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# Scaling Up FINANCE FOR WATER



A World Bank Strategic  
Framework and Roadmap  
for Action

Rochi Khemka, Patricia Lopez, and Olivia Jensen



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This publication received the support of the Global Water Security & Sanitation Partnership (GWSP). GWSP is a multidonor trust fund administered by the World Bank's Water Global Practice and supported by Australia's Department of Foreign Affairs and Trade, Austria's Federal Ministry of Finance, the Bill & Melinda Gates Foundation, Denmark's Ministry of Foreign Affairs, the Netherlands' Ministry of Foreign Affairs, Spain's Ministry of Economic Affairs and Digital Transformation, the Swedish International Development Cooperation Agency, Switzerland's State Secretariat for Economic Affairs, the Swiss Agency for Development and Cooperation, and the U.S. Agency for International Development.

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Rochi Khemka, Patricia Lopez, and Olivia Jensen

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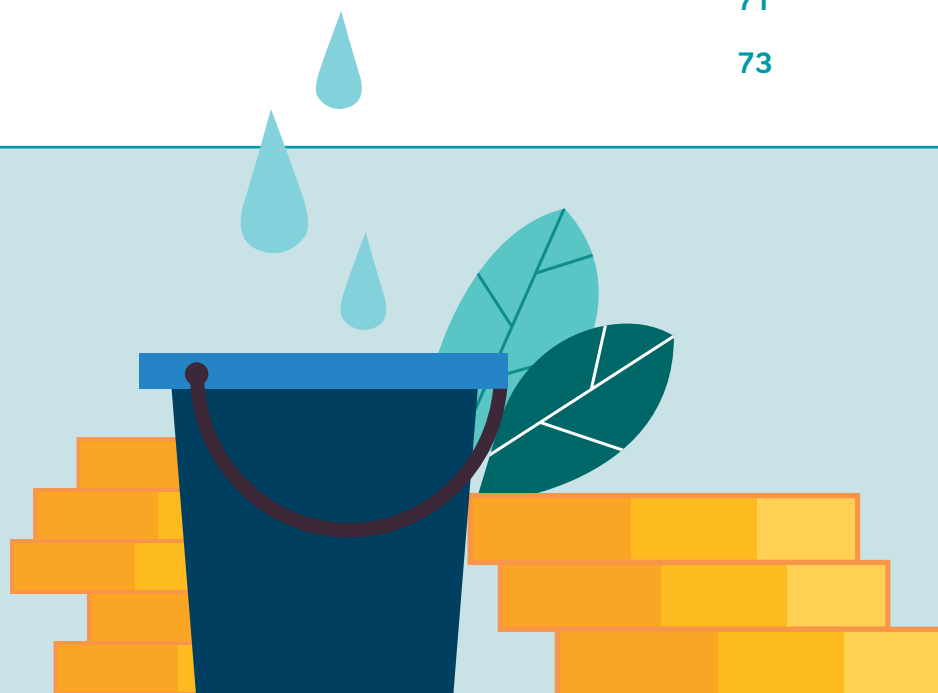
Please cite the work as follows: Khemka, Rochi, Patricia Lopez, and Olivia Jensen. 2023. *Scaling up Finance for Water: A World Bank Strategic Framework and Roadmap for Action*. Washington, DC: World Bank.

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Editing and design: Clarity Global Strategic Communications

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## Foreword

Water is a critical natural resource. The availability and sustainable management of water are key contributors to the attainment of nearly all the Sustainable Development Goals (SDGs). Water security is crucial for countries to meet long-term development objectives. At the same time, threats of water insecurity are exacerbated by climate change and impact vulnerable populations, infrastructure assets, and agricultural, energy, and industrial production. The transboundary nature of water resources resembles the characteristics of global public goods, necessitating coordinated international action. However, water resources are under severe stress and water services delivery is deficient on account of underinvestment in the sector. Closing the investment gap requires a combination of public, concessional, and private sources of finance, which are directed to meeting key sector goals, while optimizing the contributions and complementarity of both the public and the private sector.

The World Bank's vision is to create a world free of poverty on a liveable planet, supporting impactful development that is inclusive, resilient, and sustainable, including through access to clean water. With this goal in mind, different parts of the World Bank, including the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), the International Finance Corporation (IFC), the Multilateral Investment Guarantee Agency (MIGA), and 2030 Water Resources Group (2030 WRG), a public-private collaboration platform, have committed themselves to scaling up finance for water-related investments in emerging and developing economies, focusing specifically on crowding additional private sector innovation, expertise, and capital into a sector that has been historically funded through public and concessional financing in most of the developing world.

The resultant strategic framework provides a set of strategic directions and a customizable roadmap for the public sector, private sector, international organizations, intermediaries, and others to collaborate towards catalyzing greater financing and innovation for the water sector. This builds on the collective experience and knowledge of the World Bank and development partners on addressing the barriers to mobilizing additional resources in the sector.

We look forward to working closely with our partners from the public sector, private sector, international agencies, and civil society to operationalize this strategic framework to catalyze the much-needed financing and capacity to meet national, regional, and global development priorities linked to water in the context of increasing climate change challenges.

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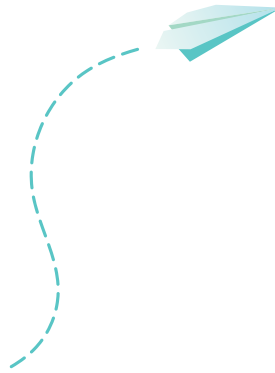
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## Preface

This strategic framework was written under the leadership of the World Bank's Water Global Practice, with inputs from a working group of colleagues from different units across the World Bank (WB), including the WB's Infrastructure Finance, PPPs, and Guarantees (IPG) and Treasury, the International Finance Corporation's (IFC's) Public-Private Partnership Transactions Advisory Department, Upstream, and Investment teams, and the Multilateral Investment Guarantee Agency (MIGA). It was prepared through a collaborative process, covering consultations with WB global and regional teams (including Task Team Leaders, Investment Officers, Financial Innovation Team colleagues, Global Leads, Practice Managers, Country Management Units) as well as external partners (e.g., Roundtable on Financing Water, multilateral and bilateral development agencies, private sector developers, operators, private financiers, and others).

While the strategic framework to scale up finance for the water<sup>1</sup> sector builds on extensive research, analytical work, and consultations with various partners from the global development community, it is primarily directed at WB management and staff, as one of its main objectives is to facilitate private sector participation (PSP)<sup>2</sup> in providing water security for the world through the WB's operational engagements at the country level, in partnership with emerging and developing countries and development partner institutions. Hence, a key area of focus of the framework is a proposed WB Roadmap to achieve this.



## Acknowledgments

This strategic framework was co-developed by Rochi Khemka (Senior Water Resources Management Specialist, 2030 Water Resources Group, World Bank Water and Task Team Leader) and Patricia Lopez (Senior Water Specialist, World Bank Water and co-Task Team Leader). The activity received research support from Olivia Jensen (Consultant, World Bank) and coordination support from Sudipto Sarkar (Lead Water Resources Management Specialist, World Bank Water). The work was carried out under the leadership and guidance of Saroj Kumar Jha (World Bank Water Global Director), Merli Baroudi (MIGA Director), and Laurence Carter (IFC Senior Advisor).

A core working group of experts across the WB provided inputs and support to this activity, including (in alphabetical order): Anthony Molle (Lead Infrastructure Finance Specialist, World Bank Infrastructure, PPPs, and Guarantees), Anupurba Roy (Financial Analyst, World Bank Treasury), Caroline Otonglo (Senior Infrastructure Finance Specialist, World Bank Infrastructure, PPPs, and Guarantees), Fabio Aparecido Da Silva (Senior Financial Officer, World Bank Treasury), Fook Chuan Eng (Lead Water Supply and Sanitation Specialist, World Bank Water), James Seward (Senior Financial Officer, World Bank Treasury), Lalrinpari Sailo (Strategy Officer, IFC), Michael Mueller (Junior Professional Officer, IFC), Midori Makino (Lead Water Supply and Sanitation Specialist, World Bank Water), Moritz Nikolaus Nebe (Sector Manager, MIGA), Naoll Cyrille Mary (Senior Operations Officer, IFC), Nicola Saporiti (Senior Investment Officer, IFC), Ntombie Z. Siwale (Operations Officer, World Bank Water), Rogerio Pilotto (Senior Investment Officer, IFC), Zhimin Mao (Water Specialist, World Bank Water), and William Llewelyn Davies (Senior Infrastructure Specialist, World Bank Infrastructure, PPPs, and Guarantees).

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In addition, technical inputs were received from a number of colleagues throughout this exercise for which the co-authors are grateful (in alphabetical order): Aileen Castro, Akinchan Jain, Amal Talbi, Christian Borja-Vega, Diego Juan Rodriguez, Eileen Burke, Esha Dilip Zaveri, Fan Zhang, Francois Onimus, Gustavo Saltiel, Hooman Dabidian, Iain Menzies, Jacob Kim, Jane Jamieson, Jean-Martin Brault, Jemima Sy, Joop Stoutjesdijk, Junglim Hahm, Lalima Maskey, Miguel Vargas-Ramirez, Nathan Engle, Rajesh Advani, Rome Chavapricha, Sean Christopher Nelson, Ye-Rin Um, Yogita Mumssen, and Zael Sanz Uriarte. The communications efforts for this activity have been supported by Alida Pham, Sarah Farhat, and Zubedah Robinson.



## Abbreviations

<b>2030 WRG</b>	2030 Water Resources Group	<b>MWSS</b>	Metropolitan Waterworks and Sewerage System
<b>BOT</b>	Build-Operate-Transfer	<b>MWI</b>	Ministry of Water and Irrigation
<b>CAPEX</b>	capital expenditure	<b>NDC</b>	nationally determined contribution
<b>CAT</b>	catastrophe	<b>NMCG</b>	National Mission for Clean Ganga
<b>CCDR</b>	Country Climate and Development Report	<b>NUWAS</b>	National Urban Water Supply
<b>CPF</b>	Country Partnership Framework	<b>NUWSP</b>	National Urban Water Supply Project
<b>CPSD</b>	Country Private Sector Diagnostic	<b>NRW</b>	non-revenue water
<b>CWIS</b>	Citywide Inclusive Sanitation	<b>NWSC</b>	National Water and Sewerage Corporation
<b>DBO</b>	Design-Build-Operate	<b>O&amp;M</b>	operation and maintenance
<b>DFI</b>	development finance institution	<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>DPO</b>	Development Policy Operations	<b>OPEX</b>	operating expenditure
<b>EFI</b>	Equitable Growth, Finance, and Institutions	<b>PCE</b>	private capital enabling
<b>EMDE</b>	emerging market and developing economies	<b>PCM</b>	private capital mobilization
<b>ESG</b>	environmental, social, and governance	<b>PER</b>	public expenditure review
<b>Fintech</b>	financial technology	<b>PES</b>	payment for ecosystem services
<b>FIT</b>	Financial Innovation Team	<b>PIR</b>	policies, institutions, and regulations
<b>FLID</b>	farmer-led irrigation development	<b>PPIAF</b>	Public-Private Infrastructure Advisory Facility
<b>FONADIN</b>	National Infrastructure Fund Trust	<b>PPP</b>	public-private partnership
<b>GDP</b>	gross domestic product	<b>PSD</b>	private sector development
<b>GHG</b>	greenhouse gas	<b>PSP</b>	private sector participation
<b>GSG</b>	Global Solutions Group	<b>PSW</b>	Private Sector Window
<b>GP</b>	Global Practice	<b>RIs</b>	results indicators
<b>GWSP</b>	Global Water Security & Sanitation Partnership	<b>SCD</b>	Systematic Country Diagnostic
<b>HAM</b>	Hybrid Annuity Model	<b>SDGs</b>	Sustainable Development Goals
<b>IBNET</b>	International Benchmarking Network	<b>SOE</b>	state-owned enterprise
<b>IDA</b>	International Development Association	<b>SPC</b>	single purpose company
<b>IDI</b>	Infilco Degremont, Inc.	<b>SSP</b>	supplementary service provider
<b>IFC</b>	International Finance Corporation	<b>STP</b>	sewage treatment plant
<b>IFI</b>	international financial institution	<b>TA &amp; CB</b>	technical assistance and capacity building
<b>InfraSAP</b>	Infrastructure Sector Assessment Program	<b>TT</b>	task team
<b>IO</b>	Investment Officer	<b>TTL</b>	task team leader
<b>IPG</b>	Infrastructure Finance, PPPs, and Guarantees	<b>VCUs</b>	Verified Carbon Units
<b>LADWP</b>	Los Angeles Department of Water and Power	<b>VGF</b>	viability gap funding
<b>LBP</b>	Land Bank of the Philippines	<b>WASH</b>	water, sanitation, and hygiene
<b>LGs</b>	local governments	<b>WB</b>	World Bank
<b>MDB</b>	multilateral development bank	<b>WICER</b>	Water in Circular Economy and Resilience
<b>MFD</b>	maximizing finance for development	<b>WRM</b>	water resources management
<b>MIGA</b>	Multilateral Investment Guarantee Agency	<b>WSS</b>	water supply and sanitation
<b>MOF</b>	Ministry of Finance		
<b>MSP</b>	multi-stakeholder platform		
<b>MTI</b>	Macro, Trade, and Investment		
<b>MWCI</b>	Manila Water Company, Incorporated		

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# EXECUTIVE SUMMARY

## WATER INSECURITY, CLIMATE CHANGE, AND THE INVESTMENT CHALLENGE

### The water and climate crisis

**Water—and the related crises brought about by climate change—is one of the most urgent challenges we face today.** Water is the planet's lifeblood, a critical resource sustaining people, biodiversity and the environment, food and energy production, business and industry, and entire economies. However, there are multiple water crises manifesting globally, with too much, too little, or too polluted water. Under prevailing trends, the world will face a 40 percent shortfall between demand and supply of water by 2030, with 10 percent of the global population already living in countries with high or critical water stress.<sup>3</sup> Moreover, more than **2.3 billion people lack access to safe drinking water and 3.6 billion people lack access to sanitation**, with implications for health, education, and human capital development.

**Water and climate change are fundamentally linked**, with climate change amplifying water-related risks and affecting the hydrological cycle. **Nine out of 10 natural disasters are water-related** and, by 2050, flood and droughts could cause \$5.6 trillion in cumulative losses to the global economy.<sup>4</sup> Moreover, climate change is threatening lives and livelihoods and heightening international tensions over scarce resources.

It is in the world's interest to prioritize and protect this precious resource and secure sustainable access to various water services for communities and economies, yet action is not being taken at the scale and with the urgency needed. **Water knows no borders—this is a local, national, regional, and global issue that requires attention and resources at every level.** Water is akin to a global public good, flowing across national boundaries, which means that pollution and overuse in one country can become another country's problem.

### Undervalued and poorly managed: Constraints to mobilizing investment in water

A major part of the problem is that **water has been chronically undervalued by public and private actors.** In most countries, the price of water does not reflect its real economic value nor the cost of provision of multiple water services. Water is often not sufficiently considered in investment, economic planning, and policy making. Water as a resource is commonly taken for granted and regularly wasted, threatening human health, and prompting social, environmental, and economic crises triggered by unsustainable approaches.

At the same time, water services are often decentralized at the municipal level and delivered by municipal divisions or sub-sovereign entities, resulting in highly atomized institutional structures. The developmental imperative of the human right to water, coupled with political economy factors, has led to **weak incentives for the operational and financial efficiency of service providers, as well as poor governance.** Low tariffs and modest or poorly planned public investment have undermined the creditworthiness and financial viability of service providers and the bankability of water infrastructure projects.

**With respect to access to financing, the lack of creditworthiness of water service providers limits their access to public and private resources.** It makes them dependent on scarce public and concessional funding and financing to maintain and expand their services. At the same time, weak enabling conditions at the country level to attract private and public investment, including technical and operational inefficiencies; the slow pace of reforms to policies, institutions and regulations; the absence of supportive governance arrangements; and high transaction costs have traditionally discouraged investment in the water sector.



### How do we close the investment gap?

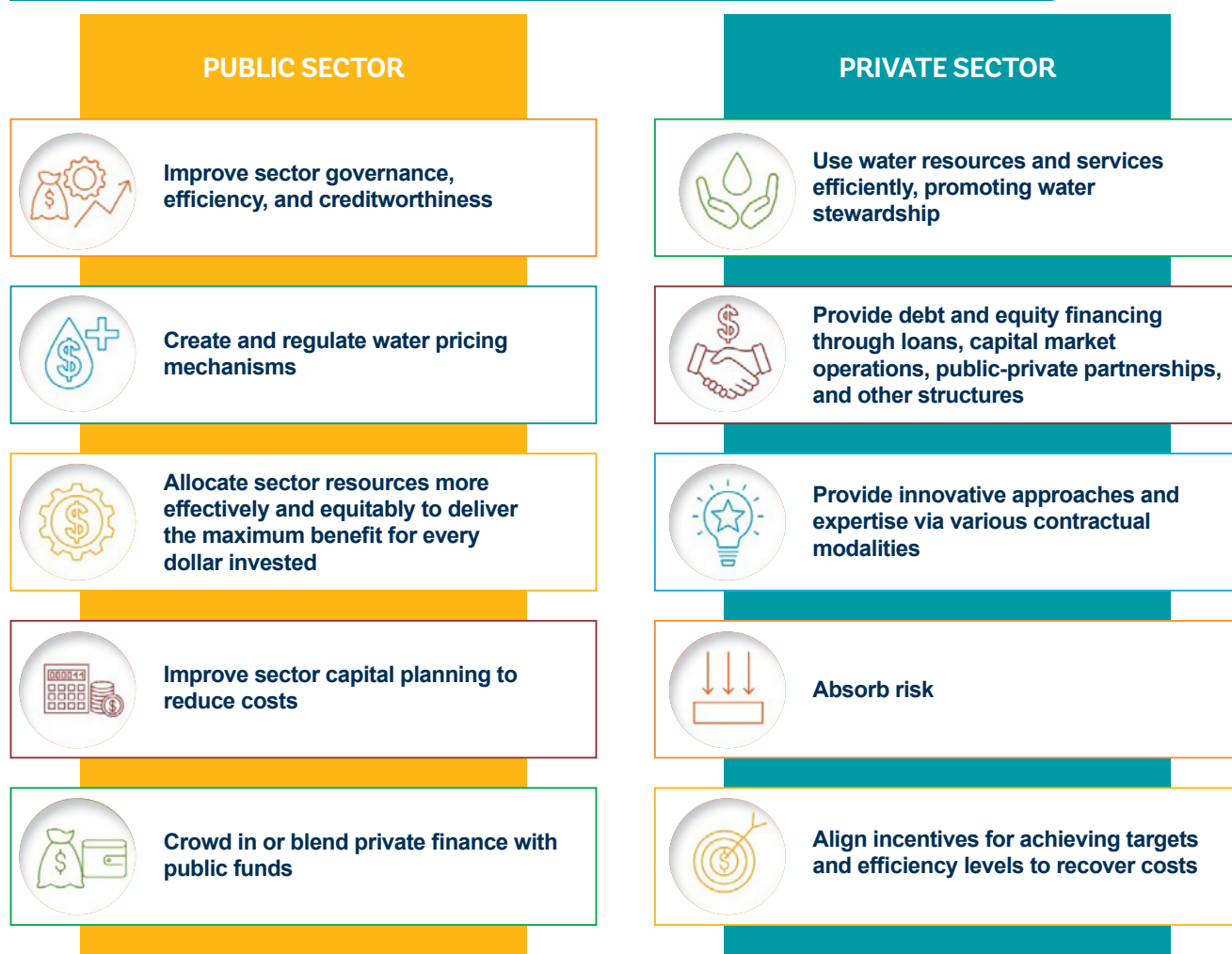
**Large, coordinated flows of public, concessional, and private capital are needed to compensate for decades of underinvestment in the water sector, and to meet present and future challenges.** Current global levels of investment are inadequate to address water sector risks and to achieve the Sustainable Development Goals by 2030. The investment needed in water-related infrastructure has been estimated at \$6.7 trillion by 2030 and \$22.6 trillion by 2050.<sup>5</sup> Achieving water security for all requires coordinated action and a massive increase in investment and financing flows across the water value chain.

**Water sub-sectors have very different institutional and economic characteristics,** which shape the types of reforms and interventions that are possible and appropriate, and their potential to mobilize private capital. However, across all water sub-sectors, there are some common priorities for mobilizing investment and financing from public and private actors. These measures include designing and enforcing policies and regulatory instruments; developing public sector skills and capacities; and improving governance and institutional arrangements to strengthen investment planning, monitoring, and execution.

**Governments** have a leading role to play in establishing the enabling conditions and necessary reforms to facilitate a greater flow of public and private finance for required water sector investments. **International financial institutions and multilateral development banks** need to support these efforts, together with other stakeholders, at the country level. Governments can create an enabling environment for improving sector governance, efficiency, financial sustainability, and private sector involvement. They can also drive in-country coordination among stakeholders to enable an efficient **multi-stakeholder approach** for financing water investments (see Figure ES1).

The **private sector**, in addition to being a key user of water resources and a beneficiary of water services, has an important role to play in providing financing, innovative approaches, and expertise, as well as absorbing risk, with aligned incentives for achieving targets and efficiency levels. The private sector can help enhance the operational and technical efficiency of water service providers, making them more financially sustainable and creditworthy and therefore able to access more financing through various contractual arrangements and public-private partnerships. At the same time, **credit enhancements and blended finance** approaches<sup>6</sup> can help de-risk projects for investors and improve creditworthiness of service providers to access financing for water sector projects.

**FIGURE ES1:** The Roles of the Public and Private Sector



It is important for these instruments to be **tailored to the maturity of the country’s capital markets and service providers** to ensure the specific context and risks are well understood and the investment opportunities are feasible and relevant.

Addressing the investment gap requires **public and private collaboration**. Governments and private actors have a key role to play in facilitating investments and financing, drawing on their **unique capabilities to manage different kinds of risks at the international, national, and local levels**. In most of the developing world, the water sector has historically been funded through public and concessional financing. In more developed regions such as Australia, the European Union, and the United States, a combination of public funding and the facilitation of private and commercial financing and private sector participation through **supportive policies, institutions, and regulations**

has enabled the development and modernization of the sector. The private and financial sectors have played a **crucial role in driving technological innovation, digitalization, the management and delivery of water infrastructure and services, and the provision of commercial financing** to creditworthy service providers. This concerted public-private engagement is also needed in the water sector of developing countries.

The nature of water as a public good requires **international collaboration**. It requires a new level of partnership that transcends national borders and traditional public sector approaches and brings in multiple sovereign, sub-sovereign, and corporate actors, international agencies and intermediaries, and civil society stakeholders. **The implementation of transboundary investments and solutions also requires innovative financing mechanisms and regional approaches.**

## A STRATEGIC FRAMEWORK FOR SCALING UP FINANCE FOR WATER

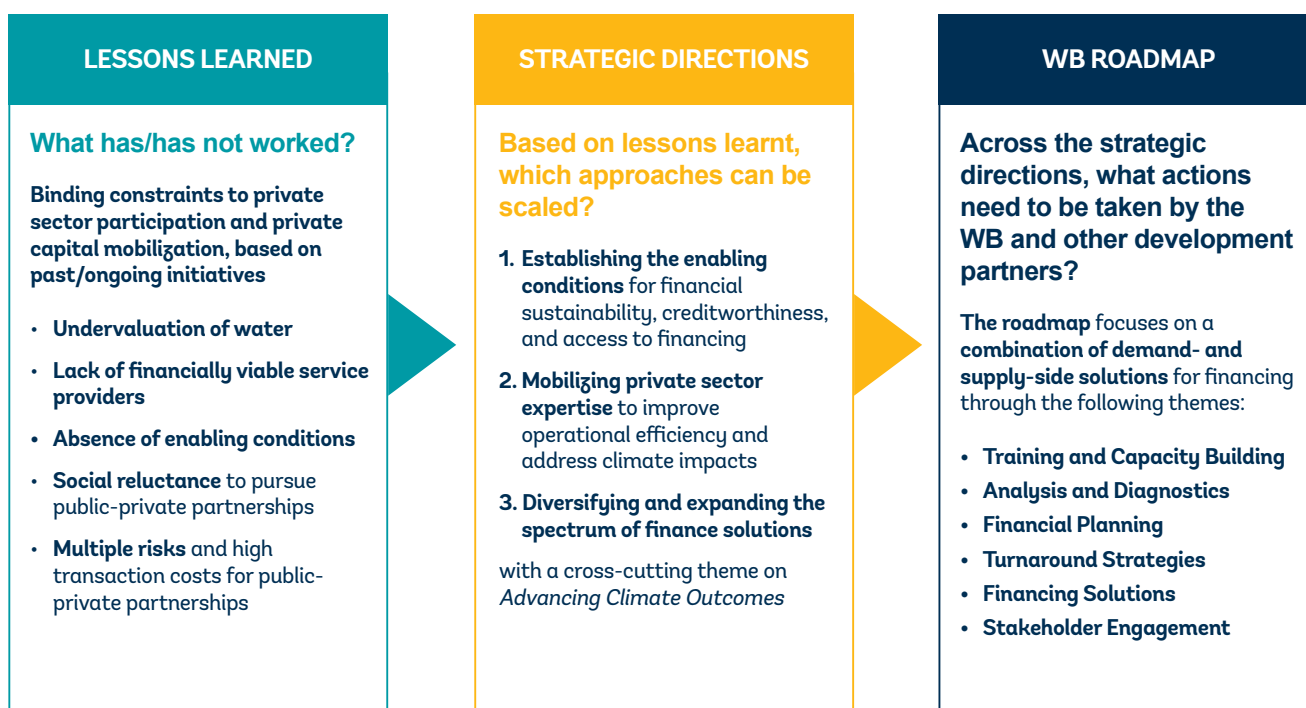
The World Bank (WB) recognizes the water-climate-food-energy nexus and the importance of a water-secure world for all. While different countries may approach the water problem differently, any holistic strategic vision must encompass elements related to: (1) **sustaining water resources**, in light of various and often competing economic and social activities; (2) **delivering services** of water supply and sanitation, bulk water for irrigation and agricultural production, hydropower, industrial manufacturing and other uses, and wastewater treatment and reuse; and (3) **building resilience to climate change** and water-related risks.

The WB's *Scaling up Finance for Water* strategic framework outlines actions and priorities for national governments, the WB, and other development partners to improve the planning and mobilization of funding and financing for water sector investments, and to promote efficiency in spending. It aims to do so by **optimizing the contributions of the public and private sectors**, and facilitating **greater engagement of the private sector in the provision of capital, innovation, and expertise**.

The water sector has lagged behind other sectors such as energy and transport in accessing volumes of commercial debt financing. Private sector engagement in water through **public-private partnerships** in developing countries over the last few decades has had a mixed track record. A renewed effort by development partners to enable public-private collaboration in the water sector must take account of lessons learned. **Key lessons learned** from past efforts to mobilize private sector involvement in the water sector provide a strong foundation for the strategic framework (see Figure ES2).

**The constraints on private sector participation require differentiated approaches** tailored to the size and income level of countries (e.g., middle-income countries vs low-income countries) and macro-fiscal situation, as well as **the level of banking sector and capital market development**. While the largest source of finance for water investments is likely to remain public and concessional financing, the mobilization of private capital, especially domestic private or commercial finance, offers tremendous potential. The lessons learned on binding constraints are reflected in the strategic directions which guide this framework.

FIGURE ES2: Strategic Framework for Scaling up Finance for Water



Meeting Climate Goals and the Water-related Sustainable Development Goals

## STRATEGIC DIRECTIONS

The framework is built around four **strategic directions**:

### 1. Establish the enabling conditions

**Governments need to establish the enabling conditions for financial viability and creditworthiness in the water sector at the sub-national level.** This will open up access to financing from private sources. Key measures include supportive policies, institutions, and regulations, introducing economic regulations, restructuring the sector, and incentivizing service providers to support water security and climate outcomes. Examples include corporatizing water service providers, consolidating entities, and establishing shadow credit-rating programs in Angola, Kenya, Turkey, and Peru; turning around the technical and financial performance of water utilities, enabling them to issue bonds in Uruguay; and designing reforms to employ private and commercial finance and expertise in water projects in Brazil, Indonesia, and Nigeria.

### 2. Mobilize private sector expertise

**Governments can mobilize private sector expertise through performance-based contracts and other contractual arrangements with the goal of improving the operational efficiency, technical capacity, and financial viability of service providers.** This expertise can help reduce water losses; increase efficiency in water and energy use; lower operating costs; raise revenues through more efficient billing and collection processes; construct, operate, and maintain complex infrastructure; conserve and recover scarce water resources; and increase resilience to climate risks. Performance- and output-based contracts have been successfully implemented in the Middle East and Africa (Algeria, Oman, and Saudi Arabia), Latin America (Brazil and Honduras), and Asia (Armenia, Philippines, and Vietnam).

### 3. Diversify and expand the spectrum of finance solutions

**Governments and other stakeholders need to diversify and expand the range of solutions available to each country depending on its context, from commercial debt, bonds, and microfinance to public-private partnerships, blended finance, and equity instruments.** The World Bank's interventions and products can be used to ensure contractually balanced and financially sustainable projects whose commercial and political risks are well mitigated and whose returns to private sector reflect the risks borne by the investors and can be considered attractive vis-à-vis other investment opportunities within the markets in question. An example is the Multilateral Investment Guarantee Agency's political risk guarantees to the AS Samra Wastewater Project in Jordan (see case study in appendix C). Blended finance can also make public-private partnership programs or projects in such markets attractive to sponsors and lenders, for example in the Metro Manila Wastewater Management Project and through the provision of viability gap funding in India's Clean Ganga Program (see case study in appendix C).

### 4. Advance climate outcomes

**Climate change manifests itself primarily through water, exacerbating water security challenges, with substantial costs to society. The water sector offers the opportunity for both adaptation and mitigation investments.** The development of projects for onsite sanitation, floating solar, irrigated rice, and hydroelectric retrofits of storage dams offer strong mitigation potential. Opportunities for climate adaptation cover a range of interventions, including strengthening early warning systems for extreme climate and weather events, making new infrastructure climate resilient, improving dryland agriculture for crop production, protecting mangroves, and fostering a transition to more resilient and robust management of water resources. Tapping climate finance requires a number of areas of focus. There is currently no established method to price the resilience value of reduced land subsidence, flood risk, and drought risk. Better data are required on current and planned investments in adaptation to track progress in mobilizing public and private finance. Technical assistance is needed to prepare investment-ready national adaptation plans and project pipelines to identify, sequence, and prioritize policies and interventions that reduce greenhouse gas emissions and boost resilience, and to reduce costs for private financing through risk mitigation and credit enhancement instruments.



## CHARTING A ROADMAP TO A WELL-FINANCED, SUSTAINABLE WATER SECTOR

The framework sets out a **roadmap of 10 steps to operationalize the strategic directions and boost investment and participation in the water sector (see Figure ES3)**. The roadmap can be customized to the country's macro-fiscal conditions, the fundamentals of water service providers, and the level of water sector and financial market maturity, with potentially a subset of steps applied in a country. The roadmap steps need not be applied sequentially, but can be adapted based on the country context. **While recognizing that addressing the issue of creditworthiness is a medium-term effort, it supports various supply-side innovations and credit enhancement solutions to meet short-term financing goals.**

The roadmap assesses the entire suite of financing solutions from commercial debt and bonds to microfinance, vendor finance, and public-private partnerships, including performance-based contracts, viability gap funding, and the use of de-risking and credit-enhancement instruments such as guarantees. It covers specific actions that countries and other partners can take, including technical assistance, capacity building, and financing, and outlines instruments to address constraints.

1

### Building capacities to support the foundations of creditworthiness

Sector investments are constrained by poor performance, lack of financial viability of service providers, and lack of solid frameworks for policies, institutions, and regulations. **Addressing foundational elements related to creditworthiness is at the heart of mobilizing finance for water investments.** This step focuses on building the capacity of governments and water service providers to improve policies, institutions, and regulations; monitoring and benchmarking systems; utility performance; financial management and creditworthiness; and circular economy solutions. Various technical assistance packages developed by the WB and other development partners can be used to do this.

2

### Assessing macro-fiscal conditions, financial market maturity, and the investment climate

Assessing a country's macro-economic and fiscal conditions, financial market maturity, and investment climate is important for

understanding constraints and identifying opportunities to **increase public and private financing of water sector investments**. The analysis would look at macro-level fiscal indicators, such as the country's debt ceiling, credit rating, risk profile, cost of capital, financial market maturity, and regulatory frameworks for public-private partnerships. Insights from this assessment process would enable the client government to target actions, support, and financing packages.

3

### Aligning water security with climate goals and economic development

To understand the full context, it is important to examine the entire water sector value chain to assess the role of water in the country's economic, social, and environment development and policy goals, and the **risks posed by climate change** to this development. The analysis will be based on national climate change adaptation and mitigation strategies and nationally determined contributions, information gained from existing diagnostic tools, and consultations with governments, the domestic banking sector, and private financiers and investors on their priorities, strategic development, and investment plans. The goal is to identify the most realistic opportunities to **mobilize public and private expertise and financing for investments in water security, aligned with priority climate outcomes.**

Investing in energy efficiency and renewable energy (such as solar photovoltaic systems) is one way in which **water supply and sanitation utilities can start targeting specific climate mitigation outcomes**, while improving their financial outlook. Viable sources of climate finance to incentivize mitigation and adaptation investments include results-based financing for emissions reductions, grants, private sector loans and investments, loans from public and multilateral lenders, and philanthropic support.

4

### Designing supportive policies, institutions, and regulations

There is considerable evidence that country-level and city-level reforms to policies, institutions, and regulations can transform operational and financial performance. **Regulation has a central role to play in enhancing financial sustainability and supporting an appropriate investment climate.** This step focuses on specific water

**FIGURE ES3: WB Roadmap: 10-Step Engagement**

STEPS OF ENGAGEMENT		TOOLS AND INSTRUMENTS
Training and Capacity Building	<b>1</b> <b>Building Capacities to Support the Foundations of Creditworthiness</b> <a href="#">International Benchmarking Network of Water Utilities</a> ; <a href="#">Water Utility Creditworthiness e-course</a> ; <a href="#">Water Utility Financing e-course</a> ; Shadow Credit Ratings; <a href="#">Utility of the Future</a> ; <a href="#">Citywide Inclusive Sanitation</a> ; <a href="#">Utilities for Climate</a>	<b>Cross-Cutting Theme</b>
	<b>2</b> <b>Assessing Macro-Fiscal Conditions, Financial Market Maturity, and Investment Climate</b> Systematic Country Diagnostic; Country Partnership Framework; Country Private Sector Diagnostic; OECD scorecard; InfraSAP Diagnostic for Water	
Analysis & Diagnostics	<b>3</b> <b>Aligning Water Security with Climate Goals and Economic Development</b> <a href="#">Country Climate and Development Reports</a> ; Climate and Economic Analyses of Resilience in Water; <a href="#">Water Security Diagnostics</a> ; <a href="#">Water in Circular Economy and Resilience</a> framework (WICER framework)	
	<b>4</b> <b>Designing Supportive Policies, Institutions, and Regulations</b> <a href="#">Water Supply and Sanitation Policies, Institutions, and Regulation: Adapting to a Changing World</a> ; Public Expenditure Reviews	
Financial Planning	<b>5</b> <b>Integrating Financial Sustainability Analysis in Sector Planning and in the WB Project Cycle</b> Financial modeling; financial viability analysis; analysis of tariffs, taxes, and transfers	
Turnaround Strategies	<b>6</b> <b>Turning Around Technical Efficiency and Operational and Financial Performance of Water Service Providers</b> Performance improvement plans (Utility of the Future); <a href="#">performance-based contracts</a> for non-revenue water reduction and improving efficiency; irrigation modernization	
Financing Solutions	<b>7</b> <b>Developing a Pipeline of Bankable Projects</b> Better data and information; market-making; support for project development; pooling projects to reach economies of scale and reduce viability risks	
	<b>8</b> <b>Creating Markets for Local Currency Financing and Mobilizing Domestic Finance</b> Domestic commercial lending and capital markets development	
	<b>9</b> <b>Mobilizing the Full Suite of Funding and Financing Solutions</b> Efficient public spending; blended finance; public-private partnerships; viability gap funding; commercial debt; microfinance; risk retention instruments; payment- and loan guarantees; <a href="#">WB Scaling ReWater Platform</a>	
Stakeholder Engagement	<b>10</b> <b>Developing a Coordinated Approach with Stakeholders</b> <a href="#">2030 WRG multistakeholder platforms</a> ; principles of engagement with multilateral development banks; donor roundtables; high-level events	<b>Cross-Cutting Theme</b>

sector policies, institutions, and regulations to identify gaps and binding constraints for optimal sector funding and financing.

Policy and regulatory tools to improve financial sustainability include **designing and implementing tariffs and subsidies that are transparent and predictable** and incentivize efficiency; mandatory financial modeling and regulations on financial management and reporting by service providers; targeted programs to bridge the gap between service providers, the domestic banking sector, and local capital markets; and capacity building for financial analysis in the sector. **Sector restructuring and reforms** can help improve the accountability and efficiency of water service providers.

5

### **Integrating financial sustainability analysis in sector planning and the WB project cycle**

Analyzing the **financial sustainability** of water service providers can help improve their creditworthiness in order to attract commercial and private financing. This entails **financial modeling and public expenditure reviews** to assess funding and financing sources and the costs of meeting water sector goals. Corporate governance and financial performance would be assessed to guide the analysis of constraints and recommendations for priority focus areas. Where data availability and resources allow, the analysis could include a cost-curve assessment to identify highest return investments and facilitate a cost-benefit analysis of alternative solutions to achieve water supply and security goals.

**Financial viability analysis will help assess the “bankability” of specific investments** and projects to support public-private partnerships, portfolio investment approaches, and pooled financing mechanisms (see step 8). Since all projects carry a degree of economic, social, financial, technical, environmental, and operational risk, a “bankable” project is one where these risks are allocated in a sufficiently optimal way to give a lender or investor the confidence to finance the project. The analysis should include economic cost-benefit analysis, the use of competitive bidding whenever possible to determine the size of needed subsidies to make the project financing viable, and fully transparent assessments regarding subsidy size, policy objectives, types of beneficiaries, and payment mechanisms.

6

### **Turning around the technical efficiency and operational and financial performance of water service providers**

Requisite elements of a good turnaround strategy for water supply and sanitation and irrigation service providers include **strong human resource and financial management, a customer-oriented vision, and appropriate incentives.**

Development partners can help governments design and implement programs at national or regional level that put in place the right **incentives for institutional change at the utility level** through new regulations, results-based financing, improved monitoring, and benchmarking. It can also help client utilities design and finance turnaround strategies and performance improvement plans, through programs such as the **World Bank’s Utility of the Future**. Improved efficiencies and performance enable service providers to offer better services at lower costs, freeing up resources that can be invested in improving or expanding services.

New technology has boosted **irrigation efficiency**, both in terms of conveyance and on-farm application of water, reducing the costs of irrigation services. This has led to **more entrepreneurial and market-oriented approaches** in the public provision of irrigation services, while purely **private irrigation has expanded enormously**, notably with the rapid development of groundwater. Performance-based contracts can support the involvement of the private sector to advance key metrics of efficiency, access, and resource sustainability. The use of automated systems, corporatization of service providers, and integrated water management from the water source to the farm level can support better water management in the irrigation chain.

7

### **Developing a pipeline of bankable projects**

This step focuses on supporting clients in **identifying and actively promoting water-related investments** for which private financing can be mobilized. Pipeline development focuses on assessing the most appropriate, viable, and cost-effective investment, and

the **best value-for-money investment**. The risk-return profile and thus the attractiveness of any investment depends crucially on the financiers' ability to assess investment and operation risks. This covers access to better data and information, market-making, financial support for project development, assessing the financial efficiency of programs, and pooling projects to reach **economies of scale and reduce viability risks**.

8

### Creating markets for local currency financing and mobilizing domestic finance

It is vital to encourage **local currency financing** and domestic finance for water sector projects and investments in developing countries, including deepening local capital markets through changes to the financial architecture, where required. Sustainable financial instruments like green, blue, or sustainability-linked bonds may be suitable for governments or utilities seeking to fund water-related investments, with more advanced middle-income countries having relatively well-developed institutional investors and capital markets.

**National development banks** can play a crucial role going forward in providing long-term financing to small and medium-sized entities that are unable to access commercial financing. In addition to financing, national development banks can provide technical assistance to service providers for project preparation, advisory support in structuring project finance, and building financial and technical capacity. Overall, such banks offer a valuable source of funding and support for mid-sized entities looking to expand their operations, while also promoting sustainable growth in the sector.

National and regional **water-financing facilities** can also help mobilize local currency financing for sub-national governments and state-owned enterprises for water investments. These facilities would serve multiple roles, including centralizing performance monitoring and incentives for service providers, directing public funds to underserved populations and Sustainable Development Goal priority projects, providing technical assistance for project preparation and management, mobilizing private finance by presenting more and better water projects, and helping to build capacity for banks to lend to different types of projects.

This approach has seen great success in **Indonesia**, where the **National Urban Water Supply program** has created a structured and systematic way to help local governments and utilities improve their water supply service delivery. The program provides customized support packages to help utilities at different stages of creditworthiness move towards commercial financing (see case study in appendix C).

9

### Mobilizing the full suite of funding and financing solutions

Recommendations on **financing options** for governments and other development partners need to be tailored to the scope and priorities identified in the previous steps, with relevant actions for all parties involved that are time-bound, action-oriented, and achievable within the short to medium term. A key focus is to identify potential blended finance solutions to secure the required financing for priority water investments.

The roadmap presents a range of financing solutions that have been successfully applied by the WB and others in the water sector and can be tailored to sub-sector and local conditions, including commercial debt and bonds, microfinance, vendor finance, and public-private partnerships.

Given the limited budget and the high cost of capital in developing countries, development partners and multilateral development banks can play an important role in **de-risking investments and providing credit enhancement**, as well as providing grant and concessional funds, investment, and lending needed for water projects, applying a blended finance approach. The use of public, grant, and concessional sources of finance and investment can be done in several ways based on the needs and circumstances of specific projects. Guarantees and credit enhancement can promote blended finance projects and facilitate private investment in the water sector, including in high-risk countries. It ensures that the investors and lenders will be repaid in case of a default event by the government or water utilities. **Table ES1** outlines typical blended finance structures.

## 10

## Developing a coordinated approach with stakeholders

Establishing a **country-level multi-stakeholder platform** is an effective way to build a constituency of support for scaling up finance for water and ensure cooperation between public, private, and multilateral financiers. These platforms facilitate dialogue and decision-making among high-level representatives of government, public agencies, the WB, development partners, the private sector, civil society, and academia. **Bringing stakeholders into dialogue with one another** early in the reform process and continuing this engagement over the long term is essential to implementing **successful and lasting water sector reforms**.

The platform approach for financing has been approved by the G20 and its effectiveness has been demonstrated in the work of the 2030 Water Resources Group (2030 WRG), a multi-donor trust fund within the Water

Global Practice of the WB. These 2030 WRG-supported platforms have created the upstream conditions for private sector participation, public-private partnerships, and private capital mobilization in the water sector in several countries, including Bangladesh, Brazil, India, Kenya, Mongolia, and Peru. Key factors of a successful multi-stakeholder platform are strong support from the central government, strategic network organization and division of responsibilities according to the nature of the project, innovative financing schemes, and incentives for businesses to actively participate.

As outlined above, unlocking financing for the water sector requires building capacities and thoroughly reviewing the context, institutions, market conditions, and proposed investments (Steps 1–6), the pipeline of projects (Step 7), and the availability of concessional financing and investor appetite to design blended finance solutions in a tailored way to ensure success (Steps 8 and 9), while coordinating closely with other stakeholders and partners (Step 10).

TABLE ES1: Blended Finance Structures

APPROACH	DESCRIPTION	APPLICATION
<b>Grants</b>	Private capital (equity and debt), with grant funds from the host government, WB and multilateral development banks, UN agencies, bilateral and multilateral donors to lower cost and bring a project to bankability, including support through technical assistance during the project preparation stage.	For non-creditworthy projects or water utilities, and/or support in the early (e.g., preparation) stages of a project.
<b>Concessional funds</b>	Private capital (equity and debt) with concessional funds on below-market terms from WB/multilateral development banks, development finance institutions, and policy banks to lower the overall cost of capital and strengthen a project's commercial viability.	For non-creditworthy projects or water utilities.
<b>Guarantees</b>	Guarantees to cover equity and debt against political risks, including a government's (or water utility's) failure to meet specific obligations to the project under a water purchase agreement and/or government guarantee. These provide credit enhancement, bring down borrowing costs, and facilitate private investment in the water sector.	For developing countries, including high-risk countries and projects; for non-/low-creditworthy water utilities/ water off-takers.
<b>Insurance</b>	A practice by which an entity provides a guarantee of compensation (demand guarantee or corporate guarantee) in case of an adverse event. Depending on the circumstances, political risk and/or credit/commercial risk insurance may be appropriate.	For projects facing high political and credit/commercial risks.
<b>Other forms of support</b>	Support from the government through subsidies by temporary tax exemption or relief; subsidies provided conditional on the service delivery and quality; upfront project capital input; and public funds used to hedge currency and/or interest rate risks.	For non-/low-creditworthy projects or water utilities; low tariffs; upfront capital required; and where private financing is in hard currency and/or on floating interest rate terms.

## 4. THE ROLE OF THE WB AND DEVELOPMENT PARTNERS

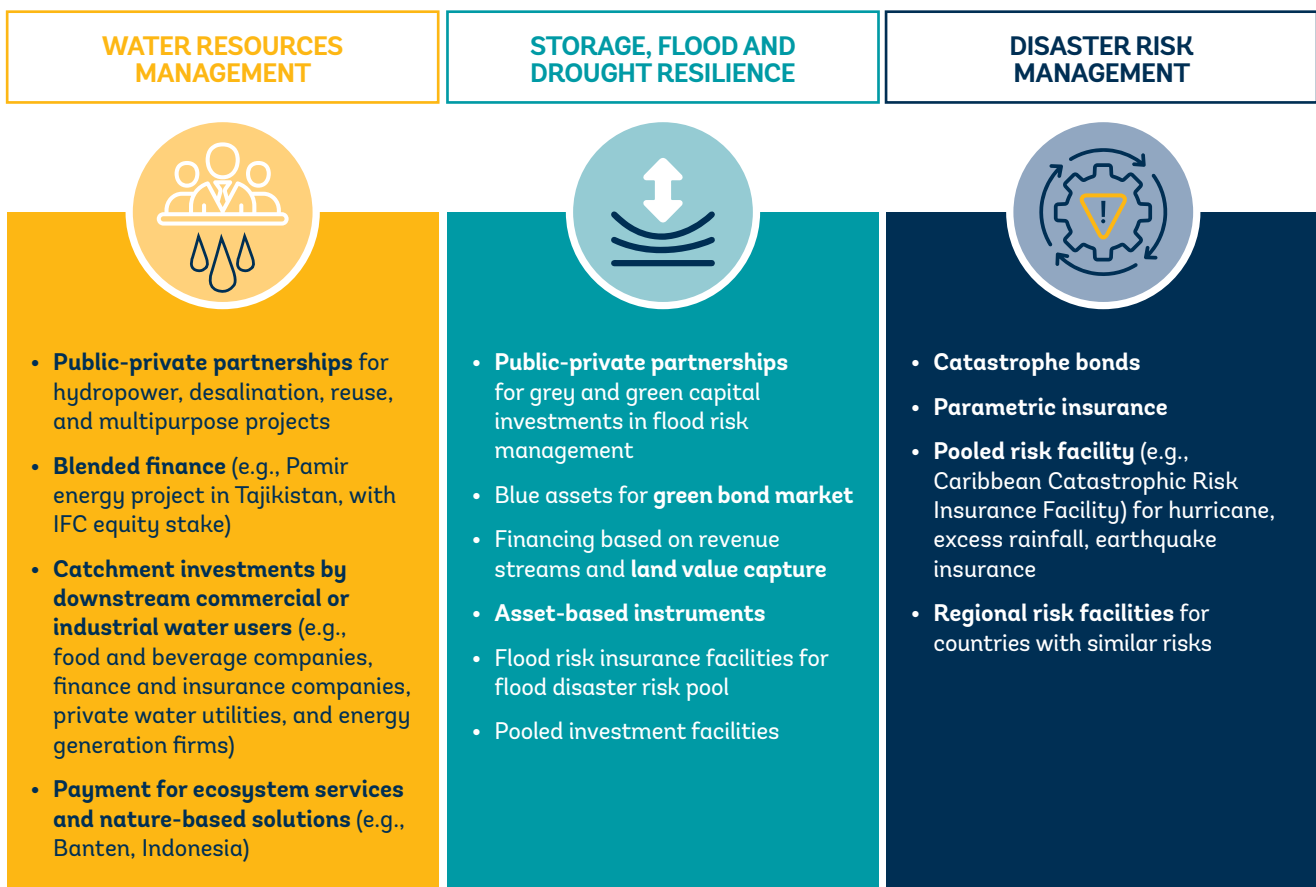
The WB is committed to bringing together development partners, governments, and financial institutions in order to fundamentally shift how the global water sector is financed, and ultimately how water is valued and managed for a more sustainable future for all.

The WB is in a unique position to leverage its **country-based engagements** with **regional and sub-regional efforts** in areas such as sustainable transboundary water management, flood control, and disaster risk management that crosses national borders. It maintains

a broad portfolio of engagements ranging from upstream policy, institutional, and regulatory reforms, financing of large-scale water infrastructure, improvement of performance and creditworthiness of service providers and state-owned enterprises, to transactions such as equity investments, debt financing, and public-private partnerships that can drive the scaling up finance agenda.

The implementation of the strategic framework will vary for the various water sub-sectors, depending on country-level needs and demand, guided by the strategic directions. The main **priorities and opportunities to mobilize additional public and private financing for water-related investments** are outlined in Figures ES4 to ES6.

**FIGURE ES4:** Financing Solutions for Water Resources Management, Storage, Floods, and Drought Resilience




**FIGURE ESS:** Financing Solutions for Water Supply and Sanitation

WATER TREATMENT & DISTRIBUTION	WASTEWATER COLLECTION & TREATMENT	ONSITE SANITATION AT THE HOUSEHOLD LEVEL
<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Governments; Design-Build-Operate arrangements</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• <b>Commercial debt</b> for corporatized utilities with creditworthiness (e.g., Uganda; Indonesia)</li> <li>• Equity finance for high-performing utilities through <b>IPOs and partial divestiture</b> (e.g., SABESP)</li> <li>• <b>Loan financing</b> for small-piped water systems (e.g., Kenya)</li> <li>• <b>PPPs</b> for desalination and <b>concessions</b> in cities with end-user tariffs (e.g., Brazil)</li> <li>• <b>Component-based financing</b> for energy efficiency improvements</li> </ul>	<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Governments; Design-Build-Operate arrangements</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• <b>Public-private partnerships</b> for water reuse, particularly to industrial users (e.g., WB ReWater initiative)</li> <li>• <b>Hybrid annuity model</b> for wastewater treatment and reuse (e.g., Ganga)</li> <li>• <b>Revolving funds</b> for rural solutions</li> <li>• Off-grid (non-utility) services and delivery by <b>microenterprises</b></li> </ul>	<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Households</li> </ul> <p><b>New Solution:</b></p> <ul style="list-style-type: none"> <li>• <b>Microfinance</b> for extension of access by micros, small, and medium-sized enterprises (e.g., donor and philanthropic contributions in Sub-Saharan Africa and Asia)</li> </ul>



**FIGURE ES6: Financing Solutions for the Irrigation Sector**

	<b>SYSTEM MODERNIZATION</b>	<b>OPERATION &amp; MAINTENANCE &amp; WORKING CAPITAL</b>	<b>ON-FARM MODERNIZATION</b>
<b>Basin-Level Investments &amp; Major Headworks</b>	<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Governments and international finance institutions</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• Public-private partnerships for dam construction/operation (e.g., Chile), desalination, and reuse</li> </ul>		<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Subsidized financing in irrigation programs (e.g., Rwanda SSIT)</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• Design of financial incentives for smallholders to use efficient irrigation (e.g., Morocco's Plan Maroc Vert)</li> <li>• Farmer-led irrigation development for access to finance, technology, and markets</li> <li>• Private sector solutions (e.g., India JOHAR) with matching grants (e.g., Punjab)</li> <li>• Access to finance by intermediaries (e.g., MFIs, rural banks), including blended finance (e.g., Philippines) and with third party guarantees (e.g., Tanzania)</li> <li>• Agri-tech service provider models (e.g., rentals, leasing, pay-per-use in India)</li> <li>• Value chain finance (e.g., consumer credit in India; supplier credit in Nigeria; outgrower contracts in Kenya)</li> </ul>
<b>Development and Modernization of Large-Scale Irrigation Schemes</b>	<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Governments and international finance institutions, with low capital cost recovery</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• Recovery of investment costs (e.g., Turkey)</li> <li>• Public-private partnerships to leverage private capital and management (e.g., Peru, Karnataka)</li> <li>• Green bond issuance (e.g., Brazil and Turkey)</li> </ul>	<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Public schemes with high subsidies and low cost recovery</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• Public-private partnerships for irrigation management, reducing public subsidies (e.g., West Bengal and Gabiro agribusiness hub)</li> </ul>	
<b>Groundwater Systems; Small-Scale Collective or Individual Systems</b>	<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Largely farmer-led or public financing (e.g. Morocco, Yemen, Afghanistan, etc.)</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• Community or individual investments through cost-sharing (e.g., Chile)</li> <li>• Public-private partnerships using blended finance (e.g. Karnataka)</li> <li>• Establishment of private institutions for financing through public support (e.g. Niger)</li> </ul>	<p>High level of public subsidies for energy, usually farmer financed</p>	



Private capital mobilization is well established in the water supply and sanitation sub-sector through multiple channels, including domestic commercial debt and equity, and public-private partnership models. However, there is considerable untapped potential in catchment management, water storage, unconventional water source development, urban stormwater management, flood risk insurance, and irrigation efficiency projects.

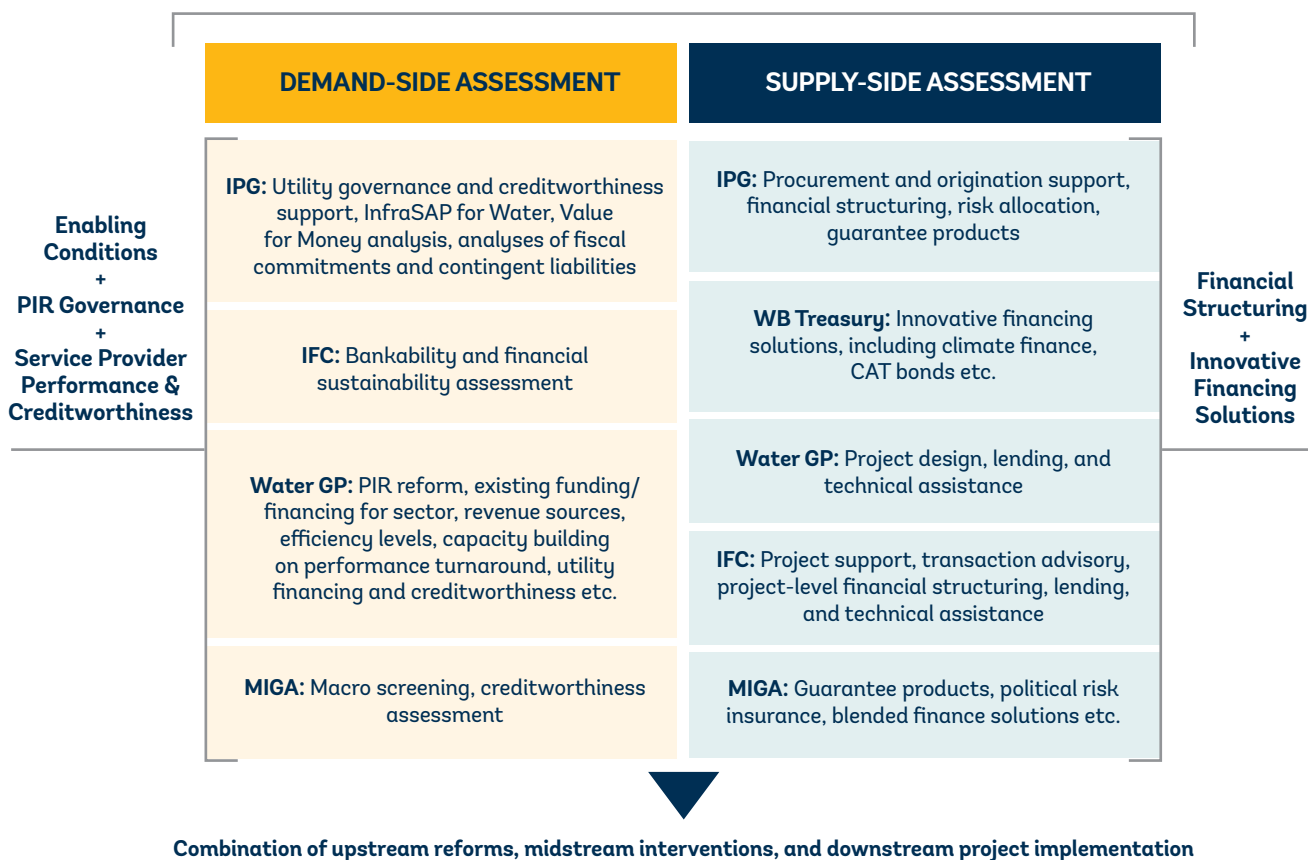
Within the **WB**, the strong support from the leadership of the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), the International Finance Corporation (IFC), and the Multilateral Investment Guarantee Agency (MIGA) to scaling up finance for water creates an important opportunity to work collaboratively with client governments and country teams, combine

resources, and help countries develop and adopt clear frameworks for the financing of water investments and advancing climate outcomes with incentive structures for the public and private sector (see Figure ES7). The **2030 Water Resources Group (2030 WRG)**, a public-private partnership platform, will play a central role in implementing the strategic framework through its work as catalyst, convenor, and coordinator.

Together with development partners, the WB will focus on creating the enabling environment for reform, fostering public-private collaboration, and promoting stakeholder engagement, aimed at maximizing finance for development through a combination of blended financing, public-private partnerships, and other instruments.

**FIGURE ES7: Joint WB Collaboration on the Roadmap**

**2030 WRG and Water and Finance GSG support for upstream enabling reforms and public-private collaboration**



# 1 INTRODUCTION

## 1.1 CONTEXT

**1. Water is a critical natural resource, a global public good, and an essential service. It is fundamental to the attainment of nearly all the SDGs.** Water security is central for countries to achieve long-term development objectives in the current context of climate change, including protecting infrastructure assets, safeguarding agricultural production, producing sustainable energy, and protecting vulnerable populations. Water resources and services are critical for social and economic development, even where the resource is a relatively abundant asset. The transboundary nature of water, combined with the challenge of pollution and over-abstraction of the resource upstream leading to downstream impacts, lends itself to classification as a global public good.

**2. However, water resources are under severe stress and water services delivery is deficient due to underinvestment in the sector.** Under prevailing trends, the world will face a 40 percent shortfall between demand and supply of water by 2030, with ten percent of the global population already living in countries with high or critical water stress. Meanwhile, 1.8 million people die every year due to poor water, sanitation, and hygiene (WASH) services and 80 percent of the world's wastewater is currently released to the environment without treatment.<sup>7</sup> In addition, water security has ramifications for food and energy security. In terms of cropland affected, about 11 percent of rainfed land and 14 percent of pastures experience severe, increasingly recurring droughts, and more than 60 percent of irrigated cropland is highly water stressed. With more than 40 percent of wheat grown in areas facing high or extremely high levels of water stress, and 58 percent of the world's thermal and hydroelectric power plant capacity, which is heavily dependent on water availability, located in highly water-stressed areas, both food and energy security could be affected with the increasing variability in water availability.<sup>8</sup> Moreover, it has been estimated that 41 percent of current global irrigation water use occurs at the expense of environmental flow requirements.<sup>9</sup>

**3. There is considerable evidence of the wide range of losses accruing from insufficient water and sanitation investments,** with implications for macroeconomic performance, health, poverty alleviation, income and gender inequality, and social and human capital development. The scale of global economic losses related to water insecurity and poor sanitation stands at US\$470 billion per year, comprising US\$260 billion per year from inadequate water supply and sanitation, US\$120 billion per year from urban property flood damages, and US\$94 billion per year of water insecurity to existing irrigators.<sup>10</sup> In 2019, the combined risk to business value from water-related losses was US\$425 billion.<sup>11</sup> At the industrial level, the cost of addressing harmful impacts to freshwater for large packaged meat and apparel companies could total close to US\$1.8 billion per year, with potential reductions in company valuation of up to 47 percent.<sup>12</sup> However, the economic value of freshwater and the costs of water insecurity are still rarely taken into account in investment decisions.<sup>13</sup>

**4. Moreover, climate change is amplifying water-related risks and affecting the hydrological cycle.** Worsening droughts, floods, and storms already impact millions of people each year, with floods and waterlogging accounting for 70 percent of deaths related to natural phenomena on the planet.<sup>14</sup> Between 2000 and 2019, over 4 billion people worldwide were affected by disasters, with over 1.2 million deaths. By 2050, flood and droughts could cause US\$5.6 trillion in cumulative losses to the global economy and cost some regions up to 6 percent of gross domestic product (GDP)<sup>15</sup> through losses in agriculture, health, income, and property, entailing sustained negative growth. An ongoing World Bank (WB) study assesses the economic costs of past and current droughts and dry shocks on GDP growth. The estimates reveal that an additional severe or extreme drought reduces between 0.4–1 percentage point of GDP growth per capita depending on the level of development, baseline climate, and severity of the shock, with a majority of impacts concentrated in low- and middle-income countries.<sup>16</sup> Compared with an average growth rate of 2.19 percent over the time period of the sample, this implies that even more moderate

shocks can send impacted areas into a deep growth slump. The recent 2022 Global Assessment Report on Disaster Risk Reduction, which looks at all types of disasters, from rapid onset events like typhoons, floods, and earthquakes to other events like droughts, saltwater intrusion, and air pollution, finds that poorer countries lose on average 0.8–1% of their GDP growth per capita to disasters per year, compared to 0.1–0.3% in higher income countries. Investments that contribute to water security also support climate adaptation, resilience, and mitigation. Net benefits of climate adaptation investments in the water sector are estimated at US\$7.1 trillion.<sup>17</sup> There are also important mitigation benefits from initiatives to decarbonize the water sector. Mobilizing investments at different levels is central to accelerating the transition to net-zero carbon emissions and to strengthening climate resilience for economies and communities.<sup>18</sup> Private financial institutions also have a role to play in pricing water risks into investment decisions and incentivizing water stewardship by companies in productive sectors.<sup>19</sup>

**5. Current levels of global investment in water are inadequate to meet the Water Sustainable Development Goals (SDGs) and address climate impacts. An acceleration in global investment is urgently needed.** The water sector constituted less than two percent of all public spending between 2009 and 2020,<sup>20</sup> or roughly 0.44 percent of GDP on average. This is much lower than estimated public expenditure levels needed in some regions. For example, in South-Saharan Africa, expenditures required to reach universal water supply and sanitation (WSS) services alone are as high as over 4 percent of GDP during the period 2017–2030. However, in many countries, current levels of funding, including revenues from customer fees and public funding from fiscal budgets, are inadequate to meet even operating and maintenance costs, resulting in significant underinvestment in much-needed water infrastructure, along with inefficiencies in operations. The annual spending gap for 2017–2030 to achieve only WASH-related SDG Targets (6.1 and 6.2) is estimated to be US\$124.2 billion in 2017 constant prices or 0.42 percent of the global GDP in 2017 for the 113 countries covered in the analysis.<sup>21</sup> The estimates suggest an increase in annual spending of 166.7 percent from the current average annual spending to achieve SDG Targets 6.1 and 6.2. Depending on the cost scenario, the annual spending gap for irrigation is estimated to range from US\$3.9 to 7.3 billion in 2017 prices between 2015 and 2030 or roughly 0.08–0.15 percent of GDP for the 41 countries covered in the analysis. The aggregate financing requirement for planetary water security in water-related infrastructure has been estimated at US\$6.7 trillion by 2030 and US\$22.6 trillion by 2050.<sup>22</sup>

**6. Domestic resources in developing economies will not be sufficient to close the funding and financing gap.**<sup>23</sup> Additionally, existing public funds raised by and allocated to the water sector are often used inefficiently, disincentivizing operational and financial performance and failing to provide water services for the poorest and most vulnerable. At the same time, failures in policies, institutions, and regulations (PIR), technical and financial inefficiencies of water service providers, inadequate project preparation, ad hoc political intervention, and overall weak governance continue to discourage both public and private investment in the water sector in developing countries. For several decades, the development community has been seeking ways to expand the pool of total funding and financing for the water sector, with limited success. The absence of robust, multisectoral, and comprehensive national water strategies, the poor financial health of many water service providers and utilities, and the lack of bankable projects with adequate revenues, stable regulation, and where needed, concessional finance and guarantees, have limited private sector participation and severely limited access of sector entities to domestic commercial financing. With regard to accessing international investments and finance, water infrastructure is exceptionally capital intensive, with high fixed capital costs, long payback periods and low profit margins, and perceived risks are generally high vis-à-vis returns expected by institutional investors. The current macroeconomic context further compounds the challenge of expanding financing for the sector (see Box 1.1).

### **BOX 1.1: Challenging Macroeconomic Context**

The current global context of high inflation, rising interest rates, weak growth forecasts, currency depreciation, and capital outflows from emerging markets<sup>24</sup> offers a challenging backdrop within which to mobilize private capital. The latest growth forecasts suggest a sharp, long-lasting slowdown, with a decline in global growth to 1.7 percent in 2023.<sup>25</sup> This context requires immediate action to mitigate the risks of a global recession and debt distress, while ensuring vulnerable groups are protected and financial systems remain resilient.

**7. However, it is possible to unlock more public and private finance in the water sector by accelerating PIR reforms, addressing the creditworthiness of underlying entities, and designing bankable projects and innovative financing instruments,** as many past and ongoing WB and other engagements in the water sector demonstrate. The collective evidence suggests that the private sector has an important role to play not only in providing the much-needed capital investment, but also in providing innovation, know-how, and expertise, with the aim of enhancing operational efficiency, lowering operating costs, raising revenues, conserving and recovering scarce resources, and increasing resilience to climate risks, among other areas. Where seen as a public service, it is possible to enable efficiency in water delivery, with cost-reflective remuneration that encourages investments.

**8. As one of the largest financiers in the water sector and climate space at the global level, the WB can play a leading role in scaling up finance for water.**

The WB provides global thought leadership backed by frontier analytical work and has the convening power to bring together bilateral and multilateral development banks (MDBs), governments, and financial institutions to work towards a common agenda. The WB is in a unique position to leverage its country-based engagements with regional and subregional efforts in areas such as sustainable transboundary water management, flood control, and disaster risk management that crosses national borders. The WB maintains a broad portfolio of engagements ranging from upstream policy, institutional, and regulatory reforms, financing of large-scale water infrastructure, improvement of performance and creditworthiness of service providers and state-owned enterprises (SOEs), to transactions such as equity investments, debt financing, and public-private partnerships (PPPs) which can drive forward the scaling up finance agenda. The 2030 WRG, a partnership housed by the Water Global Practice (GP) of the WB, has supported the formulation and implementation of groundbreaking reforms in a range of countries and demonstrated the effectiveness of a multi-stakeholder, inclusive, and consultative model to generate momentum for changes to the upstream enabling environment for public-private collaboration and finance facilitation.

**9.** Within the WB, the strong support from the leadership of the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), the International Finance Corporation (IFC), and the Multilateral Investment Guarantee Agency (MIGA) to scaling up finance for water creates an important opportunity to work collaboratively with client governments, combine WB resources, and help countries develop and adopt clear frameworks for the financing of

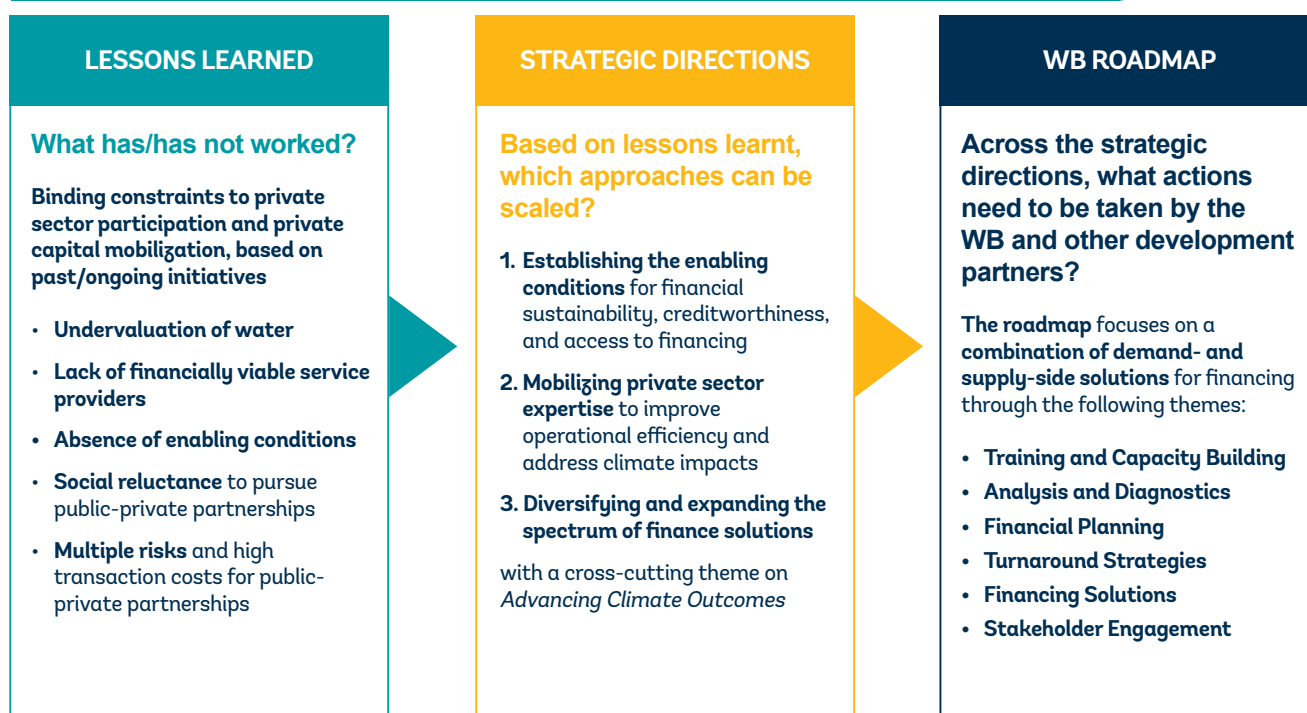
water investments with incentive structures for the public and private sector. With the fast-approaching deadline for the SDGs, investment needs are escalating on account of climate change, while global conditions are constraining the availability of governments to provide funding. With a focus on the underlying fundamentals of the water sector and appropriate project structures, concessional funds have the potential to help crowd in private capital across a broad range of water projects. This strategic framework document was developed through extensive internal collaboration among experts in IBRD, IDA, IFC, and MIGA. A core team with representatives from these institutions was established and met periodically to set the direction of the document. Various interviews were conducted with individuals and teams across the WB with specific expertise in maximizing finance for development (MFD) and water sector financing. In addition, interviews were conducted with other development partners, private companies, and financial institutions external to the WB.

## 1.2 SCOPE

**10. The Scaling Up Finance for Water Strategic Framework aims to better align the WB approach and resources to help client countries improve the planning, mobilization, and efficiency of funding and financing<sup>26</sup> for water sector investments to achieve the SDGs on water and address climate change, with a focus on crowding in private sector capital and expertise.** The Framework recognizes that it is critical to work on the demand side of financing by strengthening SOEs, water service providers,<sup>27</sup> other water sector agencies, and a broad range of intermediaries, along with catalyzing the supply side of financing. The preparation of the Strategic Framework has involved three steps, as outlined in Figure 1.1. The first step extracts lessons from past experience to understand the key constraints to scaling up finance for the sector. The second step defines strategic directions by identifying working models and scalable approaches based on the lessons learned. The third step articulates a WB roadmap which defines an overall approach and the steps that the WB needs to take to scale up financing, including mobilizing private capital and expertise, to address emerging water challenges, including climate change.

**11. The Framework looks broadly at public and private collaboration, considering the roles of both governments and private actors in facilitating investments and financing.** It considers their unique capabilities to manage different kinds of risks at the international and national levels. Governments play a central role in providing funding for water sector investments, creating enabling conditions for private

**FIGURE 1.1:** Strategic Framework for Scaling up Finance for Water



## Meeting Climate Goals and the Water-related Sustainable Development Goals

sector involvement, and supporting needed water sector financing through policies and regulations at the country level. Governments also need to lead and drive in-country coordination among stakeholders, including various financiers who may have different interests and mandates, to enable an efficient multi-stakeholder approach for financing water investments. Furthermore, the nature of water as a public good requires public-private collaboration as well as international collaboration, calling for a new level of partnership that transcends national borders and traditional public sector approaches.

**12. The public sector** can lead on actions that:

- **Provide funding** for water sector investments;
- **Improve sector governance**, efficiency, and creditworthiness;
- **Create and regulate water-pricing mechanisms**;
- **Allocate sector resources more effectively** and equitably to deliver the maximum benefit for every dollar invested (i.e., targeting capital);
- **Improve sector capital planning** to reduce unit capital costs; and
- **Crowd in or blend private finance** (i.e., mobilizing

capital with limited deployment of public funds), including through changes to the fiscal framework and the use of public funds (e.g., provision of escrow arrangements and multi-year annuities) to provide payment security to the private sector for the mobilization of additional capital.

**13.** The Framework considers the full spectrum of **private sector** roles, from being a key user of water resources and services; to providing financing, innovation, and expertise; to absorbing risk, providing economic exposure, and aligning incentives for achieving targets and efficiency levels to recover invested capital and realize profits. Such alignment in incentives serves to attract the innovation and expertise from the private sector. More specifically, the private sector:

- **Provides finance** through various instruments, including **debt and equity** (banks and commercial lenders, private equity funds, impact investors, project sponsors, and institutional investors such as insurance companies and pension funds) and **grants** (philanthropists, corporate social responsibility programs, private trust funds etc.);
- **Provides innovation and expertise** through multiple

contract types, including procurement of civil works, goods and services, management and service contracts, outsourcing, and technical assistance contracts; and

- ◆ **Uses water resources and water services** for different economic activities, with industries, corporates, and businesses as key sector stakeholders. Within water users, households deserve special consideration, given that they contribute to revenue through payment of tariffs and taxes, although affordability and social aspects are crucial (given water is a human right). In addition, farmers usually access third-party irrigation services, along with individual contributions and/or financing raised for farm-level equipment.

14. In addition, the sector involves a wide range of public and private organizations working on the demand (water

agencies or service providers) and supply (financing institutions and financiers at large) side of financing, and a wide range of intermediaries<sup>28</sup> operating at the interface between them.

15. This document mentions various terms, which are explained in Box 1.2, aligned with WB corporate terminology and as agreed with other multilateral development banks under joint private capital mobilization (PCM) efforts.

16. Box 1.3 outlines the Strategic Framework's approach to private sector participation, particularly private financing, control, and risk.

## BOX 1.2: Terminology used in the Strategic Framework

### **Private sector participation (PSP)**

refers to private sector involvement in the water sector through private finance, absorption of risk, and/or management, the latter in which the private party does not necessarily provide finance or absorb risk (e.g., management and service contracts). In addition to private financing, the Framework aims to mobilize private sector expertise and innovation to achieve key technical and financial efficiency objectives, and address capacity gaps in the sector, which may need to be addressed before private financing can be mobilized.

### **Public-private partnership (PPP)**

refers to a long-term contract between a private party and a government entity for providing a public asset or service, in which the private party bears significant commercial risk and management responsibility, and provides at least a part of the required investments, and in which remuneration is linked to performance.

### **Maximizing finance for development (MFD)**

is the WB's coordinated approach with other MDBs to responsibly crowd in private capital without pushing the public sector into unsustainable debt and contingent liabilities. This entails pursuing private sector solutions where they can help to achieve development goals and reserving scarce public finance for where it is most needed. This is the central goal of the proposed strategic framework – identifying where the private sector can best contribute to achieving the water SDGs and climate goals, with support from the WB.

### **Private capital mobilization (PCM)**

a metric tracked by the WB and other MDBs, refers to co-financing by a private entity, which is autonomous from government. This activity considers the role of the private sector more broadly to include commercial financing for government-owned entities.

### **Private capital enabled (PCE)**

refers to the monetary value of all private investments, resulting from projects that reduce or remove binding constraints to sustainable private sector solutions through policy and sector reforms, institutional capacity building, and an improved investment climate. The broader metric of PCE is of particular relevance to this activity, emphasizing the importance of establishing the enabling environment for private investments beyond single operations.

### **Private capital facilitated (PCF)**

refers to a combination of PCM and PCE.



### BOX 1.3: Private Financing, Control, and Risk

Private sector involvement in the water sector can involve private financing, transfer of management/control, and transfer of risk, examples of the latter being through bond issuances (including catastrophe bonds) and insurance. The appropriate form of private sector involvement will depend on the country and sector context. It is important to note that transferring risk and/or control or mobilizing finance from the private sector is not an end in itself and should be pursued when it contributes to development objectives. Thus, the approach under the Framework to these issues is as follows:

- **Risk** should be transferred to the party best placed to manage the risk;
- **Control** could be transferred to the private sector when this improves technical, operating, and financial efficiency; and
- **Private finance** should be employed when it minimizes life-cycle costs and when the cost of capital justifies such financing.

## 1.3 WATER WRIT LARGE

**17.** The water sector encompasses several sub-sectors (including water resources management, hydropower, irrigation for agriculture, drinking water supply, sanitation, and flood and drought prevention). These cut across the activities of several WB units, including the Water, Energy, Environment, Agriculture, Urban, and other Global Practices (GPs). The Framework applies to the entire water sector – “water writ large” – in keeping with the WB’s vision of a “Water-Secure World for All.” The Water GP Strategic Action Plan (2019) recognizes the water-climate-food-energy nexus and delivery of the vision through three inter-related pillars: (1) sustaining water resources, in light of various and often competing economic and social activities, (2) delivering services (water supply and sanitation, and irrigation), and (3) building resilience to climate change and water-related risks. The development objectives of Water GP operations generally target improvements in one or more of these strategic areas. The water sub-sectors have very different institutional and economic characteristics which shape the types of reforms and interventions and their potential for the mobilization of private capital. However, the design and enforcement of public policies and regulatory instruments, the improvement of governance and institutional arrangements to strengthen investment planning, monitoring and execution, and the development of public sector skills and capacities, rank among the priority functions needed to mobilize private investment and financing across all water sub-sectors. The Framework assumes a systems approach to engaging the private sector across the water value chain, as outlined in Figure 1.2.

**FIGURE 1.2: A Systems Approach to Private Sector Participation across the Water Cycle**

**PRIVATE SECTOR EXPERTISE MOBILIZATION**

- Extreme weather forecasting
- Flood modeling

**PRIVATE CAPITAL MOBILIZATION**

- Payment for ecosystem services
- Catchment management services
- Forest management
- Green bonds

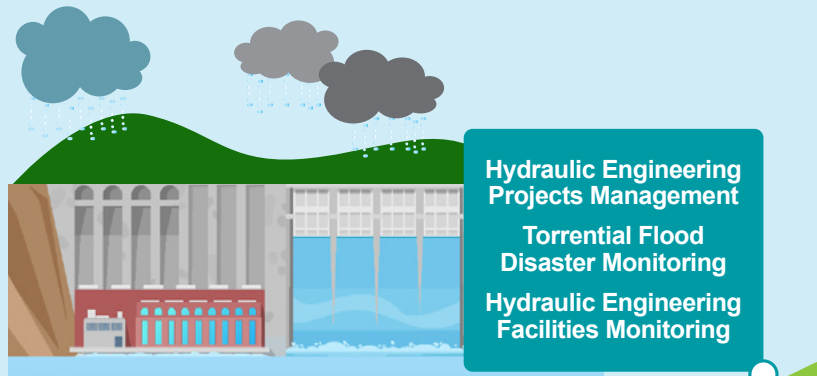
- Finance for CAPEX**
- City-level**
- Municipal loans & bonds
  - Climate bonds
- Utility-level**
- Commercial banks
  - Blended finance
  - Output based aid
  - PPP: Concession, BOT

- PPPs for operations (lease, service, management, performance-based contracts)

- Finance for OPEX: tariffs

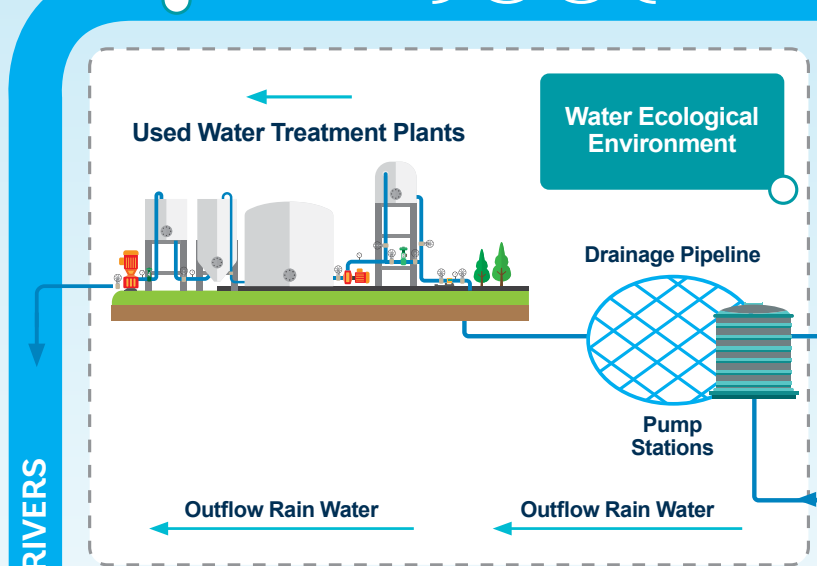
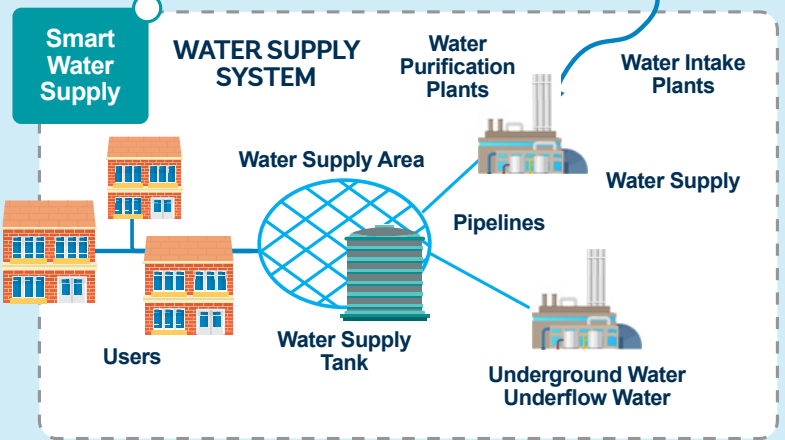
- Utility-level**
- Climate/sustainability bonds and loans
  - Energy generation at wastewater treatment plant
- Project-level**
- Nature-based solutions/sponge cities
  - Property development

- PPPs for urban river restoration



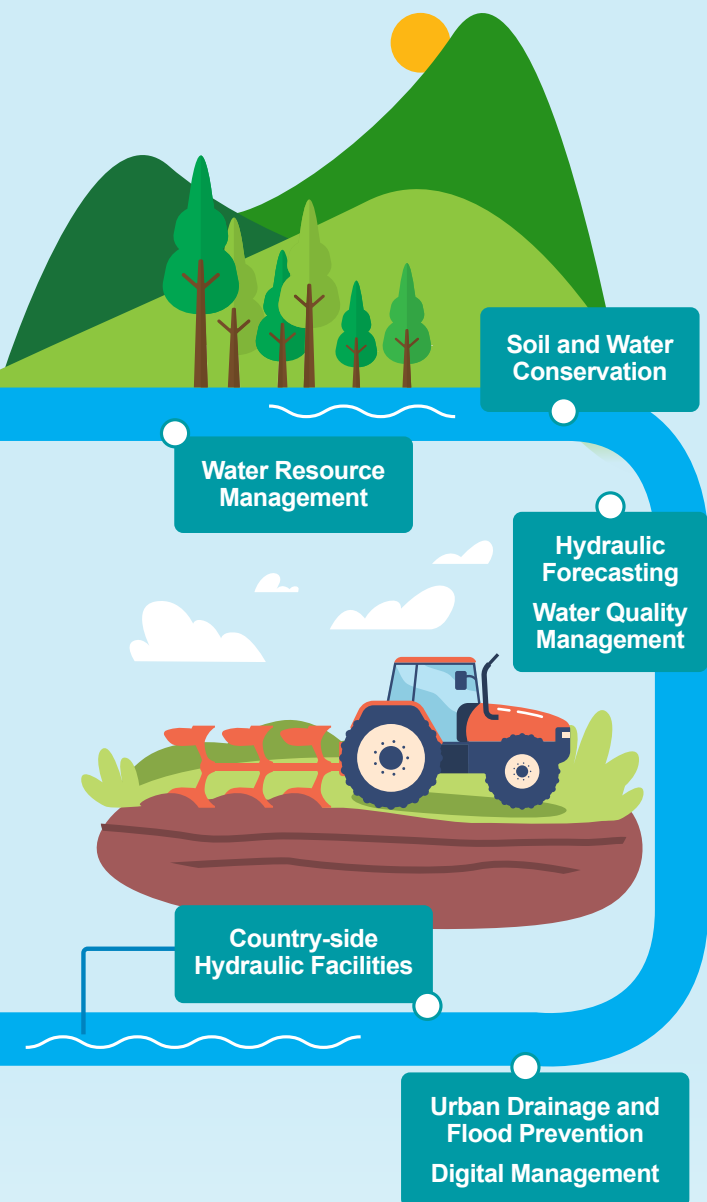
**WATER RESERVOIR**

**WATER**



**SEA**





**PRIVATE CAPITAL MOBILIZATION**

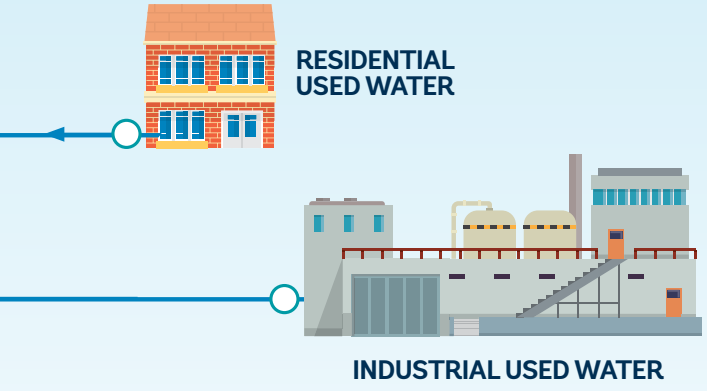
**PRIVATE SECTOR EXPERTISE MOBILIZATION**

- PPPs for irrigation
- Rural WSS

Water quality monitoring and management

PPPs for irrigation

- Disaster risk finance
- Insurance
- CAT bonds



- Green/Sustainability-linked loans/bonds (sovereign, sub-sovereign, corporate)
- **Infra finance** e.g., River basin endowment fund
- Limited recourse finance

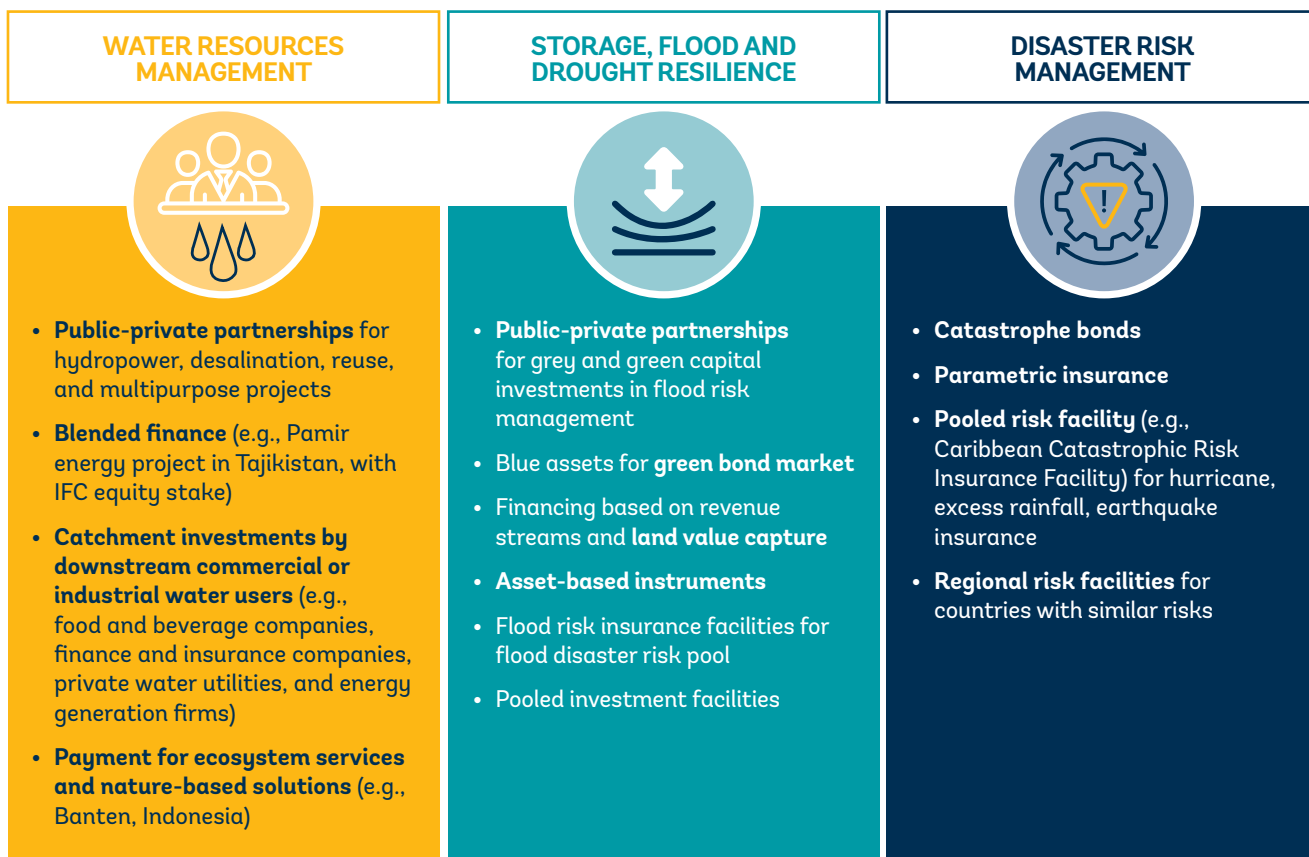
Private water/wastewater treatment for new residential mixed-use developments, industrial zones, and large-user contract operations



**18. There is an emerging consensus on developing a holistic approach towards the water sector,** synchronizing the various sub-sectors. This is motivated by various integrative frameworks that have emerged in the last few decades, such as Integrated Water Resource Management (IWRM), water-food-agriculture nexus, Water in Circular Economy and Resilience (WICER), and the water security approach. These frameworks recognize the complementarities and trade-offs across sub-sectors and the need for a cohesive institutional and policy framework for the sector as a whole, considering the critical distinction between water as a natural resource and as a service, and the essential link between them. While many governments have made solid progress in IWRM to advance water security, this has largely been achieved without structured private sector participation. This is becoming even more important now in the context of climate change and the central role of water in climate adaptation and mitigation strategies. Water is also a significant factor of production for the wider economy. Therefore, investments in energy production and urban development, among other areas, can have significant consequences for water availability and demand, and exposure and vulnerability to water risks.

**19. The design and implementation of public policies, investment preparation, and the development of skills and capacities rank among the priority functions needed to mobilize finance across all water sub-sectors.** At the same time, each traditional sub-sector (water resources management, hydropower, irrigation for agriculture, water supply and sanitation, and flood and drought prevention) typically supports ad hoc but closely interrelated water infrastructure and other investments. Examples include dams and reservoirs; desalination and recycled water (i.e. unconventional water resources); nature-based solutions for water production, wastewater treatment and flood and drought prevention; irrigation facilities for off-farm and on-farm development; water treatment for human consumption; wastewater treatment and reuse plants; water distribution and sewage networks; and off-grid decentralized facilities for water supply and sanitation. However, in most countries the water sector is fragmented across ministries, departments, agencies, and service providers at the national and subnational levels. These entities often have overlapping mandates, functions, and functionaries, thus affecting the efficiency of water use planning, as well as the allocation of finances among competing sub-sectoral priorities.

**FIGURE 1.3:** Financing Solutions for Water Resources Management, Storage, Floods, and Drought Resilience




**20. Hence, each sub-sector differs in terms of the critical functions needed to facilitate funding and financing due to their distinctive risk-return profiles and relative maturity in terms of the track record in accessing finance.** WSS utilities are the most mature sub-sector in terms of access to finance, but still face deeply rooted misperceptions that deter investors and require strong efforts of business promotion. In contrast, small-scale service providers, nature-based solutions, and farmers require a different kind of support, notably, conducive policies and regulation, coordination among multiple local stakeholders, and new types of innovative partnerships.

**21. The implementation of the Scaling up Finance for Water Strategic Framework will require different approaches for the various water sub-sectors** depending on country-level needs and demand, guided

by the strategic directions, which are applicable to all. The main priorities and opportunities to mobilize additional public and private financing for water-related investments are outlined in Figures 1.3–1.5 and described in more detail in appendix A. Overall, PCM is well established in the WSS sub-sector through multiple channels, including domestic commercial debt and equity, and PPP models. There is comparatively less global experience in PCM in the water resource management, flood management, and irrigation modernization sub-sectors, except for desalination and reuse projects, which are typically developed through Design-Build-Operate (DBO) or Build-Operate-Transfer (BOT) schemes. But there is considerable untapped potential in catchment management, water storage, unconventional water source development, urban stormwater management, flood risk insurance, and irrigation efficiency projects.

**FIGURE 1.4: Financing Solutions for the Irrigation Sector**

	<b>SYSTEM MODERNIZATION</b>	<b>OPERATION &amp; MAINTENANCE &amp; WORKING CAPITAL</b>	<b>ON-FARM MODERNIZATION</b>
<b>Basin-Level Investments &amp; Major Headworks</b>	<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Governments and international finance institutions</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• Public-private partnerships for dam construction/operation (e.g., Chile), desalination, and reuse</li> </ul>		<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Subsidized financing in irrigation programs (e.g., Rwanda SSIT)</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• Design of financial incentives for smallholders to use efficient irrigation (e.g., Morocco’s Plan Maroc Vert)</li> <li>• Farmer-led irrigation development for access to finance, technology, and markets</li> <li>• Private sector solutions (e.g., India JOHAR) with matching grants (e.g., Punjab)</li> <li>• Access to finance by intermediaries (e.g., MFIs, rural banks), including blended finance (e.g., Philippines) and with third party guarantees (e.g., Tanzania)</li> <li>• Agri-tech service provider models (e.g., rentals, leasing, pay-per-use in India)</li> <li>• Value chain finance (e.g., consumer credit in India; supplier credit in Nigeria; outgrower contracts in Kenya)</li> </ul>
<b>Development and Modernization of Large-Scale Irrigation Schemes</b>	<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Governments and international finance institutions, with low capital cost recovery</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• Recovery of investment costs (e.g., Turkey)</li> <li>• Public-private partnerships to leverage private capital and management (e.g., Peru, Karnataka)</li> <li>• Green bond issuance (e.g., Brazil and Turkey)</li> </ul>	<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Public schemes with high subsidies and low cost recovery</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• Public-private partnerships for irrigation management, reducing public subsidies (e.g., West Bengal and Gabiro agribusiness hub)</li> </ul>	
<b>Groundwater Systems; Small-Scale Collective or Individual Systems</b>	<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Largely farmer-led or public financing (e.g. Morocco, Yemen, Afghanistan, etc.)</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• Community or individual investments through cost-sharing (e.g., Chile)</li> <li>• Public-private partnerships using blended finance (e.g. Karnataka)</li> <li>• Establishment of private institutions for financing through public support (e.g. Niger)</li> </ul>	<p>High level of public subsidies for energy, usually farmer financed</p>	

**FIGURE 1.5:** Financing Solutions for Water Supply and Sanitation

WATER TREATMENT & DISTRIBUTION	WASTEWATER COLLECTION & TREATMENT	ONSITE SANITATION AT THE HOUSEHOLD LEVEL
<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Governments; Design-Build-Operate arrangements</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• <b>Commercial debt</b> for corporatized utilities with creditworthiness (e.g., Uganda; Indonesia)</li> <li>• Equity finance for high-performing utilities through <b>IPOs and partial divestiture</b> (e.g., SABESP)</li> <li>• <b>Loan financing</b> for small-piped water systems (e.g., Kenya)</li> <li>• <b>PPPs</b> for desalination and <b>concessions</b> in cities with end-user tariffs (e.g., Brazil)</li> <li>• <b>Component-based financing</b> for energy efficiency improvements</li> </ul>	<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Governments; Design-Build-Operate arrangements</li> </ul> <p><b>New Solutions:</b></p> <ul style="list-style-type: none"> <li>• <b>Public-private partnerships</b> for water reuse, particularly to industrial users (e.g., WB ReWater initiative)</li> <li>• <b>Hybrid annuity model</b> for wastewater treatment and reuse (e.g., Ganga)</li> <li>• <b>Revolving funds</b> for rural solutions</li> <li>• Off-grid (non-utility) services and delivery by <b>microenterprises</b></li> </ul>	<p><b>Traditional Financing:</b></p> <ul style="list-style-type: none"> <li>• Households</li> </ul> <p><b>New Solution:</b></p> <ul style="list-style-type: none"> <li>• <b>Microfinance</b> for extension of access by micros, small, and medium-sized enterprises (e.g., donor and philanthropic contributions in Sub-Saharan Africa and Asia)</li> </ul>

**22. Countries are responding to increased water scarcity with greater efforts to mobilize unconventional water resources.** According to Global Water Intelligence, between 2000 and 2016, there has been a threefold increase in the global installed desalination capacity and, since 2009, the annual incremental contracted reuse capacity has systematically exceeded desalination incremental contracted capacity. This recent global growth in desalination and reuse installed capacity is driven primarily by investment programs launched, for example, in the Middle East and North Africa. This momentum will drastically transform the water resources mix in many countries of the region, such as Egypt, Tunisia, and Gaza, where seawater desalination has passed from constituting a negligible share of the mix in the last decade to representing the equivalent to 12, 71, and 50 percent of today’s municipal freshwater withdrawals.<sup>29</sup>

**23. Recent WB research<sup>30</sup> provides insights on how safely managed supplementary (non-utility) service providers (SSPs) can contribute to attaining the ambitious SDG 6.1 universal coverage target (see Box 1.4).** Hundreds of millions of households globally receive water supply services from SSPs (mostly microenterprises), and it is estimated that the number will increase to 1 billion by 2030 due to the inability of utilities to keep up with rapid urban growth. Most of these people will live in Asian and African cities, including peri-urban areas.

**BOX 1.4: Water Supply – Supplementary (Non-Utility) Service Providers**

SSPs cover the full range of services, from standposts to piped networks. They may be independent or contracted by the utility or local government, and are either regulated or unregulated. Based on several case studies, WB research highlights challenges and significant opportunities (including private sector financing) for SSPs:

- Access to finance to scale-up services (e.g., access to credit);
- Reforms that allow SSPs to have a formalized role, achieve cost recovery, etc;
- Development of new models for SSPs to deliver services cost-effectively and professionally; and
- Operationalization of such models for subsequent replication at scale.

Formalizing the role of SSPs in the provision of water supply services can lower costs, expand coverage, and improve water quality. The development of practical and scalable models would enable greater access to finance for improving services by SSPs.



# 2

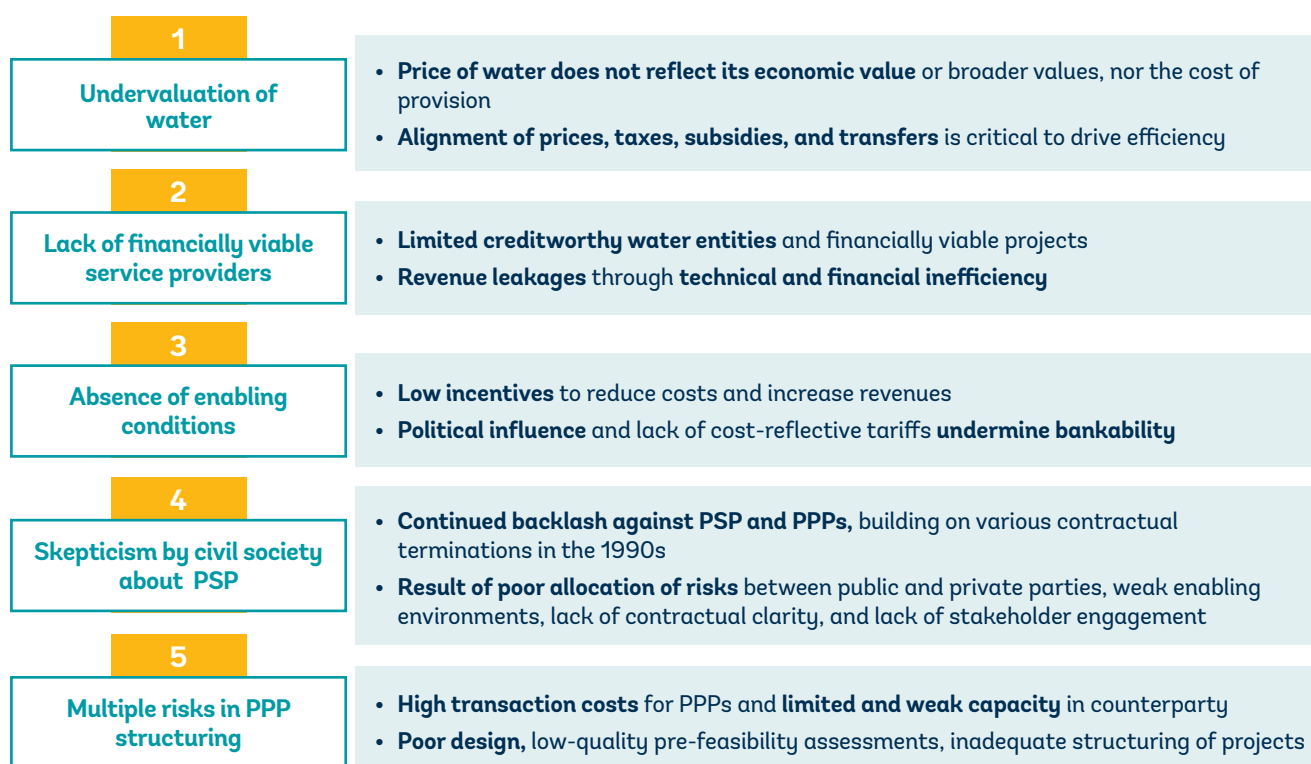
## LESSONS LEARNED

**24. There is a mixed tracked record of private sector engagement in water in developing countries over the last few decades.** A renewed effort by the WB to draw private capital into the water sector must take account of the lessons learned. While there are examples of successful projects and programs delivering improvements to service access and quality and generating appropriate returns for the private party (see appendix C on country-level case studies), these successes have rarely been scaled up to the national level or adapted and replicated in other jurisdictions. Furthermore, these positive stories of private sector participation (PSP) remain less widely known to the public than the small number of high-profile concession failures, mostly dating back to the 1990s, and cases of “re-municipalization,” contributing to continued skepticism about the value of private sector involvement.

**25.** This section highlights key lessons learned from past efforts to mobilize private sector involvement in the water sector to provide a strong foundation for the Framework. Key constraints identified relate to the undervaluation of water; the lack of financially viable service providers; the absence of enabling conditions; civil society skepticism about PSP; and multiple risks in PPP structuring (see Figure 2.1). These are each discussed in turn.

- ◆ **Gap between the Price and Value of Water:** The merit good characteristics of water and sanitation services and the status of water as a scarce natural resource imply an important role for government in setting prices which reflect water’s true value. However, in most countries, the price of water neither reflects its economic value or broader values, nor

**FIGURE 2.1:** Binding constraints to Private Sector Participation



the cost of service provision. Water as a resource is commonly taken for granted and regularly wasted, and subsidized tariffs are often ineffective in helping the poorest and most vulnerable communities. In WSS and irrigation services, poor cost recovery from user tariffs by water service providers has been a major barrier to financial sustainability and PSP in past decades. The alignment of prices, taxes, subsidies, and transfers will be critical for realizing the value of water and improving efficiency while maintaining equitable service delivery (see Box 2.1).

◆ **Lack of Financially Viable Service Providers:**

The political economy of the sector has undermined the financial viability of service providers. Prevailing governance arrangements for water supply imply weak or absent incentives for technical and operating efficiency, further undermining creditworthiness. Water distribution networks tend to be natural monopolies with high fixed costs and long-life assets. In many places, tariffs are suppressed for political and social reasons, and service providers

are, therefore, unable to cover the asset investment, operating and maintenance costs, leading to an inability to demonstrate stable and strong cash flows. These challenges are often exacerbated in cases where the owner of the utilities and service providers is the government, which can politicize decision-making and distort corporate governance practices. Water sector operations and financials often lack transparency. As a result, investors often perceive the water sector as riskier than other infrastructure sectors. This has led to a downward spiral in service quality and operating and financial performance (see Figure 2.2). Weak incentives have resulted in inflated operating costs and revenues have been suppressed as a result of a range of issues, including incomplete metering, meter-tampering, illegal connections, water wastage, inadequate billing and collection mechanisms, and water losses in distribution and transmission. This has locked utilities and service providers out of financial markets and impeded access to finance for water-related project finance vehicles.

## BOX 2.1: Valuing Water

The United Nation's 2021 World Water Development Report argues that the inability to recognize the value of water is the main cause of water waste and misuse. The report maintains that, despite the difficulty of attributing an objective and indisputable value to a resource which is fundamental to life, **recognizing, measuring, and expressing water's worth**, and incorporating it into decision-making (e.g., investment and pricing), is fundamental to achieving sustainable and equitable water resources management and the SDGs. All too often, the value of water, or its full suite of multiple values, is not prominent in decision-making at all. Especially in water, the concepts of "price", "cost", and "value" should not be confused. Waste and careless

use stems from the fact that water is all too often thought of exclusively in terms of its cost or price, without realizing its tremendous value, which is impossible to price or could be incalculable and limitless (since life cannot exist without it and it cannot be replaced). This is especially true in times of growing scarcity and against the backdrop of population growth and climate change.

The report maintains that in the case of water, there is no clear relationship between its price and its value. Where water is priced (meaning consumers are charged for using it), the price often reflects attempts at cost recovery and not value delivered. Nevertheless, the different values of water need to be reconciled, and the trade-offs between them resolved

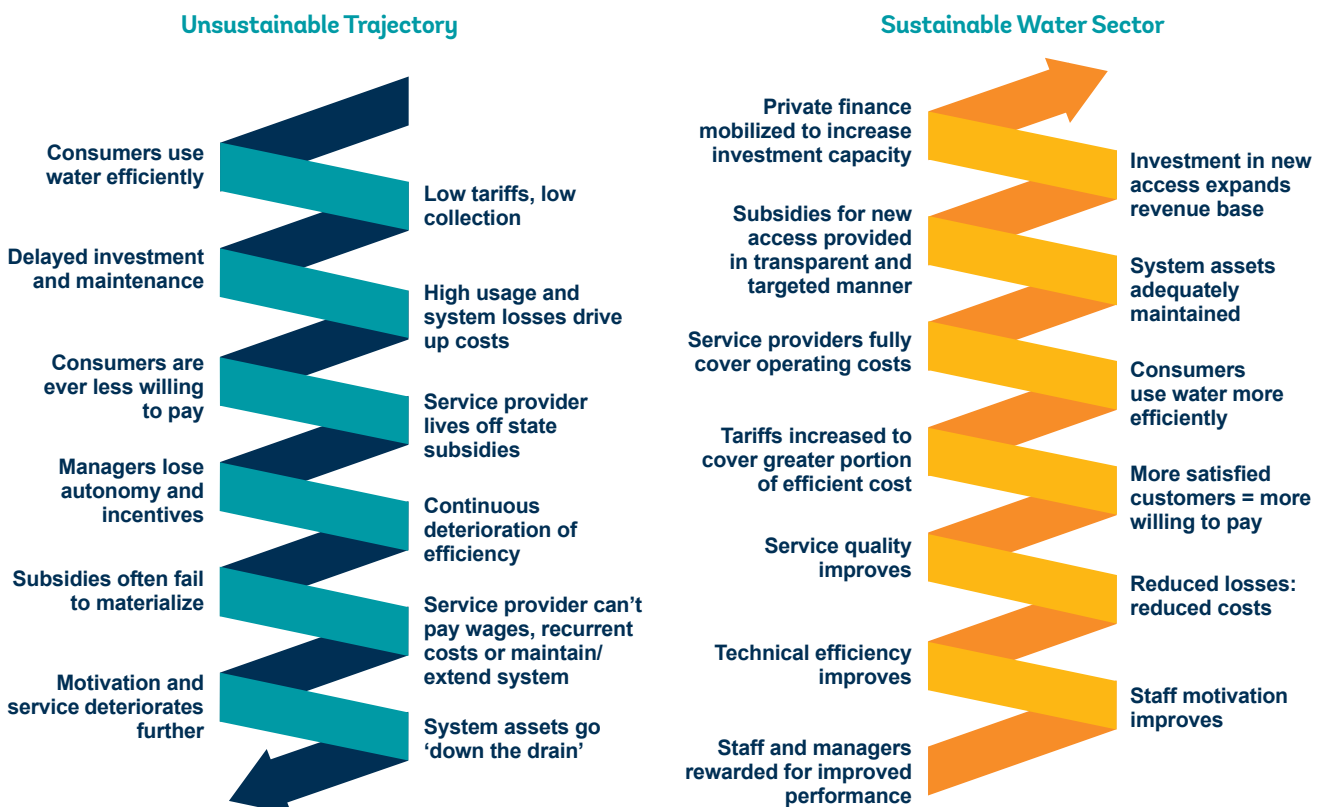
and incorporated into systematic and inclusive planning and decision-making processes. The report presents current methodologies and approaches to the **valuation of water** from five interrelated perspectives: valuing **water sources** (in situ water resources and ecosystems); valuing **water infrastructure** for water storage, use, reuse, or supply augmentation; valuing **water services**, mainly drinking water, sanitation, and related human health aspects; valuing water as an **input to production and socioeconomic activity**, such as **food and agriculture, energy and industry**, and **business and employment**; and other **sociocultural** values of water, including recreational, cultural and spiritual attributes.

- ◆ **Absence of Enabling Conditions:** PIR reform is a lengthy process frequently beset by inertia and backsliding. High-level political commitment to improving water resource management, access, and service quality is necessary, together with sustained support from the WB, sometimes over decades. When these conditions are met, the impact of PIR reform has been transformative, as the cases of Indonesia and Uruguay show. In Uruguay, reforms led to the transformation of the national water utility, Administracion de las Obras Sanitarias del Estado, from an inefficient, financially unsustainable entity to a successful public water utility able to issue bonds on local capital markets.
- ◆ **Civil Society Skepticism about PSP:** The large wave of private investments in water infrastructure in emerging markets during the 1990s ended with a strong backlash from civil society, the result of poor allocation of risks between public and private parties, weak enabling environments, lack of contractual clarity, and lack of stakeholder engagement. Continued resistance to PSP is a

lingering repercussion of the earlier contractual terminations, requiring strong engagement with civil society to secure a social mandate for PSP and clear messages from all stakeholders to communicate the benefits that PSP is expected to bring.

- ◆ **Multiple risks and high transaction costs of PPPs:** PPP models for infrastructure development face particular challenges when applied to the water sector. The traditional special purpose vehicle structure with limited recourse requires strong reliance on cash flows, calling for a specific capital structure, usually higher debt-to-equity ratios, longer tenures, heavy collateralization, and engagement with a large cohort of lenders, insurers, guarantors, and advisors, all leading to high transaction costs. The costs of PPP project preparation, including legal, technical, financial, and other costs, tend to be much higher than traditional public procurement. Additional sector dynamics – such as price sensitivity and affordability considerations – and country debt dynamics, combined with macro and market challenges, and tight indexing, usually require a

**FIGURE 2.2:** Downward and Upward Operational and Financial Performance Spirals in Water Services



Source: World Bank, *Reform and Finance for the Urban Water Supply and Sanitation Sector* (2019).



suite of solutions, including viability gap funding, de-risking, and credit enhancement. The resulting arrangement requires careful management and close monitoring to ensure sustainability of long-term contracts. This is exacerbated by the often limited and weak capacity in the PPP counterparty in the public sector to originate, procure, structure, and implement PPP contracts. Water projects are often not well prepared – pre-feasibility and design studies are weak, and identification and structuring of projects is inadequate – resulting in bottlenecks in the project pipeline. Furthermore, water investments are context-specific, making it difficult to scale up financing models or to replicate previous projects, adding to transaction costs. Nonetheless, when structured well to ensure performance-linked

payments to the private sector, PPPs can offer significant benefits over public procurement.

**26. The constraints on private sector participation will require differentiated approaches** tailored to the size and income level of countries (e.g., middle-income countries vs low-income countries), as well as the level of banking sector and capital market development. While the largest source of finance for water investments is likely to remain public and concessional financing, the mobilization of private capital, especially domestic private or commercial finance, offers tremendous potential. These lessons are reflected in the strategic directions which guide the WB's approach to scaling up finance for water.

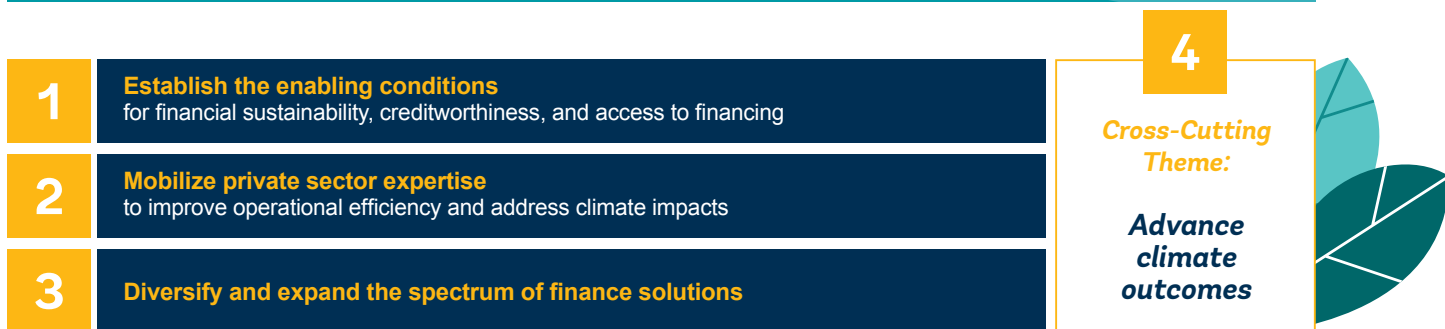


# 3

## STRATEGIC DIRECTIONS

The Strategic Framework assesses the wide range of PSP solutions and enabling conditions already in use across different regions and the associated financing instruments, with the aim of identifying solutions with the potential for broad scale-up and replication to fill the large financing gaps at the regional and country levels. Four strategic directions have been identified, as outlined in Figure 3.1.

FIGURE 3.1: Key Strategic Directions



### 3.1 ESTABLISH THE ENABLING CONDITIONS

**27. Support the Enabling Conditions for Financial Sustainability, Creditworthiness, and Access to Financing.** Sound PIR reforms and incentives for sector entities to improve their technical and financial efficiency are the foundations for scaling up finance in the water sector. Governments have a leading role to play in undertaking these actions and reforms, supported by the WB and others. Depending on the level of economic, financial market, and water sector development in the country, the starting point for these reforms may be the following (see also Figure 3.2):

- ◆ **Broad water sector restructuring to improve efficiency and accountability of service providers.** For example, corporatization of water service providers; consolidation or aggregation of entities; and/or shadow credit-rating programs (e.g., Angola, Columbia, Kenya, Mexico, Mozambique, Peru, and Turkey).

- ◆ **Policy and regulatory incentives for service providers and farmers to achieve cost recovery and raise financial and technical efficiency.** For example, increasing collections, reducing non-revenue water, extending coverage, and improving service quality. Such interventions include sector benchmarking tools, monitoring and evaluation, and linking access to public funds to improved performance through results-based financing. In some countries, legal and institutional reforms are necessary to allow service providers, municipalities, and financial institutions to use financial incentives and employ commercial finance and expertise in water projects, such as those implemented in Nigeria and Indonesia.

- ◆ **Consistency of economic regulation and tariff-setting procedures with cost recovery by service providers, along with affordability,** considering the availability of public and concessional funds to achieve social inclusion goals and protection of vulnerable groups through appropriate subsidy schemes. Ensuring the price of water is closer to its

economic value is critical in incentivizing sustainable use of the resource. This needs to be coupled with incentives for the efficient use of water by consumers through volumetric water pricing and other economic instruments. Multi-pronged strategies may be used by policymakers to achieve sector financial sustainability, combining the increase in overall revenues from tariffs, differentiated by type of user, with willingness and capacity to pay through the use of smart subsidy programs to protect vulnerable groups.

- ◆ **Structured incentives and capacity-building initiatives at the service provider and farmer level to improve operating and financial performance.** These can include regulatory diagnostics (e.g., for irrigation service providers), development of performance turnaround strategies and performance improvement plans, providing support for capacity building and overarching sector financing frameworks, and improving the overall financial planning and management. Incentives can be provided through results-based financing mechanisms and matching grants designed at a national or regional level. Both are aimed at helping entities across the water sector improve performance and investment execution levels, and ultimately achieve financial sustainability and creditworthiness, with potential for replication and scaling up. Collectively, such interventions support access to commercial finance, as demonstrated in Brazil, Indonesia, Kenya, and Uruguay, allowing public budgets and concessional financing to be directed most effectively to meet SDGs. Results-based financing at the country level has proven helpful to create the necessary incentives for performance improvement. In irrigation, opportunities exist to engage the private sector in designing financial incentives for smallholder farmers to use efficient irrigation. Such systems contribute to long-term water sustainability, climate change adaptation, and food security outcomes (e.g., Morocco's Plan Maroc Vert and India's subsidy support for micro irrigation).
- ◆ **Pricing mechanisms as economic incentives for water security.** Pricing systems should also increasingly move towards internalizing resource costs in water prices, with long-term considerations of water security at a basin level for different users (such as cities, industries, and the irrigation and energy sectors). Water scarcity is compounded by trends of increased exposure to droughts in many regions, creating the need to redesign prices to go beyond financial discussions on cost recovery. Prices, designed as economic incentives, can send the necessary signals for efficient water use,

together with regulations related to water rights and water allocation. By recognizing that water security is a public good that must be collectively paid for, appropriate pricing strategies can finance resilience initiatives (e.g., guaranteeing the existence of buffer resources for drought events, allowing for the recovery of depleted aquifers, and reducing the demand for water).<sup>31</sup>

- ◆ **Development of policy, institutional and regulatory frameworks to adapt to the greater weight of desalination and reuse in the water resources mix, where needed.** Such unconventional sources of water may not have an evident fit in water rights laws and regulations currently enforced, even in countries where they represent a significant share of the water mix (e.g., there is a lack of clarity on the rights to abstract seawater and the property and/or user rights on desalinated water and treated wastewater effluent). Countries willing to mainstream the use of unconventional water resources may also need to revisit the policies and regulations of associated sectors, such as wastewater-effluent discharge permit schemes, drinking water supply services, and energy, as well as specific regulations on agricultural activities, health, and environmental aspects (e.g., authorized uses, effluent quality standards for wastewater reuse, seawater intake conditions, and brine discharge standards for desalination projects). This may eventually require considering not just the specificities of the local context but also reuse standards applicable in importing markets of agricultural crops produced in the region to prevent the creation of undesirable trade barriers (e.g., the European Union in the case of Morocco and Tunisia). Lastly, existing institutional structures and management models may have to be adapted to ensure the efficient management of these new resources. These institutions may have to develop new capacities to take over these roles or delegate desalination and reuse development and/or operational activities to a private partner.
- ◆ **Coordination of public and private sector approaches across water sub-sectors.** Greater coordination between the public and the private sector is needed to ensure that competition between public and private financing models does not occur (e.g., between government subsidies and donor grants for irrigation equipment, on the one hand, and loans from financial institutions, on the other).

**FIGURE 3.2:** Strategic Direction on Establishing the Enabling Environment

	FOCUS AREAS	EXAMPLES
PIR and technical and financial efficiency	<p><b>Broad water sector reforms</b> to improve efficiency and accountability <i>Corporatization of water service providers, consolidation/aggregation/shadow credit-rating programs</i></p> <p>+</p>	<p><b>Angola, Colombia, Kenya, Mexico, Mozambique, Peru, Turkey</b></p>
	<p><b>Policy and regulatory incentives for service providers</b> to achieve cost recovery and improve their financial and technical efficiency</p> <p>+</p>	<p>Transformation of national water utility in <b>Uruguay</b>, enabling it to issue bonds</p>
	<p><b>Economic regulation and tariff-setting procedures</b> consistent with cost recovery and legal and institutional reforms</p> <p>+</p>	<p>Reforms to employ commercial finance and expertise in water projects in <b>Brazil, Indonesia, and Nigeria</b></p>
	<p><b>Structured incentives and capacity building of service providers</b> to improve operating and financial performance</p>	<p><b>Albania, Colombia, and Portugal</b> for strategic financial planning</p>

**28. Economic regulation – entailing the setting, monitoring, and enforcement of tariffs, service standards, and incentives for service providers – is a critical part of the PIR context needed to scale up finance for water services.** Regulation in the water sector takes many forms, such as through independent agencies, contracts, or self-regulation

by municipalities or the community. All these forms of regulation share certain high-level objectives: cost-effectiveness, transparency, predictability, fairness, autonomy, alignment with the political, social, and institutional context, and participation of stakeholders. Various forms of regulation are outlined in Box 3.1.

### BOX 3.1: Forms of Regulation in the Water Sector

Among the forms of regulation found in the water sector in low-income countries, regulation by agency and regulation by contract are the ones most often discussed, but self-regulation and municipal regulation are more prevalent. Self-regulation refers to cases in which the utility, municipality, or community providing the service also performs regulatory functions of setting tariffs and incentives and monitoring performance. Municipal regulation refers to cases in which the municipal government provides oversight of the utility. While this model is widespread across regions and offers some advantages in terms of jurisdictional consistency and coherence between policy and regulation, it also faces challenges in terms of transparency and expertise. In order to achieve regulatory objectives, the form of regulation adopted needs to fit with the local political economy and institutional conditions.

Economic regulation is a critical part of the overall PIR context and the design of any regulatory system has to be considered as part of a package. Any regulatory model must be fit for purpose and designed for the context at hand, while drawing on good practices and global experiences but not blindly adopting them. This means designing regulatory frameworks embedded within political economy and governance structures, aligned with policy and institutional frameworks, and capable of adapting over time as capacity develops.

**29. While looking at PCM, it is important to recognize that public funding and concessional finance will continue to play a key role in financing water-related investments in most developing countries.** Governments need to plan, budget, and allocate public resources more efficiently, rather than only increasing spending, for projects that contribute most to achieving policy objectives. Governments also need to ensure that public expenditure crowds in rather than crowds out the private sector. Governments and other stakeholders need to work on full execution of budgets allocated, as the water sector faces a 70 percent annual under-execution rate due to capacity weaknesses across the project cycle (design, procurement, contract management, etc).<sup>32</sup> The assessment of the enabling conditions requires an understanding of the overall investment climate in the country and the level of financial market maturity to assess and strengthen the landscape for private sector participation.

### 3.2 MOBILIZE PRIVATE SECTOR EXPERTISE

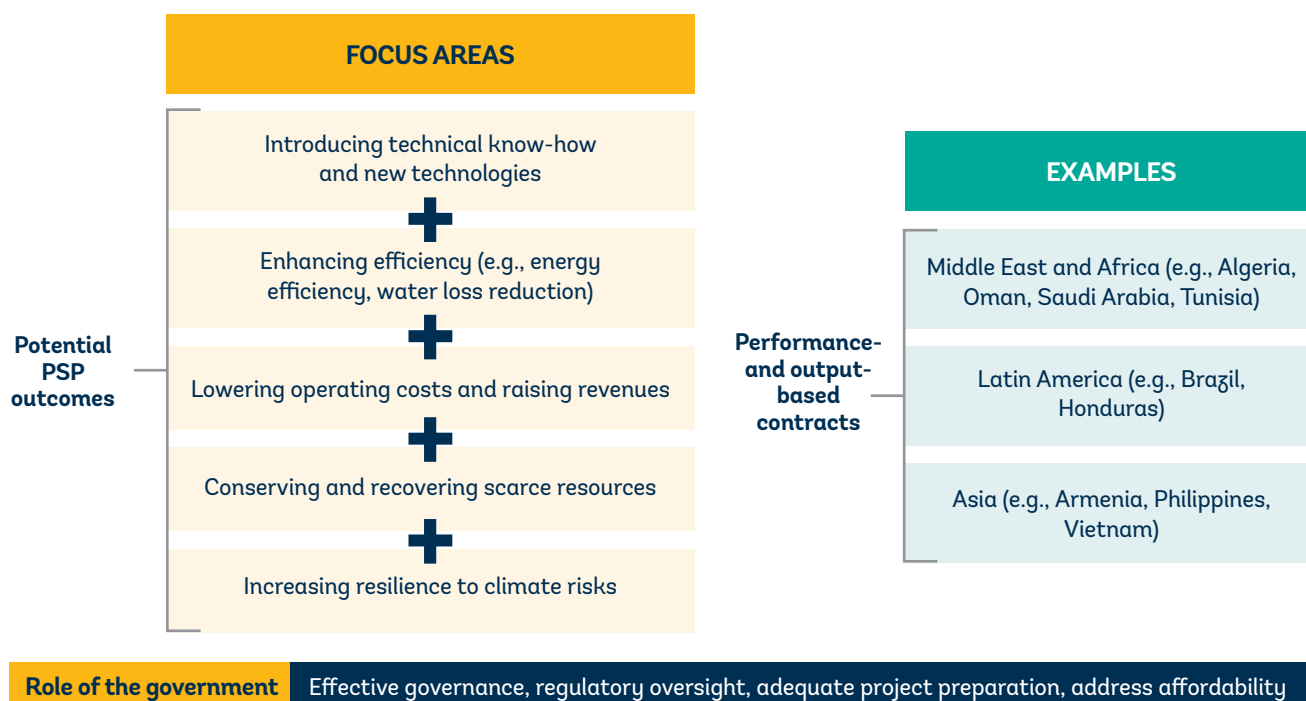
**30. Private sector innovation, know-how, and expertise contribute to technical and operating efficiency, opening up access to private finance, and contributing to water and climate policy goals** (see Figure 3.3). In many developing country contexts,

PSP models can be less politically sensitive and more financially viable than other contract types. Examples include operating and management contracts and affermage contracts in which responsibility for management is transferred to the private party with limited or no responsibility for financing. Although these “capital-light” models do not always directly mobilize private finance, they can allow the public counterpart to move towards financial sustainability and creditworthiness and thus unlock access to commercial finance by:

- ◆ Introducing technical know-how and new technologies to improve infrastructure maintenance and service quality;
- ◆ Enhancing operational efficiency (water losses reduction, and efficiency in water and energy use), with climate change adaptation and mitigation impacts;
- ◆ Lowering operating costs and raising revenues (though billing and collection efficiency);
- ◆ Conserving and recovering scarce water resources; and
- ◆ Increasing resilience to climate risks.

**31. Engaging with the private sector under any contract modality requires the public sector to support robust models of collaboration** that provide effective governance, regulatory oversight, and

**FIGURE 3.3: Strategic Direction on Mobilizing Private Sector Expertise**



adequate project preparation; address affordability; and ensure that efficiency gains from private sector participation result in greater investments and/or lower costs for the sector.<sup>33</sup>

### 3.3 DIVERSIFY AND EXPAND THE SPECTRUM OF FINANCE SOLUTIONS

**32. Stakeholders need to consider the full range of financing options and identify those most suited to the context and recipient** – national or subnational government fiscal budgets, service provider revenues, or project-generated resources. Private finance options encompass **debt** (loans from commercial banks, bonds in the capital markets, microfinance) and **equity** instruments (PPPs, initial public offerings, and partial divestiture). Sources of private finance span domestic and international capital markets, commercial banks, institutional and private equity investors, philanthropic organizations, and direct investors.

**33. In some countries and contexts, private finance will flow once enabling conditions are in place. Elsewhere, additional financial support and credit enhancement solutions will be needed from the WB and others, matched to the type of finance and local needs.** These financing and de-risking instruments do not serve as a substitute for necessary sector reforms but can help to remove barriers to private finance in particular cases. In addition, countries and other stakeholders will need to factor in the prevailing market conditions and their impact on the cost of MDB financing, which has gone up almost five-fold in the past couple of years. As such, project selectivity is critical to manage the fiscus of countries. The value of credit enhancement, including WB guarantees, provides a critical value proposition in this environment.

**34. The WB should take a “tiered” approach to assessing the right mix of solutions, proceeding from a macro country-level assessment to a water sector and sub-sector assessment and finally the entity and/or project-level assessment.** This systematic approach will help to ensure that credit enhancement and de-risking instruments are tied to meeting policy goals and do not crowd out potential sources of private finance. Opportunities for WB to support PCM are outlined in Figure 3.4 and described in more detail below (see also section 4.9).

◆ **Greater and More Efficient Deployment of Public Sector Financing:** The public sector can use various instruments to support the water sector in maximizing the needed financing. This support can

range from raising new funds through increasing revenues from tariffs and other service fees; reducing costs through efficiency improvements; increasing fiscal budget allocations; increasing efforts to access grants from available trust fund resources supporting achievement of climate goals or from the carbon markets reducing costs; issuing green and/or blue bonds that can be passed on in full or in part to eligible projects; ensuring resilience through insurance cover and contingent financing that is tailored to the water sector; and providing direct partial guarantees or loan financing that is concessional or semi-concessional. The sovereign can take advantage of its creditworthiness and fundraising ability, which is typically better than most subnationals in the home market, and it can access various kinds of financing on favorable terms from development finance institutions. This type of funding can then be part of a package to mobilize private capital through blended finance structures.

◆ **Blended Finance Solutions:** Blended finance solutions have potential for broad adoption in the water and wastewater sector (see also Box 3.2). They combine commercial finance with grant funds (including climate/sustainability-linked grants) and concessional debt (including concessional climate loans/bonds) from IDA and other MDBs, bilateral and multilateral donors, UN agencies, policy banks, and lending by national governments, coupled with de-risking instruments through an existing wide range of credit-enhancement products. WB interventions and products can be used to ensure contractually balanced and financially sustainable projects whose commercial and political risks are well mitigated and whose returns to the private sector reflect the risks borne by the investors and can be considered attractive vis-à-vis other investment opportunities within the markets in question, exemplified through MIGA’s political risk guarantees to the AS Samra Wastewater Project in Jordan. Blended finance can also make PPP programs or projects in such markets attractive to sponsors and lenders at attractive terms and conditions, including the provision of viability gap funding (VGF) as in India’s Clean Ganga Program (see appendix C for the Jordan and India case studies). Governments can also offer temporary tax exemption or relief, where appropriate. These solutions lend themselves well to attracting philanthropic funds, together with private finance.

◆ **Domestic and International Debt Capital Markets:** Domestic debt finance holds great potential and is already mobilized for the water sector in several

## BOX 3.2: Blended Finance

Blended finance refers to the use of development finance to mobilize additional funds from private and commercial sources for sustainable development in developing countries. Blended finance should be considered a structuring approach – rather than an investment approach, instrument, or end solution – that allows organizations with different objectives to invest alongside each other while achieving their goals (whether financial return, social impact, or a blend of both). It enables targeted public sector financing to attract private sector investors who would otherwise not participate due to perceived risks and limited financial returns. Blended financing is used in various sectors, such as energy, financial services, and agriculture, but it has not been as

successful in water due to potential mismatches in investor interests and project structures. From 2012 to 2017, only 1.36 percent of total private finance mobilized was in the water sector. Despite this, blended finance remains a useful structuring approach to de-risk investments and attract private sector financing for sustainable development projects in developing countries.

Blended finance can be applied as a structuring instrument to achieve one of two objectives: to reduce the perceived risk of a project, relative to its expected return; or to enhance the expected return of a project, relative to its perceived risk. In practice, most blended finance transactions are oriented towards the reduction of risk.<sup>34</sup>

The perception of risks in blended finance structures varies depending on the actor and their motivations and incentives to act, and this perception differs within and across countries. Understanding these perceptions is important not only for informing the policy direction, but also for delivering impact at scale. Recent research by the OECD (supported by the GWSP) highlights that portfolio-level deployment of concessional capital into a pooled vehicle or special-purpose facility (which is then augmented by commercial finance) will increasingly be used. The vehicle then deploys the capital across several projects, diversifying risk and lowering the average transaction cost per project.

middle-income countries such as Brazil, Indonesia, and Uruguay. In other countries, the WB can play a role in supporting the development of local financial markets' capacity, building on successful interventions in Kenya and Uganda, among others, and ongoing engagements in Brazil. In addition, many middle-income countries with sufficient credit ratings may access international capital markets for funding to channel to the water sector. This may be differentiated at the sovereign and sub-sovereign levels, as some of the subnational borrowers such as water utilities may not be financially able to directly access international markets. In either case, moving forward with debt issuances is highly case specific and depends on the level of market development and institutional readiness. However, suitable new instruments such as green and sustainability-linked loans, and green (and blue) sustainable and sustainability-linked *bonds* may be options for both sovereigns and sub-nationals to explore to diversify the investor base, signal commitment to the water sector, and potentially secure more favorable financial terms.

◆ **PPP Arrangements:** Increasing the supply of private capital in the water sector under PPP arrangements is appropriate in some contexts. With sufficient knowledge of the water and sanitation sector's unique profile, a suitable risk-reward allocation, and appropriate governance mechanisms and preparation, private operators – both traditionally in water and non-water sectors – and their financiers have shown willingness to invest in commercially viable water sector projects. Areas of the water cycle value chain which can offer robust opportunities for PPPs include wastewater and sludge treatment, storage infrastructure and bulk water supply (including from non-conventional sources, such as desalination and wastewater reuse), and water services for agriculture, as pioneered in Morocco. In many cases, attracting private capital, construction and/or operation under PPP structures will require additional de-risking instruments and mechanisms, such as guarantees (sovereign and sub-sovereign),<sup>35</sup> credit enhancement, ring-fencing of revenues, and viability gap funding from the WB or other multilateral agencies.

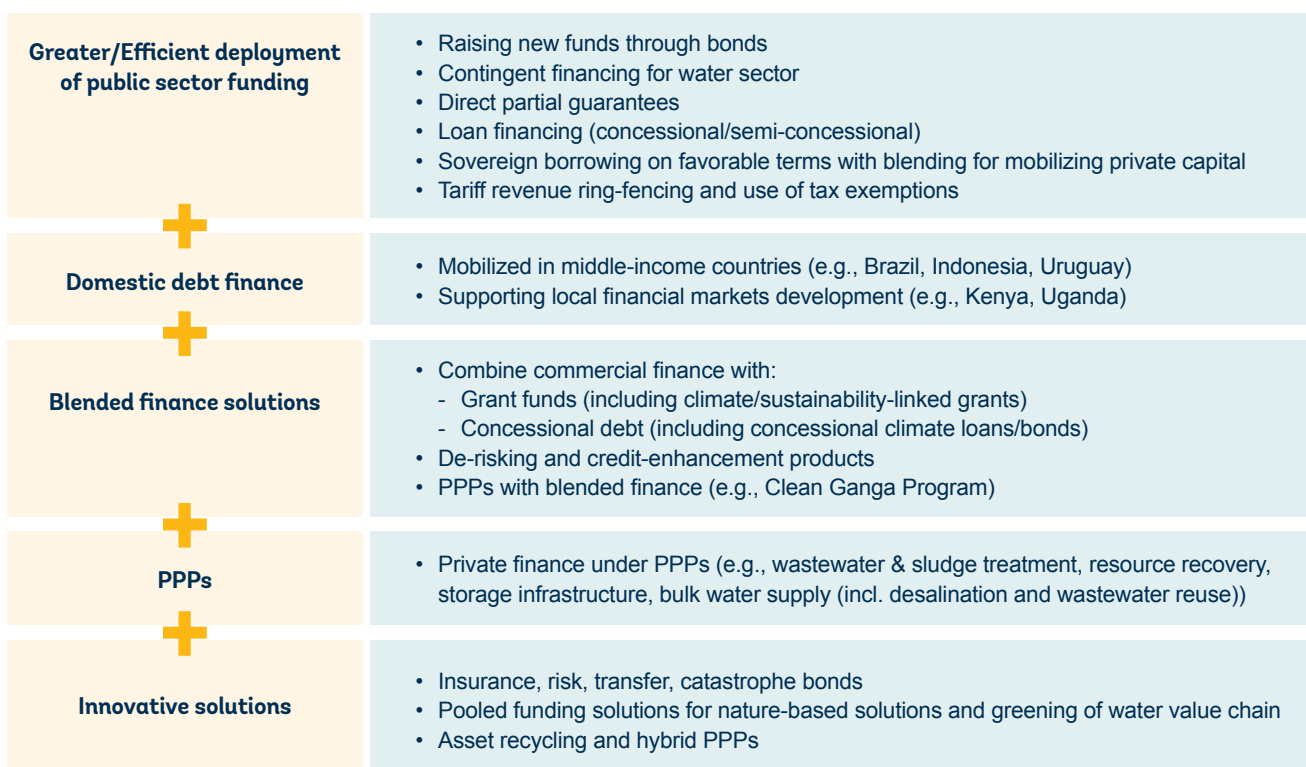
◆ **Innovative Solutions such as Catastrophe Bonds, Asset Recycling, and Hybrid PPPs:**

Performance-based financing is an innovation that could be suitable to the water sector, in particular, a loan or bond issued by the utility, or on behalf of the utility, that has performance metrics for water management. For example, the Washington DC water utility issued an Environmental Impact Bond in 2016 with a coupon step-up and step-down structure based on mitigating storm water runoff. The utility met the target, resulting in no coupon adjustment. If it had succeeded in exceeding the ambitious targets, it would have received US\$3 million from investors on a US\$25 million bond, which is a substantial discount.<sup>36</sup> Another area of innovation that may support the resilience of the water sector is insurance, risk transfer, and catastrophe (CAT) bonds, as examples of private capital leveraged to absorb risk without associated financing. These can play an important role in increasing resilience in the water sector, particularly for climate adaptation and flood and drought risks. Development finance institutions can also provide contingent financing to water utilities for such climatic risks. All such insurance-related financing can provide immediate financing for rebuilding after damages and funding alternative structures, but it can also bring added financial comfort to investors that there is a liquidity

backstop to the water utility. This can in turn improve financial access, pricing, and overall offerings from investors. Other pooled funding solutions can also be applied to advance nature-based solutions and greening of the water cycle (e.g., retrofits of wastewater treatment plants).

Additional solutions developed by IFC and IPG include asset recycling, which presents viable options to monetize capital invested in existing infrastructure (brownfield assets), and reinvesting the proceeds for developing greenfield infrastructure, meeting the operations and maintenance expenses of existing infrastructure and increasing its climate resilience. Through private sector participation, asset recycling may support (1) optimal asset utilization, such as the introduction of additional revenue streams to improve the asset value and optimize upfront proceeds, and (2) risk allocation, particularly de-risking for design, development, and construction risks, to attract additional investors. Broadly, three types of monetization model may be employed: (1) direct contractual arrangements, such as brownfield concession agreements, operations and maintenance concession agreements, or long-term public-private lease agreements; (2) divestment, with the sale of an interest in the underlying asset from the public sector to the private sector; and (3) structured finance instruments, such as pooled investment

**FIGURE 3.4:** Strategic Direction on Diversifying and Expanding the Spectrum of Finance





vehicles which allow asset owners to monetize their assets by combining various revenue-generating assets under a single entity via a trust structure.

Hybrid PPPs are another innovation which may be used, combining concessionary public funding – for example, through viability gap funding (VGF) – with private financing and operation. Hybrid PPPs may take various forms, such as (1) VGF support through a capital subsidy, where the government contributes public funding to subsidize the capital cost or provides supporting infrastructure, and (2) VGF through a subsidy towards operating expenditures, or as performance-based revenue payments to subsidize services.

The WB's private sector arm – International Finance Corporation (IFC) – has been active in the water sector in emerging markets since the mid-90s. IFC's engagements in the water sector are outlined in appendix E.

### 3.4 ADVANCE CLIMATE OUTCOMES

**35. Climate change manifests itself primarily through water, exacerbating water security challenges, with substantial costs to society.** This link between water and climate is clearly recognized in the Intergovernmental Panel on Climate Change's 6th Assessment Report, which shows the impact of climate change on worsening water insecurity, and rising drought and flood risks, and draws attention to the importance of water-related adaptation actions.<sup>37</sup> Global leaders at COP27 emphasized “protecting, conserving and restoring water and water-related ecosystems” and the need for countries to integrate water into their adaptation efforts.<sup>38</sup> Water is thus a key element of many national Country Climate and Development Reports (CCDRs) and adaptation plans. The long life of water assets magnifies the risk of lock-in of inappropriate infrastructure and technologies, and magnifies the benefits of investing in resilience and adaptive planning. In addition to intensifying competition for water among agriculture, ecosystems, settlements, industry, and energy production, climate change affects regional water, energy, and food security. Water availability and quality affect almost all economic sectors, and water insecurity raises costs, threatens supply continuity, and can lead to stranded assets. Droughts lead to long-lasting negative impacts on education, wealth, and health,<sup>39</sup> as well as energy deficits for countries dependent on hydroelectric power, while floods cause damage to critical infrastructure, disrupt social and economic activities, and can trigger outbreaks of waterborne diseases. Increasing investment in the water sector is therefore central to

resilience building. And yet in 2019–2020 the water sector received only US\$24 billion in climate finance,<sup>40</sup> less than 4 percent of the global total (concessional and non-concessional) for that period.

**36. Opportunities for climate adaptation projects in the water sector are present across regions and income levels,** with estimates of the economic rate of return on investments ranging from 2:1 to 10:1.<sup>41</sup> These interventions include strengthening early warning systems for extreme climate and weather events, making new infrastructure climate resilient, improving dryland agriculture for crop production, protecting mangroves, and fostering a transition to more resilient and robust water resources management practices.

**37. The water sector contributes to greenhouse gas (GHG) emissions, presenting opportunities for mitigation investments.** Global Water Intelligence estimates emissions from water supply, wastewater, sludge, and onsite sanitation at 847 million tonnes CO<sub>2</sub>e/year. Of this, water supply accounts for 38 percent, wastewater and sludge account for 30 percent, and onsite sanitation makes up the remaining 32 percent, due almost entirely to emissions of methane.<sup>42</sup> Together, emissions from wastewater and onsite sanitation account for 10 percent of anthropogenic methane emissions.<sup>43</sup> Recent analysis suggests a city of 1.5 million people in a low- or middle-income country could generate over 100,000 tCO<sub>2</sub>e per year<sup>44</sup> from poorly managed onsite sanitation. This is, therefore, a top priority in terms of mitigation.<sup>37</sup> Beyond WSS, irrigation is also a source of emissions. Rice production is particularly carbon-intensive: it accounts for 615–900 million tonnes CO<sub>2</sub>e/year, equivalent to approximately 1.3 percent of total global GHG emissions.

◆ **Opportunities for tapping climate finance:**<sup>45</sup> There is potential to increase the mobilization of climate finance across all water sub-sectors in developing countries. Climate finance refers to domestic or international financing provided by any public or private entity for activities that, in whole or in part, mitigate GHG emissions or support adaptation and resilience to climate change. In advanced economies, non-concessional green bonds have been launched by water service providers in the United States, Europe, and the Middle East to finance a range of mitigation and resilience-building projects, including drought and flood resilience investments, catchment management, renewable energy generation, and wastewater reuse, demonstrating the application of commercial climate finance in the sector. In WB client countries, there are select examples of concessional and semi-concessional climate finance in water,

sanitation, and irrigation, including energy and water efficiency projects in WRM, WSS, and reduction of methane emissions from paddy cultivation, and energy generation from methane at wastewater treatment plants. The Vietnam emission-reduction clean water bond, launched in 2023, demonstrates the scope for innovation in this area (see Box 3.3). Along with scaling up these projects across regions, there is potential to develop innovative projects for onsite sanitation, floating solar, and hydroelectric retrofits of storage dams, which offer strong mitigation potential. A variety of climate finance instruments are already available from the facilities such as the Global Environment Facility, the Climate Investment Funds, and the Green Climate Fund. Water projects in developing countries are eligible for these instruments as well as carbon credits. It is important to note that climate finance and carbon credits are expected to complement rather than substitute for other sources of private and public finance.

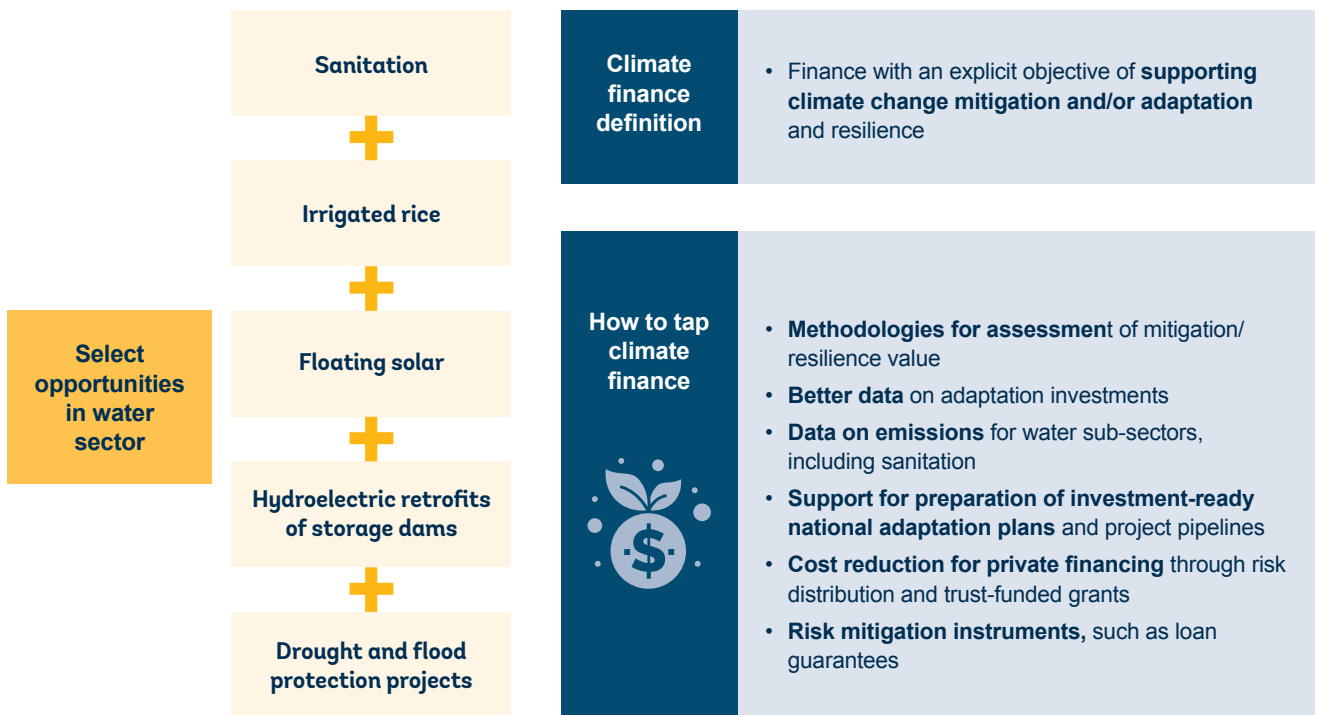
### BOX 3.3: Vietnam Clean Water Bond

A US\$50 million Emission Reduction-Linked Bond was launched in 2023, providing investors with a return linked to the issuance of Verified Carbon Units (VCUs) produced by a water project in Vietnam. The bond is an outcome-based financial instrument that mobilizes private capital to support the financing of a project to manufacture and install 300,000 water purifiers in about 8,000 schools and institutions in the country. These are expected to increase access to safe water for around 2 million students and reduce GHG emissions by around 3 million tonnes for five years. The WB priced the bond, which has a 100 percent principal protection guarantee. Proceeds will be used to fund WB sustainability initiatives. Investors do not receive an ordinary coupon – instead, an equivalent amount will be given through a hedge transaction with the financial services firm Citi to support the funding of the water purifier project, which is managed by a private developer. The investors will receive semi-annual coupon payments linked to the issuance of VCUs on the Verra Registry. The water purifiers will be free for schools and communities that were unable to access safe water.

◆ **Approach to mobilizing climate investments:** To unlock climate finance for water, methodologies for the assessment of the mitigation and resilience value of water projects need to be developed and refined. There is currently no established method to price the resilience value of reduced land subsidence, flood risk, and drought risk. In addition, better data are required on current and planned investments in adaptation to track progress in mobilizing both public and private finance. Detailed studies should be undertaken to estimate the emissions from onsite sanitation in order to develop carbon credits from community sanitation and septage management projects. Technical assistance is needed to prepare investment-ready national adaptation plans and project pipelines, building on CCDRs and ensuring the centrality of water for such plans, as these offer a strategic opportunity to identify, sequence, and prioritize policies and interventions that reduce GHG emissions and boost resilience; and to reduce costs for private financing through risk mitigation and credit enhancement instruments. Another factor to consider is the minimum scale required by various climate funds, which may be too large for a typical water sector service provider. Mechanisms to effectively aggregate service providers to access such climate financing as a group may need to be considered and developed. Additionally, a regional assessment of the sources of climate finance, eligibility criteria, and a possible screening tool for climate finance may support efforts to mobilize such sources of finance to meet mitigation and adaptation goals locally.

The climate finance opportunity space is outlined in Figure 3.5.

**FIGURE 3.5:** Strategic Direction on Advancing Climate Outcomes



# 4 | WB ROADMAP

**38. The proposed WB Roadmap builds on the lessons learnt from ongoing and past engagements in the water sector and the strategic directions outlined in this document.** It provides a joint blueprint for the International Bank for Reconstruction and Development (IBRD), IFC, and MIGA, including the IBRD's Infrastructure Finance, PPPs, and Guarantees (IPG) and Treasury groups. The Roadmap draws on the combined know-how of the three institutions, encompassing their (i) long history of engagement in the water sector and set of lessons extracted from experience; (ii) extensive and trusted relationships with the public and private sector, and their associated convening power; (iii) complementary expertise to support innovative solutions; and (iv) diverse set of products that can collectively be deployed to implement solutions. Though the Roadmap provides for a comprehensive approach, the rationale is that it can be tailored to support national, subnational, and utility-level engagements, customized to the specific context and market conditions.

**39. The Roadmap aims to clearly articulate key areas of work with WB clients to scale up finance for water investments and integrate the WB's corporate commitment around MFD and private capital facilitation into WB water operations.** Each WB operation would systematically incorporate the scaling up finance approach across the project lifecycle. WB operations would assess, as appropriate to the context, how the IBRD/IDA engagement can mobilize financing and ensure financial sustainability for water from the **entire suite of public funding, debt, and equity financing solutions**. Special emphasis will be placed on **mobilizing local currency financing** and supporting the development of domestic financial institutions and capital markets, including domestic insurance and pension funds, in collaboration with WB's Equitable Growth, Finance, and Institutions team.

**40. The Roadmap will balance longer-term objectives such as creditworthiness and financial viability of service providers with the shorter-term goals of clients and partners to mobilize private and commercial capital.** Such short-term goals may require appropriate financial structuring, for example, the provision of viability gap funding, guarantees, payment security mechanisms,

and various credit enhancement instruments, proposed to be designed through a collaborative and consultative process with local stakeholders to ensure complementarity of efforts. Nonetheless, the fiscal implications of providing such risk mitigants may pose challenges for replication.

**41. To enable the roll-out of this Roadmap by the global and regional WB teams, a roster of potential water investments and engagements at the pre-pipeline, pipeline, appraisal, and portfolio stages of WB operations has been created** and will be updated regularly. This tracker could also indicate how Bank operations are contributing to private capital facilitation, including PCE and PCM, and private sector engagement towards the achievement of SDG 6 targets and climate outcomes (see Chapter 5 for further details).

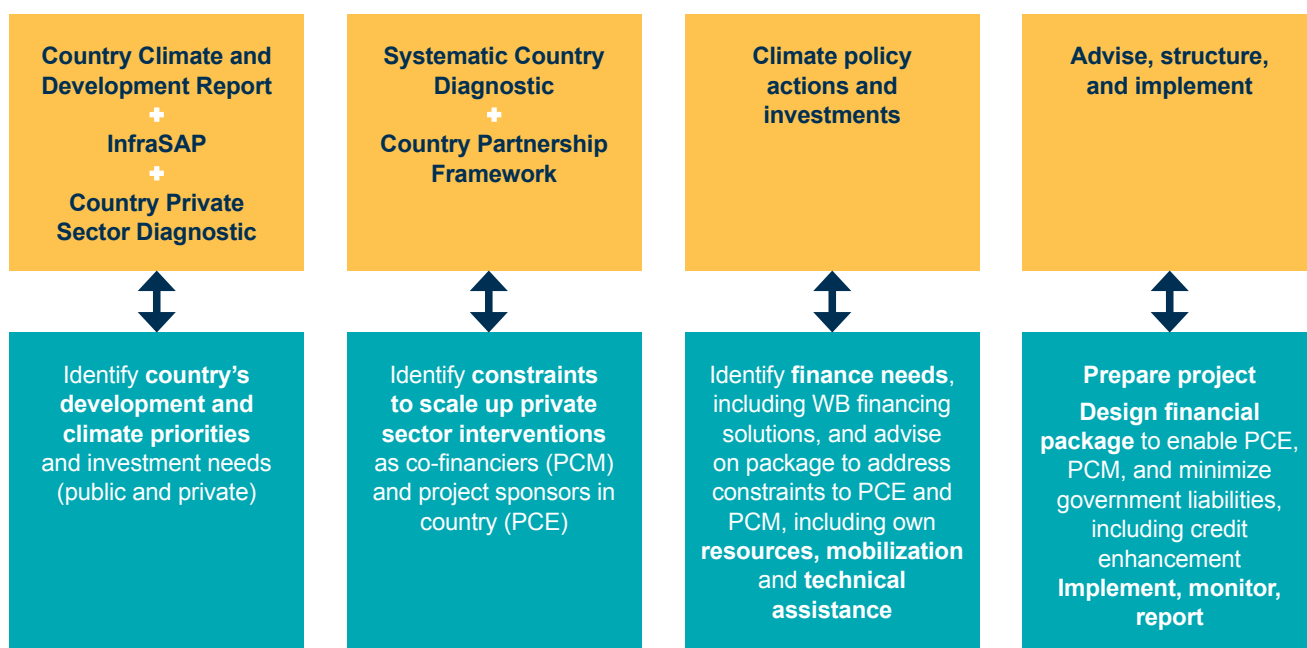
**42. The Roadmap promotes the concept of strategic financial planning by WB teams and client countries in crowding in public and private sector funding and financing for water sector investments,** and taking advantage of private sector expertise, know-how, and technology for the delivery of water sector infrastructure and services, and the achievement of water sector goals, with appropriate control and monitoring of results. This approach is intended to be demand driven, with the various steps developed at the request of and with the engagement of client governments.

**43. The proposed Roadmap has 10 key steps,** as outlined in Figure 4.1. This chapter describes each of the steps through the different phases of the WB project preparation cycle, from upstream policy dialogue and analytical and advisory work to the preparation of CCDRs, Systematic Country Diagnostics (SCDs), and Country Partnership Frameworks (CPFs), to pipeline operations (concept note and appraisal) and during implementation. Step 1 on building capacities and step 10 on developing a coordinated approach with stakeholders are cross-cutting themes, proposed to be undertaken on an ongoing basis. Figure 4.2 illustrates this approach across the operational engagement cycle. Steps 1–6 of the Roadmap involve work on the **“demand-side”** for financing, and steps 8 and 9 specifically look at the **“supply-side”**, while step 7 on pipeline development represents the bridge between

**FIGURE 4.1: WB Roadmap: 10-Step Engagement**

STEPS OF ENGAGEMENT		TOOLS AND INSTRUMENTS
Training and Capacity Building	<b>1</b>	<p><b>Building Capacities to Support the Foundations of Creditworthiness</b></p> <p><a href="#">International Benchmarking Network of Water Utilities</a>; <a href="#">Water Utility Creditworthiness e-course</a>; <a href="#">Water Utility Financing e-course</a>; <a href="#">Shadow Credit Ratings</a>; <a href="#">Utility of the Future</a>; <a href="#">Citywide Inclusive Sanitation</a>; <a href="#">Utilities for Climate</a></p> <p style="text-align: right;"><i>Cross-Cutting Theme</i></p>
	<b>2</b>	<p><b>Assessing Macro-Fiscal Conditions, Financial Market Maturity, and Investment Climate</b></p> <p>Systematic Country Diagnostic; Country Partnership Framework; Country Private Sector Diagnostic; OECD scorecard; InfraSAP Diagnostic for Water</p>
Analysis & Diagnostics	<b>3</b>	<p><b>Aligning Water Security with Climate Goals and Economic Development</b></p> <p><a href="#">Country Climate and Development Reports</a>; Climate and Economic Analyses of Resilience in Water; <a href="#">Water Security Diagnostics</a>; <a href="#">Water in Circular Economy and Resilience framework (WICER framework)</a></p>
	<b>4</b>	<p><b>Designing Supportive Policies, Institutions, and Regulations</b></p> <p><a href="#">Water Supply and Sanitation Policies, Institutions, and Regulation: Adapting to a Changing World</a>; <a href="#">Public Expenditure Reviews</a></p>
Financial Planning	<b>5</b>	<p><b>Integrating Financial Sustainability Analysis in Sector Planning and in the WB Project Cycle</b></p> <p>Financial modeling; financial viability analysis; analysis of tariffs, taxes, and transfers</p>
Turnaround Strategies	<b>6</b>	<p><b>Turning Around Technical Efficiency and Operational and Financial Performance of Water Service Providers</b></p> <p>Performance improvement plans (Utility of the Future); <a href="#">performance-based contracts</a> for non-revenue water reduction and improving efficiency; irrigation modernization</p>
Financing Solutions	<b>7</b>	<p><b>Developing a Pipeline of Bankable Projects</b></p> <p>Better data and information; market-making; support for project development; pooling projects to reach economies of scale and reduce viability risks</p>
	<b>8</b>	<p><b>Creating Markets for Local Currency Financing and Mobilizing Domestic Finance</b></p> <p>Domestic commercial lending and capital markets development</p>
	<b>9</b>	<p><b>Mobilizing the Full Suite of Funding and Financing Solutions</b></p> <p>Efficient public spending; blended finance; public-private partnerships; viability gap funding; commercial debt; microfinance; risk retention instruments; payment- and loan guarantees; <a href="#">WB Scaling ReWater Platform</a></p>
Stakeholder Engagement	<b>10</b>	<p><b>Developing a Coordinated Approach with Stakeholders</b></p> <p><a href="#">2030 WRG multistakeholder platforms</a>; principles of engagement with multilateral development banks; donor roundtables; high-level events</p> <p style="text-align: right;"><i>Cross-Cutting Theme</i></p>

**FIGURE 4.2:** One WB Approach for Operational Engagements in Water



them and step 10 provides a cross-cutting focus to ensure coordination and collaboration across stakeholders.

**44. Not all countries will apply each of the steps under the Roadmap**, as this will be driven by the government’s leadership and priorities, analytical work already undertaken, the existing framework of enabling conditions, and whether the engagement has a national or subnational focus, among other factors. Hence, different countries and WB teams may agree to work on a subset of the suggested steps. The Roadmap steps may also not necessarily be sequential. The approach aims to support the preparation of **programmatic approaches through financial sustainability assessments and coordination with public and private financiers.**

Each of the steps of the Roadmap is outlined in the following sections.

#### 4.1 BUILDING CAPACITIES TO SUPPORT THE FOUNDATIONS OF CREDITWORTHINESS

**45. Addressing foundational elements related to creditworthiness is at the heart of mobilizing finance for water investments.** As highlighted in the strategic direction on “Establishing the Enabling Conditions”, poor performance, lack of financial viability of service providers, and lack of solid PIR

frameworks constrain sector investments. Resolving this will necessarily imply building and strengthening existing external capacities through various WB tools and instruments, as highlighted in Box 4.1.

**46.** Externally, to help clients address these foundational issues and pave the way for applying the scaling up finance for water approach, a concerted effort is

#### BOX 4.1: WB Technical Assistance Packages and Tools

- **Water Utility Financing e-Learning**
- **Water Utility Creditworthiness e-Learning**
- **Utility of the Future Program**
- **International Benchmarking Network of Water Utilities - New IBNET**
- **Water Supply and Sanitation Policies, Institutions, and Regulation (PIR): Adapting to a Changing World**
- **Water Loss Reduction Performance Based Contract**
- **Citywide Inclusive Sanitation (CWIS) Initiative**
- **Water in Circular Economy and Resilience**
- **WB Scaling ReWater Program**
- **IFC Utilities for Climate (U4C) Program**

needed to deploy existing WB technical assistance packages and tools (see Box 4.1) geared at improving PIR, monitoring, and benchmarking systems, and supporting utility performance, financial management and creditworthiness, and circular economy solutions. In addition, benchmarking **data from the IBNET** and other sources, where available, would be incorporated into project design processes to support lending operations. **Shadow credit-rating programs can be supported** for relevant service providers to provide a confidential assessment of their creditworthiness and support pathways to improve the technical and financial viability of these entities to improve their ability to repay debt.

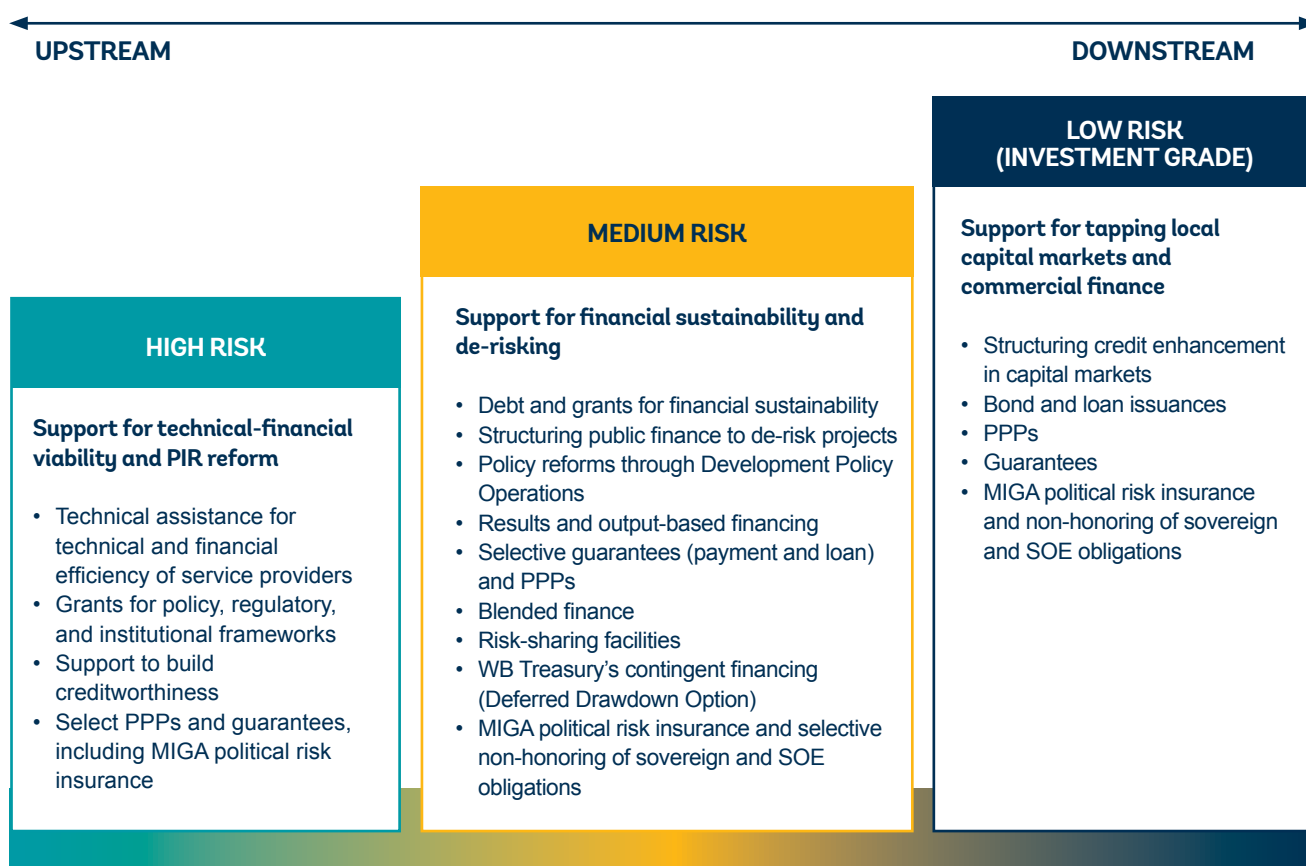
47. Operationalizing the Framework will also require WB staff to have the knowledge and skills on financing to integrate the requisite elements into projects. The capacity of WB staff to deliver the scaling up finance for water agenda will be built up through dedicated training programs on commercial and private financing and foundational elements, including the **Water Utility Finance and Creditworthiness courses**, focused on addressing various aspects of the utility business, such as governance, financial and operational management,

planning, and budgeting. While these courses are designed to help water utilities become creditworthy and help governments create an environment that promotes such creditworthy water utilities, these can also support Bank staff to build their technical capacity on utility performance. Moreover, internal capacity and knowledge on this approach could be enhanced through various learning tools, such as webinars and knowledge exchanges through the Water GP Knowledge and Learning Team.

## 4.2 ASSESSING MACRO-FISCAL CONDITIONS, FINANCIAL MARKET MATURITY, AND THE INVESTMENT CLIMATE

48. This step of the proposed roadmap consists of assessing the overall macro-economic and fiscal conditions, financial market maturity, and overall investment climate, to identify the feasibility of and the pathways to increase both public and private financing for water sector investments, including a rapid assessment of the binding constraints and the main opportunities.

FIGURE 4.3: Market Maturity Assessment



This step would help WB teams and governments in identifying the needed actions, support, and financing packages that could be offered to countries to facilitate the mobilization of finance based on the level of maturity of the country or water service provider (if the focus is at subnational/SOE level) and also identify the inherent risks, as outlined in Figure 4.3. As defined by the OECD Policy framework for Investment, “a good investment climate is one which provides opportunities for all investors: public and private, large and small, and foreign and domestic”.

**49.** The analysis could be done by WB teams in collaboration with client governments through the existing **Infrastructure Sector Assessment Program (InfraSAP)**<sup>46</sup> methodology, adjusted as needed to be tailored to the water sector<sup>47</sup> in the form of a new “WaterSAP” to be developed by the Water GP and IPG in collaboration with others as a module of the core InfraSAP tool (see Box 4.2 for a description of the potential expanded scope of the tool). This new WaterSAP tool is expected to facilitate several other steps of the proposed WB roadmap, both on demand- and supply-side assessments and proposed solutions (see appendix B).

**50.** For this specific roadmap step, the InfraSAP Standardized Analysis scope<sup>48</sup> covers the main items to be analyzed, including macro-level fiscal indicators – for example, country debt ceiling and debt sustainability profile; credit rating; country risk profile; cost of capital; assessment of local financial markets maturity; regulatory frameworks for PPPs; and procurement practices. The World Bank’s **Systematic Country Diagnostic (SCD)** and **Country Partnership Framework (CPF)** and IFC’s **Country Private Sector Diagnostics (CPSDs)** would also be used to assess the overall environment for private sector investment and activities, beyond the water sector.

**51.** Of relevance in the context of the **WB’s new Private Capital Enabling (PCE) methodology**, this step could help identify actions required at the broader macro-fiscal level to advance investment and improve corporate and public governance, along with actions for business conduct, decentralization, and procurement.

### 4.3 ALIGNING WATER SECURITY WITH CLIMATE GOALS AND ECONOMIC DEVELOPMENT

**52.** This step will look at the in-country characteristics of the entire water sector value chain and the different water sub-sectors. It will consider: 1) the role of water in economic, social, and environmental development

#### BOX 4.2: WaterSAP

Building on the InfraSAP, the WaterSAP would address policy questions on water infrastructure and water services constraints through the lens of **connectivity, finance, and governance**, such as the following:

1. How water contributes to development (in terms of macroeconomic objectives: jobs, growth, and exports).
2. How and where the key sectors of the economy and policy goals (social, environmental, climate change mitigation and adaptation) are dependent on or jeopardized by water infrastructure and deficiencies.
3. Where water infrastructure and services performance fall short and why, across the three pillars of connectivity/performance, finance, and governance. Specifically, under the finance pillar, it can address questions such as whether water infrastructure is appropriately funded, whether public expenditure on water is adequate and efficient, and what constrains domestic and international private finance for water investments.

and policy goals in a country, and the impacts of climate change risks on social growth and development; and 2) the most realistic opportunities to mobilize expertise and financing for these investments, both public and private, including equity and debt. The analysis will be based on information gained from various existing diagnostic tools and recent trends on private sector investment; from consultations with government, the domestic banking sector, and private financiers and investors on their priorities, strategic development, and investment plans; and from available **national Climate Change Adaptation and Mitigation Strategies and nationally determined contributions**. Depending on the client’s needs, the scope of this step might change or be more narrowly focused on a pre-identified investment.

**53.** The WB’s Climate Change Action Plan<sup>49</sup> introduced the **CCDRs** as a new core diagnostic tool to help countries prioritize climate actions and capture synergies between climate commitments and development objectives. Given the centrality of water in climate change, the **Climate and Economic Analyses of Resilience in Water** introduces a standardized framework for Water-CCDR analyses to offer a comprehensive coverage on water-development interlinkages, which could serve



as a good basis to identify infrastructure and service gaps. The World Bank's **Climate Change Action Plan** also mandates **alignment of all new WB operations and 85% of IFC and MIGA operations with the Paris Agreement from July 1, 2023**, moving to 100% alignment from July 1, 2025. This effort is supported by the Bank's GHG accounting system and the requirement that all Task Teams developing projects conduct climate impact assessments, which analyze a project's GHG emissions against a "no project" or defined alternative. Findings from the climate impact assessment are used to inform final project design choices and investment decisions. In addition, the Water Security Diagnostics and the WICER framework provide comprehensive approaches to water resources management and the nexus of water with other sectors.

**54.** Ongoing research by the Water GP on emerging opportunities to leverage climate finance for water infrastructure investment highlights that **interventions in sanitation, irrigated rice, floating solar, and hydroelectric retrofits of storage dams** show the greatest potential for achieving unrealized levels of mitigation outcomes.<sup>50</sup> In addition, energy efficiency and renewable energy interventions (solar photovoltaic systems) are relatively straightforward investments that can get water supply and sanitation utilities their first experiences with pursuing specific climate mitigation outcomes, while also improving their financial outlook. Climate finance levers, such as results-based financing for emissions reductions, grants, private sector loans and investments, loans from public and multilateral lenders, and philanthropic support are all viable sources of climate finance that can help to incentivize such investments.

#### **4.4 DESIGNING WATER POLICIES, INSTITUTIONS, AND REGULATIONS**

**55.** This step looks at specific water sector policies, institutions, and regulations (PIR) to identify gaps and binding constraints for optimal sector funding and financing, and formulate recommendations to optimize public spending in water, building on those under step 2, which govern the financial sector and capital markets. This assessment would include data from **PIR diagnostics, Public Expenditure Reviews in Water**, and/or other studies of a similar nature that may exist in the country.

**56.** For the most promising sub-sectors identified in step 3, this step would include a preliminary review of: (1) the binding constraints to increased private investment – e.g., legal, market structure, tariffs, access to finance, creditworthiness, governance, policy, institutional, and environmental and social requirements; and (2)

the feasibility of addressing these constraints through existing reform programs, capacity building, and other initiatives. This can then be compared against the scale of investment that could be unlocked in each sub-sector to come up with a prioritization list across the impact and feasibility axes.

**57.** There is considerable evidence that country-level and city-level PIR reforms can transform operational and financial performance.<sup>51</sup> Moreover, regulation has a central role to play in **enhancing financial sustainability and supporting an appropriate investment climate** to attract the necessary investments through designing and implementing tariffs and subsidies in a manner that is transparent and predictable and incentivizes efficiency. Policy and regulatory tools to improve financial sustainability include **tariff setting; mandatory financial modeling and regulations on financial management and reporting** by service providers; **targeted programs** bridging the gap between service providers (demand) and domestic banking sector/local capital markets (supply), while increasing knowledge on both sides to allow for the mobilization of local commercial finance in the water sector; assessment of creditworthiness; **capacity building for financial analysis** in the sector; and the provision of **efficiency incentives to sector players**, thereby **improving cost recovery** through controlling costs. In addition, the accountability and efficiency of water service providers could be improved through **sector restructuring and reforms**. Box 4.3 provides additional detail on PIR reforms.

#### **4.5 INTEGRATING FINANCIAL SUSTAINABILITY ANALYSIS IN SECTOR PLANNING AND THE WB PROJECT CYCLE**

**58.** This step would deepen the analysis of **public spending frameworks through an assessment of existing and additional assets' capital expenditure (CAPEX) and operating expenditure (OPEX) requirements to estimate financing needs**. Comparing CAPEX and OPEX needs with current revenues from tariffs, annual budgets, and retained earnings from SOEs, plus available grant funding (3Ts – tariffs, transfers, and taxes) provides an analysis of the **fiscal gap and financing needs**. The scope for this exercise could ideally be the national level in order to introduce strategic financial planning to achieve national water security goals, though it could also be done at the subnational and utility level. At any rate, it should include an assessment of the corporate governance and financial performance of selected water utilities, as this would help to guide the analysis of constraints

### BOX 4.3: PIR Reforms

The mobilization of commercial finance requires reforms that advance efficiency gains, cost reduction, and cost recovery, along with balance of taxes and tariffs as sources of finance. Certain key aspects of PIR need to be considered under any country engagement process:

- **Efficiency in the Use of Public Resources:** This requires the development of robust financial planning and management of public resources, which is collectively agreed, consistently applied, and efficiently allocated to the most productive uses. Any subsidies should be well-targeted, transparent, and quantifiable, tied to identified policy objectives, and avoid unintended outcomes, such as crowding out commercial investments.
- **Institutional Capacity Creation and Strengthening:** Adequate

institutional capacity and well-trained staff are required for the absorption of existing budget allocations and the execution of additional funds.

- **Transparency in Technical Operations and Financials:** Details on technical operational data (e.g., assets available, level and quality of coverage, and losses) and sector/sub-sector revenues and expenditures should be transparent and available. The financials require clarity on the level and composition of the sources of funding, and coverage not only of capital expenditure, but also of equipment, and operations and maintenance costs.
- **Governance Improvements and Incentives for Service Providers and Farmers:** Creation of the right governance structures and incentives can support improvements to

operational and capital efficiency. For example, performance-based financing mechanisms and incentives that link the provision of capital with adherence to specific performance standards and robust governance can lead to higher cost recovery and capital efficiency. The resultant improvements in service delivery may trigger higher tariffs and transfers from stakeholders.

- **Supportive Policies to Leverage Commercial Finance:** The policy and regulatory framework should encourage, rather than inhibit, private investment. For example, in some countries, service providers are restricted from issuing corporate bonds. Effective regulation to ensure predictability and sufficiency of revenue streams may boost investor confidence.

and recommendations for priority focus areas. Where data availability and resources allow, the analysis could include a **cost-curve assessment** to identify highest return investments and facilitate a cost-benefit analysis of alternative solutions to achieve water supply and water security goals.

**59. This step proposes to mainstream financial viability and sustainability analysis in sector planning and in all IBRD/IDA water operations.** Financial analysis should be mandatory (similar to economic analysis) to assess the **financial viability of service providers** and improve their financial sustainability and creditworthiness to increase the possibility of attracting commercial and private financing. This should also be mirrored in WB operations to incorporate the principles of financial sustainability. In addition, **financial modeling should be mainstreamed** to support sector planning and the design of water investments and service delivery. This would be the basis for coordination between the government and financiers, including private financiers, IFIs, MDBs, bilateral donors, and the finance community,

to identify financing for water infrastructure and services development, and offer the potential for diversifying financing sources (such as municipal and climate finance) and accessing local currency debt and equity markets.

**60. Financial viability analysis will also help assess the “bankability” of specific investments and projects to support PPPs, portfolio investment approaches, and pooled financing mechanisms (see step 8, in section 4.8).** Since all projects carry a degree of economic, social, financial, technical, environmental, and operational risk, a “bankable” project can be characterized as one where these risks are allocated in a sufficiently optimal way to give a lender or investor the confidence to finance the project. The analysis should include economic cost-benefit analysis, the use of competitive bidding whenever possible to determine the size of needed subsidies to make the project financing viable, and fully transparent assessments of elements such as subsidy size, policy objectives, types of beneficiaries, and payment mechanisms.<sup>52</sup>

## 4.6 TURNING AROUND THE TECHNICAL EFFICIENCY AND OPERATIONAL AND FINANCIAL PERFORMANCE OF WATER SERVICE PROVIDERS

**61.** Private sector expertise and innovation can play a central role in turning around the technical and operating efficiency of water service providers. This step is particularly relevant for WSS Utilities and WB teams supporting them (whether directly or through broader government programs targeting utility performance improvement), though achieving greater technical and operational efficiencies towards financial sustainability is a priority across the various water services, including for irrigation operators and farmers. However, these two sub-sectors deserve separate analyses, approaches, and tools to do this.

### Water and Sanitation

**62.** For WSS Utilities, operational and financial performance is key to achieving the creditworthiness required to access commercial finance. If a provider is creditworthy, then by default it is operating in a way that is sufficiently efficient and financially credible and with an acceptable level of oversight. Access to commercial finance in turn increases incentives for efficiency and further helps to disrupt the status quo. Technical and financial efficiency, coupled with transparent governance and regulation, are the building blocks of creditworthiness. While research shows that there is no one-size-fits-all solution for a turnaround program, key success factors include strong management and a clear customer-oriented vision. A second key conclusion is that a successful turnaround program will be a gradual series of improvements using the existing resources of the utility. Finally, there are a few key conditions for a successful performance turnaround: a competent and incentivized management with a minimal level of managerial autonomy and government leadership to make the changes needed and promote the right incentives.

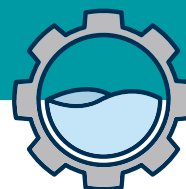
**63.** The WB, through technical assistance and operational engagements (e.g., Program for Results instruments), can help (1) governments to design and implement programs at the national or regional level that put in place the **right incentives** for institutional change through new regulations, results-based financing, improved monitoring, and benchmarking; and (2) client utilities to design and finance turnaround strategies and performance improvement plans. Tools such as the **Utility of the Future** (see Box 4.4) can help Task Teams and clients to build capacities around these efforts.

**64.** Improved efficiency is also an untapped source of funding for water investments, as inefficiency is an opportunity cost for governments and service providers. Improved efficiencies and performance enable service providers to offer better services at lower costs, freeing up resources that can be invested in improving or expanding services. Service providers' performance can be improved through more efficient upstream choices regarding capital expenditure; achievement of short-term operational efficiency gains; and aiming for financial sustainability and creditworthiness as strategic objectives.

### BOX 4.4: The Utility of the Future Methodology to Ignite Transformation in Water and Sanitation Utilities

The Utility of the Future program guides utilities in initiating and maintaining transformation efforts. The goal is to become a future-focused utility that provides reliable, safe, inclusive, transparent, and responsive WSS services through best-fit practices in an efficient, resilient, and sustainable manner. This clearly depends on **technical and commercial operations**, though not exclusively so. Other elements of sound utility management are **organization and strategy, human resource management, and financial management**. Together, these elements promote effective and efficient commercial and technical operations, while the legal framework and governance in which the utility operates shape its enabling environment.

The Utility of the Future methodology works in parallel on two dimensions to improve performance and ignite transformation in water and sanitation utilities: **management and operations** (a “hard” dimension that focuses mainly on processes and practices) and **change management** (a “soft” dimension that focuses on leveraging staff engagement, empowerment, and team building).



## Irrigation Services

**65. Irrigation modernization has implied a growing trend towards more entrepreneurial and market-oriented approaches, with smaller and better-targeted public sector intervention in the provision of services.** In parallel, purely private irrigation has expanded enormously, notably with the rapid development of groundwater. Groundwater development has vastly increased irrigated output and, through precision irrigation, boosted water productivity, though it has been accompanied by significant depletion and deterioration of the resource. The push to modernize irrigation is helped by the abundance of new technology that can boost irrigation efficiency, both in terms of conveyance and on-farm application of water, and reduce the costs of irrigation service. Performance-based contracts can support the involvement of the private sector to advance key metrics of efficiency, access, and resource sustainability. The use of automated systems, corporatization of service providers, and integrated water management from the water source to the farm level can support better water management in the irrigation chain.

### 4.7 DEVELOPING A PIPELINE OF BANKABLE PROJECTS

**66. This step focuses on supporting clients on the identification and active promotion of water-related investments for which private financing (including commercial finance) can be mobilized.** The risk-return profile, and thus the attractiveness of any investment, depends crucially on the financiers' ability to assess investment and operation risks.

**67.** This section of the roadmap can focus on helping the WB address three key areas through technical assistance and operational engagements:

- 1. The promotion of a stable and attractive business environment in the country and its water sector.**<sup>53</sup> This would be to address existing bottlenecks focused on reducing the misperceptions on investments in water-related projects and the risk perception of investors, which may be built upon low or unpredictable tariff revenues and low-performance issues. It is also crucial to ensure that opportunities are visible and known by potential investors.
- 2. The preparation of robust investment opportunities and an attractive pipeline of opportunities.**<sup>54</sup> This area would address two key bottlenecks: i) the high transaction costs of water projects, limiting efforts and resources placed in project preparation phase, which could result in

non-optimized design; and ii) the lack of financial assessments of service providers, increasing the creditworthiness risk perceived by investors.

- 3. The provision of relevant financial tools to enhance the viability and attractiveness of projects.** This involves providing a financing framework and financial incentives and tools to address the current low leveraging of technologies and practical know-how which could be embedded in the project design. These elements include: i) working to improve the efficiency of the local capital markets; ii) designing adequate blended finance approaches; iii) using standard financial tools reducing lenders' risk and borrowers' constraints (e.g., the NUWAS project in Indonesia); and iv) developing a common understanding of investment strategies and criteria.

### 4.8 CREATING MARKETS FOR LOCAL CURRENCY FINANCING AND MOBILIZING DOMESTIC FINANCE

**68. The goal of this step is to encourage local currency financing and domestic resources mobilization for water sector projects and investments in developing countries.** In general, in order to avoid currency risks, as far as possible, funding should first be sourced in the domestic market, to avoid exchange rate risks and limit transaction costs. This includes mostly debt instruments, though this requires issuers to be creditworthy and manageable, as highlighted in previous steps. However, the level of development of local capital markets can constrain the issuance of domestic debt securities, with limited local savings pools due to underdeveloped pension funds and asset management industries. Sustainable financial instruments like green, blue, or sustainability-linked bonds may be suitable for governments or utilities seeking to fund water-related investments, with more advanced middle-income countries having relatively well-developed institutional investors and deep capital markets. Appendix B provides further detail on fostering greater local currency financing and domestic finance.

**69. National development banks can play a crucial role in providing long-term financing to small and medium-sized entities that are unable to access commercial financing.** In addition to financing, national development banks can provide technical assistance to service providers for project preparation, and for structuring project finance, as well as advisory support for building financial and technical capacity. Overall, such banks offer a valuable source of funding and support for mid-sized entities looking to expand

their operations while promoting sustainable growth in the sector.

**70. The mobilization of local currency financing for subnational governments and SOEs for water investments can be supported by national or regional water financing facilities.** These facilities would serve multiple roles, including centralizing performance monitoring and incentives for service providers, directing public funds to underserved populations and SDG priority projects, providing technical assistance for project preparation and management, mobilizing private finance by presenting more and better water projects, and helping to build capacity for banks to lend to different types of projects. The facilities could also pool smaller projects under special purpose vehicles to leverage additional funding. A national or regional financing facility could be structured based on the size of the market and regulatory characteristics. A national facility may be suitable for a large market while a regional facility is appropriate for smaller countries with similar regulations. Economies of scale in financing, pooling of risk, and sharing administrative costs can be achieved with a multi-country facility. Fund managers can learn from feedback in multiple projects and streamline the preparation of further projects. The fund can be managed by a Fund Manager or an organization already operational in the country or region. The facility lends to service providers, who repay the loan from retained earnings, and the fund can be structured as a revolving fund where repayments are lent again to other projects. However, foreign exchange risks may require hedging in the case of multiple currencies. Box 4.5 provides examples of financing models across countries.

#### **BOX 4.5: Examples of Country-Level Financing Models**

Many advanced economies, including the United States and EU, have implemented financing models to support investment in the water sector, such as the Clean Water Revolving Fund and Cohesion Funds to provide grant funding for countries to meet EU directives on water, while the European Investment Bank provides technical assistance for strategy and planning, project development, and project appraisal for infrastructure projects under the JASPERS facility.

## **4.9 MOBILIZING THE FULL SUITE OF FUNDING AND FINANCING SOLUTIONS**

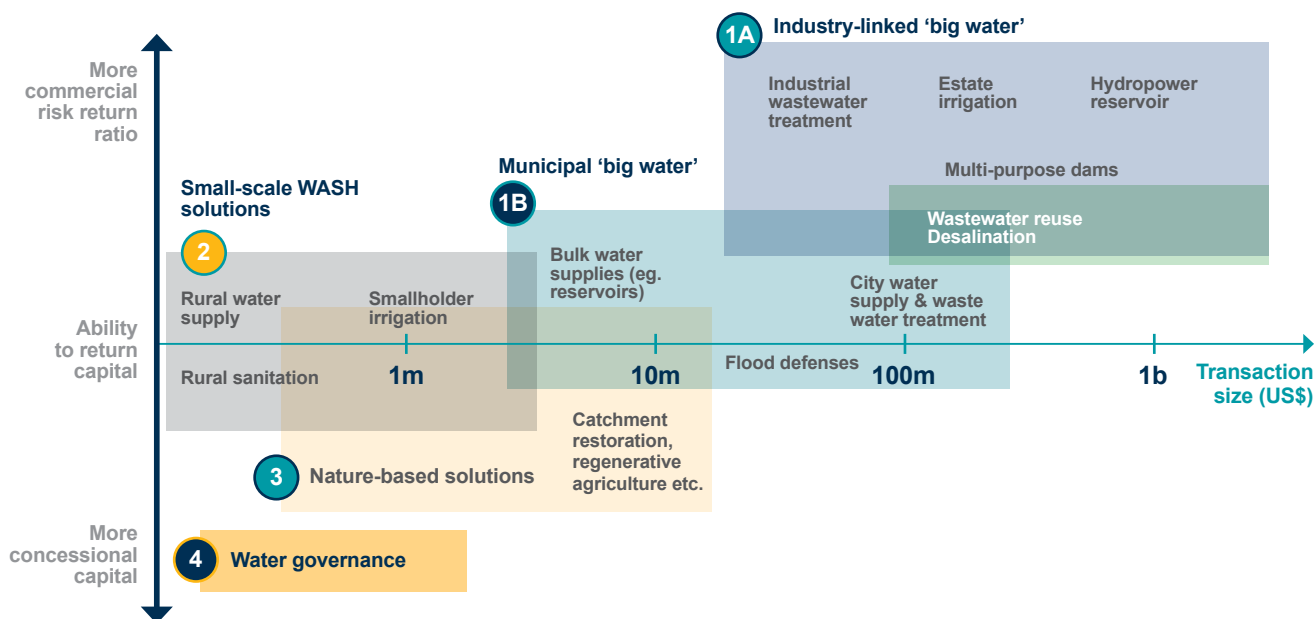
**71.** The key output of this step is a set of recommendations on financing options for governments, the WB, and other development partners tailored to the scope and priorities identified in the previous steps, with relevant actions for all parties involved that are time-bound, action-oriented, and achievable within the short to medium term.

**72.** This step suggests a review of options for client countries, the WB, and others to put in place financial structuring and innovative financing solutions, building on the priorities identified under the previous steps and using a **blended finance** approach, to finance technical assistance and investments geared towards achieving water security, water SDGs, and climate goals, as described in Strategic Direction 3 of the Framework. A starting point might be to match potential water project structures with investor interests, as often the needs for water sector investments are of a smaller scale with lower return profiles than what investors seek. Figure 4.4 shows a mapping of such water projects and investor interest to illustrate this point.

**73.** A key area of focus under this step is to identify **potential blended financing solutions which can be supported by WB and others' products to secure the required financing for priority water investments.** These factors differ by country, province, and municipality, and some barriers are higher than others. The critical element is to thoroughly review the context, institutions, market conditions, and proposed investments (Steps 1–6), the pipeline of projects (Step 7), and the availability of concessional financing and investor appetite, to design the blended finance facility in a tailored way to ensure success (Steps 8 and 9), while coordinating closely with other stakeholders and partners (Step 10).

**74.** Given the limited budget and the high cost of capital in developing countries, the WB can play an important role in de-risking investments and providing credit enhancement, as well as providing grant and concessional funds, investment, and lending needed for water projects, applying a **blended finance approach.** The use of public, grant, and concessional sources of finance and investment from host governments, the WB, and IFC to attract private capital can be done in several ways based on the needs and circumstances of specific projects. Guarantees and credit enhancement (potentially supported by the use of IDA Private Sector Window/MIGA Guarantee Facility) can promote blended finance projects and facilitate private investment in the water

**FIGURE 4.4: Map of Water Projects and Investor Interest**



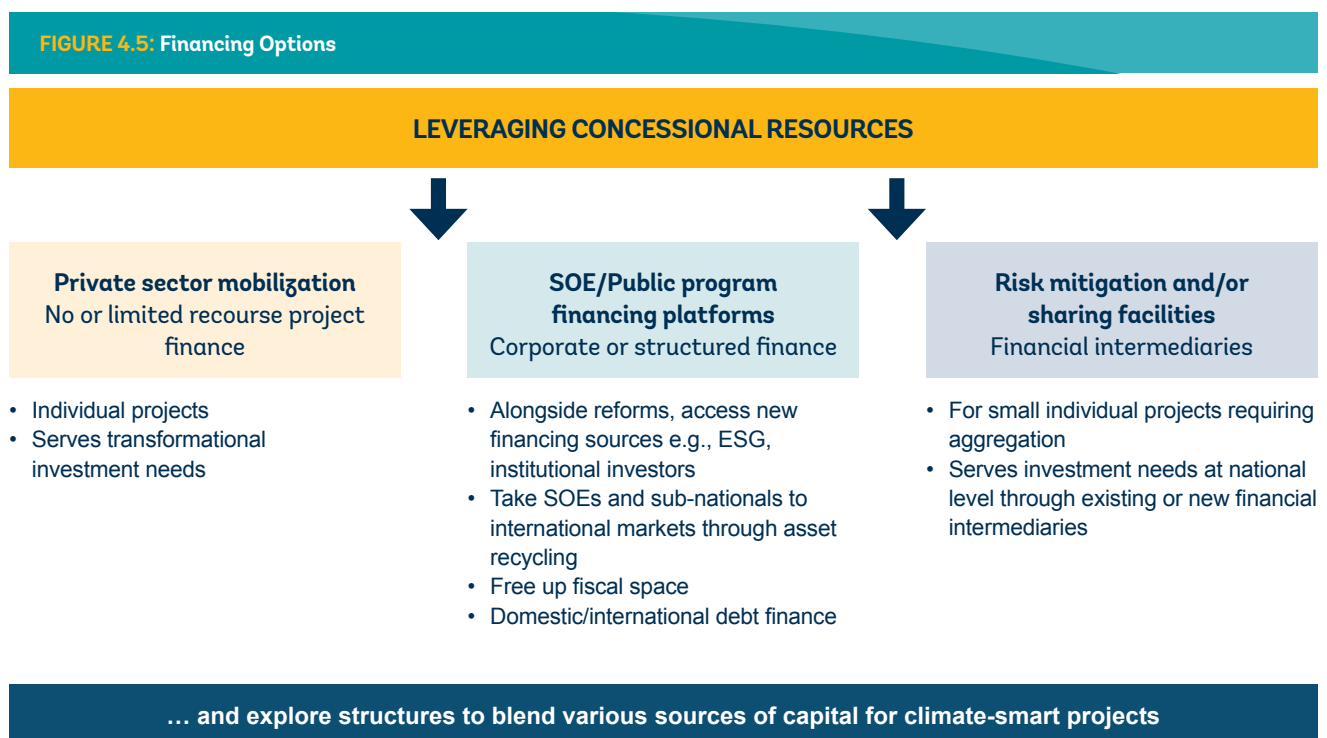
Source: Blended Finance Task Force, *Mobilizing Capital for Water: Blended Finance Solutions to Scale Investment in Emerging Markets* (2022). Wastewater reuse and desalination have been added by authors as a set of water projects with growing investor interest.

**TABLE 4.1: Blended Finance Structures**

APPROACH	DESCRIPTION	APPLICATION
<b>Grants</b>	Private capital (equity and debt), with grant funds from the host government, WB/MDBs, UN agencies, bilateral and multilateral donors to lower costs and bring a project to bankability, including support through technical assistance during the project preparation stage.	For non-creditworthy projects or water utilities, and/or support in the early (e.g., preparation) stages of a project.
<b>Concessional Funds</b>	Private capital (equity and debt) with concessional funds on below-market terms from WB/MDBs, development finance institutions, and policy banks to lower the overall cost of capital and strengthen a project's commercial viability.	For non-creditworthy projects or water utilities.
<b>Guarantees</b>	Guarantees, with potential use of Private Sector Window/MIGA Guarantee Facility or other guarantee facilities, to cover equity and debt against political risks, including a government's (or water utility's) failure to meet specific obligations to the project under a water purchase agreement and/or government guarantee. These provide credit enhancement, bring down borrowing costs, and facilitate private investment in the water sector.	For developing countries, including high-risk countries and projects; for non-/low-creditworthy water utilities/water off-takers.
<b>Insurance</b>	A practice by which an entity provides a guarantee of compensation (demand guarantee or corporate guarantee) in case of an adverse event. Depending on the circumstances, political risk and/or credit/commercial risk insurance may be appropriate.	For projects facing high political and credit/commercial risks.
<b>Other forms of support</b>	Support from the government through subsidies by temporary tax exemption or relief; subsidies provided conditional on the service delivery and quality; upfront project capital input; and public funds used to hedge currency and/or interest rate risks.	For non-/low-creditworthy projects or water utilities; low tariffs; upfront capital required; and where private financing is in hard currency and/or on floating interest rate terms.

sector including in high-risk countries. It ensures that the investors and lenders will be repaid in case of a default event by the government or water utilities. Table 4.1 outlines typical blended finance structures. Figure 4.5 covers a possible set of financing options in the water sector, leveraging concessional resources. Appendix B provides further detail on each of the listed financing solutions and how they could apply

to water security investments. The chosen set of financing solutions may include additional innovations such as asset recycling, aimed at monetizing invested capital in brownfield assets for the development of new infrastructure solutions, as well as hybrid PPPs, which combine concessional funding with private operation and financing.



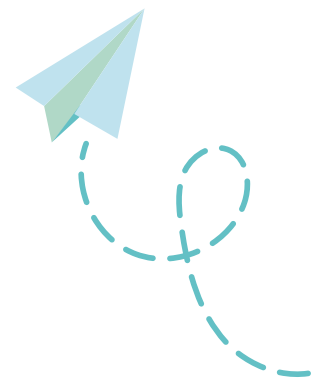
## 4.10 DEVELOPING A COORDINATED APPROACH WITH STAKEHOLDERS

75. Given the need for collaboration and coordination among stakeholders on the financing agenda for the country, this step would encompass stakeholder engagement, which may develop into a formal **multi-stakeholder platform (MSP)** for financing over time. Bringing multiple stakeholders into dialogue with one another early in the reform process and continuing this engagement over the long term is essential to implementing successful and lasting water sector reforms. In the past, instruments to support flows of private finance to creditworthy entities in the sector have on occasion been undermined by weak demand, resulting from the availability of concessional finance. Regular dialogue among development partners and financiers in an MSP would help to reinforce a common commitment to crowding in commercial finance, wherever possible, and directing concessional funds where they are most needed in the sector. Moreover, participation of the ministries of planning, economy, and finance in the water agenda is critical to improve national water investment planning and policy making.

76. This step will involve close collaboration and policy dialogue with government counterparts and other stakeholders, structured to:

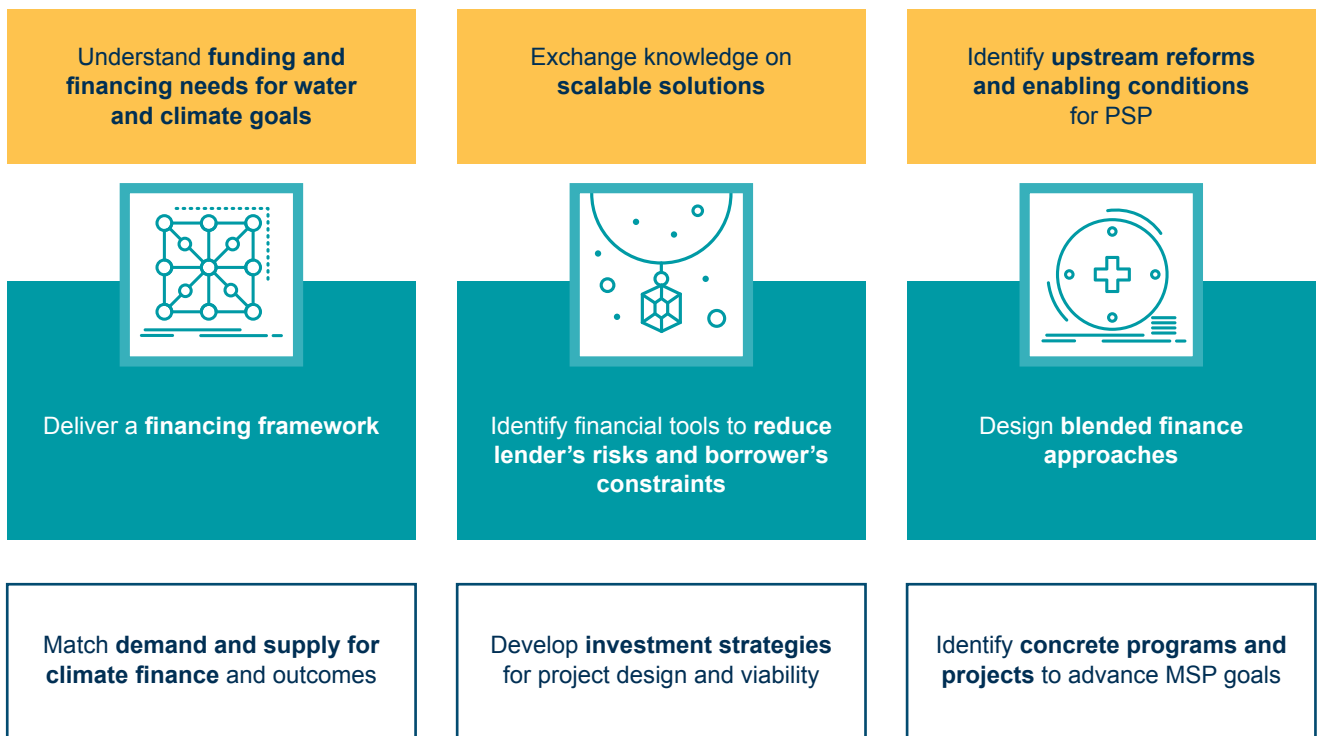
- ◆ Operationalize high MFD-potential programs and transformative engagements, sub-sectors, and regions.
- ◆ Outline specific investment priorities and private sector engagement opportunities across the above high-potential areas, along with priority actions to diversify and scale up existing sources of finance to meet such investment opportunities.
- ◆ Outline specific instruments from the WB and other development partners that may help address some of the constraints identified (covering technical assistance, capacity building, and/or financing needs). It is important to note that these would cover not only WB instruments but other financing instruments that might be available to governments from other development partners and would cover the entire suite of financing solutions from bonds and loans, to PPPs, microfinance, and other PSP options.

77. In this context, developing country platforms for financing, with participation of relevant actors, can serve to align stakeholder interests and support solutions to meet the financing needs of the sector. **MSPs** are country-level dialogue and decision-making platforms which bring together high-level representatives of government, public agencies, the WB, development partners, the private sector, civil society, and academia. **The concept of country platforms for financing was endorsed by the G20** in February 2020 through the “G20 Reference Framework for Effective Country Platforms”, proposed as vehicles for more collaborative and scalable solutions for catalyzing financing and enabling private sector investments. The Framework aims to build on this approach and on the experience of the World Bank’s 2030 WRG to create convergence around national-level priorities linked to water and accelerate financing for the water sector. MSPs can serve multiple functions, as outlined in Figure 4.6.





**FIGURE 4.6:** Multi-Stakeholder Platforms for Financing Water



# 5

## IMPLEMENTATION ARRANGEMENTS

This chapter covers key considerations for implementation arrangements to roll out the Roadmap, including on resources, pipeline development, and incentives to ensure alignment of the Strategic Framework internally and externally.

### 5.1 ONE WB APPROACH FOR WATER

**78. The proposed WB Roadmap for Scaling up Finance for Water is aligned with the World Bank’s ongoing corporate efforts to facilitate private capital investments, as outlined in the draft WB Evolution Roadmap under development.** The WB Evolution Roadmap outlines how the WB intends to use its global multisectoral knowledge and existing instruments as well as innovative, replicable, and scalable approaches to enable and mobilize more private capital. The idea is to achieve this using comprehensive solutions delivered coherently across the WB that (1) prioritize activities by sector, geographic and other needs, such as policy work to facilitate private sector engagement; (2) enable private capital flows (including by defining and tracking PCE projects); (3) build robust pipelines for PCE and PCM in addressable markets through important work such as project preparation; (4) create efficiencies through scale and replicability; and (5) ensure measurable financial results and development outcomes. This is intended to be applied across different geographies and sectors, including climate action, energy access, digital transformation, capital markets development, and SOE utility reform.

**79. The WB intends to reinforce collaboration across the Group, combining the strengths of each institution in a *One-WB approach*** to increase PCE and PCM across sectors. It will systematize the use of CCDRs, the InfraSAP, CPSDs, Country Economic Memorandums, and IFC’s upstream work to identify policy constraints and engage early at the country level. To develop a strong project pipeline, the WB will leverage existing analytics and project preparation facilities, such as the Energy Sector Management Assistance Program, the Public-Private Infrastructure Advisory Facility (PPIAF), the Global Infrastructure Facility, and IFC upstream capacity. The WB will also continue to develop and implement replicable, scalable “joint WB solutions and approaches”, such as the J-Cap program

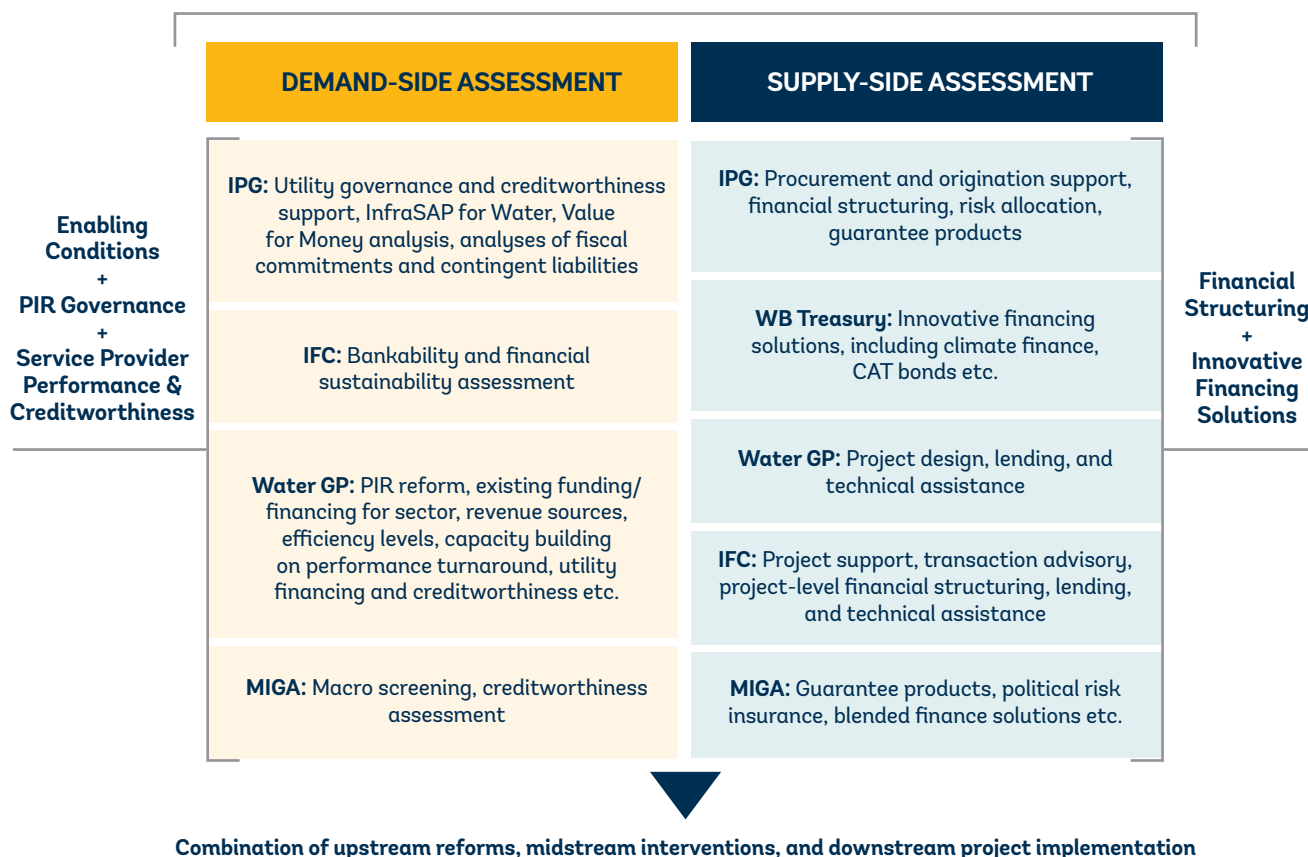
and Scaling Solar I. More generally, the WB will reinforce internal collaboration through the establishment of a high-level PCE/PCM Steering Committee and continue to track the impact of the WB ecosystem of engagements with private investors discussed above.

**80. The proposed Roadmap will also require extensive collaboration across WB institutions,** onsite data collection, interviews with stakeholders, and strong analytics. The various “steps” are proposed to be supported by multidisciplinary, collaborative teams, with focal points appointed from Global and Regional Units from the Water GP, Equitable Growth, Finance and Institutions (EFI), Macro, Trade, and Investment (MTI), the Infrastructure unit, Treasury, IFC, and MIGA, as well as IPG specialists and economists from the Chief Economist Office, with a combination of funding from WB country management units coupled with existing WB managed trust funds. Possible allocation of roles and responsibilities across the WB is illustrated in Figure 5.1.

**81. It is proposed that a new Water GP Global Solutions Group on Water and Finance support the operationalization of the Framework at the country level, revamping the existing Financial Innovation Team (FIT).** The FIT team, in collaboration with colleagues from IPG, IFC, and MIGA, has been providing operational support, knowledge sharing, and systemic support to Private Capital Facilitation (PCF) in water since 2018. Currently, the FIT team is coordinated as a community of practice under the Water GP, which involves water finance experts in regional and global units of the Water GP and IPG from the WB, IFC, MIGA, and other trust-funded programs, such as 2030 WRG. Under this strategic framework, the FIT community of practice will be restructured into a Water and Finance Global Solutions Group to support the delivery of PCM solutions across countries. In addition, 2030 WRG would support the development of the ecosystem for public-private collaboration at the country level by

**FIGURE 5.1: Roles and Responsibilities in Delivery of the WB Roadmap for Scaling Finance for Water**

**2030 WRG and Water and Finance GSG support for upstream enabling reforms and public-private collaboration**



providing leadership on stakeholder engagement, fostering collaboration through existing networks, and supporting the implementation of a well-established country platform approach (see section 5.2).

**82. An important and sustained commitment on the part of the WB and other donors is needed to support implementation.** In particular, the WB will need to provide long-term technical assistance to design and implement the enabling environment reforms and other upstream work. Support of the WB and other donors will be needed to build the pipeline of commercially viable water projects. Dedicated resources and expertise for project preparation could be coordinated by the Water and Finance Global Solutions Group or directed through national-level project preparation facilities where entities of this kind are already functioning.

**83. Additional resources should also be committed to continued innovation and development of tools and instruments to make commercial finance more**

**affordable, particularly for lower-income countries.** This would include new mechanisms and scaling up of support for microfinance for microenterprises and households to invest in water-related assets, and vendor and supplier finance to assist domestic firms.

## 5.2 2030 WRG UPSTREAM ENGAGEMENT AND STAKEHOLDER COORDINATION

**84. For the implementation of this strategic framework deliverable, 2030 WRG, a partnership platform housed in the Water GP of the WB, would support the enabling environment for reform, public-private collaboration, and stakeholder engagement through its role as a catalyst and convenor.**

**85. 2030 WRG's role would focus on the creation of supportive policies, institutional arrangements, and regulations in the sector, aimed at maximizing**

finance for development through a combination of blended financing, PPPs, and other instruments. In addition, 2030 WRG would explore opportunities for tapping climate finance for country engagements. In view of its upstream role, 2030 WRG would not prepare investments or provide financing for the implementation of solutions. However, it would work with MDBs (particularly the WB), financial institutions, and others to catalyze financing for the sector. For example, in India, 2030 WRG has initiated an engagement with the Climate Finance Leadership Initiative, and various other global and local financial institutions, project developers and implementers, to develop financing mechanisms and catalyze climate finance for water and wastewater reuse infrastructure, including reforms to the policy and regulatory environment to enable the flow of private capital and upstream pipeline development.

**86. 2030 WRG would use its convening and coordination role to support the implementation of more innovative instruments to finance water sector investments** (e.g., impact bonds, green/blue/sustainability-linked financing, microfinance, climate finance, and “debt for water” swaps), in collaboration with the WB, financial institutions, international organizations, and local government counterparts. For example, in Kenya, 2030 WRG support includes developing a national sanitation services market sizing assessment, structuring PPP contracts between public water service providers and private operators, and providing technical advisory support to water service providers on the design of technical, financial, and legal structures of performance-based contracts for non-revenue water reduction. It is also providing advisory support to improve the policy, legal, and regulatory environment for private capital mobilization in the WSS value chain in Kenya, jointly with the public sector and private financial institutions, among others.

### 5.3 DRIVERS FOR CHANGE FOR EXTERNAL STAKEHOLDERS

**87.** Implementation of the Strategic Framework across countries requires the creation of appropriate incentives. This section describes potential drivers for change for governments; MDBs; financing institutions; and donors.

**88. Incentives for Governments:** Client governments would need to be incentivized to improve the planning, mobilization, and efficiency of funding and financing for water sector investments, and to support a move towards sustainable private sector investments and solutions, complementing public resources. Creating this systemic shift in the sector would require dedicated

engagement with each client government, articulating the case for scaling up investments for the water sector, potentially through the following:

◆ **Current and Projected Gaps in Meeting the SDGs:**

The gap in achieving various SDGs that directly or indirectly rely on water at the country level – including access to WSS, food security, energy security, public health outcomes, climate goals, and jobs and labor market outcomes – could be highlighted to indicate the urgency of expanding the pool of funding and financing for the sector.

◆ **Costs of Inaction and Insufficient Action on Water Resilience and Climate Adaptation:**

The lack of adequate investments for climate adaptation and drought-related resilience threatens sustainability at the country level. The negative impact of floods and droughts on economic growth are very significant but not always fully appreciated by governments: a drought can reduce a city’s economic growth by 12 percent and in some regions, notably the Middle East and the Sahel, pursuing business-as-usual water policy and investment could lead to sustained negative growth in the context of climate change.<sup>55</sup> The recent 2022 Global Assessment Report on Disaster Risk Reduction, which looks at all types of disasters, from rapid onset events like typhoons, floods, and earthquakes to other events like droughts, saltwater intrusion, and air pollution, finds that poorer countries lose on average 0.8–1 percent of their GDP per capita growth to disasters per year, compared to 0.1–0.3 percent in higher-income countries.<sup>56</sup> In this context, policies and investments to manage water resources yield high returns. For example, groundwater acts as a buffer against droughts. Interventions to prevent the over-exploitation of aquifers could prevent up to half of the global losses in economic growth caused by drought.<sup>57</sup> The magnitude of the losses provides a direct impetus to the case for improving water sector investments and securing financing, and needs to be continually communicated to governments.

◆ **Knowledge Exchange on Reform Processes in Other Countries:**

Countries such as Brazil and Indonesia have embarked on enabling environment reforms to support private sector participation, linked to the achievement of specific goals, such as universal access targets. For example, since the passage of the 2020 Sanamento Law in Brazil, 17 PPP and concession contracts have been awarded with a total investment value of US\$9.8 billion, and more than US\$5.4 billion of concession payments have been received by government, freeing up the public budget for

additional infrastructure investments. At least 27 more PPP tenders are in the pipeline, amounting to US\$3.4 billion of additional investment to extend coverage to 15.1 million people. Sharing knowledge on the impact of reforms in such countries could provide an impetus for similar reforms elsewhere.

- ◆ **Use of WB Financing and Other Concessional Resources to Drive Reforms:** Concessional resources can be used to facilitate needed reforms in the sector and to crowd in private capital.

**89. Incentives for MDBs, Financing Institutions, and Donors:** The WB can play a valuable role in coordinating donors around the scaling up finance agenda, which will be essential to crowding in the private sector. Currently, international financial institutions (IFIs) and MDBs have strong incentives to lend to higher performing service providers, although these entities are best placed to access commercial financing. IFIs and MDBs, therefore, need to agree on a set of common principles consistent with MFD to shift concessional lending away from creditworthy entities (or only provide targeted financing that covers necessary risks to mobilize private financing) towards improving the performance of the next rung of service providers and strengthening the sub-sectors which have clear potential revenue streams, like urban water services. This will allow concessional lending and grants to be directed towards sub-sectors where social and economic benefits are high but potential revenue streams are more limited.

- ◆ **Clear metrics and transparent monitoring mechanisms.** Incentive mechanisms will rely on the availability of comprehensive and up-to-date information on actual flows of private finance to the water sector. A set of metrics and a system to gather and validate information will need to be established. The PPI database covers only financial flows under official PPP contracts and, as such, provides only a very partial picture of private finance in water. This task of mapping and measuring the full range of private finance flows would require considerable resources and could be undertaken by a consortium of international institutions and private entities committed to the scaling up finance agenda. A number of existing initiatives could be used (such as IBNET and the OECD's Observatory).

- ◆ **Strengthening international collaboration between the development community (comprising the United Nations, G7, G20, OECD countries, ODA donors, IFIs, MDBs, and development finance institutions), emerging and developing economies (EMDEs), and the private sector.** Several ongoing initiatives, such as the 2030 WRG, the Global Commission

for the Economics of Water, the Roundtable for Financing Water, the Water Finance Coalition, Blue Peace Financing, and the WASH Finance strategies led by UNICEF,<sup>58</sup> are closely aligned with the goal of this Framework to scale up finance for water. Frequent and streamlined interactions across such fora could ensure the implementation of a common set of principles in the water sector to establish a collective agenda for MDBs to crowd in private sector investments, innovation, and expertise to achieve development objectives, where appropriate, and reserve scarce public finance for areas where private sector engagement is not optimal.

- ◆ **Aligning incentives of private investors with the water SDGs and the goal of climate resilience.** Financial institutions have an important role to play in influencing and incentivizing economic sectors to recognize and price in the value of water and the full costs of water insecurity on their balance sheets, to encourage water stewardship in productive sectors and to direct private finance away from investments that exacerbate water risks. The WB can support this through ongoing efforts of governments and international organizations including the High-Level Panel on Water Investments for Africa, the “Catalyzing the Water Action Agenda for Finance” initiative and the Roundtable on Financing Water.



# APPENDIX A: SUB-SECTOR OPPORTUNITIES FOR MFD

## 1. WATER RESOURCE MANAGEMENT, STORAGE, AND “UNCONVENTIONAL” WATER SOURCES

**Concerns about water security and climate change have shown the need to mainstream water resource management into sectoral concerns.** The new World Bank report *What the Future Has in Store: A New Paradigm for Water Storage* places freshwater storage at the center of priorities in terms of water resources management to achieve planetary water security. The report shows how as demand for freshwater rises, more water storage is needed than is available in many places. The report offers a framework to maximize benefits from all forms of water storage: natural, hard infrastructure, and a combination of both, using a watershed approach. Increasing storage capacity requires significant investment and financing at local, national, and supra-national levels. Freshwater storage is also at the heart of adapting to climate change, most obviously by saving water for drier times and reducing the impact of floods. In the future, water storage for climate change mitigation is expected to increase through hydropower, which, besides generating electricity, can provide energy storage and grid-balancing services key to scaling up other more variable renewable energy.

**Mobilization of private financing related to water resources management and storage has traditionally been linked with the development of hydropower, irrigation, and multipurpose projects through PPP modalities.** In terms of attracting private investment, hydropower projects typically rank above irrigation projects, as they generally offer better and more reliable revenue flows. Blended finance is also increasingly being used. A good example is the Pamir Energy Project in Tajikistan, supported by IFC and the International Development Association (IDA). The Pamir Energy Company was formed through a PPP with Government of Tajikistan acting as regulator, and the Aga Khan Fund for Economic Development, a nongovernmental organization, which has a controlling 70 percent share of the company. IFC, whose debt was converted into equity in 2007, has a 30 percent share. The Pamir Energy Company has a 25-year concession agreement, which was signed at project appraisal. IDA's involvement was designed to reconcile the commercial objectives of the

private sector and the social objectives of keeping the electricity tariffs as low as possible. The project attracted a significant private investment of US\$26 million in a country and region that found it difficult to attract private investors. Joint WB involvement was also critical in mobilizing financing from the Swiss Government for the Government of Tajikistan to meet its social protection obligations towards the project, since a considerable proportion of the residential consumers would be unable to pay even the US\$0.12 cents/kWh tariffs. A Swiss grant (WB-administered trust fund) provided funding upon delivery of electricity services to targeted beneficiaries.

**Private finance has also been mobilized effectively for nature-based solutions in the water sector, with notable examples of catchment management projects developed and operated by private entities.** Catchment management investments developed and financed by downstream commercial or industrial water users were estimated at US\$15.4 million in 2015.<sup>59</sup> Companies driving these projects were mainly food and beverage companies, finance and insurance companies, private water utilities, and energy generation firms. Private finance for watershed management may also be channeled to riverine communities through Payment for Ecosystem Services (PES) arrangements. An example is the PES scheme in the Cidanau watershed in Banten, Indonesia, where upstream farmers receive payments for adopting sustainable agricultural practices from the downstream water supply company. Although the benefits to downstream users of watershed management in terms of improved quality of water and reduced flood risk can exceed the costs of payments, designing suitable governance arrangements for these schemes has proved challenging and has held back their replication.

**Considering the vulnerability of rivers and aquifers in numerous areas of the planet, it has become increasingly necessary to resort to other water sources.** Non-conventional sources (in the sense of being complementary to the two basic sources of freshwater previously mentioned), such as “reclaimed” water reuse, desalination of brackish and saltwater, and rainwater harvesting, can play a crucial role in providing additional resources based on the hydrological balance

of each territory. As part of efforts to diversify water supply sources, wastewater reuse, sometimes restricted to certain uses, has reached a high level of development in countries subject to greater water stress, such as Australia, China, Cyprus, Greece, Israel, Italy, Japan, Malta, Singapore, Spain, the United States. Likewise, desalination contributes to making additional water resources available in coastal areas with fewer available conventional resources (such as Australia, China, Israel, Saudi Arabia, Spain, and the western US). Lastly, rainwater harvesting stands out in countries where there is high variability in rainfall patterns, such as Indonesia, Japan, Malaysia, Thailand, and the US.

**Unconventional bulk water supply sources have experienced quite a remarkable expansion over the last few years and the development of related infrastructure (wastewater treatment and reuse plants and desalination plants) lend themselves well to development through PPP schemes.** Industry has developed several well-established procurement methods for desalination and wastewater reuse projects. One is the **Design-Build-Operate (DBO)** model, where at least a part of the financing for the project is provided by the public sector, and the private sector supplies design and construction services for a lump-sum payment, but in addition the private contractor provides operating services for the facility. Another is the **Build-Operate-Transfer (BOT)** model, whereby a private sector single purpose company (SPC) is granted a concession to build, operate, and finance the facility, for a fixed concession period, at the end of which the facility is transferred to a public authority. The SPC sources financing for the project and the land may be provided by the public authority.

**Benefiting communities may have a role to play in the management of desalination and reuse facilities in remote arid regions.** As relatively costly and technology-intensive solutions, desalination and reuse are usually viewed as viable just for utility-managed urban drinking water distribution and wastewater collection and treatment systems, or for self-supply systems feeding high-value-added industrial and commercial activities. However, in many cases, brackish water, seawater, and desalinated water are the only sources of water available to serve small island communities and rural populations located in remote arid regions that the state system does not reach. In these contexts, desalination and reuse technologies and management models may have to be adapted to allow local communities to play a role in the operation of the facilities to bring down costs and ensure their sustainability. The role of communities in the management of desalination and reuse may be even more critical in a context of fragility.

## 2. INCREASING FINANCE FOR IRRIGATION MODERNIZATION AND GHG EMISSION REDUCTION

**Irrigation modernization is a must.** There is a growing need for agriculture to produce more to feed a fast-rising population, increase resilience to climate shocks, and allocate more water for the environment and other uses. Irrigation modernization is essential to responding to these imperatives. It can produce more food and fiber with less water. And it can boost farmer incomes and GDP. Historically, public finance and international transfers have predominated in the sector, but there have been significant weaknesses as a result. Similar to the evolution in developed countries, the role of government needs to change to invest principally in public goods and basin-level infrastructure and in supporting the viability of farming systems in line with specific (targeted) economic and social objectives, while facilitating participation of the private sector and farmers to invest in irrigation infrastructure and its operation.

**Modernization of irrigation will require additional investment and access to private financing, through a repurposed use of public financing.** On the supply side, this requires developing financial markets adapted to the whole range of needs at a major system level, and at the level of larger individual farmers and smallholders. On the demand side, farmers need access to knowledge to prepare “bankable” proposals for accessing financing. Mechanisms such as access to credit and subsidies can help to close the affordability gap.

**Private finance for irrigation and modernization has grown in recent years.** New instruments have emerged, such as low entry cost models – rentals, leasing, pay-per-use – and forms of consumer credit. Guarantees and insurance are also being used to underwrite finance for modernization. Models that leverage private finance like PPPs and blended finance are becoming more workable. New sources of finance include water investment funds, ecosystem support financing, and green bonds.

**Governments can ensure a supportive enabling environment, along with targeted and predictable patterns of public investment, to develop a strategic financing approach, in partnership with all stakeholders.** To this end, governments need to work with financial institutions, trade bodies, and farmers to develop sustainable and accessible private financial markets and products, bringing in new providers, new instruments, and new sources. A vital new tool is financial technology (Fintech) which uses digital technologies to improve financial services. Governments may need to use targeted and time-bound subsidies to foster the initial development of these markets, with collaboration of all

key stakeholders – governments, financial institutions, development agencies, trade organizations, and the farming community.

**Government remains by far the biggest source of financing for modernization of off-farm infrastructure and large-scale schemes.** Thus, even where government remains the principal (or sole) investor, new cost recovery measures – through collection of irrigation service fees or tariffs – increase accountability of irrigation and drainage schemes' operators and end-water users while reducing the fiscal burden. One such example is in Turkey, where the law requires farmers and their water user associations to repay the cost of modernization over the long term.

**Over the last few years, the number of initiatives of PPPs in irrigation have increased significantly.** Under an infrastructure concession, a private operator is engaged to raise commercial finance for infrastructure development and then construct, manage, operate, and maintain the infrastructure and charge for irrigation services (e.g., the Peru Chavimochic Irrigation Project). PPPs have also been used to invest in basin-level infrastructure (e.g., Chile) over the last decade to finance the construction of dams for irrigation. Government provided part of the financing, private partners mobilized the balance, and then constructed and operated the dam, and irrigators paid a water fee for the water stored. As experience with irrigation PPP is gained, new formulations and different incentives and risk-sharing mechanisms are being devised. For example, an innovative PPP contract for drip irrigation developed by 2030 WRG on 24,000 hectares in India (**Ramthal Drip Irrigation Project in Karnataka**) provided results-based incentives for the turnkey contractors who not only developed the scheme and mobilized finance but also managed it. On the other hand, innovative PPP partnerships such as the **Gabiro Agribusiness hub**, a collaboration between the Rwandan government and Netafim, which delivers a pressurized source of water to the field, have demonstrated the challenges of large PPP schemes (such as the length of time required to clarify land rights and enable the consolidation of land in a just manner). But such partnerships have also demonstrated the benefits, such as the **large-scale development of highly productive irrigated land for commercial crop production**. These PPP models should be scaled wherever conditions allow.

**Management, operation, and maintenance contracts have also been used**, whereby the private operator is engaged to provide services in return for a fee. These contracts are being structured in the **West Bengal Major Irrigation Project** to share risks but also to provide performance incentives. The West Bengal Major

Irrigation Project is investing in the modernization of the 400,000-hectare Damodar Irrigation System. A key innovation that the project is introducing to improve the quality of irrigation service delivery is the outsourcing of performance-based operation and maintenance of canals to private irrigation service providers. These providers will also promote the installation of pressurized micro-irrigation systems.

**Public support for small-scale collective and individual irrigation.** Public investment in several countries has specifically supported the modernization of small-scale collective and individual irrigation. A notable example of public support to very small-scale individual and communal irrigation was the **Niger Private Irrigation Promotion Project**. The project successfully used matching grants to support the modernization of thousands of smallholder irrigation operations and built sustainable institutions for further development and financing of irrigation modernization.

**Farmer-led irrigation development (FLID)** for financing of small-scale and individual private irrigation is particularly relevant to smallholders and extremely resource-poor farmers whose only route out of poverty is to improve water management in their farming operations but who lack access to the knowledge, markets, and finance to bring about these changes. An example of farmer-led irrigation development can be found in Uganda. The **Uganda Inter-governmental Fiscal Transfer Program** is a local government-run program to facilitate smallholder farmers' access to partial subsidies for micro-scale irrigation equipment. This program is coupled with extensive outreach and sensitization of local financing institutions to facilitate access to loans to cover the farmers' co-payment. A digital app (IrriTrack App) for the program provides financial and technical information (e.g., price estimates) to enable decision making at the individual farmer's level. FLID diagnostics can ensure that bulk water systems are integrated effectively in irrigation systems installed by farmers. A systematic approach to supporting this sector through FLID can deliver benefits that surpass those currently delivered by public large-scale irrigation schemes. These benefits include food security (SDG2), generating employment and contributing to economic growth (SDG8), addressing impacts of climate change (SDG13), and ensuring sustainable management of water resources (SDG6). FLID may also be used as a tool for the private sector to connect with farmers to contribute to economic growth and other benefits, and could also be used by farmers to connect with equipment suppliers and possibly financiers to amplify productivity and the impact of irrigation.



**Green bonds have been used to support irrigation modernization efforts.** Globally, green bonds are now mobilizing US\$270 billion a year, with China and India – and the WB – among the leaders. The funds raised by the WB through green bonds have been used to support 111 projects around the world, largely in renewable energy and efficiency (33 percent), clean transportation (27 percent), and agriculture and land use (15 percent). In irrigation modernization, for example, green bonds helped finance the 2020 Turkey Irrigation Modernization Project, as well as irrigation efficiency and water resources management within the 2018 Brazil Sergipe Water Project.

**Rice is the largest GHG-emitting crop, generating 48 percent of total crop emissions, and is the most water-intensive grain crop. Minimizing methane emissions from rice cultivation is important to climate change mitigation globally, creating an opportunity to mobilize climate finance for irrigation efficiency projects.** Water-saving technologies such as Alternate Wetting and Drying are able to reduce methane emissions by 50 percent and water use by 30 percent without reducing yields, contributing to a country's NDC goals and benefiting individual farmers who could sell credits on voluntary carbon markets. In addition, research and piloting have shown that “package solutions” are the most cost-effective way of reducing GHG emissions from rice production. Other solutions supporting low-carbon rice production include rice paddy methane emission reduction, fertilizer reduction, water use efficiency improvements, livestock GHG emissions reduction, aquaculture GHG emissions reduction, agricultural machinery energy saving, farmland carbon sequestration, integrated straw management, and renewable energy development and utilization. Countries like China are prioritizing these solutions, with reduction of methane emissions from rice paddies heading the list. From the farmers' perspective, however, there are challenges to adopting the package solutions, especially the water-saving technologies, given lack of capacity, lack of incentives, and system constraints (such as flexible and well-functioning irrigation systems).

### 3. WATER SUPPLY AND SANITATION

**WSS services cover centralized and decentralized water treatment and distribution; wastewater collection and treatment; sludge and septage treatment and disposal; onsite sanitation at the household level; customer management; and billing.** While in most countries WSS is the responsibility of municipal governments, and services are delivered by city-level public utilities, some countries have regional or national utilities. Utilities often have responsibility for

both water and sewerage services. However, there is considerable variation across countries in the allocation of responsibility for services in informal and peri-urban areas, where residents often rely on off-grid services and delivery by microenterprises, self-provisioning or shared public water supply and sanitation facilities. Household-level sanitation solutions and septage management are often provided by under-regulated small-scale private providers – or not provided at all. This sub-sector has a clear revenue stream from water and wastewater tariffs and there is a long track record of private sector management and finance in some developing countries. Nonetheless, there is considerable political and social resistance to private sector involvement in water services in certain countries and perceptions of high political and regulatory risks on the part of private investors.

Mobilization of private sector finance and expertise for corporatized water and wastewater utilities has been tested in many countries and can be achieved through multiple channels. In countries with relatively more mature capital markets, service providers which have achieved or are moving towards creditworthiness can access **commercial debt from domestic banks and access domestic bond markets.** The WB has supported the development of domestic commercial lending to water utilities through sustained **technical assistance to improve creditworthiness and de-risking instruments** for local banks. This is demonstrated in the WB's long engagement with Uganda's National Water and Sewerage Corporation (NWSC), which began in 1984. With the World Bank's and other donors' technical assistance, the Government initiated reforms via a series of performance contracts with NWSC beginning in 2001, which led to improving technical and financial performance, and finally a creditworthy utility. NWSC received an AA national credit rating in 2018. By 2022, NWSC has raised an aggregate of UGX145 billion (US\$40 million) in domestic borrowing from three local banks. The National Urban Water Supply (NUWAS) program in Indonesia shows how a national program to mobilize commercial finance can be structured to provide incentives for utilities at different stages on the journey to creditworthiness to move towards commercial financing (see appendix C).

High-performing government-owned utilities can raise **equity finance through partial divestiture.** This includes utilities owned by national, regional, and municipal governments. SABESP, the São Paulo water utility, is an example of a high-performing listed public utility, with replication of the model by many other utilities, particularly in Latin America and Asia. The WB has supported a number of **utility transformation programs** which have led to successful initial public offerings and partial divestitures. These domestic

finance options require a strong enabling environment, a mature local capital market, and are open to utilities which are at or close to achieving creditworthiness.

At a different scale, **microfinance** directed to water service microenterprises and households to install sanitary equipment can play an important role in supporting the extension of access, particularly in informal and rural areas in lower-income countries. Donors and philanthropic associations have successfully supported microfinance schemes with a water focus in Sub-Saharan Africa and South Asia, among other areas, and there is potential for further scale-up. The WB has a role in supporting pilot programs and blended finance arrangements. One example is the support provided by the WB to K-Rep Bank, a Kenyan microfinance bank, to help rural and peri-urban communities access loan financing for improving and expanding small-piped water systems. Technical assistance was provided to develop bankable loan applications and supervise project implementation. In 2010, the program was scaled up with support from the EU. There is considerable potential to ramp up microfinance in the water sector with increasing awareness and understanding on the part of microfinance and water professionals.

Private sector participation (PSP) in water and wastewater services is well established and a wide range of PSP models have been developed which can be matched to local objectives and conditions. PSP contracts for WSS can be broadly classified along two axes: whether the private party provides financing or not; and the scope of the private party's involvement, from managing the entire utility service chain down to managing a particular service or asset.

**“Capital-light” models of PSP** (those in which the private party does not provide finance) mobilize private sector management expertise and technologies and can help to improve the utility's operating and financial performance. Non-revenue water (NRW)-reduction contracts are particularly promising and the WB has developed a model performance-based NRW reduction contract which is being employed in several countries. Capital-light contracts are suitable for utilities of different scales and levels of creditworthiness, where the priority is to increase operating and technical efficiency. However, in order to maximize the impact of these contracts on utility performance, they should form part of a robust long-term strategy of the utility to reduce NRW throughout the entire network (not restricted to a pilot or demonstration area) and be accompanied by a plan to sustain improvements. The WB can provide technical assistance in project design and development and de-risking instruments.

**PPP contracts incorporating private financing** have been employed for developing country WSS with varying degrees of success. One model which has proven attractive and financially sustainable in a wide range of contexts is the BOT-type contract for standalone water and wastewater treatment, including water reuse and desalination. While these contracts are often for greenfield assets, they have also been successfully adapted to rehabilitation and extension of existing assets. These have considerable potential for replication in countries at different levels of development. Contracts in which recycled municipal wastewater is sold to industrial customers have a robust revenue stream and are particularly suitable for replication in locations with high industrial demand and where direct abstraction of surface or groundwater by industry is restricted. The WB has provided support in the development of numerous individual reuse projects and is providing systematic support through the ReWater initiative.

Concession contracts, in which the private party takes on responsibility for most or all of the capital investment program, are suitable for large cities where end-user tariffs allow for full cost recovery and local currency financing is available at affordable pricing and tenure, based on appropriate risk allocation framework and credit enhancement. This model remains attractive to governments and private parties, as the successful award of large concession in Brazil in recent years demonstrates.

PPPs for rural water supply are less common generally due to the small scale and low customer density of rural systems. In some cases, these can be overcome by bundling several small systems under a single contract and using a blend of public and private finance to extend sanitation coverage or meet other social objectives. The WB-supported Sichuan WSS PPP project in Jingyang, Sichuan, China, provides an example of a rural PPP which provides a point of reference for other projects covering rural areas.

The potential for private capital mobilization for WSS is evident when the enabling environment exists. However, it is important to note that the process of creating the right conditions may take decades of sustained engagement by the WB and other parties, but transforms access, service quality, and sustainability when it is achieved. Nevertheless, there may be other benefits obtained in the journey towards creditworthiness and PCM. Improvements in technical and financial performance are often accompanied by improved services to customers, leading to better revenue collection, and improved operational efficiency leading to lower costs, resulting in a lower fiscal burden.

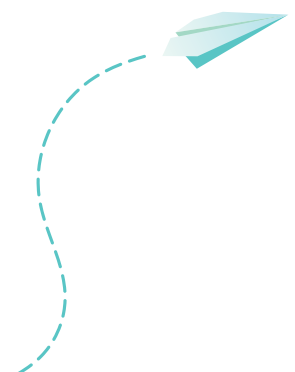
#### 4. BUILDING RESILIENCE TO FLOODS AND DROUGHTS AND REDUCTION OF GHG EMISSIONS

**Sound water resource management, including sufficient water storage, is essential for countries to cope with the mounting risks of flood and drought.**

Freshwater is stored in natural water bodies above and below ground and in dams, retention ponds, and other built infrastructure. Traditional reliance on grey infrastructure will not be adequate to meet the challenges of increased water demand and greater variability in rainfall. As a result, integrated approaches to managing storage in the watershed which combine green and grey infrastructure are starting to be adopted. The community-led groundwater management program Atul Bhujal Yojana in India, supported by the WB, provides an example of how natural groundwater storage can be collectively managed to prevent over-exploitation and raise resilience to climatic variability.

**PPPs and green bonds mobilize additional financing streams and provide efficiency incentives for grey and green capital investments** in urban flood risk management projects and have the potential to be replicated and scaled up. The appropriate financing mix depends on the affordability and collectability of associated revenue streams from direct and indirect beneficiaries and land value capture. These options include establishing special project vehicles that can issue dedicated bonds marketed to institutional investors, pooling investments across project beneficiaries and promoting new asset-backed instruments, developing blue assets for the green bond market, and engaging insurance companies in developing appropriate products, along with the establishment of flood risk insurance facilities to develop a nationwide flood disaster risk pool.

**At the national scale, financial instruments to address disaster risk – such as catastrophe bonds, parametric insurance, and state risk pooling – provide critical access to finance to recover and rebuild rapidly after flood and storm events.** Parametric insurance policies, which pay out as soon as specific trigger events occur, rather than requiring an evaluation of the precise cost of the damage, have become accessible in developing countries since the 2000s. Inter-state risk pooling arrangements provide participating states with better access to insurance markets, lower risk premia, and lower transaction costs in seeking and negotiating coverage in insurance markets. The WB supported the development of a pooled risk facility for Caribbean states, the Caribbean Catastrophic Risk Insurance Facility, which launched in 2007 and offers hurricane, excess rainfall, and earthquake insurance. Pooled insurance has potential for adoption among other groups of countries facing similar but independent disaster risks.



# APPENDIX B: DEMAND AND SUPPLY SIDE ASSESSMENTS AND FINANCING SOLUTIONS

## 1. DEMAND-SIDE ASSESSMENTS AND FINANCING SOLUTIONS

Demand-side assessments should cover performance/connectivity, finance, and governance, as outlined below.

◆ **Performance/connectivity assessments** are to be tailored to the intended scope of the assessment based on data availability (e.g., data on WSS SOE/ utility performance; WRM performance; irrigation services (public/farmer-led) performance; and water-related disasters and other risk management data).

◆ **Finance** is a core focus of this WB strategic framework. Data for a set of water- and non-water-sector-specific indicators are gathered and analyzed.

Data from existing reliable datasets can be used wherever possible. Relevant water sector finance indicators are shown in Tables B1 and B2.

◆ **Governance:** This assessment would include a rapid review of relevant policies and laws; institutions (allocation of authority across government departments/agencies and between tiers of government); regulation (economic and environmental); and resilience (risk-based, adaptive

TABLE B1: Water Sector Finance Indicators (adapted from InfraSAP2.0 Finance Pillar)

FUNDING CONSTRAINTS	ISSUES	INDICATORS
<b>Low revenues</b>	<ul style="list-style-type: none"> <li>Tariffs below cost recovery</li> <li>Subsidy reform potential</li> <li>Low revenue collection</li> <li>Poor revenue mobilization</li> <li>High costs</li> </ul>	<p><i>By municipality/region/country as appropriate</i></p> <ul style="list-style-type: none"> <li>Average water tariff in major cities</li> <li>Standardized household bill estimate (based on 20m<sup>3</sup>/month consumption)</li> <li>Tariff structure (volumetric, increasing block tariff (IBT) etc., IBT consumption thresholds)</li> <li>Billing and collection rate (domestic)</li> <li>Billing and collection rate (non-domestic)</li> <li>Non-revenue water for major cities</li> <li>Operating expenditure/m<sup>3</sup></li> <li>Tariff revenue to operating cost ratio %</li> <li>Operating cost subsidy</li> <li>Water expenditure as % of local government expenditure</li> <li>Local government expenditure: tax revenue ratio</li> <li>Local government debt ratio</li> </ul>
<b>Budget expenditure</b>	<ul style="list-style-type: none"> <li>Limited budget execution (reflecting capacity constraints and implementation delays, weak public investment management; tend to be worse at subnational level)</li> <li>Limited budget allocation</li> <li>Constrained fiscal space</li> </ul>	<p><i>By municipality/region/country as appropriate</i></p> <ul style="list-style-type: none"> <li>Infrastructure investment               <ul style="list-style-type: none"> <li>On budget (US\$, as % budget) (central/regional/local government) (debt/equity; local currency/forex)</li> <li>Via government-owned service provider (debt/equity; local currency/forex)</li> <li>Via PPPs (debt/equity; local currency/forex)</li> </ul> </li> <li>Estimate of investment required</li> <li>Executed infrastructure spending (% gov expenditure)</li> <li>Share of OPEX/CAPEX in approved total expenditure</li> <li>Maintenance expenditure per unit of service provided</li> <li>Ratio of executed to approved spending</li> </ul>

**TABLE B2: InfraSAP 2.0 Finance Pillar**

FUNDING CONSTRAINTS	ISSUES	INDICATORS
<b>Low revenues</b>	<ul style="list-style-type: none"> <li>• Tariffs below cost recovery</li> <li>• Subsidy reform potential</li> <li>• Low revenue collection</li> <li>• Poor revenue mobilization</li> <li>• High costs</li> </ul>	<ul style="list-style-type: none"> <li>• Subsidies as % of GDP</li> <li>• Subsidies as % of approved spending</li> <li>• Composition of subsidies</li> <li>• Government wages as % of GDP/total government spending</li> <li>• Ratio of tax revenue to GDP</li> <li>• Revenue collection ratio</li> <li>• Tariff revenue to operating cost ratio %</li> </ul>
<b>Budget expenditure</b>	<ul style="list-style-type: none"> <li>• Limited budget execution (reflecting capacity constraints and implementation delays, weak public investment management; tend to be worse at subnational level)</li> <li>• Limited budget allocation</li> <li>• Constrained fiscal space</li> </ul>	<ul style="list-style-type: none"> <li>• Infrastructure investment on budget (US\$, as % budget, GDP)</li> <li>• Infrastructure investment via SOEs</li> <li>• Infrastructure investment via PPPs</li> <li>• Infrastructure investment via divestitures</li> <li>• Investment required</li> <li>• Executed infra spending (% GDP)</li> <li>• Spending rigidity index</li> <li>• Public debt to GDP ratio</li> <li>• Share of OPEX/CAPEX in approved total expenditure</li> <li>• Maintenance expenditure per unit</li> <li>• Ratio executed: approved spending/ capital spending</li> </ul>
FINANCIAL CONSTRAINTS	ISSUES	INDICATORS
<b>International finance</b>	<ul style="list-style-type: none"> <li>• Country risk</li> <li>• Off-taker risk</li> <li>• PPP financing constraints</li> </ul>	
<b>Domestic finance</b>	<ul style="list-style-type: none"> <li>• Banking sector constraints</li> <li>• Capital market constraints</li> </ul>	

policy and planning). The PIR Tool has been developed for WSS and would need to be expanded to include governance of WRM, Water in Agriculture, and water-related disaster risk management. Qualitative data on governance could employ a standardized questionnaire based on the Water GP’s PIR Tool.

**Water and sanitation services and various WRM and irrigation competencies and services are devolved to the sub-sovereign or municipal level in many countries, leading to wide within-country variation in performance, finance, and governance.** Reliability and completeness of data are hence also likely to be major challenges, with respect to the assessment scope across various water sub-sectors. Further analysis needed would be recommended to key counterparts depending on the country and local-level needs.

**Similar to InfraSAPs, the demand-side analysis will seek to identify evident inefficiencies or inequities in allocation of funds.** As much as possible, the analysis will examine how expenditure in the water sector is

distributed among on-budget and off-budget vehicles, as well as across sub-sectors, functional categories (capital versus operations and maintenance), tiers of government (national versus subnational) and geographical areas, and how discrepancies arise between budgeted and final expenditures. Patterns of public and private investment in infrastructure will be compared. It will assess the potential to improve creditworthiness of sector entities. This will entail examining whether tariff levels and structures, subsidy levels, and subsidy eligibility can be restructured to raise revenues while being consistent with affordability and social constraints. It will also consider the scope to improve financial performance through improvements in billing and collection rates and operational efficiency.

Considering the complexities and costs that the due diligence, creditworthiness analysis, and data availability could pose for national-level analysis if undertaken for all water utilities/service providers, the idea would be to develop a high-level financial model, based on the detailed analysis of selected water utilities

or utility clusters representative of individual countries, and extrapolating this to an aggregate national-level projection (using unit costs and other proxies). A national-level financial model would aim to cover the points below.

- ◆ **Costs associated** with reaching different sector objectives, including financial costs. This would include estimated CAPEX as well as annual OPEX.
- ◆ **Funding sources** (3Ts: Tariffs (or service fees), Transfers, and Taxes) and available revenues on an annual basis to fund both capital and operating expenditure.
- ◆ **Funding and financing gap.**
- ◆ **Financing sources** for water infrastructure development, including the potential for diversification of financing sources (e.g., municipal finance, climate finance) and access to local currency debt and equity markets.
- ◆ **Efforts towards ensuring financial sustainability and creditworthiness** of the sector/project; service provider (national, regional, or local government-owned corporatized entities); and/or farmer access to credit.
- ◆ **Scope for PPPs**, including regulatory framework, political will, and investor appetite.
- ◆ **Affordability.**
- ◆ **Incentive framework** and scope for improving financial performance through efficiency improvements. In addition, the Assessment includes recommendations on engagement strategies for relevant groups of private financiers.

## 2. SUPPLY-SIDE FINANCING SOLUTIONS

The supply-side assessment involves identifying financing options and assessing their suitability to local conditions. Such solutions may include a combination of capital markets instruments, contingent financing mechanisms, and blended financing and risk transfer instruments, such as those described under Strategic Direction 3.

This section highlights specific WB and other financing solutions. Given the limited liquidity and the high cost of capital in developing countries, multilateral financial institutions like the WB can play an important role in de-risking investments and providing backstops, as well as providing the concessional and semi-concessional financing needed for the public sector components of water projects.

### 2.1 Debt Instruments – Domestic Capital Markets

Provided debt levels and macroeconomic conditions

are manageable, and issuers are creditworthy, debt instruments may be issued to fund water sector projects and investments. Where possible, funding should be sourced in the domestic market to avoid currency and exchange rate risks. Debt can be issued in the form of syndicated loans, structured through local commercial banks and for mid-term tenors, or bonds for longer terms and larger sizes, which may attract a broader range of investors such as pension funds, asset managers, and insurance companies. However, the issuance of domestic debt securities is constrained by the level of development of the local capital markets. In the case of many developing countries, the local savings pool is limited. Additionally, the sovereign is often the main, and in many cases, the only issuer and it drains most of the available liquidity in the market. In either case, moving forward with debt issuances is highly case specific, depending on the level of market development and institutional readiness (see Box B1 on pre-requisite factors). Sustainable finance/ESG investment instruments may be suitable for funding water-related investments. Such instruments may find favorable investors in more advanced middle-income countries with relatively well-developed institutional investors and deep capital markets.

### 2.2 Debt Instruments – International Capital Markets

International capital markets may complement domestic markets as a source of funding to the water sector. In some cases, it is the only source of long-dated funding. While the same instruments, loans and bonds are available as in the domestic market, issuing debt in international markets involves considerable costs in terms of fees for financial advisors and underwriters, legal teams, and credit-rating agencies. The challenge with external financing for the water sector is that issuing in hard currency in international capital markets results in a mismatch with revenues, which are usually in local currency, and exposes issuers to exchange rate risks in the event of depreciation. Where currency derivative instruments are available, hedging foreign currency funding is strongly recommended, but this depends on costs. Green, blue, and sustainability-linked instruments may be suitable for issuance by developing country sovereigns or sub-sovereigns to fund water sector projects. Assuming the market conditions are favorable to such issuances, these thematic bonds can support diversification of investors, attract new investors into the market, and potentially offer slightly better financial terms. However, it should be noted that such instruments also have more elaborate reporting requirements, including the requirement for identified eligible projects, inter-governmental coordination, and additional compliance costs. The WB provides

## BOX B1: Framework for Debt Capital Market Financing Options – Thematic Bonds

- 1. Fiscal Conditions (determinant factors):** Risk of overall debt distress, risk of external debt distress, WB non-accrual status, debt as a percentage of GDP, debt composition as a percentage of GDP (domestic and external), external debt composition by type of creditor, current account balance as a percentage of GDP, government balance as a percentage of GDP, government revenues composition (grants and non-grants).
- 2. Domestic Capital Markets (determinant factors):** Sovereign access to debt funding in the domestic market, sovereign curve, characteristics of previous sovereign issuances (total issued, number of bonds, tenors, whether any thematic bond), sovereign investor base (banks, pension funds, asset managers, environmental, social, and governance (ESG) funds, others), sovereign secondary market dynamics, regulatory environment, financial soundness of the market, other issuers in the domestic market, investor's interest in sustainable bonds, ESG issuances by the private sector.
- 3. Access to the international capital markets (determinant factors):** Sovereign credit ratings (or potential for ratings and pathways to a rating), sovereign curve in US\$, characteristics of previous sovereign issuances (total issued, markets of issuance, currencies, number of bonds, tenors, whether any thematic bond), sovereign investor base (banks, pension funds, asset managers, ESG funds, others), and secondary market dynamics.
- 4. Government's capacity (determinant factors),** as evidenced by indicators such as government effectiveness (captures perceptions of the quality of the civil service, the quality of policy formulation and implementation, and the government's commitment to such policies), political stability and absence of violence/terrorism, regulatory quality (ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development), rule of law, and control of corruption, all of them published by the World Bank's Worldwide Governance Indicators project.
- 5. Policy framework (not determinant but informs the analysis):** Thematic debt framework and applicable regulations in place, ability to identify green assets/expenditures (green taxonomy, climate budget tagging), alignment of thematic bonds to debt management strategy, political commitment to the sustainable agenda (such as a sustainable finance strategy).
- 6. Focus of the financing needed (not determinant but informs the analysis):** Whether project-based (e.g., use of proceeds), budget support, or others.
- 7. Financial instruments of interest (not determinant but informs the analysis):** Green, social, sustainability, and sustainability-linked bonds, and green and sustainability-linked loans.
- 8. Financing features (not determinant but informs the analysis):** Onshore or offshore issuance, local or international currency, needed tenor, pricing, eligible targeted investments.
- 9. Potential investors (not determinant but informs the analysis):** Pension/wealth funds, asset managers, ESG funds, debt funds, central banks.
- 10. Possible donor support (not determinant but informs the analysis):** WB, development banks, bilaterals, non-governmental organizations.
- 11. Costs and benefits of instruments (not determinant but informs the analysis):** Transaction costs, risks, scalability, complexity, and ability to maximize financial and other benefits to the issuer.

advisory support for such transactions and may be able to mobilize donor funds to cover costs and potentially subsidize elements of the issuance for thematic bond issuances both in domestic and international markets.

### 2.3 Risk Retention Instruments – WB Investment Project Financing (IPF) with Deferred Drawdown Option (IPF DDO)

The World Bank's IPF DDO instrument is a contingent financing line that provides immediate liquidity for earmarked expenditures when a trigger event occurs. Financing for those earmarked expenditures is

committed and ringfenced and can only be disbursed if a specified trigger event occurs. This instrument can be used to backstop water sector investments by the private sector – to cover any potential losses agreed upon upfront. The triggers could include sector-specific issues, including unexpected loss of revenues, climate impacts (e.g., droughts), and foreign exchange volatility. The IPF DDO can then provide liquidity to the water utility to cover the related losses. This liquidity backstop can provide comfort to investors and lenders and may even enhance the credit quality of the utility. The IPF DDO allows for a 100 percent immediate

drawdown possible at any time up to five years, based on agreed-upon triggers (up to eight years, if there is a project renewal, for which no fee would be charged). There is no cap on the amount drawn, but partial drawdowns are possible and all applicable IPF policies apply. The client pays a 50 basis points (bps) standby fee to have the line available (instead of the standard 25 bps commitment fee for IPFs), and a tailored repayment schedule for each drawdown is possible, subject to prevailing policy limits. The applicable lending rate (i.e., reference rate, spread, and maturity premium level) will be the prevailing one at drawdown. The IPF DDO has been used in several cases so far, most recently to provide a dedicated liquidity backstop to the deposit insurance fund of Romania.

## 2.4 Payment Guarantees and Loan Guarantees

◆ **Payment Guarantees:** These instruments cover payment obligations to privately owned project companies or special purpose vehicles where the default of such obligations are caused by failure of a public sector contractual counterpart (e.g., utility or SOE) to meet its contractual payment obligations related to a project. In India, the WB has provided payment guarantees to backstop the government's payment obligations for several Hybrid Annuity Model PPP investments in wastewater treatment (see appendix C, First and Second National Ganga River Basin Project). The WB provided a Partial Risk Guarantee of US\$78 million to the government of Albania to facilitate the privatization of their power distribution system operator in 2009 by enabling the government and CEZ of the Czech Republic as the new buyer to implement the privatization agreement under the agreed regulatory framework. IFC advised the Albanian government on the privatization including on unbundling the company, structuring the transaction, and executing an open, transparent, and competitive bidding process.<sup>60</sup>

◆ **Loan Guarantees:** A loan guarantee is a credit enhancement mechanism for mobilization by a government or an SOE (bonds and loans). It is an irrevocable promise to pay principal and/or interest up to a pre-determined amount. The payment guarantee product allows the guarantor to use its strong credit rating to help borrowers diversify their sources of funding, extend maturities, and obtain financing in the currency of their choice, including local currency. The Bitá Water Project is the first water project to use a WB guarantee product of this type which helped mobilize private commercial financing of around US\$1 billion, while improving the borrowing terms for the government of Angola. The WB guarantee is

structured to mitigate the debt service default risk of the Government of Angola on commercial financing and acts as a rolling guarantee over the life of the WB Guaranteed Loan (see appendix C). There are several examples of IFC's guarantee transactions. Among them, the guarantees to the Municipality of Guatemala City Project and to the City of Johannesburg are worth highlighting as they involve supporting these municipalities to access commercial financing to invest in key infrastructure sectors which include water supply and sanitation.

## 2.5 Development Financing and Blended Financing

The WB and other MDBs, bilateral donors and development financial institutions (DFIs) offer concessional (e.g., IDA) and semi-concessional (e.g., IBRD) financing that can be catalyzed for water sector projects. WB funding can come in the form of lines of credit, contingent financing, guarantees at a project level, or earmarked budget support to underpin policy and regulatory reforms at the sector level. Such financing, which is typically highly concessional compared to the water utility's cost of funding, can be applied to cover a key risk, such as the construction of a water treatment plant, and commercial investors can then come in to finance the operations and maintenance phase.

As part of a package to catalyze and mobilize private capital, blended finance has attracted substantial interest in recent years. The blending of funds on commercial and concessional terms can make projects financially viable that would otherwise not be; support high-impact transformative projects; and help create new markets. Blended finance solutions have potential for broad adoption in the water and wastewater sectors given their significant investment needs. Such structures can make water and wastewater projects in developing countries investable at attractive terms, through the provision of viability gap funding, coupled with de-risking instruments through a wide range of credit-enhancement products.

An enabling environment is critical to facilitate the access to blended finance in the water sector. Key components of such an environment may include strong government interest and ownership, a clear regulatory and legal framework, water sector and tariff reforms, enhancement of creditworthiness of the water utility or water off-taker, government guarantees and financial support where required, and availability of risk mitigants and credit enhancement/political risk insurance, such as MIGA guarantees, potentially supported by the use of an IDA Private Sector Window/MIGA Guarantee Facility. Governments can also offer temporary tax exemption or relief, where appropriate. These solutions can create a



conducive enabling environment and help attract both concessional funds and private sector investment in the water sector.

Alternatively, a blended structure can be developed for grant funding to cover a key portion of risk within a project and the semi-concessional funding can be blended with commercial financing to cover the larger portion of the water project. This is in essence the WB co-investing in projects alongside private investors while taking different risks. For example, the WB would take on the credit risk of the issuer or borrower, whereby if the issuer becomes insolvent for reasons not related to the project's performance, the loan or investment could become subject to a "haircut", whereas the private investor would take on the specific performance risk of the project, i.e., those investors would be subject to losses only if the project fails to produce the projected amount of revenue in the established timeframe. If, for example, a government freezes tariffs which would jeopardize the project's performance, this would impact the WB loan, without impacting the investors. However, if the project construction is delayed or if management fails to prevent leakages or waste, private investors will take the resulting associated losses.

## 2.6 Risk Transfer Instruments – Catastrophe Bonds and Insurance

A catastrophe bond (CAT bond) is an insurance contract with investors. Similar to insurance, the insured party receives a payout when a disaster event meets certain pre-defined criteria, with no obligation to repay the payout.

In a typical CAT bond structure, the entity seeking insurance enters into an insurance contract with a special purpose vehicle (SPV) and pays premiums to the SPV reflecting the risk associated with the insured event. The SPV then issues bonds to investors. The proceeds of these bonds (principal) are invested in highly rated securities that are held in a collateral trust. Investors receive the return from these investments along with the premiums paid by the insured entity as periodic coupons.

In the case of a WB intermediated CAT bond, there is no SPV, and instead, the WB enters into the insurance contract with the client and issues bonds to investors. If a catastrophe event is triggered during the life of the bonds, the bondholders lose their principal, and the funds in the trust are transferred as an insurance payment to the government. If no catastrophe event is triggered, the investors get back the principal at the expiration of the bond. Some classes of investors are satisfied to take this risk in exchange for a higher than

market rate of return, and since CAT bond returns are not correlated with global financial market movements.

A CAT bond or insurance-style instrument could be developed in order to raise funds from investors who are comfortable in taking the risk of a water project being impacted by a climatic event. In this case, the investor would only suffer a loss in case the project's performance is compromised due to the occurrence of predetermined natural disaster-based events. This would insure the water utility against unforeseen shocks and assure investors that such shocks are financed through pre-arranged instruments. The sovereign could provide the cover to the water utility through such an issuance or insurance if the conditions or capacities of the utility are not sufficient.

## 2.7 Viability Gap Funding

When project revenues (normally from user fees) are insufficient to fully recover the costs of a project, including the costs of finance, the project is said to have a viability gap. Governments may want to provide subsidies to fill this gap and ensure that a project, developed through a PPP or other mechanism, is attractive to private investors. When governments provide these subsidies through up-front cash contributions to the project, they are called viability gap payments and the funds set up to provide these payments are called viability gap funds.

The Government of India has established a viability gap funding scheme with the objective to support PPPs in the infrastructure sector. Wastewater treatment and water supply are among the sub-sectors that are targeted to address bankability issues and lower revenue streams. Under this scheme, the central government will provide up to 30 percent of the total project costs as viability gap funding and the state governments may provide an additional support of up to 30 percent<sup>61</sup> (see appendix C, First and Second National Ganga River Basin Project). The National Infrastructure Fund Trust (FONADIN) set up by the government of Mexico is another example of a viability gap fund to invest mainly in infrastructure projects including telecommunications, transportation, water, and tourism. According to a study conducted by the Asian Development Bank in 2016, these viability gap funds have been effective in mobilizing private capital investments in eligible sectors. In India, between 2005–2009, investments in infrastructure increased by more than 400 percent. Similarly, FONADIN, within the first year of its operation, mobilized US\$7 of private finance for every dollar of subsidy and 60 percent of total capital costs that received direct subsidies came from private sector investments.

# APPENDIX C: COUNTRY-LEVEL CASE STUDIES

## 1. FIRST AND SECOND NATIONAL GANGA RIVER BASIN PROJECT, INDIA

### Project Objectives

The *Namami Gange*, a flagship program of the Indian government launched in 2015, is an integrated river basin conservation program that aims to reduce river pollution by increasing sewage treatment capacity, rejuvenate the river system through surface water clean-up and river-front development, and restore the Ganga's ecosystem services through bio-diversity conservation.<sup>62</sup>

### Background and Context

The National Mission for Clean Ganga, under the Ministry of Water Resources, River Development and Ganga Rejuvenation, is overseeing the roll-out of the *Namami Gange*, including sewerage treatment and collection infrastructure investment, which is supported by a US\$1 billion WB loan approved in 2012 and by a second loan of US\$400 million approved in 2020. As of the end of 2022, of 408 sanctioned sewage treatment plants and sewerage network projects under the Ganga clean-up, 228 have been completed, 132 are in progress, and the remainder are under procurement.<sup>63</sup> One of the key contributors to this success story is the sustainable financing model used for the construction, maintenance, and operation of new wastewater infrastructure through a Hybrid Annuity PPP model. This Hybrid Annuity PPP model has been supported by the two WB loans as well as a WB payment guarantee of up to \$19 million to backstop the government's payment obligations for several of these PPPs. This is the first-ever WB Guarantee for wastewater treatment and the first in the water sector in India and is expected to help free up public resources and attract private investment.

### PPP Structure

Initially, private sector involvement was not considered for the sewage treatment plant and network projects, but progress through traditional government procurement was limited and slow. Realizing the magnitude of financial, technical, and operational challenges involved in building and operating the new sewage treatment plants and the limited technical capacity of the public sector, the Government of India collaborated with WB, IFC's Transaction Advisory Unit, and 2030 WRG experts

to develop an innovative PPP structure tailored to local conditions, known as the Hybrid Annuity Model.

Under the Hybrid Annuity Model, the concessionaire mobilizes 100 percent of the investment, of which 40 percent is reimbursed during construction and upon commissioning, and the remaining 60 percent of capital expenditure is repaid to the private operator through annuities over a 15-year period, in addition to performance-based operation and maintenance payments. The arrangement constitutes a paradigm shift in India's water sector, from a construction-oriented approach to an outcome-based one. It creates incentives for private companies to deliver well-constructed sewage treatment plants, develop a financially sustainable operation and management system that ensures profitable returns, and further motivates the development of alternate revenue channels through the sale of treated wastewater to adjoining municipalities or other stakeholders.

### Results Achieved and Private Investment Mobilized

The government had originally envisaged 15-year BOT contracts, with payments to be disbursed through local governments, but private companies deemed the engagements as too risky, due to the poor track record of municipalities in fulfilling off-take agreements. To overcome this problem, IFC, as PPP transaction advisor in the states of Uttar Pradesh and Uttarakhand, proposed a model in which payments were made directly by the central government. Further, operators were allowed to supplement their revenue in innovative ways, such as through the sale of treated wastewater, biogas generation, or power generated from biogas. For example, a new sewage treatment plant in the city of Mathura, Uttar Pradesh, would provide treated wastewater for cooling India Oil Corporation refineries, generating revenues for the sewage treatment plant, and reducing tap water consumption by 20 million liters of water per day (mld).

The new contract terms were successful in attracting private sector interest. The first pilot projects in Haridwar and Varanasi saw six and eight bids respectively, from domestic and international firms (in contrast, government

sewage treatment plant projects previously attracted two to three bids).

With successful completion of the first three pilots in Haridwar, Varanasi, and Mathura, a series of similar PPP projects were approved in more than 30 cities along the Ganga for greenfield, rehabilitation, and upgrading of sewage treatment plants and sewerage networks. Financial support from the WB for these projects has mobilized an additional US\$500 million in private investment to date.<sup>64</sup>

### Replication and Scaling

The first three projects in Haridwar, Uttarakhand (82 mld, expected cost: US\$18.6 million), Varanasi, Uttar Pradesh (capacity: 50 mld, expected cost: US\$18 million) and Mathura, Uttar Pradesh (67 mld secondary treatment, 20 mld tertiary treatment, 17 km network, capital cost: US\$30.7 million) have been completed successfully and were operating by end-2021. The lead partners in the concession vehicles for the three projects are all domestic companies.

Following the successful commissioning of the pilots, further projects based on the hybrid annuity model scheme have been prepared. According to the National Mission for Clean Ganga, 25 projects had been awarded with a value of over US\$1 billion as of mid-2022. Overall, the Hybrid Annuity Model has opened new markets for private investment, ensuring effective and timely outcomes, and delivered environmental and public health benefits.

## 2. AS SAMRA WASTEWATER TREATMENT PROJECT, JORDAN

### Project Objectives

The AS Samra Wastewater Treatment Project involves the construction, expansion, operation, and maintenance of the existing wastewater treatment plant at AS Samra, around 30 miles northeast of Amman by Samra Wastewater Treatment Plant Company Ltd (the Project Company) on an extended 25-year BOT basis. The existing project was designed to be phase I of the AS Samra Wastewater Treatment Project, and phase II of the project was a planned expansion of the plant. The Project's major objectives were to increase the wastewater treatment capacity by 37 percent (from 267,000 m<sup>3</sup>/d to 365,000 m<sup>3</sup>/d) to meet the growing needs of the population over the period 2015 to 2025, and to increase the sludge treatment capacity by 80 percent.

### Background and Context

Jordan is one of the most water-scarce countries in the world. Water demand significantly exceeds supply. Water

scarcity, coupled with the rising population and the influx of refugees, poses serious challenges for the country. At the same time, the use of untreated wastewater for irrigation or its discharge into rivers bodies has raised environmental and health concerns. Therefore, water supply and wastewater treatment – including the reuse of treated wastewater – is a top priority for Jordan.

MIGA has supported both the existing operations and expansion of the AS Samra Wastewater Treatment Plant to help address the country's major environmental and health issues and water deficit. This was supported through political risk guarantees to cover US\$13.1 million of equity investments for expansion from Suez Environnement S.A. (Suez), Infilco Degremont Inc. (IDI), and Morganti Group Inc (Morganti). The plant is the first wastewater treatment facility and the first BOT project in Jordan.

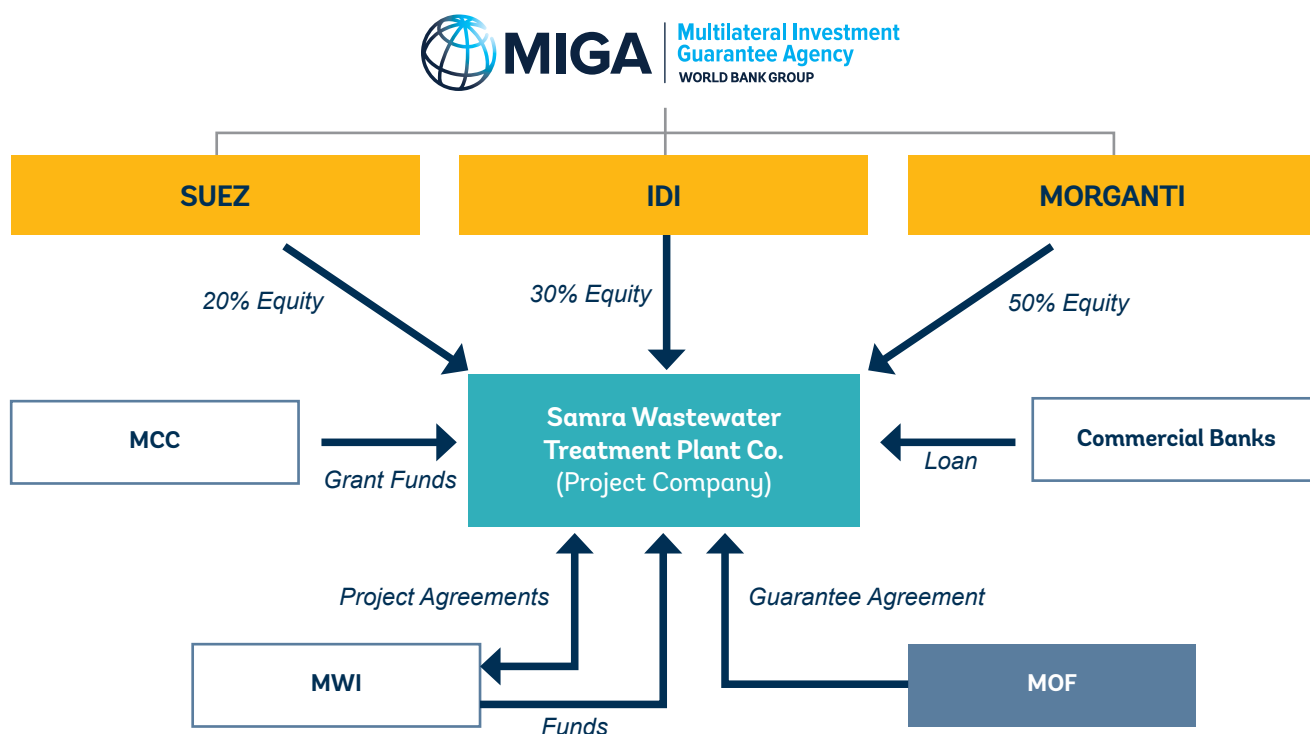
The project's innovative blended financing approach to combine grant funds from donors (USAID for phase I and Millennium Challenge Corporation for phase II of the expansion) and public financing from the Government of Jordan (the GoJ) with equity investments and commercial debt from the private sector has been a key factor for the project's success. Using an innovative blended financing approach with introduction of foreign investors and donors, the project has also brought in state-of-the-art technologies and high standards for wastewater treatment, management, and disposal of sludge to ensure environmental and social sustainability.

### PPP Structure

Figure C1 shows the project structure and capital flows. The investments for the expansion were made by three equity investors (Suez of France, IDI, and Morganti), nine local commercial banks (including Arab Bank Plc. as the lead), donors (MCC), and the GoJ, represented by the Ministry of Water and Irrigation (MWI). MCC committed to assisting the MWI with the expansion project by providing transaction advisory services and grant financing of US\$93 million. The grant lowered the capital cost of the expansion, thus making the wastewater treatment charge affordable to the users. Also, this proved crucial to securing private financing for expansion of the wastewater treatment plant through a PPP. To undertake the project, a few project agreements were signed among the parties of GoJ represented by MWI, the Project Company, and project sponsors (Suez, IDI, Morganti). To support the project, the GoJ through the Ministry of Finance (MOF) also issued a sovereign guarantee to the Project Company. In this project, MIGA provided Breach of Contract coverage to the equity investors in relation to these project agreements and government guarantee.

### Results Achieved and Private Investment

**FIGURE C1: Project Structure and Capital Flows**



### Mobilized

The Project has achieved strong operational and financial performance and development impacts, including increasing wastewater treatment capacity from 267,000 m<sup>3</sup>/d to 365,000 m<sup>3</sup>/d; 100 percent of treated wastewater used for irrigation and agriculture in the Jordan Valley; sludge treatment capacity increased by more than 80 percent; and climate benefits through production of renewable energy. Now the AS Samra Wastewater Treatment Plant can generate around 84 percent of power needed for its operations by using the hydraulic potential energy at the inlet and outlet of the plant as well as onsite biogas produced in the sludge digesters. The treated wastewater is being used for irrigation and agriculture in the Jordan Valley, representing nearly 10 percent of water consumption in the country. Besides preventing water pollution and underground contamination, using treated wastewater for irrigation/agriculture can free up to 115 million m<sup>3</sup>/year of freshwater for domestic use for an estimated 2 million people.

The project was implemented successfully in accordance with the expected capital structure and financing plan – a blended finance package from equity investors (Suez, IDI, Morganti), supported by MIGA’s non-commercial risk insurance, nine commercial banks, donors (USAID/

MCC), and the GoJ. Financial support from the donors and the GoJ has mobilized US\$205.25 million of total investment, including US\$92.39 million in private investment. The MIGA guarantee of 20 years was critical in assuring private sponsors to remain in the deal structure. The stable equity contribution comforted the lenders, facilitating them to offer long-term loans with favorable terms to the project company. Therefore, the MIGA guarantee was also critical in loan mobilization.

### Replication and Scaling

The project sets a useful example in the water and wastewater sector in terms of strong demonstration effects, implementation of innovative practices and generation of climate benefits (including adaptation and mitigation), use of high-quality technical standards, impacts on agriculture and irrigation sectors, and an innovative blended financing structure. In particular, the blended finance approach paves the way for other PPP, BOT, and private sector projects in the water and wastewater sector, as well as other sectors. Examples include BOTs like Disi Amman Water Conveyance Project and Queen Alia Airport Project in Jordan that were signed after this project and followed a similar structure. There has also been notable global recognition of the project’s blended finance approach.

### 3. BITA WATER PROJECT, ANGOLA

#### Project Objectives

As one of Africa’s fastest growing capitals, Luanda (pop. ~9 million) suffers from very limited water, sanitation, and hygiene services, causing a large share of the population to rely on unsafe and expensive private tanker truck service, and resulting in recurring typhoid and cholera outbreaks. The country’s hydraulic infrastructure needs considerable investment to ensure its long-term reliability, capacity, and resilience. As a national priority investment, the project was included in Angola’s 2012 water supply master plan and started project preparation, design, and procurement. However, progress stalled in 2015 due to a lack of financing coinciding with the deterioration of Angola’s credit rating and sharp decrease in oil prices. In 2017, the Government of Angola (GoA) requested credit enhancement using an IBRD guarantee and support in project implementation.

The Bitá Water Project is the first water project to use the World Bank’s guarantee product. The IBRD guarantee not only helped mobilize private commercial financing to meet the over US\$1.1 billion project cost, it also improved the borrowing terms for the Government of Angola. The Bitá project provides a strong demonstration effect in the use of the WB guarantee product to mobilize private capital for water infrastructure projects which have

historically been less attractive for private capital relative to other types of infrastructure projects.

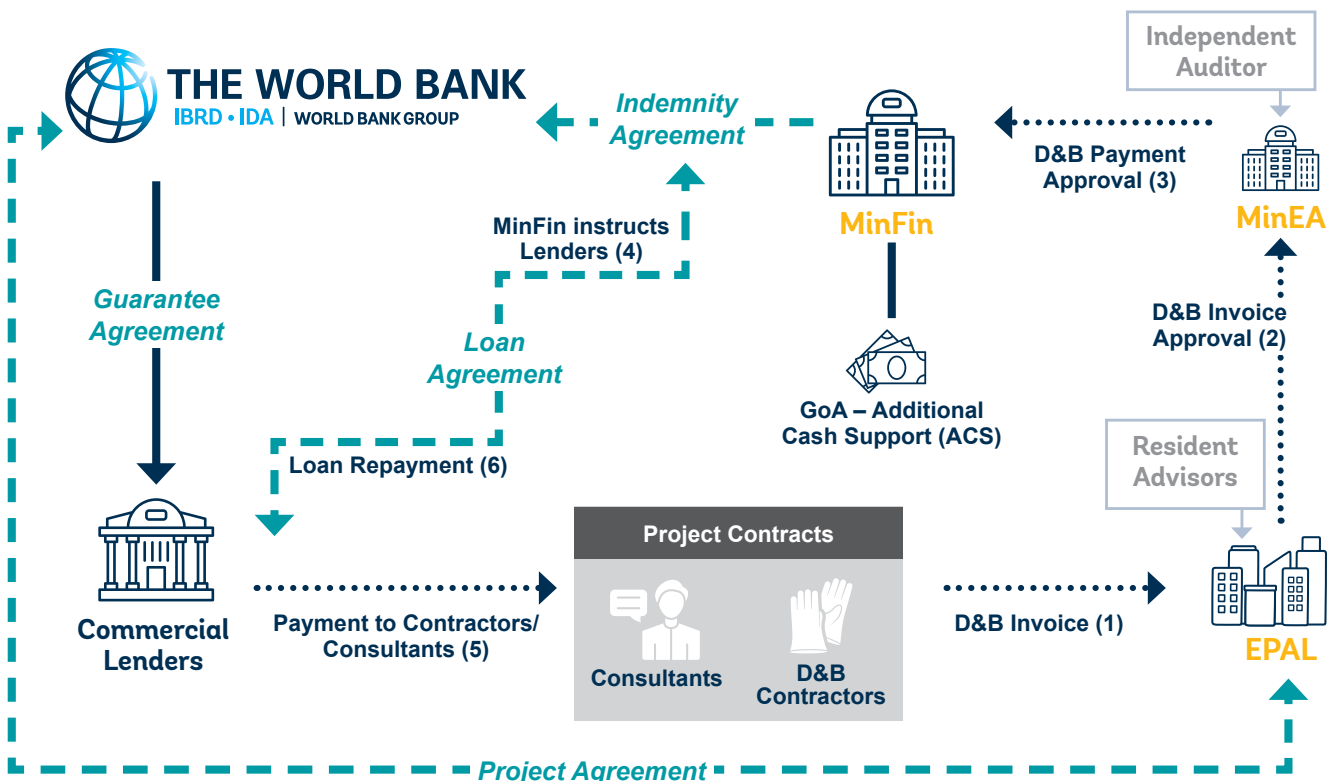
The Project will address water supply service deficits at scale. The optimized design will have an initial capacity to serve approximately 2 million people, with structural readiness for a future potential expansion to serve about 4 million. By addressing service deficits at scale, the project will have transformational impacts for Greater Luanda’s sustainable development, with immediate and lasting public health, productivity, affordability, and climate benefits.

#### Background and Context

The Bitá Water Project is a national priority investment to extend potable water services to peri-urban areas of South Luanda. The proceeds of the IBRD-guaranteed commercial loans will be used to finance investments that optimize water production, transmission, and distribution systems through the following facilities:

- ◆ Water production facilities comprising a water treatment plant near the Bitá locality, approximately 40 km southeast of Luanda, with a raw water intake in the Kwanza River. The production capacity of these facilities will be 3 m<sup>3</sup>/sec, ready for expansion to 6 m<sup>3</sup>/sec, increasing and diversifying Luanda’s water production system and making it more climate resilient.

FIGURE C2: Structure of Angola Bitá Water Project



- ◆ The transmission system will include about 82 km of trunk transmission lines and four new distribution centers in currently undeveloped peri-urban service areas of South Luanda. The trunk lines will also be extended to feed urbanized residential suburbs of Luanda, displacing the need for the more expensive, less efficient tanker truck service.
- ◆ The distribution systems will include the installation of new networks and metered connections across mostly poor peri-urban service areas, as well as the retrofitting of existing networks and connections. The gravity-based distribution systems will allow increased efficiency, reduction of non-revenue water, and elimination of thousands of daily tanker truck runs.

### Guarantee Structure

The Guarantee is structured to mitigate the debt service default risk of the GoA on commercial financing and acts as a rolling guarantee over the life of the WB Guaranteed Loan (see Figure C2). Under this structure, the guarantee covers payment of debt principal and interest until the maximum aggregate guaranteed amount of US\$500 million has been paid out. The structure also includes a cash reserve account funded with the WB Guaranteed Loan which acts as a first loss cover.

### Results Achieved and Private Investment Mobilized

The Luanda Bita Guarantee (the Guarantee) was approved by the IBRD Board in 2019 as a US\$500 million IBRD partial loan guarantee in favor of commercial lenders to enable the GoA to mobilize US\$910 million of sovereign commercial loans (the WB Guaranteed Loan) for the project, to be carried out by Luanda's water utility EPAL. Africa Trade Insurance Agency and French export credit agency BPI France Assurance Export provided complementary financing products to mobilize the overall financing requirement of US\$1.1 billion.

Considering the urgent and sizeable financing requirement of the project, the WB guarantee instrument was particularly appropriate due to its leveraging effect to mobilize commercial bank financing.

The commercial banks to provide the WB Guaranteed Loan were chosen based on an extensive competitive process, involving 25 international commercial banks. Three banks were shortlisted after several rounds of selection and negotiations. The 15-year tenor of the WB Guaranteed Loan is almost double the maturity that Angola could previously achieve for similar commercial loans, helping Angola establish a track record for future similar longer-term commercial financings. The pricing of the WB Guaranteed Loan is also significantly lower

than Angola's cost of borrowing, which helps reduce the financing cost of the project.

### Replication and Scaling

The project sets an attractive precedent for future private investments in water infrastructure in other countries in Africa and the rest of the developing world. The water sector has historically been less attractive for private capital relative to other types of infrastructure due to the perceived cash flow and operations risks in the water sector. The project sends a clear message about the GoA's commitment to develop sustainable, large-scale infrastructure projects.

## 4. CATASTROPHE BONDS FOR PUBLIC UTILITIES

**Issuer:** Los Angeles Department of Power and Water through Power Protective Re Ltd. (an SPV)

**Risk/Peril Covered:** California wildfires

**Size:** US\$50 million

**Coverage Term:** 3 years

**Date of Issue:** December 2020

**Coupon:** 10.75 percent

### Background

Los Angeles Department of Water and Power (LADWP) is the largest municipal utility operating in the United States, serving more than four million residents in the Los Angeles region of the state of California.

### Structure

In this transaction, LADWP obtained insurance coverage for its infrastructure against wildfires from insurance and investment company Aon Securities. A special purpose vehicle named Power Protective Re Ltd, created specifically for the purposes of this transaction, then issued bonds targeting US\$50 million of protection to investors. This allowed the insurance company to transfer the risk of underwriting the policy to LADWP to the market. Hannover Re also provided reinsurance coverage to Aon, and in turn, entered into a retrocessional reinsurance agreement with the SPV Power Protective Re Ltd. The CAT bond has a stepped-out payout mechanism, paying out 35 percent, 70 percent, or 100 percent of its principal depending on the severity of the wildfire event. This mechanism is based on risk modeling by EQECAT Inc.

### Replication and Scaling

In 2021, LADWP issued a second CAT bond of a smaller size (US\$30 million) at a coupon of 15 percent. Such a mechanism could be used by other utilities in the water sector to obtain insurance coverage for their infrastructure.

## 5. JORDAN'S WATER SECTOR FINANCIAL SUSTAINABILITY ROADMAP

### Background and Context

Chronic water scarcity is one of the key obstacles to Jordan's development. Growing population, expansion of the agricultural sector, and underlying water resource scarcity exacerbated by climate change have outweighed efforts to address water supply in recent years.

Opportunities to augment water supply – desalination and long-distance transfer and purchasing water from other countries – are limited and increasingly costly, posing severe financial sustainability challenges for the sector. By the end of 2019, the water sector deficit was JOD 310 million (1 percent of GDP) and sector debt was JOD 2,524 million (7 percent of GDP). This deficit and the debt accumulation are partly due to rising energy costs and significant capital investments needed to augment bulk water supply, improve the urban water supply networks, and expand wastewater treatment.

### Solution

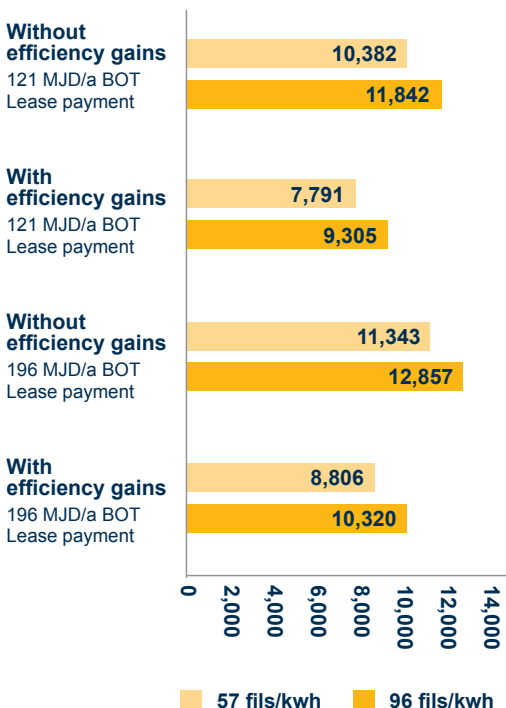
Recognizing the importance of mobilizing additional finance for the water sector, the Government of Jordan prepared a Water Sector Financial Sustainability Roadmap (FSR) through a consultative process. This outlines a set of policy and investment measures that will close the sector's operational deficit by 2029 and reduce

debt accumulation. A large part of the water sector's fiscal deficit is due to the high energy intensity and inefficiency of water supply. Efficiency gains therefore form a central pillar of the roadmap (see Figure C3). Targets in the FSR include systematically reducing non-revenue water from 53 percent to 25 percent by 2040, and improving energy efficiency and energy load-shifting. The FSR identifies tariff increases as a key policy tool in achieving cost recovery and sets out a tariff reform program. Adopting the FSR policy and investment measures would reduce water sector debt by billions of Jordanian dinar by 2040, helping to return the sector to operational cost recovery. The FSR aims to close the sector's operational deficit by 2029 and reduce debt accumulation.

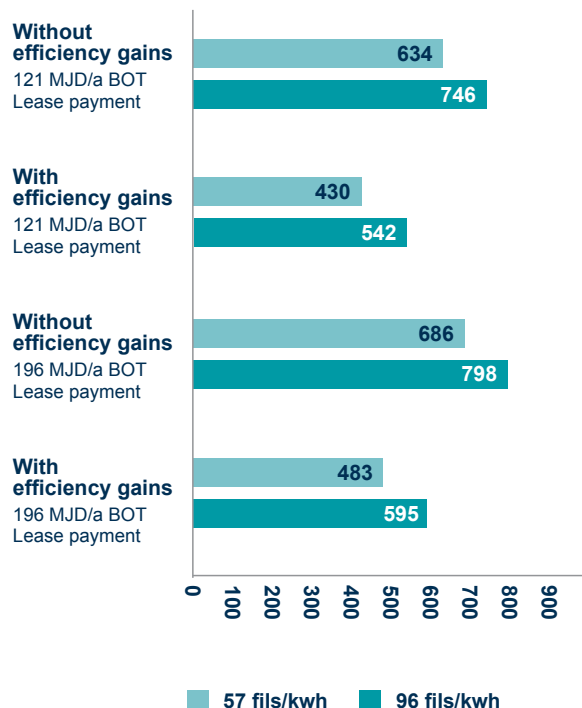
Building on the analysis of the FSR, planned actions include (1) improving the efficiency of water use in urban areas, energy efficiency investments, and an economically efficient tariff structure that recognizes the time of use, (2) investing in in-network storage to enable a shift in peak energy demand of the water sector, (3) investing in pumped hydro storage, (4) introducing "smart" net metering/billing policies that encourage the use of solar energy by accounting for the time of consumption, (5) adopting policies that accelerate the deployment of smart grid infrastructure, and (6) cooperating regionally on energy and water.<sup>65</sup>

**FIGURE C3: Financial performance of Jordan's water sector with/without efficiency gains**

#### Debt (MJD) in 2040 with/without efficiency gains



#### Deficit (MJD) in 2040 with/without efficiency gains



## 6. THE NATIONAL URBAN WATER SUPPLY PROJECT OF INDONESIA

### Project Objectives

Indonesia's National Urban Water Supply Project (NUWSP), financed by the World Bank, has supported the creation of an overarching framework for national urban water supply development and financing, known as NUWAS. NUWAS provides a structured and systematic way to help local governments and utilities to improve their water supply service delivery. The project will help Indonesia to achieve its ambitious access goals through 1.2 million new connections in at least 40 cities, benefiting 6 million people, and aims to support 200 water utilities to improve financial and operational performance.

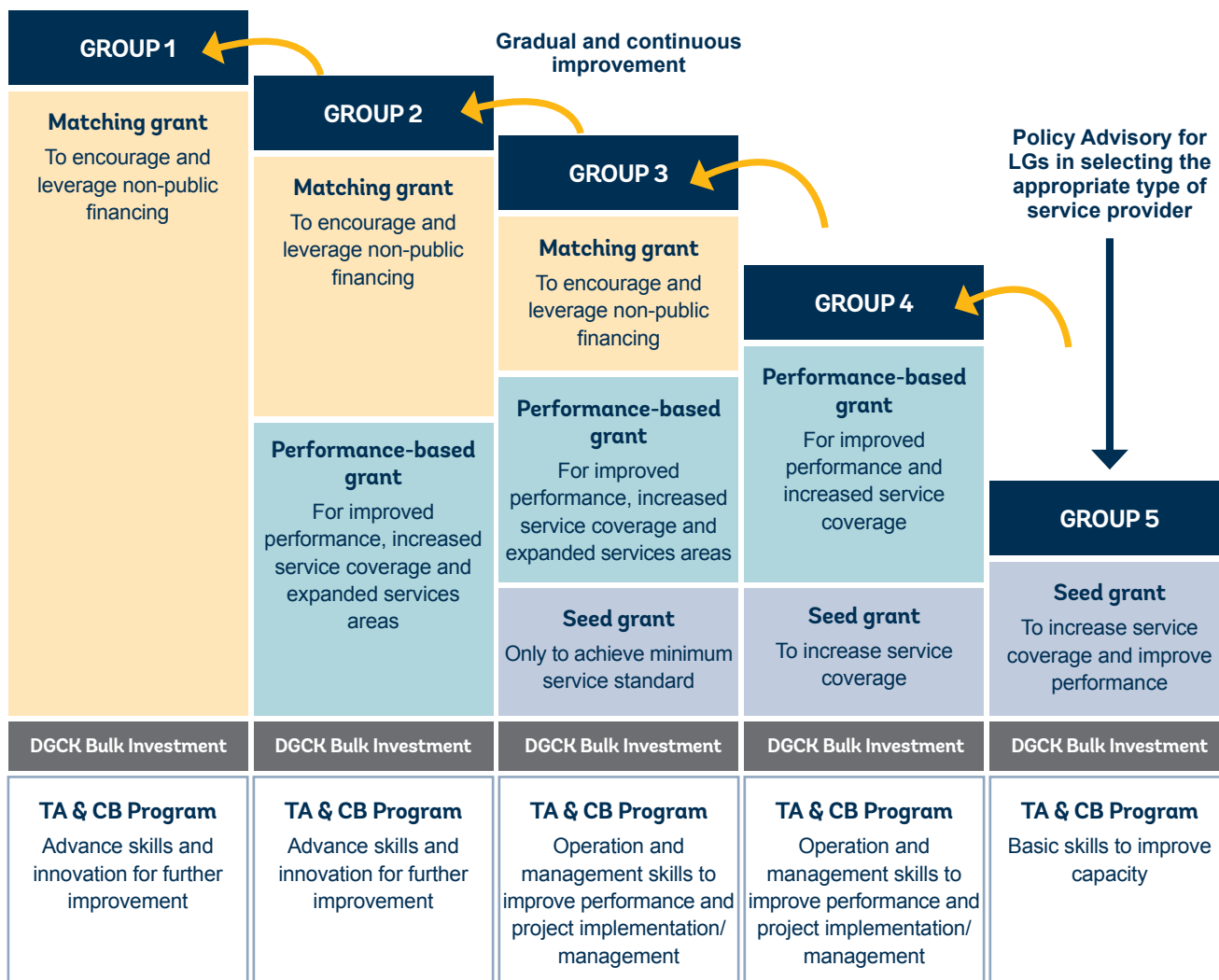
### Structure

Under the framework, 400 local governments and water utilities have been classified according to their performance into five categories (the first group being

the best performing and the fifth being the worst). A customized support package is provided according to the performance category. The packages are designed to involve both central and local government stakeholders and build on experience from former lending operations and sector diagnostics. The measures (financial support and capacity building) aim at lifting the service provider to a higher level of performance and towards eligibility for the next category of support, leading to gradual and continuous improvement and ultimately facilitating access to commercial financing.

The lowest-performing utilities have access to a stimulant support or seed grants, which is one-time capital investment support to raise services to meet the minimum service standard. Mid-performing utilities are eligible for performance-based grants linked to specific objectives of improving efficiency and service expansion to the urban poor. Higher performing, "healthy" utilities can receive matching grants. These incentivize more

FIGURE C4: NUWSP Framework





financially and technically capable entities to obtain private finance in the form of commercial debt from local banks or via PPP arrangements (see Figure C4).

## 7. BLENDED FINANCE: THE METRO MANILA WASTEWATER MANAGEMENT PROJECT

### Context

The Metropolitan Waterworks and Sewerage System (MWSS), a government corporation, is the agency responsible for providing water supply, sewerage and sanitation services in Metro Manila and some cities of Rizal and Cavite provinces in the Philippines. Since 1997, service delivery is being handled by two private concessionaires on behalf of MWSS: Manila Water Company, Incorporated (MWCI) for the east zone, and Maynilad Water Services, Incorporated (Maynilad) for the west zone of the concession area. The two Concession Agreements are set to be in operation up to 2037. Initially, most of the work of the concessionaires was on water supply. However, inadequate wastewater management has led to the build-up of high pollution levels in Metro Manila’s water bodies, including Manila Bay – leading to the provision of wastewater management services to be declared a national priority. In 2008, the Philippine Supreme Court passed a decision mandating concerned state entities (including MWSS) to clean up, rehabilitate, and restore the water quality of Manila Bay. The WB-financed Metro Manila Wastewater Management project hence aimed to finance investments in wastewater services by the two concessionaires – MWCI and Maynilad.

### Solution

Blended finance helped to lower the cost of capital, which

reduced the need to increase tariffs. As per the initial financial structure conceived, a US\$275 million loan from IBRD would cover 74 percent of the costs of the US\$372 million project, while the rest would be financed by the concessionaires themselves as an equity investment. The WB loan was made to a government financial institution – the Land Bank of the Philippines (LBP), with a guarantee from the Government of the Philippines. The LBP then on-lent it to the two concessionaires.

### Outcome

At the project’s closing, the project costs had increased from the initial estimated US\$372 million to US\$503 million. The concessionaires financed the additional amount – with MWCI financing US\$101.9 million and Maynilad financing US\$126.1 million. As of December 2020, progress in construction was reported at 82.41 percent (MWCI) and 88.8 percent (Maynilad). Despite this, the project exceeded its targets for improving the water quality of receiving water bodies (measured as Biological Oxygen demand) and the population served by the project. It exceeded or met most of the other development goals with an overall satisfactory rating at project completion. Further, the project demonstrated an innovative blended financing model, which comprised a mix of public and commercial financing using a financial intermediary to ensure due diligence and credit quality throughout the project lifecycle. The presence of the WB in the project in terms of the environmental, social, procurement, and financial management safeguards reassured investors that the project would be done based on best practices and supervised through the lifecycle. The project demonstrated that fully private operations in the sector could work successfully, contribute substantial financing to critical investment projects, and serve as a valuable example of private sector participation in the water sector.

**TABLE C1: Metro Manila Project Key Dates**

APPROVAL	EFFECTIVENESS	MID-TERM REVIEW	ORIGINAL CLOSING DATE	ACTUAL CLOSING DATE
15-May-12	19-Oct-12	30-Jan-14	30-Jun-17	30-Jun-20

**TABLE C2: Financing by Entity**

FINANCING ENTITY	INITIAL AMOUNT (in US\$ million)	% OF TOTAL	REVISED AMOUNT (in US\$ million)	% OF TOTAL
IBRD	275	74.0%	275	54.7%
MWCI	55.92	15.0%	101.9	20.3%
Maynilad	40.83	11.0%	126.1	25.1%
<b>Total</b>	<b>371.75</b>		<b>503</b>	

## 8. GUERDANE IRRIGATION PROJECT, MOROCCO

### Background/Objectives

Recurring and persistent droughts force Moroccan farmers to rely heavily on irrigation. In the southern part of the country, citrus farmers on the Guerdane perimeter have long been dependent on water from an underground aquifer. But years of intensive agricultural practices have seriously diminished groundwater levels. The government looked to IFC to attract private investment in an irrigation network that could channel water to the perimeter from a distant dam complex.

The perimeter of Guerdane in the Province of Taroudant covers about 10,000 hectares and produces 50 percent of Morocco's citrus crops. For years, private wells pumping into the Souss underground aquifer were the only source of irrigation water for some 600 citrus farmers, but due to overexploitation, the level of groundwater was decreasing by an average 2.5 meters a year. Citrus farming in the region was becoming increasingly unsustainable. Between 1995 and 2002, the area planted with citrus fruit decreased by 22 percent as farms were abandoned or put out of production.

To alleviate the lack of water in the perimeter, the 1995 Watershed Management Plan of Souss-Massa allocated an average yearly volume of 45 million cubic meters of water originating from the Mohamed Mokhtar Soussi-Aoulouz dams, about 40 miles away. The government sought a private partner to construct both a 300-kilometer water irrigation network to transport the water and a distribution system to deliver it to farmers based on the size of their citrus groves. The surface water allocated for the project met half of the water needs of the citrus farms in the perimeter.

### Solution/Transaction Structure

The transaction was structured as a 30-year concession to build, co-finance, and manage an irrigation network to channel water from the dam complex and distribute it to farmers in Guerdane. At the end of the concession, the infrastructure would be returned to the government. The total project cost was estimated at \$85 million, with the Moroccan government providing \$50 million, half as a grant and half as a subsidized loan. The private partner provided the balance.

The concession granted exclusivity to channel and distribute irrigation water in the perimeter while allocating operational, commercial, and financial risks among the various stakeholders. The construction (time and costs) and the collection risk were transferred to the concessionaire.

The government was responsible for ensuring water security. The demand/payment risk was mitigated by carrying out an initial subscription campaign whereby farmers paid an initial fee covering the average cost of on-farm connection. The concessionaire's construction obligation did not begin until subscriptions were received for 80 percent of the water available. The risk related to water shortage was allocated among the concessionaire (up to a consequential revenue loss capped at 15 percent), the farmers (via the application of a tariff surcharge in case of drought leading to a shortage of water, capped at 10 percent of the tariff), and the government (sustaining the risk of more significant water shortage through a financial compensation to the concessionaire).

The unique selection criterion was the lowest water tariff, in support of the government's goal of making surface water accessible and affordable to the largest number of farmers possible. The public subsidy was designed to maintain water tariffs equivalent to current pumping costs, making them affordable to farmers. The winning bidder provided a tariff significantly lower than the price that citrus farmers in Guerdane had typically paid for irrigated groundwater supplies.

### IFC Role

IFC provided the government with advice on structuring and implementing the Guerdane public-private partnership irrigation project to deliver a high-quality, accountable, financially sound, and environmentally sustainable public service to the farmers. With a grant from France's *Fonds d'études et d'aide au secteur privé*, the IFC team undertook technical, financial, and legal due diligence to recommend the most commercially and technically viable transaction structure.

IFC also conducted a bidding process that would set a precedent for future irrigation investments worldwide. Finally, IFC played a leading role in marketing the project, prequalifying potential investors, drafting bidding documents, ensuring a competitive and transparent bidding process, and selecting the winning bidder.

### Outcome

The concession – the world's first public-private partnership irrigation project – was awarded in July 2004. A consortium led by Omnium Nord-Africain, a Moroccan industrial conglomerate, won the 30-year concession. This meant the creation of Morocco's first domestic private infrastructure operator for irrigation projects.

By providing half the water needed by the citrus farmers, the Guerdane Project reduced the risk of depleting underground water resources and safeguarded an

agricultural industry that provides a living for an estimated 100,000 people.

The concession leveraged \$36.9 million in investments and \$10 million in tax revenues by the concessionaire. It benefited the government because the technology transfer was financed by the private sector. It also benefited the Moroccan economy because the concessionaire used local suppliers whenever possible.

## 9. LOS CABOS DESALINATION PROJECT, MEXICO

### Objectives

The Municipality of Los Cabos, State of Baja California Sur, Mexico, had a deficit to meet the demand for water for domestic, residential, commercial, and industrial uses, since the aquifers of Cabo San Lucas and San Jose del Cabo were overexploited and the declining pumping levels for groundwater were affecting the distribution system. Considering the demographic growth in the state due to its touristic demand, the water supply services in Los Cabos faced two key challenges: 1) the water level distributed by the existing desalination plant in Los Cabos was insufficient to provide water service for 24 hours a day and seven days a week, with some sections located mainly in the northern part of Cabo San Lucas receiving water at best once a week; 2) the distribution system was inefficient and the aquifers of Cabo San Lucas and San Jose del Cabo were overexploited.

### Solution

The IFC Advisory Project team proposed a dual approach to solve the problems by structuring the following two PPP projects:

- 1) A Non-Revenue Water (NRW) Project, which aims to improve the technical losses of the network and to supply drinkable water 24 hours a day and seven days a week.
- 2) A New Desalination Plant project to produce up to 250 liters per second.

The two transactions would benefit from a subsidy to cover 49% of CAPEX from Banobras, the Mexican national development bank, to ensure there would be no negative impact on the water tariff from both projects.

### IFC Role

IFC Advisory was hired in 2020 to structure the PPP projects, promote them internationally and conduct competitive tender processes to select and contract reliable and reputable private sector investors for their

implementation. IFC worked closely with FONADIN, Mexico's national infrastructure trust fund, which provided consultants for technical and legal due diligence, while IFC hired the environmental and social specialist to ensure all IFC performance standards would be included in the PPP contracts. At the request of the client, IFC provided support to Los Cabos Municipality and Water Utility until financial closing.

### Outcome

For the NRW project, four consortia formed by national and international companies bid for the transaction (three consortia formed by international and national companies and the current operator of the existing desalination plant in Los Cabos). The Water Utility of Los Cabos considered the bidding process a major success as the economic proposals were 20 percent and 149 percent lower than the estimated IFC financial model for the new desalination plant and the NRW projects, respectively.

The projects were awarded in 2021 and reached financial closure in 2022. The new desalination plant project was awarded to the consortium formed by Acciona Agua and La Peninsular (a local company with a good track record), while the NRW project was awarded to the consortium formed by FCC Aqualia and Aqualia Mexico. The estimated total capital mobilized from private sector sources to finance the development of the projects was expected to be US\$25 million for NRW and US\$50 million for the desalination plant.

The project is expected to increase the reliability of the system and the volume of drinking water for 278,000 inhabitants of Los Cabos at an average tariff of less than \$1 per cubic meter, thanks to the CAPEX subsidy.

# APPENDIX D: EXPERIENCE WITH THE MULTI-STAKEHOLDER PLATFORM MODEL

There have been a number of efforts by development partners to develop multi-stakeholder platforms (MSPs) involving government, communities, and private sector representatives around water security, land use management, agricultural innovations, climate change challenges, and disaster risk management. A few notable examples include the World Economic Forum-led Water Initiative to accelerate private-public partnership in water, 2030 WRG managed by the WB, International Land Coalition-led platforms for better land governance, and the European Commission Multi-Stakeholder Platform for SDG implementation at the EU level. In February 2020, the G20 endorsed the development of such platforms through the “G20 Reference Framework for Effective Country Platforms”, suggesting the creation of platforms to promote collaboration in catalyzing financing and greater private sector investments.

Among the water-focused MSPs, the 2030 WRG stands out in its scale and scope. This section outlines its track record and provides brief case studies.

## MSP TRACK RECORD

The MSP model has been successfully employed by the 2030 WRG, a multi-donor trust fund within the Water Global Practice of the WB. These 2030 WRG-supported platforms have created the upstream conditions for PSP in the water sector in several countries, including Bangladesh, Brazil, India, Kenya, Mongolia, and Peru. These engagements have generated lessons for future adaptation and use of this model.

## PURPOSE AND FUNCTION

In the context of the current economic environment, ensuring coordinated and cohesive approaches to national priorities on water is critical to meet the financing needs of the sector. Against this backdrop, MSPs can support the following critical functions for the water sector at a national scale:

- ◆ Build a common vision for the water sector and a shared understanding of the funding and financing needs in the country

- ◆ Assess needed reforms in PIR and the enabling environment and foster commitment from the government and other partners to implement the reforms
- ◆ Exchange knowledge on scalable financing solutions
- ◆ Develop blended finance approaches to match local needs
- ◆ Mobilize investors and financiers to match the supply of capital with the demands of the sector
- ◆ Support a programmatic approach to the mobilization of financing, in coordination with other multilateral agencies, development partners, and financial institutions
- ◆ Identify concrete programs and projects through strategic financial planning
- ◆ Design appropriate risk mitigation instruments
- ◆ Monitor the implementation of projects and programs and progress towards sector objectives
- ◆ Provide visibility to the financing needs of the water sector, with the mobilization of needed expertise and resources.

## STRUCTURE

MSPs are structured around a defined agenda of success to increase alignment, ensure transparency, and build trust (see Figure D1). They depend on clear principles of engagement:

- ◆ **Represent a balance of interests** across public sector, private sector, and civil society, with no single stakeholder group having a majority (i.e., each less than 50 percent of seats)
- ◆ **Streamline decision-making, with the identification of a high-level chair from the public sector**, and potentially a co-chair from the private sector and/or civil society
- ◆ **Ensure accountability, transparency, results orientation, and inclusivity** through the decisions of the platform
- ◆ **Create a pre-competitive space, upstream of transactions**, to build consensus on PIR reforms and enhance the technical and financial viability of water sector organizations
- ◆ **Identify core programs and projects** to advance

the objectives of the platform, following competitive and transparent procurement processes led by the government

- Support cross-sectoral alignment across sectors and stakeholders, comprising water, climate, agriculture, urban development, finance, rural development, environment; and intra-sectoral alignment across various water sub-sectors, with

the aim of promoting integrated water resources management.

The client government decides on the size and composition of the MSP, including the identification of the chair and co-chairs, in consultation with the WB. Typically, an MSP has 15–25 members.

**FIGURE D1:** Structuring MSPs for Financing



## 2030 WRG COUNTRY CASE STUDIES AND SUCCESS FACTORS

### INDIA

The MSP brought together various government departments to ensure coordinated public sector involvement, along with a wide spectrum of industrial, urban, and agricultural stakeholders. One of the 2030 WRG innovations in the state of Karnataka focuses on water efficiency through a PPP model for the first large-scale community-driven drip irrigation project, developed through a performance-based payment structure, along with collaborations with 55 agribusiness companies for market linkages, replicated across an additional 100,000 hectares and covering \$650 million in investments.

**Key factors:** Political endorsement and stability; local ownership; collaboration by businesses and civil society; shared understanding and consensus on risks, challenges, and policy solutions.

## PERU

The MSP Committee is chaired by a Presidential representative and comprises senior leaders from government, business, and civil society. Peru's President is a strong supporter of 2030 WRG, which has been key to the platform's convening power and legitimacy in the country. To ensure a coordinated government response, five key ministries are represented in the platform. Additionally, companies from the energy, mining, agriculture, and food and beverage sectors have been brought together by building a stronger appreciation of the business risk arising from water scarcity. The platform also features strong representation from civil society.

Several thematic working groups have been generated to advance a range of water initiatives. For example, a Groundwater Management and Monitoring Tariff (initially for industries and later extended to other sectors) ensured proper tracking and efficient use of groundwater resources. Another innovative scheme is "Taxes for Projects", which allows companies to use up to 50 percent of what they owe in taxes to implement mutually agreed water infrastructure projects.

**Key factors:** *Strong support from central government; strategic network organization and division of responsibilities according to nature of project; innovative financial schemes; and incentives for businesses to participate actively.*

## MONGOLIA

In 2012, the President of Mongolia invited 2030 WRG to help cultivate a national MSP to drive improvements in water governance, with a focus on water use efficiency, wastewater treatment, and effective river basin management. To address some major structural problems such as fragmented governance and lack of country-level baseline data, a detailed scientific study of affected areas was undertaken to understand the impact of water stress on communities, the environment, and the economy. Based on the knowledge generated from shared perceptions of risks, challenges, and strategies needed to protect the nation's water resources, a steering board committee under the chairmanship of the Minister for the Environment was formed.

The committee comprised representatives of government ministries, industry, civil society, and academia. 2030 WRG served as platform coordinator, facilitator, and technical advisor. Stakeholders have worked to improve existing guidelines and regulations, mobilize public-private financing, and create incentives to increase the uptake of water efficiency, pollution reduction, and reuse. For example, the MSP developed a new water pollution fee law, which incentivized investments from the private sector into pre-treatment of industrial effluent across eight industrial sectors, with operational expenses for the treatment plants supported through revenues from the pollution fees collected.

**Key factors:** *Government initiative, support, and leadership; development of a neutral, independent, transparent platform; collaborative knowledge generation.*

# APPENDIX E: IFC'S ENGAGEMENTS IN WATER

Initially, IFC focused on the traditional water supply business, which was dominated by private water concessions supporting a handful of large global sponsors primarily in Latin America in the 1990s. In the early 2000s, IFC made a strategic shift to work with local and regional sponsors who were better placed to deal with local operating conditions and tended to receive less political and social pushback. In 2003, IFC developed its subnational finance initiative, which unlocked additional investments in the water sector by financing the capital needs of municipal service providers operating on a commercial basis. Today, IFC engages in the water

sector along three verticals: (1) providing investment and advisory services to subnational utilities through its Utilities for Climate platform; (2) supporting client countries develop PPPs through transaction advisory and support via its Scaling ReWater initiative to rapidly develop wastewater treatment and reuse through competitive, transparent processes; and (3) supporting private clients that invest in emerging markets (Metito, DNP Water, Aegea, and others). IFC has committed and mobilized US\$3 billion in water projects globally from 1995 to 2022.

# Endnotes

- <sup>1</sup> References to the “water” sector in this report include sanitation and wastewater management services.
- <sup>2</sup> Private sector participation (PSP) refers to private sector involvement in the water sector through private finance, absorption of risk, and/or management. The strategic framework aims to mobilize private capital as well as expertise and technological innovation to achieve key technical and operational efficiency objectives and to address capacity gaps in the sector (which may need to be addressed before private financing can be mobilized).
- <sup>3</sup> World Bank, *A Water-Secure World for All* (2021).
- <sup>4</sup> World Bank, *High and Dry: Climate Change, Water, and the Economy* (2016).
- <sup>5</sup> World Water Council and OECD, *Water: Fit to Finance? Catalyzing National Growth through Investment in Water Security* (2015).
- <sup>6</sup> Blended finance refers to the use of development finance to mobilize additional funds from private and commercial sources for sustainable development in developing countries.
- <sup>7</sup> World Bank, *A Water-Secure World for All* (2021).
- <sup>8</sup> World Resources Institute, [WRI's Aqueduct initiative](#); Kressig, Byers, Friedrich, Luo, and McCormick, “Water Stress Threatens Nearly Half the World’s Thermal Power Plant Capacity,” World Resources Institute (2018).
- <sup>9</sup> Food and Agriculture Organization, *The State of Food and Agriculture 2020: Overcoming Water Challenges in Agriculture* (2020).
- <sup>10</sup> Sadoff et al., *Securing Water, Sustaining Growth*, Report on the GWP-OECD Task Force on Water Security and Sustainable Growth (2015).
- <sup>11</sup> CDP, *Cleaning Up their Act: Are Companies Responding to the Risks and Opportunities Posed by Water Pollution?* (2020).
- <sup>12</sup> CERES, “New Analysis Shows Value at Risk from Negative Water Impacts in Apparel and Meat Industries,” Press Release, December 8, 2021.
- <sup>13</sup> OECD, “The Reform of the International Financial Architecture: An Opportunity for Scaling Up Finance for Water?” Background note for the 9th Roundtable on Financing Water, Geneva, February 7–9, 2023.
- <sup>14</sup> Alfieri et al., “Global Modeling of Seasonal Mortality Rates from River Floods,” *Earth’s Future* 8 (9) (2020): e2020EF001541.
- <sup>15</sup> World Bank, *High and Dry: Climate Change, Water, and the Economy* (2016).
- <sup>16</sup> Zaveri, Damania, and Engle, “Droughts and Deficits: The Global Impact of Droughts on Economic Growth,” Policy Research Working Paper 10453 (2023).
- <sup>17</sup> Global Commission on Adaptation, *Adapt Now: A Global Call for Leadership on Climate Resilience* (2019).
- <sup>18</sup> The Paris Agreement recognizes that reaching these goals depends on “making finance flows consistent with a pathway towards low greenhouse gas emissions (and climate-resilient) development” (Article 2.1c).
- <sup>19</sup> The International High Level Panel on Water Investments for Africa, *Africa’s Rising Investment Tide: How Investment Partnerships Will Mobilize USD\$30 billion/year to Achieve Water Security and Sustainable Sanitation in Africa* (2023). OECD and CDP, *Finance Water Action Pathway* (2023).
- <sup>20</sup> Internal World Bank research.
- <sup>21</sup> Internal World Bank research.
- <sup>22</sup> World Water Council and OECD, *Water: Fit to Finance? Catalyzing National Growth through Investment in Water Security* (2015).
- <sup>23</sup> With aggregate GDP of 145 developing counties (excluding China) at US\$18 trillion and domestic financial assets around US\$16 trillion, there are insufficient domestic financial resources within developing countries to self-finance the SDGs (GISD Alliance, *Increasing Private Finance Mobilization* (2021)).
- <sup>24</sup> WB, *Global Economic Prospects* (September 2022).
- <sup>25</sup> WB, *Global Economic Prospects* (January 2023).
- <sup>26</sup> This report makes frequent reference to ‘funding,’ ‘finance,’ and ‘investments.’ While these terms are often used interchangeably, there are differences in their definitions. ‘Funding’ refers to the ultimate source of cash flows (and return on investment) for a given project, which in the water sector are tariffs, taxes, and transfers. For long-lived assets, these cash flows are typically generated over many years, while the capital requirements for a project are front-loaded. ‘Financing’ refers to how this gap is bridged, including through structured debt and equity instruments. The term ‘investments’ can refer to this upfront financing but can also be used to describe projects that are financed.
- <sup>27</sup> This covers a broad range of service providers across a spectrum of services, including the provision of water supply, sanitation services, wastewater treatment, and irrigation services.
- <sup>28</sup> Recent research facilitated by the OECD and the World Bank resulted in the characterization of 46 key functions needed to facilitate private water investments and financing which can be performed or supported by a variety of existing intermediary institutions (De Pazzis and Muret, “The Role of Intermediaries to Facilitate Water-related Investment” (2021)).
- <sup>29</sup> Values calculated based on data from the Food and Agriculture Organization’s Aquastat database and Global Water Intelligence’s desalination database.
- <sup>30</sup> World Bank, *City-wide Inclusive Water Supply: Adopting Off-Grid Solutions to Achieve the SDGs* (2019). Misra and Kingdom, *City-wide Inclusive Water Supply: Role of Supplementary Urban Water Service Providers* (2022). World Bank, *Supplementary (Non-Utility) Water Service Providers* (forthcoming).
- <sup>31</sup> Delacámara, “The Value of Water – If Hidden, It Will Be Overlooked” (2018).
- <sup>32</sup> Internal WB research.
- <sup>33</sup> Leigland, “Public-Private Partnerships in Developing Countries: The Emerging Evidence-based Critique,” *The World Bank Research Observer* 33 (1) (2018): 103–134.
- <sup>34</sup> Convergence, “Blended Finance” (2020).
- <sup>35</sup> MIGA’s sub-sovereign Breach of Contract cover for a municipal-level PPP in Serbia is an interesting model for sub-sovereign guarantees which may have potential for replication.
- <sup>36</sup> For more information, see <https://www.dewater.com/environmental-impact-bond>.
- <sup>37</sup> Pörtner et al., *Climate Change 2022: Impacts, Adaptation and Vulnerability* (2022).
- <sup>38</sup> UNFCCC Decision COP27 Cover Decision. [https://unfccc.int/sites/default/files/resource/cop27\\_auv\\_2\\_cover%20decision.pdf](https://unfccc.int/sites/default/files/resource/cop27_auv_2_cover%20decision.pdf).
- <sup>39</sup> Damania et al., *Uncharted Waters: The New Economics of Water Scarcity and Variability* (2017).
- <sup>40</sup> Buchner et al., *Global Landscape of Climate Finance 2021* (2021).
- <sup>41</sup> Global Commission on Adaptation, *Adapt Now: A Global Call for Leadership on Climate Resilience* (2019).
- <sup>42</sup> Global Water Intelligence, “Mapping Water’s Carbon Footprint: Our Net Zero Future Hinges on Wastewater,” White Paper (2022).
- <sup>43</sup> A recent study demonstrated that more than 50 percent of GHG emissions from Kampala, Uganda, are attributable to septic tanks that are not serviced regularly.



- <sup>44</sup> World Bank, *Private Participation in Infrastructure (PPI): Annual Report 2021* (2021).
- <sup>45</sup> Financing for climate mitigation and adaptation is often called climate finance.
- <sup>46</sup> InfraSAP is the World Bank's official extended core diagnostic for infrastructure sectors, aiming to provide regular coverage of the main IBRD and IDA client countries. The methodology is designed to identify investment gaps and policy shortfalls, as well as opportunities for private sector participation. The methodology is rigorous and evidence-based, drawing upon a rich global database of infrastructure performance indicators that permit benchmarking and a global infrastructure map that allows spatial visualization.
- <sup>47</sup> The idea of a "WaterSAP" as a customized assessment for the water sector is being discussed between the Water and Infrastructure Finance, PPPs, and Guarantees GP.
- <sup>48</sup> Single-sector InfraSAPs are usually led by the relevant GP (Global Knowledge and Expertise Units) and include IPG analysts and economists from the Chief Economist Office.
- <sup>49</sup> WB, *World Bank Climate Change Action Plan 2021–2025: Supporting Green, Resilient, and Inclusive Development* (2021).
- <sup>50</sup> Internal World Bank research.
- <sup>51</sup> Portugal provides an example of holistic, national-level reform combining economic regulation, consolidation, and PSP carried out over 25 years, with remarkable performance impacts. More recently, reforms in Indonesia under the National Urban Water Supply Framework, supported by the World Bank, are leading to creditworthiness of utilities across levels of financial health.
- <sup>52</sup> Kingdom, Baeumler, and Guzman, "Capital Subsidies Implicit in Concessional Finance: How to Make Them More Transparent and Better Targeted" (2012).
- <sup>53</sup> Some examples of actions that could be taken include: i) Characterizing the water business environment within a given territory (e.g., Myanmar Information Management Unit); ii) Providing access to information on the water sector of a given territory and its upcoming evolution (e.g., WASHfunders.org); iii) Positioning governments as public investment brokers and market coordinators (e.g., through dedicated PPP units, e.g. Philippines); iv) Showcasing and advertising the opportunities to invest in the water sector (e.g., ELAN RDC); v) Fostering meeting points for stakeholders interested in financing the water sector within regions (e.g., the "Innovate 4 Water" marketplace events organized by Waterpreneurs at country level).
- <sup>54</sup> Examples of actions that can be taken in this area include: i) Assessing the financial efficiency of existing programs and service providers and providing information about the creditworthiness and performance of service providers and of projects (e.g. the shadow credit-rating initiative by Kenyan regulator WASREB with support from PPIAF/World Bank, and the Gold Standard for Global Goods for assessing CO<sub>2</sub> avoided and economic impacts); ii) Providing financial support for project development (e.g. PPIAF, PIDG Upstream Global Facility, and GWSP); iii) Creating new and promoting existing opportunities in a given territory by consolidating investment opportunities at a territorial level to give perspectives to financiers and show them how engaging in water-related sectors can lead to a variety of opportunities, and by pooling small projects/ service providers to reach a critical scale and mitigate the viability risk (e.g., the Water and Sanitation Pooled Fund in Tamil Nadu); and iv) Ensuring third-party evaluation of investment opportunities, through certifications and rating standards available at national or regional scale, e.g., The Solar Impulse Foundation and certification of 1,000 efficient solutions.
- <sup>55</sup> Internal World Bank research.
- <sup>56</sup> Zaveri, Damania, and Engle, "Droughts and Deficits: The Global Impact of Droughts on Economic Growth," Policy Research Working Paper 10453 (2023).
- <sup>57</sup> Rodella, Zaveri, and Bertone, eds., *The Hidden Wealth of Nations: The Economics of Groundwater in Times of Climate Change* (2023).
- <sup>58</sup> 2030 WRG, <https://2030wrg.org>; Global Commission on the Economics of Water, <https://watercommission.org>; Roundtable on Financing Water, <https://www.oecd.org/water/roundtable-on-financing-water.htm>; Water Finance Coalition, <https://www.waterfinancecoalition.org>; WASH Finance Strategy Guide, <https://www.unicef.org/documents/how-develop-water-sanitation-and-hygiene-wash-finance-strategy>.
- <sup>59</sup> Bennett and Ruef, *Alliances for Green Infrastructure: State of Watershed Investment 2016* (2016).
- <sup>60</sup> IFC, "IFC Helps Privatize Albania's Electricity Distribution Company to Improve Power Supply," Press Release, March 11, 2009.
- <sup>61</sup> PIB Delhi, "Cabinet Approves Continuation and Revamping of the Scheme for Financial Support to Public Private Partnerships in Infrastructure Viability Gap Funding VGF Scheme," Press Release, November 11, 2020.
- <sup>62</sup> NMCG website, <https://nmcg.nic.in/NamamiGanga.aspx>.
- <sup>63</sup> NMCG Project Dashboard, <https://gisnmcg.mowr.gov.in/pmt/nmcgpmtmain.aspx>.
- <sup>64</sup> <https://nmcg.nic.in/index.aspx>; <https://mathurahamstp.in/>; <https://www.varanasihamstp.in/>.
- <sup>65</sup> Adapted from WB, *Jordan Country Climate and Development Report* (2022).

# References

- Alfieri, Lorenzo, Francesco Dottori, Peter Salamon, Huan Wu, and Luc Feyen. 2020. "Global Modeling of Seasonal Mortality Rates from River Floods." *Earth's Future* 8 (9): e2020EF001541.
- Bennett, Genevieve and Franziska Ruef. 2016. *Alliances for Green Infrastructure: State of Watershed Investment 2016*. Ecosystem Marketplace. <https://www.forest-trends.org/wp-content/uploads/2017/03/2016SOWIRReport121416.pdf>.
- CDP. 2020. *Cleaning Up their Act: Are Companies Responding to the Risks and Opportunities Posed by Water Pollution?* CDP Global Water Report 2019.
- CERES. "New Analysis Shows Value at Risk from Negative Water Impacts in Apparel and Meat Industries." Press Release. December 8, 2021. <https://www.ceres.org/news-center/press-releases/new-analysis-shows-value-risk-negative-water-impacts-apparel-and-meat>.
- Buchner, Barbara, Baysa Naran, Pedro Fernandes, Rajashree Padmanabhi, Paul Rosane, Matthew Solomon, Sean Stout, Costanza Strinati, Rowena Tolentino, Githungo Wakaba, Yaxin Zhu, Chavi Meattle, and Sandra Guzmá. 2021. *Global Landscape of Climate Finance 2021*. Climate Policy Initiative. <https://www.climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2021/>.
- Climate-Smart Water Investments: Emerging Opportunities to Leverage Climate Finance for Water Infrastructure Investment*. Draft report.
- Convergence. 2020. "Blended Finance." <https://www.convergence.finance/blended-finance>.
- Damania, Richard, Sébastien Desbureaux, Marie Hyland, Asif Islam, Scott Moore, Aude-Sophie Rodella, Jason Russ, and Esha Zaveri. 2017. *Uncharted Waters: The New Economics of Water Scarcity and Variability*. World Bank, Washington, DC.
- Delacámara, Gonzalo. 2018. "The Value of Water – If Hidden, It Will Be Overlooked." Water Europe. April 3. <https://watereurope.eu/the-value-of-water-if-hidden-it-will-be-overlooked/>.
- Food and Agriculture Organization. 2020. *The State of Food and Agriculture 2020: Overcoming Water Challenges in Agriculture*. Rome.
- Global Commission on Adaptation. 2019. *Adapt Now: A Global Call for Leadership on Climate Resilience*.
- Global Water Intelligence. 2022. "Mapping Water's Carbon Footprint: Our Net Zero Future Hinges on Wastewater." White Paper. <https://my.globalwaterintel-insights.com//2DC/carbonfootprintwp>.
- GISD Alliance. 2021. *Increasing Private Finance Mobilization: Recommendations for Development Banks and the Global Development Community*. [https://www.gisdalliance.org/sites/default/files/2021-10/GISD%20Position%20Paper%20-%20DC%20Recommendations%20Private%20Finance%20Mobilization\\_18%20Oct\\_0.pdf](https://www.gisdalliance.org/sites/default/files/2021-10/GISD%20Position%20Paper%20-%20DC%20Recommendations%20Private%20Finance%20Mobilization_18%20Oct_0.pdf).
- Gupta, Neeraj. "India: Cleaning up the Ganga with Private Sector Support." World Bank (blog), July 2, 2019. <https://blogs.worldbank.org/ppps/india-cleaning-ganga-private-sector-support>.
- IFC. 2009. "IFC Helps Privatize Albania's Electricity Distribution Company to Improve Power Supply." Press Release, March 11. <https://pressroom.ifc.org/all/pages/PressDetail.aspx?ID=23317>.
- Kingdom, William, Axel Baeumler, and Alfonso Guzman. 2012. "Capital Subsidies Implicit in Concessional Finance: How to Make Them More Transparent and Better Targeted." Water Papers Series, No. 69684. Washington, DC: World Bank.
- Kressig, Aaron, Logan Byers, Johannes Friedrich, Tianyi Luo, and Colin McCormick. "Water Stress Threatens Nearly Half the World's Thermal Power Plant Capacity." World Resources Institute (blog), April 2018. <https://www.wri.org/insights/water-stress-threatens-nearly-half-worlds-thermal-power-plant-capacity>.
- Lardoux de Pazzis, Anne and Amandine Muret. 2021. "The Role of Intermediaries to Facilitate Water-related Investment." OECD Environment Working Paper No. 180. Paris: OECD Publishing.
- Leigland, James. 2018. "Public-Private Partnerships in Developing Countries: The Emerging Evidence-based Critique." *The World Bank Research Observer* 33 (1): 103–134.
- Misra, Smita, and Bill Kingdom. 2022. *City-wide Inclusive Water Supply: Role of Supplementary Urban Water Service Providers*. Washington, DC: World Bank.
- Organisation for Economic Co-operation and Development (OECD). "Country-level Indicators to Support Blended finance for Water-Related Investments." Draft working note.
- OECD. 2023. "The Reform of the International Financial Architecture: An Opportunity for Scaling Up Finance for Water?" Background note for the 9<sup>th</sup> Roundtable on Financing Water, Geneva, February 7–9, 2023. Available at <https://www.oecd.org/water/background-note-global-financial-architecture-9th-RT-on-financing-water.pdf>.
- OECD and CDP. 2023. Finance Water Action Pathway. Available at <https://www.oecd.org/water/finance-water-action-pathway-CDP-9th-RT-on-financing-water.pdf>.
- PIB Delhi. "Cabinet Approves Continuation and Revamping of the Scheme for Financial Support to Public Private Partnerships in Infrastructure Viability Gap Funding VGF Scheme." Press Release, November 11, 2020. <https://pib.gov.in/PressReleasePage.aspx?PRID=1671914>.

Pörtner, Hans-Otto, et al. 2022. *Climate Change 2022: Impacts, Adaptation and Vulnerability*. The Working Group II Contribution to the Intergovernmental Panel on Climate Change's (IPCC's) Sixth Assessment Report. Geneva: IPCC.

Rodella, Aude-Sophie, Esha Zaveri, and François Bertone, eds. 2023. *The Hidden Wealth of Nations: The Economics of Groundwater in Times of Climate Change*. Washington, DC: World Bank.

Sadoff, C. W., J. W. Hall, D. Grey, J. C. J. H. Aerts, M. Ait-Kadi, C. Brown, A. Cox, S. Dadson, D. Garrick, J. Kelman, P. McCornick, C. Ringler, M. Rosegrant, D. Whittington, and D. Wiberg. 2015. *Securing Water, Sustaining Growth*. Report on the GWP-OECD Task Force on Water Security and Sustainable Growth. University of Oxford, UK.

Schur, Michael. 2016. "Public-Private Partnership Funds: Observations from International Experience." ADB East Asia Working Paper Series, No. 6. September. <https://www.adb.org/sites/default/files/publication/202486/eawp-06.pdf>.

The International High Level Panel on Water Investments for Africa. 2023. *Africa's Rising Investment Tide: How Investment Partnerships Will Mobilize USD\$30 billion/year to Achieve Water Security and Sustainable Sanitation in Africa*. South Africa.

World Bank. 2009. "World Bank Continues to Support the Electricity Sector in Albania." Press Release, May 5. Washington, DC: World Bank. <https://documents1.worldbank.org/curated/en/954511639578745622/pdf/Announcement-of-World-Bank-Continues-to-Support-the-Electricity-Sector-in-Albania-on-May-5-2009.pdf>.

World Bank. 2016. *High and Dry: Climate Change, Water, and the Economy*. Washington, DC: World Bank.

World Bank. 2019. *City-wide Inclusive Water Supply: Adopting Off-Grid Solutions to Achieve the SDGs*. Washington, DC: World Bank.

World Bank. 2020. "Project Signing: World Bank Provides \$400 million to Enhance Support for Rejuvenating the Ganga." Press Release, July 7. <https://www.worldbank.org/en/news/press-release/2020/07/07/project-signing-world-bank-provides-400-million-to-enhance-support-for-rejuvenating-the-ganga>.

World Bank. 2021. *A Water-Secure World for All*. Washington, DC: World Bank.

World Bank. 2021. "Climate Risks and Opportunities: Water Ready for Climate Change." Presentation. World Bank Water Global Practice.

World Bank. 2021. *Private Participation in Infrastructure (PPI): Annual Report 2021*. Washington, DC: World Bank. <https://ppi.worldbank.org/content/dam/PPI/documents/PPI-2021-Annual-Report.pdf>.

World Bank. Forthcoming. *Supplementary (Non-Utility) Water Service Providers*. Washington, DC: World Bank.

World Bank. 2021. *World Bank Climate Change Action Plan 2021–2025: Supporting Green, Resilient, and Inclusive Development*. Washington, DC: World Bank.

World Bank. 2022. *Global Economic Prospects*. September.

World Bank. 2022. *Jordan Country Climate and Development Report*. Washington, DC: World Bank.

World Bank. 2023. *Global Economic Prospects*. January.

World Bank and OECD. "The Implications of the COVID-19 Crisis on Financing Water-related Investment." Draft research paper.

World Water Council and OECD. 2015. *Water: Fit to Finance? Catalyzing National Growth through Investment in Water Security*. Marseille: World Water Council.

Zaveri, Esha D., Richard Damania, and Nathan Engle. 2023. "Droughts and Deficits: The Global Impact of Droughts on Economic Growth." Policy Research Working Paper 10453. World Bank Water Global Practice. Washington, DC: World Bank.

