Water Governance for Enhanced Water Security in the Context of SDG 6

Summary

This chapter examines how water governance influences water security in Asia and the Pacific. It draws on data from the AWDO and SDG indicator 6.5.1 on Integrated Water Resources Management (IWRM). The analysis offers the first regional comparison between governance scores and AWDO's five KDs of water security, supported by detailed assessments in five countries: Bangladesh, Cambodia, Nepal, Pakistan, and Tajikistan.

Water governance and water security are strongly linked, but the relationship is not one-to-one. In many cases, governance reforms have led to improvements in water security, but not always immediately or consistently. Outcomes are shaped by a range of socioeconomic and environmental factors, and progress can vary between countries and subregions. This reinforces that water governance is an essential enabler, but not the only driver.

Financing and management instruments are among the strongest levers for improving water security. These tools, such as water allocation frameworks, basin management plans, tariff structures, and monitoring systems, show the closest correlation with water security scores among the four governance dimensions assessed under SDG 6.5.1. They determine how policies translate into action, with financing providing the resources to implement plans and management instruments guiding the efficient and equitable use of those resources. Despite their importance, these areas remain the least developed in many countries. Strengthening them can deliver rapid and cost-effective gains, particularly when supported by a strong enabling environment and well-coordinated institutions. The country assessments provide clear examples of how focusing on these areas can accelerate water security.

Urban and economic water security are most responsive to better governance. These dimensions often reflect centralized decisions and national investments, making them more immediately affected by governance changes. Rural and environmental water security may respond more slowly and require broader integration across sectors and governance levels. The analysis also shows that improved governance contributes to **stronger adaptive capacity, helping countries manage both rapid and slow-onset climate-related water risks.**

Political will is critical for achieving and sustaining progress. Where national leadership has prioritized water governance and invested in long-term reform, results have followed. Embedding governance targets in national water security strategies, climate plans, and development frameworks, such as ADB's country partnership strategies (CPSs), can align efforts and increase accountability.

All actors have a role in accelerating climate-resilient water governance. Development partners, governments, and the private sector should use water governance frameworks, such as SDG 6.5.1, to guide reforms, align investment, and reduce cross-sector trade-offs. Strengthened coordination through regional platforms can support knowledge-sharing, build political momentum, and help turn plans into lasting improvements for people and ecosystems.

Water governance and water security are strongly linked, but the relationship is not one-to-one.

Introduction

Effective water governance is essential for achieving water security (Sadoff et al. 2015). However, **governance alone is not enough.** Many other factors, such as population growth, urbanization, infrastructure, climate, and water availability, also influence outcomes. This chapter explores the relationship between water governance and water security, **recognizing that one does not always lead directly to the other.**

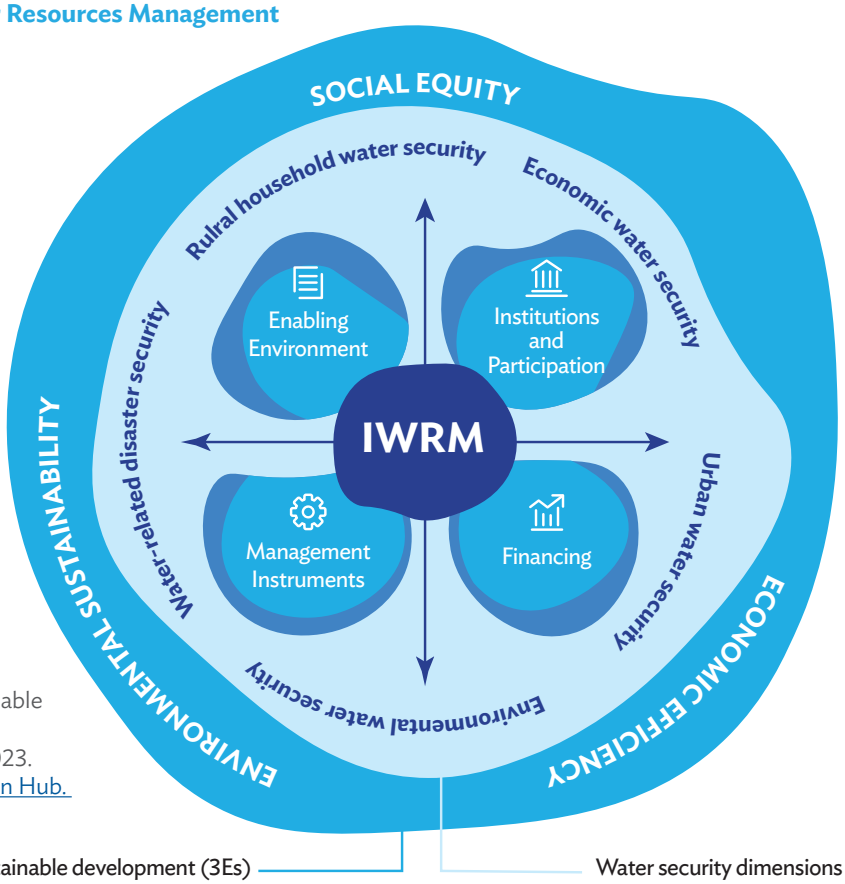
To study this relationship, we use two proxies. Water security is assessed using the five KDs from the AWDO, that has been applied consistently across four editions (2013, 2016, 2020, and 2025). Water governance is examined through SDG indicator 6.5.1, which is used as part of the SDG indicators to assess the degree of IWRM implementation. For this chapter, IWRM is used as a proxy for good water governance.

SDG 6 aims to ensure the availability and sustainable management of water and sanitation for all. Target 6.5 focuses specifically on IWRM and is measured through indicator 6.5.1. Countries report progress by completing a standardized survey with 33 questions across four dimensions (UN-Water 2025):

- **Enabling environment** – policies, laws, and plans to support IWRM
- **Institutions and participation** – roles and coordination of actors
- **Management instruments** – tools and frameworks for decision-making and management
- **Financing** – budget and financial planning for water management

These four dimensions form the basis of a governance framework that, when aligned with AWDO's five KDs, provides a five-by-four matrix. This matrix enables cross-comparison of governance and water security, **revealing which aspects of governance most strongly support improvements in each KD.** It also helps identify gaps and align future efforts. Figure 43 illustrates this conceptual framing.

Figure 43. Integrated Water Resources Management



IWRM = Integrated Water Resources Management.
Note: IWRM (the inner circle) as a means to achieve water security (the middle rim), and through it, contribute to sustainable development (the outer circle)
Source: Adapted from GWP. 2023. IWRM Explained | IWRM Action Hub.

While global and regional progress on SDG 6.5.1 has been steady, it is not fast enough. **In Asia and the Pacific, the average implementation level rose from 46% in 2017 to 57% in 2023.** At current rates, the 2030 target would not be met until 2049 (UNEP 2024). Subregions like South and Southeast Asia have made faster gains, offering lessons for others.

This chapter presents the first regional analysis comparing AWDO water security data with SDG 6.5.1 governance results. It also draws on country assessments from Bangladesh, Cambodia, Nepal, Pakistan, and Tajikistan. Together, these findings aim to identify actionable governance reforms that can accelerate water security across Asia and the Pacific.

Methodology

This chapter draws on a **mixed-methods approach,** combining quantitative analysis with qualitative insights. Neither data type alone would have provided a complete picture. **Quantitative results without context** risk misleading conclusions. Likewise, **qualitative interpretation without data** may lack rigor. The analysis aimed to balance both, allowing for a more grounded understanding of how water governance and water security interact.

Quantitative analysis relied on SDG 6.5.1 data from 2017, 2020, and 2023, and AWDO data from 2013, 2016, 2020, and 2025. **Indicator and sub-indicator scores** for both were examined at national, regional, and subregional levels. To reflect population differences, **regional and subregional averages were weighted** accordingly. **Correlation analysis** between the five AWDO KDs and the four components of IWRM was conducted using RStudio[8]. This analysis identified patterns and relationships at both Asia and the Pacific and subregional levels, highlighting which governance elements were most closely associated with water security outcomes.

To explore potential causal relationships, **a generalized linear model** was developed to predict AWDO 2025 scores. Explanatory variables included SDG 6.5.1 scores, population, education, irrigated land, urbanization, per capita renewable water availability, Human Development Index, and Gini Index. All statistical analyses were conducted using **R (Stats package, version 3.6.2).**

Qualitative data came from five country case studies in AWDO 2025: Bangladesh, Cambodia, Nepal, Pakistan, and Tajikistan. These included consultations and feedback with ADB resident missions and regional experts. National policy documents, IWRM Action Plans, NDCs, SDG 6 acceleration case studies, and **stakeholder reports** enriched the analysis. **Free-text responses** from the SDG 6.5.1 survey provided additional context and insight.

While SDG 6.5.1 is based on a self-evaluation survey, which introduces some subjectivity, the indicator methodology and stakeholder consultations are designed to deliver robust reporting at national, subregional, and regional levels. In the five country case studies, broad stakeholder consultations were conducted at least twice, which helped improve accuracy and shared understanding. These consultations were facilitated through the SDG 6 IWRM Support Programme and are recommended for all countries to enhance the reliability of reported data.

Finally, the analysis considered **both geographical and temporal trends.** Progress was reviewed across six ADB subregions: Central and West Asia, East Asia, South Asia, Southeast Asia, the Pacific, and Advanced Economies. The study also examined how water governance reforms aligned with improvements in water security across different time periods, helping to identify when such changes begin to show impact.

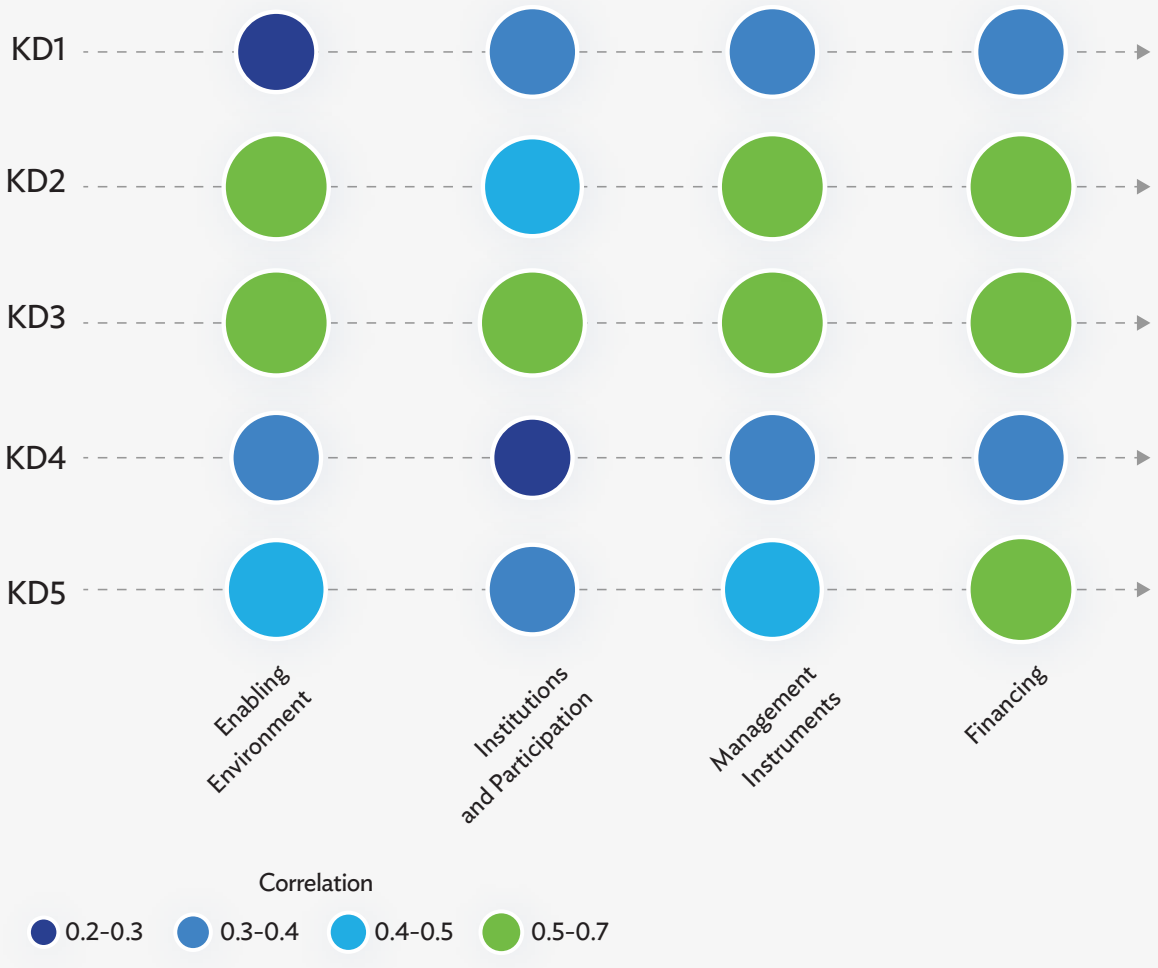
8. RStudio is an integrated development environment (IDE) used for coding and data analysis in R.

Results and Discussion

A positive relationship between water governance and water security is evident across the Asia and Pacific region. The regional analysis highlights a strong correlation between improved IWRM implementation (SDG 6.5.1) and enhanced performance across AWDO's five KDs (Figure 44). **KD2 (economic water security)** and **KD3 (urban water security)** show the highest correlations with water governance (Figure 45).

For KD2, better governance helps reduce trade-offs between competing uses of water. Growing urbanization and water demand across the region place pressure on resources for consumption, food, energy, and ecosystems. The data suggest that stronger management instruments and legal frameworks can coordinate these demands more effectively.

Figure 44. Correlation Analysis Between Integrated Water Resources Management Dimensions and Asian Water Development Outlook KDs

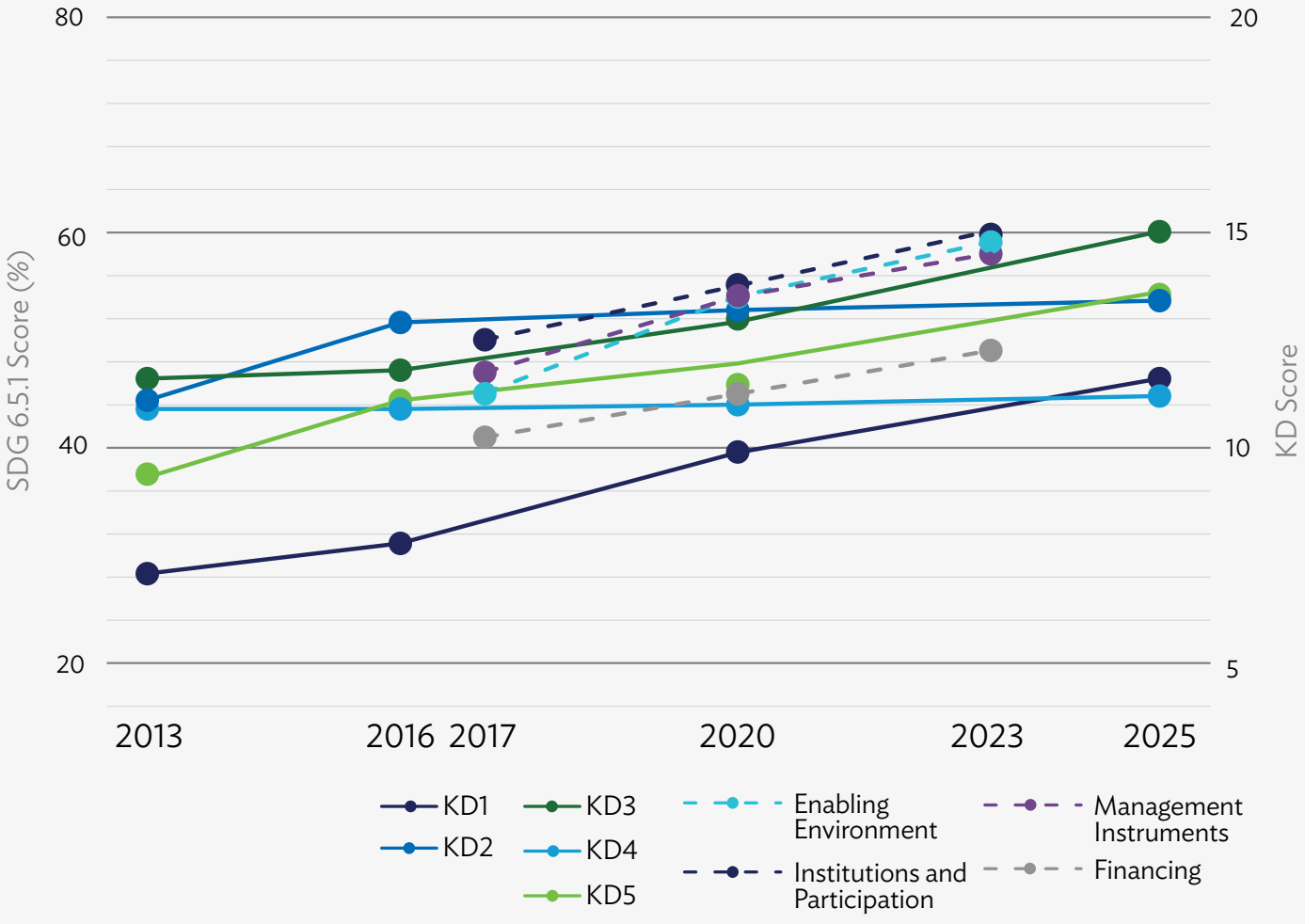


KD = Key Dimension, KD1 = rural households and water security, KD2 = economic water security, KD3 = urban water security, KD4 = environmental water security, KD5 = water-related disaster security, SDG = Sustainable Development Goal.
Source: ADB.

For example, Bangladesh illustrates how strengthening management instruments and financing can drive progress. In recent years, the government has improved its national water strategies and basin management frameworks, which has provided a clearer basis for coordinated action across sectors. At the same time, sustained public investment and strong donor support have expanded access to water supply and sanitation, while also enabling rehabilitation of critical infrastructure. Together, these improvements have not only advanced water security but also helped Bangladesh build greater resilience to climate shocks such as flooding and cyclones.

In urban water security (KD3), where infrastructure and institutional presence are often stronger, governance reforms, such as new financing schemes or legal tools, tend to show more immediate results. In contrast, rural household water security (KD1) may respond more slowly due to capacity gaps in implementation. KD4 (environmental water security) also correlates positively with governance improvements, especially when IWRM emphasizes integrated resource management. Yet other drivers, like land-use change or energy policy, remain influential.

Figure 45. Relationship Between Water Security (Asian Water Development Outlook) and Water Governance (SDG 6.5.1) (2013–2025)



AWDO = Asian Water Development Outlook, KD = Key Dimension, SDG = Sustainable Development Goal.
Source: ADB.

Financing remains the weakest-performing dimension across the region and globally. Expanding public budget allocations, aligning development partner funding with national strategies like ADB's CPSs, and leveraging private finance through risk-sharing can help scale progress. The five country assessments identify potential CPS entry points that can connect governance improvements to long-term water security gains.

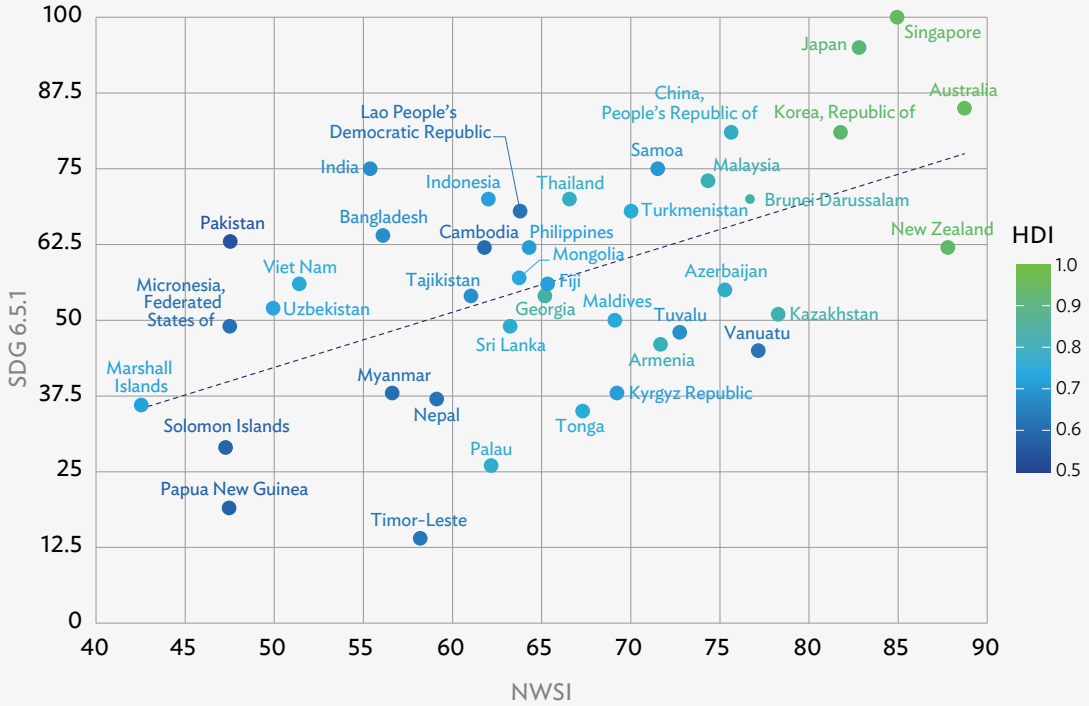
Among the governance dimensions, **financing and management instruments** show the strongest links with water security outcomes. These results suggest that **future investments in water governance should prioritize these two areas.** While enabling environments and institutions are more developed, they still require ongoing support.

Improved water governance also builds adaptive capacity. Climate extremes, such as heat causing glacier melt in Tajikistan, floods in Pakistan, and droughts in Nepal, have recently undermined water security gains. Correlation analysis of **KD5 (water-related disaster security)** shows that governance is more strongly linked to resilience when hazard exposure is removed from the KD5 calculation. This suggests that while hazard exposure is fixed, governance can shape a country's ability to manage and adapt to risk (Pahl-Wostl 2014).

A generalized linear model was also applied to examine how other development factors influence water security. The analysis found that both **Human Development Index (HDI)** and **IWRM implementation** were significantly associated with better water security outcomes. This relationship held even after accounting for income, population growth, and education. In several cases, countries with similar economic and demographic profiles showed different results based on their governance practices.

Figure 46 illustrates that **higher HDI generally aligns with stronger water governance and water security,** though exceptions exist. For example, Palau has high water security and HDI, but lower governance scores, while Pakistan has relatively strong governance but low HDI and water security. These mismatches suggest either a time lag between governance reforms and outcomes or possible data discrepancies.

Figure 46. Relationship Between Water Security, Water Governance, and the Human Development Index



HDI = Human Development Index, IWRM = Integrated Water Resources Management, SDG = Sustainable Development Goal.
Source: ADB.

At the subregional level, the contrasting cases of Southeast Asia and South Asia reveal important insights. In Southeast Asia, **water governance improved significantly,** with SDG 6.5.1 scores rising from 46% in 2017 to 62% in 2023. Over a similar period, **water security scores across all five Key Dimensions also increased,** but the gains were modest and inconsistent. **Progress varied across dimensions and years,** and was not always sustained. This nonlinear pattern suggests that improvements in governance may take time to translate into measurable outcomes for water security, and that other drivers, such as infrastructure, investment, and socio-political factors, can shape these outcomes independently.

There is not a 1:1 relationship between water governance and water security. Even where governance improves, the effects on water security may lag, fluctuate, or be overridden by external shocks such as droughts or floods. This is particularly evident in Southeast Asia, where despite strong gains in governance, overall water security improvements were limited.

South Asia presents a different pattern. **Governance scores increased from 37% in 2017 to 56% in 2023,** and this was accompanied by **significant gains in water security scores across multiple dimensions.** This suggests a closer alignment between governance reforms and sector outcomes in this subregion. It may also reflect more favorable enabling conditions, such as stronger institutions, targeted investments, or higher political priority for water sector reform.

These contrasting examples reinforce that water governance matters, but its impact is neither immediate nor automatic. **The effects of governance reforms depend on timing, context, and the presence of complementary factors.** Experience across Asia and the Pacific shows that strengthening governance is essential for achieving water security, but it must be supported by parallel efforts in infrastructure, and enhanced and coordinated political will and investment from the highest level.

Details from the Country Assessments

Bangladesh has strengthened its economic water security (KD2) through long-term planning and targeted investments. The Delta Plan 2100 and Barind Multipurpose Development Authority programs have modernized irrigation systems, promoted climate-smart groundwater use, and enhanced cross-sectoral coordination. **These efforts were supported by policy-guided investment strategies** and public–private partnerships, particularly in drought-prone regions, helping to improve both management instruments and financing dimensions of water governance.

Cambodia has made significant gains in urban water security (KD3) through expanded service coverage. The Phnom Penh Water Supply Authority has implemented a financial bundling mechanism, using **revenue from central, wealthier neighborhoods to subsidize service provision in poorer areas.** This approach has improved access and equity.

Nepal has increased political momentum for water sector reform through multi-stakeholder processes. The 2022 IWRM Action Plan and the 2024 Response Strategy for Water Resources Management (WECS 2024) laid the groundwork for a new Water Resources Bill. Once passed, the bill is expected to benefit all five KDs by strengthening legal and institutional frameworks for integrated water governance.

Pakistan has improved rural household water security (KD1) through enhanced monitoring and use of data. A rural water quality monitoring program has generated detailed assessments of drinking water in both rural and urban areas. These findings have informed policy decisions and system upgrades, particularly in sanitation and hygiene, contributing to progress under the health-related sub-indicators of KD1.

Tajikistan has advanced its water-related disaster security (KD5) by investing in early-warning systems and risk preparedness. The implementation of the "Early Warnings for All" initiative and a national road map for Multi-Hazard Early-Warning Systems has strengthened the enabling environment for disaster risk reduction. However, cross-sectoral enforcement and institutional coordination remain critical areas for continued improvement.

These country examples illustrate that targeted governance reforms, especially when **supported by strong political will**, can accelerate progress across different aspects of water security. They also highlight the potential for subregional cooperation to foster shared learning and scale up investment.

Conclusion

The analysis confirms a **positive link between water governance and water security** across Asia and the Pacific. **However, this relationship is not 1:1.** While countries with stronger governance generally show higher water security, many other factors, such as infrastructure, climate, and economic capacity, also influence outcomes. In some subregions, like South Asia, gains in governance are aligned with significant improvements in water security. In others, such as Southeast Asia, progress was more uneven and nonlinear.

Institutions and finance are key areas for strengthening. Among the four governance components assessed through SDG 6.5.1, financing and management instruments are most strongly associated with gains in water security. By contrast, enabling environments and institutional participation are more advanced, but still require continued support to ensure coherence and capacity at all levels.

Improved governance can also **enhance countries' adaptive capacity to climate-related water risks.** The analysis shows that stronger institutions, planning systems, and financing structures help countries respond more effectively to both floods and droughts. Adaptive governance supports better long-term management of the changing hydrological cycle, making water systems more resilient.

Political will is a critical driver of progress. Countries that demonstrated leadership, backed by sustained investments and reform momentum, made greater gains. Political will must be mobilized and maintained, not just through high-level declarations, but through integration into national strategies, legislation, and financing frameworks. The country assessments, in particular Nepal, support this point.

To advance this work, countries should be supported to **set national targets aligned with both AWDO and SDG 6.5.1.** These targets can help translate governance frameworks into clear priorities across sectors and at the local level. Embedding such targets in national water security strategies, ADB's CPSs, and sustainable development plans will ensure better alignment of policies, budgets, and accountability mechanisms.

Governance frameworks, such as SDG 6.5.1, offer **valuable tools for aligning investment and planning.** Using them to shape national water security goals allows for more targeted financing, avoids sectoral trade-offs, and unlocks co-benefits across climate, agriculture, energy, and health.

To accelerate progress, **stronger regional coordination is needed**. Platforms like the Asia-Pacific Water Summit, ASEAN, and Central Asia Regional Economic Cooperation offer opportunities for joint learning, investment, and reform. These efforts would benefit from more deliberate alignment.

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Construction worker plows through the drainage construction under the Urban Services Improvement Investment Program in Kutaisi, Georgia (Photo by ADB).