

# Bridging the water investment gap: A framework for delivering the UN Sustainable Development Goal 6

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Prepared for the UK as the Host Country Committee for the International Water Association (IWA) World Water Congress & Exhibition

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## Foreword



**Peter Simpson,**  
Co-Chair of the IWA's Global  
Congress in Glasgow & Chair of  
the Resilient Water Accelerator

Water security underpins human development, economic resilience and climate adaptation. Yet progress towards Sustainable Development Goal 6 (SDG 6) remains well short of what is required. Ten years after the global commitment to universal access to safe water and sanitation, the gap between ambition and delivery continues to widen. In many contexts, fiscal constraints, rising debt burdens and shifting development finance are making it harder—not easier—to sustain the investment needed to deliver resilient services.

As Co Chair of the International Water Association's World Water Congress & Exhibition (WWCE) in Glasgow, alongside Alex Plant, CEO of Scottish Water, we hear a consistent message from across the sector. The challenge is no longer one of awareness or intent. The question is how to translate commitment into practical, implementable action—at scale, and in ways that endure. WWCE offers a timely opportunity to bring the global water community together to do exactly that.

That challenge is not theoretical for me. Over many years working in the world of water across different countries and operating environments, I have seen how often progress is constrained not by a lack of ideas or funding, but by the strength of the systems that sit beneath delivery. Across low income and climate vulnerable countries, as well as middle income economies, the same lesson applies: where governance is fragmented, institutions lack capacity, or revenue systems are fragile, even substantial investment struggles to translate into lasting services. Where those foundations are addressed, momentum builds—and finance can follow.

This report—the Glasgow Framework—is intended to help close that gap between ambition and delivery. It builds on the work of others in highlighting the scale of the SDG 6 challenge, but it is deliberately focused on the practical constraints that determine whether finance can be mobilised and deployed effectively: governance, revenue, risk allocation, institutional capability and the availability of finance grade information. It is grounded in extensive consultation with practitioners across the world—including governments, service providers, investors, NGOs and charities—and is designed to be used, adapted and applied in real-world decision making.

In my role as Chair of WaterAid's Resilient Water Accelerator, I see daily the importance of coupling investment with reform and focusing relentlessly on long term service outcomes. Water security should be treated not as a cost to be managed, but as a productive investment in resilience, health and prosperity—supported by credible strategies, investment pathways, enabling frameworks and accountability for results.

Alex and I are clear that this report is not an end point. We want it to be a starting point for a broader conversation—including through the WWCE in Glasgow—and to inform preparations for the United Nations Water Conference in December. We invite readers to engage with the development of this work. Comments shared will be integrated into the final version produced following the WWCE in October.

We are grateful to the many individuals and organisations who have contributed their insight and experience. In particular, we thank Oxera for their analytical rigour and close collaboration with the Host Country Committee and the practitioner community. Without their partnership, this report would not have been possible.

The next decade must look very different from the last. Achieving SDG 6 will require clearer choices, stronger institutions and the confidence to act on what we know works. This report is a call to action—to governments, practitioners and investors alike—to use the moment ahead to turn commitment into delivery and accelerate progress towards water security for all.



The global challenge on water is not simply one of funding and financing—it is one of economic and institutional design. Despite the scale of global capital available, too many water systems remain unable to attract investment because the right structures are not in place. Water security underpins economic resilience, productivity and long-term prosperity, and governments must increasingly treat it as a strategic economic priority. The Glasgow Framework sets out a practical framework to help countries build the governance, regulation and accountability needed to unlock investment at scale.



Dr Luis Correia da Silva, Chair and Partner



## Executive summary

### Purpose of the Glasgow Framework and consultation

Water security is a fundamental human right, yet there has been insufficient progress toward universal provision of water and sanitation services. Sustainable Development Goal 6 (SDG 6), adopted in 2015, committed the world to universal access to safely managed water and sanitation. A decade on, 2.2 billion people still lack safely managed drinking water, 3.4 billion lack safely managed sanitation, and only 56% of global domestic wastewater is safely treated.

Progress has been uneven, with the greatest impacts falling on least developed countries and marginalised communities, with women and girls disproportionately impacted. Without urgent and accelerated action, failure to achieve SDG 6 will continue to inhibit improvements in public health, economic development, and climate resilience on a global scale.

Building on a significant number of previous studies and our own extensive engagement with stakeholders and analysis, this report—the **Glasgow Framework**—considers practical steps that governments can take to attract investment in clean water and sanitation. The report is presented for consultation, with the aim of gathering input on how to strengthen approaches to mobilising financing for SDG 6. It is designed not as a final blueprint, but as a practical foundation for discussion with governments, investors and sector practitioners.

We invite responses to the consultation to help refine and improve the framework, in particular on:

- how the recommendations can be made more practical and implementable at the country level; and
- whether the proposed prioritisation of recommendations is appropriate across different country contexts.

A dedicated section on consultation and next steps (section 5) sets out how stakeholders can engage and contribute to the development of the final framework.

The primary audience for this report is national governments. It is intended to serve as a practical framework for developing or strengthening National Water Strategies (NWS), while recognising the diversity and complexity of national water systems. The report is also relevant to:

- **investors and industry practitioners**, whose perspectives have informed the recommendations and prioritisation within this report, and who will be able to draw on this framework to guide their interactions with governments and other stakeholders as well as their investment decisions; and
- **development partners and wider stakeholders**, who play a role in supporting sector reform and investment.

While the majority of the report focuses on the potential components of NWS (outlined in Section 4), there are a number of wider recommendations that should also be considered, that either sit outside or precede the introduction of an NWS (Appendix A3). More broadly, this report is designed as a framework to support communication, alignment and engagement across the global water sector.

Fundamental to this is the recognition that water is not just a social and environmental necessity—it is an economic imperative, playing a foundational role in the broader economy. Reliable water and wastewater systems underpin the functioning and growth of virtually all other economic activity. Current pricing often reflects only private benefits, overlooking wider returns such as public health, ecosystem services, flood protection, and climate resilience. This undervaluation discourages investment, limits incentives for efficient use, and reinforces the financing gap for safely managed water and sanitation. Recognising water's full economic value strengthens the case for significant, long-term investment and positions the sector as a core economic priority, providing a foundation for effective NWS.

#### Defining National Water Strategies and why they matter

At the centre of this report are NWS: government-led, system-wide frameworks that set out how a country plans, finances and delivers water and sanitation services over time.

The persistent financing gap for SDG 6, estimated at USD 114 billion per year—and likely underestimated—is not primarily a shortage of global capital. Rather, it reflects structural weaknesses across the sector, including fragmented institutions, weak data and transparency, constrained revenue systems, limited creditworthiness, and poorly allocated risk. These challenges are present across all economies, including those with relatively strong access to capital.

NWS are critical because they provide a means and process by which governments can consider and address structural issues, taking account of their individual country circumstances. An effective NWS will:

- establish clear, long-term policy objectives;
- identify, at a high level, what network development is likely to be required to deliver these objectives;
- set out how institutions will work together in a joined-up way to deliver a coherent plan;
- align policy, planning, funding and financing; and
- build investor confidence through clarity, credibility and long-term direction.

Evidence from country experience shows that strategy-led, system-wide approaches can drive progress by linking ambition to delivery. More broadly, international institutions such as the United Nations and World Bank increasingly emphasise the role of 'compacts' in achieving SDG 6—NWS can serve as the practical vehicle for delivering these at the national level.<sup>1</sup>

This report is therefore framed around NWS because they represent a key way through which governments can plan and implement system-wide change.

#### What effective NWS look like in practice

Effective NWS establish the conditions required to mobilise financing and deliver sustainable outcomes. In practice, this requires strengthening four core, interdependent dimensions of water sector governance:

- **Strategy:** having a clear articulation of what nations need their water systems to deliver over the short, medium and long term. This should include, at least, ambitions for universal access to clean drinking water and effective sanitation, service quality, climate resilience, financial resilience and environmental outcomes.
- **Investment pathways:** developing a broad understanding of what investment is needed to achieve those objectives, at what cost, and in what sequence.
- **Enabling systems:** putting in place funding and regulatory frameworks that support the delivery of that investment and are sufficiently attractive and credible to mobilise private finance alongside public resources.
- **Accountability:** having a means of measuring progress against those objectives, through effective independent economic regulation, robust data systems and transparent reporting that build confidence among governments, financiers and consumers alike.

While these elements are essential, their effectiveness depends on political leadership to initiate and sustain reform. Experience across countries shows that progress in closing the SDG 6 financing gap is not driven by technical solutions alone. It depends critically on sustained political leadership, clear accountability, and the ability to navigate political economy constraints. Leadership is often required to initiate reform, align ministries and manage trade-offs between affordability, fiscal constraints and long-term investment needs. Strong institutions are essential for durability, but leadership is typically the catalyst that enables their formation and effectiveness.

Together, these elements can help to provide clarity and confidence for investors, while enabling governments and sector leaders to plan and sequence investments effectively. Strong regulatory and institutional structures are central to ensuring that investment translates into sustainable service delivery. Without such structures, investment will not be forthcoming, and the much-needed improvements the sector requires will be compromised.

While NWS cover a wide range of sector components, this report focuses specifically on those most relevant to attracting finance.

#### Why the Glasgow Framework?

This report builds on a substantial body of existing research on water sector financing and SDG 6. Its contribution is to move beyond diagnosis and provide practical, structured guidance for governments, with a specific focus on strengthening NWS around the globe.

Prepared by Oxera in partnership with the UK as the Host Country Committee for the International Water Association (IWA) World Water Congress & Exhibition (WWCE) in Glasgow, the report is intended to help translate political momentum into practical, implementable action.

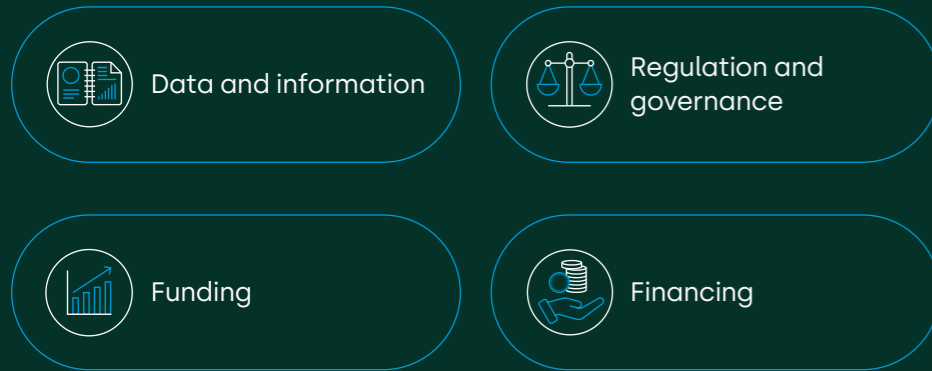
The report reflects the urgency of the current moment. Governments face tightening fiscal positions, rising debt burdens and competing demands on public spending, while reductions in development assistance are reducing the availability of concessional finance. This makes it increasingly important to mobilise private capital alongside public resources.

<sup>1</sup>United Nations (2026), 'Interactive Dialogue on Investment for Water: Mobilizing Finance, Fostering Innovation, and Strengthening Capacity Development to advance Water Security Investments'.

## The Glasgow Framework and recommendations

The report addresses persistent structural weaknesses in the financing of SDG 6 through two interconnected lenses.

First, it diagnoses the **principal barriers** to financing SDG 6, organised across four mutually reinforcing themes.



Source: Oxera.

The individual barriers identified have been developed following extensive consultation with industry practitioners from across the world, including investors, water practitioners, governments, NGOs and charities.

Second, it sets out solutions—prioritised, actionable **recommendations** for governments developing NWS, organised across the same themes.

These recommendations are outlined at the end of this Executive Summary, and include a prioritisation depending on how core the recommendation is to the achievement of SDG 6. It is worth noting that most of the solutions covered in this report have already been tested and implemented in real-world examples. This report thus builds on selected real-world cases and provides an opportunity for policymakers to deploy best practice solutions via their NWS.

Recognising that countries face widely differing circumstances, the framework groups water systems into four archetypes to tailor both diagnosis and recommendations:

- **Archetype 1:** High-coverage, ageing networks.
- **Archetype 2:** Rapidly urbanising, partially networked systems.
- **Archetype 3:** Small-scale, rural systems.
- **Archetype 4:** Professionalised rural aggregators.

To improve usability, recommendations are grouped into the following categories:

- **Foundational**—core elements required across all contexts, which we therefore recommend are addressed first.
- **Developmental**—focused on improving the offering and performance of water providers, and relevant to most water systems.
- **Accelerating**—aimed at catalysing the achievement of SDG 6 goals; however, SDG 6 can be achieved without fully implementing these recommendations.

The report recognises that prioritisation will depend on country-specific factors, including institutional capacity, system maturity and economic context.


### Next steps

This report is open for consultation. Feedback will be used to refine the framework and ensure it is practical, relevant and grounded in real-world experience.

We encourage all stakeholders to engage with the report and share their perspectives—particularly on how the recommendations can be implemented and prioritised across different contexts.

Comments received during the consultation period will be considered for inclusion in the final report, which will be published following the IWA WWCE in October. Insights from policymakers, investors and practitioners will be vital to ensuring the report reflects real-world experience and serves as a practical tool for those working to overcome barriers to achieving SDG 6.


## Summary of recommendations to close the water financing gap

Category	Recommendation	Type	Prioritisation by archetype
Data and information 	<b>Strengthen data, planning, and monitoring systems</b> , facilitating the consistent collection of high-quality, standardised data across utilities and basin organisations.	<b>Foundational</b>	A priority across all archetypes, with different emphasis depending on water system characteristics. <b>Archetype 1:</b> asset condition and lifecycle data to support renewal and resilience planning. <b>Archetype 2:</b> improve operational and commercial data (NRW, billing, informal mapping) as a core bankability constraint. <b>Archetype 3:</b> establish basic functionality and equity monitoring to direct scarce funding. <b>Archetype 4:</b> standardised portfolio reporting to build track record.
	<b>Strengthen data sharing and interoperability</b> by encouraging data exchange (at basin-level, cross-border and across agencies), clarifying institutional mandates for data sharing, and enabling benchmarking of standardised data across jurisdictions.	<b>Accelerating</b>	Relevant across all archetypes, especially where coordination failures undermine planning. This is particularly important in <b>archetype 1</b> (multi-agency silos) and <b>archetype 2</b> (municipal/national fragmentation and informal providers). It also supports benchmarking and basin coordination in <b>archetypes 3 and 4</b> .
	<b>Strengthen knowledge exchange and market understanding</b> by ensuring institutions have the capacity to leverage data in decision-making, establishing frameworks for better exchange of technical expertise between stakeholders, and improving society's understanding of the sector through education.	<b>Accelerating</b>	Cross-cutting but most impactful where reform depends on understanding real service delivery dynamics—often <b>archetype 2</b> and parts of <b>archetypes 3 and 4</b> . In <b>archetype 1</b> , supports legitimacy for resilience and tariff reform.

Category	Recommendation	Type	Prioritisation by archetype
Regulation and governance 	<b>Develop a consensus of investment needs between government, providers, and consumers</b> by developing national water investment plans, integrated project pipelines and a structured approach to blended finance to meet long-term sector-specific objectives.	<b>Foundational</b>	Relevant across all archetypes. Most urgent where funding exists but delivery is siloed—often <b>archetype 1</b> , but also high-leverage in <b>archetype 2</b> (rapid growth) and <b>archetype 4</b> (aligning aggregation, transfers and basin priorities). In <b>archetype 3</b> , can be relevant where integrated pathways enable aggregation models and predictable support for dispersed rural services.
	<b>Ensure the water system has an appropriate institutional architecture</b> that provides clear responsibilities and powers across public institutions and regulators, clarifying responsibilities and accountability mechanisms.	<b>Foundational</b>	Priority where overlapping mandates create uncertainty—common in <b>archetype 1</b> (complex regimes) and in <b>archetype 2</b> (split municipal/national authority). Also relevant in evolving <b>archetype 4</b> frameworks.
	<b>Coherent governance must be matched by institutional capacity</b> across technical, financial and managerial functions.	<b>Foundational</b>	Most critical in <b>archetypes 2 and 4</b> , where project preparation, financial structuring and regulatory enforcement constrain bankability. In <b>archetype 3</b> , focus is on operational and delegated support capacity. In <b>archetype 1</b> , capacity matters for complex resilience programmes.
	<b>Follow core principles of effective water regulation, including independence from government</b> , to provide clear mandates for institutions, transparent processes, efficiency-promoting incentives and sustainable investment for asset maintenance and expansion.	<b>Foundational</b>	Most relevant in <b>archetypes 2 and 4</b> where regulation is emerging or stabilising. Also important in <b>archetype 1</b> where regimes may need rebalancing toward long-term asset health and resilience. Less directly applicable in <b>archetype 3</b> .
	<b>Strengthening regulation to reduce risk and mobilise investment</b> by allocating risks transparently and proportionately, incentivising responsible behaviour and striking an appropriate balance between consumer affordability and investment adequacy.	<b>Foundational</b>	Most relevant in <b>archetypes 2 and 4</b> , and in <b>archetype 1</b> where existing regulation may deter long-term investment. In <b>archetype 3</b> , investor-risk reduction typically depends on sovereign/DFI backing or aggregation.

Category	Recommendation	Type	Prioritisation by archetype
Regulation and governance continued	<b>Strengthen basin-level governance</b> by establishing legally binding basin-scale allocation frameworks, defining clear accountability, embedding climate-risk scenarios into basin plans and empowering river-basin organisations through defined mandates and decision-making authority.	Developmental	Relevant across all archetypes; urgency depends on basin pressure rather than archetype. Critical in <b>archetypes 1 and 2</b> for managing trade-offs and climate risk, in <b>archetype 4</b> for coordinated allocation, and in <b>archetype 3</b> for clarifying roles and safeguarding resources.
	<b>Implement mechanisms to incentivise efficient water, sanitation and hygiene (WASH)</b> provision such as multi-year tariff settlements, efficiency-sharing mechanisms, innovation allowances and performance incentives, and enabling benchmarking and transparency.	Developmental	Most applicable in regulated and aggregated systems—typically <b>archetypes 2 and 4</b> , and mature <b>archetype 1</b> systems. In <b>archetype 3</b> , applies indirectly through performance-based grants and aggregation models.
	<b>Embed stakeholder engagement and inclusion</b> through structured approaches involving civil society, communities and private actors, embedding equity and social inclusion criteria in investment appraisal, and promoting efficiency across user groups to strengthen long-term sustainability.	Accelerating	Relevant across all archetypes. In <b>archetypes 2 and 3</b> , builds buy-in for service models, formalisation and basic tariffs. In <b>archetype 4</b> , supports subsidy and metering reforms. In <b>archetype 1</b> , strengthens legitimacy for resilience investment and tariff adjustment.
	<b>Integrate long-term climate resilience</b> by incorporating climate scenarios into infrastructure planning, supporting resilience-enhancing technologies, employing nature-based solutions and considering the full economic value of water (and costs of water scarcity).	Accelerating	Important across all archetypes. <b>Archetype 3</b> : integrate resilience into basic design. <b>Archetypes 2 and 4</b> : standardise climate screening in project preparation. <b>Archetype 1</b> : embed long-term modelling in regulatory settlements and major capital expenditure decisions.
	<b>Incorporate uncertainty into planning</b> by designing investments that remain robust under changing conditions, and using adaptive, long-term approaches that explore a range of plausible futures and incorporate identification of key risks and opportunities.	Accelerating	Important across all archetypes, but relevance varies by system context. <b>Archetypes 1, 2 and 4</b> : utilise flexible, scenario-based planning for managing long-term risk in major projects. In <b>archetype 3</b> , small scale infrastructure may be designed to remain robust under changing conditions.

Category	Recommendation	Type	Prioritisation by archetype
Funding 	<b>Establish stable income streams to provide adequate and predictable sector funding for water and wastewater service</b> through a combination of cost-reflective tariffs, targeted and predictable subsidies, and robust economic regulation, supported by measures to improve revenue collection and public acceptance.	Foundational	Fundamental across all archetypes. Binding in <b>archetypes 3 and 4</b> and parts of <b>archetype 2</b> where revenues are unstable. In <b>archetype 1</b> , the issue is political/regulatory willingness to fund lifecycle renewal and resilience.
	<b>Deploy targeted and equitable subsidy mechanisms</b> including lifeline tariffs and targeted social protection, and cross-subsidisation where required (such as urban-rural or industrial-domestic).	Developmental	Most relevant in <b>archetypes 2 and 4</b> , where affordability constrains cost recovery. In <b>archetype 3</b> , subsidies are often required for both capital expenditure and ongoing O&M.
	<b>Use public funding strategically and efficiently</b> through multi-year capital planning frameworks and aligning funding commitments with project pipeline.	Developmental	Important across all archetypes, especially <b>archetypes 2–4</b> where public transfers are material. In <b>archetype 1</b> , strategic public support is key for public-good resilience and to avoid crowding out efficient private finance.
	<b>Ensure water pricing reflects its full economic value</b> , incorporating externalities related to public health, ecosystem protection, flood mitigation and climate resilience.	Accelerating	Relevant across archetypes but most actionable in <b>archetype 1</b> and more mature <b>archetype 2</b> systems (and sometimes <b>archetype 4</b> via bulk pricing). Secondary in <b>archetype 3</b> , where basic funding stability is the priority.

Category	Recommendation	Type	Prioritisation by archetype
Financing 	<b>Deploy risk mitigation and de-risking instruments</b> such as partial credit and risk guarantees, political risk insurance, contractual risk-sharing mechanisms and viability gap funding.	<b>Foundational</b>	Most appropriate in near-bankable <b>archetypes 2 and 4</b> , and selectively in <b>archetype 1</b> for complex or first-of-a-kind investments. In <b>archetype 3</b> , generally only viable through portfolio or sovereign-backed approaches.
	<b>Use blended finance strategically</b> to crowd in private investment by addressing viability gaps and improving risk allocation.	<b>Developmental</b>	Most appropriate in <b>archetypes 2 and 4</b> , where systems are aggregated but revenues remain thin. May apply selectively in <b>archetype 1</b> for public-good resilience investments. Limited relevance in <b>archetype 3</b> unless aggregation is underway.
	<b>Leverage climate and thematic finance</b> by considering instruments such as green, blue and resilience bonds, and taking supportive action such as aligning water investments with national climate strategies and, where necessary, monitoring and reporting frameworks.	<b>Accelerating</b>	Most relevant in financially stable systems seeking long-tenor capital—typically <b>archetype 1</b> , and mature <b>archetypes 2 and 4</b> (often via national/DFI facilities).
	<b>Encourage innovative financing mechanisms</b> through regulatory clarity, pipeline development, co-financing, and capacity building, to support the potential use of instruments such as debt-for-nature swaps, microfinance models, resilience-linked bonds and public-private partnerships (PPPs).	<b>Accelerating</b>	Most relevant in <b>archetypes 2, 3 and 4</b> , where traditional finance struggles (e.g. microfinance, portfolio models, debt-for-nature). In <b>archetype 1</b> , innovation often focuses on adapting regulatory and thematic instruments for resilience investment.

Note: Foundational recommendations are core to closing the financing gap, and should be implemented by all water systems. Developmental recommendations are focused on improving the offering and performance of water providers. Most water systems should look to implement these. Accelerating recommendations will catalyse the achievement of SDG 6 goals, however, SDG 6 goals can be achieved without fully implementing these recommendations.





## Acknowledgments

We would like to express our sincere thanks to all those who contributed to the development of this report.

The Oxera team comprises: Rob Catherall, Georgia Davies (Project Manager), Chris Davis, Jessie Davidson, Ciaran Nye, Patrick Redman and Dr Luis Correia da Silva (Project Director).

We wish to thank the UK Host Country Committee and the International Water Association's (IWA) World Water Congress & Exhibition (WWCE) Steering Group for their ongoing collaboration throughout the development of this work, including Peter Simpson (Congress Co-President), Alex Plant (Congress Co-President), Marie Whaley (Chair of the Local Organising Committee), Blanca Antizar, Jonathan Farr, and Lorraine Bruce (Programme Manager).

This report draws on valuable insights gathered through workshops and consultations with industry experts. We are especially grateful to the many stakeholders who generously shared their time and expertise, and provided comments on early versions of the report.

At this stage, contributors are referenced in anonymised form. These include:

- workshop participants;
- case study contributors and reviewers; and
- peer reviewers and additional experts.

Contributors will be offered the opportunity to be formally acknowledged by name and/or organisation in the final version of the report, following stakeholder review and consent.

## Section 1: Introduction

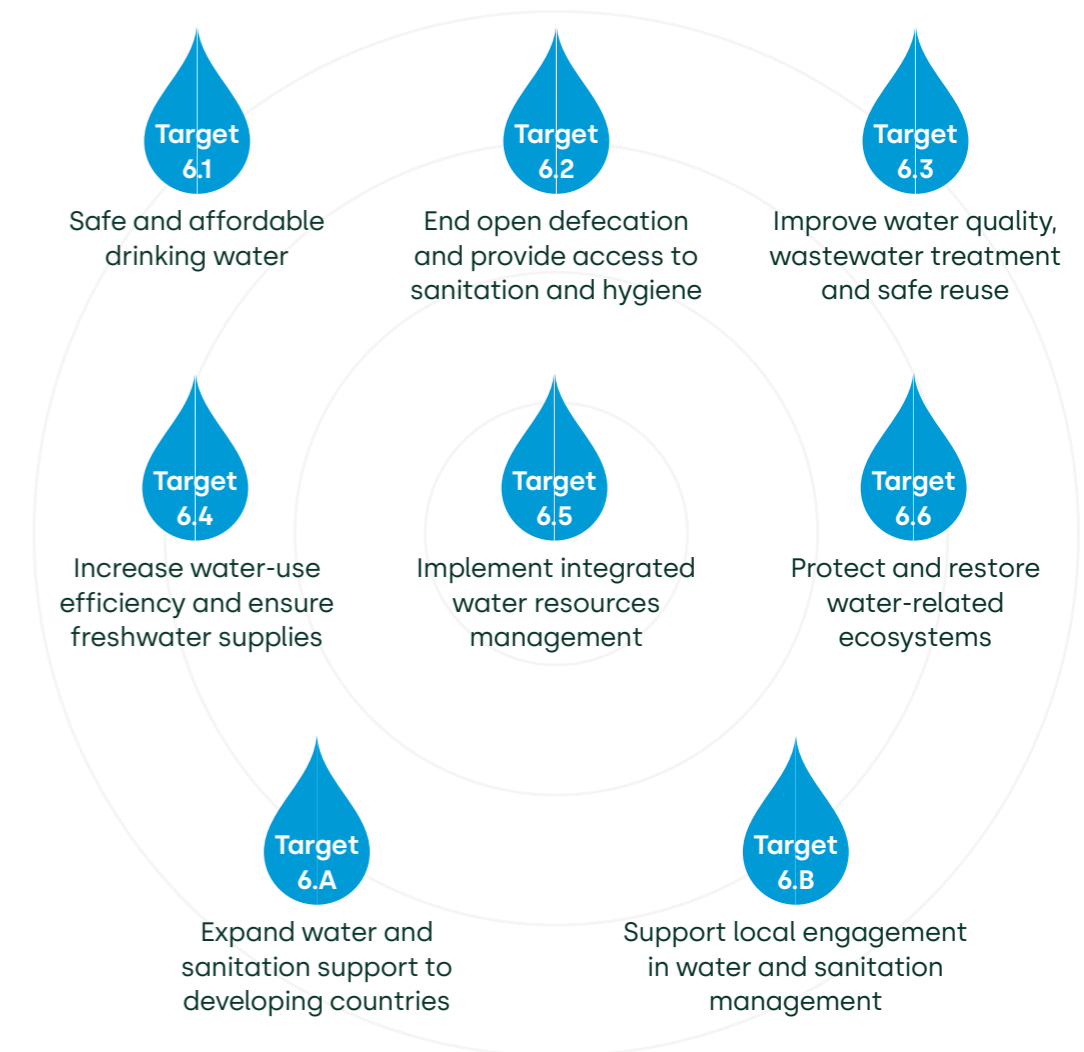
### Background to Sustainable Development Goal 6

Water security and sustainable water management are central to economic development, human wellbeing and environmental sustainability.

Sustainable Development Goal 6 (SDG 6), adopted by United Nations Member States in 2015, commits the world to universal access to safely managed water and sanitation, alongside improved water quality, wastewater treatment, water-use efficiency, integrated water resources management, ecosystem protection, and inclusive governance.

SDG 6 comprises a set of interlinked targets that collectively address both service delivery and the sustainable management of water resources. The various components of SDG 6 are summarised in Figure 1.1.

Figure 1.1 SDG 6 targets

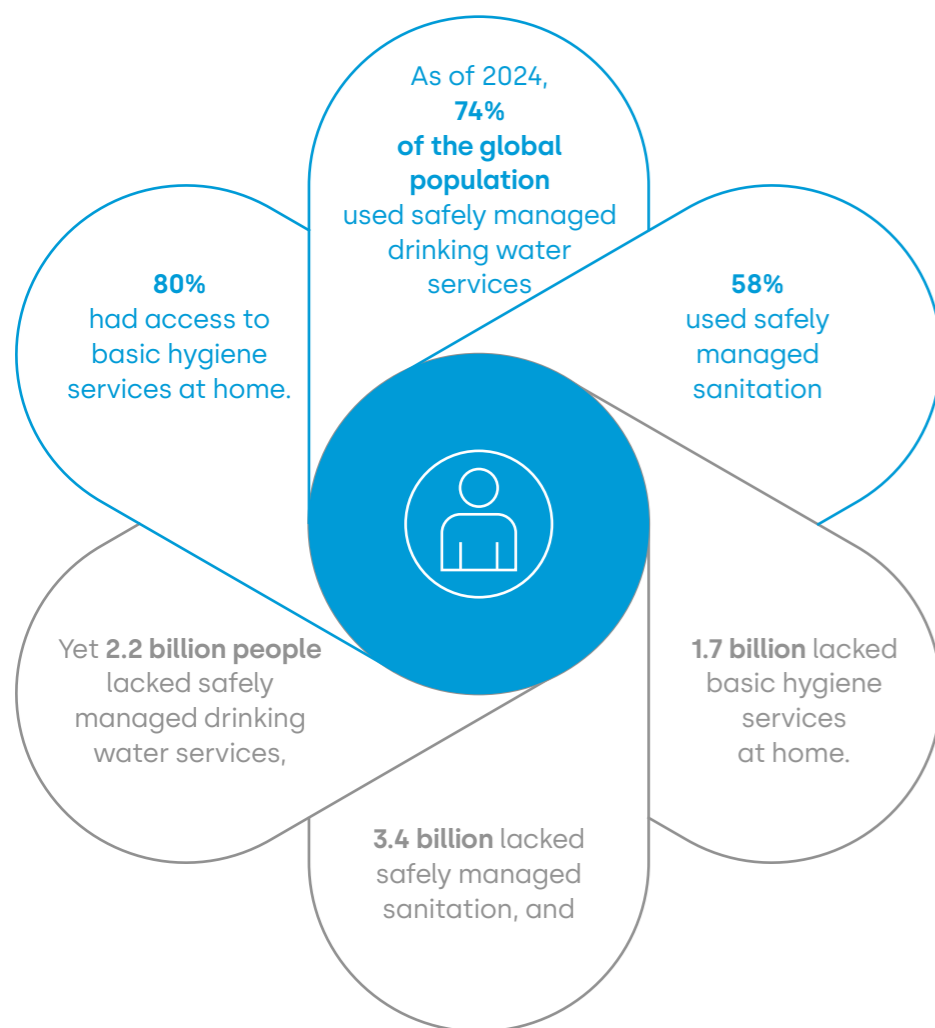


Source: European Commission, 'United Nations targets and indicators for Goal 6'. (redesign, Oxera).

Beyond its intrinsic importance, SDG 6 also plays a critical enabling role across the wider Sustainable Development Goals framework. Water security underpins progress across economic, social, and environmental systems, meaning failure to achieve SDG 6 risks undermining progress on multiple goals.<sup>2</sup> As a result, constraints in water availability, quality, or management can directly hinder development outcomes across sectors.

Improvements since 2015, when the sustainable development goals were introduced, have been modest and uneven, with wide disparities across income groups and regions. While some countries have made progress, many, particularly low-income countries, continue to face significant challenges across most targets. Billions of people worldwide still lack access to safe water and sanitation and, as of 2024, only 56% of global domestic wastewater generated was safely treated.<sup>3</sup> Global water stress remains at around 18%,<sup>4</sup> with approximately 10% of the world's population experiencing high or critical water stress.<sup>5</sup>

### Snapshot of SDG 6 progress



Source: Data from United Nations (2025), 'The Sustainable Development Goals Report: 2025', p. 20.

Regional disparities persist: many countries in Northern Africa, Western Asia, and Central and Southern Asia face stress levels exceeding 75%, and some regions have seen water stress rise substantially since 2015.

The challenge of achieving SDG 6 is global, but least developed countries face particularly acute challenges and lag substantially behind global averages, with limited progress over the past decade.<sup>6</sup> The populations of the least developed countries are more than twice as likely to lack basic drinking water and sanitation services, and more than three times as likely to lack basic hygiene services, compared with other countries.<sup>7</sup>

Even in wealthier nations, gaps remain in achieving SDG 6 targets, particularly where equitable access and water quality are concerned. In countries such as the US, Canada, Australia and New Zealand, historical marginalisation and underinvestment correlate with disproportionate water insecurity among indigenous peoples relative to national averages.<sup>8</sup>

### The need for action

At the global level, progress across SDG 6 indicators has not kept pace with what is required to meet the 2030 targets. The scale of the SDG 6 challenge is growing and while existing approaches have delivered important gains, they remain insufficient to close the widening gap between ambition and delivery.

Without accelerated action, the failure to achieve SDG 6 threatens public health, economic development, and climate resilience. Stable water and wastewater systems play a foundational role in supporting the functioning and growth of wider economic activity. This has been recognised at the international level, including through the launch of the SDG 6 Global Acceleration Framework.<sup>9</sup> Water insecurity also disproportionately affects women and girls,<sup>10</sup> limits access to education,<sup>11</sup> and can increase social tensions in water-stressed communities.<sup>12</sup>

<sup>2</sup> OECD (2013), 'Water Security for Better Lives', OECD Studies on Water, September.

<sup>3</sup> Based on data covering 84% of the world's population. See United Nations (2025), 'The Sustainable Development Goals Report: 2025', p. 20.

<sup>4</sup> The level of water stress: freshwater withdrawal as a proportion of available freshwater resources is the ratio between total freshwater withdrawn by major economic sectors and total renewable freshwater resources, after taking into account environmental water requirements. See Food and Agriculture Organization, 'Indicator 6.4.2', SDG Indicators Portal.

<sup>5</sup> United Nations (2025), 'The Sustainable Development Goals Report: 2025', p. 20.

<sup>6</sup> See information related to Indicator 6 from the United Nations SDG Indicators Database, available at <https://unstats.un.org/sdgs/dataportal/analytics/GlobalRegionalTrends>, accessed 23 December 2025.

<sup>7</sup> World Health Organisation (2025), '1 in 4 people globally still lack access to safe drinking water', August.

<sup>8</sup> For example, in Australia, hundreds of small rural and remote communities, particularly those with high proportions of indigenous residents, lack access to safe drinking water that meets national guidelines. Balasooriya, B.M.J.K., Rajapakse, J. and Gallage, C. (2023), 'A review of drinking water quality issues in remote and Indigenous communities in rich nations with special emphasis on Australia', Science of the Total Environment, 903, p. 166559; Australian National University (2022), 'Remote Australians lack access to quality drinking water', 21 July.

<sup>9</sup> The framework reflects the growing consensus that incremental improvements are insufficient given the scale of the challenge, and that structural barriers, rather than a lack of stated ambition, are now the binding constraint on progress. United Nations, 'SDG 6 Global acceleration framework'.

<sup>10</sup> United Nations (2026), 'Water for All People'.

<sup>11</sup> Ingutia, R. (2024) 'Who is being left behind in water security, where do they live, and why are they left behind towards the achievement of the 2030 agenda?', Sustainable Water Resource Management, 10, 20 August.

<sup>12</sup> Unfried, K., Kis-Katos, K. and Poser, T. (2022), 'Water scarcity and social conflict', Journal of Environmental Economics and Management, 113.

The case for action on SDG 6 is sharpened by the current global context. Governments face increasingly constrained fiscal positions, rising debt burdens, higher borrowing costs, and competing demands on public spending, which collectively limit the scope for further public investment in water and sanitation. At the same time, changes in the international development landscape<sup>13</sup> are reducing the availability of grant and concessional funding in many countries, and wars have affected the bankability of projects.

While it is widely recognised that there is a sizeable shortfall in investment needed to achieve SDG 6, its precise magnitude remains uncertain. Estimates of a gap of USD 114 billion per year are frequently cited,<sup>14</sup> but these are based on analysis undertaken nearly a decade ago and capture only part of SDG 6. The full scale of the funding and financing required across the breadth of SDG 6 is likely to be substantially higher. This gap also has a significant strain on wider socio-economic development, given the links between water investment, productivity growth, climate resilience, and public health.<sup>15</sup>

The economic value of water is often overlooked, yet it is key to unlocking funding, attracting investment, and justifying the significant resources needed for water and sanitation. Undervaluation of water services—which ignores wider social and environmental benefits—limits finance and weakens incentives for efficient management. Recognising water as an economic priority is essential to mobilising the investment required to close the SDG 6 financing gap.

### Scope of report

Achieving SDG 6 will require funding and financing approaches tailored to the diverse characteristics of countries and their water systems. This report, the **Glasgow Framework**, carried out in partnership with the UK as the Host Country Committee for the International Water Association's (IWA) World Water Congress & Exhibition (WWCE) in Glasgow, responds to this challenge by focusing on how investment in water and wastewater systems can be unlocked in practice.<sup>16</sup> This report focuses on barriers to securing investment, and the solutions that can overcome them.

The report recognises that the investment gap is not driven by a lack of global capital alone, but by system-level constraints relating to governance, revenue models, institutional capacity, risk allocation and data availability. Persistent underinvestment reflects both funding and financing gaps, alongside structural barriers that limit the effective deployment of resources.

On this basis, the report seeks to:

- identify the enabling conditions required for finance to support equitable and sustainable outcomes;
- set out priority actions to strengthen institutional coordination, information systems, capacity development, and accountability, alongside measures to close the SDG 6 financing gap and reinforce National Water Strategies (NWS).

This report builds on a substantial and well-established body of literature on SDG 6 and water sector financing. A wide range of global analyses, including the UN's Blueprint for Acceleration,<sup>17</sup> the Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS),<sup>18</sup> and research by the OECD on mobilising commercial and blended finance,<sup>19</sup> have identified the key barriers to progress and set out potential pathways forward. Initiatives such as the Sanitation and Water for All (SWA) partnership have further translated these insights into regionally tailored roadmaps.<sup>20</sup>

Rather than duplicating existing reports, our approach draws on these sources to synthesise and structure the challenges facing governments and water providers. Within the Glasgow Framework, we categorise the main barriers and set out solutions that can be drawn into NWS. This has been assessed in particular through the lens of investors, who will assess whether conditions for investing in the sector are met in any given country.

This evidence base has been complemented by insights from workshops and consultations with a wide range of stakeholders, including NGOs, investors, utilities and policymakers, ensuring that the report reflects practical experience as well as existing research.

Our approach seeks to take a global view of the challenges. To support applicability across diverse contexts, the report adopts a country-archetype framework, grouping systems that face similar structural challenges. This allows lessons, recommendations and examples of best practice to be applied more consistently across countries with comparable conditions.

The report's intended contribution is to move beyond diagnosis by providing a practical framework for policymakers. **In particular, it seeks to support the development of NWS by offering a set of actionable recommendations aimed at helping countries close the SDG 6 financing gap.**

<sup>13</sup> This includes the dismantling of bilateral development agencies such as USAID. BBC (2025), '[USAID officially closes, attracting condemnation from Obama and Bush](#)', July.

<sup>14</sup> World Bank (2016), '[The cost of meeting the 2030 sustainable development goal targets on drinking water, sanitation and hygiene: summary report](#)', January.

<sup>15</sup> World Economic Forum (2025), '[Bridging the €6.5 Trillion Water Infrastructure Gap: A Playbook](#)', December, pp. 7–11.

<sup>16</sup> While recognising that the water sector is foundational to all sectors of an economy, this report focuses specifically on the water sector itself, with particular attention to the financing barriers within the sector.

<sup>17</sup> United Nations (2023), '[Blueprint for Acceleration: Sustainable Development Goal 6 Synthesis Report on Water and Sanitation 2023](#)', pp. 38–52.

<sup>18</sup> World Health Organization, '[Water Sanitation and Health: UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water \(GLAAS\)](#)'.

<sup>19</sup> OECD (2019), '[Making Blended Finance Work for Water and Sanitation: Unlocking Commercial Finance for SDG6](#)'.

<sup>20</sup> SWA, '[Regional Roadmaps 2021-2025](#)'.

- It is intended to provide an actionable tool for **policymakers producing NWS**, drawing on insights from around the world.
- It is also designed for **investors and industry practitioners**, who have shaped the framework and its recommendations, to support more effective engagement with those developing and implementing NWS, as well as application within their own investment framework assessments.

By connecting these perspectives, the report seeks to add to the resources available for policymakers by providing a structured basis for dialogue between governments, investors, and the water sector on how to finance SDG 6. It sets out what governments might do to promote investment (via the NWS), what the water sector can contribute in return, and how finance can be better aligned with long-term service delivery and resilience objectives.

It is worth noting that the fulfilment of the recommendations outlined in this report, and in the achievement of SDG 6 more widely, is dependent on sufficient support from governments and politicians. While public budgets remain an important source of funding, the water sector often competes for limited fiscal resources. Strong political leadership is therefore required to champion the sector's central economic importance and the benefits that can be realised through improving water and sanitation provision, as well as to enable the mobilisation of a wider range of financing sources to meet investment needs.

### Promoting discussion

The timing of this report coincides with a critical policy window in 2026, providing an opportunity to influence both immediate discussions and longer-term water policy and investment decisions. Our aim is to inform international discussions, including preparations for the IWA WWCE in October,<sup>21</sup> and the United Nations Water Conference in December,<sup>22</sup> translating renewed political attention into practical, implementable action.<sup>23</sup> The report also supports the World Bank Group's Water Strategy Implementation Plan, which promotes country-led 'Water Compacts' setting government ambition, financing targets, and policies to improve sector performance and expand access.<sup>24</sup>

As part of this, we invite all readers to engage with the development of this report. Comments received can be integrated into the final version, to be published following the IWA's WWCE. All views are welcome, as insights from policymakers, investors and other stakeholders will support our aim to make this report a practical tool for governments, investors and practitioners.

The remainder of the report is structured as follows.

- Section 2 provides an overview of the framework used to assess the barriers and solutions to financing.
- Section 3 summarises the barriers to attracting finance.
- Section 4 presents a policy framework for unlocking finance.
- Section 5 sets out the next steps and consultation process for the Glasgow Framework.

The report also comprises four appendices:

- A1 offers a detailed overview of the barriers to financing SDG 6.
- A2 presents case studies illustrating how policies, institutional arrangements, and financing initiatives have helped overcome barriers to investment across different archetypes.
- A3 presents broader recommendations that fall outside the scope of an NWS.
- A4 is a glossary of key terms used throughout the report.

<sup>21</sup> This sits within the wider IWA World Water Congress & Exhibition.

<sup>22</sup> See [2026 United Nations Water Conference: 2-4 December 2026, United Arab Emirates](#).

<sup>23</sup> See, for example, Global Commission on the Economics of Water (2024), [The Economics of Water: Valuing the hydrological cycle as a global common good](#); United Nations (2026), [Interactive dialogue on investment for water: mobilising finance, fostering innovation, and strengthening capacity development to advance water security investments](#), section 3.

<sup>24</sup> World Bank Group (2025), [The World Bank Group Water Strategy Implementation Plan](#), Mission Water for a Water Secure Future, December.

## Section 2: Framework for closing the barriers to financing for SDG 6

Achieving SDG 6 requires that resources be mobilised from two different but interconnected sources.

- **Funding** refers to money that is provided that is non-repayable. The funding arrangements determine whether it is users, taxpayers or charitable donations that ultimately pay for water and wastewater services. Sources of funding can include revenues derived from tariffs levied directly on users, taxation (i.e. where public budgets are allocated to the water sector), and transfers (grants and overseas development assistance).
- **Finance** is repayable capital that is provided by debt or equity investors with a view to earning a return on capital (for example, in the form of interest repayments, dividends or capital gains). Finance provides the bridge where an upfront capital investment is needed and the costs associated with that investment will be recovered over multiple years. Repayments to investors typically comprise the return of the upfront capital (i.e. depreciation) and a return on the capital (i.e. debt interest and equity returns).

There are a number of different forms of finance that could potentially be accessed for SDG 6:

- **Commercial finance**, provided at market rates by private institutions. This includes bank lending (corporate or project finance), capital market instruments such as municipal, green or blue bonds, and equity investments.
- **Concessional finance**, provided at below-market terms (in order to support development objectives) by multilateral development banks (MDBs), bilateral donors and development finance institutions (DFIs), often through longer maturities, grace periods or reduced interest rates.
- **Climate finance**, a subset of financing directed toward mitigation and adaptation outcomes, which may be commercial or concessional in nature.
- **Blended finance**, which combines concessional or public capital with private finance to improve risk-return profiles and mobilise additional investment. Instruments may include guarantees, first-loss capital, viability gap funding, technical assistance and results-based incentives.

Governments can use public-private partnerships (PPPs), under which private entities may provide upfront capital and operational expertise, with risks and returns allocated contractually between public and private parties. PPP structures are diverse<sup>25</sup> and can incorporate various types of finance introduced above.

<sup>25</sup> Contracts vary significantly in scope and duration. For more information, see Water PPP Hub, '[Understanding Water Public-Private Partnerships](#)'.

Countries face very different circumstances in their water systems, including institutional and regulatory frameworks, levels of urbanisation and economic development, service coverage, and revenue potential. As a result, barriers to financing SDG 6 vary widely, and no single solution will be effective across all contexts.

Public funding has historically played a central role in water services due to their significant public benefits, high upfront costs, long asset lifetimes, and natural monopoly characteristics.<sup>26</sup> This creates a strong case for government investment, particularly in areas like universal access, sanitation, and ecosystem protection where private incentives are limited.

At the same time, some services—especially utility-based systems with billing—can generate predictable revenues and support the user-pays principle. Where revenues are sufficient, this can improve creditworthiness and attract private finance. However, private investment has remained limited because revenues often fail to cover even operating costs, let alone capital investment. Unlocking private finance will require governments to enable cost-recovery tariffs, alongside safeguards to maintain affordability for low-income households.

The balance between public funding and private financing depends on revenue potential, risk, and institutional capacity. Grouping water systems into archetypes with similar challenges can help tailor more effective financing approaches.

## 2.1 Rationale for the Glasgow Framework

This report aims to take a truly global view when identifying and proposing solutions to the causes of the financing gap, and must thus consider the huge variety of water systems around the world.

To make this issue tractable and to ensure that the recommendations of the report are relevant and actionable, the Glasgow Framework has been developed by:

- defining a set of **archetypes** to group water systems based on their key characteristics including topography, and the age of the network assets and institutions that manage them;
- identifying barriers and solutions to closing the SDG 6 financing gap. Specific **barriers** and **solutions** have been identified following extensive consultation with industry stakeholders, with recognition that these will vary across the different archetypes.

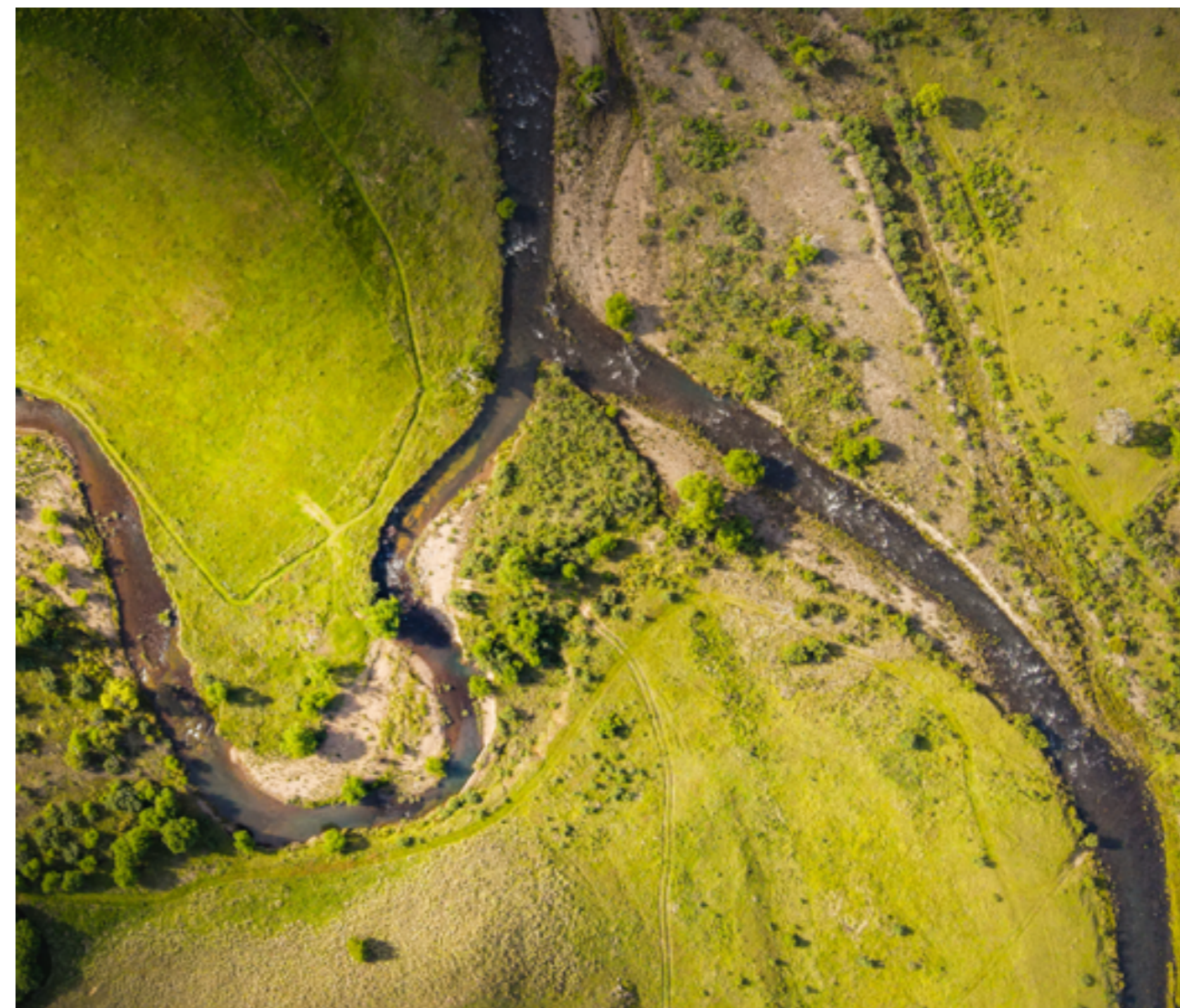
<sup>26</sup> Although many water services are partly excludable, elements such as watershed protection, flood resilience and public health improvements produce wide social benefits that cannot easily be captured through tariffs.

We use this framework throughout the following sections to recognise the variety of challenges faced by different water systems (Section 3 and Appendix A1), and ultimately to produce a prioritised list of recommendations that can be tailored to specific systems (Executive Summary and Table 4.1).

## 2.2 Water system archetypes

Four water system archetypes are used in this report. Together, these are broad characterisations of the majority of water systems globally and provide a practical basis for tailored recommendations.

In practice, most countries sit across multiple archetypes and will need to draw insights from several of these when developing and implementing their NWS.



### Archetype 1: High-coverage, ageing network systems

The first archetype captures countries in which water and wastewater networks are well-established and mature, providing near universal coverage to the population. The age of the infrastructure means that sustainable replacement of existing infrastructure is a key consideration. These systems are typically found in high-income countries. Systems within this archetype generally do not lack access to commercial finance, but face political and regulatory constraints that limit the substantial reinvestment that is required in existing assets.

#### Key features and characteristics

- High-income, largely urbanised countries with extensive legacy water infrastructure.
- Near-universal access to piped water and basic sanitation.
- Mature regulatory frameworks and institutional systems.
- Established utilities with professional management.
- Strong domestic capital markets.

#### Key current forms of funding

- Primarily tariff-based revenue complemented by public budgets for resilience and environmental obligations.
- Political constraints often limit tariff increases despite underlying cost pressures.
- Tariffs may not fully reflect long-term system costs, such as those associated with climate adaptation costs.

#### Key current forms of financing

- Access to commercial debt (bank loans, corporate bonds), green/blue bond issuance.
- Concessional finance used less often given market access.
- PPPs used selectively for major projects.
- Blended finance used for resilience and environmental objectives.

#### Examples:

UK, France, Germany, Japan, Canada, Chile

Source: Oxera.

Despite a large number of widely-shared characteristics, important differences within archetype 1 systems exist, driven by variation in governance structures and ownership models. Many jurisdictions operate structures that are largely publicly owned and financed (such as Scotland, Germany and Canada). A small number of countries have utilised private finance, backed by economic regulation (such as England, Wales and Chile).<sup>27</sup> Some systems are highly delegated and fragmented. For example, the UK has multiple regulators with overlapping and fragmented mandates,<sup>28</sup> and Canada demonstrates fragmented governance between national and municipal levels.<sup>29</sup> By contrast, other systems are highly centralised, with integrated management structures, as seen in Singapore.<sup>30</sup>

Differences in exposure to climate stress may also drive differences in system features, including *within* countries with significant variation such as Chile.<sup>31</sup> Tariff structures and the use of finance may also vary, with differences in levels of metering and differing institutional factors affecting private participation in the supply of utilities.



<sup>27</sup> It is worth noting that Welsh Water is a mutual, with no shareholders, with profits reinvested into its network. It is regulated under the same regime as English water companies. Source: Welsh Water, 'About us'.

<sup>28</sup> Independent Water Commission (2025), 'Final Report', p. 157.

<sup>29</sup> Government of Canada (2017), 'Water governance and legislation: shared responsibility'.

<sup>30</sup> Tortajada, C. (2007), 'Water Management in Singapore', ETHOS, Issue 2, April.

<sup>31</sup> Meza, F.J. (2025), 'Climatic Profile and Drought Characteristics in Chile', in D. Rivera and G. Donoso (eds), *Droughts in Chile*, Volume 31, Springer.

## Archetype 2: Rapidly urbanising, partially networked systems

Archetype 2 relates to countries that are experiencing rapid urbanisation that requires enhancement to existing infrastructure in order to meet and be resilient to growing demand. Where this rapid growth in demand outpaces institutional capacity and infrastructure expansion, persistent service gaps may result.

### Key features and characteristics

- Fast urban population growth, often with informal/peri-urban expansion.
- Networks expanding unevenly and struggling to keep pace with demand.
- Utilities with mixed performance and institutional fragmentation.
- High levels of non-revenue water (NRW) due to physical leakages and commercial losses.
- Weak billing/collection systems in informal settlements.

### Key current forms of funding

- Tariffs often insufficient to cover operations and maintenance (O&M) and capital renewal.
- Heavy reliance on concessional finance, transfers and subsidies.
- Public budgets constrained by competing priorities.
- Informal areas largely unserved by formal utility services.

### Key current forms of financing

- Blended finance plays a larger role to make projects bankable.
- Concessional lending via MDBs/DFIs often anchors projects.
- Commercial finance is limited or tied to stronger utilities or ring-fenced projects.
- PPP uptake is inconsistent due to institutional and regulatory concerns.

### Examples:

Brazil, Mexico, Malaysia, Indonesia, South Africa, India, Philippines

Source: Oxera. NRW is the difference between the total produced water volume and the total billed volume. This includes technical and commercial losses, such as those arising due to leakage or incomplete billing. See IBNET (2023), 'Definitions', October.

While archetype 2 systems share common features, rapid urbanisation, partial network expansion and transitional governance, significant variation exists across systems within this archetype, reflecting differences in the pace of urban growth, institutional maturity and the role of private sector participation. Some countries that contain these systems, such as Brazil, the Philippines and parts of South Africa, have developed more established regulatory frameworks and professionalised utilities, alongside growing engagement with private finance. Others, exhibit diverse institutional arrangements and varying approaches to service delivery. Differences in urban growth patterns, climate exposure and levels of informality further shape how water services evolve across this archetype.

## Archetype 3: Small-scale rural systems (self-supply and community-based)

Archetype 3 refers to countries characterised by small-scale systems in dispersed rural populations. These may struggle to attract financing due to the absence of institutions and sustainable revenue models.

### Key features and characteristics

- Small, dispersed rural communities with independent water sources.
- Often community-managed handpumps or small piped schemes.
- Limited professional O&M capacity.
- Very low tariff revenue streams and limited institutional formality.
- Minimal economies of scale.

### Key current forms of funding

- Grants, Official Development Assistance (ODA) and third-sector support dominate.
- Public budgets often focused on capital setup; recurrent costs underfunded.
- Community contributions are frequently ad hoc.

### Key current forms of financing

- Virtually no access to formal financing market.
- Lack of a legal borrowing entity prevents debt-based financing.
- Aggregation models rare—financing is project-by-project and highly fragmented.

Source: Oxera.

### Examples:

Rural parts of Ethiopia, Niger, Malawi, and Nepal

While archetype 3 systems share dispersed rural service provision and limited institutional formality, significant variation exists. Differences relate to the sustainability of funding, the degree of aggregation, and the level of municipal or government support and clarity of institutional roles. Some communities rely on self-supply or informally managed handpumps, while others operate small piped schemes with varying levels of community management or external support. Scale, management formality and household participation therefore differ widely, shaped further by geography and population density, with remote areas typically relying on decentralised solutions and more settled regions developing early forms of aggregation or structured oversight.

### Archetype 4: Professionalised rural aggregators

These systems aggregate multiple rural schemes under professional management, often supported by cross-subsidies from urban areas or central government.

#### Key features and characteristics

- Aggregated rural/small-town systems under professional management.
- Standardised technical designs, centralised billing and O&M.
- Often regional utilities, delegated management, or associations of schemes.
- Subsidies from central transfers support financial flows.
- Growing institutional maturity relative to archetype 3.

#### Key current forms of funding

- Mixed tariffs—often insufficient per connection, supplemented by minimum payments by government.
- Public transfers fill operational gaps, especially in low-income areas.
- Concessional grants and MDB support used for capital projects.

#### Key current forms of financing

- Blended finance increasingly used to build bankable aggregated portfolios.
- Some access to commercial finance for larger pooled assets.
- Limited number of tailored financial products for semi-bankable rural aggregation.

#### Examples:

Rwanda, Vietnam, Morocco, Burkina Faso, Cambodia

Source: Oxera.

Although archetype 4 systems all involve consolidation of rural supply infrastructure, important differences arise in ownership models, regulatory maturity, funding structures and financial readiness. In rural Rwanda, piped systems predominantly constructed by the government through public funding are clustered into larger service areas and managed under delegated contracts,<sup>32</sup> whereas in Cambodia rural networks are typically privately-developed and owned, small and independently operated systems.<sup>33</sup> The predictability of subsidies, the clarity of legal mandates and contract enforcement, and the availability of performance data also vary across systems, shaping their interaction with financiers and the pace at which they can transition toward more structured financing.

A comparison of archetype characteristics is summarised in Table 2.1 below.

Table 2.1  
A comparison across archetypes

Metric	Archetype 1	Archetype 2	Archetype 3	Archetype 4
<b>Reliable and equitable access</b>	<b>High</b> , though pockets of inequality exist; network coverage high.	<b>Low-moderate</b> , uneven coverage and quality; large informal gaps.	<b>Low</b> , frequent breakdowns and unreliable supply.	<b>Low-moderate</b> , better than disaggregated systems but constrained by revenue.
<b>Environmental performance</b>	<b>Moderate-high</b> , but regulatory fragmentation across water and climate sectors can reduce coherence.	<b>Low-moderate</b> , environmental compliance secondary to access expansion.	<b>Low</b> , limited monitoring and enforcement.	<b>Low-moderate</b> , dependent on policy coherence.
<b>Resilience to climate and demand variability</b>	<b>Moderate</b> , constrained by underinvestment in adaptation-relevant assets (e.g. storm overflows and water supply resilience (security)).	<b>Low</b> , limited planning capacity and weak asset base.	<b>Low</b> , low adaptive capacity.	<b>Low-moderate</b> , enhanced capacity through aggregation.
<b>Service continuity</b>	<b>Moderate</b> , ageing assets face deferred maintenance and increasing failure risk due to underinvestment.	<b>Low-moderate</b> , intermittent supply and poor asset utilisation.	<b>Low</b> , high rates of non-functioning without sustained funding.	<b>Low-moderate</b> , strengthened by professional O&M but revenue limits persist.

Source: Oxera analysis.

<sup>32</sup> Kenya Markets Trust (2023), 'A Global Water Benchmarking Study For Kenya', p. 8.

<sup>33</sup> Water.org, 'The family business of water supply'.



## Section 3: Barriers to financing SDG 6

This section provides a brief overview of the barriers that hinder progress in mobilising finance for SDG 6 objectives. A more detailed discussion of each of these barriers is provided in Appendix A1.

The barriers we note are not intended as an exhaustive account of all challenges affecting water sector financing globally. Rather, they represent a prioritised set of the most significant barriers. This prioritisation has been informed by extensive consultation with stakeholders across diverse water systems and archetypes, and draws on expertise from a broad range of groups—including investors, governments, intergovernmental organisations, and water utilities and service providers.

Water is essential for health and the environment, as well as a critical economic imperative. Yet its full value is often overlooked, with pricing and investment failing to reflect wider social and environmental benefits. This undervaluation limits funding, weakens investment incentives, and constrains the scale of finance needed to achieve SDG 6. Recognising water as an economic priority is key to unlocking the substantial, long-term investment required.

We organise barriers into four broad thematic areas:

- Data and informational barriers;
- Regulatory and governance barriers;
- Funding barriers; and
- Financing barriers.

Overcoming barriers to financing means recognising that, while some obstacles to financing may arise independently, many overlap and reinforce one another. Indeed, barriers to financing reflect a set of interrelated institutional, informational and financing constraints that shape how finance is assessed, allocated and deployed. For example:

- Weak data and information systems (**data and informational barriers**) limit effective risk assessment.
- Fragmented institutional responsibilities and regulatory uncertainty (**regulatory and governance barriers**) slow decision-making and disincentivise finance.
- Insufficient cost recovery and constrained public budgets, which may not be effectively spent, mean providers might not have sufficient funds to meet targets and investment plans (**funding barriers**).
- A lack of creditworthy service providers, alongside limited local technical and managerial capacity, reduces project bankability and constrains the scale of investment (**financing barriers**).

Together, these factors create a reinforcing cycle that limits the effectiveness of financing.

The impacts of **climate change** cut across each of these constraints, adding further complexity and uncertainty. Climate change and water systems are intrinsically linked: shifts in precipitation patterns, rising temperatures, and the increasing frequency and severity of extreme events directly affect water availability, quality, and infrastructure performance. This intensifies physical risks to water assets, increases revenue volatility for utilities, and complicates long-term planning assumptions on which investment decisions depend.

For financiers, heightened climate variability increases uncertainty around cash flows, asset lifespans and risk profiles.<sup>34</sup> Projects may require higher upfront capital expenditure to build resilience, while returns may become less predictable due to demand shocks, service disruptions or regulatory adjustments. In addition, a lack of suitable climate data may prevent governments from fully recognising the scale of challenges facing the sector. This in turn may limit their ability to substantiate the need for increased public funding levels or to communicate these needs to donors or concessional funders.

### 3.1 Data and informational barriers

Informational barriers are a constraint to the effective mobilisation and deployment of finance for SDG 6. Across many countries, gaps in understanding of infrastructure condition, hydrological risk, demand growth and utility-level commercial performance data limit the ability to prioritise investment and undermine investor confidence. These barriers are summarised below and explored in turn in Appendix A1.1.

- Weak data systems and lack of financial visibility.
- Limited data on infrastructure condition and operational performance.
- Hydrological and climate data gaps.
- Fragmentation and non-interoperable data systems.

### 3.2 Regulatory and governance barriers

Governments can play a dual role in the water sector: they can provide public funding that underpins service delivery and helps crowd in additional finance, while also shaping the enabling environment that determines whether investments are viable, bankable and scalable.

A strong enabling environment comprises coherent policy frameworks, stable and enforceable regulation, capable institutions, and financial-sector conditions that support long-term capital mobilisation. Where these conditions are weak or fragmented, investment risk increases, capital costs rise, and there may be reduced access to finance.

Across country contexts and water system archetypes, several recurring governance barriers constrain investment. These barriers are summarised below and explored in turn in Appendix A1.2.

- Weak basin governance, unclear water rights and unpriced environmental costs.
- Institutional fragmentation and siloed policy.
- Institutional capacity and incomplete centralisation.
- Weak, capricious or politicised regulation.

These challenges are often rooted in underlying political economy constraints, including fragmented accountability, short political cycles, and misalignment between sector objectives and broader fiscal or economic priorities. Without clear leadership and ownership, reforms can stall even where technical solutions are well understood.

### 3.3 Funding barriers

Barriers to financing in the water sector are often rooted in weaknesses in underlying funding systems. Investors need to be confident that the upfront capital they provide will be recovered through future income streams. The lack of financing often stems from inadequate or unpredictable funding from tariffs, public budgets or transfers. Because financing depends on projects demonstrating stable and sufficient revenue streams, access to capital cannot compensate for weak funding structures.

Analysis of financing gaps for SDG 6 therefore needs to consider how funding systems interact with capital markets. In some cases, public funding remains the only viable mechanism to support investment and service delivery. In other cases, revenues raised from user charges may be sufficient to recover investment costs.

Three interlinked funding barriers are particularly significant, summarised below and set out in Appendix A1.3.

- Undervaluation of water and insufficient cost recovery.
- Constrained budgets.
- Funding not effectively spent, where allocated budgets are underutilised or ineffectively deployed.

### 3.4 Financing barriers

While funding barriers relate to the availability and reliability of non-repayable revenue streams (tariffs, taxes and transfers), financing barriers are distinct in that they concern constraints on mobilising repayable capital, such as limited creditworthiness, revenue predictability and risk allocation frameworks.

Financing plays a critical but often misunderstood role in achieving SDG 6. It is not a substitute for sustainable funding, nor a standalone solution to investment shortfalls. Rather, it is a mechanism for mobilising upfront capital against the expectation of future, reliable revenue streams.

<sup>34</sup> The Intergovernmental Panel on Climate Change recognise an 'increased frequency and/or intensity of some weather and climate extremes since pre-industrial times, in particular for temperature extremes'. See Seneviratne, S.I., Zhang, X., Adnan, M., Badi, W., Dereczynski, C., Di Luca, A., Ghosh, S., Iskandar, I., Kossin, J., Lewis, S., Otto, F., Pinto, I., Satoh, M., Vicente-Serrano, S.M., Wehner, M. and Zhou, B. (2021), 'Weather and Climate Extreme Events in a Changing Climate', in V. Masson-Delmotte, P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds), chapter 11, Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press.

The effectiveness of finance—including commercial, concessional, climate and blended finance—in the water sector ultimately depends on the strength of underlying funding systems, institutional credibility and risk allocation frameworks. Where revenues are insufficient or unpredictable, creditworthiness is weak, or regulatory environments lack stability, capital will not materialise. Conversely, where institutions are robust and revenue structures adequate, financing can play a role in enabling service expansion and quality improvements. This section therefore examines the principal barriers to financing in the water sector.

Different financing mechanisms rely on core enabling conditions such as: predictable revenue streams; credible regulatory and policy frameworks; sound governance; and institutions with sufficient financial and operational capacity to manage debt and risk.

The barriers to financing are summarised below and set out in Appendix A1.4.

- Inadequate and unstable revenue streams.
- Investment risk in complex water systems.
- Weak creditworthiness.
- Project characteristics and rural underfinancing.
- Complexity and coordination requirements.
- Challenges in assessing water sector investments.
- Constraints of existing financial instruments.
- Crowding out of commercial finance.

### 3.5 Conclusion

Taken together, these constraints highlight that the SDG 6 gap is not fundamentally a shortage of capital, nor even solely a problem of funding. It reflects a deeper set of structural weaknesses—fragmented institutions, weak data and transparency, constrained fiscal systems, limited creditworthiness and poorly allocated risk. Financing barriers are often the most visible manifestation, but they are rarely the root cause. Where governance is fragile, information is incomplete and revenue systems are unstable, neither public nor private capital can flow efficiently or at scale. Addressing SDG 6 therefore requires systemic reform that aligns institutions, data, funding structures and financing mechanisms into a coherent investment framework.

Section 4 outlines our corresponding recommendations for how these barriers can be overcome, through measures policymakers can implement in NWS.

## 3.6 Overview of barriers affecting specific archetypes

### Archetype 1

#### Overview

Mature, ageing systems with near-universal coverage, established economic regulation, and deep domestic capital markets.

#### Main barriers

Political resistance to tariff increases

Regulatory uncertainty

Institutional fragmentation and siloed policy

#### Examples:

UK, France, Germany, Japan, Canada

#### Summary

In archetype 1, the binding barrier to attracting finance tends to be the **lack of alignment** between **political objectives**, **government policy**, **regulatory design** and **sector delivery**. Where tariffs fail to reflect full lifecycle costs and resilience needs, financing cannot sustainably support reinvestment.

Without reform to regulatory incentives and tariff structures, even financially sophisticated systems risk gradual deterioration of infrastructure and rising long-term costs.

## Archetype 2

### Overview

Rapidly urbanising areas with unevenly expanding utility networks. Often high NRW and fragmented utilities.

#### Main barriers

Complexity and coordination requirements

Weak basin-scale governance and allocation

Inadequate and unstable revenue streams

### Examples:

Brazil, Mexico, Indonesia, Philippines

### Summary

In archetype 2, the binding constraint is often institutional and commercial performance. Capital is available globally, but **weak cost recovery, high NRW** and **governance risk** often prevent the emergence of bankable entities.

In rapidly urbanising areas, **revenue streams may be unstable**, and **complexity and coordination issues** can hinder effective planning approaches when institutions and financing approaches are less formally established.

## Archetype 3

### Overview

Dispersed rural communities where water services are typically small-scale and independently managed.

#### Main barriers

Project characteristics and rural under-financing

Inadequate and unstable revenue streams

Institutional capacity and incomplete decentralisation

### Examples:

Rural parts of Ethiopia, Niger, Malawi, Nepal

### Summary

Represents the most challenging water system archetype to finance, often due to rural **project characteristics**.

The key binding constraints are typically the **absence of formal institutions, aggregated professional management, predictable funding streams**, and **reliable performance data**. Without aggregation, professionalisation, and targeted public sector support—including guarantees and enabling frameworks—these systems remain largely dependent on grants and other sources of funding, limiting their ability to access conventional financial markets.

## Archetype 4

### Overview

Aggregation of multiple rural or small-town schemes under professional management structures.

#### Main barriers

Inadequate and unstable revenue streams

Weak, capricious or politicised regulation

Weak data systems and lack of financial visibility

### Examples:

Rwanda, Vietnam, Morocco, Burkina Faso

### Summary

Represents an intermediate level of financing readiness.

Aggregation and professional management improve institutional credibility, operational efficiency, and enable portfolio-based financing. However, **thin margins**, reliance on transfers, legal and contractual uncertainty, product-market mismatches, and **limited performance data** still constrain financing. These systems are typically funded through blended approaches, with concessional capital, guarantees, or development finance institutions playing an anchoring role. While more bankable than disaggregated rural systems, archetype 4 systems often still depend on structured public support to mobilise sustainable financing at scale.





## Section 4: Recommendations for closing the SDG 6 financing gap

This section provides recommendations on how an NWS can address the barriers to financing SDG 6 investments identified in Section 3.

An important first step in this process is the development of clear, sector-wide objectives that can be used to define investment needs and assess the scale of the current financing gap. The estimation of the financing gap could be supported by the development of a standard and consistent methodology encompassing the measurement of expenditure, forward-looking investment needs, demand projections, and efficiency. The development of this standard would sit outside the scope of an NWS, along with other non-NWS recommendations outlined in Appendix A3.<sup>35</sup> Finally, the recommendations outlined in this report could form the basis of a new international standard for NWS seeking to attract and mobilise sources of finance.

Depending on the particular challenges facing different countries and regions, closing the financing gap requires a coherent programme of national-level policy and regulatory measures, and possibly reform, that is focused on strengthening data governance, institutional capacity, regulatory certainty, and the strategic deployment of funding and finance. The degree to which specific recommendations apply in their totality or partially depends on the extent of the barrier identified. Governments are central to this process: several key barriers to investment—including regulatory uncertainty, institutional fragmentation, weak data systems, and misaligned incentives—are structural and fall within government control. As such, strengthening institutions, governance and regulatory frameworks enables governments to create the environment necessary to mobilise sustainable financing at scale.

The recommendations set out in this report are framed within the context of NWS, reflecting the United Nations' guidance that progress towards SDG 6 requires an integrated and accountable approach to water management.<sup>36</sup>

<sup>35</sup> These include the development of a standard for water governance and the recommendation that priorities identified in NWS should be reflected in other national policy frameworks.

<sup>36</sup> The United Nations identifies four core areas for reform within an NWS. These are: **foundational reforms** (strengthening institutions, governance, and regulatory frameworks); **strategic use of funding and financing** (leveraging public resources to mobilise private investment); **capacity development and technological innovation** (building skills and promoting innovation in water management); and **development of bankable projects** (creating investment-ready opportunities that attract private capital). See United Nations (2026), '[Interactive dialogue on investment for water: mobilising finance, fostering innovation, and strengthening capacity development to advance water security investments](#)'.

While the strategy sets the overarching direction at a government level, delivery will depend on practitioners having practical tools that enable implementation in day-to-day industry activity. The discussion that follows **sets out cross-cutting, high-level recommendations and practical actions relevant across all water system archetypes**. These are organised thematically and are accompanied by tools designed to support practitioners, as well as illustrative examples of successful initiatives. The analysis further examines how these recommendations should be tailored to different water system archetypes, identifying which solutions are most relevant to each system type. The use of **water system archetypes** in this framework provides a practical way to tailor recommendations to the specific characteristics and challenges of different national water systems. By grouping systems according to shared features, policymakers and practitioners can more easily identify which actions are most relevant and impactful for their context.

Some recommendations are more key to the achievement of SDG 6 than others. To aid policymakers in identifying those recommendations that are core to the achievement of SDG 6 goals, our recommendations are categorised into the following groups:


- **Foundational:**  
These recommendations are core to closing the financing gap. Policymakers and water providers should focus on fulfilling these as they underpin the implementation of the other recommendations, and the creation of a financially sustainable water sector more widely.
- **Developmental:**  
These recommendations are focused on improving the offering and performance of water providers. Most water systems should look to embed these recommendations once the foundational recommendations have been implemented. However, these would largely strengthen current institutions and practices, rather than creating those in the first place or representing significant additions or transformations.
- **Accelerating:**  
These recommendations will accelerate the achievement of SDG 6 goals, by allowing providers to access novel sources of finance or with innovative financing structures, and it will protect progress against a number of headwinds. However, it is conceivable that a country could achieve SDG 6 without fully implementing these recommendations.



Taken together, this section provides a structured pathway from systemic financing constraints to improved SDG 6 investment outcomes. By combining cross-cutting reforms with system-specific prioritisation, it demonstrates how coordinated governance, policy, and financing reforms can unlock capital and support progress to achieving SDG 6.

The effectiveness of these recommendations, however, depends fundamentally on leadership and political economy conditions. Progress is most evident where reforms are backed by a sustained political mandate, clear accountability, and coordination across government. This is reflected in the case studies presented in Appendix A2. Leadership plays a central role in initiating change, aligning incentives, and ensuring that reforms are maintained beyond electoral cycles.


Table 4.1 Summary of recommendations to close the water financing gap

Category	Recommendation	Type	Prioritisation by archetype
Data and information 	<b>Strengthen data, planning, and monitoring systems</b> , facilitating the consistent collection of high-quality, standardised data across utilities and basin organisations.	<b>Foundational</b>	A priority across all archetypes, with different emphasis depending on water system characteristics. <b>Archetype 1:</b> asset condition and lifecycle data to support renewal and resilience planning. <b>Archetype 2:</b> improve operational and commercial data (NRW, billing, informal mapping) as a core bankability constraint. <b>Archetype 3:</b> establish basic functionality and equity monitoring to direct scarce funding. <b>Archetype 4:</b> standardised portfolio reporting to build track record.
	<b>Strengthen data sharing and interoperability</b> by encouraging data exchange (at basin-level, cross-border and across agencies), clarifying institutional mandates for data sharing, and enabling benchmarking of standardised data across jurisdictions.	<b>Accelerating</b>	Relevant across all archetypes, especially where coordination failures undermine planning. This is particularly important in <b>archetype 1</b> (multi-agency silos) and <b>archetype 2</b> (municipal/national fragmentation and informal providers). It also supports benchmarking and basin coordination in <b>archetypes 3 and 4</b> .
	<b>Strengthen knowledge exchange and market understanding</b> by ensuring institutions have the capacity to leverage data in decision-making, establishing frameworks for better exchange of technical expertise between stakeholders, and improving society's understanding of the sector through education.	<b>Accelerating</b>	Cross-cutting but most impactful where reform depends on understanding real service delivery dynamics—often <b>archetype 2</b> and parts of <b>archetypes 3 and 4</b> . In <b>archetype 1</b> , supports legitimacy for resilience and tariff reform.

Category	Recommendation	Type	Prioritisation by archetype
Regulation and governance 	<b>Develop a consensus of investment needs between government, providers, and consumers</b> by developing national water investment plans, integrated project pipelines and a structured approach to blended finance to meet long-term sector-specific objectives.	<b>Foundational</b>	Relevant across all archetypes. Most urgent where funding exists but delivery is siloed—often <b>archetype 1</b> , but also high-leverage in <b>archetype 2</b> (rapid growth) and <b>archetype 4</b> (aligning aggregation, transfers and basin priorities). In <b>archetype 3</b> , can be relevant where integrated pathways enable aggregation models and predictable support for dispersed rural services.
	<b>Ensure the water system has an appropriate institutional architecture</b> that provides clear responsibilities and powers across public institutions and regulators, clarifying responsibilities and accountability mechanisms.	<b>Foundational</b>	Priority where overlapping mandates create uncertainty—common in <b>archetype 1</b> (complex regimes) and in <b>archetype 2</b> (split municipal/national authority). Also relevant in evolving <b>archetype 4</b> frameworks.
	<b>Coherent governance must be matched by institutional capacity</b> across technical, financial and managerial functions.	<b>Foundational</b>	Most critical in <b>archetypes 2 and 4</b> , where project preparation, financial structuring and regulatory enforcement constrain bankability. In <b>archetype 3</b> , focus is on operational and delegated support capacity. In <b>archetype 1</b> , capacity matters for complex resilience programmes.
	<b>Follow core principles of effective water regulation, including independence from government</b> , to provide clear mandates for institutions, transparent processes, efficiency-promoting incentives and sustainable investment for asset maintenance and expansion.	<b>Foundational</b>	Most relevant in <b>archetypes 2 and 4</b> where regulation is emerging or stabilising. Also important in <b>archetype 1</b> where regimes may need rebalancing toward long-term asset health and resilience. Less directly applicable in <b>archetype 3</b> .
<b>Strengthening regulation to reduce risk and mobilise investment</b> by allocating risks transparently and proportionately, incentivising responsible behaviour and striking an appropriate balance between consumer affordability and investment adequacy.	<b>Foundational</b>	Most relevant in <b>archetypes 2 and 4</b> , and in <b>archetype 1</b> where existing regulation may deter long-term investment. In <b>archetype 3</b> , investor-risk reduction typically depends on sovereign/DFI backing or aggregation.	

Category	Recommendation	Type	Prioritisation by archetype
Regulation and governance continued	<b>Strengthen basin-level governance</b> by establishing legally binding basin-scale allocation frameworks, defining clear accountability, embedding climate-risk scenarios into basin plans and empowering river-basin organisations through defined mandates and decision-making authority.	Developmental	Relevant across all archetypes; urgency depends on basin pressure rather than archetype. Critical in <b>archetypes 1 and 2</b> for managing trade-offs and climate risk, in <b>archetype 4</b> for coordinated allocation, and in <b>archetype 3</b> for clarifying roles and safeguarding resources.
	<b>Implement mechanisms to incentivise efficient water, sanitation and hygiene (WASH)</b> provision such as multi-year tariff settlements, efficiency-sharing mechanisms, innovation allowances and performance incentives, and enabling benchmarking and transparency.	Developmental	Most applicable in regulated and aggregated systems—typically <b>archetypes 2 and 4</b> , and mature <b>archetype 1</b> systems. In <b>archetype 3</b> , applies indirectly through performance-based grants and aggregation models.
	<b>Embed stakeholder engagement and inclusion</b> through structured approaches involving civil society, communities and private actors, embedding equity and social inclusion criteria in investment appraisal, and promoting efficiency across user groups to strengthen long-term sustainability.	Accelerating	Relevant across all archetypes. In <b>archetypes 2 and 3</b> , builds buy-in for service models, formalisation and basic tariffs. In <b>archetype 4</b> , supports subsidy and metering reforms. In <b>archetype 1</b> , strengthens legitimacy for resilience investment and tariff adjustment.
	<b>Integrate long-term climate resilience</b> by incorporating climate scenarios into infrastructure planning, supporting resilience-enhancing technologies, employing nature-based solutions and considering the full economic value of water (and costs of water scarcity).	Accelerating	Important across all archetypes. <b>Archetype 3</b> : integrate resilience into basic design. <b>Archetypes 2 and 4</b> : standardise climate screening in project preparation. <b>Archetype 1</b> : embed long-term modelling in regulatory settlements and major capital expenditure decisions.
	<b>Incorporate uncertainty into planning</b> by designing investments that remain robust under changing conditions, and using adaptive, long-term approaches that explore a range of plausible futures and incorporate identification of key risks and opportunities.	Accelerating	Important across all archetypes, but relevance varies by system context. <b>Archetypes 1, 2 and 4</b> : utilise flexible, scenario-based planning for managing long-term risk in major projects. In <b>archetype 3</b> , small scale infrastructure may be designed to remain robust under changing conditions.

Category	Recommendation	Type	Prioritisation by archetype
Funding 	<b>Establish stable income streams to provide adequate and predictable sector funding for water and wastewater service</b> through a combination of cost-reflective tariffs, targeted and predictable subsidies, and robust economic regulation, supported by measures to improve revenue collection and public acceptance.	Foundational	Fundamental across all archetypes. Binding in <b>archetypes 3 and 4</b> and parts of <b>archetype 2</b> where revenues are unstable. In <b>archetype 1</b> , the issue is political/regulatory willingness to fund lifecycle renewal and resilience.
	<b>Deploy targeted and equitable subsidy mechanisms</b> including lifeline tariffs and targeted social protection, and cross-subsidisation where required (such as urban-rural or industrial-domestic).	Developmental	Most relevant in <b>archetypes 2 and 4</b> , where affordability constrains cost recovery. In <b>archetype 3</b> , subsidies are often required for both capital expenditure and ongoing O&M.
	<b>Use public funding strategically and efficiently</b> through multi-year capital planning frameworks and aligning funding commitments with project pipeline.	Developmental	Important across all archetypes, especially <b>archetypes 2–4</b> where public transfers are material. In <b>archetype 1</b> , strategic public support is key for public-good resilience and to avoid crowding out efficient private finance.
	<b>Ensure water pricing reflects its full economic value</b> , incorporating externalities related to public health, ecosystem protection, flood mitigation and climate resilience.	Accelerating	Relevant across archetypes but most actionable in <b>archetype 1</b> and more mature <b>archetype 2</b> systems (and sometimes <b>archetype 4</b> via bulk pricing). Secondary in <b>archetype 3</b> , where basic funding stability is the priority.

Category	Recommendation	Type	Prioritisation by archetype
Financing 	<b>Deploy risk mitigation and de-risking instruments</b> such as partial credit and risk guarantees, political risk insurance, contractual risk-sharing mechanisms and viability gap funding.	Foundational	Most appropriate in near-bankable <b>archetypes 2 and 4</b> , and selectively in <b>archetype 1</b> for complex or first-of-a-kind investments. In <b>archetype 3</b> , generally only viable through portfolio or sovereign-backed approaches.
	<b>Use blended finance strategically</b> to crowd in private investment by addressing viability gaps and improving risk allocation.	Developmental	Most appropriate in <b>archetypes 2 and 4</b> , where systems are aggregated but revenues remain thin. May apply selectively in <b>archetype 1</b> for public-good resilience investments. Limited relevance in <b>archetype 3</b> unless aggregation is underway.
	<b>Leverage climate and thematic finance</b> by considering instruments such as green, blue and resilience bonds, and taking supportive action such as aligning water investments with national climate strategies and, where necessary, monitoring and reporting frameworks.	Accelerating	Most relevant in financially stable systems seeking long-tenor capital—typically <b>archetype 1</b> , and mature <b>archetypes 2 and 4</b> (often via national/DFI facilities).
	<b>Encourage innovative financing mechanisms</b> through regulatory clarity, pipeline development, co-financing, and capacity building, to support the potential use of instruments such as debt-for-nature swaps, microfinance models, resilience-linked bonds and public-private partnerships (PPPs).	Accelerating	Most relevant in <b>archetypes 2, 3 and 4</b> , where traditional finance struggles (e.g. microfinance, portfolio models, debt-for-nature). In <b>archetype 1</b> , innovation often focuses on adapting regulatory and thematic instruments for resilience investment.

Note: Foundational recommendations are core to closing the financing gap, and should be implemented by all water systems. Developmental recommendations are focused on improving the offering and performance of water providers. Most water systems should look to implement these. Accelerating recommendations will catalyse the achievement of SDG 6 goals, however, SDG 6 goals can be achieved without fully implementing these recommendations.



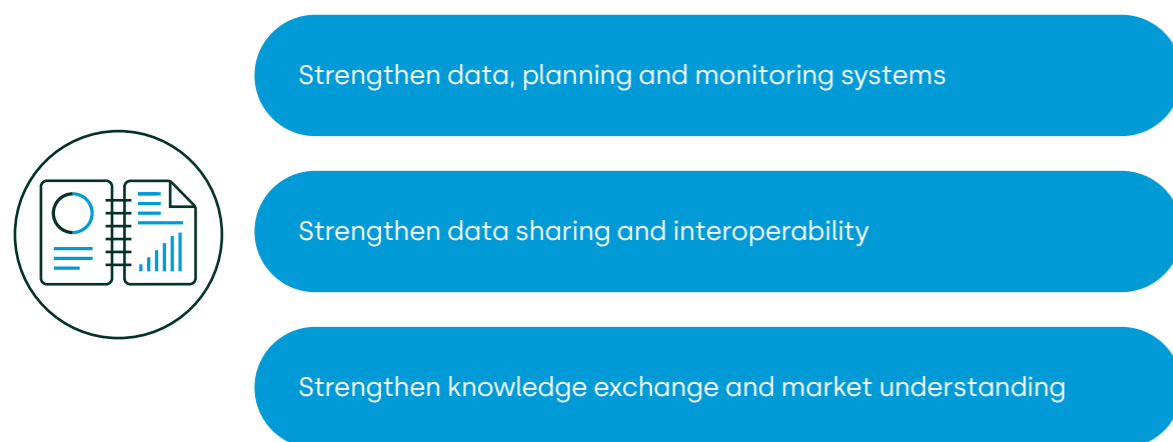
The cross-cutting recommendations are organised around the four barriers identified in Section 3:

- Data and information;
- Regulation and governance;
- Funding;
- Financing.

#### 4.1 Recommendations relating to data and information

Robust data and information systems are a key enabler of an effective NWS. Consistent data on infrastructure condition, network development, service performance, hydrology, climate exposure, and financial flows allows governments to identify investment needs and prioritise investment effectively. At the same time, such data allows regulators to better assess performance, and investors to assess and price risk more accurately.<sup>37</sup> NWS recommendations with respect to data and information are summarised in the figure below.

Figure 4.1  
Data and informational  
recommendations



Source: Oxera

<sup>37</sup> World Bank (2024), 'Funding a water-secure future: an assessment of global public spending', p. 25.

#### 4.1.1 Strengthen data, planning, and monitoring systems

Governments should consider mandating the consistent collection of high-quality, standardised data across utilities and basin organisations. This could include information on a range of data types, such as those listed below.

Relating to basin organisations:

- Hydrological and climate risk data
- Agriculture and industrial water-use reporting relating to utilities
- Operational and commercial indicators, including NRW, billing efficiency and collection rate
- Disaggregated service data, including low-income, marginalised and indigenous communities

Standardisation enables benchmarking across regions and utilities, supports performance monitoring over time, and improves the allocation of public resources. It also provides the transparency required for private investors to evaluate risk and return profiles.

In dispersed rural contexts in archetype 3 and 4 systems, limited visibility over functionality, service quality and equity outcomes constrains decision-making and undermines investor confidence. Improved monitoring, including asset inventories, performance indicators and digital reporting, can help identify priority investments and support lifecycle management.<sup>38</sup> Better data also enables more transparent allocation of public funding, reduces perceived risk for funders and supports a gradual shift from grant dependence toward more structured financing approaches.

#### 4.1.2 Strengthen data sharing and interoperability

In developing NWS, governments should consider the benefits of establishing frameworks that:

- Clarify institutional mandates for data sharing
- Promote interoperability across agencies
- Encourage basin-level and cross-border data exchange
- Enable benchmarking across jurisdictions

Improved methodological consistency supports evidence-based decision-making, strengthens accountability and facilitates identification of best practices. In addition, data-sharing initiatives may provide practical models for improving interoperability and access to standardised data. For example, the open platform Stream, developed by UK water companies in collaboration with industry and civil society partners, provides shared infrastructure for publishing and accessing water data across the sector.<sup>39</sup>

<sup>38</sup> For further discussion on investments in data and monitoring efforts in rural Nepal (archetype 3), see Appendix A2.3.

<sup>39</sup> Stream (2025), 'About Stream', May.

#### 4.1.3 Strengthen knowledge exchange and market understanding

Data collection and standardisation are necessary but may not be sufficient. An NWS should also consider whether institutions have the capacity to interpret, analyse and apply data in decision-making. Without this capability, even high-quality datasets will not translate into improved project preparation, climate-resilient planning, or effective policy design. Governments may consider establishing frameworks to enable better exchange of technical expertise between utilities, basin authorities, regulators, scientists and policymakers. In addition, knowledge exchange through education programmes and awareness campaigns<sup>40</sup> can improve people's understanding of the true value of water and may lead to stronger willingness to pay for services and increased water conservation.

Reform should be grounded in a realistic understanding of how water systems operate in practice. Formal utilities frequently coexist with informal vendors, small-scale private operators, community-managed systems and industrial self-supply. Where these actors are poorly understood or excluded from analysis, regulatory and financing interventions risk being misaligned with actual service delivery dynamics.

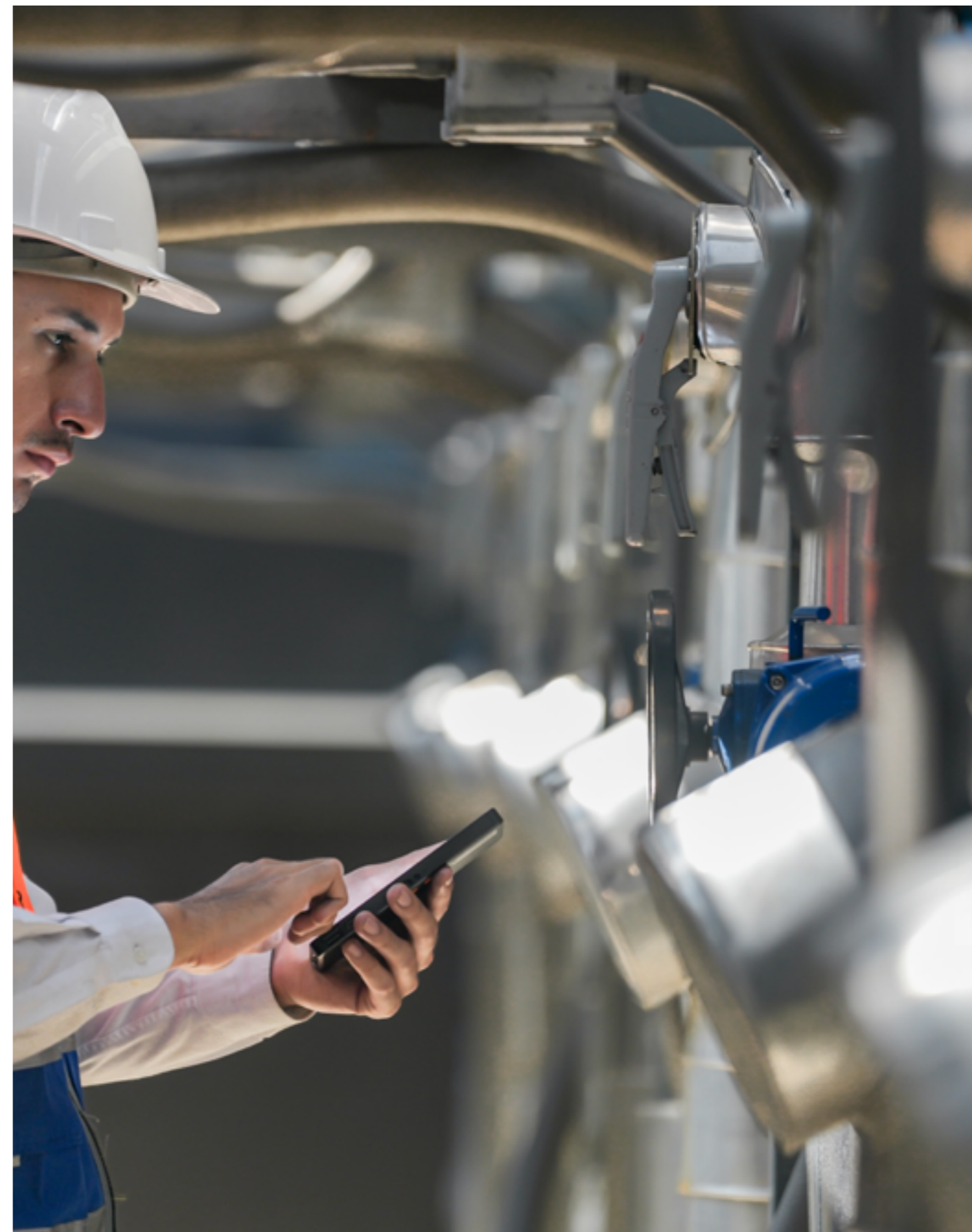
Potential elements of an NWS in this area could include:

- Mapping formal and informal service provision
- Analysing cost structures, pricing dynamics, consumer coping strategies and consumer willingness to pay
- Assessing institutional incentives and regulatory enforcement capacity
- Building technical capacity to integrate hydrological, financial and climate data into planning
- Establishing peer-learning platforms and partnerships with academic and scientific institutions

Using data to bridge the gap between market realities and policy design is essential.

A range of tools can support practitioners in converting data and information into actionable insights and informed decision-making across diverse water systems.

<sup>40</sup> For example, see PUB (2024), 'Schools', June; and Dixit, K. (2025), 'Ganga cleanliness and conservation added to CBSE academic curriculum', 'The Times of India', 8 June.



## Examples of tools practitioners can use when overcoming data and informational barriers



- Market mapping frameworks:**  
 Structured approaches to identify key actors, water source type (i.e. where water supply is delivered), flows of capital, and gaps in the water sector value chain (for example, work by the Resilient Water Accelerator to develop a framework for municipal water market assessment that considers both formal and informal provision).<sup>41</sup>
- Financial (modelling) templates:**  
 Standardised tools that structure and aggregate financial and operational data to demonstrate creditworthiness and investment potential (for example, Water.org working with Cambodian private water operators to aggregate financial and operational data and develop business plans to present to banks).<sup>42</sup>
- Climate risk screening tools:**  
 Assessment tools to identify and prioritise climate-related risks affecting water investments, such as the Climate and Disaster Risk Screening Tools from the World Bank.<sup>43</sup>
- Utility benchmarking platforms:**  
 Systems that use standardised KPIs, management practice indicators and tariff data to compare utility performance and identify gaps, such as the International Benchmarking Network for Water and Sanitation Utilities (IBNET).<sup>44</sup>
- Management information systems:**  
 Platforms that facilitate the collection and use of data on water sector investments, infrastructure, and service delivery to track performance and support planning and accountability (such as the development of the National Water Supply, Sanitation and Hygiene (NWASH) system in Nepal,<sup>45</sup> used to collect local-level data on water and sanitation and support the development of financial plans).

Source: Oxera

<sup>41</sup> Resilient Water Accelerator and Athena Infonomics (2025), 'From Projects to Markets: A framework for municipal water market assessment', December.

<sup>42</sup> Water.org, 'The family business of water supply'.

<sup>43</sup> The World Bank, 'Climate and Disaster Risk Screening Tools'.

<sup>44</sup> International Benchmarking Network for Water and Sanitation Utilities, 'Use Data'.

<sup>45</sup> Ministry of Water Supply (2026), 'National WASH Data Collection Status'.

## 4.2 Recommendations relating to regulation and governance

The regulatory and governance landscape plays a central role in determining the investability and long-term sustainability of the water sector. Political processes and regulatory systems can either mitigate or amplify underlying investment risk. This section presents NWS policy recommendations for strengthening coordination and governance within the water sector to enable sustainable investment. It identifies the institutional and regulatory foundations required to create an enabling environment for investment in SDG 6. The discussion is structured around three interdependent pillars, as shown in the figure below.

Figure 4.2  
Regulatory and governance  
recommendations



### Address fragmentation and clarify institutional roles

- Establish integrated national investment pathways
- Address regulatory fragmentation
- Strengthen basin-level governance
- Establish stakeholder engagement and social inclusion
- Integrate long-term climate resilience

### Strengthen institutional capacity and project preparation

- Coherent governance must be matched by institutional capacity
- Incorporate uncertainty into planning

### Ensure stable and independent regulation

- Follow core principles of effective regulation, including independence from government
- Implement mechanisms to incentivise efficiency
- Incentivise investment while reducing unnecessary risk to investors

Source: Oxera

It is worth noting that implementing the recommendations outlined in this paper requires significant and sustained support and championing from politicians and governments. NWS must, by their nature, be underpinned by long-term political thinking, given the disconnect between when investment is undertaken and when consumers experience the benefits (as well as the payback period on capital investment). Furthermore, the centrality of water to people's lives and livelihoods means that reforming the way a water system operates requires significant political capital and leadership. Many of the recommendations outlined here may be politically difficult to achieve, particularly with regard to changing roles of private and public organisations, and the need to ensure adequate funding for a sustainable water sector with potential tariff increases.

The issue of ensuring effective leadership should be considered by governments, water providers, regulators and investors. These four groups should work together to implement the necessary recommendations and create the conditions that enable progress towards SDG 6. The social and economic benefits of water sector investment should be communicated effectively to build support for this. Underpinning this is a corresponding need for sufficient accountability, ensuring that funds are spent well and promises are delivered, as well as sufficient engagement with communities.

#### 4.2.1 Develop a consensus of investment needs between government, providers, and consumers

Water investments frequently generate gains across WASH, water resources management, agriculture, industry, ecosystems and climate resilience.

An NWS will ideally, therefore, establish coherent national investment pathways that integrate all aspects of water management and align them with broader development priorities. This requires:

- National water investment plans translating strategic objectives into sequenced, costed and prioritised programmes.
- Integrated project pipelines spanning WASH, water resources management and climate resilience to capture co-benefits and avoid siloed delivery.
- Strong project preparation facilities providing technical, legal and financial structuring support to improve bankability.
- A structured approach to blended finance clarifying how concessional and public support will be used strategically to mobilise private capital.

As part of developing these investment pathways, governments can champion investment in the water sector as a high-impact use of funds. In addition to delivering social benefits such as universal WASH access, water investments can support broader economic growth through delivering a wide range of societal and economic benefits,<sup>46</sup> while reducing negative environmental impacts and strengthening resilience to climate change.<sup>47</sup> Governments may consider how the impactful nature of water investments can be communicated to attract finance to the sector.

As part of this process, independent economic regulators can play a critical role in supporting transparency, building trust among stakeholders, and providing assurance on tariff setting and service standards, thereby underpinning the credibility of investment plans and financing strategies.

In practice, building and sustaining this consensus requires active political leadership to align stakeholders, manage trade-offs, and maintain momentum over time, particularly where reforms involve tariff changes, subsidy reform or reallocation of public resources.

Examples of integrated national planning approaches include the following.

- Kenya, where the National Water Supply and Sanitation Investment Program (NAWASIP) has been developed, whose goal consists of achieving universal access to WASH by 2030. This represents a central planning framework with both urban and rural components.<sup>48</sup> The government has also recognised improving creditworthiness as a key pillar for closing the financing gap.<sup>49</sup>
- Colombia's national development bank, FINDETER, which shows how integrated planning can be operationalised through city-level action plans and blended finance with the Inter-American Development Bank.<sup>50</sup> In Bucaramanga, for example, this supported a multi-sector package of water and mobility investments.<sup>51</sup>

<sup>46</sup> For example, the World Economic Forum highlights the high economic multipliers associated with water infrastructure investments, representing a strategic opportunity to generate long-term value for society. See World Economic Forum (2026), ['Why water is the catalyst for the next wave of global growth'](#), 14 January.

<sup>47</sup> Water Europe (2024), ['Socio-economic Study on the Value of the EU Investing in Water'](#), October.

<sup>48</sup> The World Bank (2023), ['Kenya Water, Sanitation and Hygiene Program \(P179012\)'](#), 9 January.

<sup>49</sup> Ndungu, P. (2024), ['In Kenya, enhancing creditworthiness is key to bridging the water sector financing gap'](#), World Bank Blogs, 31 October.

<sup>50</sup> GIZ (2025), ['Cities fit for climate change'](#), p. 51.

<sup>51</sup> Juan, E. (2014), ['National to City, Diagnosis to Funding'](#), *Americas Quarterly*, 17 January.

#### 4.2.2 Ensure the water system has an appropriate institutional architecture

Optimal governance systems define clear responsibilities and powers across public institutions and regulators, such that there is clarity over who is responsible and accountable for decision-making. Regulatory fragmentation, arising from overlapping mandates and inconsistent regimes, can obscure accountability and create confusion. Even in advanced systems such as the UK, where private investment and universal service coverage have been achieved, regulatory complexity can weaken strategic oversight and hinder long-term planning. The Independent Water Commission's review of England and Wales identified significant challenges arising from fragmented institutional arrangements and made a series of recommendations aimed at promoting joined-up, systems-level thinking (see the box below).<sup>52</sup>

##### Box 4.1 Insights from the UK experience



The Cunliffe Review concluded that existing institutional arrangements have resulted in a fragmented and overly complex regulatory landscape, obscuring accountability and weakening strategic oversight. Multiple regulators and planning frameworks have created duplication, blurred responsibilities and reduced coherence in long-term investment decision-making.

To address this, the review recommended:

- Clearer strategic direction from government through the development of NWS for England and Wales, supported by a Ministerial Statement of Water Industry Priorities
- The creation of independent regional system planners aligned with River Basin Districts to translate national objectives into locally grounded plans
- The rationalisation of strategic planning frameworks from nine to two to streamline long-term investment planning
- The consolidation of economic, drinking water quality and environmental regulatory functions into a single integrated regulatory body for England to strengthen coordination and accountability

Source: Independent Water Commission (2025), 'Final Report', 21 July, p. 157.

Other archetype 1 systems have successfully addressed institutional fragmentation, including Singapore, under its Public Utilities Board (PUB). Since 2001, sewerage, drainage, and water resource management has been undertaken within one institution, enabling planning across multiple different objectives (i.e. desalination, drinking water treatment, and wastewater recycling). Holistic management of this system has meant that Singapore has been able to reduce unaccounted for water, similar to NRW, to 4.5% of total water production, among the lowest rates of any water system.<sup>53</sup>

This issue is also important for archetype 3 and 4 systems. In addressing regulatory fragmentation, governments can also clarify the institutional roles of different authorities (providers, investors, and regulators). This can help establish responsibility for funding, asset ownership, and service delivery. This process can also involve working with existing systems and providers, which may not be formalised, to integrate them into regulated systems. Such an approach can be less costly than setting up water systems from scratch (though it can nonetheless be complex).

To avoid similar fragmentation challenges, governments might aim to:

- Rationalise regulatory frameworks by consolidating or clearly delineating responsibilities across economic, environmental and quality regulators.
- Clarify institutional roles and decision-making authority to ensure coherent delivery of water policy objectives.
- Establish coordination mechanisms where multiple regulators are necessary, such as joint planning requirements or statutory consultation processes.
- Provide clear direction, in terms of priorities for the sector, through NWS.

#### 4.2.3 Coherent governance must be matched by institutional capacity

Weak absorptive capacity and poor project preparation remain major constraints on SDG 6 progress and sector investability.<sup>54</sup> Even where financing is available, many utilities and government agencies lack the technical, financial and managerial capabilities to develop bankable projects, manage contracts and deliver services efficiently.

The need to expand institutional capacity focused on project preparation is particularly acute in archetype 2 systems, which urgently need to expand their networks. This need is further exacerbated by systems particularly affected by climate change, which require additional skillsets in project development. Improved institutional capacity allows projects to be developed faster, expanding the scope for investment.

<sup>52</sup> See Oxera (2025), 'The Independent Water Commission—implications for regulation: initial reflections', July.

<sup>53</sup> Tortajada, C. (2007), 'Water Management in Singapore', ETHOS, 2, April.

<sup>54</sup> Weak absorptive capacity refers to the inability to efficiently utilise, manage, and implement available funds, even when capital is present.



To address these barriers, governments may consider:

- Investing in capacity building at national, regional and local levels, including financial management, data governance and partnership development. This should encompass both technical skills and institutional processes.
- Developing sequenced, transparent and prioritised project pipelines linked to basin and national strategies. Pipelines should identify projects at different stages of preparation, enabling investors to understand the forward flow of opportunities.
- Strengthening project preparation processes to improve technical quality, financial structuring and risk allocation, thereby reducing investor risk and enhancing bankability.

Tools and mechanisms that could support project preparation are captured below.



#### Examples of tools and mechanisms to support project preparation

- **Project preparation facilities (PPFs):** Provide funding or technical support for feasibility studies, environmental/social assessments, financial modelling, and legal structuring (such as World Bank Global Infrastructure Facility (GIF) and Africa50).<sup>55</sup>
- **Standardised development frameworks:** Offer structured guidance for project appraisal and stakeholder engagement (for example, World Bank PPP Reference Guide<sup>56</sup> and OECD Water Governance Principles).<sup>57</sup>
- **PPP support platforms:** Provide guidance, networking, and resources to help water utilities and governments develop PPP projects and enhance investment readiness (such as the Water and Wastewater PPP Hub, powered by AquaFed).<sup>58</sup>

Source: Oxera.

<sup>55</sup> World Bank Group, 'Financial Intermediary Funds (FIFs)', and Cities Climate Finance Leadership Alliance, 'Africa50 Project Development'.

<sup>56</sup> World Bank Group, 'PPP Reference Guide'

<sup>57</sup> OECD (2015), 'OECD Principles on Water Governance', 11 May.

<sup>58</sup> The Water and Wastewater Hub provides a consolidated collection of selected resources and tools from a range of trusted sources to deliver guidance and practical methodologies for the successful development of PPPs. See Water PPP Hub, 'The trusted federation advancing water PPPs globally'.

#### 4.2.4 Follow core principles of effective water regulation, including independence from government

Where private finance is utilised in the provision of water and sanitation services, regulation can play an important role in aligning private incentives with public policy objectives—for example, in balancing customer affordability, financial sustainability and environmental objectives.

Effective regulatory frameworks typically combine strong institutions with clear mandates, transparent processes, capacity-building, and incentives that promote efficiency, resilience, and sustainable investment. These principles are likely to be applicable across all archetypes, though for some, such as archetype 2 and 4 systems with maturing institutions, it will be both more achievable and yield more immediate benefits.

In terms of the design of regulatory frameworks, NWS may seek to:

- **Provide clear mandates and transparent tariff-setting processes** that balance cost recovery with affordability, ensuring that tariff methodologies are predictable, evidence-based and subject to stakeholder consultation.
- **Ensure policy stability and regulatory independence**, reducing political interference and revenue uncertainty. Independent regulators with statutory authority and secure funding are better able to resist short-term political pressures and maintain credible long-term frameworks.<sup>59</sup>
- **Incentivise operational efficiency through benchmarking**, performance targets and outcome-based regulation. Comparative performance assessment—i.e. comparing utilities within or across countries—can drive improvements by identifying best practices and underperformance.
- **Support appropriate asset maintenance and long-term investment**, ensuring decisions are framed against long-term objectives, and avoid regulatory frameworks that inadvertently encourage short-term cost reductions at the expense of system resilience.
- **Allocate risks transparently and proportionately**, to allow investors (and other stakeholders) to understand who carries which risks, how risks are priced and how they are mitigated.

<sup>59</sup> This can be an issue across all systems, regardless of archetype. However, by definition, those systems with proven track records of regulatory independence often face lower regulatory risks. Independence can be signalled through government policies, which take decision-making power away from day-to-day government control, instead being directed by long-term strategies and priorities. An example of this, for an archetype 2 system, is Brazil, which has implemented standardised regulation across its jurisdictions at the federal level. IWA (2024), 'The New Legal Framework for Water and Sanitation Services in Brazil and the Standardised Guidelines', April.

#### 4.2.5 Strengthening regulation to reduce risk and mobilise investment

Even established regulatory frameworks may inadvertently disincentivise necessary investment, undermining long-term financial sustainability and sector performance.

For example, in the UK, there are concerns over whether the regulatory framework has contributed to underinvestment in asset maintenance and replacement.<sup>60</sup> Evidence shows there has been a disconnect between the growing value of the asset base and funding to maintain it.<sup>61</sup> This issue is partially due to a lack of data on asset condition, which has made assessing and targeting the scale of required investment difficult.<sup>62</sup>

This experience underscores the importance of regulatory design that balances affordability with appropriate incentives for capital maintenance.

Water sector institutions and investors face a broad range of risks, including operational challenges, climate and hydrological variability, and pollution from external sources (such as agricultural runoff) over which they have limited control. Governments and regulators might therefore seek to implement measures that:

- **Strike an appropriate balance** between consumer affordability and investment adequacy, avoiding regulatory frameworks that inadvertently encourage underinvestment.
- **Allocate risks transparently and proportionately**, ensuring that investors and service users understand who carries which risks, how they are priced, and how they are mitigated.
- **Incentivise responsible behaviour** without imposing disproportionate burdens on water companies and investors that could deter capital deployment.

<sup>60</sup> Independent Water Commission (2025), 'Final report', July.

<sup>61</sup> Oxera (2025), 'A new approach to performance and supervision in the England and Wales water sector', prepared for Water UK, April, Figure 2.1.

<sup>62</sup> It is worth noting, however, that Ofwat and water companies in England and Wales have made significant progress on this in recent years, and Ofwat has prioritised developing the understanding of the asset base to support this. Source: Ofwat (2025), 'Enhancing asset health understanding update paper', June.

#### 4.2.6 Strengthen basin-level governance

Basin-scale governance is essential to balance competing uses, internalise externalities and support long-term resilience. Coordinated basin planning can also enable cross-subsidisation and unlock investment in projects with strong net social benefits but limited standalone financial viability.

Most countries lack enforceable water allocation rules, empowered basin authorities, environmental flow requirements and cross-sector coordination. To close this gap, governments and relevant authorities could consider the merits of putting in place the following:

- Legally binding basin-scale allocation frameworks: clear allocation rules can balance competing water uses, reduce conflict and provide long-term certainty for investment decisions.
- Empowered river-basin organisations: basin authorities should have defined mandates, technical capacity and decision-making authority to coordinate across sectors and implement basin plans effectively.
- Establish clear accountability: responsibilities for planning, funding decisions, and delivery obligations across government, regulators and water companies should be transparent and enforceable.
- Climate-risk scenarios embedded in basin plans: integrating climate projections into planning helps ensure infrastructure and water allocations remain viable under changing hydrological conditions.
- Performance-linked finance for compliance: linking funding or concessional finance to adherence with basin plans can incentivise coordinated management and strengthen accountability across institutions.

Examples of successful basin-level management are captured in the box below.



#### Box 4.2 Examples of successful basin-level management

**Australia's Murray–Darling Basin Plan** provides a model for legally binding basin-scale management. Established in 2012, the Plan sets limits on how much water can be used for irrigation, drinking water, and industry to ensure the long-term health of the environment. A key feature is the requirement for all Murray–Darling Basin states to prepare water resource plans that set out how they will comply with the sustainable diversion limits. The plans improve consistency and transparency in water resource management.<sup>63</sup>

**South Africa's National Water Act (1998)** embeds the concept of an ecological reserve, the quantity and quality of water required to protect aquatic ecosystems and basic human needs, as a legal priority in water allocation. River-basin management agencies are empowered to implement catchment management strategies that balance sectoral demands while protecting environmental flows.<sup>64</sup>

**Water Resources East (England)** demonstrates regional coordination. This multi-stakeholder partnership brings together water companies, agricultural interests, environmental regulators and local authorities across eastern England to develop long-term water resource management plans. The collaborative approach has enabled investment in new infrastructure, including inter-basin transfers and reservoir development, by identifying shared benefits and coordinating funding across sectors.<sup>65</sup>

Source: Oxera.

#### 4.2.7 Implement mechanisms to incentivise efficient WASH provision

Where appropriate, mechanisms such as multi-year tariff settlements, efficiency-sharing arrangements, innovation incentives and risk-sharing structures can strengthen financial sustainability while protecting consumers. These include:

- **Multi-year tariff settlements:** Setting tariffs over a fixed regulatory period (typically three to seven years) provides revenue certainty while incentivising utilities to reduce costs and improve performance. Efficiency gains achieved within the settlement period can be retained by the utility before being passed on to consumers in future reviews, creating a dynamic incentive for continuous improvement.

<sup>63</sup> Department for Energy Environment and Climate Action, 'What is the Murray-Darling Basin Plan?'

<sup>64</sup> Department of Water Affairs and Forestry, 'Guide to the national water act'.

<sup>65</sup> Water Resources East (2023), 'Regional water resource plan for Eastern England', December.

- **Efficiency-sharing schemes:** These arrangements allow utilities to share a portion of efficiency savings with customers, balancing incentives by encouraging cost reductions while ensuring that consumers benefit from improved performance over time.
- **Innovation allowances and performance incentives:** Regulatory mechanisms that allow utilities to retain part of the gains from efficiency improvements—such as reductions in NRW, energy use or operational costs—can drive innovation and continuous improvement. Complementary funding mechanisms can also support innovation; for example, the Ofwat Innovation Fund supports collaborative projects that address sector-wide challenges.<sup>66</sup>
- **Benchmarking and transparency:** Publishing comparative performance data creates reputational incentives and enables stakeholders to hold utilities accountable. Examples include Chile's water utility benchmarking system and the IBNET.

Regulatory regimes should incentivise efficiency across water-sector institutions, recognising that improved operational performance can act as an untapped first source of finance by freeing up resources that would otherwise be lost to inefficiencies. Regulators can encourage efficiency through performance-based incentives, benchmarking and transparency requirements, and outcome-focused regulatory frameworks that reward cost savings and service improvements rather than input levels, and efficiency targets (for example, reductions in NRW or energy use).

This issue is particularly relevant for systems facing constrained budgets where there are good levels of institutional capacity, such as archetype 1 and 2 systems. However, it also remains relevant to archetype 3 and 4 systems, which are looking to establish a track record of good performance to attract commercial financing. Furthermore, this recommendation can be supported in archetype 3 systems that can be aggregated and professionalised, taking advantage of economies of scale and thus becoming more efficient.

#### 4.2.8 Embed stakeholder engagement and social inclusion

Investability depends not only on financial metrics but also on political and social legitimacy. Early and structured stakeholder engagement can reduce resistance to infrastructure projects and tariff reforms, shorten lead times, increase certainty for investors and enhance project design (for example, by sharing community based knowledge and insights).

Governments may consider taking steps to:

- Institutionalise structured stakeholder engagement across civil society, communities and private actors, ensuring that affected populations have meaningful input into planning and decision-making processes.<sup>67</sup>
- Embed equity and social inclusion criteria in investment appraisal, including targeted subsidies, affordability safeguards and measurable inclusion indicators. Operational measures include adopting pro-poor financing models and integrating gender equality and indigenous rights considerations into project appraisal frameworks.
- Promote behavioural change and efficiency among households, agricultural and industrial users to strengthen long-term sustainability.<sup>68</sup>

Existing water systems that fall outside current regulatory frameworks, as in some archetype 3 and 4 systems, may need to be integrated. In many jurisdictions, informal local schemes, community-managed systems or traditional water markets operate but are not accounted for in policy design.<sup>69</sup> Bringing these systems into the regulatory fold, where appropriate, can improve service coverage, support equity objectives and strengthen overall sector coordination.

Improved stakeholder engagement also supports other recommendations by improving the political support for changes in the water system. As noted previously, implementing these recommendations is likely to require sustained championing by governments and politicians. Ensuring that stakeholder engagement and social inclusion are core to the way the sector operates can increase support for reforms and raise the profile of these issues.

<sup>67</sup> This can be facilitated through trusted relationships built by providing timely, informed and accessible opportunities for stakeholders to contribute, supported by transparent communication and feedback mechanisms to avoid tokenistic involvement.

<sup>68</sup> This can take the form of corporate water audits, community education initiatives (as implemented in Singapore through PUB's public engagement programmes) and the use of smart metering and digital tools to reduce water usage. Academic partners can support implementation science and behaviour change research to inform and build evidence-based practice to support this.

<sup>69</sup> Jeppesen, M. (2025), 'Concretizing the Right to Water: Engaging Infrastructurally Powerful Actors in Nairobi', *African Studies Review*, 68:2, pp. 252–72.

<sup>66</sup> Ofwat, 'Water Innovation Fund'.

#### 4.2.9 Integrate long-term climate resilience

Water investments are long-lived and exposed to climate uncertainty. Best-practice appraisal frameworks adopt forward-looking approaches that incorporate low-probability, high-impact risks such as drought and flooding. This requires strategic, scenario-based planning approaches to assess long-term risks and investment needs.

This approach has been demonstrated in the UK, where long-term water resource planning informed the National Infrastructure Commission's 'Preparing for a Drier Future',<sup>70 71</sup> highlighting the economic case for early investment in resilience.<sup>72</sup>

In this context, governments across all archetypes may consider:

- Integrating long-term climate scenarios into planning across all infrastructure sectors.
- Including consideration of the full value of water, including the economic, social and environmental costs of water scarcity or flooding and the impact of other sectors, when appraising water-related infrastructure.
- Supporting resilience-enhancing technologies, including diversified supply sources where appropriate.<sup>73 74</sup>
- Nature-based solutions such as wetlands and green urban infrastructure that enhance water quality and flood resilience.
- The appropriate charging mechanisms for climate-resilience water-related infrastructure, including consideration of tariffs, public sector funding, cross-subsidisation from other sectors or the use of green bonds (see Section 4.3 for further discussion of these funding and financing models).

<sup>70</sup> Water UK (2018), 'Water resources long term planning framework (2015-2065)', November.

<sup>71</sup> This initiative was supported by then DEFRA Water Minister, Rory Stewart, who played a key leadership role in encouraging companies to develop it.

<sup>72</sup> National Infrastructure Commission (2018), 'Preparing for a drier future', April.

<sup>73</sup> Adopting these technologies early may enable countries to leapfrog conventional system designs and build more diversified and climate-resilient water supply systems.

<sup>74</sup> For example, desalination powered by low-carbon energy can strengthen supply in water-scarce coastal areas, while low-cost point-of-use technologies such as membrane filtration offer alternatives where centralised systems are not viable. Sombei, D.C., Mecha, C.A. and Chollom, M.N. (2025), 'A Review of Low-Cost Point-of-Use Water Treatment Solutions Addressing Water Access and Quality in Resource-Limited Settings', *Water*, 17:12.

#### 4.2.10 Incorporate uncertainty into planning

Given the uncertainty associated with climate change, population shifts, evolving industrial demand, and changing agricultural patterns, there are benefits to moving planning beyond single, fixed forecasts.<sup>75</sup> Decision-makers should embrace adaptive, scenario-based approaches that explore a range of plausible futures, incorporate identification of key risks and opportunities, and design investments that can remain robust under changing conditions.

A prominent example of scenario-based, long-term water planning is the Dynamic Adaptive Policy Pathways (DAPP) approach, which aims to support developments of plans that are capable of dealing with deep uncertainty. These plans can incorporate 'Adaptation Tipping Points', reached when scenario-dependent external changes are significant enough to threaten the objectives of a policy. Plans can then be adapted to reflect emerging conditions.

Examples of the DAPP approach include:

- In Canberra, Australia, where adaptive planning was used to develop the existing Drought Management Plan, including the development of a suite of drought portfolio investments that incorporated future uncertainty and vulnerabilities.<sup>76</sup>
- In the Solomon Islands, where climate-resilient investments for solid waste management were developed through a plan that combined short-term actions with medium- to long-term options that could be pursued, dependent on which conditions emerged.<sup>77</sup>

Relatedly, by incorporating the needs of multiple sectors into planning processes, using multi-sector approaches allows water system planners to more effectively identify which types of investments are most likely to deliver effectively for a range of stakeholders within a catchment or region. An example of a multi-sector approach is the establishment of five regional water resource groups in the UK, which bring together stakeholders from across sectors to take a multi-sectoral view of how to address water shortages and best value solutions.

Archetype 2 systems in particular may benefit from incorporating uncertainty into planning. These systems face urgent and changing investment needs, and many additionally face pressures from climate-related risks. Incorporating an adaptive planning approach allows these systems to remain flexible to changing requirements, ensuring funds are used efficiently.

<sup>75</sup> Deltares, 'Dynamic Adaptive Policy Pathways'.

<sup>76</sup> Aurecon (2023), 'Rain, hail or shine: Adaptive planning for an uncertain world', 31 October.

<sup>77</sup> Development Asia (2023), 'A 5-Step Rapid Approach to Climate-Resilient Investment Planning', 23 May.



### 4.3 Recommendations relating to funding

Achieving SDG 6 requires both adequate funding and appropriate financing, which serve distinct but complementary functions within an NWS. Financing can only be mobilised sustainably where underlying funding streams are stable and predictable. An NWS must therefore operationalise reforms across both dimensions: strengthening funding foundations to ensure long-term financial sustainability, and enabling financing mechanisms to mobilise capital at scale.

Operationalising an NWS therefore requires governments to:

- Establish sustainable funding models that ensure cost recovery while protecting affordability.
- Create enabling conditions that attract and de-risk commercial and concessional finance.

This section outlines the reforms required to deliver these objectives in practice. It does this by first looking at strengthening funding foundations, followed by strategies to enable finance to scale. Practitioner tools are set out at the end of the section.

Figure 4.3  
Funding recommendations



Ensure adequate and predictable sector funding

Deploy targeted and equitable subsidy mechanisms

Use public funding strategically and efficiently

Ensure water pricing reflects its full economic value

Source: Oxera

#### 4.3.1 Establish stable income streams to provide adequate and predictable sector funding for water and wastewater service

Governments must ensure that water sector institutions receive adequate and stable funding through a combination of cost-reflective tariffs and targeted subsidies from taxation.<sup>78</sup>

Sufficient funding, derived from tariffs,<sup>79</sup> taxes and transfers, is essential not only for achieving SDG 6 outcomes directly, but as a prerequisite for attracting commercial and concessional finance. Funding must be reliable both at project initiation and throughout the asset lifecycle.

An NWS could therefore be used to:

- Facilitate the introduction of a robust and predictable system of independent economic regulation.
- Establish a clear pathway toward cost recovery, where feasible.

In many systems, tariffs do not cover full costs.<sup>80</sup> Moving toward cost-reflective tariffs reduces fiscal pressure and dependence on MDB and ODA transfers. However, tariff reform must be balanced against affordability constraints,<sup>81</sup> and practical challenges surrounding revenue collection may exist. Utilities may also benefit from effective processes to reduce arrears and non-payments, thereby strengthening revenue predictability.

In lower-income or rural areas, digitisation and innovative payment systems—such as mobile billing platforms or pre-paid meters<sup>82</sup>—can improve revenue collection by enabling smaller, more frequent payments and reducing administrative costs.

While digitisation and innovative payment systems may help improve revenue collection in lower-income or rural areas, in some higher-income systems, affordability may not be the primary barrier; political resistance and reputational concerns may nonetheless constrain tariff reform.<sup>83</sup> In such contexts, improved communication, performance transparency and independent regulation can support gradual tariff optimisation. This process may be driven by a robust, independent and predictable framework of economic regulation using multi-year price-setting frameworks.

In lower-income or high-inequality contexts, particularly in rural areas where costs are higher and incomes lower, tariffs alone may not achieve cost recovery. In these cases, targeted and predictable subsidy mechanisms are essential to ensure financial sustainability. This may include cross-subsidisation across user groups with differing willingness and ability to pay, to alleviate affordability concerns for poorer households where appropriate. This is particularly the case for archetype 4 systems.

Public communication should clearly explain the value of water services and the long-term costs of underinvestment, particularly where trust in the water sector is low despite tariffs remaining affordable for most households. Demand management and public education can also improve water-use efficiency and moderate bill increases.

Singapore provides an example: PUB has implemented tariff increases linked to full cost recovery alongside clear communication on water scarcity and infrastructure needs, while providing U-Save rebates and promoting conservation.<sup>84</sup> Where investments deliver broader public benefits, such as climate resilience, governments may also supplement tariffs with public funding or cross-subsidies from high-volume users to ensure predictable and credible revenue frameworks. Ensuring consumers are informed of the value of the water that is supplied is crucial in gaining public support for bill increases to maintain adequate levels of funding.

Where there is strong opposition to bill increases from households in relation to climate and resilience related investments, funding can be partially cross-subsidised by other industries that would be affected by events the investment would protect against. For example, in Quito, Ecuador, an archetype 2 system, local water users including the power company and local brewery regularly contribute to the Fund for Protection of Water (FONAG) under a self-taxing arrangement.<sup>85</sup> The fund is used to support watershed conservation and protect and enhance the urban water supply.<sup>86</sup> Innovative use of different sources can thus unlock funding that would otherwise be unavailable.

<sup>78</sup> Transfers from ODA and MDBs can provide an important source of funding, particularly in the short to medium term. Over the longer term, however, governments should seek to reduce structural reliance on external transfers by strengthening domestic funding foundations, primarily through cost-reflective tariffs complemented by targeted subsidies financed through taxation.

<sup>79</sup> Tariff schedules may be structured to allow differentiated rates between different types of users, to reflect different cost profiles associated with their use and variance in willingness to pay. For further discussion on differentiated tariffs in Malaysia, see Appendix A2.1.

<sup>80</sup> See, for example, OECD (2022), 'Financing a Water Secure Future', March, p. 24.

<sup>81</sup> World Bank Group (2020), 'Troubled Tariffs Revisiting Water Pricing for Affordable and Sustainable Water Services', April, p. 116.

<sup>82</sup> For example, see Murrar, A., Paz, V., Yerger, D. and Batra, M. (2024), 'Enhancing financial efficiency and receivable collection in the water sector: Insights from structural equation modelling', *Utilities Policy*, **87**, April.

<sup>83</sup> OECD (2013), 'Water and Climate Change Adaptation: Policies to Navigate Uncharted Waters', September, p. 94.

<sup>84</sup> Public Utilities Board (2022), 'Sustainability Report 2022'; Ministry of Finance (2025), 'More than 950,000 Singaporean HDB households to benefit from U-Save and S&CC rebates in January 2026', 30 December.

<sup>85</sup> Innovation for Sustainable Development Network (2019), 'Ecuador Fund for Water Protection – FONAG', 18 April.

<sup>86</sup> United Nations, Department of Economic and Social Affairs, 'Fund for Protection of Water'.

#### 4.3.2 Deploy targeted and equitable subsidy mechanisms

Governments can deploy structured support mechanisms. These subsidies can be targeted to ensure prices of water services reflect the cost of supply and incentivise economic usage. Some examples of powerful subsidising mechanisms include:

- **Lifeline tariffs and targeted social protection:** Public transfers funded through taxation to protect low-income households while preserving utility revenue stability. Chile's introduction of targeted, central government-funded subsidies for basic water needs, allows utilities to charge full-cost tariffs for additional use while maintaining affordability for low-income households and improving financial sustainability.<sup>87</sup> In the UK, water companies have also implemented social tariffs<sup>88</sup> funded through cross-subsidies, with customer engagement used to determine acceptable levels of bill redistribution.
- **Reform of harmful subsidies:** Redirecting poorly targeted or distortionary subsidies (for example, underpriced bulk water or energy subsidies) toward pro-poor and sustainability-enhancing interventions.
- **Urban–rural cross-subsidisation:** Using stronger urban revenue bases to support higher-cost rural service provision. For example, policies in Brazil facilitate cross-subsidisation between metropolitan regions and rural areas, across municipalities.<sup>89</sup>
- **Cross-subsidisation across water uses:** Industrial users with higher ability to pay can support drinking water, sanitation, or ecosystem management functions. For example, in Malaysia, domestic water tariffs are cross-subsidised by industry tariffs,<sup>90</sup> improving affordability for households. Additionally, commercial organisations with high water demand can be required, or may voluntarily commit, to contribute to the financing of infrastructure that supports progress towards SDG 6. For example, for their Louisiana data centre, Meta are investing over USD 300 million to help improve local infrastructure, including water and wastewater systems.<sup>91</sup>

Subsidies should be predictable, transparent and fiscally sustainable. Poorly designed subsidies can undermine utility performance and distort incentives; well-designed subsidies enhance equity while preserving financial discipline. Operationally, an NWS can provide guidance on:

- Who is subsidised
- How subsidies are financed
- How they are targeted
- How they support long-term sustainability

<sup>87</sup> Leflaive, X. and Hjort, M. (2020), 'Addressing the social consequences of tariffs for water supply and sanitation'. OECD Environment Working Papers No. 166, June.

<sup>88</sup> Consumer Council for Water, 'Help with bills'.

<sup>89</sup> Narzetti, D. and Marques, R. (2020), 'Models of Subsidies for Water and Sanitation Services for Vulnerable People in South American Countries: Lessons for Brazil', *Water*, 12:7.

<sup>90</sup> Lee, C. (2005), 'Water Tariff and Development: the Case of Malaysia', Centre on Regulation and Competition, Working Paper Series, Paper No. 117, June.

<sup>91</sup> Meta (2025), 'One Year In: Meta's Richland Parish Data Center Supports Louisiana Economy with \$875M In Contracts', 19 December.

#### 4.3.3 Use public funding strategically and efficiently

Where tariffs cannot cover costs, predictable public funding is essential to bridge the viability gap. However, allocation alone is insufficient. A major constraint in many systems is the gap between budget allocation and execution.

An NWS might therefore seek to:

- Improve public expenditure execution rates
- Strengthen multi-year capital planning
- Stabilise transfers to utilities
- Align funding commitments with project pipelines

Public funding should also be deployed strategically to maximise leverage. Concessional resources should prioritise systems with limited commercial viability, while more finance-ready systems should rely more heavily on market-based funding.

For some systems, public funding may be required to fund specific projects for which the cost-recovery profile may be politically sensitive, or where the projects exhibit public good characteristics. This is particularly the case for resilience investments, as these can be difficult to justify to customers given their protection against low-probability, high-impact events. Additionally, this is relevant in systems where the majority of funding and financing comes from private sources. For example, the Netherlands supports major flood-protection and freshwater-security investments through the national Delta Programme, with the Delta Fund providing public funding for climate-resilient infrastructure.<sup>92</sup>

#### 4.3.4 Ensure water pricing reflects its full economic value

Water pricing often reflects only private benefits and does not capture broader social and environmental externalities, including public health, ecosystem protection, flood mitigation and climate resilience.<sup>93</sup> This underpricing leads to underinvestment and weak incentives for conservation.

An NWS could:

- Recognise the full economic value of water. This includes ensuring that decision-making reflects not only the direct costs of supply and use, but also water's wider contributions to ecosystems, health, livelihoods, and economic activity.
- Incorporate environmental and resilience considerations into pricing frameworks.
- Explore mechanisms such as payment for ecosystem services.
- Consider positive externalities that may justify targeted public support.
- Apply the 'polluter pays' principle, ensuring that those responsible for pollution contribute to mitigation or treatment costs.

<sup>92</sup> Delta Commissioner (2025), 'National Delta Programme 2026', September.

<sup>93</sup> Global Commission on the Economics of Water (2024), 'The Economics of Water: Valuing the hydrological cycle as a global common good', p. 78.

Proper valuation improves resource allocation, strengthens sustainability, and clarifies where public subsidy is economically justified. Mechanisms such as debt-for-nature swaps or payments for ecosystem services translate this valuation into concrete investments that protect water-related ecosystems. These systems are most feasible in advanced water systems with high institutional capacity, such as archetype 1 systems.

Given the persistent investment gaps arising from traditional funding approaches, enabling water to be treated as an investable asset class is crucial to drive both the meeting of SDG 6 and facilitate climate adaptation strategies.<sup>94</sup> Achieving this requires recognition of water's intrinsic and economic value, similar to infrastructure, energy, or commodities. For example, in South Africa, the Green Climate Fund is aiming to support a 'paradigm shift' through a wide-ranging programme that will use blended financing to establish water reuse infrastructure as a new asset class in the country.<sup>95</sup>

In Singapore, water pricing reflects the full costs of supply and production, including reservoirs, treatment, desalination, and infrastructure, while accounting for scarcity and encouraging sensible usage. Prices are higher for water from unconventional sources (NEWater and desalination) and include a conservation charge to signal the value of water and promote responsible consumption.<sup>96</sup> Applying the polluter pays principle can further ensure that those responsible for pollution contribute to mitigation costs, reinforcing pricing that reflects economic, social and environmental objectives. In addition, tariff structures may differentiate between domestic and industrial users, reflecting differences in willingness and ability to pay across user groups and the varying cost implications of domestic versus industrial connections.<sup>97</sup>

Additionally, the full costs of resilient supply should be incorporated into the price of water. For example, the UK **National Infrastructure Commission** has incorporated the potential economic impacts of severe drought scenarios when assessing long-term water infrastructure needs in England, illustrating how resilience considerations can be reflected in investment planning and valuation.

A range of tools can support governments and practitioners to overcome funding barriers.

<sup>94</sup> Elmahdi, A. (2025), 'Advancing Sustainable Financing for Water Security: Treating Water as an Asset Class', Food and Agriculture Organization of the United Nations, 16 March.

<sup>95</sup> Green Climate Fund (2023), 'FP209: Climate Change Resilience through South Africa's Water Reuse Programme ("WRP")', Funding Proposal, 3 August.

<sup>96</sup> Public Utilities Board (2022), 'Sustainability Report 2022', p. 20.

<sup>97</sup> For further discussion on tariff differentiation in Malaysia, see Appendix A2.1.



#### Examples of tools practitioners can use when determining the appropriate level of tariffs

- **Cost recovery and affordability diagnostic tool:** provides structured analysis of cost coverage, affordability, and revenue gaps, directly supporting tariff design and reform recommendations (for example, IWA tariff setting guidelines).
- **Public expenditure execution tracker:** helps track financial execution and institutional performance, feeding into maturity assessments and highlighting areas for operational improvement (for example, IWA utility maturity ladder).

Source: Oxera; IWA (2020), 'Guidelines for Public Participation in the Regulation of Urban Water Services', 8 September.



#### 4.4 Recommendations related to financing

Strengthened funding foundations create the conditions necessary to mobilise financing. However, making use of the full spectrum of instruments is important to crowd in private capital and scale investment.

Figure 4.4  
Finance recommendations



Source: Oxera

#### 4.4.1 Deploy risk mitigation and de-risking instruments

Investors assess projects based on risk-adjusted return. Even where revenue streams exist, perceived risks—regulatory, demand, climate or political—can constrain investment.

Governments (central, regional or local) and development partners can deploy a range of risk mitigation and de-risking instruments. For example:<sup>98</sup>

- Partial credit and risk guarantees reduce lenders' exposure to specific risks, such as payment default or regulatory changes, to improve project bankability and lower financing costs.
- Political risk insurance protects investors against non-commercial risks such as expropriation, currency restrictions or contract breach, helping attract private capital to water projects in higher-risk environments.
- Contractual risk-sharing mechanisms are structured agreements between public authorities and private partners— including minimum-revenue guarantees, availability payments or adaptive tariff clauses—that allocate risks to the parties best able to manage them, de-risking investment for private partners.
- Viability gap funding is targeted public or concessional funding that can be used to bridge the gap between project costs and expected revenues, allowing socially beneficial but low-margin water investments to attract investment.
- Conditional incentive structures aligned with SDG outcomes, including performance-linked financing or disbursement conditions, tie funding to measurable outcomes such as increased access, reduced NRW or improved water security, ensuring that financial incentives directly support progress towards SDG 6 targets.

De-risking mechanisms should be targeted and proportionate. They are particularly appropriate for large-scale infrastructure, climate-resilient investments, and first-of-a-kind projects. Overuse can distort markets; underuse can limit investment.

<sup>98</sup> Global Commission on the Economics of Water (2024), 'The Economics of Water: Valuing the hydrological cycle as a global common good', p. 142.

#### 4.4.2 Use blended finance strategically

Blended finance—the use of public or concessional capital to crowd in private investment—can help bridge the viability gap where revenue streams are insufficient to attract commercial finance independently.<sup>99</sup>

An NWS can:

- Clearly define the roles of public, concessional and private capital.
- Encourage the use of concessional finance to address specific market failures.

Blended finance is particularly relevant in systems with partial but not full commercial viability.

For example, the Philippine Water Revolving Fund (PWRF) blended domestic public funding with commercial financing at a 3:1 ratio. This structure, combined with successful guarantees, successfully crowded-in private finance with banks offering water operators longer tenors at lower, fixed rates.<sup>100</sup>

In more mature contexts, where utilities are approaching financial sustainability, mechanisms such as viability gap funding and guarantees<sup>101</sup> can help close residual viability gaps, improve risk allocation and crowd in private investment. In less mature systems, where project preparation capacity and regulatory frameworks are still evolving, blended finance is often more effective when deployed to support early-stage infrastructure, technical assistance and institutional strengthening, alongside targeted subsidies to address affordability constraints and stabilise service delivery. For example, the Green Climate Fund has established the 'Scaling Resilient Water Infrastructure Facility', comprising a PPP structuring component that funds 'project preparation, structuring, and transaction advisory activities' provided by the International Finance Corporation (IFC) and a concessional finance component that provides eligible projects with 'concessional co-investments'.<sup>102</sup>

#### 4.4.3 Leverage climate and thematic finance

Climate and water-aligned financial instruments, including green, blue and resilience bonds, can channel capital toward water infrastructure while aligning with investor demand for sustainable assets. These instruments typically ring-fence proceeds for climate-resilient infrastructure, wastewater treatment, nature-based solutions or drought and flood resilience measures, enabling access to capital markets while demonstrating measurable environmental impact.

<sup>99</sup> For example, Brazil's national development bank, BNDES, has played a key role in enabling private investment in the sector by providing affordable anchor financing to private investors. For further discussion on reforms in Brazil, see Appendix A2.5.

<sup>100</sup> OECD (2019), 'Making Blended Finance Work for Water and Sanitation: Unlocking Commercial Finance for SDG 6', OECD Studies on Water, OECD Publishing, Paris.

<sup>101</sup> For example, in Manila, guarantees provided by the Department of Finance provided comfort to bidders for concession contracts. For further discussion on concession arrangements in Manila, see Appendix A2.2.

<sup>102</sup> Green Climate Fund (2024), 'FP254: GCF-IFC Scaling Resilient Water Infrastructure (RWI) Facility', 26 November.

An NWS might:

- Align water investments with national climate strategies.
- Where necessary, align with or reference monitoring and reporting frameworks as they evolve to guide impact verification.

Non-concessional green bonds have been launched by water service providers in the US, Europe, and the Middle East to finance a range of mitigation and resilience-building projects, including drought and flood resilience investments, catchment management, renewable energy generation, and wastewater reuse.<sup>103</sup>

For example, Anglian Water raised capital through a green bond that achieved a lower coupon, demonstrating how sustainable financing can reduce the cost of capital while delivering measurable environmental benefits such as reduced carbon emissions and improved biodiversity.<sup>104</sup> In South Africa, the City of Cape Town issued its first green bond in 2017, with capital raised used for a range of projects including water capture, storage and distribution infrastructure and alternative water treatment plants.<sup>105</sup>

These instruments are particularly relevant for climate-resilient infrastructure, wastewater treatment, nature-based solutions and drought and flood resilience.

Governments should champion investment in the water sector as a high-impact deployment of funds. In addition to delivering social benefits such as universal WASH access, water investments can support broader economic growth while reducing environmental impacts and strengthening resilience to climate change. Governments might consider how the impactful nature of water investments can be communicated to attract finance to the sector, particularly from climate and thematic sources.

#### 4.4.4 Encourage innovative financing mechanisms

Innovative financing mechanisms can address structural barriers and align with water's long asset lifecycles and public-good characteristics. For example:

- Debt-for-nature swaps can redirect sovereign debt obligations towards water security, ecosystem restoration or watershed protection, creating fiscal space while supporting environmental outcomes.<sup>106</sup>

<sup>103</sup> World Bank (2023), 'Scaling up finance for water', p. 24.

<sup>104</sup> Anglian Water (2022), 'Sustainable Finance Impact Report 2022'.

<sup>105</sup> Cities Climate Finance Leadership Alliance, 'Green bond for infrastructure financing in Cape Town, South Africa', accessed 5 March 2026

<sup>106</sup> For instance, a debt-for-nature swap in The Bahamas redirected funds from the debt service into projects that safeguard marine ecosystems and support long-term water security. IDB (2024), 'The Bahamas Launches Debt-for-Ocean Conservation Swap with IDB Support', 22 November.

- Microfinance models can provide small-scale lending to households or communities and finance connections, sanitation facilities or treatment technologies where utilities cannot extend network finance, expanding access while building demand and repayment track records that can crowd in larger pools of capital.<sup>107</sup>
- Resilience-linked bonds tie financing terms to climate-resilience or service performance indicators, rewarding issuers for improving water security outcomes and attracting investors seeking measurable adaptation impacts alongside financial returns.<sup>108</sup>
- PPPs structured around long-term service delivery can mobilise private investment by allocating risks through contractual arrangements and providing predictable revenue streams over the asset lifecycle, enabling infrastructure expansion while maintaining public oversight of service quality and affordability.
- The use of independent vehicles to undertake specific infrastructure projects can also help to access finance.<sup>109</sup>

Governments play a central role in enabling these mechanisms through regulatory clarity, pipeline development, co-financing, institutional capacity building, and supporting structures that can enable stable and sufficient revenue streams into water utilities.

While water infrastructure has historically relied heavily on public budgets and traditional utility finance, countries today can 'leapfrog' this pathway by adopting innovative financing mechanisms from the outset, helping mobilise private capital while aligning investment with long-term water security and environmental outcomes.

Examples of tools that governments and industry practitioners can use to implement these recommendations are set out below.



## Examples of tools to enable financing at scale

- **Financing readiness assessment tool:**  
A structured diagnostic that evaluates revenue stability, governance quality, and regulatory predictability to determine a utility's or project's ability to attract commercial or blended finance (such as the World Bank's Water Creditworthiness Initiative Self-Assessment & Planning Toolkit).<sup>110</sup>
- **Blended finance structuring guide:**  
A framework to clarify the appropriate roles of public, concessional and private capital, ensuring risk-sharing arrangements are transparent and proportionate.<sup>111</sup>

Source: Oxera

<sup>107</sup> For example, in Tamil Nadu, India, microfinance programmes have enabled households to borrow for safe sanitation facilities. Mahanta, S. and Sen, S. (2024), '[From Subsidies to Sustainability](#)', Microfinance as a Catalyst for Advancing Sanitation in India.

<sup>108</sup> For example, in 2021 the Chilean company CMPC issued a sustainability-linked bond with financial terms tied to reducing industrial water use intensity, directly linking investor returns to measurable water efficiency improvements. WBCSD Communications (2021), '[CMPC closes the first sustainability-linked bond \(SLB\) for a Chilean company](#)', 13 April.

<sup>109</sup> The Thames Tideway Tunnel, a large sewer infrastructure project in London, was undertaken by a new independent company with its own financing sources. This was separate to the incumbent water company that would usually be responsible for such a project (Thames Water). The use of this new financing structure allowed the project to be financed when it would not have been possible for Thames Water to have done so on its own balance sheet. Ofwat (2022), '[Competition in strategic investment: a high-level stocktake](#)', July, p. 6.

<sup>110</sup> The World Bank, '[Water Creditworthiness Initiative Self-Assessment & Planning Toolkit](#)'.

<sup>111</sup> For further discussion on blended finance for water and sanitation, including instruments, risk allocation and structuring approaches, see OECD (2019), '[Making Blended Finance Work for Water and Sanitation: Unlocking Commercial Finance for SDG 6](#)', OECD Studies on Water, OECD Publishing, Paris.



Our analysis shows that the barriers to water investment are often structural rather than purely financial. Weak data, fragmented institutions, poor risk allocation and constrained revenue systems continue to undermine confidence. The Glasgow Framework is designed to help decision-makers diagnose these challenges systematically and apply solutions tailored to their specific context, recognising that different countries and water systems require different approaches to reform and financing.



Georgia Davies, Senior Consultant

## Section 5: Next steps and consultation process

This report represents an initial step in a broader consultation process aimed at strengthening how countries can mobilise financing to achieve SDG 6. It is intended not as a final framework, but as a practical foundation for discussion with governments, investors, and sector practitioners.

The consultation is designed to test and refine the framework set out in this report, with a particular focus on ensuring that recommendations are actionable, appropriately prioritised, and adaptable across different country contexts. Feedback from the consultation, along with input gathered during the IWA WWCE, will inform the final version of the report, to be published following the event.

### Questions for consultation

We invite targeted feedback to support the refinement of the framework. In particular, we welcome views on the following.

- **Supporting implementation:** What would be most helpful for governments and other stakeholders in taking the recommendations forward and driving meaningful change? What challenges or barriers might they face, and how could the framework better support them?
- **Prioritisation of recommendations:** Do you agree with the prioritisation of recommendations presented in Table 4.1? Which recommendations, if any, should be prioritised differently? Do you agree with the definitions used to describe foundational, developmental and accelerating priorities?
- **Gaps and completeness:** Are there any important actions, enablers, or risks that are not sufficiently reflected in the framework?
- **Mobilising finance in practice:** From your perspective, what would most increase confidence in the framework's ability to support the mobilisation of financing?

### Timings

The consultation will run as follows:

- **Consultation launch:** 20 April 2026
- **Consultation close:** 21 June 2026

### Next steps

Responses to the consultation will be reviewed and synthesised to identify key themes, areas of consensus, and points requiring further development.

- A summary of responses will be shared during the IWA Global Congress and Summit.
- An updated version of the report will be published following the Summit in October 2026, incorporating stakeholder feedback.

### How to respond

We welcome responses from all stakeholders, including governments, utilities, investors, development institutions, and sector practitioners.

### Responses can be submitted via:

- <https://www.oxera.com/insights/reports/bridging-the-water-investment-gap-a-framework-for-delivering-the-un-sustainable-development-goal-6/>

### For further information, please contact:

- [glasgowframework@oxera.com](mailto:glasgowframework@oxera.com)





**Appendices**  
Barriers, archetype case studies and wider recommendations

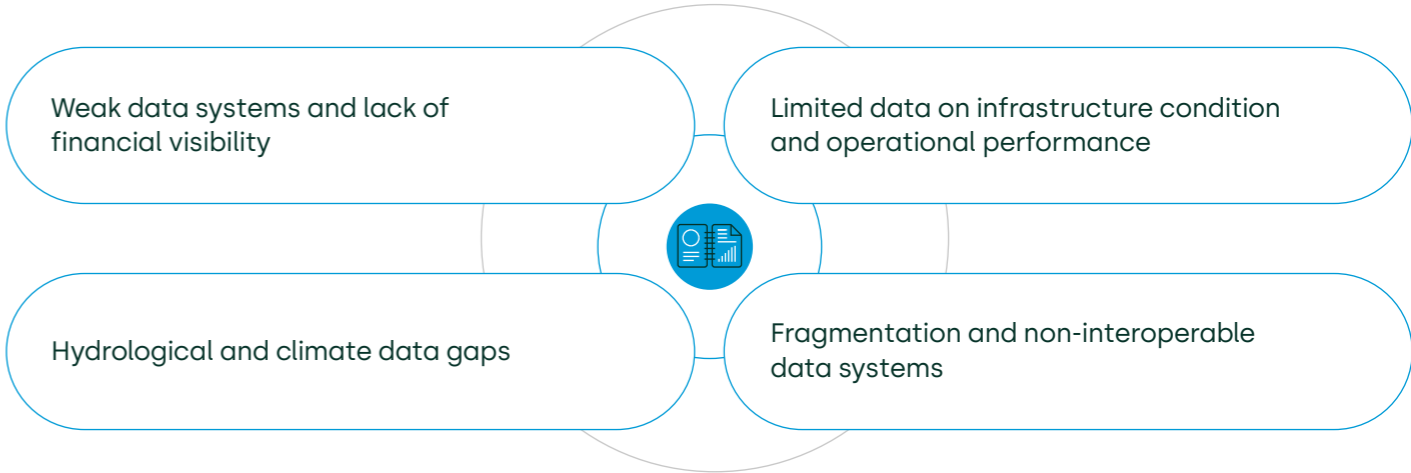
### A1 Barriers to financing SDG 6

This appendix summarises the principal barriers constraining the mobilisation of finance for SDG 6, based on stakeholder consultation and expert input across the water sector. These barriers are grouped into four thematic areas—data and information, regulation and governance, funding, and financing—while recognising that they frequently overlap and reinforce one another. Together, they reflect a set of interconnected constraints that affect how investments are assessed, structured and delivered, ultimately limiting the flow and effectiveness of finance.

#### A1.1 Data and informational barriers

Informational barriers are a constraint to the effective mobilisation and deployment of finance for SDG 6. These barriers are summarised in Figure A1.1 below and explored in turn.

Figure A1.1  
Data and informational barriers



Source: Oxera

### A1.1.1 Weak data systems and lack of financial visibility

Data underpins how water is valued and governed,<sup>112</sup> yet gaps in water data pose a fundamental constraint to mobilising finance. Water data systems range from operational monitoring platforms such as SCADA,<sup>113</sup> to asset management systems, and newer subscription services such as Celeste<sup>114</sup> and WaterPlan,<sup>115</sup> which help collect, manage, and visualise sector information. Credible, timely and comparable information strengthens accountability, enables evidence-based prioritisation, and signals transparency to investors. Where data systems are weak, governments struggle to allocate scarce public resources effectively, and private actors face heightened uncertainty and risk.

A key obstacle to achieving SDG 6 is the absence of comprehensive, accurate and up-to-date information on how much financial resource is being spent in the sector, how effectively it is used, and where gaps remain at national, regional and global levels.<sup>116</sup> Without this visibility, funding shortfalls are poorly quantified and financing strategies are built on incomplete foundations.

There are significant gaps in the quality and availability of data on performance against SDG 6 targets, including on where gaps in achievement remain.<sup>117</sup> Almost 60% of countries do not have data available for more than four global SDG 6 indicators, and only 6% reported on more than eight global indicators, representing a major knowledge gap.<sup>118</sup> This gap is further exacerbated in relation to marginalised and indigenous groups.<sup>119</sup>

Weak expenditure tracking also constrains financing. Capital mobilisation requires clarity on baseline funding and financing flows, lifecycle costs and investment backlogs. Where these are not visible, pipeline development remains fragmented and donor-driven.

This is a particular issue for archetype 3 and archetype 4 systems. Archetype 4 systems may not have long-term or granular records of performance, meaning they are not able to demonstrate sustained operational efficiency or revenue stability, limiting access to commercial finance. For archetype 3 systems, this is particularly acute in highly disaggregated contexts, where marginalised populations in remote geographies may not be captured in national monitoring systems.

### A1.1.2 Limited data on infrastructure condition and operational performance

Governments and water sector institutions have incomplete knowledge of their infrastructure assets, the condition of these assets and rates of asset renewal.<sup>120</sup> This lack of data has, even in the most advanced archetype 1 systems, likely contributed to underinvestment in critical parts of the infrastructure.

Many archetype 1 systems have ageing asset bases, which means that the asset replacement liability is increasing. However, the exact scale of this asset liability is not always known as a result of the paucity of data on the state of assets, meaning that billpayers may face unexpected price rises in the future. Opposition to these price rises creates challenges to attracting finance, where regulators face pressure to keep bills low. This was a particular issue highlighted in the English and Welsh water sectors, where regulators and water companies were found to have poor quality data on the state of their assets.<sup>121</sup>

<sup>112</sup> Global Commission on the Economics of Water (2024), 'The Economics of Water: Valuing the hydrological cycle as a global common good', October, p. 175.

<sup>113</sup> SCADA refers to supervisory control and data acquisition. See eLynx, 'A Simple Guide to Understanding SCADA for Water Systems'.

<sup>114</sup> Celeste is a financial AI platform that helps investors and sustainability teams assess water risks, evaluate resilience investments, and mobilise capital. See Celeste, 'Make Water a Financial Decision'.

<sup>115</sup> WaterPlan is an AI-native operations, EHS and sustainability platform unifying environmental, production and financial insights for data-driven decision-making. See WaterPlan, 'The AI-native platform for water-dependent industries'.

<sup>116</sup> World Bank (2024), 'Funding a water-secure future: an assessment of global public spending'.

<sup>117</sup> UN Water (2018), 'Sustainable development goal 6 synthesis report on water and sanitation', May, p. 9.

<sup>118</sup> Ibid., p. 9.

<sup>119</sup> Mattos, K.J., Mulhern, R., Naughton, C.C., Anthonj, C., Brown, J., Brocklehurst, C., Brooks, C., Desclos, A., Escobedo Garcia, N.E., MacDonald Gibson, J., Linden, K.G., Lindsay, C.A., Newby, J., Sinclair, R. and Smith, A. (2021), 'Reaching those left behind: knowledge gaps, challenges, and approaches to achieving SDG 6 in high-income countries', Journal of Water, Sanitation and Hygiene for Development, 11:5, September, pp. 849–858.

<sup>120</sup> OECD (2022), 'Financing a water secure future', p. 69.

<sup>121</sup> National Audit Office (2025), 'Regulating for investment and outcomes in the water sector', 25 April, para. 17.

These weaknesses extend across:

- Operational data (flows, pressures, losses, service continuity).
- Asset-condition data (age, state and renewal needs).
- Commercial data (metering, billing and customer records).

Limited visibility and understanding of existing infrastructure can distort investment decisions. A more comprehensive understanding of existing systems that recognises both the infrastructure and market context can support informed decisions and enable more efficient allocation of public funding and concessional finance.

Weak commercial and operational data contributes directly to inefficiency, particularly through high levels of NRW. High rates of NRW are a notable problem in many developing and developed countries. By reducing billable volumes and cash collection, elevated NRW can also weaken revenues, increase the revenue required to achieve cost recovery, and undermine the long-term financial sustainability of utilities. Further, as operational efficiency and commercial management practices are key indicators for lenders, high NRW deters commercial finance.<sup>122</sup>

Efficiency gains help to strengthen performance, unlock resources, and create fiscal space. However, without credible benchmarking data, audited accounts and performance transparency, efficiency improvements cannot be quantified, monetised or translated into strengthened creditworthiness.

This opacity obscures the scale of cost-recovery gaps, cross-subsidies and fiscal burdens associated with service provision. Without transparent and comparable pricing data, governments cannot credibly assess the potential for tariff reform or enhancement as a source of sustainable funding. At the same time, investors face uncertainty regarding revenue stability and long-term financial viability.

Strengthening pricing transparency and cost data is therefore central not only to improving efficiency and equity, but also to enhancing the investment case for the sector.

### A1.1.3 Hydrological and climate data gaps

Limited hydrological monitoring further constrains effective funding and financing. Many countries lack reliable data on water quantity and quality, groundwater systems and water-related ecosystems, reflecting insufficient monitoring and weak enforcement systems.<sup>123</sup> Gaps in hydrological data limit the ability of scientists and policymakers to understand complex hydrological systems, which in turn impacts the understanding of risk and investment.<sup>124</sup>

There are also ongoing challenges in translating hydrological and climate science into finance-relevant risk information. Investors may value quantified, standardised risk metrics and modelling of asset performance under changing climate conditions. Where risks are not presented in formats that can be incorporated into financial analysis, resilience investments may be undervalued, and uncertainty can influence the price or yield at which investors are willing to provide finance.

### A1.1.4 Fragmented data

Even where data is collected, it is frequently fragmented across agencies, inconsistent and non-interoperable.<sup>125</sup> This fragmentation makes it difficult to compare trends across countries and over time, increasing transaction costs for investors and complicating performance benchmarking. At the same time, the lack of appropriate analytical tools and data to assess complex water-related investments limits the ability of water sector institutions to attract blended and private financing,<sup>126</sup> in turn making it difficult to evaluate the credit risk and operational viability of prospective projects.<sup>127</sup> The absence of reliable water demand forecasts, including demographic and urbanisation trends, further limits the ability to prioritise investments and plan for future service needs.

These data challenges manifest differently across contexts. In advanced systems, data gaps limit long-term asset planning and risk modelling. In rapidly urbanising systems, the lack of reliable data on the cost and quality of services provided by many private water service providers complicates authorities' ability to assess how such providers could be integrated into the sector's overall service options.

<sup>122</sup> OECD (2022), 'Financing a water secure future'.

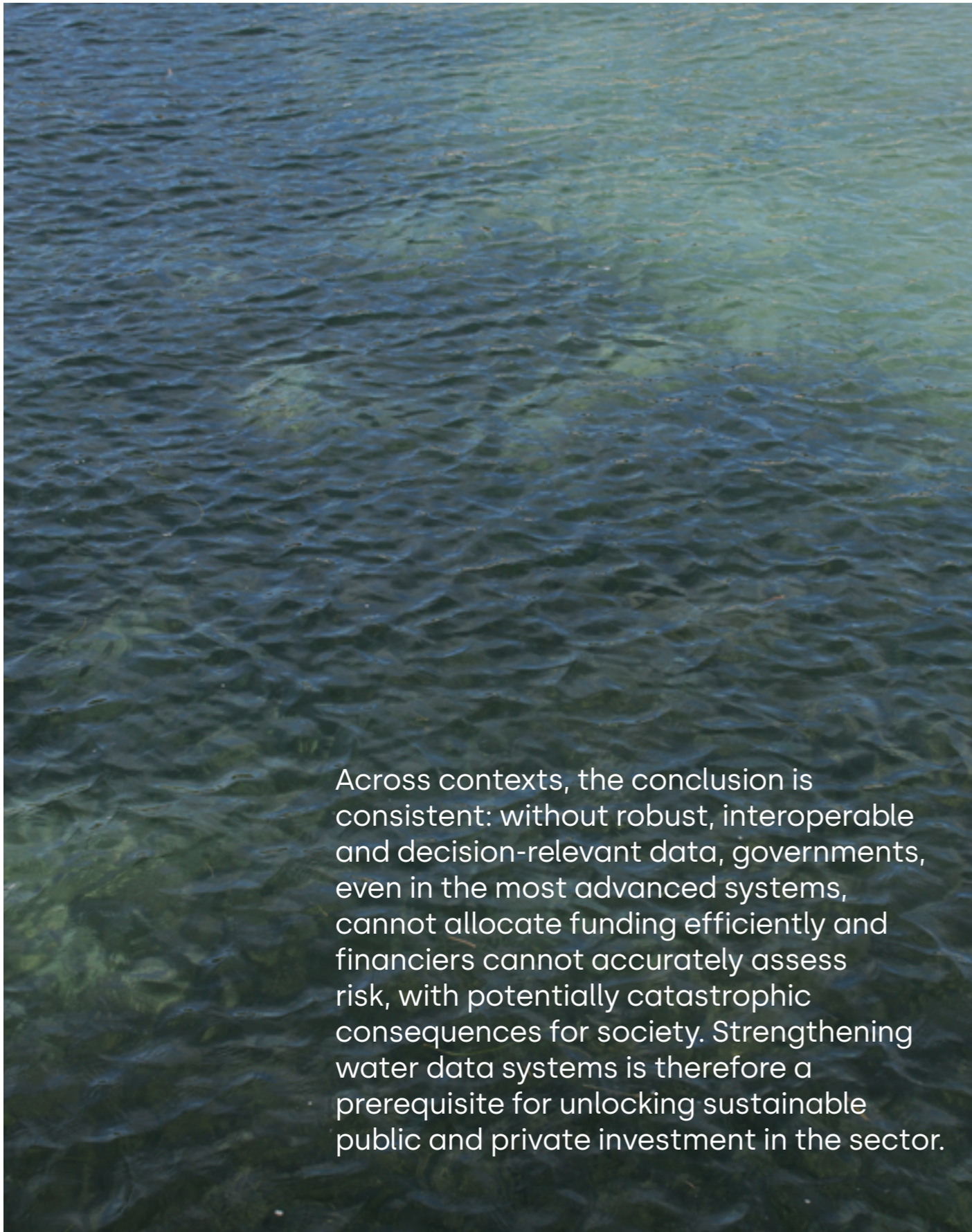
<sup>123</sup> UNESCO (2023), 'The United Nations world development report 2023: partnerships and cooperation for water'.

<sup>124</sup> Intergovernmental Panel On Climate Change (2022), 'Climate change: 2022: Impacts, adaptation and vulnerability', p. 1346.

<sup>125</sup> Global Commission on the Economics of Water (2024), 'Valuing the hydrological cycle as a global common good', October.

<sup>126</sup> OECD (2018), 'Financing water investing in sustainable growth', March, p. 5.

<sup>127</sup> World Water Council (2022), 'Blended finance in the water sector: challenges and attributes', March.

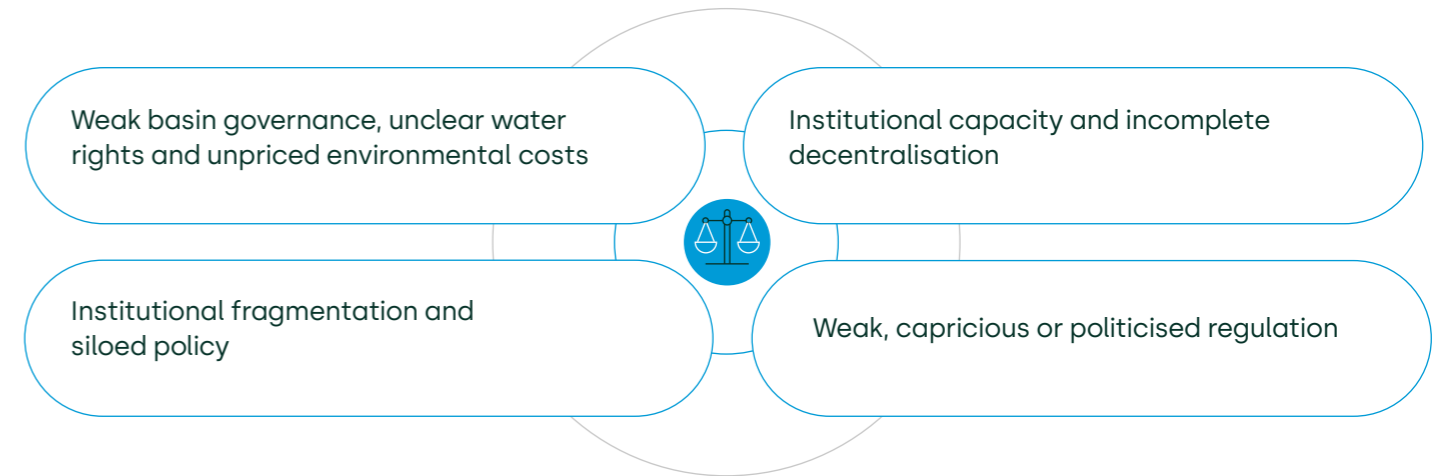


Across contexts, the conclusion is consistent: without robust, interoperable and decision-relevant data, governments, even in the most advanced systems, cannot allocate funding efficiently and financiers cannot accurately assess risk, with potentially catastrophic consequences for society. Strengthening water data systems is therefore a prerequisite for unlocking sustainable public and private investment in the sector.

### A1.2 Regulatory and governance barriers

Weak or fragmented government roles create systemic barriers that increase investment risk, raise capital costs, and constrain the scale of financing in the water sector. Regulatory and governance barriers are captured in Figure A1.2 and explored in turn.

Figure A1.2  
Regulatory and governance barriers



Source: Oxera

#### A1.2.1 Weak basin governance, unclear water rights and unpriced environmental costs

In many countries, systems for managing water at the river basin level remain weak.<sup>128</sup> Water abstraction rights are often unclear or poorly enforced, environmental flow requirements are missing or inconsistently applied, and basin authorities may lack the legal powers or funding needed to manage resources effectively.

When allocation rules are unclear, investors face uncertainty about whether water will be available for infrastructure over the long term. This increases the risk that assets could become unusable or underutilised if water supplies decline. As a result, financing becomes more expensive or may not materialise at all. Effective basin governance is therefore not only an environmental issue; it is also necessary for infrastructure to be financially viable.

Where water abstraction is poorly regulated and pollution is not priced or penalised, users do not bear the full costs of their activities (negative externalities). When these costs are ignored, water resources

<sup>128</sup> UNU INWEH (2026), 'World enters "era of global water bankruptcy" UN scientists formally define new post-crisis reality for billions', January.

can effectively become open-access resources, which encourages overuse and pollution and the resultant environmental impacts remain unaccounted for.

These challenges are often made worse by wider institutional and legal uncertainty. In some countries, property rights are weak or unclear, and responsibilities for water services are spread across multiple agencies with overlapping mandates. This can make it difficult to define infrastructure projects clearly or to establish reliable contracts with service providers.

The effects of unpriced water use can be seen in Bangladesh. Water used for certain industrial activities is often unpriced, particularly groundwater extracted directly by factories in the country's large textile sector.<sup>129</sup> Without pricing or clearly enforced abstraction limits, firms do not face the full social cost of their water use. In Gazipur, a major industrial zone, groundwater levels are declining by around two to three metres per year.<sup>130</sup> This decline affects local domestic supply. Stronger regulation and the introduction of groundwater pricing could reduce these pressures. Pricing water use can encourage industries to use water more efficiently or invest in reuse systems.

Finally, although fairness and inclusion are often mentioned in water policy discussions, they are rarely built directly into investment decisions. Project financing frameworks do not consistently consider class or gender impacts, or indigenous rights. When these issues are ignored, projects may face political opposition or lose public support, which can threaten their long-term stability.

#### A1.2.2 Institutional fragmentation and siloed policy

One of the most persistent structural barriers to SDG 6 investment is institutional fragmentation. In many countries, responsibilities for water supply and sanitation, wastewater management, irrigation, river basin management, ecosystem protection and urban planning are distributed across multiple ministries and agencies with differing mandates and planning horizons.<sup>131</sup>

This fragmentation weakens accountability for system-wide outcomes and makes it difficult to assess costs and benefits holistically. Infrastructure interventions that span administrative boundaries or generate cross-sector benefits, such as wastewater reuse, source protection to reduce treatment costs, or multi-purpose storage, often struggle to secure coordinated funding or financing because governance and budgeting systems remain siloed.<sup>132</sup> Approximately half of countries lack formal national mechanisms for cross-sectoral coordination in relation to water resources management and are mostly only undertaking ad hoc collaboration.<sup>133</sup>

Even where formal cross-sector coordination mechanisms exist, implementation challenges persist due to overlapping mandates, insufficient authority, resource constraints or political instability.<sup>134</sup> For investors, fragmentation translates into higher transaction costs, longer approval timelines and increased renegotiation risk. For governments, it reduces the ability to aggregate projects, structure blended finance or cross-subsidise underfunded SDG 6 targets such as water quality (6.3) and ecosystems (6.6)—see targets in Figure 1.1.

This fragmentation is a key learning from the Cunliffe review in England and Wales.<sup>135</sup> This is captured in the box below.



#### Box A1.1 Insights from the UK's Cunliffe Review

The English and Welsh water sector is currently regulated by a number of different institutions.

- **Ofwat:** This is the economic regulator, responsible for assessing the majority of investment needs and efficient day-to-day operating costs. Ofwat sets allowances for companies that ultimately translate into bills that customers pay.
- **The Environment Agency (EA):** Part of the UK Government, the EA is responsible for environmentally regulating companies, setting compliance levels, some investment needs, and fines for non-compliance.
- **The Drinking Water Inspectorate (DWI):** The DWI is responsible for ensuring the quality of drinking water supplied to properties, and can require companies to take remedial action, and ultimately issue fines to companies.

This institutional fragmentation has led to a siloed approach to policymaking, and both gaps and overlap in regulatory oversight.<sup>136</sup> In particular, the economic regulator operates separately to the DWI and the EA, which determine some of the performance needs of companies. While these institutions can work in tandem, Ofwat is often required to fund investments that are mandated by the EA. This can lead to inefficiency, as neither organisation can take a system-level view of the sector to determine which investments might provide the most affordable and climate-friendly investments.

The Cunliffe Review recommended that the UK Government establish a new integrated regulator, combining the functions of Ofwat, the EA, the DWI and others. A strength of this proposed approach is that it would allow for enhanced company oversight and supervision.<sup>137</sup>

Source: Independent Water Commission (2025), 'Final Report', 21 July, p. 157.

<sup>129</sup> Resilient Water Accelerator (2025), 'Accelerating Water Stewardship Investments in Global Apparel Supply Chains'.

<sup>130</sup> Textile Today (2025), 'Water no longer free: Experts urge Bangladesh to value industrial water use', 1 December.

<sup>131</sup> UNESCO (2023), 'The United Nations world development report 2023: partnerships and cooperation for water'.

<sup>132</sup> United Nations (2021), 'Progress on integrated water resource management: Global indicator 6.5.1 updates and acceleration needs', p. 25.

<sup>133</sup> Ibid., p. 25.

<sup>134</sup> Ibid.

<sup>135</sup> Independent Water Commission (2025), 'Final Report', 21 July.

<sup>136</sup> Ibid., p. 165.

<sup>137</sup> Ibid., p. 165.

### A1.2.3 Institutional capacity and incomplete decentralisation

Water authorities require technical, financial and administrative capabilities to undertake long-term planning, set tariffs based on credible cost projections, manage assets efficiently and engage effectively with lenders. In many emerging and developing contexts, decentralisation reforms have transferred service delivery responsibilities to municipal entities without equivalent fiscal autonomy or capacity-building support.<sup>138</sup>

Where decentralisation is fragmented or incomplete, municipal utilities may lack the governance structures, financial management systems and credit history necessary for creditworthiness. This limits their ability to access capital markets or structure blended finance. Investors assess institutional robustness as carefully as project fundamentals; weak governance capacity therefore raises transaction costs and constrains financing options.<sup>139</sup>

### A1.2.4 Weak, capricious or politicised regulation

Predictable and independent regulation is central to financial sustainability in natural monopoly sectors such as water supply and sanitation.<sup>140</sup> Where tariff-setting processes are subject to political interference, utilities struggle to generate stable operating revenues, undermining cost recovery and limiting their ability to finance maintenance or network expansion. Weak regulatory enforcement can also reduce incentives for efficiency, leading to asset deterioration and declining service quality. For investors, regulatory instability translates directly into revenue uncertainty and higher perceived risk, increasing the cost of capital and reducing private participation.

Investment in water infrastructure is shaped not only by sector-specific governance but also by broader financial and legal frameworks. Underdeveloped domestic capital markets limit access to long-term financing, particularly from commercial investors. In some countries, utilities face legal restrictions on borrowing or issuing bonds, while banks may face exposure limits that constrain infrastructure lending. Weak contract enforcement and regulatory uncertainty further increase perceived political risk, reducing investor appetite. These constraints are particularly acute in archetype 3 systems and recently aggregated archetype 4 systems.

For example, weak contract enforcement has been highlighted as an issue in Bangladesh.<sup>141</sup> Research on private investment in the energy sector suggests that where contract enforcement is weak, firms without sufficiently close connections to government may be less willing to enter into contracts, hindering private participation through perceived high-risk premia.<sup>142</sup>

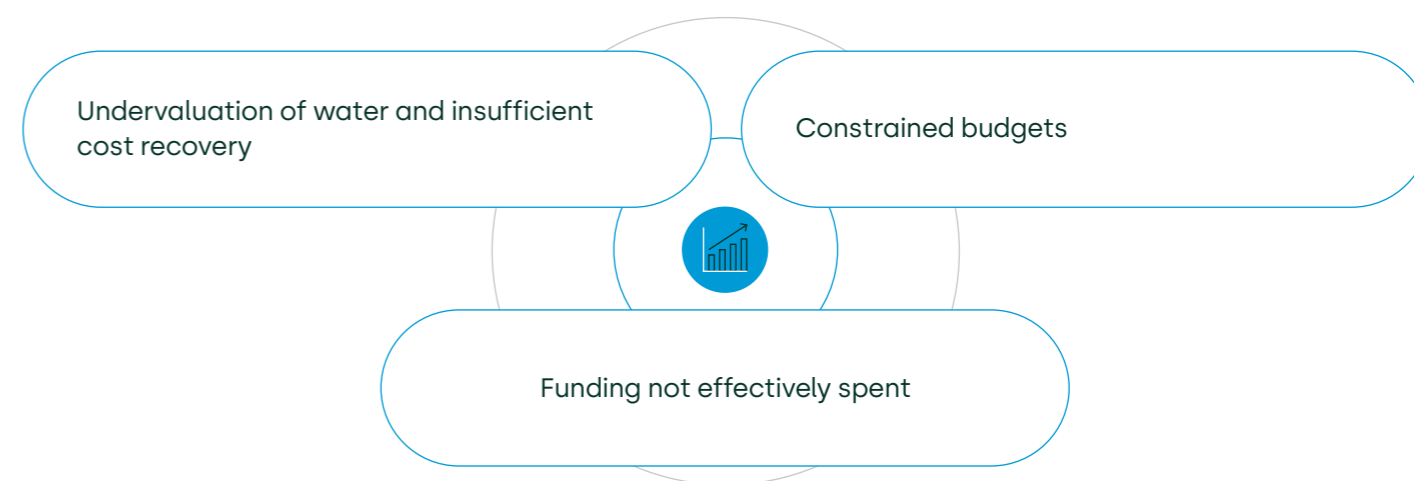
In some jurisdictions, competition or trade rules may unintentionally constrain mechanisms such as payments for ecosystem services, limiting innovative financing for catchment protection.

Weak PPP frameworks can also deter private capital. Where procurement processes lack transparency, risk allocation is unclear, dispute resolution mechanisms are ineffective, or regulatory oversight is inconsistent, investors perceive elevated political and contractual risks. Given the administrative burden inherent in navigating complex regulatory environments, designing a flexible and inclusive framework for enabling PPPs can support private-sector participation.<sup>143</sup> Capacity constraints, at both local and central levels of government, can also hinder the ability of policymakers to engage with the private sector on establishing PPPs.

### A1.3 Funding barriers

Analysis of financing gaps for SDG 6 needs to consider how funding systems interact with capital markets. Three interlinked funding barriers are particularly significant, summarised in Figure A1.3 and explored in turn.

Figure A1.3  
Barriers to funding



Source: Oxera

<sup>138</sup> OECD (2022), 'Financing a Water Secure Future', OECD Studies on Water, OECD Publishing, Paris.

<sup>139</sup> Ibid., p. 71.

<sup>140</sup> Natural monopoly refers to an industry in which certain characteristics, such as large economies of scale, mean that it is most efficient to have one provider. Due to the need to maintain a large water supply network, most water systems in an area are provided by one supplier.

<sup>141</sup> World Bank Group (2019), 'Enforcing contracts', Doing Business Archive, May.

<sup>142</sup> Khan, M., Watkins, M. and Zahan, I. (2022), 'De-risking private power in Bangladesh: How financing design can stop collusive contracting', *Energy Policy*, 168.

<sup>143</sup> OECD (2018), 'Subnational Public-Private Partnerships: Meeting Infrastructure Challenges', OECD Multi-level Governance Studies.

### A1.3.1 Undervaluation of water and insufficient cost recovery

Water tariffs in many jurisdictions do not reflect either the full economic value of water or the true costs of providing water services. Water systems generate significant public benefits—including improved public health, ecosystem protection and climate resilience—that are rarely incorporated into pricing structures. At the same time, polluter pays principles are often weakly enforced, meaning the costs of agricultural runoff or industrial pollution are frequently borne by utilities or taxpayers rather than by polluters.<sup>144</sup> As a result, water is systematically undervalued in pricing systems and investment decisions, contributing to chronic underinvestment in water quality, ecosystem protection and system resilience.

User tariffs are nonetheless the primary funding source for many water systems.<sup>145</sup> Where tariffs do not cover operational and maintenance costs, let alone capital reinvestment, utilities must rely on uncertain fiscal transfers. Political resistance to tariff increases, affordability concerns, weak billing systems and collection inefficiencies can further limit realised revenues. Subsidies may also be poorly targeted: quantity-based subsidies, for example, are often regressive as poor households tend to be larger. Further, many low-income households are often connected to formal utility networks, meaning that subsidies for utility-provided services often largely benefit middle- to upper-income households.<sup>146</sup>

Reliance on tariffs varies significantly across jurisdictions. While some systems, such as that of the UK, are funded largely through user tariffs, others maintain very low tariffs or none at all.<sup>147</sup> In many contexts, this results in revenues that are insufficient to support long-term investment. In archetype 1 systems, investment needs are increasingly concentrated on resilience improvements whose benefits are difficult to demonstrate to consumers in the short term, making tariff increases politically challenging. In archetype 3 systems, small and dispersed service providers often have limited and uncertain revenue bases, meaning funding frequently depends on governments or development partners.

Without predictable and cost-reflective revenue streams, utilities struggle to demonstrate financial sustainability or bankability, even where financing instruments are available.

<sup>144</sup> Global Commission on the Economics of Water (2024), 'Valuing the hydrological cycle as a global common good', October.

<sup>145</sup> OECD (2022), 'Financing a Water Secure Future', OECD Studies on Water, p. 66.

<sup>146</sup> Andres, L., Thibert, M., Lombana Cordoba, C., Danilenko, A., Joseph, G. and Borja-Vega, C. (2019), 'Doing More with Less: Smarter Subsidies for Water Supply and Sanitation', World Bank Group, Working Paper, June.

<sup>147</sup> Ofwat (2022), 'Investment in the water industry', 11 March; UN Water and WHO (2017), 'GLAAS 2017 Report', p. 17.



The message from the investor community is clear: unless these funding barriers are addressed, efforts to scale financing for SDG 6 will remain constrained.

### A1.3.2 Constrained and unpredictable public budgets

Public budgets remain foundational to water infrastructure and pro-poor service provision. Water has historically been a low investment priority for many countries, even in the most advanced economies, often overshadowed by competing fiscal demands—a challenge now compounded by rising debt burdens and tightening fiscal space.

Even where allocations are formally made, unpredictability in disbursement undermines planning and maintenance. Irregular funding flows delay projects, increase costs and weaken confidence among co-financiers. Underfunding of operations and maintenance accelerates asset deterioration, raising long-term financing.

In addition to this, unpredictable funding can be a result of a lack of political will and organisation around support for the water sector. Reform efforts, partially aimed at increasing the amount of funding for the water sector, can falter with changes of government or competing priorities unless consensus is built around the importance of the water sector.

### A1.3.3 Available funding that is not effectively spent

A distinct barrier arises where public funding is allocated but not fully or effectively utilised. Weak procurement systems, limited project preparation capacity, bureaucratic bottlenecks and governance shortcomings can result in low budget execution rates. Between 2009 and 2020, the proportion of the global water sector's budget that was actually spent was around 72%, meaning that nearly one-third of allocated funds went unused.<sup>148</sup> There is substantial regional and sectoral variation: budget execution rates are highest in Europe and Central Asia (87%) and lowest in the Middle East and North Africa (67%).<sup>149</sup> The water sector's execution rate is also lower than transport (91%) and agriculture (89%), suggesting comparatively weaker implementation capacity.

Low execution rates are symptomatic of broader constraints on financial absorptive capacity, driven by systemic challenges in public investment and financial management systems, project planning, and cross-agency coordination.

Water infrastructure projects typically span multiple years from preparation through to implementation, leaving annual spending vulnerable to delays in project design, procurement, land acquisition, permitting and fund disbursement. Limited technical and managerial capacity, fragmented funding flows and weak coordination across agencies can further slow project delivery and reduce the sector's ability to absorb available resources.

In some cases, inefficient allocation compounds the problem. Capital investments may be prioritised over lifecycle maintenance, leading to deteriorating assets and stranded infrastructure. Investment planning may also fail to reflect service delivery realities.

The result is a dual inefficiency: funds are either left unspent or invested in ways that do not deliver the greatest service improvements. This weakens sector performance and reduces confidence among potential financiers.

Under-execution of public budgets can also undermine financial sustainability. When planned transfers, maintenance allocations or operating subsidies are delayed or only partially disbursed, expected revenue streams may not materialise. Utilities may then rely more heavily on tariffs or ad hoc funding, weakening creditworthiness and discouraging lenders. Predictable public funding commitments are therefore often essential to sustaining operations and supporting viable long-term investment.



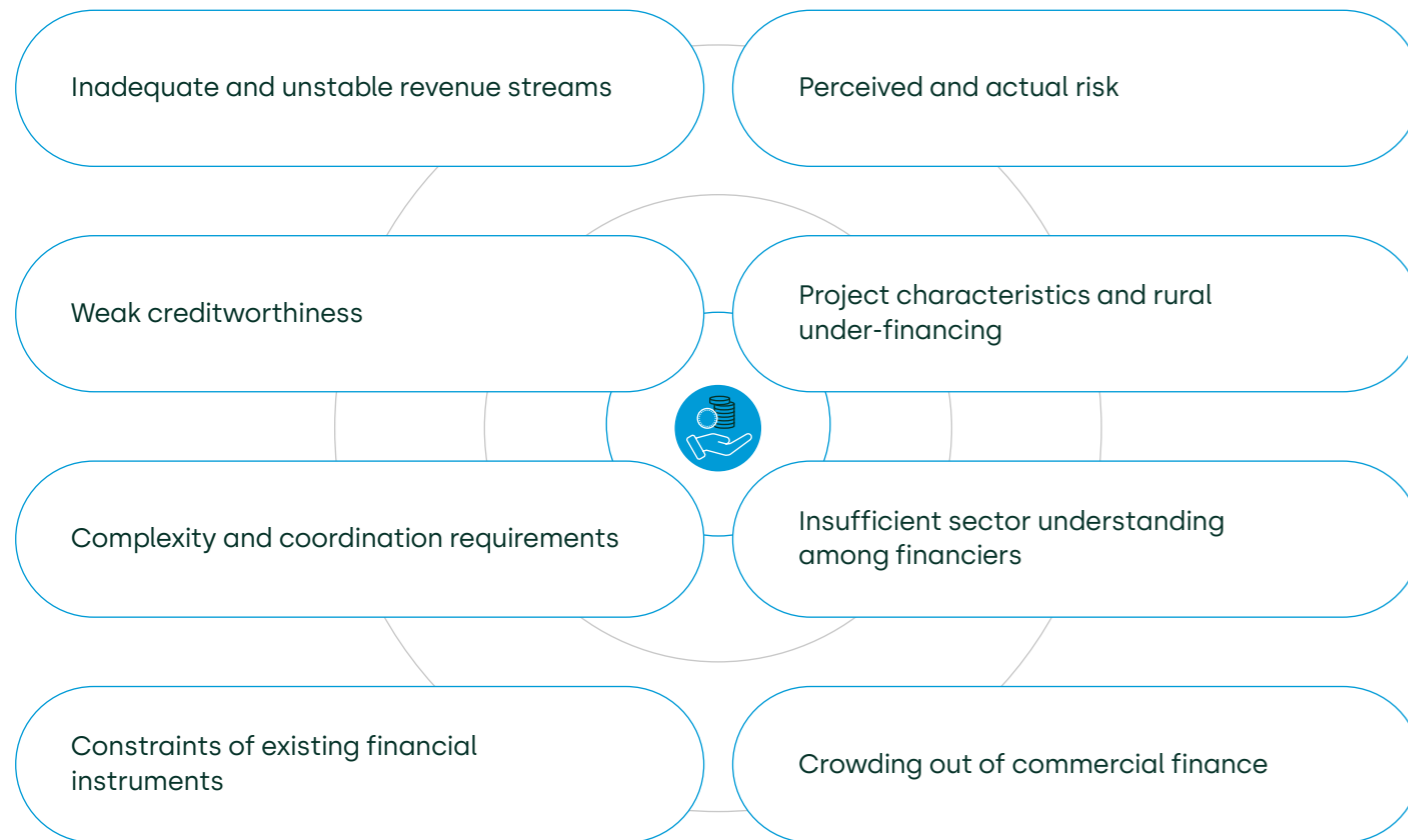
<sup>148</sup> World Bank (2024), 'Funding a water-secure future: an assessment of global public spending'.

<sup>149</sup> Ibid., Box 3.2.1.

### A1.4 Financing barriers

Financing is often misunderstood in the context of SDG 6: it is not a substitute for sustainable funding or a standalone fix for investment gaps, but a tool to mobilise upfront capital based on the expectation of reliable future revenues. The barriers to financing are summarised in Figure A1.4 and explored in turn.

Figure A1.4  
Barriers to financing



Source: Oxera

#### A1.4.1 Inadequate and unstable revenue streams

Financing requires stable and sufficient cash flows. Many SDG 6 investments, particularly in sanitation, rural water supply, watershed protection and climate resilience, exhibit public good characteristics and do not generate direct or fully cost-recovering revenues. Their social and environmental benefits are diffuse, long term and not easily monetised. Revenue streams may be inadequate, and unstable.

Where tariff systems are politically constrained or set below cost-recovery levels, utilities are unable to generate operating surpluses or demonstrate creditworthiness. Even when infrastructure is socially valuable, the absence of predictable revenue undermines its bankability. Investors cannot underwrite projects on the basis of societal benefit alone; they require clear repayment capacity.

This is a particular issue for archetype 2 systems, where utilities operating in rapidly urbanising areas may suffer from operational inefficiencies and struggle to achieve cost recovery through tariff collection. This may mean utilities struggle to generate the predictable and regular cashflows required to attract commercial finance. This issue is accompanied by high levels of NRW in these systems, which further reduces revenue below the level required for cost recovery, negatively impacting creditworthiness.

Furthermore, both archetype 3 and 4 systems are also likely to face challenges in achieving appropriate funding. Archetype 3 systems typically have unstable funding, made up of constrained public budgets, ad hoc community contributions, and declining ODA. Archetype 4 systems have high costs per connection, despite aggregation, coupled with households' low ability to pay. Both of these systems face constrained and unstable revenue streams that reduce the ability of these systems to attract commercial financing.

#### A1.4.2 Investment risk in complex water systems

Water investments often operate within complex regulatory, political and environmental contexts. Investors may perceive heightened risk in jurisdictions characterised by both sector-specific factors and broader macro-level conditions, including:

- Policy or tariff uncertainty
- Environmental obligations
- Weak enforcement of contracts
- Political interference in cost recovery
- Currency volatility
- Underfunded maintenance regimes that increase asset deterioration

Higher perceived risk translates into a higher cost of capital. Banks must hold more capital against exposures deemed high risk, reducing their appetite. Institutional investors bound by prudential regulation may avoid non-investment-grade assets altogether. The result is a structural financing premium for water projects in precisely the contexts where investment needs are highest.

#### A1.4.3 Weak creditworthiness

Creditworthiness is central to accessing both commercial and concessional finance. Chronic underpricing of services erodes balance sheets and constrains borrowing capacity. In addition, due to historical reliance on public funding and concessional finance, service providers may also lack the expertise and capacity needed to effectively produce supporting documentation such as financial statements and cost-benefit analyses.<sup>150</sup> In this sense, weak creditworthiness is often an outcome of underlying funding, governance and operational challenges, rather than a standalone issue.

Weak credit profiles exclude entities from large pools of institutional capital, particularly where regulatory frameworks limit exposure to sub-investment-grade assets. In Emerging Markets and Developing Economies (EMDEs), underdeveloped domestic capital markets further restrict access to long-term local currency financing, exposing borrowers to foreign exchange risk when borrowing internationally.

Even concessional lenders may be constrained where repayment capacity is uncertain. Thus, poor creditworthiness represents both a financing barrier and a reflection of deeper funding and governance challenges. Further, lack of investment quality data can constrain investment in the water sector from both commercial and concessional lenders.

#### A1.4.4 Project characteristics and rural under-financing

Many water projects are small-scale, bespoke and highly context-specific. Rural supply systems, decentralised sanitation, nature-based solutions and catchment restoration initiatives are often tailored to local hydrological and social conditions. While appropriate from a service perspective, this limits standardisation.

Investors typically favour scalable and replicable asset classes that reduce transaction costs and enable portfolio approaches. Fragmented project pipelines increase due diligence costs and reduce the efficiency gains associated with scale. Without aggregation mechanisms or programmatic approaches, financing remains transaction-intensive and unattractive to large investors.

<sup>150</sup> OECD (2019), 'Making Blended Finance Work for Water and Sanitation: Unlocking Commercial Finance for SDG 6', OECD Studies on Water, OECD Publishing, Paris, p. 43.

#### A1.4.5 Complexity and coordination requirements

Water investments frequently require coordination among multiple actors: national and local governments, regulators, MDBs, DFIs, private operators and community stakeholders. Blended finance structures, while valuable for risk mitigation, can introduce contractual complexity and extended negotiation periods.

Poor risk allocation within PPP arrangements can further deter private investment. If risks are transferred in ways that private partners cannot reasonably manage—for example, political or demand risk without compensatory mechanisms—projects become unviable. Conversely, excessive public assumption of risk may undermine value for money and create fiscal exposure. Weak PPP frameworks can also deter private capital. Where procurement processes lack transparency, risk allocation is unclear, dispute resolution mechanisms are ineffective, or regulatory oversight is inconsistent, investors perceive elevated political and contractual risks.

Institutional capacity constraints can also delay procurement, weaken contract management and reduce investor confidence. Capacity constraints, at both local and central levels of government, can also hinder the ability of policymakers to engage with the private sector on establishing PPPs. Given the administrative burden inherent in navigating complex regulatory environments, designing a flexible and inclusive framework for enabling PPPs can support private-sector participation.<sup>151</sup>

#### A1.4.6 Challenges in assessing water sector investments

Despite the essential nature of water services, the sector is often perceived as technically complex and operationally opaque. Financial institutions may lack familiarity with regulatory structures, tariff-setting processes or performance benchmarks. Limited availability of comparable project data restricts accurate risk assessment. This information asymmetry increases due diligence costs and may result in conservative risk pricing or outright avoidance. Even in developed markets, water can be viewed as a niche infrastructure class relative to transport or energy.

Financiers may have limited familiarity with rural water revenue profiles, seasonal variability, and low-margin operating environments in archetype 4 systems. Conventional infrastructure lending structures often assume stable and predictable cash flows, whereas aggregated rural systems may experience seasonal demand variation and fluctuating collection rates. These challenges are often most pronounced in newer aggregation models with limited track records. Limited sector-specific expertise among financial institutions can therefore constrain investment and increase perceived risk premiums.

<sup>151</sup> OECD (2018), 'Subnational Public-Private Partnerships: Meeting Infrastructure Challenges', OECD Multi-level Governance Studies.

#### A1.4.7 Constraints of existing financial instruments

Financial instruments with the potential to mobilise greater investment in the water sector, including green bonds, climate finance, and other innovative mechanisms, remain underdeveloped and underutilised.<sup>152</sup> The limited availability of de-risking instruments and guarantees constrains private participation by failing to address key regulatory, revenue, and implementation risks. Consequently, financing options are frequently high-cost, short-tenor, and misaligned with the risk profile and long asset life of water infrastructure.<sup>153</sup> For example, in Cambodia, high collateral requirements and relatively short tenures on available loans constrain investments by private water operators (PWOs).<sup>154</sup>

This can be an issue for archetype 2 systems where rapid urbanisation increases demand for long-term infrastructure investment, but these locations also lack local capital market depth. Utilities may rely on foreign borrowing, exposing them to exchange rate volatility, or face short-term lending that is ill-suited for larger capital projects. This reinforces dependency on public transfers or concessional finance.

For some archetype 3 systems, this issue arises because the water sector providers themselves are often not formal legal entities that are able to borrow and invest. Providers may be managed informally by communities and volunteers, and may lack the organisational discipline required to generate an operating surplus, where enabled by tariffs. Establishing the appropriate legal and governance structures is therefore necessary to incentivise these systems to generate an operating surplus, and to then access finance.

#### A1.4.8 Crowding out of commercial finance

In some contexts, public finance and/or grant and concessional financing is deployed in ways that inadvertently crowd out commercial financing.

If public and/or grant resources are not strategically targeted toward genuinely unbankable segments, they can eliminate opportunities for commercial participation, resulting in a gross misallocation of increasingly scarce public and grant financing. Effective sequencing and targeting of public finance is therefore essential to ensure additionality rather than substitution.

<sup>152</sup> OECD (2025), 'Strengthening the sustainability of water instruments: Alternative financing approaches and models', 12th Roundtable on Financing Water: Thematic meeting.

<sup>153</sup> Pories, L., Fonseca, C. and Delmon, V. (2019), 'Mobilising Finance for WASH: Getting the Foundations Right', *Water*, 11:11, November

<sup>154</sup> World Bank Group (2023), 'Country climate and development report: Cambodia', September.



Where public budgets or concessional finance are directed toward projects that could attract commercial funding, they may displace rather than mobilise private investment.

## A2 Archetype case studies

The following case studies highlight policies, institutional arrangements and financing initiatives relevant to the archetypes discussed in this report. They show how different jurisdictions have addressed service delivery and financing challenges in practice. Each case study is structured around three sections: **context and objectives, design and implementation**, and **financing outcomes and impact**, concisely examining how different approaches influenced financing access and service outcomes.

### A2.1 Tariff reforms in Malaysia—archetype 2

#### Context and objectives

Globally, balancing affordability, cost recovery and investment capacity poses a fundamental challenge for water sector utilities. Tariffs represent a key source of funding for water and sanitation services,<sup>155</sup> directly impacting providers' ability to achieve and maintain quality of service and undertake capital investment. While there is limited consensus on optimal tariff design,<sup>156</sup> regulators and utilities may benefit from considering tariff differentiation across user types—for example, domestic, commercial and industrial users—to better align rates charged to customers with the costs imposed by each user category.

In Malaysia, differentiated tariff structures between domestic and non-domestic users have been used as a core tool to balance affordability objectives with financial sustainability. Historically, water tariffs in many states were maintained at a stable level for decades, leading to average tariffs frequently lagging behind actual costs of provision.<sup>157</sup> Recognising these challenges, the national regulator, Suruhanjaya Perkhidmatan Air Negara (SPAN), introduced a Tariff Setting Mechanism (TSM) to standardise tariff structures and gradually move tariffs closer to cost-reflective levels.

Differentiated tariffs are becoming increasingly relevant as industrial growth and expansion of water-intensive infrastructure—including data centres—place additional pressure on bulk water supply, treatment capacity and distribution networks.

#### Design and implementation

Malaysia's water tariff structures typically apply higher volumetric rates to commercial and industrial users than to domestic consumers.<sup>158</sup> From an economic perspective, differentiated tariffs can allow pricing structures to better reflect the principle of cost causation, whereby customers pay in proportion to the incremental costs they impose on the water system. Industrial and other high volume users may require larger or more reliable supply infrastructure, a factor that has been recognised by those in government.<sup>159</sup> Serving such demand can necessitate expanded treatment capacity, transmission systems, storage, and network reinforcement, all of which carry significant capital and operating costs for utilities. The differentiated tariff structure is also likely to reflect differences in willingness and ability to pay across consumer groups. Commercial and industrial users are likely to demonstrate a higher willingness and ability to pay for reliable water services, particularly where water is critical for production or cooling. Structuring tariffs to capture these contributions can generate more predictable and stable revenue streams while allowing domestic tariffs to remain comparatively affordable.

#### Financing outcomes and impact

From a financing perspective, differentiated tariffs can support utilities' creditworthiness and investment planning by ensuring that revenue streams reflect both the cost of service provision and users' ability and willingness to pay.

In Malaysia, tariff increases for a range of consumer groups and the introduction of a new tariff category specifically for data centres led to stronger-than-expected results for Ranhill Utilities Bhd, lifting the provider's water revenue to a record high.<sup>160</sup> Increasing revenue from differentiated tariff structures is likely to lead to improved creditworthiness and a reduction in financing costs. Improved revenue is likely to be reflected in higher earnings before interest, taxes, depreciation, and amortisation (EBITDA) margins, a key profitability measure used to measure the creditworthiness of utilities.<sup>161</sup> Given the need for significant investment to reduce NRW in the country, improved revenue streams are therefore likely to improve the ability of providers to access finance, upgrade infrastructure and reduce leakage from the high levels currently seen.<sup>162</sup>

As Malaysia continues to expand industrial and digital infrastructure, such tariff structures are likely to play an increasingly important role in ensuring utilities can finance the capital investments required to expand and sustain water and sanitation services while maintaining equitable access for households.

<sup>155</sup> OECD (2009), 'Managing Water for All', March.

<sup>156</sup> Andrés, L., Saltiel, G., Misra, M., Joseph, G., Cordoba, C., Thibert, M and Fenwick, C. (2021), 'Troubled Tariffs, Revisiting Water Pricing for Affordable and Sustainable Water Services', World Bank Group, p. 11.

<sup>157</sup> Mahmud, A. (2024), 'Malaysia's water tariff hike is the first increase in decades for some households. What will it achieve?', Channel News Asia, 27 January.

<sup>158</sup> For example, see Air Selangor (2025), 'Water Tariff 2025'.

<sup>159</sup> The Star (2025), 'Data centre demand will not cause domestic water tariff hike, says Akmal Nasrullah', 8 December, accessed 20 March 2026.

<sup>160</sup> The Star (2025), 'Data centre demand, tariff hikes to lift Ranhill', 1 December, accessed 20 March 2026.

<sup>161</sup> World Bank Group, 'Measuring Creditworthiness of Water Utilities', Session 10.

<sup>162</sup> Ahmad, R., Samsudin, S., Azmi, N. and Yatim, N. (2024), 'Addressing Non-Revenue Water Challenges: a Pathway Towards Sustainable Development Goal (SDG)', *Journal of Lifestyle and SDGs Review*, 5:1.

## A2.2 Manila—archetype 2

### Context and objectives

In 1994, the Metropolitan Waterworks and Sewerage System (MWSS) supplied water to two-thirds of Metro Manila. The standard of water and sewerage services was low: water was supplied to only two-thirds of its coverage population for an average of just 16 hours per day, while sewerage services were provided to only 8% of MWSS's coverage population.<sup>163</sup> NRW exceeded 50%, and overall, only 26% of the East Zone of Manila had access to a continuous water supply.<sup>164</sup> Poor service provision left the government unable to raise water tariffs, leading to very low cash flow,<sup>165</sup> constraining both network expansion and maintenance of existing infrastructure.

The passing of the Water Crisis Act 1995 gave the President the authority to privatise MWSS, but did not prescribe 'any particular procedure for privatisation'.<sup>166</sup> The Water Crisis Act was subsequently used as the legal basis for implementing the concession model that followed.

### Design and implementation

With a water system characterised by intermittent supply and leakage, the Government of the Philippines restructured water and sanitation services in Metro Manila through two long-term concession contracts in 1997. These were awarded by MWSS to the Manila Water Company for the East Zone—formed by Ayala Corporation and its international partners, United Utilities (the UK) and Bechtel Corporation (the US)—and to Maynilad Water Services for the West Zone, formed by Benpres Holdings of the Lopez Group together with its international partner, Lyonnaise des Eaux (France).<sup>167</sup> These international partners brought both technical expertise and access to financing, strengthening the capacity of the new concessionaires to meet ambitious service targets.

The concessions established clear goals, including reaching 24/7 water service within six years and universal coverage for water within 11 years. In addition, water quality was to meet national standards at an elevated pressure of 16 psi. A key structural feature of the 1997 agreements was a performance undertaking issued by the government's Department of Finance. This effectively guaranteed the most crucial commitments on behalf of the MWSS. This has been recognised as one of the most important drivers of the transaction, as it provided necessary comfort to the bidders, and their bankers.<sup>168</sup>

### Financing outcomes and impact

The concession system led to a significant increase in investment in the water system. For example, Manila Water disbursed over PHP 111 billion in capital expenditure. This is 'roughly twice the value of assets earmarked for the East Zone Service Area of Metro Manila and Rizal Province'. Operating expenditure also grew significantly.<sup>169</sup> NRW has also greatly reduced from the exceptionally high levels seen pre-concession, to around 13% in the case of Manila Water<sup>170</sup> and 31% in the case of Maynilad Water.<sup>171</sup>

In addition, the concessionaire's ongoing ability to raise finance has been supported by the involvement of development institutions. Having played a key advisory role in the original development of the concession agreements,<sup>172</sup> the IFC acquired a 9% stake in Manila Water in 2004, representing its first East Asian water sector investment.<sup>173</sup> In addition, the IFC extended a \$30 million, 13-year loan to the provider, used for funding capital requirements and further regional expansion. This acted as a 'stamp of approval', supporting the company's initial public offering in 2005.<sup>174</sup>

Overall, the Manila concessions demonstrate how implementation of an effective PPP arrangement can lead to significant gains in efficiency and service delivery, in particular when underpinned by governmental guarantees (such as a performance undertaking) and financing streams from development institutions.

<sup>163</sup> Dumol, M. (2000), 'The Manila Water Concession, A Key Government Official's Diary of the World's Largest Water Privatization', The World Bank, July, p. 5.

<sup>164</sup> Rivera Jr, V. (2024), 'A concession success story: the private sector's role in water and sanitation in Manila', Proparco Groupe AFD, 3 December, accessed 20 March 2026.

<sup>165</sup> Ibid.

<sup>166</sup> Dumol, M. (2000), 'The Manila Water Concession, A Key Government Official's Diary of the World's Largest Water Privatization', The World Bank, July, p. 25.

<sup>167</sup> Asian Development Bank (2012), 'Good Practices in Urban Water Management', p. 163.

<sup>168</sup> Dumol, M. (2000), 'The Manila Water Concession, A Key Government Official's Diary of the World's Largest Water Privatization', The World Bank, July, p. 44.

<sup>169</sup> Rivera Jr, V. (2024), 'A concession success story: the private sector's role in water and sanitation in Manila', Proparco Groupe AFD, 3 December, accessed 20 March 2026.

<sup>170</sup> Manila Water (2026), 'Manila Water replaces over 160,000 meters in 2025', 23 February, accessed 20 March 2026.

<sup>171</sup> Maynilad Water (2026), 'Maynilad cuts NRW to 30.7% by year-end 2025', 26 January, accessed 20 March 2026.

<sup>172</sup> International Development Select Committee (2006), 'Joint memorandum submitted by United Utilities plc and Manila Water Company', September.

<sup>173</sup> Peña, Z. (2004), 'IFC takes 9% stake in Manila Water', The Philippine Star, 2 June, accessed 20 March 2026.

<sup>174</sup> International Finance Corporation (2014), 'Manila Water Company, Inc.', August, p. 4.

### A2.3 Rural Nepal—archetype 3

#### Context and objectives

More than a third of Nepal's population live in rural municipalities where providing water services presents persistent structural challenges.<sup>175</sup> Dispersed settlements, rugged mountainous terrain, and limited commercial potential constrain opportunities for financing water services through private sector investment in these settings. In contrast to urban areas served by larger providers—such as Kathmandu Upatyaka Khanepani Limited—rural water services are typically smaller schemes, managed by community-based Water and Sanitation User Committees (WSUCs). Financing for these services remains heavily dependent on public funding. Subnational governments rely heavily on federal 'equalisation grants' to fund local WASH services. In turn, Nepal's federal expenditure in the WASH sector is heavily dependent on foreign loans and grants to finance sector development.<sup>176</sup>

Achieving SDG 6 in these contexts presents challenges, and may require bespoke approaches tailored to the region in question. This case study focuses on investments in data systems and the use of Water Use Master Plans (WUMPs) to formalise localised action on water provision.

#### Design and implementation

Nepal has introduced several complementary reforms aimed at strengthening rural water governance. WUMPs—recognised as good practice by the government of Nepal—represent a participatory planning tool and process, applying an integrated regional water management (IRWM) approach enabling action rooted in local community needs.<sup>177</sup> These plans can be adapted to a wide range of contextual situations to reflect diverse sets of requirements across settlements. This process involves considering local water resources, as well as water demands and potential uses, through a holistic and integrated approach.<sup>178</sup> This can help ensure marginalised or underserved groups are included in planning processes, expanding access to water and sanitation to those lacking appropriate service.

In addition, Nepal introduced institutional reforms such as the NWASH system.<sup>179</sup> NWASH is Nepal's national monitoring platform for tracking water quality, service functionality, and investment in infrastructure planning. The system supports local governments in prioritising water supply and sanitation projects, maintaining an asset inventory, and identifying gaps in order to achieve SDG 6 targets. While capacity limits have been recognised as constraining data collection and monitoring in some local governments,<sup>180</sup> this system has been described as 'pivotal' in Nepal's use of data to transform its sanitation efforts<sup>181</sup> through improved evidence-based decision-making in the sector. Data from 625 local governments have been recorded on the NWASH system to date.<sup>182</sup>

<sup>175</sup> Nepal Economic Forum (2022), 'Key highlights from the Census Report 2021', 15 February, accessed 20 March 2026.

<sup>176</sup> WaterAid (2025), 'Fiscal decentralisation and water, sanitation and hygiene services', March, p. 34.

<sup>177</sup> Helvetas (2013), 'Water Use Master Plan: The Nepal Experience', 13 November.

<sup>178</sup> Helvetas, 'Water Use Master Plan (WUMP)', Helvetas Project Experience.

<sup>179</sup> Unicef (2021), 'N-WASH Management Information System (MIS)', December.

<sup>180</sup> Asian Development Bank (2022), 'Accelerating Sanitation for All in Asia and the Pacific', Technical Assistance Consultant's Report, July, p. 22.

<sup>181</sup> Environment and Public Health Organisation (2025), 'Nepal Progress Towards Achieving 2030 Sanitation Goal', 3 February.

<sup>182</sup> Ministry of Water Supply (2026), 'National WASH Data Collection Status'.



## Financing outcomes and impact

In regions where settlement dispersion structurally limits professionalisation and private sector delivery, effective monitoring and allocation of funding are crucial for improving WASH outcomes and expanding coverage. For example, WUMPs have been used to identify water hardship areas where piped gravity schemes are infeasible, and alternatives such as solar lift pumps and rainwater harvesting have been implemented.<sup>183</sup> Data from the NWASH system is widely used by local governments to prepare municipal-level WASH plans. WaterAid and the Department of Water Supply and Sewerage Management recently ranked municipalities by service levels using NWASH data, with plans to rank them across a range of performance measures in future. Nepal has made steady progress towards SDG 6, reaching 95.5% sanitation coverage and 88.6% water supply coverage. The nation was also declared Open Defecation Free in 2019,<sup>184</sup> following the completion of a nationwide campaign.

However, sustaining these improvements requires continued strengthening of local governance and financial management models. Capacity at local government level is required to improve absorption of allocated budgets effectively and improve their ability to generate and manage revenue at the subnational level.<sup>185</sup> Federal restructuring in 2015 created uncertainty over which level of government is responsible for setting standards, financing infrastructure, overseeing service delivery, and bearing the associated costs.<sup>186</sup> Clearer delineation of roles, responsibilities and functions would strengthen accountability and improve the efficiency and sustainability of water and sanitation services across the country. This would help enable greater accountability at all levels, and the NWASH system could play a central role in monitoring the status of WSUCs against KPIs and displaying the results in the portal.<sup>187</sup>

Relatedly, a substantial gap exists between the support that service providers should receive under the WSUC management model, and the actual support received across a range of areas, impeding professionalisation. A number of government interventions have been proposed to address these issues, including: formulating a dedicated strategy for professionalising rural water supply provision; enhancing monitoring and regulation; developing tailored capacity-building support to service providers; and building the material, financial, and human capacity of relevant government offices, at local and provincial levels.<sup>188</sup>

<sup>183</sup> Helvetas (2021), 'Water Use Master Plans: What They Entail', March.

<sup>184</sup> Environment and Public Health Organisation (2025), 'Nepal Progress Towards Achieving 2030 Sanitation Goal', 3 February.

<sup>185</sup> WaterAid (2025), 'Fiscal decentralisation and water, sanitation and hygiene services', Case study: Nepal, March.

<sup>186</sup> Ibid.

<sup>187</sup> As the regulatory environment matures and evolves, this monitoring could allow a financial incentive framework to be developed to help drive sustained delivery against targets.

<sup>188</sup> WaterAid (2024), 'Professionalising rural and small town water supply management: the need to enhance support arrangements', Nepal Country Brief, December 2024.

## A2.4 Rwanda—archetype 4

### Context and objectives

In the 1990s Rwanda's rural water supply was highly fragmented. The Rwandan Civil War and 1994 genocide led to significant damage to infrastructure, and the sector faced a number of challenges including high per capita investment costs and low sustainability. A 2004 World Bank-commissioned field review found that due to inadequate management and low cost recovery, around half of Rwanda's piped rural water supply systems were nonfunctional.<sup>189</sup>

Users often did not pay for the water they consumed, and some fees that were collected were mismanaged.<sup>190</sup> In 2004, the government introduced a delegated management model, within which, district governments play a crucial role.

### Design and implementation

These and future reforms saw the role of the public sector shift from direct provider to facilitator, with central government providing support to district authorities and water users' associations.

Piped water schemes are segregated into clusters, allowing operators—and communities—to benefit from consolidation and economies of scale. The Rwanda Utilities Regulatory Authority (RURA) issues licenses to private firms, who can then be contracted by districts for the operation and maintenance of schemes in a given geographic 'cluster'. Under this 'affermage' model, district governments maintain ownership of the relevant assets, and operator remuneration depends on revenues from water sales. The district also receives a fee, which increases with the volume of water sold under the delegated contract.<sup>191</sup> The Water and Sanitation Corporation (WASAC) provides higher-level technical support, while District Water Boards facilitate communication with water user committees and consumers, in the case of complaints, for example.

<sup>189</sup> International Finance Corporation (2010), 'Improving Rural Water Service in Rwanda with Public-Private Partnerships', SmartLessons, November.

<sup>190</sup> Ministry of Infrastructure, Republic of Rwanda (2019), 'National Guidelines for Sustainable Rural Water Supply Services', Edition 1.0, May, p. 1.

<sup>191</sup> Kenya Markets Trust (2023), 'A Global Water Benchmarking Study For Kenya', p. 8.

Investments were also made into improving data provision and monitoring. A permitting system operates through an efficient online portal, and a water information system has been developed. This spatial database helps identify key areas at risk of erosion, and water quality is tested at regular intervals. The government continues to drive improvements in data gathering and sharing, with the majority of the country's monitoring stations installed after 2020.<sup>192</sup>

#### Financing outcomes and impact

Rwanda's delegated management and clustering reforms have strengthened operational accountability and financial discipline in rural water services. By pooling multiple schemes into geographic clusters, operators benefit from economies of scale. Analysis of the operating companies in Rwanda's water sector shows that where companies expand to hold more licenses (and therefore cover more service areas), they tend to be better performing.<sup>193</sup>

SDG indicator 6.5.1 assesses four key components of integrated water resource management, each assigned a score out of 100. The overall degree of implementation for IWRM in Rwanda increased significantly between 2017 and 2023, from 35 to 68. At the component level, this comprised improvements from 31 to 83 for 'institutions and participation', and from 28 to 50 for 'financing'.<sup>194</sup>

Access to improved drinking water sources has reached 90% nationally (2023/24), while access to improved sanitation services reached 94% of households.<sup>195</sup>

<sup>192</sup> United Nations (2025), 'Rwanda', SDG 6 Country Acceleration Case Study, December.

<sup>193</sup> Kenya Markets Trust (2023), 'A Global Water Benchmarking Study For Kenya', p. 8.

<sup>194</sup> The degree of implementation for 'enabling environment' also rose from 47 to 76, and from 33 to 66 for 'management instruments'.

<sup>195</sup> National Institute of Statistics of Rwanda, 'Water & Sanitation'.

## A2.5 Brazil—archetypes 2 and 4

### Context and objectives

Brazil has a population of 212.6 million<sup>196</sup> and an economy that currently ranks as the world's 11th largest.<sup>197</sup> In 2019, approximately 92.9% of its urban population was served by water supply services, while 61.9% had access to sewer services. However, access is considerably lower in rural areas, where 32% of the rural population had access to piped water and 5% were connected to sewer networks.<sup>198</sup>

In Brazil, responsibility for the provision of water and sanitation services is held at the level of the state government, with services historically provided directly by state-owned enterprises (SOEs). During the COVID-19 pandemic, under government mandates to provide water and sanitation services free of charge, many SOE water and sewerage utilities—whose financial status were already out of compliance with fiscal regulations—were pushed toward bankruptcy.<sup>199</sup> Brazil's macroeconomic conditions at the time, combined with other fiscal constraints, also meant that there was very limited public investment available for SOEs to attempt to recover.

### Design and implementation

Against this backdrop of the significant need to accelerate expansion in access to service, especially within rural areas, and the newfound insolvency of many SOE water utilities, Brazil introduced federal legislation in 2020 that is widely credited for the transformation of its sector. With the universalisation of sanitation and water supply by 2033 as its goal, Brazil's New Sanitation Legal Framework of 2020 incentivised the regionalised provision of services, encouraged competition from the private sector to attract investment, and provided regulatory uniformity of the sector, including the standardisation of contracts. The regionalisation of service provision was critical, as it enabled potential contracts to gain scale and, in turn, economic viability.

Brazil's national development bank, BNDES, has played an indispensable role in enabling private investment in the sector by providing affordable anchor financing to private investors, enabling them to crowd in additional investment from multilateral development banks, corporate finance and other sources. While BNDES has increased its lending to the sector seven-fold, lending a total of \$6.88 billion since 2020, it has in parallel reduced the sector's reliance on its own financing from 90% (15 years ago) to 60%, currently.<sup>200</sup>

<sup>196</sup> Brazilian Institute of Geography and Statistics (2024), 'Brazil's estimated population will reach 212.6 million residents in 2024', 29 August, accessed 20 March 2026.

<sup>197</sup> Valor International (2026), 'Brazil slips to 11th in global GDP ranking as Russia moves ahead', 5 March, accessed 20 March 2026.

<sup>198</sup> World Bank (2022), 'All Drops in the Bucket for Universalization: Public Expenditure Review of Water and Sanitation in Brazil', March.

<sup>199</sup> Ibid.

<sup>200</sup> Quaresma, M. (2026), 'How BNDES wrote the rulebook on financing Brazil's water sector', Global Water Intelligence, 28 January.

### Financing outcomes and impact

Brazil has mobilised over \$33.94 billion in public and private investment in its water and sanitation sector since 2000, among the highest levels of investment by any middle-income country globally.<sup>201</sup> While India has seen similar levels of investment over this period, most of its investment has been via public grants.

By 2025, in approximately one third of Brazilian municipalities—covering around 40% of Brazil's population—water and sanitation services were provided either under a full or partial private services concession or under other PPP contracts, a 525% increase from 2019.<sup>202</sup> From 2019 to 2023, the latest period for which comprehensive data is available, Brazil newly connected approximately 6.3 million households to piped water and nearly 6.2 million households to sewerage networks, with significant increases in access to services among lowest-income communities.<sup>203</sup>

Other middle-income countries seeking to learn from Brazil's experience may start by introducing similar regulatory and legislative drivers that require SOE water utilities to be fiscally solvent, and also introduce consequences where they are not, such as opening markets to private competition. National development banks will likely need to be ready to play a leading role in mobilising affordable, yet repayable, public finance that can crowd in new private investment at scale.

<sup>201</sup> Elias, J. (2025), 'Número de cidades com saneamento privatizado cresce 500% em 5 anos', *Veja Negócios*, 5 August, accessed 20 March 2026.

<sup>202</sup> ABCON (2025), 'Panorama de participação privada no saneamento 2025'.

<sup>203</sup> Ibid.



## A3 Wider recommendations

While the focus of the recommendations in this report is on providing a list of actions to consider when developing NWS, there are a number of other recommendations we propose that sit outside these strategies. These focus on developing standards that can be used by governments and supporting organisations, as well as on embedding water strategies within wider government policy frameworks.

### A3.1.1 Develop a consistent methodology for assessing the SDG 6 investment gap

A consistent methodology for assessing the scale of the SDG 6 funding and financing gap, combined with accurate data on current SDG 6 performance, would allow governments and other relevant institutions to assess the areas where funding needs are greatest. This would help to prioritise expenditure from limited funding, ensuring efficient government decision-making.

There is currently no consistent global methodology for calculating the SDG 6 financing gap, and data deficiencies are greatest for marginalised and low-income populations. Existing estimates often understate future needs, as they do not fully incorporate climate stress and long-term resilience requirements.<sup>204</sup>

Governments, multilateral development banks and development partners should collaborate on establishing a consistent framework for:

- Measuring current expenditure flows
- Estimating forward-looking investment needs
- Incorporating climate-adjusted demand projections
- Tracking spending effectiveness

Without clarity on the scale and composition of the financing gap, limited public funds cannot be allocated efficiently. A credible, standardised methodology would improve prioritisation, strengthen budget planning, and support more strategic engagement with private capital. This should define key parameters, including scope, baselines, costing methodologies, expenditure taxonomy, and time horizons, to ensure comparability and practical application. It should also explicitly support the development of investable project pipelines.

Consideration should be given to involving the private sector to ensure alignment with investor expectations and to facilitate capital mobilisation. The methodology could leverage existing standardisation and disclosure initiatives (for example, the International Organization for Standardization (ISO) or International Sustainability Standards Board (ISSB) to enhance coherence and credibility.

### A3.1.2 Addressing fragmentation between the water sector and other sectors of the economy

Although an NWS provides a central framework for addressing water sector challenges, water cannot be managed in isolation. Water resources are deeply interconnected with food security, climate resilience, healthcare, and broader economic development, among other things. Because progress toward SDG 6 generates benefits across these sectors, treating water as a standalone issue risks undervaluing its systemic importance and underinvesting in infrastructure.

SDG 6 objectives should therefore be embedded not only within NWS, but also across national development, climate and economic policy frameworks. Governments should foster a supportive cross-sector policy environment for water-related investment while reducing institutional fragmentation between water and other sectors.

Key actions include:

- **Integrating water into national climate and development planning:** Embed water priorities within Nationally Determined Contributions (NDCs), adaptation plans and resilience strategies to ensure that water projects form part of climate finance pipelines.
- **Strengthening cross-sector governance at regional and municipal levels:** Empower authorities with oversight across interconnected sectors (for example, energy, agriculture, health and environment) to internalise system-wide benefits and coordinate investment decisions.
- **Enabling cross-sector partnerships:** Create regulatory and institutional conditions for collaboration between water, energy, health and agriculture actors, unlocking integrated solutions and new financing opportunities.
- **Removing legal barriers to investment:** Reform constraints that limit utilities' ability to borrow, aggregate, or scale operations, thereby improving access to commercial finance.
- **Incorporating water impacts into wider economic appraisal:** Ensure cost-benefit analyses in non-water sectors account for impacts on water resources and SDG 6 outcomes, supporting more efficient allocation of public investment.

<sup>204</sup> World Bank (2024), 'Funding a water-secure future: an assessment of global public spending', p. 35.

### A3.1.3 Developing a standard for the quality of water governance

Outside of individual countries' NWS, the international community could collaborate on the development of a standard for effective water sector governance. Enabling environments for water investment—including policy and regulatory frameworks, institutional arrangements, data-sharing practices and financing conditions—vary widely across countries, increasing uncertainty and transaction costs for investors and development partners.

A common standard could provide a shared reference point to assess the strength of national enabling environments, improve comparability across jurisdictions and help identify priority reforms. Such a standard could be applied at the national level and include minimum expectations related to data quality, institutional clarity, governance and regulatory effectiveness, supporting more consistent and investable conditions in the water sector. In developing such a standard, consideration should be given to leveraging existing international standard-setting mechanisms, such as the ISO, whose consensus-based processes could support global alignment, harmonisation and the credibility of the framework.

### A3.1.4 Developing a standard to reflect government priorities in water sector investment plans

Over several years the financial community have collaborated to develop a standard that sets out the core principles needed to manage their climate related risks (including both mitigation and adaptation) and to ensure that they have credible organisational strategies to achieve these. A key input to this process came from the Glasgow Financial Alliance for Net Zero (GFANZ) launched at COP26 in Glasgow.<sup>205</sup> Building on this foundation and other relevant financial frameworks from IIGCC, TPT and OECD, ISO has developed ISO 32212, a new international standard for net zero transition planning for financial institutions. While ISO 32212 does not address SDG 6 directly, it provides a credible basis for financial institutions to mobilise and reallocate capital towards water-related adaptation and resilience activities, particularly in developing countries and where these are embedded in national adaptation and transition planning.<sup>206</sup>

The Glasgow Framework seeks to apply a similar logic to the water sector. It identifies key governance conditions needed to mobilise private capital in support of national water policy objectives. One potential next step is the development of an international standard based on these principles, which could act as a counterpart to emerging climate governance standards and provide a consistent foundation for NWS designed to attract long-term investment.

<sup>205</sup> GFANZ, 'Glasgow Financial Alliance for Net Zero'.

<sup>206</sup> The standard is currently in a final draft stage—ISO (2026), 'ISO/FDIS 32212 Sustainable finance — Net zero transition planning for financial institutions'.

## A4 Glossary

Term	Definition
Archetype 1	Captures countries in which water and wastewater networks are well-established and mature, providing near universal coverage to the population. The age of the infrastructure means that sustainable replacement of existing infrastructure is a key consideration. These systems are typically found in high-income, largely urbanised countries with near-universal access to piped water and basic sanitation. They feature mature regulatory frameworks, professional utilities, and strong domestic capital markets. Political and regulatory constraints can limit reinvestment in ageing infrastructure and full-cost recovery, including lifecycle maintenance and climate adaptation. Financing typically combines tariff-based revenue with commercial debt, selective use of concessional finance, public-private partnerships for major projects, and blended finance for resilience and environmental objectives.
Archetype 2	These systems are typically found in middle-income countries experiencing fast urban population growth, including informal or peri-urban settlements. Networks might expand unevenly and may struggle to keep pace with demand. Utilities are often characterised by mixed performance and institutional fragmentation, with high levels of non-revenue water, while billing and collection systems may be weak in informal areas. Funding frequently relies heavily on concessional finance, transfers, and subsidies, while commercial finance is often limited and public-private partnership uptake is inconsistent. Blended finance is increasingly used to make projects bankable.
Archetype 3	These systems consist of small-scale, dispersed rural projects, often community-managed or reliant on independent water sources. They often face low tariff revenue streams, limited professional operations and maintenance capacity, and minimal economies of scale. Grants, Official Development Assistance, and third-sector support dominate funding, with recurrent costs frequently underfunded and community contributions ad hoc. Access to formal debt markets is virtually non-existent in most cases, and financing may be fragmented and delivered on a project-by-project basis.
Archetype 4	These systems aggregate multiple rural schemes under professional management, often supported by cross-subsidies from urban areas or central government. Tariffs are often insufficient for cost recovery, public transfers fill operational gaps, and concessional grants and multilateral development banks support capital projects. Blended finance is increasingly used to build bankable aggregated portfolios, while larger pooled assets may have access to commercial finance.

Term	Definition
Blended finance	A structuring approach that allows for the mobilisation of commercial/private capital by using concessional or philanthropic funds as a de-risking mechanism. <sup>207</sup>
Climate finance	A subset of financing directed toward mitigation and adaptation outcomes, which may be commercial or concessional in nature.
Commercial finance	Finance provided at market rates by private institutions. This includes bank lending (corporate or project finance), capital market instruments such as municipal, green or blue bonds, and equity investments.
Cost recovery	The ability of a service provider to take in sufficient revenues from customers to cover their current and some of their future costs. These include operations and maintenance costs as well as capital costs. <sup>208</sup>
Creditworthiness	An assessment by a lender of a potential borrower's capacity and likelihood to repay their debt obligations.
Crowding in	Occurs when public or concessional funding leads to greater private sector involvement. For example, the use of blended finance may crowd in additional sources of private financing through reduced perceived risk.
Crowding out	Occurs when public spending leads to a decrease in private sector activity (or prevents potential private sector spending being realised).
Debt-for-nature swap	Financial mechanisms that allow portions of a developing country's foreign debt to be forgiven, in exchange for commitments to invest in biodiversity conservation and environmental policy measures. <sup>209</sup>
Desalination	The process of removing salts and other minerals from water, making it suitable for human consumption, irrigation, or industrial uses. <sup>210</sup>
Externalities	The impact of an economic activity experienced by an unrelated third party. These can be positive (experienced as a benefit) or negative (experienced as a cost).
Financing	Repayable capital provided by (debt or equity) investors with a view to earning a return (e.g. in the form of interest repayments, dividends or capital gains). Repayments to investors typically comprise the return of the upfront capital (i.e. depreciation) and a return on the capital (i.e. debt interest and equity returns).

<sup>207</sup> Global Water Partnership, 'Blended Finance', Water Knowledge Hub.

<sup>208</sup> Rodriguez, D., van den Berg, C. and McMahon, A. (2012), 'Investing in Water Infrastructure: Capital, Operations and Maintenance', November.

<sup>209</sup> Bove, T. (2021), 'What Are Debt-For-Nature Swaps & How Can They Address Countries' Climate and Debt Crises?', Earth.org, 16 February.

<sup>210</sup> US Department of Energy, 'What Is Desalination and Why Is It Important?'

Term	Definition
Funding	Non-repayable sources of money provided such as revenues derived from tariffs levied directly on users, taxation (i.e. where public budgets are allocated to the water sector), and transfers (grants and overseas development assistance).
Green bond	Financial instruments that finance green projects and provide investors with regular or fixed income payments. <sup>211</sup>
Microfinance	Microfinance refers to the financial services provided to low-income individuals or groups who are typically excluded from traditional banking. <sup>212</sup>
National Water Strategy (NWS)	A government-led, system-wide framework that sets out how a country plans, finances and delivers water and sanitation services over time.
Non-revenue water (NRW)	Non-revenue water is the difference between the total produced water volume and the total billed volume. This includes technical and commercial losses. <sup>213</sup> For example, two key drivers of non-revenue water are leakage and incomplete billing.
Off-take arrangements	An agreement between a producer and buyer to purchase or sell portions of the producer's upcoming goods, which can support the securing of finance.
Polluter pays principle	The idea that the costs of polluting activities should be borne by the party who caused it, rather than the individual or community who suffer from the consequences of pollution. <sup>214</sup>
Public-private partnerships (PPPs)	A mechanism that allows governments to procure and implement public infrastructure or services using the resources and expertise of the private sector. <sup>215</sup>

<sup>211</sup> World Bank Group (2021), 'What You Need to Know About IFC's Green Bonds', 8 December.

<sup>212</sup> FINCA, 'What is microfinance'.

<sup>213</sup> IBNET (2023), 'Definitions', October.

<sup>214</sup> Ruhland, K. (2024), 'Explainer: What Is the Polluter Pays Principle and How Can It Be Used in Climate Policy?', Earth.org, 28 March.

<sup>215</sup> World Bank Group, 'About Public-Private Partnerships'.



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