FINANCING WATER PROJECTS: BUILDING A SUSTAINABLE FUTURE

WORLD
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COUNCIL

FINANCING WATER PROJECTS: BUILDING A SUSTAINABLE FUTURE

WORLD WATER COUNCIL, TASK FORCE ON FINANCING WATER

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FOREWORD

Planetary water resources are under increasing pressure, mainly due to climate and demography challenges. This is why securing these water resources is a political, economic, and humanitarian priority.
We sum it up in three words:

"Preserve, reserve, serve."

Ensuring this security relies on three pillars: knowledge, governance, and finance.

These pillars must encourage developing knowledge to innovate, sharing governance and increase financing. When it comes to financing, the core issue of this report, we must imagine new forms and sources, in light of the emergence of "bankable" projects.

All the while recognizing that financial viability is no longer an end in itself.

It is with this in mind that the World Water Council's Task Force on Financing Water examined this issue with realism and determination, through the lens of sustainability. I would like to take this opportunity to thank the Task Force's Chair for his excellent work.

Our aim is therefore to encourage a more comprehensive, concrete, and resilient approach to water-related projects.

In doing so, we will be able to focus more effectively on implementing three major priorities: water for health, water for food, and water for nature.

We wish you enjoyable and insightful reading of this report.

Loïc Fauchon
President – World Water Council

FOREWORD

Water is essential for food, health, production, and environmental balance, and is interconnected with all the sustainable development goals, and as such, vital for the growth and development of countries. This resource, as precious as it is finite, faces significant risks: increasing temperature and other variables are altering hydrometeorological cycle, causing more frequent and intense floods; on the other hand, prolonged droughts are occurring, and forecasts are becoming uncertain: flash floods and flash droughts are more recurrent. This situation is further complicated by the discharge of untreated wastewater from cities, industries, mines, and from agriculture.

It is essential to accelerate projects to manage water and sanitation appropriately, acknowledging that more than two billion people worldwide still lack secure access to water, and the gap is greater for sanitation, and water is also essential for increasing productivity and to balance ecosystems. These challenges require the concourse of both public and private investment.

This document proposes to align financing with the holistic approach of the value of water under consideration of the existence of typology of investors and typology of projects, that can be guided by a broader understanding of "sustainable and resilient projects". To this end, proposals are made regarding aspects such as (i) project structures and metrics; (ii) financing sustainability; (iii) coordination and scale; as applying the concept of resilience to manage risks and uncertainties.

The WWC Task Force on Financing Water is pleased to provide this piece of work, to contribute to mobilizing greater financial resources, an objective shared by all the institutions that comprise it.

Dr. Franz Rojas-Ortuste
Chair of the Task Force on Financing Water, WWC
Director de Análisis de Agua y Saneamiento, GDTS-VCPE, CAF

ACKNOWLEDGEMENTS

ABBREVIATIONS

IFI	International financial institution
MDB	Multilateral development bank
M&E	Monitoring and evaluation
NGO	Non-governmental organization
OECD	Organisation for Economic Co-operation and Development
O&M	Operations and maintenance
PPP	Public–private partnership
SDGs	Sustainable Development Goals
SDG6	Sustainable Development Goal 6: Clean Water and Sanitation
WASH	Water, sanitation and hygiene

SUMMARY

This report revisits the process of financing water projects by placing emphasis on sustainability and resilience, going beyond the narrow, profit-oriented focus on bankable projects.

The report stresses that for projects to be truly sustainable, they must be financially viable, socially acceptable, and environmentally responsible over the long run. It also highlights resilience – the capacity of projects to adapt and continue successfully through disruptions, particularly from climate change – as an essential part of sustainability. The report makes three key contributions:

1. **Redefining sustainability**: It proposes a more specific and practical vision of sustainability in projects, going beyond high-level framings. It argues for integrating sustainability as a core design principle to mitigate persistent challenges such as short-termism, a lack of local participation, and low levels of private sector investment.

2. **Linking project and system**: It combines project-level analysis with a systems perspective to improve overall impact. It advocates for involving national and regional stakeholders in discussions on obstacles and success factors.

3. **Breaking silos**: It calls for greater connection between the water, climate, nature and development sectors. The report encourages cross-sectoral funding, financing and collaborative platforms to address systemic challenges collectively.

The report proposes an integrated and sustainable approach to designing, financing and implementing water projects that can truly contribute to achieving universal access to water and sanitation.

To do so, it identifies **five project-level challenges** to sustainability: gaps in preparation and risk assessment, shortcomings in evaluation frameworks, lack of planning for long-term operations and maintenance, inadequate stakeholder engagement, and skills and capacity gaps. For each challenge, examples and solutions are provided based on detailed case studies.

It then presents **seven systems pathways** for addressing these challenges: revisiting project structures, redefining metrics of success, improving financing instruments, strengthening coordination and scale, learning from mistakes, awareness of design traps, and embedding resilience. The seven systems pathways analysis draws on the experiences and insights of interview participants and authors.

The report also helps to close gaps in the narrative and discussions around project implementation. Indeed, such discussions are often confined to closed-door conversations among a small group of stakeholders. It seeks to build a wider understanding among all parties involved of the systemic drivers needed to progress on universal access to water and sanitation.

The scope of the report is bounded: it is not intended as an implementation guide, nor does it presume sustainability as an absolute priority. Instead, it shows how its principles may be better embedded in project design, funding and implementation.

In summary, this report calls for a more explicit consideration of sustainability at both project and system levels, with the goal of improving the effectiveness of existing investments and attracting new sources of funding and finance.

INTRODUCTION
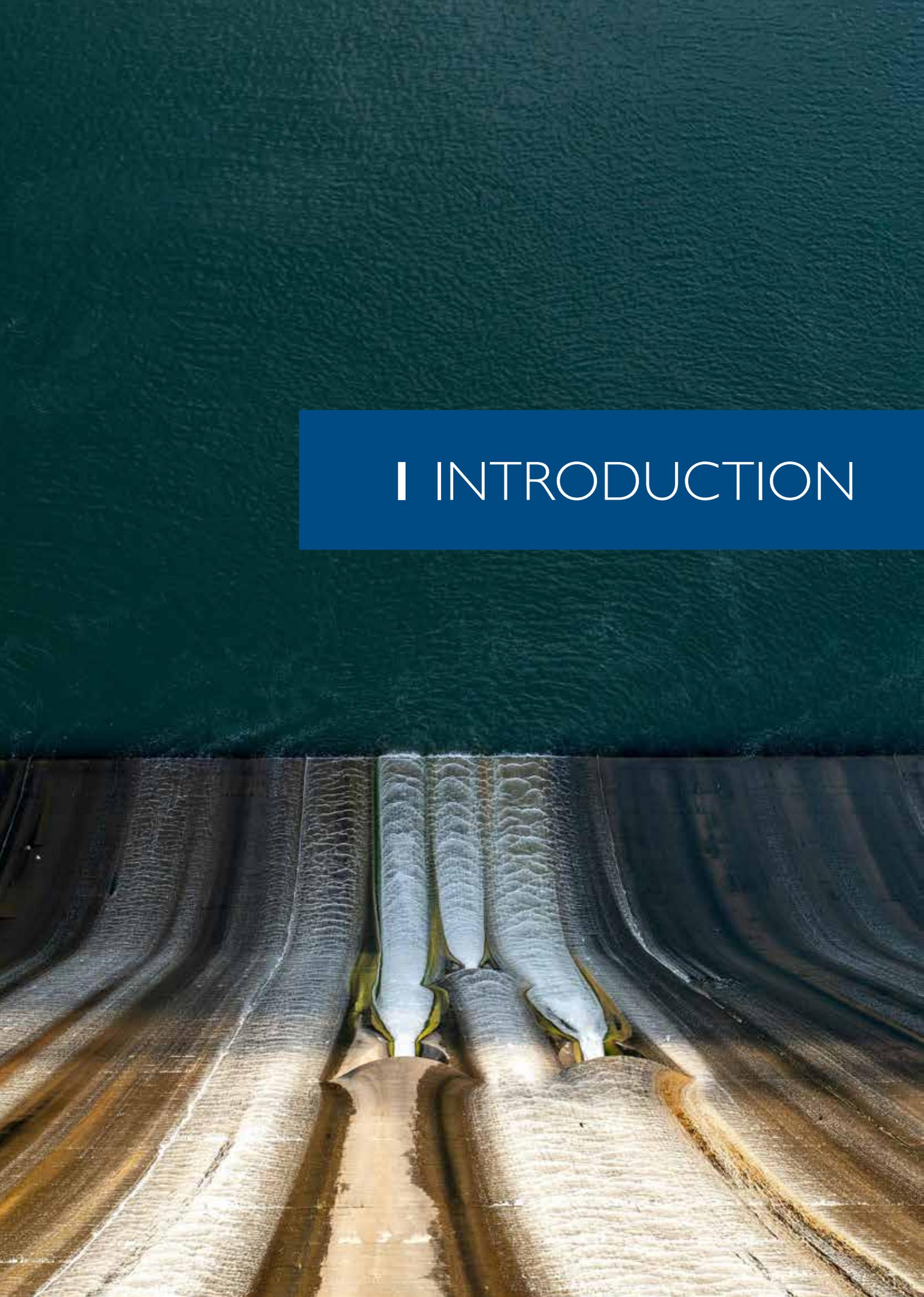
1.1 CONTEXT

In the context of a multi-trillion-dollar water finance gap and sub-optimal progress toward Sustainable Development Goal 6 (SDG6), substantial efforts are needed to make better use of existing sources of finance and to mobilize new ones[1]. This also applies to the water funding gap[2]. Recent discussions have focused on the economic, governance, policy, institutional and sector transformations necessary to filling the funding, finance and SDG6 progress gaps[3]. However, success, in part, will also be mediated by the sector's ability to implement and sustain water projects[4] that catalyze genuine benefits at a local scale while collectively moving the dial toward the SDGs.

While focusing on the project scale has inherent limitations (see section 2.2), this report argues for a more explicit consideration of the role of the project cycle in meeting sector-wide goals. Specifically, it focuses on how improving project *sustainability* – at the individual and systems levels – can both improve the effectiveness of existing investments and attract new sources of funding and finance.

Regarding existing investments, the report presents case studies where a more explicit integration of *sustainability* could have strengthened the achievement of intermediate and long-term goals. For example, this could have been through improved anticipation of risks and design gaps; better use of evaluation frameworks to convert project activities into *outcomes*; enhanced consideration of benefits, both tangible and non-tangible; and more effective use of stakeholder engagement to ensure projects are needed, wanted and will be sustained by user communities. Recognizing that achieving full sustainability is often constrained at the project level, the report also presents pathways for developing systems solutions to resolve these challenges at scale.

Regarding new sources of funding and finance, project *sustainability* is connected with prevalent water financing challenges such as low bankability and creditworthiness, unattractive risk–return ratios and weak enabling environments, which are seen as barriers to attracting private, philanthropic and public investment. Sustainability-aligned project design and implementation can partly resolve such challenges, for example by improving the likelihood (and evidence) of long-term or 'catalytic' benefits; strengthening the enabling environment through skills, capacity building and institutional support; and mitigating avoidable design and implementation risks. A focus on sustainability can also lend itself to specific financing instruments, such as public–private partnerships (PPPs) and results-based finance, and open opportunities for mobilizing additional resources from climate finance by tackling cross-sector challenges.

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1 WWC and OECD (2015) estimated the investment needed in water-related infrastructure at $6.7 trillion by 2030 and $22.6 trillion by 2050. See also UN-Water (2024a, 2024b).

2 Joseph et al. (2024) estimated an annual spending shortfall of up to $140 billion. In this report, funding refers to the sources of money such as government budgets, grants, donor contributions, or tariffs used to support water infrastructure and services. Finance involves the mechanisms and tools, like loans or bonds, used to mobilize and manage those funds over time to ensure sustainable investment.

3 In recent examples, the Global Commission on the Economics of Water has foregrounded economy-wide changes needed in food systems, habitats, circularity, energy and WASH, with partnerships, finance, data and governance as critical enablers of change (Mazzucato et al., 2024). The World Bank has highlighted enabling conditions, private sector expertise and finance solutions as three priority strategic directions for improving the planning and mobilisation of water sector investments (Khemka et al., 2023), and presented budget execution rates, productivity, efficiency and equality in investments as key recommendations for overcoming public sector spending gaps (Joseph et al., 2024).

4 A broad term, the authors define water projects as targeted interventions in water and sanitation, which may include infrastructure, services, policy/ institutional change and nature-based solutions. Projects are generally bound by geographical focus, budget and target outcomes. They may be funded by multilateral development banks, governments, philanthropic or other grant-making organizations, non-governmental organizations, private investors or a combination. Only projects in developing and emerging economies are assessed here.

Guiding questions

1 How is sustainability conceptualized, measured
and implemented in water projects?
SECTION 4

2 What are the key challenges to sustainability at the project level,
and how can they be resolved?
SECTION 5

3 How can sustainability be strengthened through
systems-level solutions?
SECTION 6

Key Takeaways

This report considers the significance of sustainability in mobilizing funding for water projects, and
identifies critical interventions that deliver impactful outcomes.

It highlights the importance of incorporating sustainability attributes into both project design and
funding frameworks.

Challenges to incorporating sustainability often occur in risk assessment, theories of change, project
evaluation, stakeholder engagement and the availability of appropriate skills and capacity.

These challenges can be addressed at both the project and systems levels – for example through
improved coordination, project structuring, financing instruments and learning feedback loops.

Foregrounding project resilience within the concept of sustainability can also support improved
outcomes under uncertainty.

1.2 RECOMMENDATIONS

Table 1 summarizes the practical recommendations, best practices and learnings presented throughout the report.

Table 1. Summary of recommendations

Section	Description	Recommendations
SECTION 5. DESIGNING AND IMPLEMENTING SUSTAINABLE WATER PROJECTS		
5.1 Preparation and Risk Assessments	Minor omissions in the project design and risk assessment process can combine to have negative impacts on project timelines, budgets and outcomes, which can undermine sustainability. These cover infrastructure, geography, environment, planning, stakeholders, finance, legal and security elements.	**Project** ▸ Comprehensively map risks and design needs, including factors outside the project scope ▸ Identify permissions, permits and affected stakeholders early ▸ Engage stakeholders early ▸ Conduct market research to benchmark consultant costs ▸ Source and hire locally where feasible ▸ Include contingency planning in timelines and budgets ▸ Use technical assistance for complementary sustainability-aligned activities **System** ▸ Embed projects within a longer-term programmatic approach (6.1) ▸ Ensure funder and project structuring processes facilitate greater flexibility, contingency and comprehensiveness (6.1) ▸ Adapt to risks via a focus on resilience (6.7) ▸ Learn from unmitigated risks and design gaps in future projects (6.5)
5.2 Project Evaluation Frameworks	Shortcomings in a project's monitoring and evaluation (M&E) and theory of change can inhibit the full capture of project outcomes, posing challenges to the sustainability of long-term benefits.	**Project** ▸ Forecast potential indirect benefits ▸ Ensure clear definitions of, and distinction between, outputs and outcomes ▸ Ensure the theory of change is visible and used in key planning and evaluation documents ▸ Use independent evaluators and conduct repeat audits where possible ▸ Measure project elements such as cooperation and stakeholder views ▸ Ensure targets are accompanied by clear measurement indicators **System** ▸ Develop more appropriate indicators for measuring non-tangible outcomes (6.2) ▸ Ensure funder and project structuring processes facilitate greater flexibility in M&E metrics and approaches (6.1, 6.2) ▸ Apply funding and financing instruments that incentivize sustainable services, not just infrastructure provision (6.3) ▸ Coordinate between projects and funders to forecast and plan indirect and systemic project benefits (6.4)

5.3 Operations and Maintenance (O&M)	Plans for continued O&M during and after project implementation is critical to the operational sustainability of infrastructure, but is often underemphasized in project designs, activities, budgets and risk assessments.	**Project** ‣ Use stakeholder engagement to establish local responsibility and ownership over continued O&M ‣ Use M&E and theory of change frameworks to prioritize service reliability, accessibility and sustainability as key indicators of success **System** ‣ Fill local skill and capacity gaps for operating and maintaining services (6.1, 6.3) ‣ Identify sustainable funding and finance for long-term O&M (6.3) ‣ Project timelines and evaluation processes should account for long-term service sustainability (6.1, 6.2)
5.4 Stakeholder Engagement	Another trend that emerged across the case studies was the absence or inadequacy of stakeholder engagement, identified as critical to social and operational sustainability.	**Project** ‣ Define and follow principles for effective stakeholder engagement: - Early - Meaningful, intentional, transparent - Right people, right time - Sustained **System** ‣ Ensure funder and project evaluation processes prioritize process outputs and outcomes such as stakeholder inclusion and participation (6.1, 6.2) ‣ Prioritize the resilience of services for different user groups under dynamic social conditions (6.7)
5.5 Skills, Capacity and Expertise	The ability of local institutions to implement and sustain project activities, processes and infrastructure, during and after project support, was identified as one of the most significant hurdles to institutional sustainability.	**Project** ‣ Conduct quality assurance of consultants and contractors ‣ Engage consultants on longer-term contracts ‣ Ensure gender mainstreaming efforts reach the highest levels of leadership ‣ Diversify responsibility across multiple leadership staff ‣ Incorporate interventions to improve corporate governance and institutional conditions **System** ‣ Ensure funder and project evaluation processes fully account for the value of skills and capacity building efforts (6.1, 6.2) ‣ Identify cross-sector opportunities for investing in local skills, institutions and capacity (6.3, 6.4)
SECTION 6. SYSTEMS SOLUTIONS FOR SUSTAINABILITY		
6.1 Project Structuring	Approaches to structuring projects were identified to be at odds with sustainability.	‣ Connect projects with longer-term programs, collaborations and technologies: - Embed projects within programmatic approaches that target high-level goals and implement sustainability-enabling activities - Develop strong project–funder–government relationships, built on transparency, equality, mutually aligned goals and flexibility - Consider the potential for automating project documentation and experimental forms of monitoring using advancements in artificial intelligence

6.2 Metrics of Success	Closely related to project structure, approaches to measuring also ran counter to the needs of sustainability.	▸ Develop more appropriate metrics and evaluation processes, such as:
		  - Measures for enablers of sustainability: stakeholder engagement, skills and capacity building, integration of O&M plans, context-sensitive design
		  - Gender targets that reflect interventions to tackle root causes of inequality, not surface-level forms of inclusion
		  - Human rights–based approaches
		  - Sustainable service checklists
		  - Partnership and cooperation metrics
		  - Evaluation that prioritizes experimentation and slower, systems-changing interventions over efficiency
		  - Sustainability metrics tied to funding or finance source, e.g. results-based finance
		  - Return evaluations to monitor sustainability of results

6.3 Financing Sustainability	Specific financing instruments and approaches can promote sustainability within water projects from the outset.	▸ Consider the five solutions highlighted here for further exploration and implementation, which will rely on close collaboration between policymakers, financiers and regulators:
		  - Co-financing
		  - Thematic bonds
		  - Results-based funding/finance
		  - Public–private partnerships
		  - Water valuation

6.4 Coordination and Scale	Improved coordination across different levels was identified as key to sustainability, by embedding projects within existing systems and resources, mitigating duplication and trade-offs and connecting projects with longer-term goals and outcomes.	**Funder coordination including multilateral development banks (MDBs), international financial institutions (IFIs), philanthropy and private finance** ▸ Learn from the effective coordination between funders that often occurs post-disaster ▸ Improve alignment between typologies of investors (WWC, 2018a) and typologies of projects (WWC, 2018b), considering how different funders can deliver different activities along a long-term pipeline **For project developers** ▸ Develop government and community buy-in simultaneously, as they can strengthen each other ▸ Consider targeting training efforts toward particular groups such as senior leaders, who can then implement training and exhibit best practices in their communities ▸ Strengthen corporate boards as an important mechanism for institutional sustainability ▸ Seek follow-on funding (possibly from a smaller, more flexible provider) where project activities are incomplete or require further action to ensure sustainability **For all stakeholders** ▸ Seek systemic change even through small-scale interventions: if success from changing the status quo is evidenced at a small scale, it may be embedded by larger institutions as a standard or form of best practice ▸ Explore multi-stakeholder or cross-sector opportunities for investing in skills, capacity and the enabling environment, either as a precursor to or alongside water projects ▸ Investigate how systemic barriers to sustainable projects may be experienced across other sectors such as climate, nature and development, and what opportunities this creates for finance and shared learning ▸ Consider not only standalone water projects but the role of water across all areas of the economy and sustainable development pathways

6.5 **Learning from** **Mistakes**	To ensure that best practice and potential solutions identified are actually embedded into future sustainable water projects, it is important to consider approaches to learning.	▸ Enable learning exchanges and mentorship ▸ Reimagine alternatives through small-scale practices ▸ Establish a learning culture within organizations
6.6 **The Traps of** **Design**	This report focuses on improving sustainability via project design and systems change. Two areas of caution related to this perspective are highlighted.	▸ Be aware of two risks of overemphasizing sustainability at the expense of other important project/ systems approaches: - The prioritizing of design over implementation - The equating of sustainability with basic solutions
6.7 **From** **Sustainability to** **Resilience**	While this report has focused on sustainability, incorporating the concept of resilience may help to resolve some of the major project- and systems-level failures identified.	▸ Consider not only how to *sustain* project outputs and outcomes in a known future, but also how to *ensure resilience* in an evolving and uncertain future ▸ Apply the concept of resilience to consider many possible future risks, uncertainties and synergies that could (positively or negatively) impact project outputs, outcomes or equitability ▸ Use the concept of resilience to advocate for skill and capacity building, stakeholder engagement and local ownership as means of ensuring owners can continuously adapt project outputs and outcomes in a changing context (e.g. a context affected by climate change)

1.3 CONTRIBUTION

This report revisits the concept of *sustainable and resilient* water projects to go beyond the narrow, profit-oriented focus on *bankable* projects. Sustainable projects should be financially viable to contribute to long-term economic well-being, and environmentally and socially acceptable over the long run. They involve more than just profitability – they encompass budgetary sustainability, cost effectiveness, investment feasibility and the creation of lasting economic value for stakeholders.

Resilience, in addition, looks to ensure that projects can adapt and continue successfully through disruptions, particularly from the effects of climate change, and should be embedded as part of the sustainability concept to create a powerful and holistic approach.

This report makes three key contributions to the discussion on the water investment and SDG6 progress gaps:

Firstly, it seeks to bring greater specificity and practicality to *sustainability* as an important concept, indicator and practice in water projects. This is advanced through both a top-down perspective (funder evaluation frameworks, international definitions and practices, systems approaches) and a bottom-up perspective (operationalization of sustainability at the project level). The report argues that integrating sustainability as a core project design principle and practice entails a holistic and explicit consideration of the long term, which is not adequately captured by evaluations of effectiveness, impact, coherence, efficiency and relevance. This has the potential to overcome persistent short-termism in the water sector, where unreliable infrastructure[5], low private sector investment[6] and lack of local ownership and social sustainability of interventions are major barriers to achieving SDG6.

Secondly, by combining detailed project-level analysis with a systems perspective, the report proposes *practical* and *scalable* ways forward for improving sustainability and project success rates at *both levels*. Discussions on the practicalities of project implementation and resolving key challenges are generally confined to the side rooms of conferences (and attended by implementing organizations, small funders, research and data institutions and 'beneficiaries'), and are rarely considered at a higher level. However, by identifying systemic drivers of project failures, the report advocates for involving national and regional stakeholders in this discussion in order to move the dial on SDG6.

Finally, this report intends to make a meaningful step toward breaking silos between the water, climate, nature and development project landscape, considering how systems failures and solutions to creating sustainable water projects may be common across these sectors. Such a recognition calls attention to the need for cross-sectoral funding, financing and collaborative platforms to advance collective solutions to systemic challenges. This recognition is not new, nor easy to operationalize, but it may be more easily answered through the lens of project-level sustainability and resilience.

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5   For example, it is estimated that one in four handpumps in sub-Saharan Africa are non-functional at any point in time (Foster et al., 2018).

6   91% of annual spending on water comes from the public sector, with less than 2% from the private sector (Khemka and Sterte, 2024).

2 METHODOLOGY

2.1 OVERVIEW

Responding to the key guiding questions, a three-step mixed methods approach was applied.

Figure 1. Three-step mixed methods approach

1. Funder selection & analysis: **sustainability frameworks & outcomes (section 4)**

2. Case study selection & analysis of project documentation: **project barriers & solutions to sustainability (section 5)**

3. Expert interviews & analysis: **systems solutions (section 6)**

The primary rationale for this method was to bridge the gap between high-level recommendations and detailed project-level guidance. By situating case study analysis in the context of the broader funder landscape and expert interviews, the report seeks to offer nuanced, novel and practically grounded insights that are relevant for multiple stakeholder groups, including project implementers, funders, investors and policymakers.

While each method primarily informed a distinct section of the report, as illustrated in figure 1, the sequential steps taken enabled cross-validation and comparison between each section, as well as the integration of wider literature and expert insights from the authors. Insights from the case study analysis and interviews are anonymized and generalized throughout the report to maintain flow.

Each step is summarized below. The full methodology and outputs are provided in the appendices, including case study descriptions (appendix 3) and a summarized interview transcript (appendix 4) .

Step 1: Funder selection and analysis

Multilateral funders and philanthropic investors were selected from the World Water Council's *Typology of Water Infrastructure Investors*, given the availability of public information on funding disbursements and project evaluations, and their high relevance for strengthening project-level sustainability.

Data on investment levels was then retrieved from the Organisation for Economic Co-operation and Development (OECD) Creditor Reporting System to shortlist top funders in the water sector across the two categories of multilateral funders and private philanthropy. This shortlist – composed of the World Bank, European Union, Asian Development Bank, Inter-American Development Bank, African Development Bank, Bill & Melinda Gates Foundation, Conrad N. Hilton Foundation and IKEA Foundation – was used as the basis for case study selection in step 2. Annual reports and development effectiveness reviews were also sought for the top multilateral funders, to analyze their project evaluation frameworks and portfolio-wide results, with a focus on how sustainability was defined and measured (section 4).

Step 2: Case study selection and analysis

Based on the shortlist of top donors, project pages were identified and filtered by water and sanitation projects with a completion date between 2019 and 2024. Purposive sampling was used to select case studies across a range of project types, investment types, geographies, size, objectives and outcomes. Sampling was also influenced by the quality, language and availability of documentation for different projects. This approach was preferable to systematic sampling, which was tested, but yielded a comparatively less useful case study list. Project evaluation documents were identified for each case study and analyzed in detail, with a particular focus on "lessons learned" and performance evaluation sections. The final case study selection is detailed in appendices 2 and 3.

The purpose of this step was to understand the design and implementation features that helped or hindered the sustainability of outcomes in each project, and to identify commonalities that would act as the basis for section 5. Despite the small sample size, high consistency in barriers to sustainability were seen across nearly all case studies, and were validated by interviewees and authors. However, the relatively limited scope of this report means that the findings cannot be entirely comprehensive. It is intended that this analysis will provide the basis and rationale for a future, more comprehensive assessment on project sustainability, including direct attribution of results achievement to sustainability features, to build on the solutions and recommendations provided in this report.

Step 3: Expert interviews

A series of high-level, semi-structured interviews were conducted with senior representatives from the water and, sanitation sector. These were designed to interrogate the challenges in project-level sustainability identified at step 2, and to explore these within the context of systems failures and solutions. Interviewees were selected using a mix of purposive and snowball sampling, prioritizing diversity in opinion and professional experience; broadening perspectives beyond MDBs and philanthropy (the focus of the case studies); and building on relationships established during the 10th World Water Forum held in May 2024 in Bali, Indonesia.

We are grateful for the contributions of the interview participants, who are named below. Their contributions are anonymized throughout the report to maintain clarity and flow.

- ⊙ **Henk Ovink**, *Executive Director, Global Commission on the Economics of Water*
- ⊙ **Amanda Loeffen**, *CEO, Human Right 2 Water*
- ⊙ **Lesley Pories**, *Lead Policy Analyst – WASH Finance, WaterAid*
- ⊙ **Lance Gore**, *Principal Water Resources Specialist, Asian Development Bank*
- ⊙ **Cate Nimanya**, *Regional Director – Africa, Water for People*
- ⊙ **Alejandra Suarez**, *Director – International Financial Institutions for Development, Suez*

Interviews were conducted in January 2025, based around a series of prompts (see appendix 4). Following interviews, insights were collated, anonymized and analyzed to inform section 6.

2.2 LIMITATIONS

Sample size

The majority of the analysis in this report is based on five case studies, progress reports and evaluation frameworks by four major multilateral funders, six interviews, and the extensive experience of the authors and reviewers. Acknowledging the limited scope and sample size used in this analysis, the report does not seek to draw conclusive trends about the most significant project design gaps or systems solutions. By connecting design principles and systems thinking to specific concepts of sustainability, as an under-explored area of inquiry, the analysis is intended to open avenues for future debate, discussion, practical research and application, rather than being a comprehensive guide to project sustainability and sector solutions. The authors acknowledge the multitude of existing best practice and successful case studies relating to many of the areas covered in this report, but reduce references to external sources in order to retain focus and clarity in the report.

Scale of analysis

In focusing on the project as the predominant scale of analysis (as linked to the systems scale), this report is limited in advancing the economy-wide transformations necessary to promoting water security and advancing toward the SDGs. Water conservation, circularity, valuation, flood- and drought-preparedness, accessibility and quality must be embedded across all projects, programs, economic activities and sectors in order to achieve sustainable water management – and water projects can only go so far. Assessing sustainability in the context of these broader projects and economic activities would be a productive area for further exploration.

Recognizing failures

Throughout this report, terms such as 'failure' or 'shortcoming' are used to highlight where progress is needed to improve outcomes for sustainability and water security. These terms are not used to place responsibility on any single project, organization or approach. It is important to recognize the individual and collective efforts that are continually invested in advancing progress toward SDG6, at the same time as understanding where more needs to be done.

3 USING THIS REPORT

This report outlines five project-level challenges to sustainability:

- gaps in the preparation and risk assessment process (section 5.1)
- shortcomings in project evaluation frameworks (5.2)
- lack of planning for long-term operations and maintenance (5.3)
- inadequate stakeholder engagement (5.4)
- skills and capacity gaps (5.5).

Examples of each failure in practice, and proposed solutions at the project level, are provided based on detailed case study analysis.

The report then presents seven systems pathways for addressing the challenges identified:

- project structures (section 6.1)
- metrics of success (section 6.2)
- financing instruments (6.3)
- coordination and scale (6.4)
- learning from mistakes (6.5)
- awareness of the traps of design (6.6)
- embedding resilience (6.7).

This analysis is situated within narrative experiences and insights of the interview participants and authors.

The report contributes to closing gaps in the written narrative around the practicalities of project implementation. These discussions are often confined to closed-door conversations between a small number of stakeholders. In presenting this report, the authors hope to help build a wider understanding among stakeholders around the systemic drivers to move the dial on SDG6.

The scope of this report is bounded. It is not intended as a source of applied implementation guidance, for example. Well-developed documentation already exists to support implementers with specific aspects of project design. Nor does the report presume that considerations of sustainability (as conceptualized here) have any intrinsic primacy in terms of project design or development. Rather, the aim is to socialize how principles of sustainability might be better embedded.

In summary, this report seeks to advance the case for a more explicit consideration of sustainability in project design, funding and implementation, as well as at a whole-system level. The intended purpose is to support stakeholders in meeting twin objectives: improving the effectiveness of existing investments, and attracting new sources of funding and finance.

4 CONCEPTUALIZING SUSTAINABILITY

4.1 WHAT IS A 'SUSTAINABLE WATER PROJECT'?

A review of project appraisals, evaluation frameworks and annual reports of major multilateral investors highlighted sustainability as a key criteria for understanding the success of projects or portfolios. This was often applied in the context of the OECD's Development Evaluation Criteria, illustrated below.

Figure 2. Sustainability in the context of OECD's six Development Evaluation Criteria (OECD, 2019)

Relevance *Is the intervention doing the right thing?*	Coherence *How well does the intervention fit?*	Effectiveness *Is the intervention achieving its objectives?*	Efficiency *How well are resources being used?*	Sustainability *Will the benefits last?*	Impact *What difference does the intervention make?*

"The extent to which the net benefits of the intervention continue, or are likely to continue"

- Includes an examination of the financial, economic, social, environmental and institutional capacities of the systems needed to sustain net benefits over time.
- Considers resilience, risks, and trade-offs.
- Depending on the timing of evaluation, this may involve analysing the actual flow of net benefits since project completion, or estimating the likelihood of net benefits continuing over the medium-long term.

Building on the OECD definition, this report defines a sustainable water project as a project in which an intervention or a set of interventions *leads to outcomes and impacts that are lasting and remain beneficial over time*. In particular, this report draws attention to:

- ⊙ The *self-sustaining* nature of project outputs and outcomes, and the extent to which they can be maintained through local systems, resources and actors
- ⊙ the *equitability* of long-term outcomes and impacts, and whether sustained benefits are distributed fairly across relevant social groups
- ⊙ the *resilience* of the positive change, and the ability to sustain benefits in the context of climatic, demographic, geopolitical and other sudden or gradual changes.

Measuring and evaluating project sustainability relies either on a predictive assessment of likely benefit flows in the medium to long term, or a retrospective evaluation of the actual continuation of benefits, for example by conducting repeat evaluations at a defined period (e.g. one year) following project completion. Such a consideration of long-term change is encouraged at the 'outcomes' and 'impacts' phase of developing a theory of change. However, sustainability should also be considered earlier in the theory of change, to ensure the effective and equitable continuation of *inputs*, *activities* and *outputs* within the social, environmental and economic constraints of the context.

Hence, while project sustainability focuses on the ability to sustain interventions through time, its operationalization relies on a much broader array of principles and practices, outlined below.

4.2 OPERATIONALIZING SUSTAINABILITY IN WATER PROJECTS

Ensuring that water projects can achieve and sustain their intended long-term benefits (project sustainability) relies on a range of related modes and practices, loosely categorized as financial sustainability, institutional sustainability, social sustainability, environmental and resource sustainability, operational sustainability and resilience. These are outlined in table 2, based on key practices identified through the case study analysis. Evidently, such practices are not independent from the enhancement of project effectiveness, relevance, efficiency, coherence and impact. As such, this section supports a holistic understanding of project sustainability that can be embedded at various stages of design, implementation and follow-up action.

Table 2. Modes and practices for operationalizing sustainability in water projects

MODE	PRACTICES
Financial sustainability *Potential to attract and sustain the financial resources necessary to ensure continued project benefits. May also include the ability to mobilize additional private sector funding and finance. Often implies measures to improve the creditworthiness, bankability or risk–return profile of an implementing organization.*	▸ Cost recovery ▸ Tariff design ▸ Efficiency measures ▸ Long-term government commitment, 'bridge financing' ▸ Improved corporate governance, reporting ▸ Business model design, financial risk mitigation ▸ Results-based finance ▸ Blended finance ▸ Cost–benefit analysis ▸ Forecasting expected rate of return ▸ Affordability measures
Institutional sustainability *Capacity, willingness, knowledge and mandate among key institutions to continue implementing project activities and ensuring positive outcomes.*	▸ Training ▸ Capacity building ▸ Clear allocation of ownership, institutional roles and corresponding responsibility ▸ Establishing and implementing M&E frameworks ▸ Accountability and trust building ▸ Coordination and partnership building ▸ Policies, processes, systems, strategies, tools ▸ Corporate governance and integrity
Social sustainability *Project is responsive to the context, responds to an identified need or problem, and leads to genuine, long-term benefits for the community.*	▸ Behavior change ▸ Communications and awareness ▸ Decentralized, local ownership ▸ Stakeholder engagement ▸ Mechanisms for accountability and feedback ▸ Participatory approaches ▸ Diversity, equity, inclusion ▸ Skills building, education, economic development for local population ▸ Social rate of return or social return on investment assessment
Environmental and resource sustainability *Project inputs, activities and outputs are responsive to the local environmental context, will continue to be feasible within ecological and resource limits, avoid or mitigate environmental harm, and create long-term benefits for nature.*	▸ Nature-based solutions ▸ Sustainable land management practices ▸ Water rights allocation for humans and ecosystems ▸ Climate or nature co-benefits ▸ Environmental and social impact assessment ▸ Adverse environmental impacts are contained, reversible, temporary, mitigated

Environmental and resource sustainability *Project inputs, activities and outputs are responsive to the local environmental context, will continue to be feasible within ecological and resource limits, avoid or mitigate environmental harm, and create long-term benefits for nature.*	▶ Technical design ▶ Safety and contingency plans ▶ Feasibility studies ▶ Local sourcing ▶ Allocation of O&M budgets, responsibility, plans ▶ Performance monitoring ▶ Establishment of formal operating procedures, health and safety measures, minimum service levels
Resilience *Projects can be adaptable, flexible and continue successfully under disruption or uncertainty, including from climate change effects.*	▶ Vulnerability and risk assessments affecting water resources and services ▶ Adaptation strategies including hybrid green/gray infrastructure ▶ Water conservation and demand management to buffer against droughts and supply shocks ▶ Stakeholder engagement for co-developing adaptive measures ▶ Integration of traditional knowledge, leveraging local practices and cultural values ▶ Flexibility and redundancy of systems to maintain service during disruptions

Despite a broad understanding of key modes and practices for achieving project sustainability, there remain gaps in the ability of water projects to deliver and sustain desired outcomes.[7] This report argues for a more thorough consideration of project- and systems-level barriers and solutions to sustainability, as a means of filling gaps in project success rates and advancing progress toward SDG6.

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7 For example, while assessing the achievement of sustainability in development banks operations, it was observed that sustainability levels across all Asian Development Bank sovereign operations in 2022 stood at 63% — lower than in 2020 (68%) and 2021 (70%). In 2022, sustainability was identified as one of the worst-performing project criteria, alongside effectiveness (ADB, 2023). The African Development Bank's measurement of 'completed operations delivering sustainable outcomes (%)' between 2019 and 2023 highlights challenges in project sustainability across the board, with 2023 achieving the lowest rate in that time period at 85% (AfDB, 2024). An assessment of the World Bank's support to water supply and sanitation projects between 2007 and 2016 found that, while 71% of completed projects had moderately satisfactory or better outcomes, 42% faced significant or high risks to project development outcomes, reflecting critical gaps in project sustainability (World Bank, 2017).

5 DESIGNING & IMPLEMENTING SUSTAINABLE WATER PROJECTS

This section outlines major project-level barriers to sustainability. Examples of each failure in practice, and proposed solutions, are provided based on the case study analysis.

5.1 PREPARATION & RISK ASSESSMENTS

Omissions in project preparation and risk assessments were found to be a persistent challenge across the case studies. These were one or a combination of:

- ⊙ **unanticipated** – risks and design features were plausible but were not anticipated or planned for prior to project implementation (e.g. environmental characteristics, site distance and accessibility, social license)
- ⊙ **uncontrollable** – risks emerged from occurrences that would have been more difficult to fully predict and/or control (e.g. pandemics, conflict, extreme weather, supply chain shocks)
- ⊙ **anticipated** but evaluated too difficult, costly or marginal to mitigate
- ⊙ *out of scope* of the project's geography, mandate or practical constraints.

It was often the case that multiple small gaps in project design or risk assessment accumulated in delays, budget overruns or underachievement of outputs and outcomes. Ascribing a causative relationship between these variables is not in the scope of this report, but it is assumed that gaps in the design process have important implications for long-term sustainability, even where they appear to be minor, short-term or isolated issues. These are visualized below, along with case study examples.

Figure 3. Implications of design and risk assessment gaps for project budgets, timelines, implementation effectiveness and sustainability

GAPS IN DESIGN, PREPARATION AND RISK ASSESSMENT unanticipated ⇔ uncontrollable ⇔ anticipated ⇔ out of scope	INTERMEDIATE IMPACTS Delays and budget overruns Increased difficulty of implementation reduced performance of outputs/ outcomes[8]
Infrastructure ▸ Targets for the reduction of non-revenue water were missed, as rehabilitation of the aged water distribution network outside the central area was not included in the project ▸ Infrastructure depended on a reliable power source but there were frequent outages ▸ Modular installation units required considerable work on arrival to ensure they worked on-site **Geography** ▸ Long distances to emptying points for fecal sludge discouraged cesspit emptiers with prohibitive transport costs ▸ Pilot sites were far from management teams, presenting challenges for sampling and maintenance ▸ Limited site accessibility and difficulty identifying a suitable delivery company made delivery and unloading of large equipment tricky and unsafe ▸ Facilities were located at the bottom of a hill, creating access issues for people with limited mobility ▸ Environment ▸ Hard and difficult foundations delayed borehole drilling ▸ Fluctuations in the water table affected certain infrastructure elements ▸ Extreme temperatures affected workers and outdoor infrastructure ▸ Excessive rains interrupted operations **Environment** ▸ Hard and difficult foundations delayed borehole drilling ▸ Fluctuations in the water table affected certain infrastructure elements ▸ Extreme temperatures affected workers and outdoor infrastructure ▸ Excessive rains interrupted operations **Preparation and planning** ▸ Plans with no room for error forced the project to be significantly reduced in scope at a later stage, particularly in areas affected by fragility, conflict and violence ▸ An actual implementation timeline exceeding the planned timeline raised the project cost ▸ An incomplete pre-investment phase affected investment and O&M costs ▸ Final designs were insufficiently completed	**IMPLICATIONS FOR SUSTAINABILITY** **Operational** Challenges relating to the installation, maintenance, and use of infrastructure and services that arise during the project are likely to remain a challenge unless resources are appropriately reallocated to mitigate them. For example, if infrastructure is operationally impacted by unreliable power, extreme weather, site remoteness/inaccessibility, security risks and unavailability of local materials during the project, these are unlikely to self-rectify. Reallocating resources toward appropriate mitigation measures to ensure long-term operational sustainability of infrastructure and services may be difficult where such risks were not identified at the design stage, given dependencies and pre-allocation of budgets and workstreams. **Financial** Budget overruns, significant delays, inefficient conversion of resources into impact, underperformance of outputs and outcomes, and (real or perceived) failure to identify material project risks may threaten the ability to attract future funding and finance. These impact a project's risk–return profile, eroding trust and undermining the bankability of projects and their implementing organizations. **Social** Real or perceived ineffectiveness of project implementation can erode social license and local trust in the solutions and implementing organizations, particularly where there is insufficient local ownership and/or engagement. Applying accessible and inclusive design principles (e.g. in the location of infrastructure and how services are used by vulnerable groups) is much harder to retrospectively implement. Social groups excluded during the project are likely to remain so, unless targeted interventions are prioritized.

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8   For example, ADB (2023) found that for every one additional month delay, projects faced a 1.2% decline in the probability of project success. Projects with full utilization of financing were also associated with higher performance.

Stakeholders
- Compensation of project-affected persons was delayed due to sickness, slow decisions regarding who should receive payment, need for letters of administration for the deceased to make payment to the proper person, communities not accepting compensation, and difficulty identifying land owners
- There were delays in hiring a hydrogeologist to run a database and modeling exercise, and delays in onboarding consultants due to security risks at the study site and awaiting the necessary clearances at regional and local levels for the feasibility study
- There were capacity and staffing limitations

Sourcing
- COVID-19 affected supply and timely delivery of materials and equipment
- Late supply of electromechanical equipment from abroad caused delays
- Cement shortage in-country required switching to imports

Finance and legal
- Procedures for tax and duty exemption for contractors and processing of payment for consultants were not streamlined up front
- Disagreement arose around legal requirements on tax exemption, where the financing agreement exempted the project from all taxes but the contract exempted only VAT
- Delayed payments to contractors and consultants incurred interest
- Costs were miscalculated for feasibility studies, consultants and external contractors, with underestimation and excessive rates due to lack of market research
- Complex customs and importation procedures caused significant delays and lack of transparency in related costs
- Acquisition of permits for wayleave and construction was delayed

Safety and security
- Theft and vandalism occurred at community-based installations where access was not restricted

Operational
Challenges relating to the installation, maintenance, and use of infrastructure and services that arise during the project are likely to remain a challenge unless resources are appropriately reallocated to mitigate them. For example, if infrastructure is operationally impacted by unreliable power, extreme weather, site remoteness/inaccessibility, security risks and unavailability of local materials during the project, these are unlikely to self-rectify. Reallocating resources toward appropriate mitigation measures to ensure long-term operational sustainability of infrastructure and services may be difficult where such risks were not identified at the design stage, given dependencies and pre-allocation of budgets and workstreams.

Financial
Budget overruns, significant delays, inefficient conversion of resources into impact, underperformance of outputs and outcomes, and (real or perceived) failure to identify material project risks may threaten the ability to attract future funding and finance. These impact a project's risk–return profile, eroding trust and undermining the bankability of projects and their implementing organizations.

Social
Real or perceived ineffectiveness of project implementation can erode social license and local trust in the solutions and implementing organizations, particularly where there is insufficient local ownership and/or engagement. Applying accessible and inclusive design principles (e.g. in the location of infrastructure and how services are used by vulnerable groups) is much harder to retrospectively implement. Social groups excluded during the project are likely to remain so, unless targeted interventions are prioritized.

Based on the case study analysis, table 3 highlights six pathways and example solutions for mitigating design gaps, delays and budget overruns.

Table 3. Solution pathways for resolving gaps in project preparation, design and risk assessment

SOLUTION PATHWAY	EXAMPLES
Comprehensiveness	▸ Project preparation should account for a wide array of possible risks and design needs covering infrastructure, geography, environmental variability, stakeholders, sourcing, finance and legal, and safety and security considerations, as identified in figure 3. ▸ Early stakeholder engagement may also facilitate the identification of less obvious design needs and potential risks (see section 5.4).
Pre-completion of activities	▸ All necessary information on potential compensation refusal should be collected before finalizing the design. ▸ In the case of permits and/or permissions, these must be identified early to allow sufficient time for the process to be conducted. ▸ Preparatory studies should aim to reduce uncertainty, including feasibility studies, final designs and financial closing studies. ▸ Early completion of advance activities such as an annual plan and budget, draft terms of reference, contact with regional database experts and hiring of regional hydrology experts can speed up implementation, and can ensure institutional and funder support is used effectively where it is most needed. However, this may not always be preferable due to the risk of issues arising in later project stages. ▸ When external contractors are required to carry out work, a project should seek at least three quotations, as there can be significant variation. ▸ Market sounding provides more clarity on the expected costs and timing for feasibility studies.
Local sourcing and hiring	▸ Material specifications should be locally available and/or consistent with local markets. This includes using indigenous species for biological components of nature-based solutions. ▸ Creation of local jobs is essential for legitimacy and institutional sustainability. ▸ Local design considerations should enable the long-term maintenance of infrastructure and replacement or repair of components in a timely, affordable and technically achievable manner. ▸ Prioritizing local markets can also contribute to indirect job creation and economic growth that boosts social and financial sustainability. ▸ Local sourcing can mitigate material supply risks, although variation in the quality of products can be a disadvantage.
Contingency	▸ Timelines should build in contingency in timescales and budgets at several stages, particularly in areas affected by fragility, conflict and violence, where sudden occurrences can halt operations or affect project dependencies. ▸ One project considered that a realistic implementation timeframe would have eliminated most of the risks that resulted in increased project costs.
Programmatic approach	▸ A programmatic approach allows a longer time horizon for implementation, including of politically sensitive reforms (for example on water tariffs), while ensuring that subsequent programs build on previous work (see section 6.4).
Flexibility	▸ Dependencies between tasks are unavoidable, as activities need to build on prior work to advance toward project goals. However, it may be beneficial to integrate additional tasks that are separate from the overall project pipeline: these can be flexibly carried out despite time or cost overruns or alterations due to fragility, conflict and violence. ▸ Flexible tasks may include the use of technical assistance to build institutional capacity for sustainability of outputs and outcomes after project completion.

Despite the availability of project-level solutions, multiple systems-level dynamics also mediate a project's ability to implement effective design and risk assessments. These include *limited* capacity and *flexibility* to carry out advance activities, build in contingency and conduct fully comprehensive designs and risk assessments, and inherent *disincentives* to comprehensive risk identification when projects compete for limited funding (see section 6.1). In addition, risks appear much more obvious in hindsight; therefore, what is important is that projects *adapt* to such risks (see section 6.7 on resilience) and use them as *learning opportunities* to mitigate future risks (see section 6.1 on "focused inefficiency" and section 6.5 on learning). Such acknowledgments are important to avoid placing undue responsibility on project implementation teams, and to consider how project-level design failures may be resolved at scale.

5.2 PROJECT EVALUATION FRAMEWORKS

In addition to unaddressed risks during project design and implementation, several of the case studies presented difficulties in fully capturing the outcomes of an intervention. This was often related to shortcomings in the project's M&E framework or theory of change. Implications for sustainability are highlighted in table 4, with specific challenges and mitigation measures presented in table 5.

Table 4. Relation between project evaluation frameworks and project sustainability

SUSTAINABILITY COMPONENT	RELATION WITH PROJECT EVALUATION FRAMEWORKS
Financial	▸ Failing to fully 'capture' all of the project benefits (either predictively or retrospectively) is a missed opportunity to strengthen the business case and value proposition to potential funders and financiers. ▸ Not linking project outcomes with portfolio outcomes is a missed opportunity to move the dial toward higher-level development goals, as well as to aggregate projects for additional funding and finance, which would enhance financial sustainability.
Social	▸ An unclear distinction between outputs and outcomes is a risk to social sustainability. Outputs do not inherently lead to full and equitable benefits unless work is done to ensure they convert into an outcome. For example, the provision of drinking water infrastructure is an output; equitable access to safe, reliable and affordable drinking water services is an outcome. Significant work is required between output and outcome in this scenario, to ensure equitability, reliability, safety, affordability and continued maintenance, particularly for underserved groups. If a project sees the provision of infrastructure as an end in itself, it is less likely to achieve social sustainability of benefits (see sections 5.3 on O&M and 5.1 on measurements of success). ▸ Projects that focus only on small-scale direct benefits miss an opportunity to proactively support indirect systems-level change. The examples of unanticipated outcomes in table 5 (row 8) are arguably more important for social sustainability than this case study project's core outcomes, as they represent long-term change relating to women's leadership, local jobs and economic growth, and connection of underserved groups to existing services. Had such benefits been anticipated, they might have been more proactively addressed and monitored to ensure maximum impact and equitability. For example, while the project prioritized its gender equality targets well in direct activities, women occupied just 2.4% of the nearly 20,000 indirect employment opportunities it generated.
Operational and institutional	▸ If effective data collection and reporting approaches are not integrated into the processes of executing institutions, this will likely hinder long-term operational and institutional sustainability. Without consistent evidence of successes and failures, executing institutions will be unable to maintain, adapt, improve and build trust in their services after the project timeline.
Environmental and resource	▸ Non-mandatory or one-off environmental audits and impact assessments may undermine environmental sustainability. Projects and their contexts are dynamic, making it hard to foresee project inputs or outputs becoming environmentally unsustainable at a future date. This is particularly important in the context of climate change and the need for resilience (see section 6.7).

Table 5. Challenges and solutions to improving project sustainability via evaluation frameworks

CHALLENGE	MITIGATION
1. The project plan did not account for the major (known) risks to development outcomes due to fragility, conflict and violence and capacity limitations.	Enhance comprehensiveness of risk assessments and mitigation (section 5.1).
2. A theory of change was not included in the key documents.	Ensure key evaluation frameworks are visible and applied in planning documents.
3. An environmental and social audit was completed once, but it was recognized that the absence of independent annual audits could limit the project's ability to identify and document good practices adaptable to similar projects in the future, in a timely manner.	Use independent evaluators and conduct repeat audits where possible.
4. Aspects of the project that would have been useful to measure, such as cooperation and stakeholder perspectives, were left out.	Use independent evaluators and conduct repeat audits where possible.
5. Clear measurement indicators were absent.	
6. Certain activities were incorrectly identified as outcomes. For example, providing "support" to selected institutions to "prepare for the development and management of groundwater through strengthening knowledge systems, building their capacity and assessing the feasibility of specific investments" is not an outcome; it would have been stronger to refer to improving the institutions' capacity to deliver regional groundwater investments.	Clearly define and distinguish between outputs and outcomes.
7. Outcomes of individual projects were not tied to a coherent portfolio-level outcome.	Forecast potential long-term and indirect benefits, and actively integrate them into project plans and evaluations.
8. Certain positive outcomes were not anticipated at the design stage. For example, the project created direct and indirect employment opportunities and contributed to the economy by purchasing local equipment. Training sessions built women's confidence and led them to take on more leadership roles in the community. Some compensated residents were able to buy pieces of land equivalent to or larger than the land compensated for under the project, enabling farming and commercial enterprises. Underserved families were connected to people and services from which they were previously unconnected, such as the ward community development officer and community health fund. A reliable clean water supply improved the hospitality and tourism sector. Such positive outcomes may have been more proactively addressed if anticipated at the project design stage.	

Applying a systems perspective, project evaluation should also consider the difficulty of measuring and communicating non-tangible outcomes (section 6.2); the existence of pre-defined funder evaluation frameworks that constrain novel approaches to M&E and theory of change design (sections 6.1 and 6.2); the absence of sustainable business models to convert *infrastructure* into a sustainable *service* (section 6.3); and the need for coordination to enable more ambitious theories of change and forecasting of indirect project benefits (section 6.4).

5.3 OPERATIONS AND MAINTENANCE (O&M)

Plans for continued O&M during and after project implementation is critical to the operational sustainability of infrastructure, but is often underemphasized in project designs, activities, budgets and risk assessments. One case study in particular reflected such challenges, facing persistent low sustainability of service delivery models including:

- **low functionality** – less than half of certain facilities were reported as reliable and delivering expected yield
- **unreliability** – there were frequent, if short-lived, interruptions in service provision relating to technical and water resource issues
- **poor water quality** – levels of bacteriological contamination posed a risk to users
- **variation in inclusivity levels** – certain facilities offered more accessible, but less affordable services; others were affordable but less accessible
- **long repair times** varying from several months up to two years
- **capacity constraints** – O&M was frequently performed for public sector–run schemes, but was constrained by the lack of vehicles, fuel and spare parts in the area
- **data gaps** – plans for O&M and infrastructure sustainability were constrained by the absence of formal monitoring, accountability and collective decision-making frameworks as well as forward-looking information on population-driven water demand.

Where O&M is likely to limit sustainability, one project design solution lies in stakeholder engagement that establishes local responsibility and ownership for continued operations (see section 5.4). Another solution is using M&E and theory of change frameworks to prioritize service reliability, accessibility and sustainability as key indicators of success within workstreams and budgets (see section 5.2). However, ensuring adequate long-term resourcing for O&M – particularly in rural contexts – is a persistent and systemic issue in the sector, and this cannot be resolved through project design alone. Systemic drivers include local skill and capacity gaps for operating infrastructure and services, conducting repairs and sourcing spare parts (see section 5.5); the absence of sustainable business models for O&M (see section 6.3); and structural constraints relating to limited project timelines and short-term metrics of success (see sections 6.1 and 6.2).

5.4 STAKEHOLDER ENGAGEMENT

Another trend that emerged across the case studies was the absence or inadequacy of early, sustained, meaningful and transparent stakeholder engagement. This was identified as critical to improving project legitimacy, accountability (*social sustainability*) and user-centered design (*operational sustainability*). Stakeholder engagement increases the odds that solutions are needed and wanted by the population; that solutions are responsive to the social, environmental, cultural and economic context; and that local stakeholders are empowered with a sense of ownership and responsibility to sustain project activities after the implementation period (given adequate funding, institutional capacity, etc.). Supporting examples are outlined in table 6.

Table 6. Illustrative examples of the importance of early, meaningful, transparent, timely and sustained stakeholder engagement

DESIGN PRINCIPLE FOR STAKEHOLDER ENGAGEMENT	EXAMPLES
Early	▸ The government and other stakeholders were new to policy-based loan reform actions, so preparation and approval took longer than expected. ▸ Early engagement with program stakeholders and design of subsidy programs responsive to vulnerable groups (including women) were necessary to speed up complex policy reforms. ▸ Preliminary workshops before the installation of a treatment system were required to involve communities in the installation process, inform them on the benefits of sanitation, strengthen ownership and ensure social acceptance.
Meaningful, intentional, transparent	▸ Vulnerable groups tend to voluntarily exclude themselves from public consultations unless specifically invited in a culturally appropriate way. A key lesson for designing subsidy programs that are responsive to vulnerable groups and women was the importance of meaningful stakeholder engagement, and explicitly stating the necessity of increasing tariffs to provide quality services. ▸ Stakeholder engagement should also be used to manage expectations of communities. For example, there was an expectation among residents that all water problems would be resolved following significant drilling works, which was not necessarily the case. That can lead to disappointment and contempt for project results, even where the project succeeds in its intended outputs and outcomes. ▸ Work on transboundary issues need full transparency. Countries share data, and in return they need to see the value added by other institutions using that data and turning it into a high-value product for all. ▸ Stakeholder engagement can raise controversial topics, or even undermine the suitability or credibility of the project itself. In one instance – a demonstration site characterized by extremely low incomes and lack of basic access to water and power – wastewater treatment was found to not be a priority. The hierarchy of needs in the community meant that the benefits of wastewater treatment were not sufficient for social acceptance of a new system. In addition, engagement with influential community members, local authority officials and local leaders proved to be a very important aspect, particularly in a wastewater treatment context where people are extremely sensitive to associations with bad smell and illnesses. The demonstration site manager believed that local acceptance could have been improved with a community awareness event before the installation of the system, specifically involving neighbors of the treatment site and older people. ▸ In another demonstration site, efforts to engage with the community office were made early in the project, but the community office was poorly resourced, which impacted its ability to disseminate the information. The site manager commented that most community members were not familiar with the processes or relevance of wastewater treatment, and that a wastewater unit directly located in the community remained a sensitive topic.

Right people, right time	▸ An aquifer management project highlighted the need to ensure continuity of stakeholders; to discuss issues like the final contour of the aquifer and its vulnerable and inaccessible areas; and to target engagement with the institutions that possess data and information, integrating them into the process and exploring opportunities for collaboration that leverage existing knowledge. ▸ Building trust from the bottom up takes time, and the effective use of opportune moments is key to building cooperation on transboundary water resources. It is critical to be a persistent partner, have a dedicated local/regional champion with experience and trust in the context, and be vigilant for the right opportunity to match technical and political interests for effective cooperation. ▸ In a project funded by a philanthropic organization, there were multiple grants where district leadership was neglected. District government involvement in grant activities was limited to information and basic consultation rather than genuine partnership or leadership. In some cases, the district was unaware of planned interventions when implementation started. In others, only national authorities were involved, but even this engagement was not necessarily substantial. This highlights the challenge of government engagement for projects that are not funded by MDBs with their established government relationships.
Sustained	▸ Comprehensive stakeholder engagement must be maintained through the full project timeline, as it was also identified as a problem during the O&M phase of the project.

There is a range of publicly accessible guidance on designing and implementing effective stakeholder engagement at the project level, for example provided by the World Bank (2023) and OECD (2015). For better operationalization of such guidance at scale, systems solutions that prioritize *process outcomes* (see section 6.2) and *resilience* (see section 6.7) – even where the necessary activities and engagements may be more costly, more time-intensive and less visible – must also be a focus.

5.5 SKILLS, CAPACITY AND EXPERTISE

The ability of local institutions to implement and sustain project activities, processes and infrastructure – during and after project support – was identified as one of the most significant hurdles to *institutional* sustainability. This covered a range of stakeholders including consultants, contractors, service providers, government staff, community groups and user groups. Key issues included limited levels of expertise (technical, operational, managerial, financial, scientific), high staff turnover, limited staff and institutional capacity (number of staff, time constraints, budgetary constraints, limited mandates), and low accountability or willingness to engage in training and collaborative processes. Figure 4 highlights specific case study examples.

Figure 4. Case study examples of challenges relating to skills, capacity and expertise

Contractor non-performance An advance payment was made for a contract that was later cancelled due to technical non-performance, which led to budgetary overruns. This highlighted the need to assure contractors' financial and technical capacity to carry out work prior to the project and associated payment.	**Inconsistent receipt of training** Staff were trained on management of the installed plants and equipment, but this was not fully embraced, and the need for continuous training and capacity building became apparent with high staff turnover.	**Low coordination between personnel** Advance planning and coordination of the various experts needed on-site was important to maximize efficiency and avoid delays.
Unavailable expertise Electrical, civil and automation expertise were required to varying degrees at each of the sites, and the availability of qualified personnel proved a challenge at some sites. It was suggested that engaging a general contractor with all of these skills can improve efficiency, but adequate advance planning is a prerequisite.	**Institutional unreadiness** One case study frequently highlighted inadequate institutional readiness, particularly associated with staffing. The organizational structure, limited technical experience, small number of core staff and limited operational experience of the central delivery institution led to a heavy reliance on outsourcing, which hindered efficiency.	**Reliance on external assistance** While a project made impressive progress in strengthening WASH systems, sustainability remained uncertain. It had not addressed deep-rooted, systemic weaknesses, like service authority reliance on external assistance, low staffing levels, and low acceptance of certain types of water service provision.
Staff turnover There is a need to establish strategies for continuity in case of staff turnover, particularly in the core team. This can be achieved by ensuring the team leader works closely with multiple staff who can take over key management roles if needed. The project in this case anticipated the risk and intended to build capacity and mitigate institutional shortcomings within the organization, but the starting institutional conditions still impeded continuity.	**Gender imbalance** Where training and capacity building efforts were implemented, there were clear challenges in gender equality mainstreaming across project staff. For example, one project described the challenge of receiving board buy-in to increase women's representation on the board. This was achieved through technical assistance to develop statements of corporate intent that formalized the board's procedures. However, the project identified a need for broader efforts to develop a pipeline of female specialists and managers in the field and the organization.	**Barriers to institutional sustainability** Key barriers to a project's institutional sustainability included the absence of a formal management structure and public involvement in community-based provision; inadequate technical and financial skills and knowledge on functionality and maintenance among water and sanitation committees; and skill gaps among public-sector water managers in accounting, business management and maintenance.
Need for complementary grants One project identified a clear benefit in having additional grants focused on addressing key gaps in the WASH system not directly linked to service delivery, and not directly within the sphere of influence of individual grantees (see section 6.4) .	**Gender mainstreaming shortfalls** In another project, despite noteworthy gender-mainstreaming efforts – a four-day training program for core staff, a second training for ministry and department representatives from seven countries, and the creation of gender action plans – there were several areas for improvement. The results framework did not measure beneficiaries, so it was left to the client's initiative to maintain gender-disaggregated data; there was no attempt to recruit women to the many trainings and meetings where gender equality was not the core topic; and leadership did not attend the staff gender training.	

Project-level solutions identified for improving institutional sustainability include:

- ◉ conducting more rigorous checking of consultants and contractors
- ◉ engaging qualified consultants on longer-term contracts to gradually expand their scope of work, increase efficiency and improve continuity
- ◉ ensuring gender mainstreaming efforts reach the highest level of leadership
- ◉ identifying additional funding or activities to improve the underlying institutional conditions prior to more collaborative or complex project work
- ◉ spreading responsibility across staff to ensure continuity in case of leadership change.

Improving corporate governance – including through strengthening corporate boards (see section 6.4) – is another important mechanism. It has the potential to mitigate fragmentation between water operators; align long-term social and environmental goals (e.g. social tariffs, service expansion, accessibility) with financial sustainability (cost recovery); and strengthen accountability, bankability and local trust in service providers.

However, the persistence of skills and capacity gaps as a limiting factor of sustainability – even where strengthening activities are included within projects – calls for greater attention toward systems solutions. This is supported in the literature, which identifies the widening gap between the severity of water problems and the knowledge and capacity required to address them.[9] Solution pathways include better *valuing* skills and capacity building through appropriate metrics and evaluation frameworks (see section 6.2); identifying new *funding and financing* instruments to invest in local capacity (see section 6.3); and exploring multi-funder, programmatic or cross-sector opportunities for skills development (see section 6.4).

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9   UN-Water (2024b) identified gaps in technical (efficiency, engineering, grey water, water recycling) and non-technological (legal, policy, institutional, negotiation in conflict-prone regions) skills, capacity and education.

6 SYSTEMS SOLUTIONS FOR SUSTAINABILITY

This report aims to bring a systems perspective to project-level sustainability. Section 6 builds on the recognition that the design and implementation challenges identified in section 5 are driven by systemic forces. Such a recognition opens opportunities for improving project sustainability at scale. This is important if we are to leverage sustainability to increase funding and finance toward the water sector, and to enable new and existing projects to more effectively move the dial toward SDG6.

Seven systems pathways for advancing project sustainability are presented, covering barriers and solutions identified through interviews and case study analysis. These are largely theoretical and are designed to provide various avenues for further discussion and exploration, rather than acting as in-depth practical guidance.

The first two pathways address closely linked elements of a common tension: the ways projects are structured and the metrics used to evaluate them are often at odds with the ambition to establish sustainable water projects.

6.1 PROJECT STRUCTURING

The ways in which projects are structured – and subsequently funded, implemented and evaluated – are not conducive to sustainability. Project timeframes are sometimes too short to see the full challenges to sustainability and the long-term benefits. Project funding and finance might fall into a "vicious machine" of submitting proposals, tailoring projects to different financier mandates and goals, and implementing with limited resources. This does not allow sufficient time to reflect on what will actually work in the context given, and what is needed to ensure or increase the impact.

In this environment, organizations are dependent on financiers' criteria to remain operational. Without reporting frameworks and internal structures to ensure that project implementers maintain the outputs and outcomes, and financiers follow up on this, organizations will move on to new opportunities, for example by different funders. The tendency to fund new infrastructure and services over improving existing provisions leads to a constant cycle of high capital investments in infrastructure, which falls into disrepair and is then replaced or abandoned for new infrastructure. This severely limits sustainability in terms of the social (trust in solutions is lost), operational (new infrastructure is prioritized over maintenance), environmental (in some cases, building new infrastructure can be more environmentally harmful and resource-inefficient than improving existing services) and financial (lack of long-term operations and outcomes disincentivizes private sector investors).

The way projects are funded and evaluated in a competitive environment disincentivizes comprehensive risk assessments, more deliberative or experimental approaches, and admission of mistakes. At the proposal stage, organizations will not want to emphasize all potential project risks (see section 5.1) if they are competing for limited funding and forced to present an attractive risk–return ratio following only an economic rationale. Deliberative approaches based on participation, partnerships and experimentation do not have known outcomes and might take more time, so they may be replaced by interventions whose benefits are easier and quicker to forecast. Advocating for new metrics of success (see section 6.2) risks increasing the reporting and data collection burden

on capacity-constrained project implementation teams. Finally, pre-allocated budgets, pre-defined deliverables and agreed disbursal dates means that project implementers are unlikely to highlight mistakes or the need to change course during or after project implementation.

As one interviewee described, "even though we all say we should be learning from failure, no one wants to go on the record as having failed" (see section 6.5).

A prevailing narrative in the water sector has focused on the need for partnerships and coalitions to go further and faster than organizations can go alone. One interviewee argued that we cannot mandate partnerships as part of projects without building in the time, processes and funding that are required to build trusting and productive relationships. Partnerships require multiple meetings, country travel, aligning on objectives, and administrative resources. This is particularly the case when advocating for innovative partnerships where organizations are not used to working together. These processes are at odds with project or donor timeframes that are only feasible for a single organization.

The slowness of institutional change is at odds with the urgency of action on water: many will acknowledge that the existing system is not working, but still work within it to get things done. There is also a challenge in advocating for institutional change at higher levels of seniority, where individual responsibilities are constrained by the need to attract new business, develop commercial partnerships and advance strategic goals, as opposed to favoring *learning* or exploration of alternatives. There are, nevertheless, alternatives, some of which were suggested in interviews.

Programmatic approaches

Programmatic approaches embed projects within a higher-level ambition, where each project can logically and meaningfully contribute to longer-term goals (see section 6.4). Ideally programs are defined before the projects, contain a variety of funding and finance instruments and partners, and establish a unified impact reporting approach that balances performance-based metrics with process-based indicators (see section 6.2).

Strong, aligned relationships

Strong **project–funder–government relationships** should be built on transparency, equality, mutually aligned goals and flexibility. Such principles are more likely to promote *learning from mistakes* (see section 6.5), continuous *adaptation* for resilience (see section 6.7), and the establishment and acceptance of new measurements of success even where these are slower, less visible or harder to quantify and value (see section 6.2). It is possible to advocate for new approaches without undermining the efforts already taken by funders to develop suitable evaluation metrics, in agreement with project implementation teams and government actors. Performance-based or economically-aligned metrics remain important tools for accountability, comparability and validation in the project landscape. New approaches should therefore consider and integrate the value of existing approaches at the same time as promoting greater flexibility and opportunities to account for wider social and environmental sustainability benefits.

New documentation tools

The automation and generative capabilities of **artificial intelligence** for project documentation is another field that merits further exploration. New tools could support not only reducing the time investment in reporting, data collection and digitization, but also the generation of new metrics and narratives for measuring sustainability based on existing project documentation and sector-wide learning.

6.2 METRICS OF SUCCESS

Sustainability is *definitionally* difficult to measure during any project period, given that it requires a consideration of net benefits through *time*. Instead, it is possible to measure the *enablers* of sustainability identified in section 5 – such as stakeholder engagement, skills and capacity building, O&M and context-sensitive design. However, the enablers are also hard to measure. Their outputs and outcomes are often less visible, diffuse or slow to materialize. The social benefits tend to be felt at the local scale rather than contributing to a project's easily measurable economic value, and thus are difficult to 'value'. Projects are held accountable to quantitative performance metrics, which are typically prioritized over long-term or indirect benefits by funders and other stakeholders.

The major trend underpinning these challenges is the tendency for project evaluation frameworks to favor quantitative economic measures of short-term success over narrative descriptions of social and systems change and predicted future change and resilience. The principles commonly used to evaluate and communicate the 'success' of a project – such as *efficiency, risk–return ratio, cost–benefit analyses, value for money* or *financial sustainability* based on current and future revenue – do not typically capture the full value of engagement, cooperation, capacity building, social or systems change, and investing in the enabling environment, even though investing in water access has impacts across nearly all of the SDGs. This may be seen as an *institutional* finance gap (funding projects based on short-term revenue or finance-aligned metrics) and an *instrument* gap (the absence of financing instruments to account for the full value of sustainable water access).

Meanwhile, gender targets can lead to the tokenization of women and marginalized groups while failing to reflect genuine change. One interviewee cited work on microfinance in India, where institutions prioritize lending to women (for many reasons, including the aim to drive social change and women's empowerment, but also stereotypes of women as more reliable). The failure to tackle underlying inequalities meant that women were often loan recipients in name only, and did not retain control over the money nor see any of the benefits. This challenge was also seen in several of the case studies, for example where equality targets had been met for gender-specific training but were not integrated across project outputs or outcomes.

Interviews presented four ways forward for enabling sustainability through metrics.

Alternative metrics

Several methods were cited by interviewees that provide frameworks to evaluate sustainability enablers or outcomes. For example, a **human rights–based approach** can encourage attention toward *processes* – how projects are actually being implemented – as well as results (Human Right 2 Water, 2021a). The human rights–based approach guides the entire project management cycle, and is based on core principles of equality, non-discrimination, participation, inclusion, access to information, accountability and sustainability. It was suggested that in addition to applying the human rights–based approach to evaluate new and existing projects, it could also be used to retrospectively assess whether certain outcomes would have been achieved with the approach. This could enable better communication of the value of hard-to-quantify processes in project performance evaluations. The UNECE (2019) **People First PPP Evaluation Tool** was highlighted as another example that explicitly foregrounds and measures sustainability, in terms of processes and outcomes. This tool focuses on five core outcomes of access and equality, environmental sustainability, economic effectiveness (including fiscal sustainability), replicability, and stakeholder engagement. Specific guidance on stakeholder engagement – considered as the "backbone" for realizing the other goals – is also available (Human Right 2 Water, 2021b), and provides practical guidance building on section 5.4 of this report.

Another interviewee cited their use of sustainable service checklists, which ask key questions such as:

- ⊙ Are the water boards in place?
- ⊙ Are utilities and government departments set up with dedicated staff?
- ⊙ Have early warning and monitoring systems been established?
- ⊙ Do the service providers have a plan for future provision?
- ⊙ Have they calculated how much they need in direct support?
- ⊙ Do they have the money required to conduct major repairs and replacements?
- ⊙ Are piped water systems metered?
- ⊙ Are allocations restricted by government?
- ⊙ Is the service provision responsive to catchment management plans, groundwater and surface water monitoring, and holistic WASH needs?
- ⊙ Are services resilient to climate change? (see section 6.7)

There also may be an opportunity for **partnership metrics**, such as the number of collaborative meetings or team training sessions held.

"Focused inefficiency"

As identified, the tendency to measure project efficiency in economic terms (i.e. the conversion of financial/funding inputs into return value over time) means that projects prioritizing socially aligned, harder-to-quantify or gradual goals may be considered less efficient relative to their inputs. One interviewee explained, however, that seemingly *inefficient* processes can be very *effective*. Investing in the enabling environment, opportunity creation, systems, governance and capacity building is slow, and the benefits are more diffuse, but they are essential for "not just presenting the alternatives, but making alternatives work". Effective innovation may also benefit from inefficiency when it opens spaces for experimentation and *learning* (see also section 6.5).

A focus on efficiency may therefore undermine effectiveness, while the ambition to convert dollars into short-term outcomes may generate more risk in the medium to long term.[10] There needs to be a better consideration of the externalities of efficiency and its impact on the potential to achieve long-term goals. Even if efficiency is in tension with effectiveness and sustainability, the structures of funding institutions – with their need to spend down high annual budgets and provide evidence of results – means they will prioritize efficiency so long as it is easier to communicate in annual budget cycles and reporting. Shifting instead toward forms of "laser focused, inefficient approaches" can encourage prioritization of people, capacity and institutions, which underpin the long-term effectiveness and sustainability of a project. This, in turn, strengthens the business case for investment, albeit not on traditional terms of short-term efficiency or returns. It may be supported by developing approaches that calculate the social rate of return or social return on investment; however, as identified previously, it is not always possible or desirable to convert social outcomes into quantitative economic metrics, and narrative indicators should also be prioritized. Other financing instruments that foreground sustainability are explored in section 6.3.

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10 For example, the IPCC (2019) Special Report on Climate Change and Land identifies how vulnerabilities can be increased by investments, land uses and maladaptations.

Return assessments and organizational ambition

It was identified that large funders rarely undertake post-project impact assessments (i.e. several years down the line) or make them as visible as conventional performance reviews at project close. There are strong disincentives: return assessments come with costs, capacity demands and bureaucracy, and there are reputational, financial and institutional risks in discovering that a project did not sustain its outcomes. Without this evidence, however, it is difficult to truly understand sector sustainability. Funders could consider the potential to conduct return assessments in an efficient and equitable manner that avoids placing a high burden for data collection at the local level and diluting funding away from implementation. This entails not just a shift in project evaluation frameworks, but in an organization's strategic aims. One interviewee identified how organizations that make sustainability a central ambition – in terms of their reputation, project selection and project evaluation – can more effectively shift their evaluation frameworks to suit the long-term nature of measuring *sustainability*, even where results may take much longer to report (and therefore require significant interim efforts in communications and trust-building). This shift may also be linked to an organization's *learning culture*, which is explored in section 6.5.

Cross-sector study

Another suggestion was to evaluate the social and economic value of proper design through stakeholder engagement across all of the SDGs. This could support an understanding of the collective challenges and solutions across the water, climate, biodiversity and development project landscapes (see section 6.4).

6.3 FINANCING SUSTAINABILITY

As identified in section 5, strengthening project sustainability can attract follow-on funding and finance, based on evidence of long-term or catalytic impact, efforts to mitigate design risks, and improved bankability characterized by strong institutions and enabling environments. Such follow-on funding and finance can create a positive sustainability feedback loop, both by strengthening financial sustainability and by providing opportunities to reinvest in further capacity building, long-term interventions and coordination.

However, financiers may also consider specific financing instruments and approaches that can promote sustainability within water projects from the outset. Five solutions are highlighted below that are considered of particular importance for further practical exploration and implementation. Such approaches rely on close collaboration between policymakers, financiers and regulators to ensure coherence with national strategies and the incentivization of forward-looking interventions via a consistent policy and enabling environment.

Co-financing

Early identification and implementation of government co-financing was identified as a facilitator of project sustainability. The additional government funds committed can enable a proportion of the total budget (such as 30%, in one interviewee's recommendation) to be allocated to sustainability and the implementation of activities that cannot be included within the project period. These may include capital replacements, implementation of management models, policy making, investing in service providers, establishing systems and data collection processes, bringing in additional human resources, strengthening the enabling and regulatory environment, or broader capacity building efforts. Blended finance is one such approach that combines development finance with additional non-development finance; another is climate funds that provide grants and/or concessional loans.

Thematic bonds

Green bonds, climate bonds and other emergent variations like sustainability-linked bonds (ICMA, 2021a), blue bonds (IFC, 2025a), social bonds (IFC, 2025b), adaptation bonds (Buhr, 2022) and sustainability-linked perpetual bonds are fixed-income debt instruments earmarked to raise money for climate, social and environmental projects. Similarly to traditional bonds, they offer investors a stated return via interest payments and a commitment to use the proceeds to finance sustainable projects. They may have tax incentives such as credits and exemptions that make them more attractive to investors (Investopedia, 2024). Standards such as the Green Bond Principles (ICMA, 2021b) and Climate Bonds Standard (Climate Bonds Initiative et al., 2021) can provide third-party verification of the instrument's environmental benefits, and can include specific criteria for water infrastructure.[11] These bonds offer an opportunity to mobilize additional financing from MDBs, impact investors or non-governmental organizations (NGOs), with terms contingent on meeting sustainability-related key performance indicators (see Grantham Institute, 2023). Notable examples in the water sector include the issuing of Blue Peace Bonds via the Blue Peace Financing Initiative (UNCDF, 2023); a green bond listed in 2024 by the Tanga Urban Water Supply and Sanitation Authority to finance access to clean and affordable water in Tanzania (UNCDF, 2024); and the AU$500m Climate Adaptation Bond announced by the Asian Infrastructure Investment Bank in January 2025, which will partly finance water infrastructure and waste management projects (AIIB, 2025). These instruments can promote sustainability by actively incentivizing long-term finance, holistic interventions and multi-stakeholder coordination.

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11   The Climate Bonds Standard primarily measures contribution to adaptation and resilience via two components: a) the ability of the asset to be robust and flexible in the face of ongoing and potential climate impacts; and b) the sustainability of the relationship between the asset and upstream and downstream ecosystems as climate shifts continue to evolve (Climate Bonds Initiative et al., 2021).

Results-based funding and finance

Directly linking project funding and finance to evidenced outcomes can provide a clearer economic incentive for investing in sustainability. For example, **Uptime Global** designs and executes scalable results-based contracts, where qualified maintenance service providers are paid based on the achievement of results across service reliability, water volume, local revenue and disbursed grant funding. Users pay some, but not all of the service costs. This incentivizes service providers to sustain and continue improving their services. There are also opportunities to scale this approach to attract private finance, for example to support corporate water stewardship, financial risk mitigation or impact investment, based on clear evidence of "social returns" (McNicholl and Hope, 2024). A similar approach from MDBs is program-for-results financing, which empowers countries' programs and foregrounds institutional strengthening and capacity building following countries' own indicators and targets (World Bank, 2024a). As identified in sections 6.1 and 6.2, however, careful formulation of expected results is required to capture and incentivize long-term social, environmental and economic outcomes; and reporting on sustainability-aligned *processes* as well as *performance* should also be considered. In addition, it is important that agreed key performance indicators are achievable and sufficiently flexible to ensure funding and finance is still channeled toward higher-risk contexts (see section 6.6), and to avoid increasing debt burdens.[12]

Public–private partnerships

PPPs were identified as a particularly effective approach to ensuring long-term sustainability in water projects, depending on the model selection (design–build, design–build–operate, build–operate–transfer, etc.) and the establishment of a suitable national framework such as a PPP law. Where private operators are involved throughout the design, build and operate stages, they can provide important capacity building, training and education, technical expertise and experience, and innovation capabilities to support operational sustainability. It was identified that securing financing for the O&M phase can be difficult, particularly where the revenue stream from water tariffs is unreliable (see also water valuation below). Guarantees are one solution. Another identified benefit of PPPs was their ability to embed a mandate for stakeholder engagement, given that close dialogue is required between private operators, public authorities, IFIs, investment funds, users, and civil society to resolve complex issues (for example on tariffs, allocation of risks and responsibilities, and local agreements with the project or private operator). Recent advances[13] and collaborative work in this space point to growing momentum in PPPs as an important project mechanism to promote sustainability.

Water valuation

The undervaluation of water was identified as another major barrier to sustainability. In water-stressed, resource-constrained regions, the price of water is frequently subsidized to provide access to all as a common good. The resultant price of water has little correlation with the cost of service provision, investment needs for improving services, water users (who is using it, how much and for what purpose) or resource dynamics (present and future supply and quality, including the impacts of climate change). This disincentivizes efficiency, hinders utility cost recovery and traps water-scarce, resource-constrained contexts in a persistent cycle of high public sector costs, low efficiency, low accessibility and quality of services, and low creditworthiness. This issue has been widely documented in the literature (e.g. Khemka et al., 2023), but its specific relevance to sustainability is outlined here:

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12   Debt swaps have also been advanced as a means of simultaneously reducing debt burdens and mobilising resources towards nature, climate and water action. For an example see CAF (2024).

13   One interviewee cited successful examples in Tunisia, Senegal and Morocco.

- ⊙ **Operational**: low cost recovery among utilities means that there is little or no capacity to invest in capital replacement, system upgrades or expansion, or measures to build climate resilience. This makes it difficult for utilities to maintain even a basic level of service.
- ⊙ **Financial**: governments spend constrained public sector budgets on subsidizing the price of water, undermining their ability to invest in longer-term sector change. Low profitability and poor reliability of service providers undermines the bankability and risk–return ratio of investments. Water infrastructure and service projects have therefore struggled to attract private sector investment due to high risks and low predicted returns. This is, however, starting to change: water is increasingly being considered a financially material risk and an opportunity for impact investment, given its intersections with climate adaptation, human health, education, gender equality, economic growth and sustainable development. Greater attention is needed toward how these benefits may be better measured and applied in calculation of financial returns.
- ⊙ **Environmental**: the low cost of water disincentivizes efficiency, which can lead to waste, including in agriculture, water-intensive industries and non-revenue water losses. Furthermore, nature-based solutions for water have struggled to make a viable business case for public and private sector investors, as the full value of freshwater ecosystems, water quality and drought and flood mitigation (among other benefits) is not captured in economic models.
- ⊙ **Social**: poor communities are excluded from water projects that advance water-related business models without proactive measures to ensure low- or no-cost access for the most vulnerable users.
- ⊙ **Institutional**: persistent low profitability and financial unsustainability means that the sector has struggled to attract and retain the expertise and talent necessary to establish effective, sustainable water projects, policies and programs. Several interviewees highlighted this issue of the water sector not being seen as a viable, valuable career path. This may be said for both developing/emerging economy contexts as well as – if to a lesser extent – the WASH sector in developed economies, including in NGOs, water technology, research and the public sector.
- ⊙ There is, additionally, **political** unsustainability in water undervaluation: revising water prices is politically contentious, given the ongoing subsidization of water prices for all users regardless of consumption volume and use case; the absence of science-based methodologies for setting more value-reflective water prices; and the poor bankability of utilities and service providers.

Some of the case studies analyzed for this report aimed to tackle the valuation challenge at a project scale through tariff design that accounts for willingness and ability to pay, resource allocation and social tariffs for affordability and inclusion. However, the resource intensive and politically contentious nature of such activities make it difficult to transform approaches to water valuation and pricing within the scope of an individual project. Further exploration of systems-wide, context-sensitive solutions is needed. Progress on water valuation is gaining momentum, with the work of the **Global Commission on the Economics of Water**, the **Valuing Water Finance Initiative**, **Watermarq**, **CDP**,[14] and individual corporates and investors exploring internal water pricing (Watermarq, 2024).

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14 CDP includes internal water pricing in its questionnaire for corporate sustainability disclosure.

6.4 COORDINATION & SCALE

Improved coordination across different levels was identified as key to sustainability. Interviewees believed this could be achieved in three ways: by *embedding* projects within existing systems, resource flows and institutions; by *avoiding duplication* or negative trade-offs between projects; and by bridging the gap between individual projects and SDG6 outcomes at *scale*. Key levels of coordination are presented below, according to the case study analysis and interviews.

Coordinating funders

Positive examples of inter- and intra-funder coordination were identified and described to be embedded into MDB processes. One interviewee commented on the effective manner in which MDBs and governments tend to come together post-disaster to jointly mobilize funding, where the investment need exceeds what is possible for an individual funder. The cost of such disasters could be better used to advocate for proactive, multi-funder investments in disaster readiness, mitigation and adaptation.

Considering the importance of non-revenue-generating activities for project sustainability (including skills and capacity building, investments in the enabling environment and stakeholder engagement, as identified in previous sections), there is a benefit to evaluating the most appropriate funding and financing instruments for different stages of a project or program. In this sense, different funders may leverage their different mandates and expertise in a more coordinated way. For example, philanthropy may deliver community grants as a precursor to or alongside MDB project implementation and policy change, with private finance entering only when there is a sustainable business model. This comes down to better aligning typologies of investors and projects (WWC, 2018a, 2018b).

In addition, multiple projects had outstanding actions that, if implemented, would have dramatically improved target outcomes and long-term sustainability. While it may be the case that such actions are implemented using follow-up investment by the same funder, this was not captured in project documentation. There may be a further opportunity for smaller, more flexible investors to pick up follow-on tasks from larger projects and programs, where such tasks can boost the success and sustainability of existing interventions and investments with outsized impact. This possibility must be weighed up with the responsibility to take a full life cycle approach to projects.

Coordinating from projects to programs and beyond

In addition to advancing sustainable water projects, we must consider how to embed sustainable water use across all areas of the economy (Mazzucato et al., 2024). This is not just about water provision, but is about establishing community functions based on an environment where water can flourish. It is also about viewing water as a lever for food security, energy security, stability, health, economic and social prosperity, and more. This understanding requires a more programmatic, holistic approach. Long-term comprehensive approaches should be connected to shorter-term catalytic approaches, based on partnerships, accountability and transparency.

Such an approach may also be considered under the framework of "water development paths" (UN-Water, 2024b), referring to a sequence of interventions and investments that go beyond individual projects to address longer-term trajectories and outcomes. These paths may include a sequence of policies, regulations, investments, information, infrastructure, institutions and efforts to build adaptive and governance capacity. This can promote sustainability by embedding water projects within broader development ambitions.

Coordinating the local and national scales

Government buy-in was seen as key to sustainability and scale in nearly all case studies and interviews. Community buy-in and ownership was identified as an essential facilitator of effective government engagement. Hence, it is necessary to constantly move between the local and national scales rather than assuming a direct sequence.

Having a compelling argument for why a project is needed or beneficial, backed by evidence, data and designs, was identified as critical to engaging communities – as a precursor to more participatory approaches. Such information may also be used by MDBs to mediate discussions between the government and community stakeholders. In this sense, implementing monitoring systems, building human capacity to manage these systems, and accessing better data (on rainfall, water consumption, etc.) were described as "low-hanging fruit" for any project.

One interviewee described a project where community-led practices were implemented alongside policy change. By establishing an environment that incentivized the development of alternative practices, farmers, communities and mayors could deliver institutional change by *practicing* it. Such changes occur at a small scale, but when they illustrate success, they can be adopted as the standard. This reflects the value in establishing smaller changes that are programmatically under an umbrella of a larger institutional context, which can both spotlight smaller initiatives and upscale them into national or multinational best practices, rather than applying top-down interventions.

Coordinating governments

Coordination within subnational governments (multi-level governance) and between national governments is necessary to effectively manage and scale sustainable water projects and programs. One interviewee identified a case where 17 or more government departments had some form of influence on water management at the basin level. This challenge has been widely documented, particularly in a transboundary context.

Engaging ministries of finance can support sustainability via long-term funding commitments, financial and corporate policy and regulatory change, ensuring institutional accountability (e.g. by establishing mandatory reporting), and mobilizing additional private finance. One interviewee explained that for effective ministry engagement, it's important to make a case for how much it costs the economy *not* to have the proposed systems, institutions or infrastructure in place. This information may be sparse depending on the context, which links to the need for baseline data as an effective low-hanging fruit in the early stages of a project.

Making multi-stakeholder investments in skills, capacity building and enabling environment

In addition to integrating focused capacity building efforts into project budgets, efforts are needed to fund broader capacity building programs, as a *precursor* to, or *alongside*, individual projects. As one interviewee identified, "if you want to spend a billion, you have to spend a million first" on capacity building. However, relying on individual projects to fund the required capacity building and enabling environment risks advancing disjointed approaches or

duplication of effort, as well as simply not being enough to fill the institutional, governance and capacity gaps. Such a suggestion is not new, and programmatic approaches to skills and capacity building are regularly advanced by MDBs, national governments and NGOs. At the same time, there may be new opportunities to leverage climate finance, or small and decentralized grant funding[15] to advance the business case for cross-sector, holistic capacity building interventions. Another approach is to use targeted, catalytic investments in training programs: for example, focusing on skills development, behavior change and leadership among higher-level executives who will then direct change on the ground.[16]

Lastly, the corporate board is another institution that is key to project sustainability but often underemphasized in the literature and collaborative spaces. Corporate boards provide important institutional memory, documentation of evidence, and accountability between service providers and users. They can also strengthen financial and human resources management, thereby increasing trust and bankability, which are crucial for attracting private finance.

Coordinating beyond water

Water projects and programs (particularly among governments and NGOs) have traditionally struggled to access climate finance, for a variety of reasons including low financial sustainability and difficulty establishing a strong narrative that makes the critical link from water action to climate mitigation and adaptation. Tackling some of the systemic barriers identified in this report – for example, on valuing water (and nature more broadly), programmatic skills and capacity building, and building resilience as a form of climate adaptation – provides a unique opportunity to make the case for accessing climate finance and integrating water projects into National Adaptation Plans and Nationally Determined Contributions.

In addition, the project-level barriers to sustainability identified are unlikely to be unique to the water sector, given they generally relate to project design and implementation principles as opposed to water-specific interventions. This offers additional opportunities to break silos within the climate, nature and development ecosystems, to consider how to make all projects more sustainable in pursuit of the 2030 Agenda. Multipurpose investments such as dam projects for water, energy and irrigation, or urban projects combining WASH interventions with solid waste management, can support the case for sustainable water projects that are embedded across multiple economic activities and institutions. They can also yield efficiencies in institutional strengthening, training and more.

Further studies are needed to validate these assumptions and to explore the practical intersectoral approaches, funding sources, evaluation metrics and collaborative spaces needed for multi-sector action on sustainability.

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15   For example, see ISW (2025). Zambia's Constituency Development Fund is also an interesting case of how cross-sector community grant making can build the baseline human and institutional capacities required for projects to be sustainable (upcoming research, Climate Compatible Growth Programme, University of Oxford).

16   See the newly launched Singapore Water Center (World Bank, 2024b).

6.5 LEARNING FROM MISTAKES

Two key questions posed throughout this research were:

- ⊙ Why do certain projects still struggle to achieve successful, sustained outcomes despite the wealth of experience and documentation available?
- ⊙ How can we better learn from our collective mistakes?

As illustrated throughout this report, shortcomings in sustainability arise at both the project level and the systems scale. To consider how these persistent challenges may be practically *resolved*, we must turn to our approach to learning. Three ways forward are highlighted, as identified through case study analysis and interviews.

More *actionable* approaches to shared learning are needed that go beyond documentation of project and sector-wide challenges. Some interviewees questioned the value of high-level reports and conferences, which – while all useful and well-intentioned – can make it difficult to distill practical ways forward from amid the noise. Two alternatives were proposed.

Learning exchanges and mentorship

Several interviewees highlighted the practical value of learning exchanges, where project stakeholders visit a similar project in a different context. This can improve stakeholder buy-in and ownership by showing what the project is trying to achieve, providing an opportunity to consider how it may be tailored to the context, and creating designs based on the challenges and successes of the existing project. This process is not new, but can support sustainability by encouraging effective design at the same time as enhancing local ownership and interest in sustaining project outcomes.

One organization also highlighted mentorship programs as a particular area of success: as opposed to one-off workshops, local government staff are trained consistently, learning from a similar project that has performed well.

Reimagining through practicing

As one interviewee described, "the best incentive for changing course is an awareness of how we fail… plus an awareness of how we could succeed". Awareness of, and commitment to, sustainability can increase when organizations see their investments fail – although improving transparency around individual and organizational mistakes is not easy. This may partly be resolved by promoting a culture of learning (see below), accountability and transparency.

Setting up alternative practices – and highlighting how they work in adding value and creating opportunities – was identified as a critical driver of systems change. Reimagining the status quo of unsustainable water projects must be accompanied by an idea of what the alternatives look like in practice. This can empower civil society and other stakeholders by providing inspiration through a suite of alternatives. Such empowerment is critical to broadening institutional power where innovation, trust and investment in viable projects is needed.

This understanding also encourages continued attention toward the project as an effective scale for innovation, experimentation, capacity building and collaboration, and a vehicle for systems change. As identified in section 6.4, systems change is about advancing these smaller-scale interventions in the context of, and to drive change within, larger-scale institutional programs and processes.

The third way forward relates to organizational and sector-wide approaches to learning:

Establishing a learning culture

During the case study analysis and interviews, there was substantial evidence of documentation of project successes and failures – commonly described as "lessons learned". This evidence may be directly shared by funders, and increasingly it is also being shared by private investors as part of voluntary and mandatory corporate disclosure. However, the extent to which these lessons are actually embedded within and across projects and funders is less clear.

One interviewee, describing how they often partner with organizations with specific expertise to implement part of a project where they have gaps in their expertise, commented, "if learning is part and parcel of an organization's culture, then we should be able to learn from our mistakes". This is particularly pertinent for project sustainability – as it encourages organizations to prioritize the more difficult, costly, risky and/or invisible interventions necessary to establish project sustainability where they know that this has not been achieved before. Such a recognition may appear obvious, but the tendency to prioritize short-term gain over long-term sustainability remains an issue (see section 6.1).

Establishing a learning culture *and* an organizational focus on sustainability can thus be seen as harmonious goals, given the opportunity to re-align project selection, partnership approaches and metrics of success. These may focus on goals such as cooperation, training, knowledge transfer, project adaptability, flexibility, resilience and long-term outcomes through repeat evaluations, say one year following project completion. Such goals may be less visible, and require carefully planned narratives to communicate to donors or other key stakeholders. Nevertheless, they are more likely to encourage organizational and project sustainability through a consistent process of learning and adapting to challenges.

Multiple interviewees emphasized that calls for greater learning, accountability and transparency of project successes and failures is not about a "blame game", but is about empowering change and exploring alternative practices across various levels. Publicly reporting organizations are naturally subject to greater scrutiny, so it is important to recognize that adaptation and learning will not lead to perfect results, particularly given calls to re-prioritize long-term outcomes over short-term, more easily quantifiable outputs.

6.6 THE TRAPS OF DESIGN

This report has considered how to improve sustainability in the water sector through project design (section 5) and systems change (section 6). Two areas of caution in relation to this perspective are highlighted.

Trap 1: Prioritizing design over implementation

While project design (comprehensive preparation and risk assessments, effective stakeholder engagement, well-aligned evaluation frameworks, etc.) and systems change (skills and capacity building, coordination, business models, evaluation metrics, etc.) are shown as key to project sustainability, it is important not to forget the power of projects to get things done. Resources (financial, time and capacity) are limited, and overemphasizing the need to tackle all causes of potential *unsustainability* risks diluting the resources available for targeted, sector-specific interventions. Reimagining alternative systems through experimentation and implementation in practice can act as a useful way forward in this regard (see section 6.5). In addition, placing too much emphasis on sustainability as an essential characteristic for attracting funding may not always be suitable. Consider, for example, contexts affected by increased health problems, or by fragility, conflict and violence where sustainability of outcomes cannot be guaranteed; or more experimental, deliberative projects where results are hard to control or forecast. In this sense, sustainable and *resilient* project design (see section 6.7) may be a good alternative, which promotes a realistic approach to sustainability in which imperfect designs can still lead to adaptable, long-term benefits.

Trap 2: Equating sustainability with basic solutions

As identified in section 5, sustainability is often limited by the implementation of infrastructure or services that are not responsive to the environmental, institutional, financial and social context. For example, they may require imported materials, depend on an unreliable power supply, or be impossible for local organizations to maintain technically, operationally and institutionally. However, overemphasizing the need for context-responsive solutions risks implementing only the most basic options, at the expense of more technical, expensive or disruptive solutions that could lead to significantly higher social outcomes if accompanied by sufficient investment and capacity building. This can be seen in the continued implementation of unsafe borehole technology over piped solutions. Another case study – in recognizing that the solution implemented was dependent on an unreliable power source – suggested that power requirements should instead have been designed out of the project. This is a short-term fix, where a much longer-term and holistic approach would be to consider how alternative funding or partners may be identified to improve power supply *prior* to or *alongside* project implementation. This ambition is inevitably constrained by the short timelines, limited budgets, inflexibility and pre-defined targets associated with many project structures (see section 6.1), but merits further consideration and cross-sector thinking (see section 6.4).

6.7 FROM SUSTAINABILITY TO RESILIENCE

While this report has focused on *sustainability*, the concept of *resilience* may help to resolve some of the major project- and systems-level failures identified. If sustainability considers the ability of present financial, operational, social, environmental and institutional systems to maintain project outputs and outcomes into the future, resilience more explicitly accounts for the fact that such futures are highly uncertain in the context of climate change and other drivers. Resilience, then, is "about making effective decisions in an evolving rather than stable system, with imperfect knowledge of the future" (Chapagain et al., 2021).

This perspective can encourage a more holistic approach to project design by ensuring outputs and outcomes are sustainable under many possible futures. This requires a more comprehensive consideration of potential future risks and mitigation measures, and of synergies, blockages or trade-offs outside the project scope, which were identified as persistent challenges in section 5.1. A focus on building *resilient* water projects can also strengthen the case for skills and capacity building, stakeholder engagement and local ownership, as communities must be well equipped not just to *sustain* project outputs and outcomes, but to continuously *adapt* and *improve* them in line with a changing context. As such, we may move toward a system characterized not by static interventions, but by *catalytic* projects that can genuinely move the dial toward SDG6. While the proposals here are largely conceptual in nature, there are many practical efforts under way to promote *resilience* as a facilitator of more effective water projects,[17] and this is considered a productive area for future study.

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17 For example, the Resilient Water Accelerator and the Water Resilience Coalition.
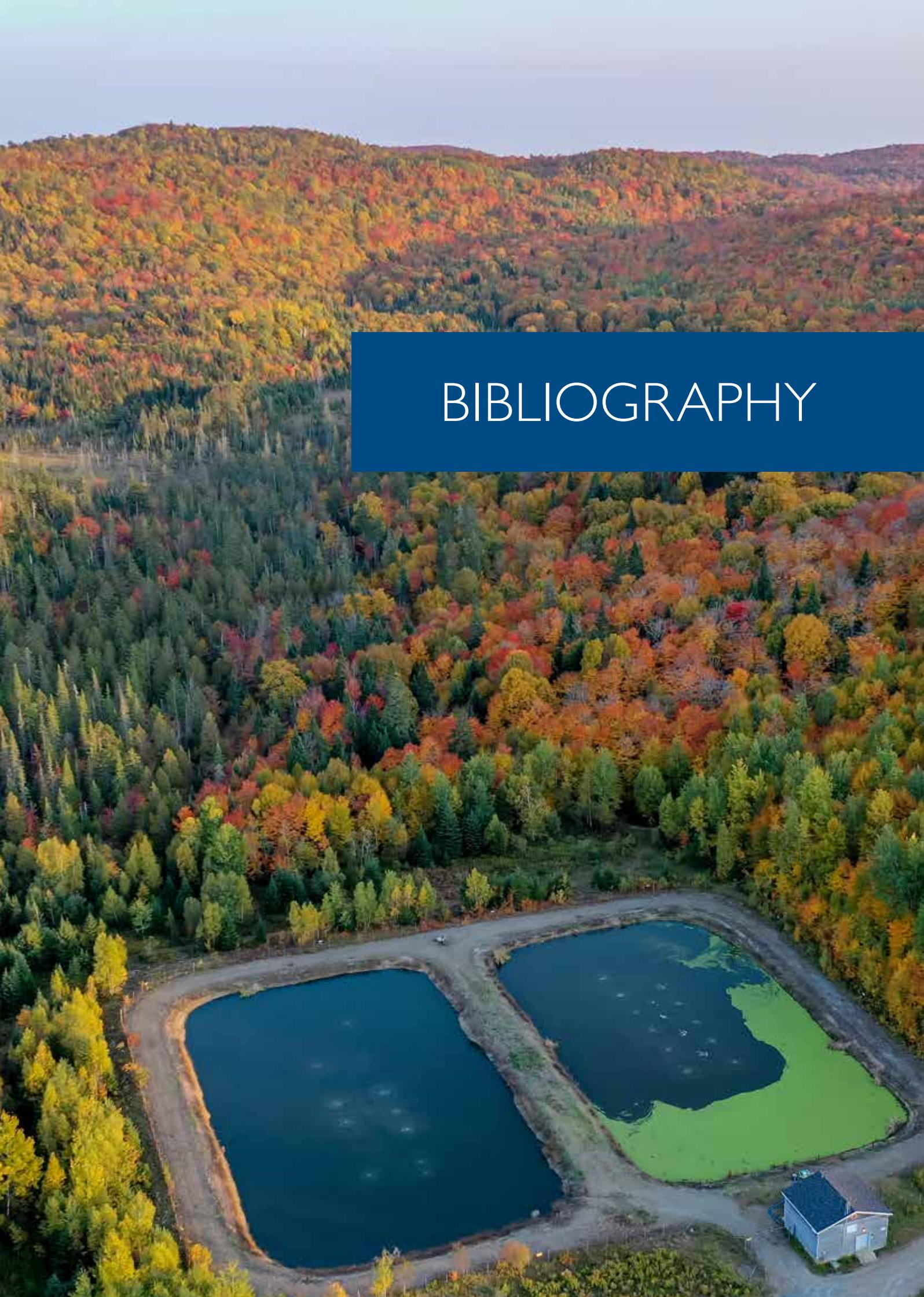
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APPENDICES

APPENDIX 1. PROJECT 'DEEP DIVES'

Five case studies were selected for in-depth analysis of project documentation and sustainability characteristics. This was based on a two-step process:

Step 1: Identification of major investors in water projects

The World Water Council's Typology of Water Infrastructure Investors describes four key groups: institutional investors, corporate investors, development finance and philanthropy. These are summarized in table 1.

Table 1. Categories of public and private sector investors in water

Type	Examples
Institutional investors	Banks, investment companies, insurance companies, public pensions, sovereign wealth, infrastructure developers, infrastructure private equity, endowments
Corporate investors	Companies, including large multinational organizations investing in infrastructure and water stewardship
Development finance	Public sector multilateral development banks, private sector development finance institutions
Philanthropy	Foundations, family offices, personal donations, crowdfunding
Other	Overlapping institutional and corporate investments in water, for example where institutional investors hold shares in corporations, or corporate green bond issuance Blended finance, where development finance 'crowds in' private sector capital through instruments and mechanisms that reduce risk and enhance return Impact investors, including institutional investors, corporations, development finance institutions or philanthropists, that allocate capital with the explicit intention to generate social and environmental impact alongside a financial return

To answer the guiding questions, multilateral funders (predominantly development banks) and philanthropic investors were selected as the focus for case study analysis, given their tendency toward project-level approaches; the availability and accessibility of public data on their investments and projects; and their wider relevance for the water sector given their communications influence and multi-stakeholder relations.

With this focus, data on investment levels were retrieved from the Organisation for Economic Co-operation and Development (OECD) Creditor Reporting System (CRS) via **OECD Data Explorer**. Data were filtered by disbursements to developing countries in the water supply and sanitation sector in 2022 (the latest available year with comprehensive data), and the top three funders for each investor category were extracted, shown in figure 1. While 2022 investment levels do not necessarily reflect the top investors overall, and there are likely data gaps in the CRS (particularly regarding private donors, the majority of which are not listed on the CRS), this exercise was not designed to retrieve a comprehensive overview of the largest donors, but rather to provide the basis for case study identification that represents a subset of important actors.

Figure 1. Top donors to water supply and sanitation in 2022, according to the OECD CRS

OFFICIAL DONORS > MULTILATERALS	
Donor	**Millions US$, 2022**
Regional Development Banks	3,088.023
World Bank	2,449.07
EU Institutions	891.092

OFFICIAL DONORS > MULTILATERALS > REGIONAL DEVELOPMENT BANKS	
Donor	**Millions US$, 2022**
Asian Development Bank	1,208.613
Inter-American Development Bank	640.639
African Development Bank	490.017

PRIVATE DONORS	
Donor	**Millions US$, 2022**
Bill & Melinda Gates Foundation	73.513
Conrad N. Hilton Foundation	31.05
IKEA Foundation	3.155

Note: Figures shown for multilaterals are the sum of 'Official Development Assistance' and 'Other Official Flows (non Export Credit)'. Figures shown for private donors represent disbursements of private development finance. Data extracted 16 November 2024.

As shown in figure 1, the resulting shortlist from this process was the World Bank, European Union institutions, Asian Development Bank, Inter-American Development Bank, African Development Bank, Bill & Melinda Gates Foundation, Conrad N. Hilton Foundation and IKEA Foundation.

In addition to providing the basis for case study selection, this shortlist was used to identify reports for the top multilateral funders that highlighted their approach to project evaluation and portfolio-wide results, with a focus on how sustainability was defined and measured (see section 4 of the full report).

Step 2: Purposive sampling to identify suitable case studies

It was decided that a deep dive into specific water projects would be an effective means of understanding shortcomings and solutions to sustainability at the project level, before analyzing how common failures may be resolved at a systems level. Project pages for each of the top 2022 donors were identified, and filtered by water and sanitation projects with a completion date within the past 5 years (2019–2024). Purposive sampling was used to select case studies across a range of project types, investment types, geographies, size, objectives and outcomes. Sampling was also influenced by the quality, language and availability of documentation for different projects. This approach was preferable to systematic sampling, which was tested, but yielded a comparatively less useful case study list: for example, using each funder's largest investment in 2022 skewed the sample toward loans and large infrastructure projects; and using the top case study highlighted on funders' water and sanitation pages skewed the sample toward the more successful projects, and documentation for these case studies was inconsistent.

The final case study selection is provided in appendices 2 and 3. Eventually, only one project funded by a private donor (the Conrad N. Hilton Foundation) was selected, due to the relative lack of detailed project documentation shared by private funders compared to multilateral funders. The Asia-Pacific, Africa and South America regions are represented by at least one case study each, but the overall sample is skewed toward East Africa due to the concentration of project activity of the selected funders in this region, and the high quality of project documentation identified during the sampling process.

While the final sample cannot be fully representative of water project funding and finance as a whole, and is still open to selection, geographical and other types of bias, maximum efforts were made to identify an effective range of case studies that would provide precise and transferable learnings and insights for improving project- and systems-level sustainability. We hope that this analysis provides the basis and rationale for a future, more comprehensive, cross-funder assessment on project sustainability, to build on the solutions and recommendations provided in the report.

APPENDIX 2. CASE STUDY SAMPLE

Funder	Project	Location	Geography	Million US$	$[1] Size	$ Type	Characteristics and Key Theme	Documents
African Development Bank	**1.** Arusha Sustainable Urban Water and Sanitation Delivery Project	Tanzania (East Africa)	Urban	154	Large	Standard loan	Strategic WASH infrastructure, capital investment	(1) Project Summary (2) Appraisal Report (3) Project Completion Report
Asian Development Bank	**2.** Palau Public Utilities Corporation Reform Program	Palau (Micronesia, Western Pacific)	Small Island Developing States	10.6	Med.	Policy-based loan + technical assistance	Joint energy–water utility, enabling environment for private sector investment	(1) Subprogram 1 Webpage (2) Subprogram 2 Webpage (3) Completion Report
European Union (Horizon 2020)	**3.** Innovation for Wastewater Treatment (INNOQUA)	Including Ecuador, Peru, India, Tanzania	Multi-national	7.8[2]	Small	Research grant + co-financing	Nature-based services, multinational pilots, highly technical/ scientific approach, multiple partners including research	(1) Water Briefing Global (2) Lessons from the Demonstration Sites (3) Project Deliverables (4) INNOQUA website
World Bank	**4.** Horn of Africa Groundwater Initiative	East Africa	Trans-boundary	2.7	Small	Grant	Groundwater, transboundary capacity building and data, regional stakeholders, feasibility studies	(1) Project page (2) Completion & Results Report
Conrad N. Hilton Foundation	**5.** Investments in Service Delivery Models	Ghana, Ethiopia, Uganda (East and West Africa)	Rural	64	Med	Grant	Foundation portfolio, rural service delivery models, institutional strengthening + infrastructure	(1) Review of the Conrad N. Hilton Foundation's Investments in Service Delivery Models for Rural Water Provision

1   Based on the thresholds of <$10 million as small, $10–100 million as medium and >$100 million as large.

2   Horizon 2020 investment in the INNOQUA project was €7 million, with the project commencing in 2016. Using a 2016 Euro/US$ conversion rate of 1.1068, the rough investment was calculated as $7.8 million (rounded).

APPENDIX 3.
CASE STUDY DESCRIPTIONS

Arusha Sustainable Urban Water and Sanitation Delivery Project

Funder	Location	Geography	Million US$	$ Size	$ Type	Characteristics and Key Theme	Documents
African Development Bank	Tanzania (East Africa)	Urban	154	Large	Standard loan	Strategic WASH infrastructure, capital investment	(1) Project Summary (2) Appraisal Report (3) Project Completion Report

Project aims:
- ⊙ Improve the quality of water supply and sewerage services in the area under the Arusha Urban Water Supply and Sanitation Authority (AUWSA).
- ⊙ Ensure equitable provision of adequate, reliable and sustainable water and sanitation services that contribute to improving health, social well-being and living standards, and enhance performance of the national economy.
- ⊙ Complement other social services and boost socio-economic activities in the city by providing a conducive business environment.
- ⊙ Provide climate adaptation benefits relating to water sources management.
- ⊙ Reduce waterborne disease and associated healthcare costs.
- ⊙ Targeted beneficiaries: 600,000+ residents in Arusha city, 250,000 additional people who commute to the city during the day.

Context:
- ⊙ Arusha city is a strategically important business, diplomatic and tourism hub but water coverage was less than 44%. The city's only sewerage treatment plant, catering to less than 8% of the city's inhabitants, was critically overloaded, posing a major environmental and health hazard. Waterborne disease in the project area accounted for around 40% of per-capita health expenditure.
- ⊙ AUWSA met its costs from internally generated revenue, and had been rated the best performer in terms of cost recovery among all 23 regional water utilities in Tanzania.
- ⊙ Financing to date had focused on rural water and sanitation. This project extended support to the urban subsector, bringing the Bank's vast experience in urban projects and supporting utilities.

Activities:
- ⊙ Improved existing infrastructure and enhanced the operational, commercial and service delivery efficiency of AUWSA through three main components:
  - sanitation infrastructure and services improvement
  - water supply infrastructure and services improvement
  - institutional support and project delivery.

Palau Public Utilities Corporation Reform Program (Subprograms 1 and 2)

Funder	Location	Geography	Million US$	$ Size	$ Type	Characteristics and Key Theme	Documents
Asian Development Bank	Palau (Micronesia, Western Pacific)	Small Island Developing States	10.6	Med.	Policy-based loan + technical assistance	Joint energy–water utility, enabling environment for private sector investment	(1) Subprogram 1 Webpage (2) Subprogram 2 Webpage (3) Completion Report

Project aims:

⊙ Strengthen state-owned enterprises in Palau by:
- improving the corporate governance and financial management of Palau's electricity and water utility company, the Palau Public Utilities Corporation (PPUC)
- providing an enabling environment for private sector participation in the electricity and water subsectors.

⊙ Support the government's long-term reforms in electricity and water and sanitation.

Context:

⊙ Palau is a small island developing state with a population of around 18,200. It is heavily dependent on revenues from tourism and services, which contributed almost 55% of annual gross domestic product (GDP) and employed three-quarters of the formal workforce before the COVID-19 pandemic.

⊙ The utility sector comprises water, wastewater and electricity and is regulated by the Palau Energy Administration. About 96% of Palau's population has access to public water supply systems. The Koror–Airai water supply system serviced more than 96% of the population living in Koror–Airai, but water supply systems outside Koror–Airai were in poor condition and service delivery standards were low. Frequent water outages had a significant impact on women's time poverty.

⊙ The PPUC, established in 1994, is the largest state-owned enterprise in Palau and is responsible for power generation, transmission and distribution. It also became responsible for providing public water and wastewater operations (WWOs) in 2013. The PPUC's financial performance was poor and distorted by external interference, imposing high risks on fiscal sustainability. It had operating losses of $6.87 million (2.6% of GDP) and its largest cash deficit (20% of revenues) in financial year 2019. The PPUC maintained its liquidity by deferring all maintenance works. Delayed metering and power grid upgrades resulted in network losses of up to 16%. These issues, combined with inadequate financial management (poor accounting systems, delayed reporting and audit), thrust the PPUC into a negative spiral of limited investments, poor efficiency and debt. With negative liquidity, the PPUC required continuous public subsidies to remain solvent. It was also heavily dependent on annual subsidies for operation and maintenance and for replacing capital assets. The PPUC was operating under poor corporate governance and transparency. It failed to develop a high-performance culture in setting revenue and operational targets, resulting in poor creditworthiness. The PPUC was heavily dependent on public funds, with no access to private capital for energy or WWO investments.

Activities:

⊙ Managed tariff reforms, including cost-recovery tariffs for electricity and WWOs; a subsidy program for poor and low-income households; awareness campaigns for poor and low-income households on the subsidy program; a communications strategy on the grievance redress mechanism; and the creation of a single regulatory agency (Palau Energy and Water Administration) for electricity, WWO regulation and tariffs.

⊙ Enhanced the PPUC's financial management, with Board approval of accounting policy and procedures; a corporate annual revenue model and revenue enhancement action plan; and business analytics procedures for performance monitoring.

⊙ Strengthened the PPUC's corporate governance and transparency, with Board approval of a code of corporate

governance; a gender strategy and gender-sensitive human resources management procedures; a statement of corporate intent and key performance indicators; procedures for audit, risk and compliance; independence, qualifications and performance of internal and external auditors; evaluation of risk in operations and investment decisions; and compliance with the legal and regulatory framework of Palau.

⊙ Supported market access for private sector participation in the energy sector, with Ministry of Finance approval of disclosure procedures for public–private partnerships to strengthen market confidence and manage sovereign fiscal risks through enhanced transparency of transactions and disclosure of key terms and conditions.

Innovation for Wastewater Treatment (INNOQUA)

Funder	Location	Geography	Million US$	$ Size	$ Type	Characteristics and Key Theme	Documents
European Union (Horizon 2020)	Including Ecuador, Peru, India, Tanzania	Multinational	7.8	Small	Research grant + co-financing	Nature-based solutions, multinational pilots, highly technical/scientific approach, multiple partners including research	(1) Water Briefing Global (2) Lessons from the Demonstration Sites (3) Project Deliverables (4) INNOQUA website

Project aims:

⊙ Meet sanitation and water resource challenges by promoting sustainable water sanitation technologies capable of performing a whole water treatment cycle.

⊙ Demonstrate in real conditions a modular system for water treatment based on the purifying capacity of biological microorganisms. These technologies resemble natural cleaning processes and are based on the purification capacity of earthworms, zooplankton, microalgae and sunlight exposure.

⊙ Adjust the configuration of the system according to the targeted markets in order to answer the most feasible market needs.

⊙ As the final objective, provide an ecological water sanitation system for rural areas and communities; for industries with specific characteristics (such as agriculture and aquaculture); for sustainable home builders or collective housing owners; and for developing countries worldwide.

Context:

⊙ The project responded to the growing need for protection and improvement of natural water resources, in the context of persistent low access to proper sanitation systems in the European Union and globally.

⊙ The project involved 20 partners from 11 countries, under the coordination of Nobatek, a French research and technology organization.

⊙ Demonstration sites included:
  - Ecuador: domestic apartment complex in Quito, where 97% wastewater was untreated and discharged into local rivers
  - Peru: university campus in Arequipa hosting 350 students, where wastewater was usually discharged, untreated, into the nearby Socabaya River
  - India: nine low-income households in a community with 150 households, where wastewater was treated with a decentralized system or discharged without treatment; with a plan for the treated wastewater to irrigate a community garden, providing fruit and vegetables to a nearby school
  - Tanzania: 37 beneficiaries from a middle- and low-income community, where 80% of the population used pit latrines or septic tanks as the main form of sanitation, with no water treatment; with a plan for treated wastewater to be used for irrigation of an existing banana plantation.

Activities:
- Integrated individual, low cost, sustainable and biologically-based water sanitation technologies capable of performing a whole water treatment cycle and available in multiple modular configurations adapted to local contexts and markets.
- Demonstrated the long-term viability of such solutions in 11 countries across four continents, to support the commercialization of the proposed solutions and stimulate economic growth, business and job creation in the water sector within and outside Europe.
- Optimized the proposed solutions to increase sustainable performance through reduced water consumption, increased resource efficiency and reduced carbon footprint; and establish socially accepted and affordable wastewater treatment systems.

Horn of Africa Groundwater Initiative

Funder	Location	Geography	Million US$	$ Size	$ Type	Characteristics and Key Theme	Documents
World Bank	East Africa	Trans-boundary	2.7	Small	Grant	Groundwater, transboundary capacity building and data, regional stakeholders, feasibility studies	(1) Project page (2) Completion & Results Report

Project aims:
- Support countries under the Intergovernmental Authority on Development (IGAD) to prepare for the development and management of groundwater through strengthening knowledge systems, capacity building and assessing the feasibility of specific investments.

Context:
- Groundwater represents the main source of water in the Horn of Africa.
- IGAD lacked technical capacity to support its stakeholders on groundwater management and development, and several IGAD countries had limited knowledge of their groundwater resources. Levels of transboundary cooperation were limited, not capturing existing opportunities nor adequately mitigating risks.

Activities:
- This initiative focused on mapping and planning the sustainable use of regional deep groundwater by:
  - expanding the knowledge base on regional groundwater resources
  - strengthening capacities in groundwater development and management in IGAD member countries
  - maximizing the benefits of groundwater to strengthen resilience to drought and economic development in the region.

Investments in Service Delivery Models in Ghana, Ethiopia and Uganda

Funder	Location	Geography	Million US$	$ Size	$ Type	Characteristics and Key Theme	Documents
Conrad N. Hilton Foundation	Ghana, Ethiopia, Uganda (East and West Africa)	Rural	64	Med.	Grant	Foundation portfolio, rural service delivery models, institutional strengthening + infrastructure	(1) Review of the Conrad N. Hilton Foundation's Investments in Service Delivery Models for Rural Water Provision

Project aims:

⊙ The Foundation funded the Safe Water Initiative (SWI) to ensure reliable and safe water for one million people in low-income households, health facilities and schools in sub-Saharan Africa.

Context:

⊙ As part of its SWI, the Foundation commissioned a review of its investments in Ethiopia, Ghana and Uganda. The review's primary aim was to investigate the effectiveness and sustainability of different service delivery models for rural water supplies, including community-based management, publicly-owned utilities and private sector approaches, and the relevance of the Foundation's investments to support rural water service provision.

Activities:

⊙ The Foundation's investments in the SWI portfolio covered three main categories:
- support to service delivery models: supporting and improving rural water service delivery models
- strengthening of WASH systems: improving the enabling environment and elements of the WASH system, specifically to achieve district-level improvements
- national-level advocacy: mobilizing political will, strengthening stakeholder coordination and communication, and increasing accountability at the national level.

APPENDIX 4.
SUMMARY INTERVIEW TRANSCRIPT

Note: comments have been anonymized and condensed for clarity.

1, Why do water projects still fall short of successful, sustained outcomes given the wealth of best practice, guidance, experience and collaborative spaces available?

Institutional, finance, governance gaps
- There is an institutional capacity gap: national level, public sector. For example, ministries of water and individual water ministers. Topping up budgets does not matter if the spending capacity is lower than the budgets.
- And at the project level – utilities, cities, private sector actors together do not have the capacity to see projects through.
- Next to this institutional/individual professional gap is an informal capacity gap: the enabling environment within which projects should flourish. There is no enabling environment.
- Then there is an institutional finance and validation gap: the way we fund projects comes with models of assessment on how finance should produce revenues. Both financing and validation methodologies are focused on short-term revenue streams, not on longer-term valuation. When deciding what projects get money, we only focus on short-term revenues, even though we know that investing in water trickles down across every Sustainable Development Goal (SDG).
- This is an institutional gap but also an instrument gap.
- Of course there is also a data gap: we don't have enough information. If we have the information it is not available for all. If it is available for all it is not readable for all/does not empower and inform.
- Governance gap: accountability, transparency. Private sector and coalitions.

'Projects' as a scale for sustainability are insufficient
- If we want to succeed on sustainability impact a project is just a drop on a plate. Need to move toward a more programmatic approach. Not just projects based on water provision but based on establishing community functions that tap into an environment where water flourishes. Water as a lever for ensuring food security, energy security, stability, health, economic and social prosperity.
- Globally we focus on projects (short-term, sectoral) over long-term, holistic programs.
- We need a framework which considers longer-term comprehensive approaches as connected to shorter-term catalytic approaches, where partnerships, accountability and transparency prevail.
- Projects are projects – the timeframe is too short to see the challenges and benefits.

Low returns and investment in the sector
- There is a perception that water isn't worth investing in due to poor returns.
- Seen as a common good so people don't want to pay for it. Things like mobile phones, people are willing to pay more as it is a luxury item. Water is expected.
- Not seen as an exciting area to invest in.
- Makes it very difficult when the envelope is small. It particularly doesn't work in poorer areas where people don't have the money to start with.
- When working in poor communities – if there are no other economic activities in the project – they won't be able to pay for the services.

How projects are designed, funded, structured
- A lot comes down to how projects are designed with the donors.
- Donors want sustainability but rarely pay for post-project impact assessment and follow-up. There are perverse incentives against this due to the risk that projects are not sustaining their outcomes.
- If there is no money on the line, and the reporting frameworks and internal structures to incentivize implementers to maintain the work, and donors to follow up on it, do not exist, then organizations move on to new projects and funding sources. Organizations have to follow the money.
- Nonprofit organizations are under intense scrutiny to prove value for money.
- Organizations such as Water for People have placed a lot of their reputation on sustainability. In recent years they have been able to verify what has been achieved.
- Everyone aspires to do it [focus on sustainability] but the reality is if you don't have an organizational focus on it, it is hard.
- A lot of it comes back to donor demands and where they choose to invest.
- Many projects are aimed at pleasing donors and suffer from lack of government participation.

This is not the case; most projects do have successful outcomes
- The premise of this question is that water projects don't achieve outcomes. Don't agree with that.
- In development bank funded projects, independent evaluators often conduct thematic evaluations (e.g. for all water projects). Look at issues and challenges; then collective findings are used internally.
- When we talk about successful and unsuccessful we are looking at the project indicators agreed with the government and bank at the time of approval.
- At the urban level most investments are successful because ultimately people are getting access to water in their house or new treatment where it wasn't being provided before.
- The rural level becomes challenging due to scale. River basins are large – there are lots of stakeholders involved. You need good governance, policy and institutions to manage it. There could be many institutions that all have a mandate in some way to deal with the river basin. There could be 17+ government departments that all have some kind of influence on how water is managed at the basin level. Need coordination between departments to plan a basin accordingly. Everyone is territorial over their control over certain parts of the basin. Then when you consider agri/irrigation projects covering vast areas – farmers and villages reliant on this water – effective coordination becomes challenging.
- Policy, legislation, regulation are outdated in countries and are too challenging to address – so you try and address it at the project level not the systems level.

2, Why do you think projects still implement infrastructure or other solutions that are unsuitable for the context? What is the solution?

Lack of thinking about long-term sustainability
- Once funding has run out, how will the project be funded, who is responsible for maintaining it and ensuring it is either a viable business or a funded project?
- The danger is that investors come in – they build the facility and then may or may not train people up at the beginning. As soon as money is gone there is a lack of interest in continuing the work as there is no return.
- The enabling government environment, including the regulatory environment and the way projects are supported by local government, needs to be looked at to ensure sustainability, e.g. via subsidies, capacity building.
- A lot of projects are short-sighted because they are performance-based – e.g. target to provide 10,000 people with water. There needs to be measures in place to ensure that processes remain after investment.
- Another problem is that people who really need the water aren't able to pay much or anything at all, and are therefore excluded from the business models. Projects are not designed around vulnerable groups.
- We need a more holistic view of infrastructure.

This is not the case; it is uncommon for solutions to be unsuitable for the context
- This is disappointing to hear – luckily can't recall examples to mind.

How projects are designed, funded, structured (see question 1); lack of incentives for change
- Most likely due to organizations following the money. It is a vicious machine – submitting proposals, completing projects, etc. This does not create sufficient time to reflect on what would actually work and what is needed to make things work.
- Even though we all say we want to/should be learning from failure, no one wants to go on the record as having failed. No one wants to report to a donor at a halfway stage that they did things wrong at the beginning and will need to reallocate budgets, they won't meet certain deadlines or milestones, etc.
- This comes back to the rigidity of the original contract and the relationship with the funder. You may be working with someone who will advocate for the project, but they cannot remove the bureaucracy.
- We know that these are the challenges but the reality of getting some of these institutional changes is hard – when people have organizational deadlines, priorities, etc. The technical people working on projects know that things need to change but navigating this up is too hard.
- Reports are published but this does not mean people read them – there is almost too much information. All of it is good and well-intentioned. It is also about your agency to respond to information – getting the right information to the right level of authority to read and act. But as you get more senior you have less time for learning – you are also bound by the need to form partnerships, bring in new business, etc. (e.g. at conferences). The higher up you get the more ability you have to make change but the less time to learn/think about how.

Tendency toward basic solutions
- Borehole technology is still promoted by donors even though the technology has been the same for many years and communities consistently say they still travel 30+ minutes for water. There are so many other risks – e.g. the safety of girls traveling to fetch water. They are also prone to pollution, climate change if not well protected.
- But people and funding models still promote them because they are cheap to install, although not cheap to sustain. They are perceived as cheap.
- Attended a workshop where someone asked, why should you give poor solutions to poor people? We shouldn't be promoting these technologies – we should be promoting technologies where households can go and open a tap – even if not in their house, at least in schools and hospitals.
- In many of the countries they work in, governments are coming in strong and moving away from point water sources to piped systems – it is very expensive and takes a lot of work as you need to prepare the utilities – but it gives hope.
- People don't know all the options and believe that you can't give a good solution to a poor community.

3, How do we prevent effective stakeholder engagement and capacity building from being seen as a 'nice to have' instead of a critical condition for long-term success of solutions and projects? do we prevent effective stakeholder engagement and capacity building from being seen as a 'nice to have' instead of a critical condition for long-term success of solutions and projects?

An awareness of how we fail; and how we could succeed
- There is more commitment and awareness on this when we see our money fail. The best incentive for changing course is an awareness of how we fail. Plus an awareness of how we could succeed.
- You need better insight on the alternatives and how these could work in adding value, creating opportunities.
- Data, information, accountability, transparency and disclosure are key. Anything from CDP to Science Based Targets for Nature. Public banks that are able to show what works and what doesn't. Create portfolios of failures to learn from – but this is not a blame game. That doesn't work. Disasters don't work.

- The way to inform society is through empowerment. Empowerment needs inspiration and therefore the suite of alternatives. A library of alternatives to reimagine. Reimagination has to come with an idea of what these alternatives actually are in practice.
- Do this by actually setting up such alternative practices. Working with coalitions on the ground.
- Features: capacity building, creating an enabling environment to bring stakeholders together in a safe space, building trust, insight, capacity. Informing alternatives that change the status quo.
- Not in a blame game way, but an empowering way, where we broaden the institutional power where we want to fund innovations to change our systems. Moving money toward these projects.
- Need to put these small coalitions at the heart of political decision making. Showing the world that the alternative works.
- These are needed as much in the Global South as in the Global North.
- Is it enough? I don't know, but it's the beginning of an emerging practice.
- Change will not come from a revolution. The next big thing is a lot of small things. We cannot wait for salvation.
- Delivering institutional change by practicing it. Stakeholders such as farmers can become the change agent for sustainable use. Instead of the scapegoat and one to blame for environmental damage.
- It happens at a small scale. In river basins, places that at first will not be on the pages but that is fine. That change is lasting, it can inform policy.
- These smaller changes are programmatically under an umbrella that is connected to a larger institutional context that can put a spotlight on smaller initiatives.
- They can inform policy change, governance change, institutional change across the layers that you need.
- Then they may be adopted by an international institution as best practice – they become the standard. If we can present these alternatives to inform changing the standards then that becomes the benchmark.
- Moving across these scales constantly instead of focusing on the large and small scale alternately.

Integrating into evaluation tools

- For example, the People First PPP Evaluation Tool. Stakeholder engagement part. Checklist running through all the stages of sustained engagement, meetings, design, etc.
- Focused on five outcomes – access and equality, environmental sustainability, economic sustainability, replicability, stakeholder engagement. You can't achieve any of the other four without stakeholder engagement. It allows you to optimize the outcomes you are looking for in terms of a sustainable project. If a project should be designed around local environmental conditions, be socially and culturally acceptable, etc., you need to engage stakeholders.
- No one calculates the economic value of engagement even though it exists. The value you get is more for the community (social, environmental, cultural benefits) than the investors (financial returns). There is some economic value, e.g. people are more likely to purchase resources if they have been designed in a socially/culturally acceptable way, but the long-term sustainability is harder to value, e.g. local health benefits from improved water resources is not measured as part of the project. If you formulate a project around the vulnerable then you are improving the health of the most vulnerable. This has value to local government, people, communities, etc. that isn't seen by the project.
- If you talk to the community you might design the project differently – you might site it somewhere different based on transport networks, how people would access the infrastructure, etc.
- These are just two examples but if you go through all the SDGs and look at the benefits of proper design through stakeholder engagement, the social and economic value is much larger.
- In a blended finance project where you have a government partner they will see the wider social and economic value but they will not necessarily count it. Projects should look more at measuring community value to give governments more of an incentive to participate, and we should find a way to incorporate this value into investor returns.
- Lack of measurement also means projects lack accountability to the community. If they have a grievance mechanism to understand what people like or don't like about the project, it is often just a box tick. They don't

think about how people can actually make comments, how to make them anonymous, and most importantly how they redress issues in a way that is transparent and shared with the community so that they encourage more community engagement.

- Development banks in particular have vast grievance mechanisms but everyone is scared to use them because of either a) fearing repercussions or b) thinking there is no point as no one will respond.

- More effort is needed to address how people are communicated with, and how they can communicate back – to be more transparent. You need a whole toolbox of approaches including online responding, face to face, via internet or post, women-only meetings (in some cultures women are not allowed to speak up in front of men), translation into local languages, 1:1 or group, pictures/visual content for those who cannot read.

- In their evaluation process, they use sustainable service checklists. Including: are the water boards in place, utility companies, dedicated staff, early monitoring, finance plans? Have they calculated how much they need to undertake direct support? Do they have the money required to do major repairs and replacements, do they have a plan? For piped water supply systems – are they metered, is the technology right, what allocation has been made by government? Is the infrastructure climate resilient and responsive to catchment management plans, groundwater and surface monitoring, WASH, etc.? Metrics relating to the sustainability of the service.

Focusing on specific stakeholders

- When we look at the categories of stakeholders – in their projects, usually the most important one is the service provider. Community-based institution, a utility. They are the ones to collect tariffs, do repairs, ensure quality is good during breakdown.

- Most times people just want to hand over the project with little training. Many projects do the CapEx but who will do the replacement when the infrastructure is down to continue paying the social worker?

- There are a number of other important stakeholder groups, such as financiers for capital replacement, politicians, community culture groups. They all play different roles.

- Stakeholder engagement is not a waste of time – people should be intentional about when they engage, depending on the time of the project, and should ensure their capacities are built – human and financial resources.

Coordination between stakeholders, including via good data

- You need to design a good communications strategy, have good stakeholder engagement at all levels and particularly at the higher government level. You have to get them on board. They are a pass or fail element.

- But you also have to make sure you have the end users engaged, e.g. farmer and water user groups. Work with them to design a participatory approach.

- If you can help users understand why the project is beneficial, can leverage this to convince government to support. You need to have a compelling argument for why the project is needed.

- This requires good evidence-based information, designs, reasons why things are necessary. There is a paucity of good data for this – measurement data, rainfall, consumption. Low-hanging fruit for any project is to get better monitoring systems in place and people to manage these systems.

- Another successful approach they have taken is taking project stakeholders to another project area, e.g. outside the country, and show them what you are trying to achieve – they can talk to counterparts and understand the benefits, think about how they can tailor it to their own situation and come out with a better project design.

4, Solutions to persistent skills and capacity gaps: how do you think this is best approached? Through cross-sector funding, or skills and capacity building to be more explicitly included and funded in individual projects?

How projects are designed, funded, structured (see questions 1 and 2)

- There is no silver bullet answer. It is part of a larger ambition – not just for the water sector. If you want to spend

a billion you have to spend a million first.

- You could easily argue – and this is underpinned by research – that there is enough money to fund projects with a business case. But this means that money funds more vulnerability because business case validation methods are short-term, sectoral innovations. We don't need more of these because they add up to more vulnerability in the long term – profitability prevails over sustainability, resilience, equity. This is because we don't spend money on the enabling environment.

- If we want to change that, focusing on money (billions and trillions in projects and programs) is not the answer to changing course. If we don't focus on people, capacity, institutions first we are never able to change course. If our financial mechanisms don't change, then the business case will never change.

- Happens in the Global North and South. Our institutions are focused on profit-oriented revenue streams.

Emphasis on local ownership

- Some of the more successful projects, especially in Latin America, local ownership is built into governance structure. Very little money but water management is given to the local community. This doesn't work without training and building local capacity, but if people think it is their project they are more likely to maintain it in the long term.

- Blended finance models can bring in this extra level of local effort – not necessarily additional funding but a local owner that can ensure a more sustainable outcome.

Focused training and partnerships

- Skills and capacity gaps are a huge problem. In water, but assume it is more widespread.

- A lot of capacity building focuses on individual people. People are fungible just like money. You can invest a lot of time and effort on training a lot of people – internally or in local environments. What people do with those skills – as any rational economic actor will do – is leverage them to get a better paying job.

- In a postcolonial development agenda you need to ensure things are government led – you put a lot of time and energy in developing those relationships then they get transferred. It means that a lot of time and effort in capacity building goes down the drain.

- Need to find a way to build capacity and create incentives for people to stick around where it is within their control (sometimes it isn't – e.g. government moves someone to a new department). Don't think anyone has figured that out correctly. Open lines of communication get completely broken.

- Speaking to a recent multilateral funder, a more recent approach they have taken recently is to concentrate skills building efforts – gearing toward higher-level executives. Based on the idea that intense 1-week trainings serve more benefit than a lot of smaller investments, as you trigger behavior change at senior levels to direct change on the ground.

- A prominent narrative in the water sector has been around partnerships – the idea that we can't do big things alone, we need more coalitions, etc.

- Partnerships take longer – you need to meet many times, align on objectives, schedule meetings. For one organization the project might be the biggest money they have coming in, for another it is comparatively small. You have to build in so much more time. Especially when you are talking about innovative partnerships where organizations are not used to working together.

- Despite this, donors still hold commitments to single time frames that can only really be achieved through a single entity.

- You cannot just demand partnerships and expect it to happen. This assumption that you should do partnerships needs to be accompanied by donors accepting that you need time to build those partnerships well.

- Always assuming positive intent across all actors – everyone wants to work better, but the reality is difficult.

- The bigger something gets, the longer it takes. The longer it takes, the higher the budgets. It is a leap of faith to presume that taking the time to build partnerships and bringing actors together will result in the scale and successes anticipated. The reality is we don't know.

- Proposes adjustments to funder evaluations – e.g. making the monitoring longer, include milestones to measure

things like relationship management and partnerships. Build in some actual partnership metrics – how many meetings, full team training, etc.

⊙ When monitoring inclusion of women – gender targets can lead to so much tokenization of women and marginalized groups. Just because a woman is there doesn't say anything, she doesn't necessarily retain the benefits/influence.

Learning exchanges

⊙ One of their most effective services has been developing mentorship programs. Has worked so well. Not one-off workshops or trainings but taking local government staff to where a project has worked well.

⊙ Also learning exchanges, or contracting an organization that is very good at something where they are lacking skills/capacity.

Directed funding and interventions

⊙ Need the right policy, institutions, legislation.

⊙ Need adequate funding – unless there is a career there people will not join.

⊙ Public expenditure allocations need to be substantially increased so they can fund staff levels, training, education.

⊙ You can address it at a project level if it is really focused on one geographic area but generally better to go beyond that – working with implementing agencies and their needs, and providing training – not just in the project area but across the sector. When you have long-term engagement with departments this is easier. You can have a long-term capacity building program in the department, carried out through separate sequential projects. Or you can have a large single investment in a country – the size of the investment would include in that skills and capacity development program with institutions. Could cover technical subjects, training on water systems, building a sustainable office that handles it. Also for infrastructure, procurement, contract management – not directly related to water management but it is important because if not implemented well a project will not achieve its outcomes. Development banks tend to coordinate with other multilateral development banks (MDBs) and donors to avoid duplication.

⊙ This is slow work; it requires commitment from governments and Ministries of Finance (MoFs).

⊙ To engage MoFs, you need to be able to make a case for how much it costs in the economy for not having those systems, institutions, infrastructure in place. That information is patchy depending on those involved. Working where public funding is scarce and not allocated as transparently or where it might be useful and appropriate; you are competing against other sectors for scarce funding.

⊙ When there is a disaster MoFs will put more funds in for a short period – so use these examples to show why being more planned and prepared for disasters is better.

5, How could project learnings be better scaled so that we can avoid repeating past mistakes?

Monitor processes and human rights–based approaches, not just performance

⊙ Human rights–based approach includes things like access to information, non-discrimination, respect for human rights. Organizations don't report on the human rights–based approach.

⊙ Need a study which looks at which projects have incorporated a human rights–based approach, how successful they have been (based on a set of criteria including equity and inclusion), and what approaches did they use (types of participation, data transparency, accountability mechanisms). What happened that wouldn't have happened without a human rights–based approach? Which groups were not reached as a result of not implementing human rights–based elements? How successful was the project in process AND outcome?

⊙ We need to actually look at how things are being done – a lot of the issues around water projects are linked to the fact that it is done in a performance-based manner, not looking at the processes.

Learning exchanges (see question 4); sharing lessons learned; organizational culture
- Publish lessons-learned documentation and make it publicly available.
- Provide mentorship, learning exchanges between successful projects.
- If learning is part and parcel of an organization's culture then we should be able to learn from our mistakes. Especially in areas of sustainability – if you know that an approach doesn't work it shouldn't be repeated.

6, How do we avoid overemphasizing project design considerations at the expense of rapid implementation and funding in high-risk contexts where sustainable outcomes may not be guaranteed?

How projects are designed, funded, structured (see questions 1, 2, 4): in particular, how 'efficiency' is defined and measured
- Perhaps this is a question about efficiency.
- Seemingly inefficient processes can be very effective.
- If we can focus more on impact in the context of opportunity creation, increasing the enabling environment, systems, capacity, governance. Over a modernist focus on efficiency which is centered on profitability – i.e. if I invest a dollar, want a return tomorrow. There is a question of effectiveness, if that dollar creates more risks than profits in the mid-term, where does that lead. The externalities of profitability need to be considered in the mid- to long term.
- Goes back to first question response on how our financial models are not incentivizing value creation.
- Efficiency and effectiveness are then in competition.
- A lack of efficiency creates an array of opportunities. Running around in circles may not be the best use of time but investing in an enabling environment is. Whilst time consuming, it is super beneficial for creating those capacities that are so needed. Not only presenting the alternative but making alternatives work.
- Haven't spoken much about a full life cycle approach – maintenance, operations, ongoing development, iteration. Here innovation benefits from inefficiency. Effective innovation is not just by time but by impact.
- Efficiency can be too small and narrow if not coupled with effectiveness.
- This idea of 'inefficiency' is not saying 'everything goes' but it is about the 'frills'. Impact as the key focus – inefficiency but without luxury of time. Long-term doesn't mean unfocused. Forms of laser focused, inefficient approaches. It is not black and white.

This is not a concern
- For example for MDBs, they operate via country partnership agreements, they establish a multi-year forward looking pipeline. Looking at each sector in the country individually – what are the needs, how have past projects performed, where do things need to be adjusted? Then they use the sector evaluations to work out how to better design projects at the inception. Propose the projects to MoF based on this information. This is generally a good process – generally little pushback, collaborative, co-designed with government, beneficiaries and stakeholders.
- It won't crowd out funding because MDBs always coordinate with MoFs. MoFs are generally good at coordinating between donors. MDBs also meet routinely with other donors.
- Post-disaster, donors come together as the financing need usually exceeds what an individual donor can provide.

Additional comments

Reporting: what is the right balance?
- The burden of reporting – under so much pressure to demonstrate impact. At the same time, it is a basic and core component of holding organizations/projects accountable.
- A big conversation has been how to access climate finance. There is not enough information/data on climate finance flows at the country level – you can't hire a consultant for every country you want to work in. Need this information but this is just adding to the reporting burden.
- How much of this work could be automated? Is there an increasing role for AI in project documentation?
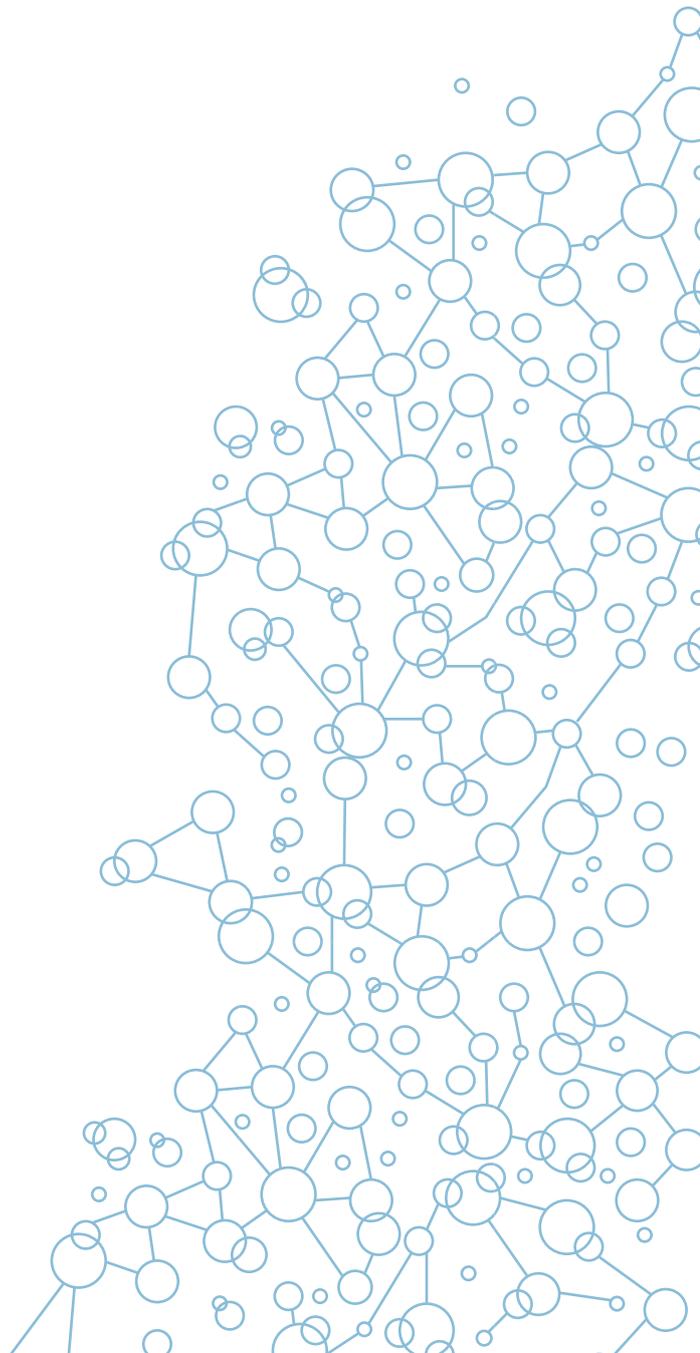
Co-financing
- One of the things that has worked really well is co-financing – government commitment. The extra funding can go into capital replacements and ensuring that things that can't be in the project period can be implemented years after. Getting that commitment from the government at the start is good.
- For every project at least 30% should be related to sustainability. When funders specify how money should be used, not all of it should be used in access alone when it comes to WASH. Should leave some for sustainability – building capacity, putting in place management models, investing in policies, service providers, etc.
- They take a whole systems approach: not just focused on small community project, you look at blockages outside the geographical area which are having a direct impact.
- If a water project is there but it is not receiving inflows from government over the next 10 years, that will be a problem.
- You have to influence at the national level to access financing, ensuring systems, databases, the need for extra human resources.
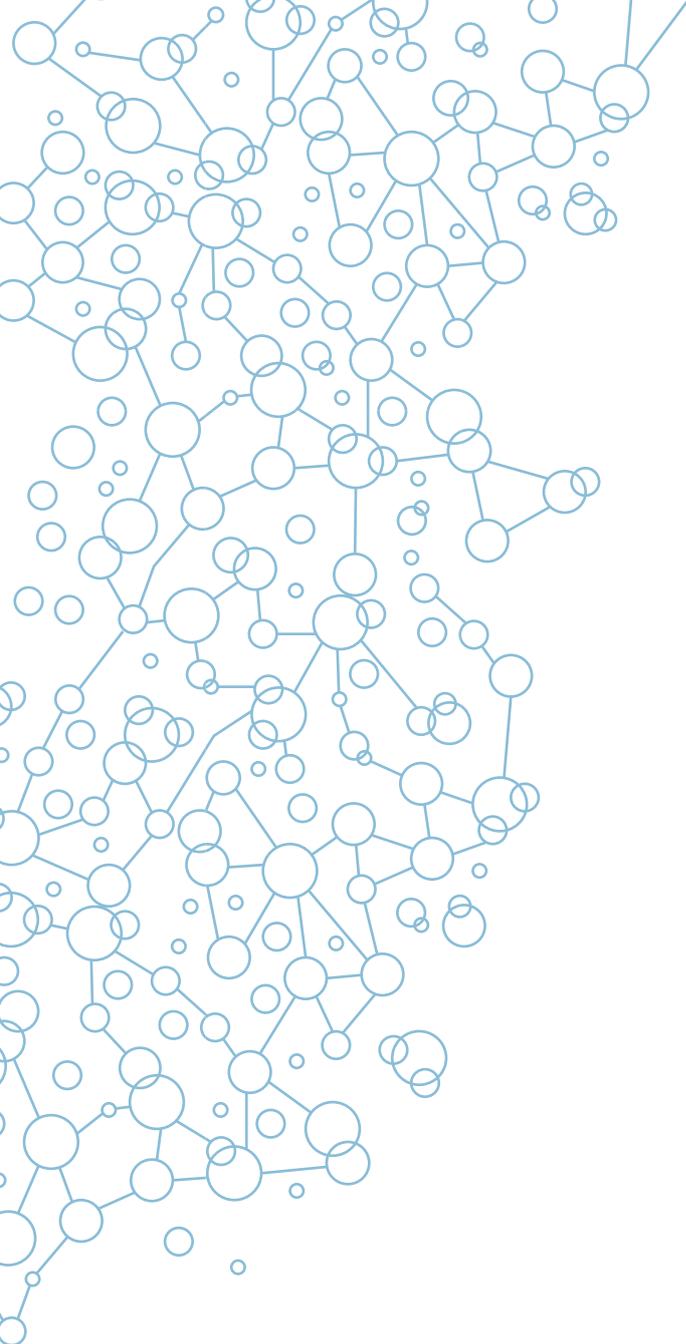- Work has to be done on the enabling environment, policies, regulation to ensure sustainability after the project.

Public–private partnerships (PPPs)
- Discussion a few years ago was always about the financing gap. The problem is not money, it's that we don't have enough investable/bankable projects.
- When they are deciding go/no go for a project it is rarely because they don't see the finance, it's because it's not bankable, well-structured, doesn't make sense, not sustainable, not accepted by the population, not choosing the right technology.
- Technology needs to be right – e.g. desalination may not be suitable if you haven't monitored/reduced non-revenue water first.
- Various stages to a project – design, build, operate, invest, technical assistance. Different organizations can carry out the different elements or multiple elements.
- Where projects are designed by Public Authorities (PAs), private operators don't have the capacity to change a lot of things.
- When they want a sustainable project they push for a PPP – design and build often doesn't work as the private operator leaves after 2 years, and often the utility cannot continue operating.
- Tunisia, Senegal, Morocco where PPPs have been successful.
- Once established, a PPP gives you a long-term contract where you have a serious, experienced operator who runs the infrastructure for 6–7 years (varies) and then transfers.
- Integration of training – people, creation of water schools for young people, etc.
- PPPs are not enough. You need the environment/ framework for a PPP to work. International finance institutions (IFIs) are key.
- PPPs are a good option in developing contexts where – we don't have enough money or expertise, private sector has a lot of experience training people, capacity building. But you also need a PPP law. Quite obvious but we see it a lot – countries don't have one before trying to set up a PPP. You need the framework in place. Need dialogue with the PAs – on structure, work with MoF, finance PPP unit in the ministries, allocate responsibilities,

- risks, who is putting in money.
- Takes time. Going from 4 hours per day to 24 hour service provision takes 4–5 years. You need to invest in repairing losses, pipes, building plants… If PAs need to invest this increases the tariff – people are not happy with that, most of the time they don't understand why.
- Sustainability is closely related to the model. Say the PA decides on design–build–operate for 10 years. Building is not difficult for them but the problem is during the operation – they are mostly paid by the tariffs so this is unreliable. There is a lot of financing for the [design and build] part but no secure financing for the operations and maintenance (O&M) phase. This is a problem for operators. They are not going to operate in a country where O&M will not be paid for.
- There are some options in this case...
- IFIs can finance O&M – very rare but a discussion they are having a lot at the moment – IFIs should look at this more seriously.
- Maybe IFIs don't finance but they provide a guarantee that the private operator is paid in the case that they cannot be paid by the PA.
- PPPs also a solution to embedding stakeholder engagement. A PPP is like a big stakeholder agreement.
- The water sector is quite sophisticated – need technical skills. It is risky because if you don't manage it correctly you can kill people. Water is an essential service – if it's not well treated it can lead to sickness. Unlike other sectors.
- PPPs take out the ideological questions. They agree that water is a common good but treatment is not free – it costs a lot.
- When we argue for PPPs, it's because the problems in the water sector are big and increasing with climate change. We need everyone on board – PAs, investment funds, IFIs, civil society who understand the issues, private sector to operate and invest. We cannot do it alone. We believe in PPPs because it's too complicated to manage alone.
- Sustainable projects are key right now – cannot continue putting money into projects that are not sustainable.
- Recent PPPs are performing much better.
- Need to share successful PPPs at conferences, workshops.