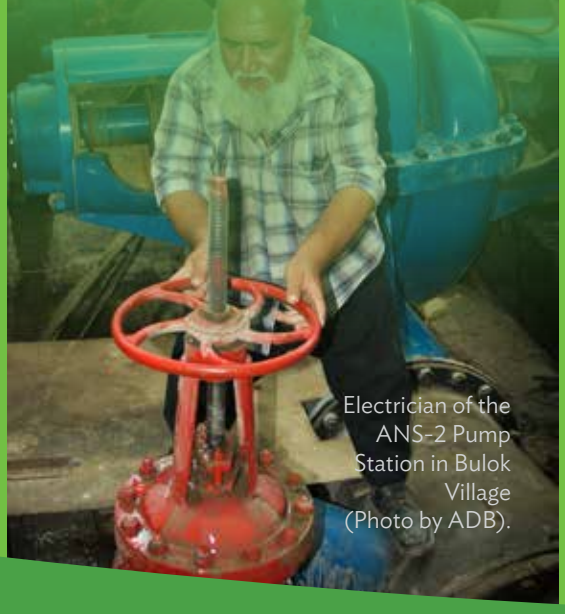
Enabling environment. The enabling environment dimension increased from 49% in 2020 to 61% in 2023. This reflects the adoption of comprehensive water-related laws and policies that align more closely with IWRM principles. Key national strategies, including the Water Code and the National Water Strategy to 2040, have helped create a stronger legal foundation. However, several areas still require enhancement, particularly the development of sub-decrees for reservoir use and the enforcement of legal frameworks. Awareness-raising among water users and beneficiaries at all levels about equitable water use also needs strengthening.

Institutions and participation. Institutional arrangements and participation improved from 43% to 48%. Government agencies have led IWRM implementation, and river basin committees have been formed at both national and subnational levels. These are intended to include a wide range of stakeholders, although they remain government-dominated in practice. Private sector engagement is encouraged but limited by financial constraints and weak coordination mechanisms. Overlapping institutional mandates and capacity shortages further complicate governance.

Management instruments. This increased from 48% to 54%. Progress includes the development of a National Water Information System within the national data center and the approval of basin water resource management plans, such as for the Zarafshon River. However, the data system is not fully operational, and information sources remain fragmented. Limited data integration and weak knowledge bases continue to hinder timely decision-making and risk-informed planning.

Financing. Financing improved from 42% to 52%. A growing number of projects are underway in the water supply and sanitation sector, with total investments of approximately $278 million. These projects focus heavily on infrastructure rehabilitation and construction. However, financing for governance components remains weak. Limited cross-sectoral integration and low returns from existing investments deter private participation and reduce the effectiveness of available funding.

Overall, while Tajikistan has made visible progress in aligning its water governance framework with IWRM, **further work is needed** to close the implementation gap. Institutional reforms, better data systems, and more sustainable financing will be key to delivering lasting improvements in water outcomes.



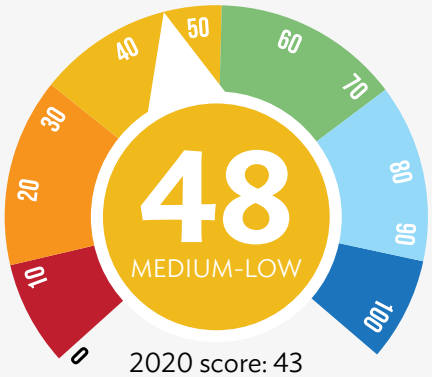
Electrician of the ANS-2 Pump Station in Bulok Village (Photo by ADB).

Figure 56. SDG Indicator 6.5.1 And Sub-Components For Tajikistan (2023)

2020 score: 49
2017 score: ND

Enabling environment

Policities, plans and laws to support IWRM



2020 score: 43
2017 score: ND

Institutions and participation

Capacity, participation and coordination at all levels

2020 score: 48
2017 score: ND

Management instruments

Instruments to monitor and manage water resources and ecosystems

2020 score: 42
2017 score: ND

Financing

Budgets and revenue raising for IWRM and infrastructure

IWRM = Integrated Water Resources Management, SDG = Sustainable Development Goal.
Source: SDG 6.5.1, 2023.

Relationship Between Tajikistan's Water Security and Water Governance

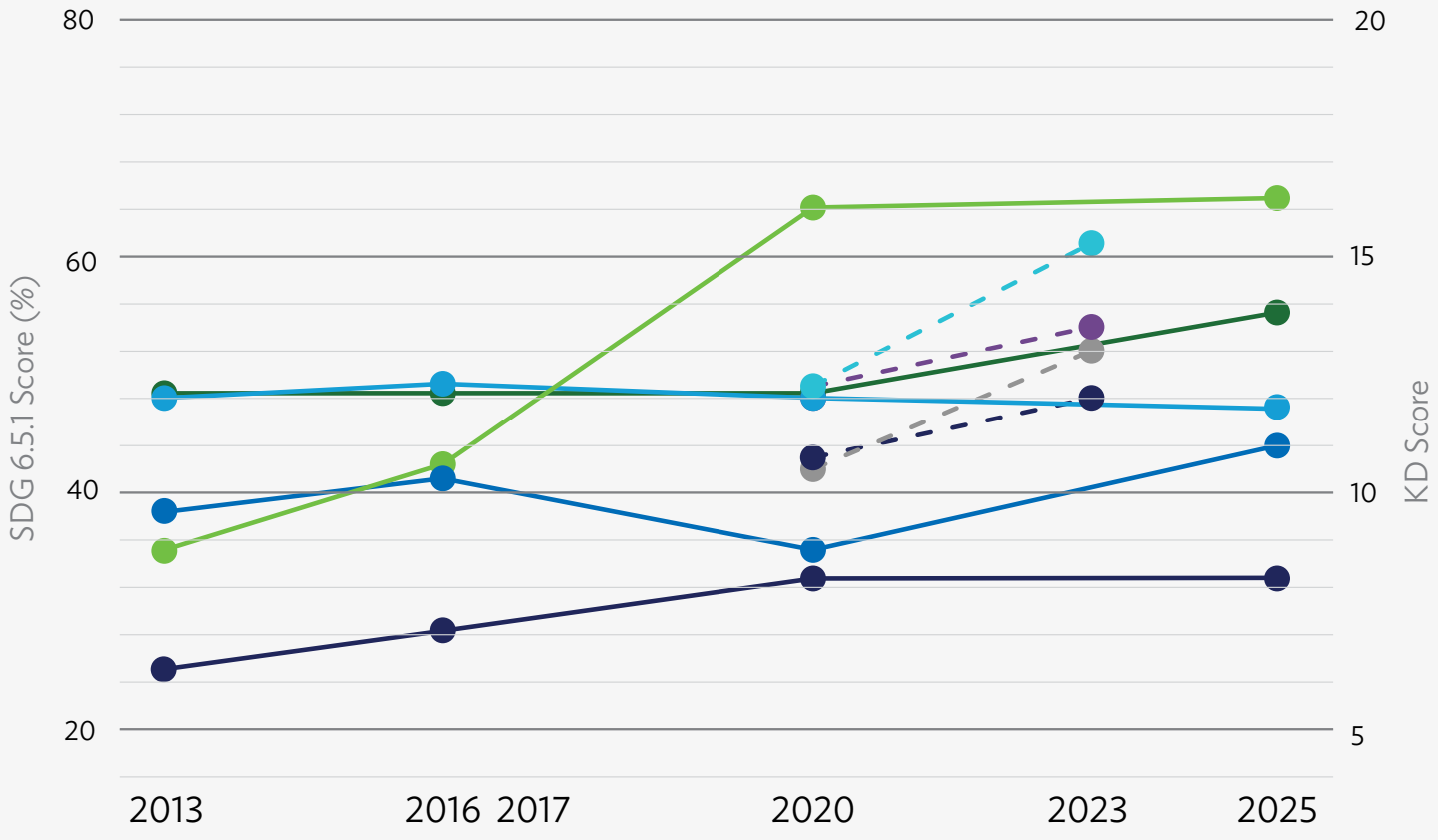
Tajikistan has made moderate but steady progress in both water governance and water security (Figure 57). While these trends show a positive direction, the relationship between improved governance and better water outcomes remains uneven across the five KDs.

Rural household water security (KD1) improved alongside clearer legal and institutional arrangements. Laws such as the Water Code and National Policy on Rural Water Supply Security have established a stronger framework for service delivery. Domestic and external investments have supported sectoral programs, and a monitoring system now tracks rural water availability and use. These gains are underpinned by improved management tools, like the National Water Information System, and participation processes. However, investment levels remain low relative to need, limiting the sector's ability to meet growing rural demand.

Economic water security (KD2) benefited from water sector reforms grounded in IWRM principles. Tajikistan has created basin organizations with mandates and financing plans for water management. While national and decentralized agencies now exist, many operate in silos, and water risks are not yet integrated into economic planning. A financing platform and increased public spending have supported infrastructure development, but private and non-government contributions remain limited. About 60% of sector investments still rely on loans and grants from development partners, underlining the need for more sustainable financial strategies.

Urban water security (KD3) has improved as policies and investments create a stronger enabling environment. Recent tariff increases have helped utilities strengthen services and expand coverage. The Water Sector Strategy

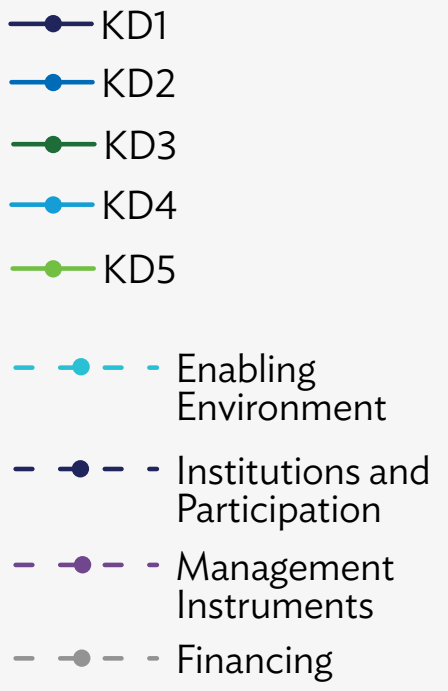
Figure 57. Status of Water Governance vs. Water Security in Tajikistan



and its supporting programs set clear targets to increase urban access and reduce losses. Public spending is also expected to attract more private and donor investment, which, if well directed, can help address remaining challenges.

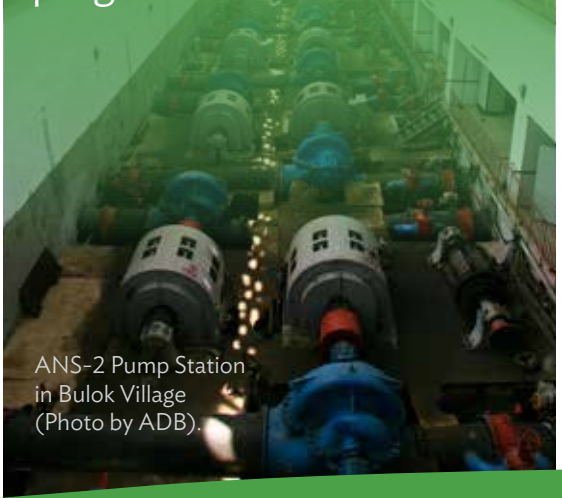
Environmental water security (KD4) remains one of the weakest links between governance and outcomes. The 2022 Law on Environmental Protection and other sectoral programs have introduced better regulatory tools, but ecosystem management remains basic. Information systems are underdeveloped, and coordination across sectors is weak. Investments in environmental water management are increasing, yet they are not sufficient to reverse degradation trends. Freshwater ecosystems continue to face serious threats, limiting KD4 improvements.

Water-related disaster security (KD5) saw strong improvement, supported by a growing governance framework for disaster risk reduction. Regulatory tools, financial mechanisms, and a national mitigation system for water-related disaster management are in place. However, implementation is inconsistent. A water-related disaster mitigation system has been established at the national level, but it is still fragmented. While at the basin level, it is not yet institutionalized into a regular water governance framework and is therefore very dependent on external support. The absence of stable domestic funding and limited private sector engagement constrain resilience-building efforts. Institutionalizing early-warning systems and risk reduction planning will be critical to sustaining gains in KD5.



KD = Key Dimension.
Sources: SDG 6.5.1 and AWDO 2025 data.

Overall, Tajikistan's experience shows that stronger governance frameworks do not automatically translate into improved water security. Legal and institutional reforms **must be paired** with operational capacity, financing, and effective implementation. Where these elements align, progress has been visible.



ANS-2 Pump Station in Bulok Village (Photo by ADB).

Findings and Recommendations

Tajikistan's water security presents a mixed picture. National frameworks have improved and investments are increasing, but systemic challenges continue to limit progress across KDs.

Rural household water security has improved but remains fragile. Many rural areas continue to face unreliable access due to outdated infrastructure, low energy supply, remote water sources, and limited financial resources. Seasonal water quality issues and population growth add further pressure. Expanding blended financing models that combine public and private sector financing could help reduce infrastructure gaps and improve service delivery. Sustainable tariffs and revised tax systems for water-using sectors would also support cost recovery, ensuring rural systems are more resilient and reliable.

Economic water security remains constrained by inefficiency and weak incentives. Agricultural and industrial water use efficiency is low, limited by outdated infrastructure and insufficient finance. Institutional fragmentation and the absence of strong incentives for conservation further reduce productivity. Promoting water-efficient farming, drought-resistant crops, agroforestry, and green technologies would help reduce vulnerability. Inclusive and gender-sensitive approaches will be needed to ensure broad participation in agricultural water reforms.

Urban water security is under growing strain. Rapid urbanization and aging infrastructure have led to poor water quality, frequent leakage, and weak service reliability. Tariffs have increased in 2018, but improvements in service delivery have yet to materialize, reflecting the lag between investment and outcomes. Targeted investment to reduce nonrevenue water, leak detection, and improved water accounting could improve efficiency and align public expectations with future service improvements.

Environmental water security is stagnant and at risk. While river basin plans and environmental laws have strengthened the regulatory framework, ecosystems continue to degrade due to pollution, limited allocation for environmental needs, and weak monitoring. Many basin management rules date back to the Soviet era and no longer reflect current needs. Updating water quality standards, enforcing regulations, and improving monitoring would safeguard fresh water ecosystems. Incentives for compliance, penalties for polluters, and support for local eco-activists could also improve outcomes.

Water-related disaster security has strengthened nationally but remains weak locally. Tajikistan continues to face high risks from floods, glacial hazards, and droughts. Legal and institutional frameworks exist, but early-warning systems and protective infrastructure are uneven and heavily reliant on external support. Expanding and institutionalizing early-warning capacity, backed by legal, technical, financial, and institutional reforms, would reduce disaster risks and improve resilience to climate change.

In summary, Tajikistan has advanced frameworks and growing investments, but water security outcomes depend on turning commitments into practice. Blended financing, water-use efficiency, targeted investment in urban systems, updated environmental standards, and stronger disaster preparedness will be critical for delivering reliable and sustainable water security across all dimensions.

Floating pump station (Pontoon) located in Khojabakirgan, Bobojon Gafurov District (Photo by ADB).

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