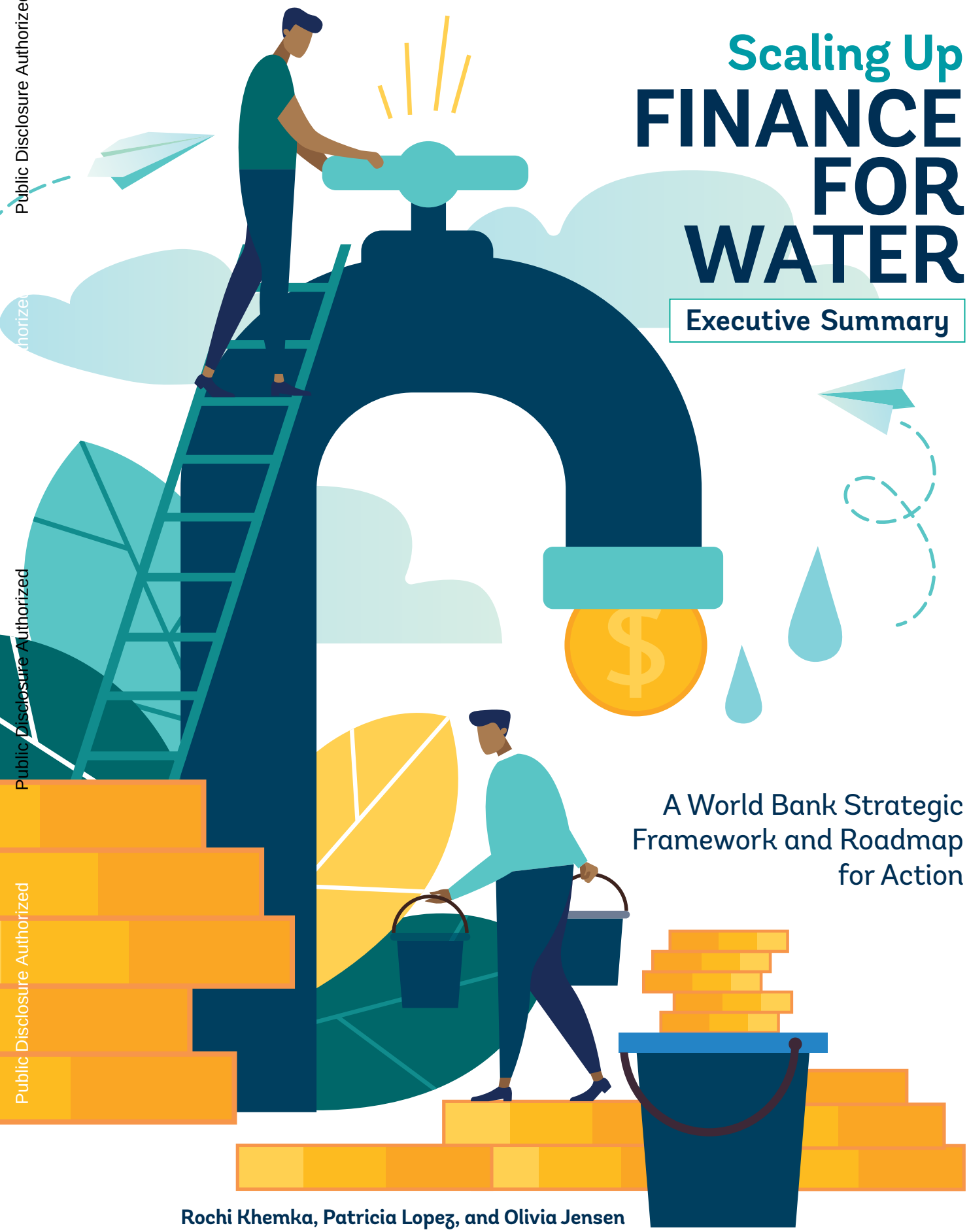
Scaling Up FINANCE FOR WATER

Executive Summary



A World Bank Strategic Framework and Roadmap for Action

Rochi Khemka, Patricia Lopez, and Olivia Jensen

WORLD BANK

GWSP
GLOBAL WATER SECURITY & SANITATION PARTNERSHIP

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An Executive Summary of the World Bank Strategic Framework and Roadmap for Action

Rochi Khemka, Patricia Lopez, and Olivia Jensen

1818 H Street NW, Washington, DC 20433
Telephone: 202-473-1000; Internet: www.worldbank.org

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Contents

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.

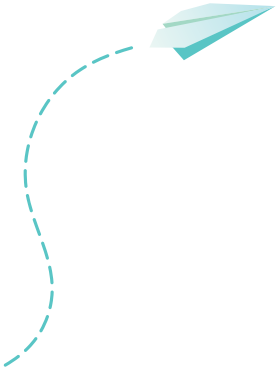
The resultant strategic framework provides a set of strategic directions and a customizable roadmap for the public sector, private sector, international organizations, intermediaries, and others to collaborate towards catalyzing greater financing and innovation for the water sector. This builds on the 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.

Juergen Voegele
Vice President
Sustainable Development
World Bank

Mohamed Gouled
Vice President
Global Industries
IFC

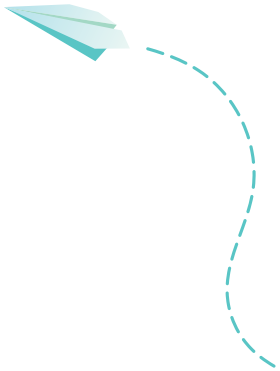
Ethiopis Tafara
Vice President and
Chief Risk, Legal, and
Administrative Officer
MIGA



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[1] 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)[2] 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).

The peer reviewers for this work included technical experts across the WB to whom the co-authors express their sincere appreciation: Aijaz Ahmad (Lead Public-Private Partnerships Specialist, World Bank Infrastructure, PPPs, and Guarantees), Dan Vardi (Principal Investment Officer, IFC), Joel Kolker (Lead Water Supply and Sanitation Specialist, World Bank Water), Laila Nordine (Senior Advisor, World Bank Operations Policy and Country Services), Steen Byskov (Senior Financial Officer, World Bank Treasury), and Wenhe Zhang (Senior Underwriter, MIGA).

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

2030 WRG	2030 Water Resources Group
BOT	Build-Operate-Transfer
CAPEX	capital expenditure
CAT	catastrophe
FONADIN	National Infrastructure Fund Trust
FSR	Financial Sustainability Roadmap
GSG	Global Solutions Group
IBRD	International Bank for Reconstruction and Development
IDI	Infilco Degremont, Inc.
IFC	International Finance Corporation
InfraSAP	Infrastructure Sector Assessment Program
IPG	Infrastructure Finance, PPPs, and Guarantees
LADWP	Los Angeles Department of Water and Power
LBP	Land Bank of the Philippines
MIGA	Multilateral Investment Guarantee Agency
MOF	Ministry of Finance
MWCI	Manila Water Company, Incorporated
MWI	Ministry of Water and Irrigation
NMCG	National Mission for Clean Ganga
NUWAS	National Urban Water Supply
NUWSP	National Urban Water Supply Project
PIR	policies, institutions, and regulations
PPP	public-private partnership
PSP	private sector participation
SDGs	Sustainable Development Goals
SPV	special purpose vehicle
TA & CB	technical assistance and capacity building
WB	World Bank
WICER	Water in Circular Economy and Resilience

List of Figures and Tables

FIGURES

TABLES

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.[3] 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.[4] 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?

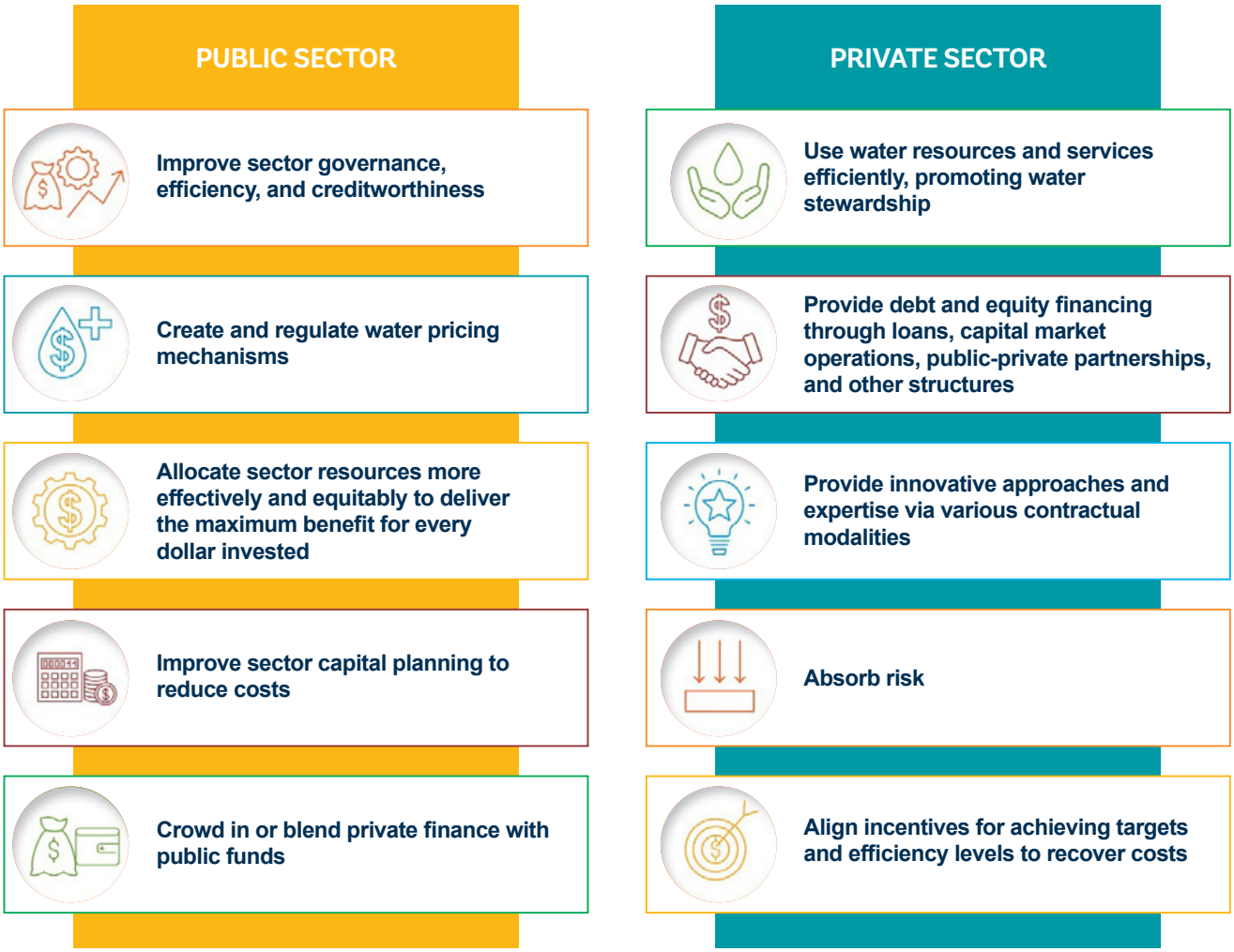
Large, coordinated flows of public, concessional, and private capital are needed to compensate for decades of underinvestment in the water sector, and to meet present and future challenges. Current global levels of investment are inadequate to address water sector risks and to achieve the Sustainable 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.[5] 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 1).

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[6] can help de-risk projects for investors and improve creditworthiness of service providers to access financing for water sector projects.

FIGURE 1: 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 2).

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 2: Strategic Framework for Scaling up Finance for Water

LESSONS LEARNED

What has/has not worked?

Binding constraints to private sector participation and private capital mobilization, based on past/ongoing initiatives

- **Undervaluation of water**
- **Lack of financially viable service providers**
- **Absence of enabling conditions**
- **Social reluctance** to pursue public-private partnerships
- **Multiple risks** and high transaction costs for public-private partnerships

STRATEGIC DIRECTIONS

Based on lessons learnt, which approaches can be scaled?

1. **Establishing the enabling conditions** for financial sustainability, creditworthiness, and access to financing
2. **Mobilizing private sector expertise** to improve operational efficiency and address climate impacts
3. **Diversifying and expanding the spectrum of finance solutions**

with a cross-cutting theme on *Advancing Climate Outcomes*

WB ROADMAP

Across the strategic directions, what actions need to be taken by the WB and other development partners?

The roadmap focuses on a **combination of demand- and supply-side solutions** for financing through the following themes:

- **Training and Capacity Building**
- **Analysis and Diagnostics**
- **Financial Planning**
- **Turnaround Strategies**
- **Financing Solutions**
- **Stakeholder Engagement**

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 WB'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 the appendix). 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 the appendix).

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 3).** 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 3: WB Roadmap: 10-Step Engagement

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. This step would ideally be conducted at the national level in order to introduce strategic financial planning to achieve national water security goals, but it could also be done at the sub-national and utility level.

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 **WB'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 the appendix).

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 1** 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 1: Blended Finance Structures

APPROACH	DESCRIPTION	APPLICATION
Grants	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.
Concessional funds	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.
Guarantees	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.
Insurance	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.
Other forms of support	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 4 to 6.

FIGURE 4: Financing Solutions for Water Resources Management, Storage, Floods, and Drought Resilience

WATER RESOURCES MANAGEMENT	STORAGE, FLOOD AND DROUGHT RESILIENCE	DISASTER RISK MANAGEMENT
		
• **Public-private partnerships** for hydropower, desalination, reuse, and multipurpose projects • **Blended finance** (e.g., Pamir energy project in Tajikistan, with IFC equity stake) • **Catchment investments by downstream commercial or industrial water users** (e.g., food and beverage companies, finance and insurance companies, private water utilities, and energy generation firms) • **Payment for ecosystem services and nature-based solutions** (e.g., Banten, Indonesia)	• **Public-private partnerships** for grey and green capital investments in flood risk management • Blue assets for **green bond market** • Financing based on revenue streams and **land value capture** • **Asset-based instruments** • Flood risk insurance facilities for flood disaster risk pool • Pooled investment facilities	• **Catastrophe bonds** • **Parametric insurance** • **Pooled risk facility** (e.g., Caribbean Catastrophic Risk Insurance Facility) for hurricane, excess rainfall, earthquake insurance • **Regional risk facilities** for countries with similar risks

FIGURE 5: Financing Solutions for Water Supply and Sanitation

WATER TREATMENT & DISTRIBUTION	WASTEWATER COLLECTION & TREATMENT	ONSITE SANITATION AT THE HOUSEHOLD LEVEL
Traditional Financing: • Governments; Design-Build-Operate arrangements **New Solutions:** • **Commercial debt** for corporatized utilities with creditworthiness (e.g., Uganda; Indonesia) • Equity finance for high-performing utilities through **IPOs and partial divestiture** (e.g., SABESP) • **Loan financing** for small-piped water systems (e.g., Kenya) • **PPPs** for desalination and **concessions** in cities with end-user tariffs (e.g., Brazil) • **Component-based financing** for energy efficiency improvements	**Traditional Financing:** • Governments; Design-Build-Operate arrangements **New Solutions:** • **Public-private partnerships** for water reuse, particularly to industrial users (e.g., WB ReWater initiative) • **Hybrid annuity model** for wastewater treatment and reuse (e.g., Ganga) • **Revolving funds** for rural solutions • Off-grid (non-utility) services and delivery by **microenterprises**	**Traditional Financing:** • Households **New Solution:** • **Microfinance** for extension of access by micros, small, and medium-sized enterprises (e.g., donor and philanthropic contributions in Sub-Saharan Africa and Asia)

FIGURE 6: Financing Solutions for the Irrigation Sector

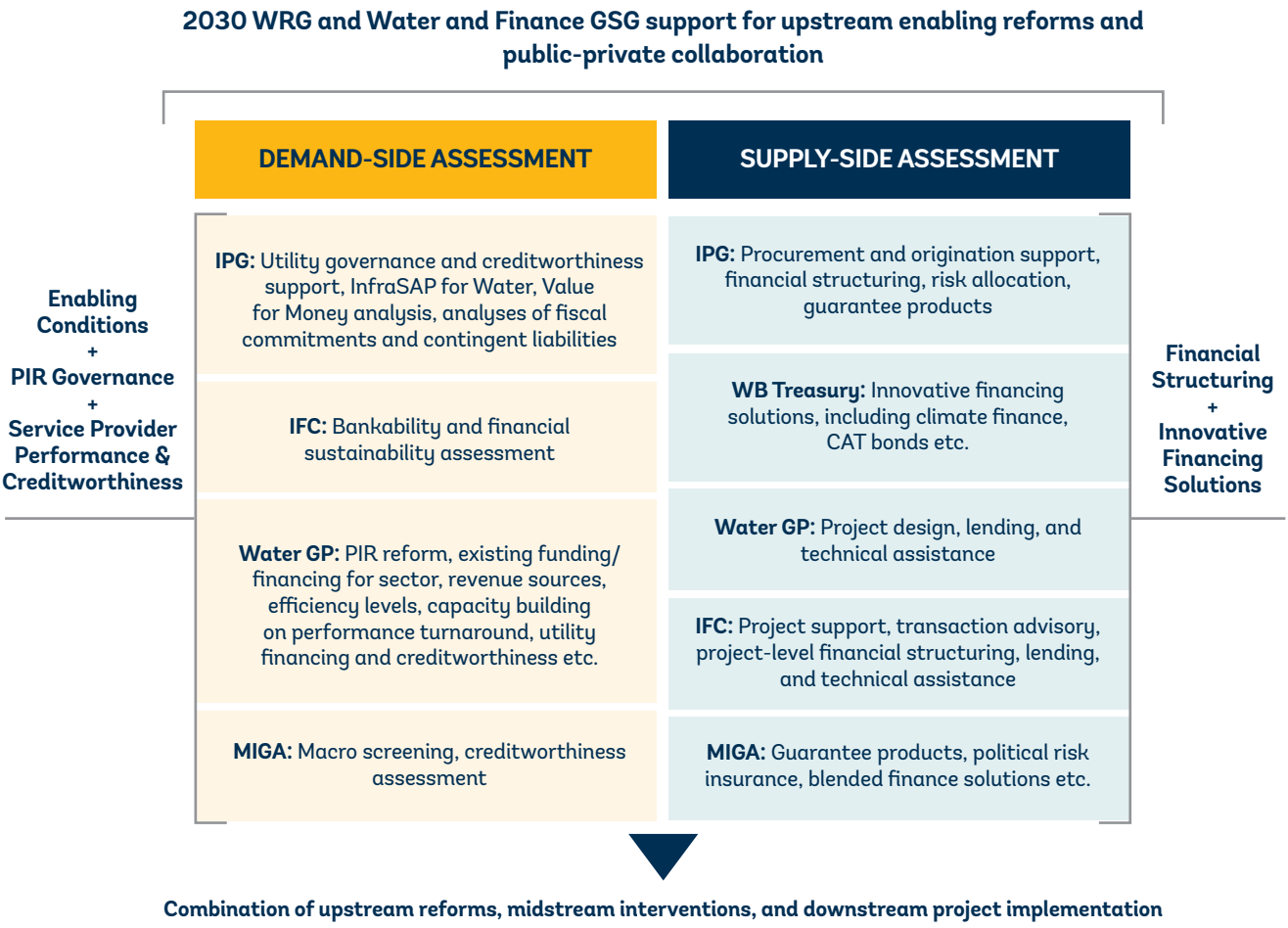
	SYSTEM MODERNIZATION	OPERATION & MAINTENANCE & WORKING CAPITAL	ON-FARM MODERNIZATION
Basin-Level Investments & Major Headworks	**Traditional Financing:** • Governments and international finance institutions **New Solutions:** • Public-private partnerships for dam construction/operation (e.g., Chile), desalination, and reuse		**Traditional Financing:** • Subsidized financing in irrigation programs (e.g., Rwanda SSIT) **New Solutions:** • Design of financial incentives for smallholders to use efficient irrigation (e.g., Morocco's Plan Maroc Vert) • Farmer-led irrigation development for access to finance, technology, and markets • Private sector solutions (e.g., India JOHAR) with matching grants (e.g., Punjab) • Access to finance by intermediaries (e.g., MFIs, rural banks), including blended finance (e.g., Philippines) and with third party guarantees (e.g., Tanzania) • Agri-tech service provider models (e.g., rentals, leasing, pay-per-use in India) • Value chain finance (e.g., consumer credit in India; supplier credit in Nigeria; outgrower contracts in Kenya)
Development and Modernization of Large-Scale Irrigation Schemes	**Traditional Financing:** • Governments and international finance institutions, with low capital cost recovery **New Solutions:** • Recovery of investment costs (e.g., Turkey) • Public-private partnerships to leverage private capital and management (e.g., Peru, Karnataka) • Green bond issuance (e.g., Brazil and Turkey)	**Traditional Financing:** • Public schemes with high subsidies and low cost recovery **New Solutions:** • Public-private partnerships for irrigation management, reducing public subsidies (e.g., West Bengal and Gabiro agribusiness hub)	
Groundwater Systems; Small-Scale Collective or Individual Systems	**Traditional Financing:** • Largely farmer-led or public financing (e.g. Morocco, Yemen, Afghanistan, etc.) **New Solutions:** • Community or individual investments through cost-sharing (e.g., Chile) • Public-private partnerships using blended finance (e.g. Karnataka) • Establishment of private institutions for financing through public support (e.g. Niger)	High level of public subsidies for energy, usually farmer financed	

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 7). 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 7: Joint WB Collaboration on the Roadmap



APPENDIX: 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.[7]

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.[8] 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.[9]

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 m³/d to 365,000 m³/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.

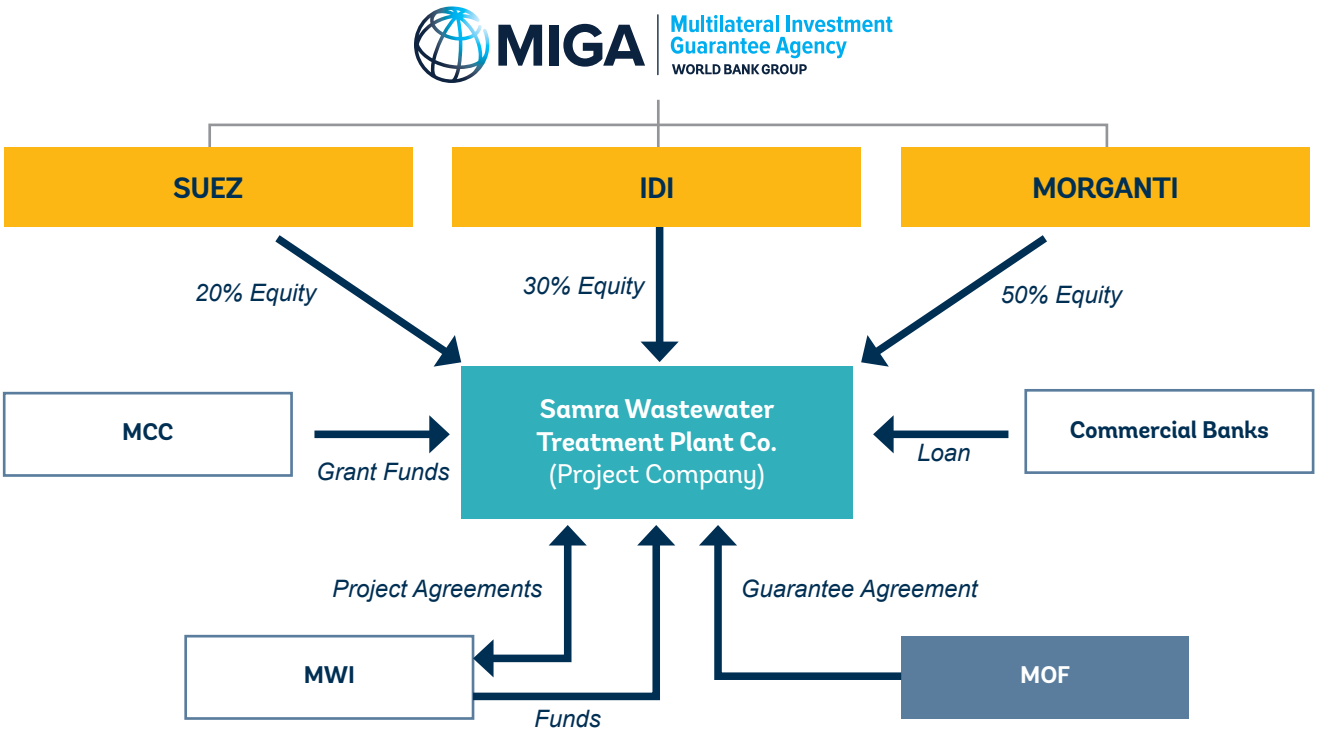
MIGA has supported both the existing operations and expansion of the AS Samra Wastewater Treatment Plant to help address the country's major environmental and health issues and water deficit. This was supported through political risk guarantees to cover US$13.1 million of equity investments for expansion 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 A1 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.

FIGURE A1: Project Structure and Capital Flows



Results Achieved and Private Investment Mobilized

The Project has achieved strong operational and financial performance and development impacts, including increasing wastewater treatment capacity from 267,000 m³/d to 365,000 m³/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 m³/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 Bita Water Project is the first water project to use the WB'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 Bita 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.

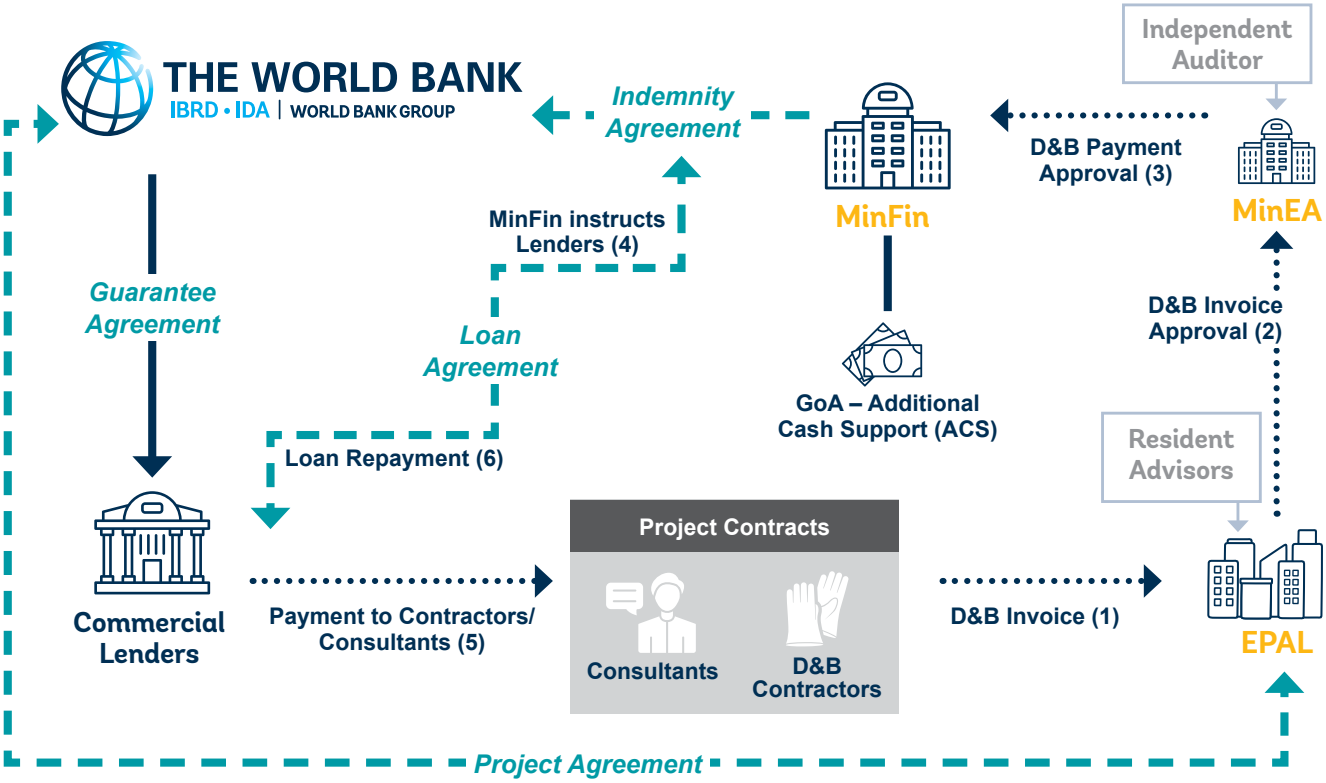
The Project will address water supply service deficits at scale. The optimized design will have an initial capacity to serve approximately 2 million people, with structural readiness for a future potential expansion to serve about 4 million. By addressing service deficits at scale, the project will have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

Background and Context

The Bita 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 Bita 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^3/sec, ready for expansion to 6 m^3/sec, increasing and diversifying Luanda's water production system and making it more climate resilient.

FIGURE A2: Structure of Angola Bita 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 A2). 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.

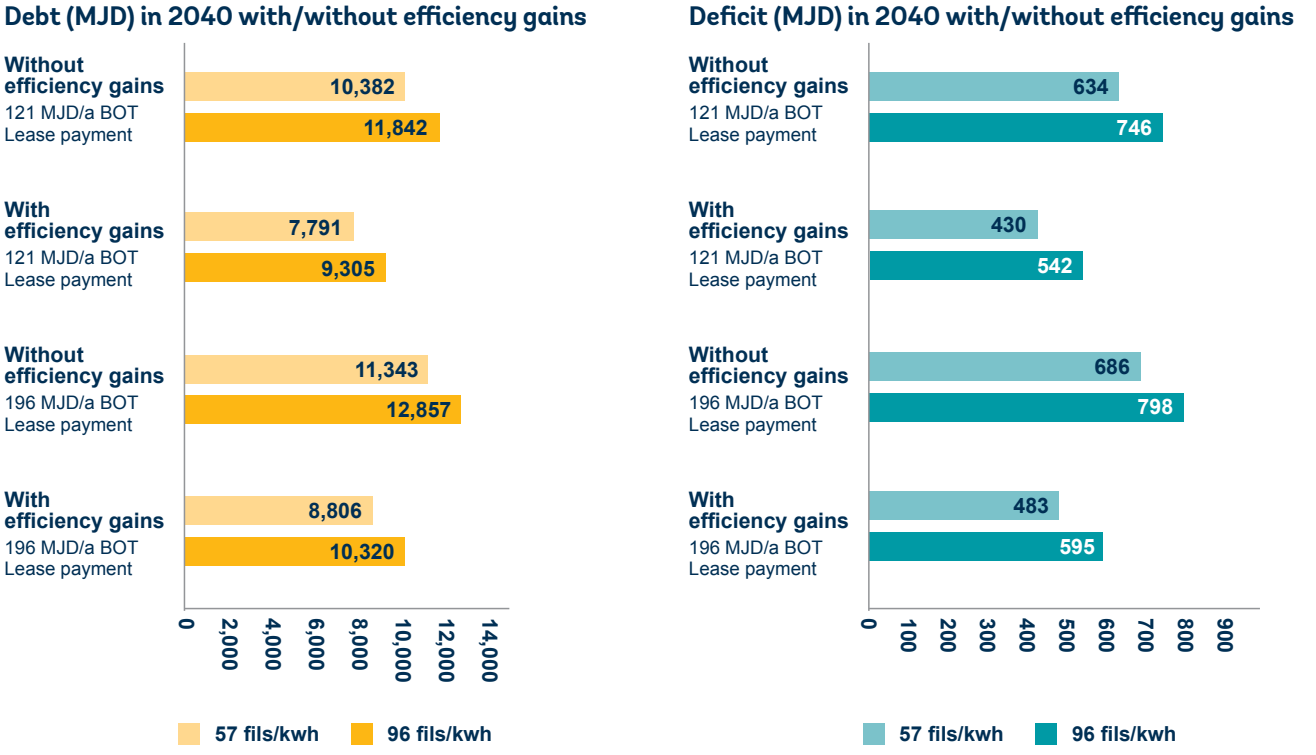
Opportunities to augment water supply – desalination and long-distance transfer and purchasing water from other countries – are limited and increasingly costly, posing severe financial sustainability challenges for the sector. By the end of 2019, the water sector deficit was JOD 310 million (1 percent 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 A3). 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.[10]

FIGURE A3: Financial Performance of Jordan's Water Sector with/without Efficiency Gains



6. THE NATIONAL URBAN WATER SUPPLY PROJECT OF INDONESIA

Project Objectives

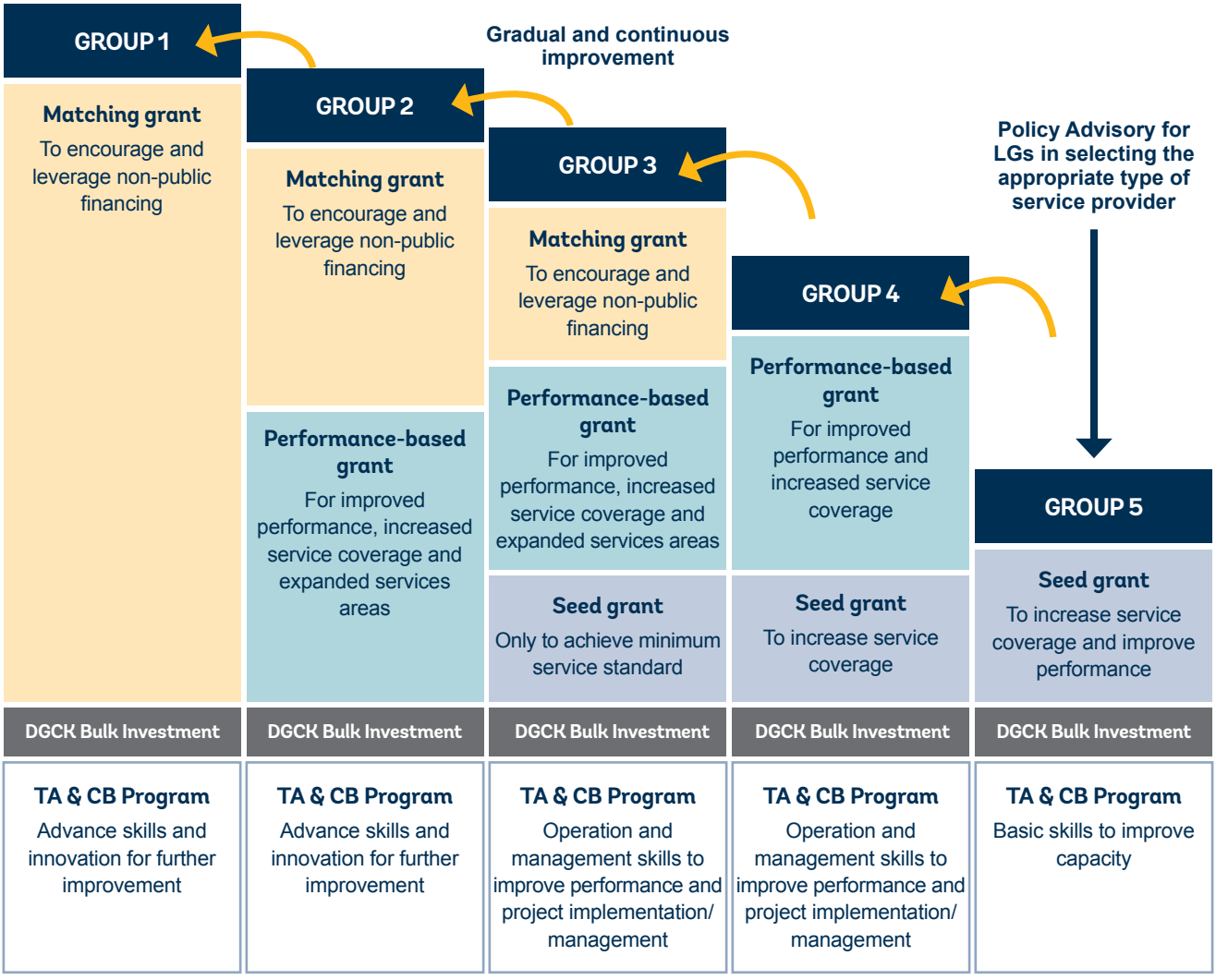
Indonesia's National Urban Water Supply Project (NUWSP), financed by the WB, has supported the creation of an overarching framework for national urban water supply development and financing, known as NUWAS. NUWAS provides a structured and systematic way to help local governments and utilities to improve 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 A4: 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 A4).

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 A1: 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 A2: 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%
Total	**371.75**		**503**	

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'etudes 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 loses 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.

Endnotes

[1] References to the “water” sector in this report include sanitation and wastewater management services.
[2] 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).
[3] World Bank, *A Water-Secure World for All* (Washington, DC: World Bank, 2021).
[4] World Bank, *High and Dry: Climate Change, Water, and the Economy* (Washington, DC: World Bank, 2016).
[5] World Water Council and OECD, *Water: Fit to Finance? Catalyzing National Growth through Investment in Water Security* (Marseille: World Water Council, 2015).
[6] Blended finance refers to the use of development finance to mobilize additional funds from private and commercial sources for sustainable development in developing countries.
[7] NMCG website, https://nmcg.nic.in/NamamiGanga.aspx.
[8] NMCG Project Dashboard, https://gisnmcg.mowr.gov.in/pmt/nmcgpmtmain.aspx.
[9] https://nmcg.nic.in/index.aspx; https://mathurahamstp.in/; https://www.varanasihamstp.in/.
[10] Adapted from WB, *Jordan Country Climate and Development Report* (Washington, DC: World Bank, 2022).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