

Water *Finance Framework*

Unlocking Water Capital by Aligning Needs
with Appropriate Financing Structures

A contribution to the 2026
United Nations Water Conference

June 2026



Preface

The 2026 United Nations Water Conference, co-hosted by the United Arab Emirates and Senegal, represents an important opportunity to move from ambition to execution on water security and SDG 6 – clean water and sanitation for all. In this context, the Water Finance Framework is presented as the Global Climate Finance Centre's (GCFC) contribution to the Conference and its preparatory process, with the aim of supporting dialogue and practical progress on the role of finance in accelerating delivery across the water sector.

In line with its role at the intersection of policy, finance, and implementation, GCFC focuses on translating public priorities into investable opportunities. This framework reflects that approach, drawing on practical insights developed in collaboration with Water.org on how different forms of capital can be more effectively aligned with the realities of water systems.

It is not intended as a research paper, but as a decision-making tool. At its core is a recognition that one of the main barriers to scaling investment in water is the persistent misalignment between the characteristics of water services and the way capital is structured and deployed.

By establishing a clear logic to classify water investments, identify credible payers, and match them with appropriate forms of capital, the framework aims to provide a common language for policymakers, financiers, and practitioners. In doing so, it supports more coherent pipeline development, improved capital allocation, and more effective delivery across the water system.

This framework is offered as a contribution to the UN Water Conference process and its interactive dialogues, with the intention of supporting more practical, coordinated, and scalable approaches to water finance.



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These engagements have strengthened both the analytical framing and practical applicability of the report.

Disclaimer

The findings, interpretations, and conclusions expressed in this report are those of the authors and do not necessarily reflect the views of the contributing organisations.

About GCFC

GCFC is a global platform established at COP28 to accelerate capital flows into climate solutions. Headquartered in Abu Dhabi, GCFC focuses on unlocking investment by addressing structural barriers, advancing financial frameworks, and supporting market development across emerging markets.

About Water.org

Water.org is a global nonprofit organisation working to expand access to safe water and sanitation. The organisation pioneers market-based solutions that remove financial barriers, enabling households to access water and sanitation through affordable financing. To date, Water.org has helped empower more than 88 million people with access to safe water or sanitation.



Table of Contents

1	Introduction: Why a Water Finance Framework is Needed	Page 5
2	Key Principles of Water Finance	Page 6
3	Applying the Framework	Page 7
	Water Investment Typology	Page 8
	Role of Capital & Risk Instruments	Page 13
	Lifecycle Costs & Payers	Page 15
4	Financial Viability Spectrum	Page 17
5	Water Investment Archetypes	Page 19
6	Applying the Framework to Water Compacts	Page 33
7	Conclusion & Next Steps	Page 34
8	Annex 1: Applying the Framework to Senegal's Water Forward Compact 2026–2030	Page 35

Introduction: Why a Water Finance Framework is Needed

The water sector faces a pressing financing challenge in delivering SDG 6 and responding to the impacts of a worsening climate crisis. Clear pathways exist to expand and strengthen water systems, including through new infrastructure, the upgrading and maintenance of existing assets, and the protection and restoration of the natural ecosystems that underpin water security and service delivery. Yet funding remains insufficient while the hydrological context in which water systems operate is becoming increasingly unstable. Traditional funding modalities, tariffs, taxes, and transfers, are under growing strain, with constrained public budgets, declining overseas development assistance (ODA) flows in some contexts, and rising affordability pressures all limiting the ability of existing models to sustain investment at the scale required. These pressures are particularly acute in emerging markets and last-mile communities, where financing gaps remain widest and service needs are most urgent.

The seeming paradox is that in many contexts water is both systematically undervalued in pricing, as well as unaffordable and/or inaccessible for billions of people. The challenge is not to choose one view over the other, but to recognise that, water is not a singular investment category. It involves services and system functions with fundamentally different revenue profiles, cost structures, and public value. Some can support user-paid or contract-backed finance. Others are structurally non-commercial and must be funded as public services. Many fall in between and require a deliberate mix of public finance, concessional instruments, and targeted performance incentives.

Key challenges of water financing

Siloed Understanding of Water as a Single Sector or Vertical

Treating water as uniform infrastructure rather than a system with heterogeneous financial characteristics

CAPEX-Driven Disconnection

Emphasis on near-term capital expenditure that overlooks long-term service delivery financing

Unrealistic Expectations of Commercial Finance

Expectation of commercial finance in contexts where repayment fundamentals do not exist

Under-Investment in Natural Systems

Systematic under-investment in natural water systems despite macro-critical resilience role

This Framework is a practical decision-support tool to address these challenges. It demystifies water finance by establishing a shared logic for classifying water investments, understanding their financial nature, and aligning them with appropriate capital stacks. It distinguishes funding from financing, and clarifies why the financing logic for last-mile household access cannot be the same as for regulated utilities, basin resilience, or industrial offtake and reuse. By making these differences explicit, the framework supports better allocation of public and catalytic capital, improves realism around what is commercially financeable, and strengthens service outcomes where public funding is essential.

Takeaway: The framework helps policymakers, utilities, project developers, financiers, and ecosystem enablers answer: What type of water investment is this? What is its true financial nature? And what forms of capital belong here?

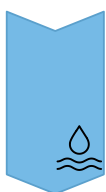
Key Principles of Water Finance

To support practical decision-making, the framework begins with five key principles that reflect structural characteristics of water systems, including the interlinkages between water and climate risks. These principles summarise recurring structural constraints observed in water service delivery and finance and are intended to support more realistic matching of capital to service fundamentals.



Water & Climate Risks Are Interlinked

Climate risks directly impact water service delivery, increasing variability, operational stress, and long-term investment needs. Many water investments therefore deliver adaptation co-benefits, creating opportunities to align water financing with climate and resilience funding.



Water Is a System with Public-Good Components

Parts of the water system, particularly basins, ecosystems, and nature-based functions, deliver system-wide benefits but do not easily generate direct or attributable revenues. These services need to be funded primarily through public finance, grants and concessional sources, rather than project cashflows.



Financing Follows a Credible Payer

All water services are ultimately paid for through tariffs, taxes, and transfers. Financing can shift the timing of costs, but it cannot replace the underlying payer. If the payer is unclear, fragmented, or politically unreliable, repayable finance will not hold.



Risk & Return Have Structural Limits

Even where a payer exists, many water service investments remain low-return, long-horizon, and exposed to political and institutional risk. Risk can be reduced or shared, but it cannot be eliminated through structuring. Blended finance is most useful where performance is improving and cashflows are stabilizing, not as a substitute for service fundamentals.



Lifecycle Costs Must Be Fully Covered

CAPEX alone is not service delivery. Financing decisions must account for the full cost of sustaining a service, including OPEX, capital maintenance (CapManEx), and institutional capacity. If any essential lifecycle cost is unfunded, the service will fail over time, even if construction is fully financed.



These principles are reflected throughout the typology, viability assessment, and archetypes that follow. They form the analytical backbone of all water financing decisions.

Applying the Framework

The framework is to be applied in four practical steps, at project, portfolio, or country level (i.e. Water Compacts). Each step builds on the previous one, ensuring that capital allocation decisions are grounded in service delivery realities.

The framework organises water investments into six archetypes, each anchored in a distinct service purpose. Within each archetype, investment scenarios are derived from the combinations of service geography, revenue characteristics, and institutional context that produce materially different financing profiles. Each scenario carries an empirically grounded capital stack, derived from the analysis of 192 real-world projects across 40 countries, spanning both lower-middle-income and upper-middle-income country contexts. The capital stacks are not prescriptions, they are observed financing tendencies that reflect how comparable investments are actually structured in practice. Practitioners begin by identifying the archetype and scenario that best fits their investment, then apply the four steps below to confirm and refine the diagnosis

The archetypes and scenarios are diagnostic lenses, not rigid categories. Many real-world investments cut across multiple archetypes, particularly in multi-component programmes and country-level compacts, as Annex 1 demonstrates through the Senegal Water Compact. In those cases, practitioners should assess each component separately before constructing a programme-level financing view.

Framework steps

1

Classify the Investment

- Key question: What kind of water service or system function is this?
- What to assess: Service purpose, service geography, institutional context, and revenue characteristics

2

Map the Lifecycle Costs

- Key question: What costs must be funded across the life of the service?
- What to assess: CAPEX, OPEX, CapManEx, institutional costs, and cost of capital (where relevant)

3

Identify Payers

- Key question: Who pays for each lifecycle cost component?
- What to assess: Whether costs are funded by users, taxpayers, cross-subsidies, transfers, or external funding

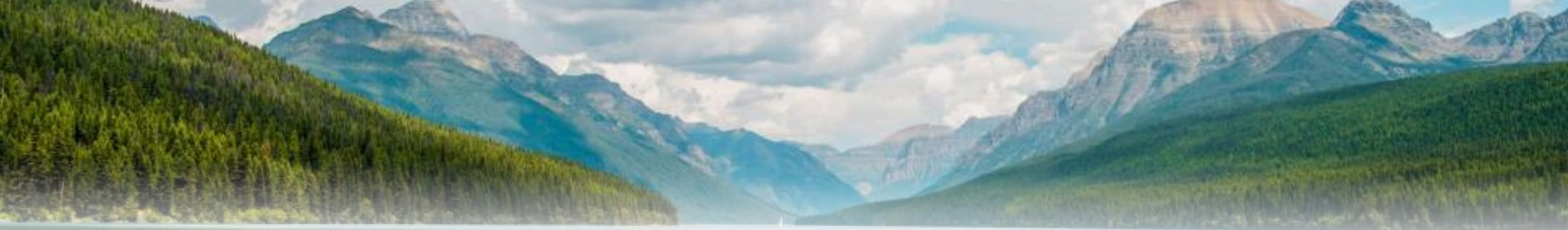
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Match Forms of Capital

- Key question: What capital is appropriate given the payer logic and risk profile?
- What to assess: The realistic role of public allocation, grants, concessional finance, and commercial finance

At every stage, the framework enforces a single discipline: Capital must follow service reality, not ambition.

This disciplined approach prevents the systematic failures that have undermined water finance for decades: mismatched capital structures, unfunded lifecycle costs, and the inappropriate expectation that commercial capital fill in for contexts where repayment fundamentals do not exist.



Water Investment Typology

1. Classify the investment

This section provides a simple investment typology to help practitioners accurately diagnose the financial characteristics of a water investment before financing decisions are made. Investments are classified across four dimensions, service purpose, service geography, revenue characteristics, and institutional context — each of which materially affects financial viability and the appropriate capital stack.

Correctly identifying these dimensions is critical because they determine the nature of the payment stream, the feasibility of cost recovery, the appropriate role of different actors, and which investment archetype may apply. No single dimension is determinative; it is their combination that shapes the financing logic. A single water programme may include multiple uses and contexts, so components should be disaggregated and classified separately before financing decisions are made.

The typology connects directly to the investment archetypes and financing scenarios that follow. Service purpose serves as the organising entry point, defining which archetype a water investment belongs to. The remaining three dimensions, service geography, revenue characteristics, and institutional context, then determine the specific financing scenario within that archetype, reflecting how the same service purpose can generate fundamentally different financial viability profiles and capital stack requirements depending on context.

Water Investment Typology Dimensions

Dimension 1 - Service Purpose

The fundamental good or function that the water investment seeks to deliver to its intended beneficiary, whether a public good, a user service, or an enabling system function. Service purpose shapes what is delivered and to whom, but does not alone determine financial viability.

Dimension 2 - Service Geography

The spatial and settlement context in which a water service operates, determining the cost structure, feasibility of networked delivery, and revenue potential of the investment.

Dimension 3 - Revenue Characteristics

The nature and source of the payment stream that ultimately funds the service, whether direct user charges, public taxes, or donor payments, independent of institutional strength or creditworthiness.

Dimension 4 - Institutional Context

The governance, regulatory, and fiscal capacity of the entities responsible for mobilising and managing revenues or public funding, determining whether financial obligations can be reliably honoured over time.

 **Key Principle:** These four dimensions must be assessed independently and in combination. The same service purpose can have completely different financial characteristics depending on geography, institutional context, and revenue structure.

Service Purpose

DIMENSION 1

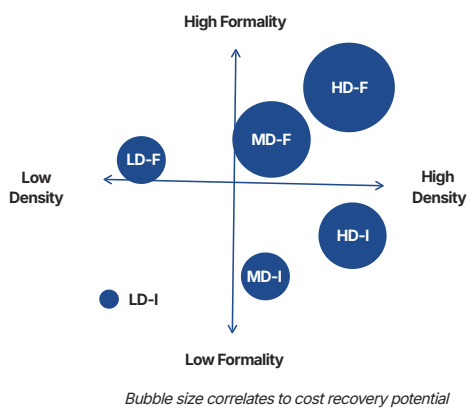
This dimension classifies water investments based on their primary service purpose. Correctly identifying the use or function of a water investment is critical because it determines the likely beneficiaries, the potential or absence of revenue, and ultimately the financial characteristics of the water investment. It is worth noting that a single water programme may include multiple uses and functions, therefore components should be disaggregated and classified separately before financing decisions are made.

Use / Function	What This Covers	Typical Examples
Water Ecosystem Conservation and Restoration	Green water systems, nature-based functions, and watershed services underpinning long-term water security, climate resilience, and biodiversity.	Watershed restoration, wetland conservation, aquifer recharge, environmental flows, nature-based flood buffers.
Water Hazard Management	Managing the risks of water-related extremes, including floods, droughts, and climate-induced water variability.	Flood protection infrastructure, drought preparedness systems, early warning systems, water storage for resilience, coastal protection.
Water Service Provision	Delivering potable or process water to end users across household, municipal, and industrial contexts, through networked or decentralised systems...	Urban water networks, rural piped schemes, desalination plants, small-scale decentralised supply, Non-Revenue Water (NRW) reduction.
Sanitation Service Provision	Collecting, treating, and safely managing human waste and wastewater, including reuse	Sewerage networks, wastewater treatment plants, on-site sanitation, faecal sludge management, water reuse schemes.
Agricultural Service Provision	Supplying and managing water as an input to food production and rural livelihoods	Irrigation schemes, drainage systems, on-farm water efficiency, water storage for agriculture, small-scale productive water.
Water Governance and Resource Management	Institutional, regulatory, data, and operational systems enabling water services to function sustainably across all other categories.	Utility management systems, sector regulation, water data platforms, capacity building, sector planning and reform.

 **Key Principle:** These categories apply at the level of the investment component, not the entity or programme. A watershed restoration programme, for example, may include both an ecosystem resilience component and an agricultural irrigation component, each with fundamentally different revenue characteristics, payer structures, and financing logic, and should therefore be classified and assessed separately before financing decisions are made.

Service geography is a critical determinant of unit costs, feasibility of networked versus decentralised solutions, scope for cost recovery, and level of ongoing public support required. Even for the same service purpose, geographic context can dramatically alter financial and operational outcomes.

This framework classifies service geography along two dimensions. The first is derived from the internationally recognised Degree of Urbanisation (DEGURBA), placing settlements along an urban-rural continuum. The second introduces a formality dimension, distinguishing between planned settlements with formal tenure and networked infrastructure, and informal or unplanned settlements where end-users lack tenure security and fall outside standard service delivery and cost recovery models, as recognised under the UN-Habitat's SDG 11.1.1 framework. These two dimensions constitute predictive factors for monetisation norms and service delivery models, which in turn drive the overall cost recovery potential.



● LEGEND

(HD-F) High Density Formal: Dense urban areas with formal tenure, planned infrastructure, and established institutional frameworks.

(HD-I) High Density Informal: Dense urban or peri-urban areas with informal tenure and unplanned settlement patterns, where residents lack formal property rights or access to networked infrastructure.

(MD-F) Medium Density Formal: Towns, peri-urban areas, and organized commercial zones with structured service delivery arrangements (i.e. commercial production zones with formal contracts and governance).

(MD-I) Medium Density Informal: Intermediate density peri-urban or town-fringe areas with informal tenure, where settlement patterns are partially organized but lack formal governance or secure infrastructure access.

(LD-F) Low Density Formal: Rural areas and dispersed communities with organized governance structures or formal service schemes (i.e. nucleated villages, cooperative-managed schemes, or formally delegated service arrangements).

(LD-I) Low Density Informal: Dispersed rural or peri-rural contexts without formal tenure, organized community structure, or planned service infrastructure (i.e. subsistence communities with fragmented land arrangements and informal access).

(SW) System Wide: Basin-scale, national, or cross-boundary systems serving diffuse beneficiaries across broad geographic catchments (i.e. watershed management, national irrigation networks, basin-scale water governance).

The chart illustrates how the two dimensions interact to determine the financing logic of a water investment. Settlement density drives the cost structure and revenue potential of a service. High-density urban contexts enable networked delivery and support cost recovery, reflected in the larger bubbles of HD-F and HD-I. As density falls, so does cost recovery potential, regardless of formality. For agricultural water investments, density reflects production intensity and commercial scale rather than settlement population.

Formality then determines whether that revenue potential can actually be realised. Planned settlements can be connected to utility networks, billing systems, and regulatory frameworks, while informal settlements are structurally excluded from them even where density is high, as in the case of HD-I. As both density and formality decrease, conventional utility models become increasingly unviable.

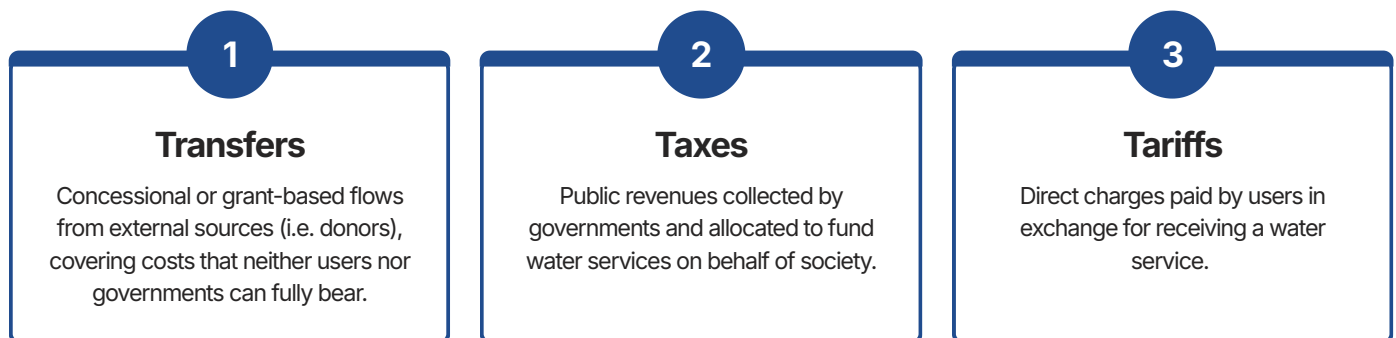
However, this does not mean dependence on public funding alone. Decentralised and small-scale service providers, community-managed schemes, and bottom-up financing mechanisms including microfinance and pay-as-you-go models can emerge as viable alternatives, capturing willingness to pay that formal utility structures cannot reach. The appropriate financing response therefore shifts from utility-scale commercial and concessional finance toward a blend of public funding, catalytic grants, and bottom-up mechanisms calibrated to local delivery realities. These combinations feed directly into the financial viability assessment and archetype selection that follow.

Revenue Characteristics

DIMENSION 3

This dimension classifies water investments by how services are ultimately paid for. It focuses on the source and structure of funding flows, independent of institutional strength or creditworthiness, and determines whether a service can support repayment, how predictable funding is, and what forms of capital are appropriate.

Water services are funded through three primary sources, transfers, taxes, and tariffs, which sit along a spectrum of financial sustainability.



Tariff-funded services generate predictable, recurring funding flows independent of public budgets or external goodwill, making them the most sustainable funding base. Tax-funded services depend on government fiscal capacity and political commitment. Transfer-dependent services are the least sustainable, as flows are voluntary, time-limited, and subject to external priorities.

In practice, most water services draw on a combination of all three, and the funding mix varies significantly depending on the nature of the service. As the chart below illustrates, the further a service sits from direct user benefit, the more it depends on taxes and transfers rather than tariffs. Water Resource Systems and Ecosystems relies almost entirely on transfers and taxes with no direct tariff revenue, while Water Supply Services and Sanitation and Wastewater generate meaningful tariff contributions alongside public funding. Water Hazard and Resilience Management is predominantly tax-funded, reflecting its public good character and absence of direct user payment mechanisms.

Some service types exhibit high variability in financing composition across contexts. Agricultural Water Management, for example, can range from fully subsidised irrigation schemes to commercially structured arrangements where user revenues provide a reliable payment base.



Institutional Context

DIMENSION 4

This dimension classifies water investments based on the institutional, regulatory, and fiscal environment in which the service operates. It captures whether revenues, if they exist, can be reliably mobilised, managed, and translated into sustainable service delivery or repayment capacity. This dimension is independent of service purpose or revenue model: the same tariff structure can behave very differently depending on institutional context.

1	2	3
Institutionally Weak Affordability, governance, or fragility prevent reliable revenue mobilisation or repayment. Examples include fragile utilities dependent on ad-hoc transfers and weak regulatory environments. Financing Implication: Repayable finance is inappropriate; grants and public funding dominate.	Institutionally Constrained Revenues or transfers exist but are undermined by weak governance, inefficiencies or policy constraints. Examples include utilities with high non-revenue water, politically constrained tariffs, and irregular subsidy flows. Financing Implication: Financing possible only alongside reform, efficiency gains, or aggregation.	Institutionally Strong Institutions have the capacity and credibility to manage revenues or public transfers and honour financial obligations. Examples include utilities with audited accounts, sovereign entities with stable fiscal transfers, and enforceable contracts. Financing Implication: Repayable finance may be feasible; concessional or commercial capital can play a role.

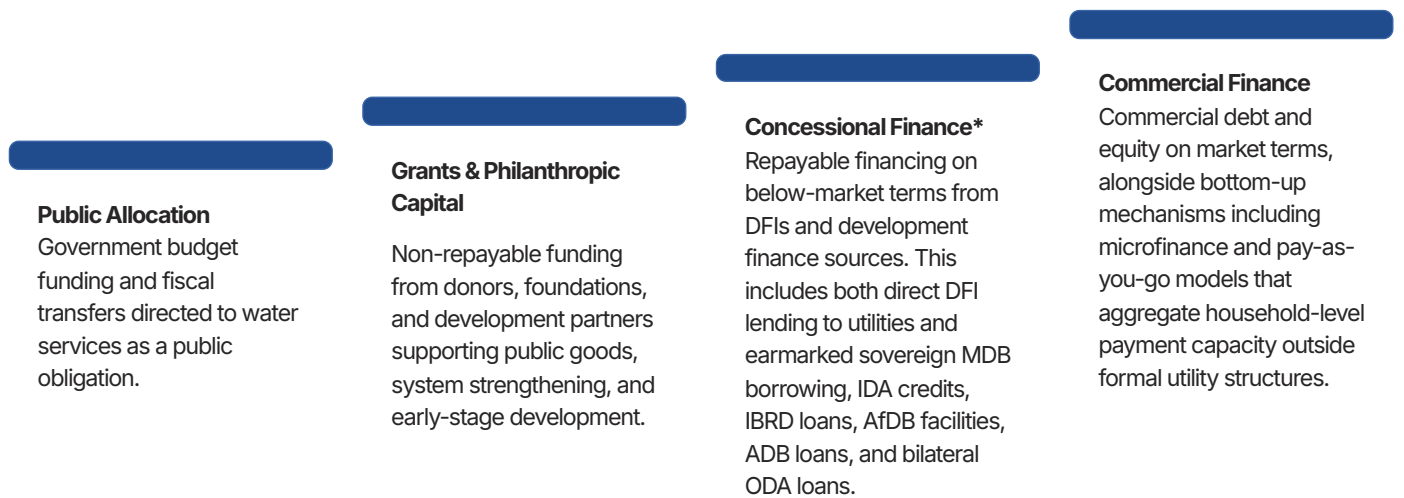
Institutional capacity can be evaluated across the four following dimensions.

Predictable Cashflows Reliable and recurring revenue or funding flows that can cover service costs over time.	Creditworthy Offtaker A payer or counterparty with the financial strength and credibility to meet its payment obligations	Enforceable Contracts Legal and regulatory arrangements that can be upheld in practice, giving financiers confidence in repayment and performance obligations.	Financial Independence of Entity The degree to which the entity can manage revenues, costs, and financial decisions without excessive political or external interference.
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Role of Capital and Risk Instruments

Different forms of capital serve distinct functions within the water system and are not interchangeable. Their role is determined by the nature of the service, the structure of lifecycle costs, and the credibility of underlying payers.

Water investments are financed through four primary forms of capital: public allocation, grants & philanthropic capital, concessional finance, and private and market-based finance. Each plays a distinct role within the water system and cannot compensate for the absence of a credible payer or sustainable service model.



**Where the loan is specifically negotiated and conditioned for water sector investment. General budget support loans allocated internally by governments are classified as public allocation.*

Best suited for: public goods and basin resilience investments, institutional and regulatory functions, and ongoing service delivery where revenues are absent or structurally insufficient.

Best suited for: closing affordability gaps, funding diagnostics and transaction development, piloting innovative delivery models, and catalysing investment where repayment capacity is not yet established.

Best suited for: investments with partial cost recovery where reform, efficiency gains, or aggregation can strengthen the revenue base over time, particularly when combined with performance-based or output-linked structures.

Best suited for: investments with predictable, enforceable, and sufficient revenues to cover full lifecycle costs, and for last-mile contexts where bottom-up mechanisms can capture willingness to pay that formal utility structures cannot reach.

Across these four categories, a wide range of financial instruments can be deployed, including guarantees, bonds, insurance, private equity, results-linked instruments, and pay-as-you-go models, each serving to manage risk, improve affordability, or structure repayment in ways appropriate to the service context. Critically, risk instruments can only be effective where underlying service fundamentals, payer structures, and revenue pathways are credible. They reduce or transfer risk; they cannot create bankability where it does not exist.

Blended finance, understood as the strategic combination of these forms of capital to improve risk-return profiles, is often positioned as a solution to mobilise additional investment. In practice, however, its use remains limited at scale within the water sector. Public funding and financing continue to dominate, yet often face challenges in efficiency, service delivery, and in crowding in private and market-based financing. Strengthening the effectiveness of public finance, alongside more targeted and disciplined use of blended approaches, is therefore critical.

Country Fiscal Context

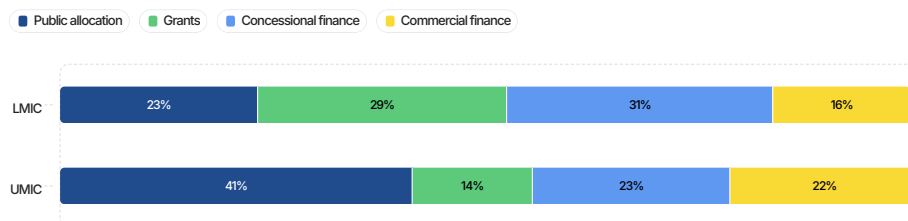
The four forms of capital described, are not equally accessible to all governments and institutions. Country fiscal context shapes which capital sources are available, on what terms, and in what proportion, independently of investment type, service purpose, or financial viability band.

The most significant determinant is a country's position within the international development finance architecture. Countries eligible for IDA concessional lending access near-zero interest rates, extended tenors, and in some cases non-repayable IDA grants, making concessional finance available on terms that substantially reduce the cost burden of public investment. Countries that have graduated to IBRD-only borrowing lose grant eligibility and access concessional finance at rates closer to, though still below, commercial market terms. At the upper end of the middle-income range, countries increasingly fund water investment from national budget and domestic capital markets, with bilateral grant access largely exhausted and MDB borrowing serving a supplementary rather than primary role.

This creates a structural difference in capital stack composition that runs across all archetypes and scenarios. Two governments implementing the same investment type in the same financial viability band may rely on fundamentally different capital mixes: one drawing primarily on grants and IDA credits, the other on national budget and IBRD loans. Neither is more financially viable than the other; they are simply operating within different fiscal envelopes. The practical implication is that the financing strategy for any investment must account for the country's grant eligibility, sovereign borrowing terms, and fiscal capacity alongside the investment's own cost structure and revenue characteristics.

This dynamic is reflected throughout the archetype analysis, where financing compositions are presented across both Lower-Middle Income Country (LMIC) and Upper-Middle Income Country (UMIC) contexts. Where the income group divergence is material, it is noted within the relevant scenario narrative. The Methodology Note sets out the income group classification approach applied across the empirical dataset.

Aggregate LMIC vs. UMIC capital composition



Development finance eligibility thresholds

Category	GNI per capita	Primary instrument	Approx. rate and tenor	Bilateral grant access
LIC / IDA grant-eligible	Below \$1,085	IDA grants and IDA credits	0% grants; 1.25% credits; 38–40 year tenor	High — broad bilateral ODA, UNICEF, EU, GCF, GEF accessible
LMIC / IDA credit-eligible	\$1,085–\$1,285	IDA credits; some blend IDA and IBRD	1.25–2%; 25–38 year tenor	Moderate — targeted bilateral, GEF, GCF windows
LMIC / IBRD-only	\$1,285–\$4,466	IBRD loans; bilateral DFI lending (AFD, KfW, EIB)	SOFR + ~0.5%; 20–30 year tenor	Limited — thematic windows only (GEF, GCF, GFDRR)
UMIC / IBRD	\$4,466–\$12,535	IBRD loans; domestic capital markets; DFI direct lending	SOFR + ~0.5–1%; 15–25 year tenor	Minimal — highly targeted instruments only

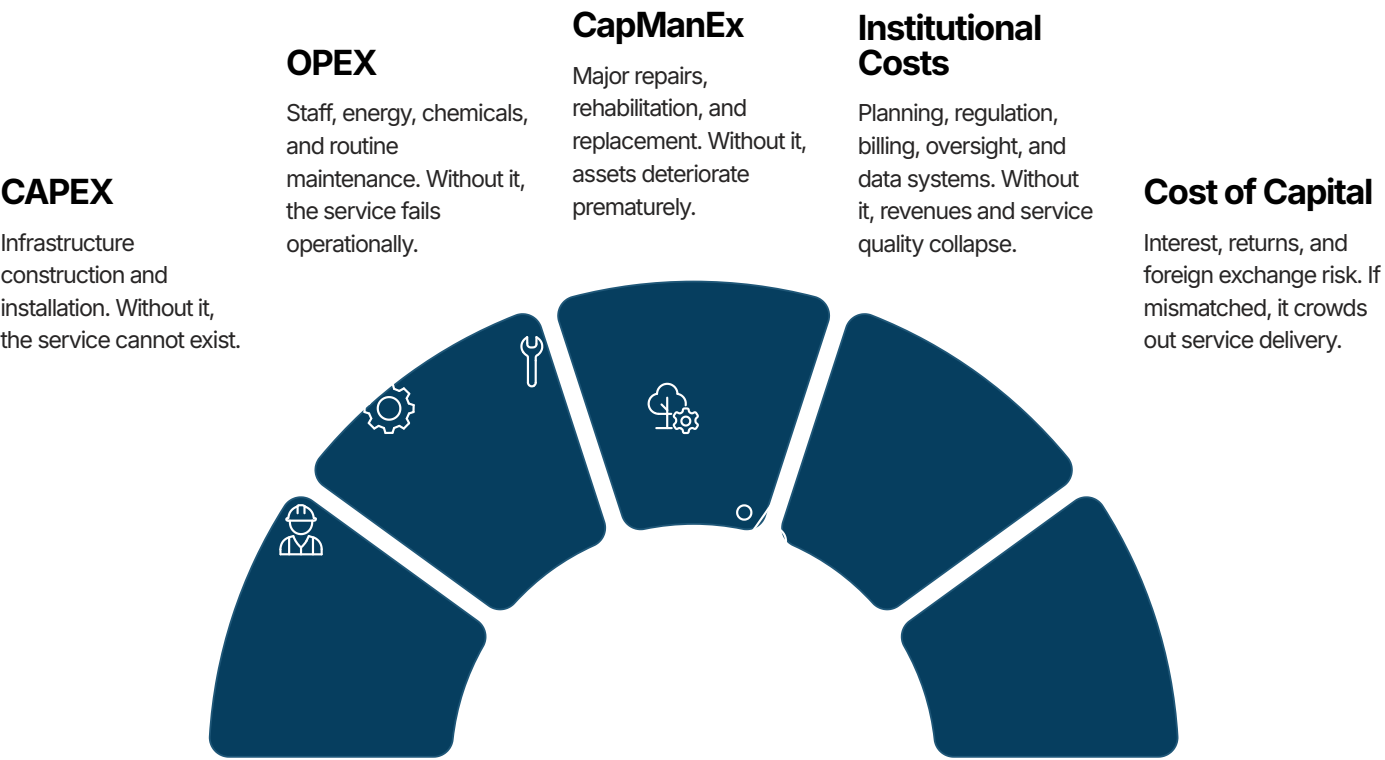
GNI thresholds reflect World Bank FY2024 classifications. SOFR-linked rates are indicative; actual spreads vary by country creditworthiness and loan terms. Examples from this dataset: Ethiopia, Niger, Mozambique (LIC); Bangladesh, Ghana, Kenya (IDA credit); Morocco, Jordan, Egypt, Philippines (IBRD-only LMIC); Brazil, Colombia, South Africa, China (UMIC).



Lifecycle Costs - the Foundation of Financial Viability

Once a water investment is classified across the typology dimensions, the next step is to assess its financial sustainability over time. This assessment is not a judgement of importance or impact, but a determination of which forms of capital are appropriate given lifecycle costs, revenue sources, and institutional context. In the water sector, viability is defined not by the ability to finance construction alone, but by the ability to deliver and sustain services across the full lifecycle, with all essential costs reliably covered.

Water services generate predictable lifecycle costs, including upfront CAPEX, ongoing operations and maintenance (OPEX), periodic capital maintenance and replacement (CapManEx), institutional and regulatory costs, and the cost of capital where financing is used. Financial sustainability depends on whether each of these cost components has a credible and sustained source of funding throughout the life of the service. For publicly funded investments, the cost of capital may not appear at the project level, but it remains present where public funding is itself debt-financed, making sovereign fiscal capacity a material consideration in any lifecycle cost assessment.



Fundamental Rule: If any essential lifecycle cost lacks a credible payer, the service is not financially viable, regardless of financing structure.

From Lifecycle Costs to Payers

3. Identify the Payers

Lifecycle costs are ultimately met by one or more payers: users, taxpayers, transfers, or external grants. In water services, these payers often differ across cost categories. User contributions typically fund day-to-day operations, while public budgets and transfers are required to absorb affordability gaps, fund maintenance, or support institutional capacity. Understanding who pays for what is a prerequisite for determining whether a service can support repayable finance.

Users

- Through tariffs, fees, or service charges
- Includes households, industry and indirect beneficiaries (i.e. agribusiness) that can support repayment pathways

Users pay because they receive a service directly or indirectly

Government

- Through taxation, public budgets, and fiscal transfers
- Includes municipal, provincial, and national levels along with cross-subsidies or sectoral contributions

Governments pay due to a mandate or obligation to provide services

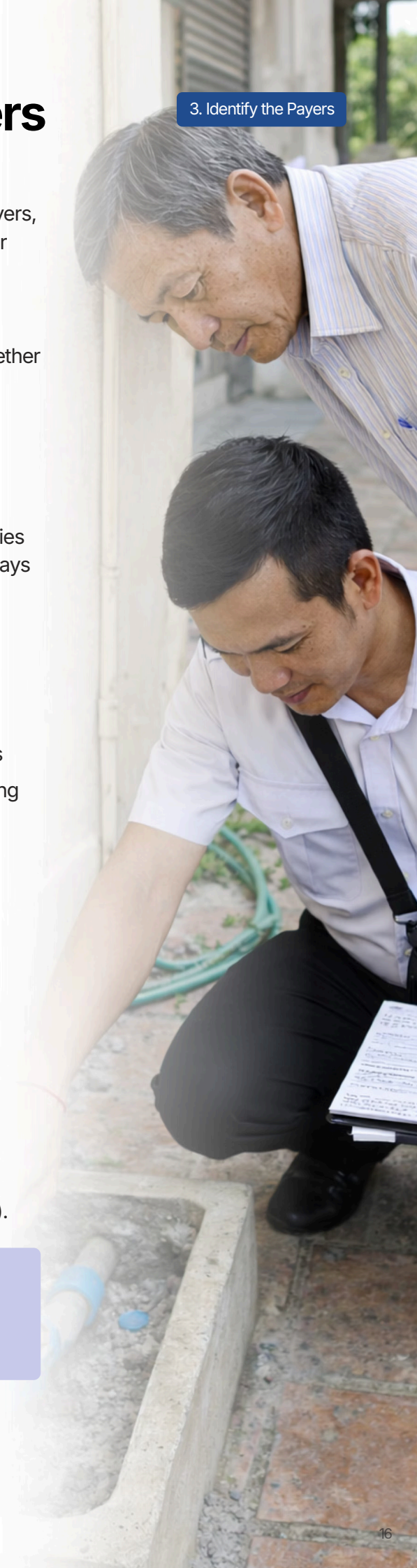
Aid

- Through philanthropy, development assistance, and concessional finance

Aid flows are provided on a voluntary basis

Financial viability depends on whether these payers are: willing to pay (affordability and political acceptance), able to pay (income levels and fiscal space), and reliable over time (institutional and budget credibility).

☐ **Takeaway:** If any essential lifecycle cost lacks a payer, the service will ultimately fail, regardless of how the investment is financed.



Financial Viability Spectrum

Combining the investment's typology classification, its lifecycle cost structure, its payer logic, and the capital forms available in its country context, water investments can be placed along a spectrum of financial viability. This reflects how lifecycle costs are structured, funded, and financed across different service contexts — ranging from fully public and grant-based models to those supported by user payments and private capital. It does not reflect the importance or policy priority of an investment, nor does it imply that commercially financed models are free of public funding. In practice, most investments across the spectrum rely on some combination of public and private capital, with the balance determined by the credibility of underlying payers and the strength of cost recovery.

Financial viability refers to the ability of a service to sustain its lifecycle costs through credible funding sources, including user payments, public finance, and transfers. It is distinct from bankability, which reflects the ability to attract financing based on risk, structure, and investor confidence.

All bands can be financially viable where lifecycle costs are reliably covered. The spectrum does not imply progression from one band to another, but rather different funding and financing models, each requiring an appropriate mix of capital forms and risk instruments to ensure sustainability and bankability.

1

Band 1 - Non-Commercial

0-10% commercial

Services in this band rely predominantly on public and grant-based support, as they do not generate a dependable payment base capable of sustaining repayable finance.

- **Service Geography:** Catchments, basins, and low-density rural areas where populations and benefits are spatially dispersed
- **Revenue Characteristics:** No direct or attributable revenue streams; benefits are indirect and widely distributed
- **Institutional Context:** Weak to absent, with limited capacity or mechanisms to mobilise and manage funding

2

Band 2 - Limited Commercial

10-30% commercial

These services can recover a portion of their costs, but revenues remain limited / uncertain to support commercial financing without continued public or concessional support.

- **Service Geography:** Small towns and mixed-density areas where populations are partially concentrated but service delivery remains fragmented
- **Revenue Characteristics:** Partial and often unreliable revenue streams, with only limited attribution to users; typically requires subsidies, transfers, or concessional support to remain viable
- **Institutional Context:** Present but still developing, with early-stage mechanisms for cost recovery and limited capacity to plan, finance, and manage revenues

3

Band 3 - Partially Commercial

30-60% commercial

For these services, the revenue base is sufficiently credible to support repayable finance, although targeted public or concessional support is still needed to address affordability, risk, or bankability constraints.

- **Service Geography:** Cities and higher-density areas where populations are concentrated and service delivery can be more efficiently structured
- **Revenue Characteristics:** Largely predictable and attributable revenue streams, with high levels of cost recovery, though still supported by targeted public or concessional inputs
- **Institutional Context:** Functioning and increasingly mature, with defined roles, regulatory oversight, and growing capacity to manage revenues and financing

4

Band 4 - Mostly Commercial

>60% commercial

These services are supported by strong and predictable revenues, together with the institutional conditions required to sustain financing on commercial terms.

- **Service Geography:** Large cities and dense urban or industrial areas with highly concentrated demand and integrated service delivery
- **Revenue Characteristics:** Fully attributable, predictable, and sufficient revenue streams enabling full cost recovery and access to commercial financing
- **Institutional Context:** Mature and creditworthy, with strong governance, regulatory clarity, and the ability to independently access and manage capital

 **Takeaway:** Financial viability does not determine whether an investment should proceed, but it does indicate how it should be funded and financed.

The capital allocation below reflects a single underlying logic: repayable finance requires a credible cashflow base, and the appropriate mix of capital shifts as revenues and institutional capacity strengthen across the bands. The mapping is grounded in the empirical analysis of 192 projects across the six archetypes; a full description of the methodology is set out in the Methodology Note.

Public allocation and grants anchor Band 1 where no revenue base exists, with concessional finance entering supplementarily as earmarked sovereign MDB borrowing for public good investments. Concessional finance deepens to primary across Bands 2 and 3 as partial revenues improve creditworthiness and create conditions for project-level repayable obligations, while commercial finance remains minimal in Band 2 and supplementary in Band 3. Commercial finance becomes primary in Band 4, where revenues are fully predictable, enforceable, and sufficient to service lifecycle costs.

Forms of Capital by Financial Viability Band

	Band 1	Band 2	Band 3	Band 4
Public Allocation	PRIMARY	SUPPLEMENTARY	TARGETED	MINIMAL
Grants & Philanthropic Capital	PRIMARY	SUPPLEMENTARY	TARGETED	CATALYTIC ONLY
Concessional Finance	SUPPLEMENTARY	PRIMARY	PRIMARY	SUPPLEMENTARY
Commercial Finance	NON-EXISTENT	MINIMAL	SUPPLEMENTARY	PRIMARY

PRIMARY:	Forms a central part of the capital mix, typically representing 25% or more of the total stack in that band and context.	CATALYTIC ONLY	Used highly selectively to mobilise or enable other capital sources, typically representing less than 5% of the total stack.
SUPPLEMENTARY:	Complements the core capital sources in a meaningful way, typically representing 10-35% of the total stack.	MINIMAL	Present only to a limited extent, typically representing less than 10% of the total stack.
TARGETED	Applied selectively where a specific financing need or constraint is being addressed, typically representing 5-20% of the total stack.	NON-EXISTENT	Non-existent within the stack or representing less than 5% of the total.

The capital type mapping above shows the appropriate financing instruments by band. The matrix below shows which funding source, taxes, tariffs, or transfers, typically covers each lifecycle cost component at each stage of the viability spectrum, and identifies where systematic funding gaps most commonly arise.

Lifecycle Cost Funding Composition by Financial Viability Band

	Band 1	Band 2	Band 3	Band 4
CAPEX	TRANSFERS TAXES	TAXES TRANSFERS TARIFFS	TAXES TARIFFS	TARIFFS
OPEX	TAXES TRANSFERS	TAXES TARIFFS TRANSFERS	TARIFFS TAXES	TARIFFS
CapManEx	TRANSFERS TAXES	TAXES TRANSFERS	TAXES TARIFFS	TARIFFS
Institutional Costs	TRANSFERS TAXES	TRANSFERS TAXES	TAXES TRANSFERS	TAXES

PRIMARY	Sole or dominant funding source for this cost at this band	SUPPLEMENTARY	Material but secondary funding contribution
TERTIARY	Emerging or minor contribution, context-dependent		

Cost of capital is treated separately and is embedded within each funding source; see archetype-level charts for its lifecycle share by archetype

CapManEx (capital maintenance expenditure) is the most systematically underfunded lifecycle cost component across the water sector. It sits between CAPEX (which attracts dedicated financing instruments) and OPEX (which is covered by operational revenues or budgets) and is frequently omitted from both financing plans and tariff structures. Band 1 is where this gap is most acute and most consequential for long-term service sustainability. In Band 2, Transfers, through donor rehabilitation programmes and performance-linked ODA, are the most common source when CapManEx is addressed, though coverage remains partial.

For CAPEX and CapManEx, the balance between Transfers and Taxes as the primary public funding source varies by income context. In LMIC countries, constrained national budgets mean Transfers dominate in Bands 1 and 2. In UMIC countries, greater fiscal depth allows Taxes to play a correspondingly larger role.

Water Investment Archetypes

This section translates the typology and financial viability logic into a set of practical water investment archetypes. Each archetype is anchored in Dimension 1 (service purpose), which serves as the primary entry point for diagnosis. Within each archetype, scenarios are derived by identifying which combinations of the remaining three dimensions (service geography, revenue characteristics, and institutional context) produce materially different financing profiles. Those scenario boundaries were tested and refined against an empirical dataset of 192 real-world projects, ensuring that the scenarios presented reflect financing conditions practitioners actually encounter rather than theoretical constructions alone.

The scenarios are illustrative rather than exhaustive. Real-world investments may fall between scenarios or combine characteristics from more than one; in those cases, practitioners should use the closest scenario as a diagnostic anchor and apply the typology dimensions to refine the assessment. The dataset methodology, classification approach, and source documentation are set out in the Methodology Note on the following page.



Archetype 1. Water Ecosystem Conservation & Restoration

Protects and restores basin-level and nature-based water systems that underpin long-term water security, climate resilience, and biodiversity.

1A: Catchment and basin scale, no cost recovery

1B: Rural basin-adjacent, minimal cost recovery

1C: Commercial zone, partial cost recovery



Archetype 2. Water Hazard Management

Manages the risks of water-related extremes including floods, droughts, and climate-induced water variability through protection and resilience infrastructure.

2A: Towns and peri-urban, no cost recovery

2B: Dense urban, partial cost recovery



Archetype 3. Water Service Provision

Delivers potable or process water to end users across household, municipal, and industrial contexts through networked or decentralised systems.

3A: Rural and community-managed, minimal cost recovery

3B: Urban utility, partial cost recovery

3C: Urban utility, full cost recovery



Archetype 4. Sanitation Service Provision

Collects, treats, and safely manages human waste and wastewater, including enabling reuse across urban and rural contexts.

4A: Dispersed rural informal, no cost recovery

4B: Community-governed, partial cost recovery

4C: Urban networked utility, partial cost recovery



Archetype 5. Agricultural Service Provision

Supplies and manages water as an input to food production and rural livelihoods, from large-scale irrigation to commercially structured agri-water arrangements.

5A: National and basin scale, no cost recovery

5B: Organised smallholder scheme, minimal cost recovery

5C: Commercial production zone, full cost recovery



Archetype 6. Water Governance and Resource Management

Strengthens the institutional, regulatory, data, and operational systems that enable all other water services to function sustainably.

6A: System-wide, no revenue stream

6B: Utility-level, performance-linked

Methodology Note on Archetype Scenarios

6

Archetypes

Covering a total of 16 scenarios

192

Water Projects Analyzed

~12 projects per scenario

40

countries Represented

Across LMIC & UMIC

Dataset Construction, Classification, and Limitations

The dataset comprises 192 projects across 40 countries, drawn from World Bank, AfDB, IDB, IFC, IFAD, bilateral DFI, and institutional documentation. Each scenario is supported by 12 projects classified across all four typology dimensions and selected to represent a range of geographies, investment scales, and institutional contexts.

Each scenario targets a balanced split of six LMIC and six UMIC projects. Three scenarios (1B, 1C, and 2B) carry a UMIC-weighted sample by design, because the semi-commercial payment mechanisms that define those scenarios are structurally less developed in LMIC institutional contexts, and introducing weaker examples solely to restore balance would misrepresent the empirical reality. A small number of entries are classified as UMIC* to indicate countries that are formally LMIC by World Bank GNI threshold but treated as UMIC for financing access analysis, where a country is an IBRD-only borrower with limited bilateral grant eligibility and a financing profile consistent with UMIC comparators. Affected countries are Morocco, Jordan, and Egypt in selected scenarios. The rationale for each adjustment is documented in the supporting project dataset.

Project-level capital stack compositions are derived using a tiered approach, reflecting the variable availability of public financing data. Where full financing breakdowns are disclosed in appraisal documents, implementation completion reports, or institutional publications, compositions are based directly on those figures. Where financing structures are known but not fully disaggregated in public sources, which is the case for many entries, compositions are estimated using the known instrument mix, financing parties, and co-financing ratios, calibrated against comparable projects within the same archetype scenario. A smaller number of entries, particularly community-managed programmes and smaller bilateral projects, rely on pattern-based estimation where project-specific financial detail is not publicly available. Source references are intended as starting points for independent verification, not as confirmed citations of precise financing data.

Life-cycle cost compositions follow a separate methodology, as the 192-project dataset captures financing structure rather than disaggregated lifecycle cost data, which is rarely disclosed in project appraisal documents at the level of CAPEX, OPEX, CapManEx, institutional, and cost of capital components. For each archetype, the framework derives a single composition across these five cost categories over a 25-year undiscounted horizon, triangulated from peer-reviewed cost profile studies and established sector benchmarks. Key sources include Kang et al. (2023, Ecosystem Services Journal) for ecosystem investment programs, the CACTUS urban sanitation database for sanitation, Bluefield Research utility forecasts and IRC WASHCost benchmarks for water service provision, FAO and AQUASTAT cost studies for agricultural water, US Army Corps levee cost analyses for hazard management, and IRC WASHCost direct and indirect support benchmarks for governance. Where the underlying source data is drawn from high-income contexts, values are calibrated for LMIC and UMIC labour and energy cost structures using comparable benchmarks within the WASHCost dataset. The resulting compositions are intended as archetype-level diagnostic reference points, not precise project-level estimates.

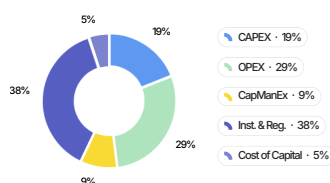
Individual project compositions should not be treated as audited financial data, and the same principle applies to the life-cycle cost compositions: both are most reliable at the level they are intended to inform. The analytical value of the capital stack dataset lies in the scenario-level averages, where averaging across 12 projects per scenario substantially reduces the impact of individual estimation errors and produces compositions that reflect genuine financing tendencies for that investment type and context. Life-cycle cost compositions are intended at the archetype rather than scenario level, reflecting the broader patterns across cost profile studies rather than project-specific estimates. Practitioners should use both as diagnostic reference points and treat individual project or scenario entries as illustrative rather than precise.

Archetype 1. Water Ecosystem Conservation and Restoration

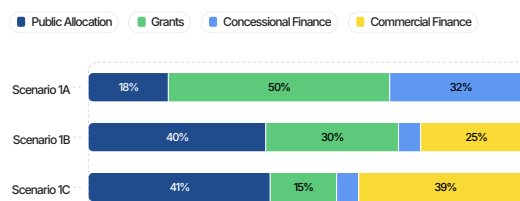
Water ecosystem conservation and restoration investments protect and restore the basin-level and nature-based water systems that underpin long-term water security, climate resilience, and biodiversity. These services, including watershed protection, wetland conservation, aquifer recharge, and environmental flows, deliver diffuse, system-wide benefits and function as public goods by design.

	Scenario A	Scenario B	Scenario C
Dimension 2: Service Geography	System-wide (SW) Basin and catchment-scale systems serving dispersed beneficiaries across broad geographic areas, outside standard settlement classification.	Low-Density Formal (LD-F) Rural and peri-rural formal areas with organised community structures or municipal arrangements, typically adjacent to upstream conservation zones.	Mid-Density Formal (MD-F) Organised commercial zones and town-scale areas with formal institutional and legal frameworks supporting structured service arrangements.
Dimension 3: Revenue Characteristics	No direct or attributable revenue, benefits are non-excludable and accrue across sectors and generations	Indirect payment potential through PES arrangements, utilities, municipalities, or agribusiness structured as payers; contingent on arrangement design	Partial contracted revenue from downstream offtakers, predictable enough to support repayable finance on a ring-fenced basis
Dimension 4: Institutional Context	No formal basin governance mechanism, stewardship dependent on public mandates and climate fund eligibility	Emerging basin governance, beneficiary identification and PES structuring feasible but not yet formalised or enforceable	Improving to strong, enforceable offtake contracts in place with creditworthy counterparties
Illustrative Example & Case-Study	A national watershed restoration programme in a water-stressed basin, funded through government budget and grants, restoring forest cover and aquifer recharge with no direct revenue stream. Malawi Watershed Services Improvement Program (MWSIP), 2020	A water fund where downstream municipalities and agribusiness pay into a trust that finances upstream land stewardship, structured as a payment for ecosystem services arrangement. Upper Tana-Nairobi Water Fund (UTNWF), Kenya, 2015	A wetland restoration programme where a downstream utility contracts to purchase improved water quality at the intake, with offtake revenues covering restoration and stewardship costs. Xin'an River Basin Ecological Compensation, China, 2012
Financial Viability Band	BAND 1	BAND 2	BAND 3

Life-Cycle Costs



Financing Composition



Water ecosystem conservation and restoration is dominated by institutional and stewardship costs rather than physical infrastructure. Ecosystem management, basin coordination, monitoring, and long-term stewardship are continuous obligations that cannot be deferred without eroding the system functions the investment was designed to protect. OPEX is persistent and represents a substantial share of the lifecycle, reflecting ongoing land payments, biophysical monitoring, and routine maintenance of nature-based works. Physical CAPEX is moderate and nature-based in character, concentrated in the establishment phase, while CapManEx is low because natural systems regenerate and require only periodic top-ups. Cost of capital is low across the archetype, consistent with the capital-light and largely non-repayable nature of ecosystem investments.

Water ecosystem conservation shows sharp progression toward commercial finance, driven entirely by whether a downstream payer can be identified and contracted. Where none exists (Scenario A), grants (50%) and concessional finance (32%) absorb the majority investment cost with commercial finance absent. The introduction of payment-for-ecosystem-services arrangements in Scenario B restructures the stack significantly: commercial contributions from downstream payers enter at 25%, concessional exits to 5% as the market logic it enabled takes hold, and public allocation rises to 40% as governments anchor the PES governance structure. By Scenario C, contracted offtake with creditworthy counterparties takes over: commercial leads at 39%, public holds at 41%, and grants reduce to a catalytic 15%.

The sharp decline in concessional finance from Scenario A to near-zero in Scenarios B and C reflects a specific dynamic: concessional enters Scenario A not because the investment generates revenue, but because earmarked sovereign MDB credits (IDA, IBRD, and AfDB loans conditioned on watershed outcomes) are routinely deployed for ecosystem programmes and repaid from fiscal revenues rather than project cashflows. The moment a downstream payer emerges, the rationale for below-market subsidy weakens and concessional largely exits. The income group pattern in Scenario A reflects different pathways to the same outcome: lower-income country programmes tend to access ecosystem finance primarily through sovereign MDB borrowing, while higher-income country programmes rely more on international biodiversity and climate grants (GEF, bilateral ODA, and philanthropic capital), where stronger institutional capacity enables access to those funding windows.

Grants are the most dynamic element across the progression, falling from primary source in Scenario A to catalytic instrument in Scenario C as commercial finance assumes the leading role. In lower-income Scenario B contexts, grants remain elevated as the transaction costs of structuring PES mechanisms (legal design, capacity building, verification infrastructure) continue to require donor subsidy even after commercial payments begin; in higher-income contexts, those costs are absorbed institutionally and commercial payer contributions are correspondingly higher. By Scenario C, the grant role narrows to transaction design and first-loss cover regardless of income context, as contracted offtake with creditworthy counterparties reduces the need for concessional subsidy at the investment level.

The table below identifies the primary financing and risk instruments applicable to each scenario.

Scenario A	Scenario B	Scenario C
- Output-Based Aid (OBA) - Results-Based Financing (RBF) - Concessional Debt (IDA / IBRD / AfDB earmarked)	- Results-Based Financing (RBF) - Credit Guarantee - First-Loss Tranche / Junior Equity - Water Stewardship Bonds	- Partial Credit Guarantee (PCG) - Political Risk Insurance (PRI) - FX Hedging Facility - Offtaker / Counterparty Insurance - Debt Service Reserve Account (DSRA)

Key Financing Insight

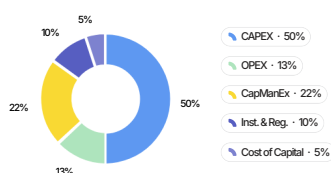
Ecosystem conservation generates diffuse public-good benefits with no inherent revenue stream. Repayable finance becomes possible only where a downstream beneficiary can be structured as a payer through payment-for-ecosystem-services arrangements; without such a payer, the archetype remains a public-good investment dependent on public budgets, grants, and concessional borrowing.

Archetype 2. Water Hazard Management

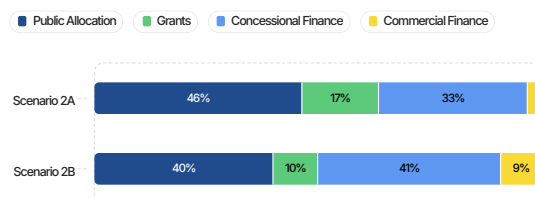
Water hazard management investments protect communities, economies, and ecosystems from water-related extremes, including floods, droughts, and climate-induced variability. These investments range from large-scale flood protection infrastructure to drought resilience systems and climate-adapted urban water networks. They are united by a common characteristic: their primary beneficiary is often society as a whole, which limits direct cost recovery at system level, although identifiable beneficiaries and partial payments may emerge in specific urban or value-chain contexts.

	Scenario A	Scenario B
Dimension 2: Service Geography	Mid-Density Formal (MD-F) Towns and peri-urban areas representing the primary geographic context for broad hazard management programmes with dispersed populations.	High-Density Formal (HD-F) Dense formal urban zones with defined service boundaries, established institutional frameworks, and identifiable commercial and industrial areas.
Dimension 3: Revenue Characteristics	No direct revenues, non-excludable public safety and economic resilience benefits with no attributable payment stream	Partial cost recovery through levies, benefit assessments, stormwater tariffs, or developer contributions; supplemented by performance-linked instruments where institutional capacity allows; partial and contingent on beneficiary arrangement design
Dimension 4: Institutional Context	Government mandate as sole delivery and funding mechanism, no user payment infrastructure exists	Developing to sufficient institutional arrangements for beneficiary identification and payment collection; partial enforceability of levy or tariff mechanisms; where institutional capacity allows, structured repayable obligations alongside public co-financing
Illustrative Example & Case-Study	A national flood protection programme delivering embankments, drainage infrastructure, and early warning systems across cities and towns, funded through public budgets and climate adaptation grants with no direct user payments. Bangladesh Comprehensive Disaster Management Programme (CDMP II), 2010-2015	Urban flood resilience infrastructure where downstream economic beneficiaries contribute through levies, stormwater tariffs, developer mechanisms, or performance-linked arrangements, partially recovering costs alongside public and concessional finance. Rotterdam Climate Change Adaptation Strategy, Netherlands, 2013
Financial Viability Band	BAND 1	BAND 2

Life-Cycle Costs



Financing Composition



Water hazard management investments are characterised by high capital intensity and significant periodic rehabilitation requirements. Physical infrastructure (embankments, drainage systems, drought storage, early warning networks) requires substantial upfront CAPEX and significant CapManEx to maintain protection standards over an extended asset life. OPEX is low but continuous, covering maintenance, monitoring, and emergency response readiness, reflecting the largely passive nature of flood and drought infrastructure between events. Institutional and regulatory costs are moderate, anchored in established government departments and regulatory frameworks rather than requiring extensive new institutional architecture. Cost of capital is low to moderate, consistent with the capital-intensive and predominantly non-repayable nature of hazard assets financed through sovereign and concessional sources.

Unlike most other archetypes in this framework, water hazard management does not follow a progression toward commercial primacy. The financing question is not how to unlock private capital but how to structure the most effective combination of public, concessional, and risk instruments at each stage. In Scenario A, public allocation (46%) and concessional finance (33%) together cover nearly four-fifths of the stack, with grants supplementing at 17%. In Scenario B, as urban beneficiaries are identified and levy or tariff mechanisms structured, commercial contributions enter at 9% through stormwater charges, developer requirements, and performance-linked arrangements, while concessional deepens marginally to 41% and grants fall to 10%. Public allocation holds at 40% throughout.

The sustained concessional share across both scenarios reflects one structural reality: earmarked sovereign MDB credits (IDA, IBRD, ADB, and bilateral ODA loans specifically conditioned on hazard outcomes) are the primary financing vehicle for this investment class, repaid from fiscal revenues rather than project cashflows. Grants play a more significant role in lower-income country Scenario A programmes, where dedicated climate adaptation and disaster risk funds remain accessible; in higher-income contexts, national budget and MDB borrowing carry the weight that grants cover elsewhere.

Commercial capital remains at the margin throughout. Flood and hazard protection benefits extend across entire communities and cannot be charged back to individual users in a practical way, the conditions for meaningful private investment are limited at the system level. The 9% commercial share in Scenario B, drawn from property levies and developer contributions in specific urban contexts, represents a realistic ceiling for this archetype rather than a transitional stage toward greater private participation.

The table below identifies the primary financing and risk instruments applicable to each scenario.

Scenario A	Scenario B
• Parametric Insurance • Contingent Credit Line (CAT-DDO) • Disaster Risk Pooling • Output-Based Aid (OBA)	• Concessional Debt (IDA / IBRD / ADB earmarked) • Benefit Assessment Levy Mechanism • Results-Based Financing (RBF) • Performance-Linked Subsidy • Credit Guarantee & Partial Credit Guarantee (PCG) • Insurance-Linked Securities • FX Hedging Facility

Key Financing Insight

Hazard management benefits are largely non-excludable, leaving the archetype structurally non-commercial at the system scale. Investment is therefore predominantly publicly funded, with risk instruments playing a critical role in protecting fiscal stability when climate shocks materialise. Partial cost recovery is achievable only where identifiable beneficiaries can be structured into a levy or contribution mechanism.

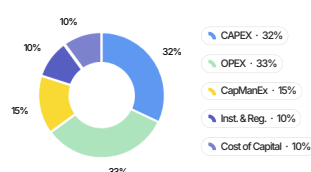
Archetype 3. Water Service Provision

Water service provision investments deliver potable or process water to end users across household, municipal, and industrial contexts. The archetype spans a wide spectrum of delivery models, from decentralised community-managed systems in informal settlements and rural areas through to regulated urban utilities and mostly commercial networked supply including bulk water, desalination, and wastewater reuse with contracted offtake. This breadth means the archetype includes some of the most grant-dependent investments in the water sector alongside some of its most commercially financeable. The networked versus un-networked distinction is the single most important diagnostic in this archetype, as it shapes cost structure, revenue potential, and the entire capital stack logic.

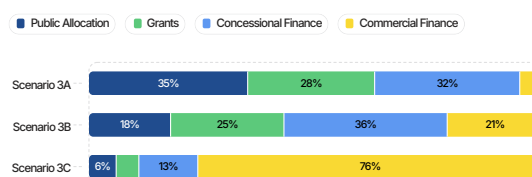
Bottom-up financing mechanisms, including microfinance, pay-as-you-go models, household water connection loans, and community contributions, are applicable across all scenarios in this archetype. They capture willingness to pay that sits outside or alongside formal utility billing structures, and form the primary repayment base in contexts where networked delivery is absent or partial.

	Scenario A	Scenario B	Scenario C
Dimension 2: Service Geography	Low-Density Formal (LD-F) Rural and dispersed communities with some organisational structure, served through decentralised or community-managed systems outside formal utility networks.	High-Density Formal (HD-F) Formal urban service areas with existing utility infrastructure and mixed-density populations on an institutional reform pathway.	High-Density Formal (HD-F) Large formal urban and industrial centres with integrated distribution infrastructure and established institutional frameworks.
Dimension 3: Revenue Characteristics	Willingness to pay captured through bottom-up mechanisms, but no formal billing or collection infrastructure in place	Tariff revenues supporting operations but insufficient for full lifecycle cost recovery, constrained by affordability limits, high non-revenue water, or weak collection systems	Predictable, enforceable tariffs or contracted offtake revenues sufficient to cover full lifecycle costs including debt service
Dimension 4: Institutional Context	Structurally subsidised, community-managed with weak or absent formal utility presence and no creditworthy counterpart	Institutionally constrained, reform underway but governance, billing efficiency, and revenue management remain limiting factors	Mature and creditworthy, strong regulation, independent capital access, and enforceable contracts with identifiable offtakers
Illustrative Example & Case-Study	A community-managed rural piped water scheme serving nucleated village settlements, funded through public grants and development assistance, where willingness to pay exists through community contributions but no formal billing or utility infrastructure is in place. Uganda Water Management & Development Project, World Bank, 2012–2018	A regulated municipal utility delivering networked water supply where tariffs cover operational costs but fall short of full lifecycle recovery due to high non-revenue water, constrained tariff setting, and affordability limits. ONEA Urban Water Sector Project, Burkina Faso, World Bank, 2009–2018	A commercially structured bulk water or desalination facility with a long-term offtake contract with a creditworthy utility or industrial user, where revenues are sufficient to cover all lifecycle costs including debt service. Sohar II WPP (Industrial Water & Power), Oman, 2007
Financial Viability Band	BAND 1	BAND 2 BAND 3	BAND 4

Life-Cycle Costs



Financing Composition



Water service provision is among the most operationally intensive archetypes in the framework where networked delivery applies. OPEX is high, driven by energy, chemicals, and the operational complexity of managing pressurised distribution, and represents the largest single share of the lifecycle. CAPEX is substantial, covering trunk mains, treatment works, pumping stations, and distribution infrastructure, while CapManEx is significant though smaller than CAPEX, reflecting the periodic rather than continuous nature of network rehabilitation. Where delivery is decentralised and community-managed, CAPEX and CapManEx moderate considerably, reflecting simpler asset bases, though institutional costs remain persistent and should not be underestimated. Cost of capital is the highest of any archetype in the framework, rising sharply where commercial finance enters the stack in Scenario C and reflecting the debt-financed nature of large networked utility investments.

The capital stack shift across scenarios is one the most pronounced in this framework, and the networked versus un-networked distinction is the primary diagnostic. In Scenario A, public allocation (35%), grants (28%), and concessional finance (32%) share the stack, with commercial playing only a marginal role at 5%. The composition of that stack differs meaningfully by income context: LMIC governments rely heavily on grants and earmarked MDB concessional credits to finance community and rural water, as fiscal constraints leave them dependent on IDA, AfDB, and bilateral windows to deliver basic access, while UMIC governments fund the same investment type primarily from national budget with concessional supplementing and grants playing a limited role. The 5% commercial share also understates the role of bottom-up household willingness to pay. Communities without formal utility access frequently pay more per unit of water than networked customers, through vendors, tankering, and self-supply, and where small-scale operators and aggregation mechanisms are present, PAYG models, community water funds, and structured microfinance can extend the reach of the capital stack within the band without requiring a formal utility counterpart.

In Scenario B, as utilities develop tariff bases and reform capacity, grants fall to 25%, concessional deepens to 36%, and commercial enters at 21% as improving governance creates conditions for market finance. The income group dynamic at this stage is equally pronounced but operates differently: LMIC reform-pathway utilities remain heavily grant-dependent because donor financing continues to fund the institutional reform and capacity development that commercial capital requires before it can enter. UMIC utilities have largely completed that transition, enabling more direct commercial access and attracting DFI direct lending against stronger tariff bases, driving their commercial share well above the combined average.

In Scenario C, the stack inverts entirely: commercial leads at 76%, concessional provides supplementary support at 13%, and public and grants are reduced to minimal positions. Income group differences effectively disappear at this stage, with commercial finance leading across both LMIC and UMIC contexts. The remaining concessional share reflects the catalytic first-mover role that IFC and development finance institutions play in pioneering transactions where private finance has not previously entered. Where revenues are predictable and sufficient to service lifecycle costs, the commercial financing logic holds regardless of income group.

The table below identifies the primary financing and risk instruments applicable to each scenario.

Scenario A	Scenario B	Scenario C
- Output-Based Aid (OBA) - Results-Based Financing (RBF) - Household Water and Sanitation Loans (microfinance) - PAYG and Community Water Fund mechanisms - Concessional Debt (IDA / IBRD / AfDB earmarked)	- Partial Credit Guarantee (PCG) - Concessional Debt - Performance-Linked Subsidy - NRW Reduction Performance Contract - Results-Based Financing (RBF) - Viability Gap Funding (VGF) - First-Loss Tranche / Junior Equity	- Commercial Debt / Project Finance - Political Risk Insurance (PRI) - Offtaker / Counterparty Insurance - FX Hedging Facility - Debt Service Reserve Account (DSRA) - Construction and Performance Risk Instruments

Key Financing Insight

Water service provision spans the full financing spectrum, from grant-dependent community delivery to fully commercial infrastructure. The defining structural divide is between networked and un-networked systems. Networked utilities with a tariff base can progressively access concessional and commercial finance as governance improves; un-networked delivery depends on grants, public allocation, and bottom-up household mechanisms that capture willingness to pay outside formal billing structures.

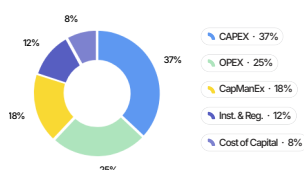
Archetype 4. Sanitation Service Provision

Sanitation service provision investments collect, treat, and safely manage human waste and wastewater across household, community, and urban contexts. The archetype spans from basic un-networked sanitation in rural and informal settings, where the primary investment objective is ending open defecation and protecting public health, through community-managed solutions with structured payment mechanisms, to networked sewerage and wastewater treatment in urban centres. Sanitation faces structurally steeper financing challenges than water service provision: political visibility is lower, household willingness to pay is harder to establish at the system level, and the public health benefits, while significant, are diffuse and non-excludable. The degree of community organisation and governance is the most important diagnostic in this archetype at the lower end of the spectrum, determining whether investment attracts unconditional grants or more structured results-based instruments. Where community-based organisations (CBOs) are present and capable of managing shared facilities, collecting user fees, and maintaining service accountability, the capital stack can move meaningfully toward outcomes-linked financing without requiring a formal utility counterpart.

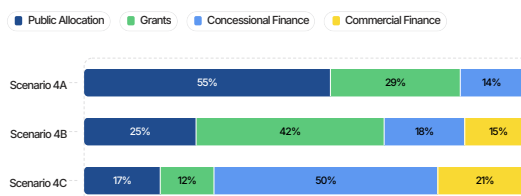
Bottom-up financing mechanisms, including household sanitation loans, faecal sludge management user fees, community sanitation funds, and sanitation marketing, are applicable across all scenarios in this archetype. They capture household and community willingness to pay where formal tariff structures are absent or insufficient to recover full lifecycle costs.

	Scenario A	Scenario B	Scenario C
Dimension 2: Service Geography	LOW-DENSITY INFORMAL (LD-I) Dispersed rural and peri-rural settlements without organised service infrastructure or formal governance arrangements.	LOW-DENSITY FORMAL (LD-F) Rural and peri-urban communities with established CBO, WASH committee, or cooperative governance structures providing an organisational anchor for service delivery.	HIGH-DENSITY FORMAL (HD-F) Dense formal urban areas with existing sewerage networks and organised utility counterparts.
Dimension 3: Revenue Characteristics	No direct payment mechanism; public health mandate drives investment with benefits accruing to the whole community on a non-excludable basis	Community-structured payment commitments through user fees for shared facilities or FSM services, small and irregular but sufficient to anchor results-based disbursement mechanisms	Tariff revenues contributing to operational costs but falling short of full lifecycle recovery due to affordability constraints, weak cost-reflective pricing, and the high capital intensity of treatment infrastructure
Dimension 4: Institutional Context	Weak to absent institutional presence; service delivery dependent on public mandates, NGO programmes, and government-led behaviour change campaigns with no creditworthy counterpart	Strong community governance through CBOs, WASH committees, or NGO-facilitated structures; payment accountability exists but no formal utility counterpart or creditworthy institutional anchor	Functioning utility with developing regulatory and revenue management capacity; reform underway but governance and cost recovery remain limiting factors for structured finance
Illustrative Example & Case-Study	A government-led open defecation free programme in rural communities, funded through public budgets and development grants, providing basic latrine construction and behaviour change support with no user payment mechanism. Swachh Bharat Mission (Grameen), India, 2014–2019	A community-managed rural sanitation programme structured around village WASH committees, where ODF verification and FSM service fees for shared facilities anchor results-based grant disbursements linked to verified utilisation and maintenance outcomes. WSUP Ghana Community Sanitation Programme, Ghana	A regulated urban sewerage utility where tariffs support operational costs but are insufficient to cover the full cost of network rehabilitation and wastewater treatment, requiring concessional finance and performance-based subsidies alongside public co-financing. Senegal ONAS Water & Sanitation Sector Project, AfDB, 2014–2024
Financial Viability Band	BAND 1	BAND 2	BAND 2 BAND 3

Life-Cycle Costs



Financing Composition



Sanitation service provision is highly capital-intensive in networked contexts, with CAPEX, CapManEx, and OPEX driven by collection networks, pump stations, treatment plants, and sludge management. CAPEX is the largest single category, exceeding even that of networked water delivery, because sewerage networks must be laid at density before any service can be delivered. CapManEx is significant, reflecting the rehabilitation requirements of both sewer assets and treatment plant equipment. OPEX is moderate, lower than water service provision because sanitation is less continuously energy and chemical intensive. In un-networked contexts, physical costs moderate significantly but institutional costs do not: sustaining behaviour change, community governance, and programme coordination are continuous obligations that cannot be deferred without reversing service outcomes. Cost of capital is moderate, consistent with the concessional and DFI debt that anchors this archetype's financing stack.

Sanitation financing is structurally more challenging than water service provision because household willingness to pay is harder to establish, political visibility is lower, and public health benefits, while significant, are diffuse and non-excludable. The quality of community governance is the decisive variable at the lower end of the spectrum, determining not just whether investment occurs but whether grant capital can be structured around outcomes rather than inputs. In Scenario A, where investment functions as a pure public health mandate, public allocation (55%) and grants (29%) dominate, with concessional entering at 14% and commercial at 2%. The commercial share understates the latent willingness to pay that exists even in ODF contexts: households in informal settings frequently invest in their own sanitation solutions when community pressure and awareness create demand, and CBO-structured user fee mechanisms can channel this into the capital stack where governance supports it. In Scenario B, the presence of strong community governance transforms the financing logic: grants remain the largest source at 42% but shift from unconditional subsidy toward outcomes-linked instruments, with OBA and RBF disbursements anchored to verified ODF status, CBO utilisation rates, and FSM service delivery. Commercial contributions enter at 15% through CBO user fees for shared facilities, and concessional at 18% where institutional capacity allows structured repayment.

The income group divergence in Scenario A is pronounced: LMIC ODF programmes depend heavily on bilateral WASH grants from UNICEF, dedicated WASH funds, and bilateral ODA, as fiscal constraints prevent governments from funding basic sanitation coverage from national budget alone, while UMIC governments carry the majority of investment costs directly, with grants playing a supplementary role. In Scenario B, the divergence shifts: LMIC community sanitation programmes remain heavily grant-dependent because the institutional and programme costs of establishing and sustaining CBO governance continue to require donor subsidy well beyond initial investment, while UMIC programmes at the same stage attract concessional DFI finance (IDB, BNDES, FINDETER) where municipal institutions provide a creditworthy anchor alongside community structures.

In Scenario C, concessional finance reaches 50%, the highest share of any single scenario in this framework, reflecting the distinctive financing window that sanitation utilities occupy: creditworthy enough to service project-level concessional debt from DFIs, but not yet able to access commercial capital at scale. That distinction is consistent across both income groups at the concessional level, though commercial finance is more accessible in UMIC contexts where stronger tariff regimes and domestic bond markets provide the institutional foundation for private participation.

The table below identifies the primary financing and risk instruments applicable to each scenario.

Scenario A	Scenario B	Scenario C
- Output-Based Aid (OBA) - ODF-linked Results-Based Financing (RBF) - Unconditional Grants (bilateral and multilateral) - Sanitation Marketing mechanisms - Concessional Debt (IDA / IBRD / AfDB earmarked)	- Results-Based Financing (RBF) (utilisation and maintenance-linked) - Output-Based Aid (OBA) - Concessional Debt (DFI direct to municipal counterparts) - Household Sanitation Loans (microfinance) - FSM Payment Mechanisms - Community Water and Sanitation Fund Mechanisms	- Concessional Debt (DFI) - Viability Gap Funding (VGF) - Partial Credit Guarantee (PCG) - Performance-Linked Subsidy - Sewerage Connection Financing - Results-Based Financing (RBF)

Key Financing Insight

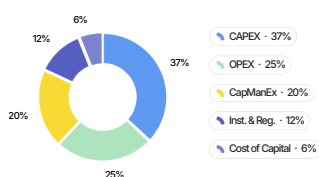
Sanitation faces structurally steeper financing challenges than water service provision, with full cost recovery through tariffs remaining unrealistic in most developing country contexts. The defining variable is institutional rather than infrastructural: community governance and utility reform capacity determine whether grant capital can transition into outcomes-linked instruments and, eventually, structured concessional and commercial finance.

Archetype 5. Agricultural Service Provision

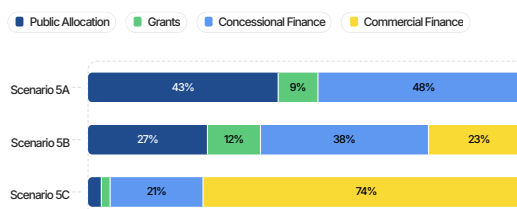
Agricultural service provision investments supply and manage water as an input to food production and rural livelihoods. The archetype spans from large-scale publicly funded irrigation infrastructure where water is delivered as an agricultural public good, through smallholder schemes supported by value-chain aggregation, to commercially structured agri-water arrangements with contracted offtake. Agricultural water investments are distinctive in that the financial returns they generate, through improved yields, reduced crop failure, and strengthened rural livelihoods, rarely accrue directly to the water service provider. This structural gap between economic value created and revenue captured is the defining financing challenge across all three scenarios. The degree to which aggregation mechanisms can translate agricultural value into predictable payment streams is the primary diagnostic in this archetype.

Scenario A		Scenario B	Scenario C
Dimension 2: Service Geography	SYSTEM-WIDE (SW) National or basin-scale irrigation command areas serving dispersed agricultural communities across broad geographic catchments.	LOW-DENSITY FORMAL (LD-F) Organised rural smallholder irrigation schemes with cooperative, water user association, or formally delegated governance structures.	MID-DENSITY FORMAL (MD-F) Commercial agricultural production zones with intensive operations, concentrated infrastructure, and formal institutional arrangements.
Dimension 3: Revenue Characteristics	No direct user payment; water delivered as an agricultural public good with costs borne entirely by public budgets and grants	Indirect and seasonal revenues through value-chain arrangements, farmer organisation payment mechanisms, or aggregated offtake structures; partial and contingent on aggregation design	Predictable, enforceable contracted revenues from commercial agribusiness or industrial offtakers, sufficient to cover full lifecycle costs including debt service
Institutional Context	Public irrigation authority, often fiscally constrained with limited capacity for cost recovery or financial management; investment entirely dependent on government mandate and external support	Emerging institutional arrangements through farmer organisations, cooperatives, or value-chain aggregators; payment accountability developing but not yet creditworthy at institutional level	Strong, creditworthy operators with enforceable contracts, independent capital access, and operational capacity to manage commercial financing obligations
Illustrative Example & Case-Study	A national large-scale irrigation scheme delivering water to smallholder farmers across a river command area, funded through the government budget and development grants, with no water user fee or cost recovery mechanism in place. Koga Irrigation & Watershed Management Project, Ethiopia, AfDB	A smallholder irrigation programme where a farmer cooperative aggregates water fees across members and structures payments to a scheme operator, with value-chain offtake arrangements providing partial revenue predictability sufficient to attract limited concessional finance. El Guerdane Irrigation PPP, Morocco, IFC, 2004	A commercially structured large-scale irrigation scheme or industrial process water facility serving an agribusiness operator under a long-term water supply contract, where revenues are predictable, enforceable, and sufficient to cover full lifecycle costs including debt service. IFC / Illovo Sugar Malawi Irrigation Upgrade, 2025
Financial Viability Band	BAND 1	BAND 2 BAND 3	BAND 4

Life-Cycle Costs



Financing Composition



Agricultural water service provision covers a wide range of physical asset types, from large-scale irrigation canals and storage infrastructure at the system level to smallholder drip equipment and on-farm water management at the scheme level. CAPEX is high for national and regional systems and moderate for smallholder scheme upgrades. CapManEx is significant throughout, as irrigation assets degrade rapidly without sustained maintenance, and represents a larger share of lifecycle cost than in most other archetypes. OPEX is driven by energy, canal operations, and the coordination costs of managing seasonal delivery across dispersed farming communities. Institutional costs are persistent and often underestimated, particularly where water user associations and cooperative governance require sustained investment to function. Cost of capital is low to moderate across the archetype, rising toward the higher end only where commercial structures are deployed in Scenario C.

The presence or absence of a creditworthy offtaker is the single variable that determines whether commercial finance can enter this archetype, as reflected in the capital stack across scenarios. In Scenario A, where national irrigation schemes deliver water as an agricultural public good with no direct payment mechanism, public allocation (43%) and concessional finance (48%) cover virtually the full stack, and commercial finance is entirely absent. In Scenario B, as smallholder value chains are aggregated through cooperative or water user association structures, commercial contributions enter at 23% through produce sales, cooperative dues, and PAYG mechanisms, while concessional remains significant at 38% as DFI lending supports the governance infrastructure that aggregation requires. In Scenario C, contracted offtake with a creditworthy agribusiness counterpart transforms the stack entirely: commercial leads at 74%, concessional provides catalytic support at 21%, and public and grants are negligible.

The income group divergence in Scenario A is the largest in the archetype and runs through the public and concessional split rather than the overall level of subsidy. LMIC governments rely primarily on earmarked sovereign MDB credits (AfDB ADF loans, IDA credits, JICA ODA facilities) as the principal financing vehicle for national irrigation, as fiscal constraints limit the share of investment that national budget can carry. UMIC governments fund the majority of the same investment type from national budget, using concessional borrowing as a supplement rather than a primary source. The practical implication is that LMIC Scenario A programmes are structurally dependent on MDB pipeline availability and sovereign debt capacity, while UMIC programmes are primarily a fiscal planning question. In Scenario B, that divergence disappears almost entirely: LMIC and UMIC compositions are near-identical, reflecting that the value-chain aggregation logic that enables commercial finance to enter operates the same way regardless of income context once cooperative governance and offtaker relationships are established.

By Scenario C, income group makes no material difference to the capital stack. The commercial financing logic is determined by the offtake structure, not by country classification, and the concessional share retained in both LMIC and UMIC contexts reflects the catalytic first-mover role of IFC and regional DFIs in anchoring private bank participation in markets where agribusiness project finance is not yet established.

The table below identifies the primary financing and risk instruments applicable to each scenario.

Scenario A	Scenario B	Scenario C
- Concessional Debt (IDA / AfDB ADF / JICA ODA earmarked) - Output-Based Aid (OBA) - Results-Based Financing (RBF) - productivity-linked - Unconditional Grants (bilateral and multilateral)	- Partial Credit Guarantee (PCG) - Concessional Debt - Value-Chain Aggregation Finance - PAYG Irrigation Financing - Results-Based Financing (RBF) - First-Loss Tranche / Junior Equity - Viability Gap Funding (VGF)	- Commercial Debt / Project Finance - Political Risk Insurance (PRI) - Offtaker / Counterparty Insurance - FX Hedging Facility - Water Purchase Agreement (WPA) / Offtake Contract Structure - Debt Service Reserve Account (DSRA) - Construction and Performance Risk Instruments

Key Financing Insight

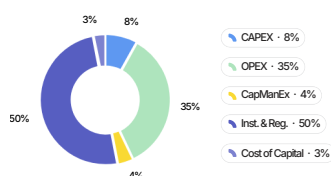
Agricultural water provision is structurally financing-resistant because the economic value water generates, through improved yields and rural livelihoods, rarely flows back to the service provider as recoverable revenue. Aggregation mechanisms that translate agricultural value into predictable payment streams, whether through cooperatives, value chain arrangements, or contracted offtake, are the essential prerequisite for repayable finance.

Archetype 6. Water Governance and Resource Management

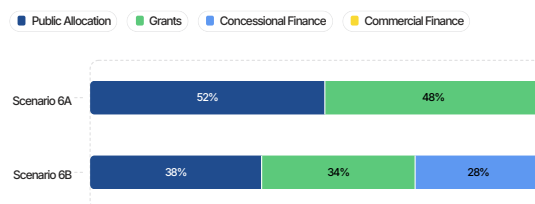
Water governance and resource management investments strengthen the institutional, regulatory, data, and operational systems that enable all other water services to function sustainably. These investments do not deliver water directly. They build the capacity to plan, regulate, allocate, and manage water resources and service delivery systems over time. As a result, they generate no direct revenue and cannot be linked to user payments in any attributable way, their benefits accrue system-wide through improved service quality, stronger financial performance, and better asset stewardship across multiple services and providers. This archetype is predominantly dependent on public allocation and grants, with the primary variable being whether performance-linked mechanisms can improve accountability and outcomes within that non-commercial funding base.

	Scenario A	Scenario B
Dimension 2: Service Geography	SYSTEM-WIDE (SW) System-wide, national, or basin-level institutional context, non-geographic in character with impacts dispersed across all water users and services.	HIGH-DENSITY FORMAL (HD-F) Formal urban and utility-level institutional boundaries with defined service areas and measurable performance baselines.
Dimension 3: Revenue Characteristics	No direct revenue stream of any kind; investment is core public-sector expenditure justified by system-wide enabling function	No direct tariff revenue, but performance-linked funding mechanisms including results-based financing create incentive-driven disbursements tied to verified efficiency or service improvements
Dimension 4: Institutional Context	Public and enabling, government and regulatory counterparties with mandate to deliver institutional functions; no commercial or quasi-commercial dimension	Reforming public institution, performance-based counterparties with credible baseline and measurable improvement targets; results verification systems in place or being developed
Illustrative Example & Case-Study	A national water sector regulatory reform programme strengthening licensing, tariff-setting, and utility oversight frameworks, funded through government budget and multilateral grants, with no user payment component. Jordan Water Sector Efficiency Project, World Bank, 2023	A utility-level operational reform programme where results-based financing disbursements are tied to verified reductions in non-revenue water, improvements in billing efficiency, or service coverage expansion, attracting supplementary concessional finance alongside performance grants. Amendis NRW Reduction Performance Contract, Tangiers, Morocco, 2002–2008
Financial Viability Band	BAND 1	BAND 1

Life-Cycle Costs



Financing Composition



Water governance and resource management investments are dominated by institutional and human capacity costs rather than physical infrastructure. Institutional and regulatory costs represent the largest single share of the lifecycle, reflecting the personnel, regulatory development, and capacity-building functions that define this archetype. OPEX is substantial, covering staffing, regulatory operations, data management, training, and programme coordination, reflecting the personnel-intensive nature of governance functions. CAPEX is low, reflecting limited civil works, with CapManEx similarly low. Cost of capital is the lowest of any archetype, consistent with the non-commercial and predominantly grant-funded nature of governance investments.

Water governance is the only archetype in this framework that does not progress toward commercial finance, because the investment generates no revenue by design and no mechanism exists to link its system-wide benefits to an identifiable payer. In Scenario A, public allocation (52%) and grants (48%) cover the full stack, with no role for repayable finance of any kind. The investment is funded rather than financed, and the relevant assessment of its viability is whether public budgets and grant programmes are predictable and sufficient, not whether a financing structure can be assembled. In Scenario B, the overall composition shifts toward concessional at 28%, while public (38%) and grants (34%) remain primary. The character of the grant component changes as importantly as its size: unconditional allocations give way to performance-conditioned disbursements, with RBF and OBA instruments anchoring accountability to verified outcomes such as NRW reductions, billing efficiency improvements, and service coverage expansion.

The income group divergence in Scenario A is material and runs through the public and grants split rather than total subsidy level. LMIC governments rely heavily on bilateral and multilateral grants to finance institutional reform, because national budgets cannot absorb the full cost of regulatory capacity building, basin governance development, and data system investment without external support. UMIC governments carry the majority of governance investment from national budget, with grants playing a supplementary and technically focused role. That divergence narrows significantly in Scenario B: the concessional component is near-equal across LMIC and UMIC contexts, because performance-linked DFI lending responds to the quality of the institutional counterpart and verification framework rather than to country income level.

Commercial finance is absent throughout and will remain so. The 28% concessional share in Scenario B is distinctive within the framework: it is the only scenario where concessional finance functions as a governance instrument rather than an infrastructure financing tool, enabled by the presence of a creditworthy utility counterpart and a measurable performance baseline rather than by any physical asset or revenue stream.

The table below identifies the primary financing and risk instruments applicable to each scenario.

Scenario A	Scenario B
- Unconditional Grants (bilateral and multilateral) - Technical Assistance Grants - Sector Budget Support - Capacity Building Facilities (e.g. WBI, GWP) - Programmatic Development Policy Lending (DPL)	- Results-Based Financing (RBF) - Output-Based Aid (OBA) - Performance-Linked Concessional Debt (DFI) - Sector Reform Grants (performance-conditioned) - Technical Assistance Facilities (verification-linked)

Key Financing Insight

Water governance and resource management is non-commercial by design, generating no direct revenue and serving system-wide rather than user-specific beneficiaries. The financing question is therefore not about capital stack structure but about funding discipline: whether public allocation and grant capital are deployed with the performance conditions, accountability mechanisms, and multi-year predictability that governance functions require to deliver lasting impact.

Applying the Framework to Water Compacts

In April 2026, the World Bank launched Water Forward, a global initiative targeting water security for over one billion people by 2030 through three pillars: Water for People, Water for Food, and Water for Planet. At the heart of the initiative are country-led Water Compacts: government action plans that connect policy reform, institutional strengthening, and investment planning in a single coordinated framework. Each compact represents a country's commitment to building the conditions, stable policy environments, capable institutions, and investment-ready projects, that attract and sustain capital at scale.

Water Compacts are political commitments, not financing vehicles. Their value is in establishing national reform priorities and signalling government intent. But translating that intent into a deployable investment programme requires a further step: determining what types of investment are involved, who will pay for them, and what forms of capital are appropriate. That translation is the role of the Water Finance Framework.

The Starting Point and Its Limitations

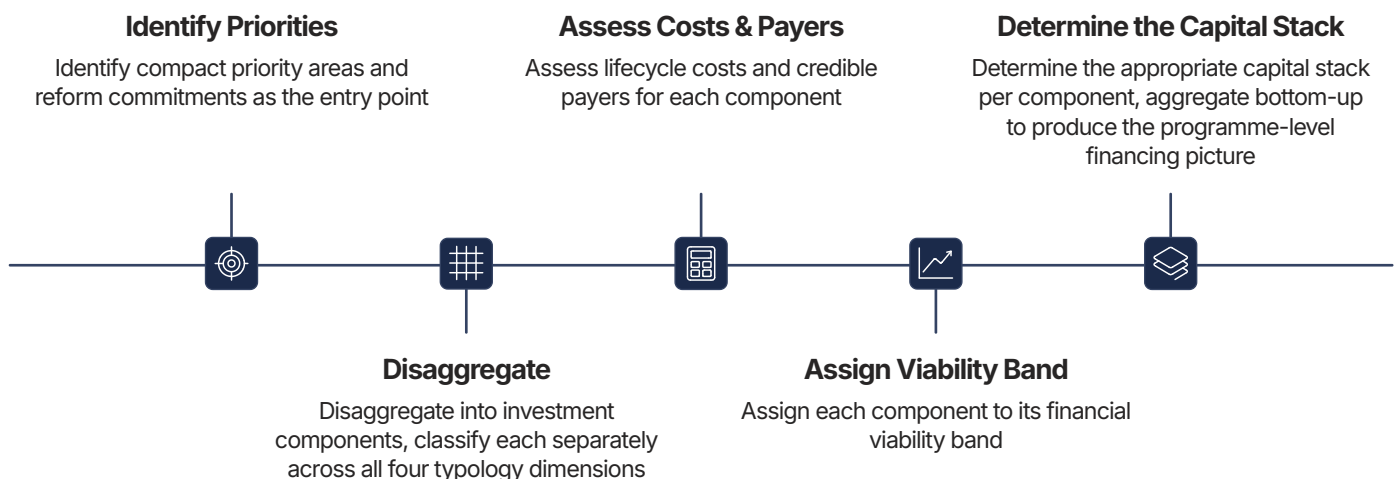
National water priorities and political ambition are the essential starting point for any Water Compact. They establish what a country needs to achieve, signal government commitment, and create the conditions for international partners to engage. But ambition must be met by rigorous financial costing and structuring of the solutions required. Without it, the gap between what a compact commits to and what capital can actually deliver remains invisible until it becomes a problem: unfunded lifecycle costs, mismatched instruments, and commercial finance applied to contexts where repayment fundamentals simply do not exist.

The Framework Discipline

The framework provides that bottom-up structuring discipline. It requires that each investment programme is disaggregated into its component investment types, each classified across the four typology dimensions, each assessed for lifecycle costs and credible payers, and each matched to its appropriate capital stack. The total capital requirement and source then emerges from this component-level analysis, grounded in service realities rather than top-down budget assumptions. National ambition determines where a country wants to go. The framework helps determine what it will take to get there.

- ❑ A national Water Compact typically spans multiple investment types with fundamentally different financial characteristics, from commercially financeable bulk water infrastructure to non-commercial ecosystem services and governance reform. Presenting the full programme to financiers as a single portfolio produces mismatched capital, failed transactions, and unfunded lifecycle costs. The framework prevents this by requiring disaggregation before any financing decisions are made.

Framework Approach to Water Compacts



The Water Finance Framework is applicable to compacts at any stage of development. Where a compact is mature, it provides a common analytical language for diverse stakeholders to engage with a complex investment portfolio from a shared starting point. Where a compact is still being drafted, its contribution is more fundamental: it shapes what the compact contains, guides which investment types belong together, identifies where commercial finance expectations are realistic, and surfaces which lifecycle costs risk remaining unfunded. The financial viability spectrum also helps inform reform pathways, making visible which institutional and revenue conditions fall short of what more ambitious capital structures require, and where improvement would unlock additional financing options.

Annex 1 applies the framework to Senegal's National Water Security Compact 2026–2030, a USD 4.5 billion programme published in April 2026 under Water Forward. As co-host of the 2026 UN Water Conference, Senegal represents a directly relevant application of the framework to an active compact, demonstrating how its scalable solutions disaggregate into six investment components spanning all four financial viability bands, and how the appropriate capital stack for each emerges. The framework exists to help other countries get there.

Conclusion & Next Steps

The challenge in water finance is not merely a lack of capital. It is the persistent misalignment between the nature of water investments and the way capital is structured and deployed.

Correcting this misalignment requires moving beyond general calls for mobilisation toward a more disciplined understanding of how different parts of the water system are funded and financed. Without this clarity, the risks are predictable: fragmented interventions, misaligned expectations, and capital deployed in ways that do not sustain services over time.

Important structural constraints remain. Many parts of the water system depend on public finance and concessional support that are often insufficient or unreliable. Addressing this requires more than better frameworks. It requires clear reform pathways that strengthen service delivery, improve institutional effectiveness, enable complementary investment, and expand the mechanisms that convert economic value into reliable payment streams. It also requires financing strategies that recognize and incentivize both top-down and bottom-up financing approaches, including community-level, household, and small-scale financing mechanisms that support access, resilience, and long-term service sustainability across diverse operating environments. This framework provides the foundation. GCFC is committed to driving its implementation.

GCFC calls on:

- Governments to apply this framework in structuring their Water Compacts, classifying investments by service purpose, identifying credible payers, building investable pipelines grounded in service realities, and defining reform pathways that enable sustainable and coordinated financing over time.
- Financial institutions and investors to align capital deployment with the true risk-return profile of water investments, avoiding misapplication of commercial finance where repayment fundamentals do not exist, and engaging blended and concessional structures where service performance is improving.
- Development partners and philanthropic actors to deploy catalytic capital with discipline, prioritising system foundations, early-stage transaction development, and results-based mechanisms that crowd in sustainable financing rather than substitute for it.

The 2026 UN Water Conference is the moment for coordinated commitment. GCFC will work with governments, institutions, and partners to translate that commitment into deployable capital at scale.

A scenic photograph of a coastal town in Senegal. In the foreground, a mosque with a prominent dome and arched windows sits on a sandy area. Behind it, a cluster of white buildings is visible. To the right, a steep, rocky cliff rises from the town. The ocean is a vibrant turquoise color, meeting a clear blue sky at the horizon.

Annex 1: Applying the Water Finance Framework

Senegal Water Forward Compact 2026–2030

Applying the Water Finance Framework to Senegal Water Forward

Senegal's Water Forward Compact, published April 2026, is one of 14 country compacts announced at the World Bank's Water Forward launch. It is also one of the most structurally complex: spanning commercially financeable desalination infrastructure, concessional reform-linked sanitation investments, grant-dependent rural water services, and non-commercial flood management and governance, all within a single national programme. It is precisely this complexity that makes it the most instructive application of the framework.

Country Context and Compact Overview

Country	Republic of Senegal	Network Efficiency	76% urban (SEN'EAU/SONES); 60–70% rural (OFOR network)
Income Classification	Lower-middle income*	Climate Cost	Over 10% of GDP annually from water-related hazards
Population (2030)	22 million	Compact Period	2026–2030
Urban Concentration	60% in Dakar-Mbour-Thiès (DMT) triangle, generating 50% of GDP	Total Investment Target	USD 4.5 billion
Water Stress	Renewable freshwater approaching the 1,700 m³/capita international stress threshold	Key Partners	World Bank, AfDB, IFC, AFD, KfW, bilateral donors, private sector
Urban Water Access	88% basic; 28% safely managed sanitation; 17% of wastewater treated		

*The framework dataset presents financing compositions across both LMIC and UMIC country contexts. This annex uses the LMIC reference composition throughout, as the closer fit for Senegal's income classification.

Compact Solutions & Priority Reforms

S1: Optimise Services
End tariff freeze (in place since 2020, requiring USD 25m annual state subsidy). Restore SONES/SEN'EAU efficiency to 85%. Complete ONAS sanitation PPP (IFC transaction advisory signed October 2025).

S2: Bankable Investments
Grand Transfert d'Eau (GTE — 5 million beneficiaries, 12,000 ha irrigation). ACWA Power desalination plant (400,000 m³/day, USD 800m, 100% renewable). PISEA (USD 200m Phase 1, USD 800m total - Greater Dakar sanitation, Lake Guiers restoration, wastewater reuse pilot).

S3: Sustain Rural Services
OFOR/DSP reform. Borehole solarisation and digitalisation. Fluoride treatment for Groundnut Basin (aquifer levels at 4–5 mg/l, three times WHO standard). Rural sanitation integration into OFOR model.

S6/S7: IWRM and Climate Resilience
Flood management across 7 priority sites (Touba alone: USD 55m average annual damages). 500-station telemetered aquifer monitoring network. Blue Fund Senegal (USD 150m capitalisation target). Blue Bonds targeted 2029.

2027: Tariff Reform
End freeze, restore SONES financial equilibrium

2027: New Water Sector Regulatory Authority (ARSE)

2027: Water Code Revision
Pending since 2014

2028: ONAS sanitation PPP completion
Affermage model replicating SEN'EAU framework

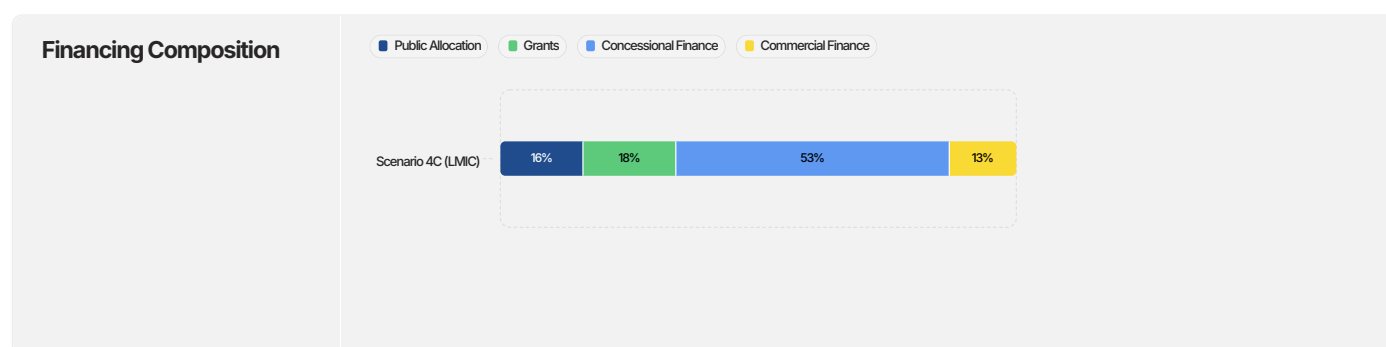
Framework Disaggregation: Investment Component Overview

Pillar	Label	Investment
1	S1: Urban Sanitation Transformation — ONAS PPP	USD 900m
1	S2-A: ACWA Power Desalination Plant	USD 800m
1	S2-B: Grand Transfert d'Eau (GTE) — Dual Dividend	~USD 200m
1	S2-C: PISEA — Greater Dakar Sanitation Network	% only
1	S2-D: PISEA — Lake Guiers Ecosystem Restoration	% only
1	S2-E: PISEA — Tivaouane Peulh WWTP and REUT Pilot	USD 100m
1	S3: Rural Water Services Reform	~USD 750m
3	S6: Urban Flood Resilience — 7 Priority Sites	~USD 600m
3	S7: IWRM, Aquifer Protection and Blue Fund	~USD 450m

Methodology Note
The framework dataset presents financing compositions across both LMIC and UMIC country contexts. This annex uses the LMIC reference composition throughout, as the closer fit for Senegal's income classification. S2-C, S2-D and S2-E form part of the PISEA programme (USD 800m total, Phase 1 USD 200m World Bank IDA). Sub-component investment figures are not provided in the compact. An equal-weighted average is applied to the USD 800m PISEA total in the aggregation table. All figures marked ~ are framework estimates derived from the compact's sector cost breakdown table. Source: Senegal National Water Security Compact 2026–2030 (Ministère de l'Hydraulique et de l'Assainissement, April 2026). Framework application by GCFC.

Programme: ONAS Strategic Development Plan 2026–2030 + IFC-supported affermage PPP transaction. Scale: USD 900m total investment need (ONAS Strategic Plan estimate).

Dimension 1: Service Purpose	SANITATION SERVICE PROVISION
Dimension 2: Service Geography	PRIMARY: HIGH-DENSITY FORMAL (HD-F) SECONDARY: HIGH-DENSITY INFORMAL (HD-I)
Dimension 3: Revenue Characteristics	Currently sub-cost-recovery tariffs. No cost-reflective pricing. Affermage PPP model targets progressive cost recovery as operations are professionalised. Reform-dependent trajectory toward Band 3.
Dimension 4: Institutional Context	Institutionally constrained, improving. ONAS reform underway with IFC advisory support. Transitioning toward private affermage replicating the SEN'EAU/SONES framework.
Financial Viability Band	BAND 2 (current) BAND 3 (post-reform)
Archetype Scenario Alignment	ARCHETYPE 4 SCENARIO C Archetype 4 Scenario C: Networked, partial to full cost recovery trajectory.



Financing Context	Investments of this type, specifically networked urban sanitation services on a reform trajectory from public utility toward private affermage, sit in Band 2 transitioning toward Band 3. The appropriate capital composition is anchored by concessional DFI finance, which provides the long-tenor, patient capital that reform-linked sanitation investments require, supplemented by public allocation and grants during the transition period. As institutional performance improves and tariff revenues strengthen, the capital composition progressively shifts toward a smaller concessional and public share, with results-based mechanisms providing accountability for reform delivery. Commercial finance plays a limited supplementary role until cost recovery is sufficiently credible. In Senegal's compact context, the financing logic for this investment type is directly conditioned on the tariff reform trajectory and ONAS PPP transaction completion, both of which are priority reform milestones targeted for 2027 and 2028 respectively. Until these reforms are confirmed, the investment remains in Band 2 and concessional and grant capital must carry the primary financing burden. The Blue Fund Social Window provides a complementary vehicle for equity access and subsidised connections during the reform transition period.
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Programme: ACWA Power desalination plant, Grande-Côte, Dakar. PPP signed July 2025. Two-phase delivery: Phase 1 200,000 m³/day; full capacity 400,000 m³/day. 100% renewable energy. Scale: USD 800 million total project cost. Reduces critical dependence of the Dakar-Mbour-Thiès triangle on Lake Guiers, which currently supplies over 50% of Dakar's water from 250 km away.

Dimension 1: Service Purpose	WATER SERVICE PROVISION
Dimension 2: Service Geography (DEGURBA)	HIGH-DENSITY FORMAL (HD-F) Dakar-Mbour-Thiès formal urban zone with dense, contiguous settlement and integrated distribution infrastructure. 60% of national population, 50% of GDP, concentrated demand with SONES as creditworthy bulk off-taker.
Dimension 3: Revenue Characteristics	Contracted bulk water revenues through a long-term purchase agreement with SONES as creditworthy off-taker. Full cost recovery is contingent on tariff reform and ARSE regulatory authority operationalisation, both targeted for 2027. The 100% renewable energy structure creates additional eligibility for concessional climate finance and green bond issuance alongside the primary commercial capital base
Dimension 4: Institutional Context	Institutionally strong. ACWA Power PPP signed July 2025 with government-confirmed commercial terms. SONES is a mature patrimony company with audited accounts. Third-generation reform (SONES as bulk water purchaser managing multiple independent producers) in progress. ARSE regulatory authority establishment by 2027 is enabling condition for full commercial close.
Financial Viability Band	BAND 4
Archetype Scenario Alignment	ARCHETYPE 3 SCENARIO C Networked, full cost recovery. Commercially structured bulk water facility with long-term offtake contract with creditworthy utility.

Financing Composition

Public Allocation Grants Concessional Finance Commercial Finance

Scenario 3C (LMIC)

8% 12% 77%

Financing Context

Commercially structured bulk water supply with a creditworthy utility off-taker in a high-density formal urban context sits in Band 4 and is primarily suited to commercial project finance. The revenue base is predictable and contractually anchored, the institutional context is strong, and the risk profile is consistent with international infrastructure debt and equity markets. Public allocation plays a minimal role; the government's primary contribution is the regulatory framework and land rights rather than capital. Concessional finance enters supplementarily at 12%, drawn from GCF climate facilities and green lending windows made accessible by the 100% renewable energy structure, reducing the overall cost of capital and extending tenor beyond what unblended commercial markets offer alone.

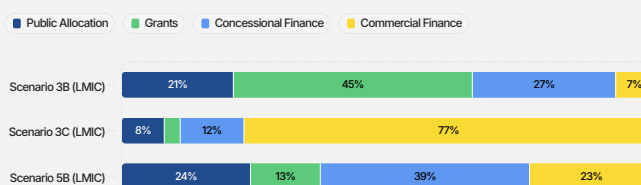
In Senegal's compact context, the commercial financing logic for ACWA Power is enabled by two institutional conditions: the SONES third-generation reform, which positions SONES as a bulk water purchaser coordinating multiple independent producers, and the operationalisation of the ARSE regulatory authority. Both are compact milestones targeted for 2027 and represent the regulatory certainty that commercial infrastructure investors require before full financing close. The PPP agreement signed in July 2025 confirms the commercial structure is in place; the outstanding reform milestones confirm the conditions for full capital mobilisation are not yet complete.

Programme: Grand Transfert d'Eau, a PPP between FONSI (Fonds Souverain d'Investissements Stratégiques du Sénégal) and Sinohydro. Agreement signed October 2024. Transfers water from Lake Guiers to the Dakar-Mbour-Thiès triangle, with three explicit offtake points for agro-pastoral use. Serves 5 million beneficiaries immediately and 11 million by 2050, and irrigates 12,000 hectares in the Niayes. Scale: investment figure not explicitly stated in the compact; derived from sector arithmetic applied to the compact's financing framework table.

Multi-archetype note: GTE is the only component in this compact that spans two archetypes with fundamentally different financing logics. Both are assessed jointly here given the single PPP structure, but practitioners should note that the agricultural component has a structurally weaker revenue base that depends on agro-pastoral value-chain aggregation through CAC cooperatives.

Dimension 1: Service Purpose	WATER SERVICE PROVISION (PRIMARY) AGRICULTURAL SERVICE PROVISION (SECONDARY)
Dimension 2: Service Geography	URBAN SUPPLY COMPONENT: HIGH-DENSITY FORMAL (HD-F) IRRIGATION COMPONENT: LOW-DENSITY FORMAL (LD-F) MEDIUM-DENSITY FORMAL (MD-F) HD-F covering urban supply to the planned Dakar-Mbour-Thiès zone with dense and networked settlement, alongside MD-F and LD-F as secondary contexts covering the Niayes peri-urban and nucleated rural agricultural zones with intermediate to low density and road connectivity and emerging irrigation infrastructure.
Dimension 3: Revenue Characteristics	The urban supply component generates contracted bulk water revenues through a long-term purchase agreement with SONES, contingent on SONES third-generation reform completion. The agricultural component generates indirect seasonal revenues through CAC cooperative aggregation in the Niayes, partial and contingent on cooperative governance development. The FONSI sovereign wealth fund structure strengthens access to concessional DFI lending beyond what a standard government counterpart would support.
Dimension 4: Institutional Context	The PPP structure operates under FONSI as a sovereign wealth fund providing institutional strength, alongside Sinohydro as an experienced infrastructure contractor. The SONES third-generation reform is required to formalise the multi-source integration framework of which GTE is a component. Agricultural offtake governance through CAC cooperatives is developing but not yet creditworthy at the institutional level.
Financial Viability Band	URBAN SUPPLY COMPONENT: BAND 1 (current) BAND 4 (Post-reform) IRRIGATION COMPONENT: BAND 2 For Urban Supply, transition from Band to Band 4 contingent on SONES reform and ARSE
Archetype Scenario Alignment	URBAN SUPPLY COMPONENT: ARCHETYPE 3 SCENARIO B & C IRRIGATION COMPONENT: ARCHETYPE 5 SCENARIO B

Financing Composition



Financing Context

Dual-dividend infrastructure spanning a reform-pathway urban water utility and a smallholder agricultural irrigation component carries two distinct financing logics that must be structured and sequenced separately despite the single PPP vehicle. The urban supply component sits at the Archetype 3 Scenario B-to-C boundary: in its current pre-reform period, the reference composition is anchored by grants (45%) and concessional finance (27%), with public at 21% and commercial at 7%, reflecting the grant-heavy financing profile of LMIC reform-pathway utilities before tariff revenues reach cost-reflective levels. As reform milestones are confirmed, the composition progressively shifts toward the 3C LMIC reference (77% commercial, 12% concessional), where SONES's creditworthy offtake fully anchors commercial project finance. The agricultural component operates under the Archetype 5 Scenario B logic throughout: concessional finance (39%) leads alongside commercial contributions from value-chain aggregation (23%), with public allocation (24%) providing the enabling co-investment that cooperative governance structures require before commercial capital can enter at scale.

In Senegal's compact context, the financing trajectory of GTE is determined by three interdependent reform conditions. First, the SONES third-generation reform must formalise GTE as an integrated supply source within the multi-producer framework, which is the prerequisite for SONES offtake revenues to serve as a commercial financing anchor. Second, the ARSE regulatory authority operationalisation, targeted for 2027, provides the investor certainty required for full commercial close on the urban supply component. Third, CAC cooperative governance development in the Niayes determines the pace at which the agricultural component can access concessional DFI lending rather than remaining primarily grant-dependent. FONSI's sovereign wealth fund role provides the institutional strength to access concessional DFI windows in the interim period, bridging the gap between current reform progress and the financing conditions required for the full capital stack to be mobilised.

- ☐ S2-C, S2-D and S2-E form the three components of PISEA (Projet Intégré de Sécurité de l'Eau et de l'Assainissement — USD 800m total, Phase 1 USD 200m World Bank IDA approved June 2024).

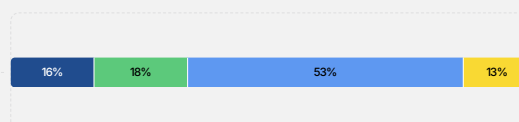
Programme: PISEA Component - Greater Dakar sanitation network extension and wastewater treatment system. 400 km of additional sewers in Greater Dakar. Rehabilitation of 16 existing STEPs toward NS-05-061 effluent standard compliance (currently only 1 of 16 compliant). Bay of Hann depollution project (184.5m euros, AFD/EU/Netherlands, 13 km interceptor, Mbao WWTP) included in this component. Scale: indicative % only — part of USD 800m PISEA total.

Dimension 1: Service Purpose	SANITATION SERVICE PROVISION
Dimension 2: Service Geography (DEGURBA)	HIGH-DENSITY FORMAL (HD-F) HIGH-DENSITY INFORMAL (HD-I) Dense urban zone with existing but severely underperforming sewerage infrastructure. Significant informal settlement component alongside formal networked coverage across the greater Dakar metropolitan area.
Dimension 3: Revenue Characteristics	Tariff revenues through the ONAS sanitation charge on water bills, currently sub-cost-recovery and insufficient for full lifecycle cost coverage without public subsidy. The Bay of Hann interministerial decree (December 2024) establishes the first polluter-pays sanitation pricing mechanism in Senegal, creating a new levy on 260 industrial units, though this mechanism has not yet been tested at full scale and its extension beyond the Bay of Hann remains contingent on regulatory expansion. Climate finance eligibility is strong given the effluent quality and depollution character of the investment.
Dimension 4: Institutional Context	Institutionally constrained, improving. ONAS in structural reform through IFC-advised affermage PPP transaction (S1). World Bank IDA Phase 1 (USD 200m) provides anchor financing and reform conditionality. Effluent compliance at 4% reveals deep operational weaknesses requiring both physical rehabilitation and operational transformation under the incoming private affermage operator. The Bay of Hann project introduces a new financing architecture through the polluter-pays mechanism that, if successfully operationalised, strengthens the institutional context for this investment type.
Financial Viability Band	BAND 2
Archetype Scenario Alignment	ARCHETYPE 4 SCENARIO C Networked, partial to full cost recovery trajectory. ONAS reform pathway from public utility toward private affermage.

Financing Composition

Public Allocation Grants Concessional Finance Commercial Finance

Scenario 4C (LMIC)



Financing Context

Networked urban sanitation infrastructure in a mixed formal and informal context, with sub-cost-recovery tariffs and deep operational performance gaps, sits in Band 2. The reference composition (16% public, 18% grants, 53% concessional, 13% commercial) reflects the structural reality of LMIC networked sanitation utilities: concessional DFI finance is the primary instrument, providing the long-tenor, patient capital that infrastructure of this scale and reform complexity requires. Grants absorb the portion of lifecycle costs that tariff revenues cannot yet cover, with results-based mechanisms linking disbursements to verified coverage expansion and effluent compliance improvements. Commercial contributions are modest, anchored by the Bay of Hann industrial levy rather than tariff revenues, whose extension across other industrial zones would progressively strengthen this component.

In Senegal's compact context, the World Bank IDA Phase 1 (USD 200m) serves as the anchor financing instrument, providing both capital and reform conditionality that structures the ONAS reform trajectory. The financing logic for the full USD 800m PISEA programme is conditioned on the ONAS PPP transaction completion targeted for 2028 and tariff reform targeted for 2027 - both of which are prerequisites for the investment to progress from its current Band 2 position toward Band 3. The Bay of Hann depollution component (EUR 184.5m, AFD/EU/Netherlands) introduces an additional grant and concessional financing stream aligned with the polluter-pays industrial levy, demonstrating that the revenue base for networked sanitation in Senegal is broadening beyond household tariffs, even if it has not yet reached cost-reflective levels.

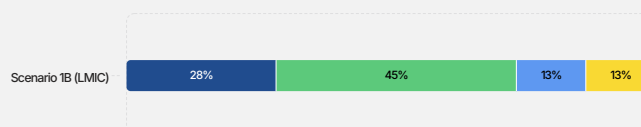
- S2-C, S2-D and S2-E form the three components of PISEA (Projet Intégré de Sécurité de l'Eau et de l'Assainissement — USD 800m total, Phase 1 USD 200m World Bank IDA approved June 2024).

Programme: PISEA Component A covering Lake Guiers ecosystem restoration and source security. Modernisation of the Richard Toll hydraulic ouvrage, rehabilitation of 10 kilometres of embankments, and upstream watershed management targeting a 20% increase in lake inflows. Scales the AFD and AdaptAction Pout nature-based aquifer recharge model to four strategic hotspots: Lake Guiers, the northern littoral, the Diass horst, and the DMT triangle. Scale: indicative percentage only, forming part of the USD 800 million PISEA total.

Dimension 1: Service Purpose	WATER ECOSYSTEM CONSERVATION & RESTORATION (PRIMARY) WATER GOVERNANCE & RESOURCE MANAGEMENT (SECONDARY)
Dimension 2: Service Geography	SYSTEM WIDE (SW) Basin-adjacent and dispersed catchment. Benefits accrue across the full DMT population as downstream water security. Lake Guiers serves as the primary freshwater source for the Dakar-Mbour-Thiès corridor.
Dimension 3: Revenue Characteristics	No direct attributable revenue from ecosystem restoration activities. Indirect payment potential exists through a Payment for Ecosystem Services arrangement with SONES as the downstream institutional off-taker, whose operational security depends directly on Lake Guiers' hydrological integrity, though this arrangement is not yet formalised. Strong climate finance eligibility given the nature-based adaptation character of the investment and its alignment with Senegal's NDC 3.0 commitments.
Dimension 4: Institutional Context	Emerging basin governance with a clear institutional mandate. OLAC holds the formal mandate for Lake Guiers management and DGPRI is responsible for aquifer monitoring. A PES arrangement with SONES is technically feasible but not yet formalised. The AFD and AdaptAction Pout aquifer contract model provides a replicable governance template for structuring a downstream payer arrangement at scale within the compact period.
Financial Viability Band	BAND 2 (with downstream off-taker)
Archetype Scenario Alignment	ARCHETYPE 1 SCENARIO B Catchment-scale investment with public mandate as the primary driver and an identifiable downstream institutional payer in SONES creating conditions for a structured PES arrangement.

Financing Composition

Public Allocation Grants Concessional Finance Commercial Finance



Financing Context

Basin-scale ecosystem conservation with a quantifiable downstream institutional beneficiary sits at Archetype 1 Scenario B. The Scenario 1B LMIC reference composition (28% public allocation, 45% grants, 13% concessional finance, 13% commercial finance) is applied here as the appropriate reference for Lake Guiers, reflecting a catchment investment where a structured PES arrangement with SONES as the downstream off-taker is both technically feasible and institutionally grounded within the compact period. In the absence of a formalised PES arrangement, the composition would remain closer to the Scenario 1A profile: predominantly concessional MDB credits (IDA, AfDB) supplemented by climate and biodiversity grants from GEF, GCF, and bilateral ODA windows, with no commercial contribution. The 13% commercial component in the 1B reference reflects the progressive introduction of SONES fee payments into a structured conservation fund as the PES arrangement is formalised.

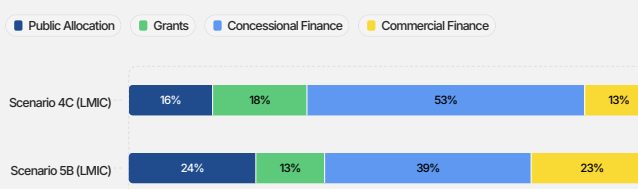
The institutional basis for this trajectory is strong. Lake Guiers is the hydrological anchor for the entire DMT system: both the ACWA Power desalination facility and the Grand Transfert d'Eau depend on its sustained inflows, giving SONES a direct and quantifiable financial interest in the lake's integrity. The AFD and AdaptAction Pout aquifer recharge contract provides a proven contractual template already demonstrated within Senegal, reducing the governance risk of the PES pathway considerably. Formalising the SONES arrangement within the compact period, supported by the joint water-agriculture master plan targeted for 2027, would confirm the Band 2 financing structure and progressively reduce reliance on concessional borrowing.

- ☐ S2-C, S2-D and S2-E form the three components of PISEA (Projet Intégré de Sécurité de l'Eau et de l'Assainissement — USD 800m total, Phase 1 USD 200m World Bank IDA approved June 2024).

Programme: PISEA Component covering the Tivaouane Peulh wastewater treatment plant PPP and 600-hectare treated effluent reuse pilot for peri-urban irrigation in the Diender Valley. IFC transaction advisory signed October 2025. Hybrid PPP model combining World Bank PISEA public financing with private investment estimated at USD 38 to 58 million. Private partner responsible for design, construction, financing, operation, and maintenance. Advanced treatment processes enable reuse of treated effluent for irrigation in a zone facing groundwater overexploitation. Designed as a replication model for a national REUT strategy covering the Dakar-Mbour corridor, Thiès, Saint-Louis, and Touba. Scale: total project cost approximately USD 100 million as stated in the compact.

Dimension 1: Service Purpose	SANITATION SERVICE PROVISION (PRIMARY) AGRICULTURAL SERVICE PROVISION (SECONDARY)
Dimension 2: Service Geography	MEDIUM DENSITY FORMAL (MD-F) MEDIUM DENSITY INFORMAL (MD-I) MD-F and MD-I covering the sub-urban Dakar periphery at Tivaouane Peulh and the Diender Valley agricultural zone. Intermediate density with emerging infrastructure and partially formal tenure. Willingness to pay for treated irrigation water exists among Diender Valley smallholders given deteriorating groundwater quality from overexploitation, placing the agricultural component at the more commercially promising end of the peri-urban spectrum.
Dimension 3: Revenue Characteristics	Two partial revenue streams: the ONAS sanitation charge transferred to the private PPP operator, currently sub-cost-recovery and improving on the reform trajectory, and treated effluent sales to Diender Valley smallholder irrigators, once a national REUT regulatory framework is incorporated into the Water Code revision targeted for 2027. Combined revenues are insufficient for full commercial financing but credible enough to anchor a hybrid PPP structure on a reform-dependent pathway.
Dimension 4: Institutional Context	Developing, reform-linked. IFC transaction advisory establishes a credible PPP structuring pathway and World Bank PISEA provides anchor public financing. A national water reuse regulatory framework is currently absent and must be incorporated into the Water Code revision targeted for 2027 before treated effluent can be legally sold as an agricultural input. The polluter-pays industrial levy established in December 2024 creates a complementary revenue mechanism whose extension beyond the Bay of Hann would strengthen the broader sanitation PPP model.
Financial Viability Band	BAND 2 (current)
Archetype Scenario Alignment	SANITATION SUPPLY COMPONENT: ARCHETYPE 4 SCENARIO C IRRIGATION COMPONENT: ARCHETYPE 5 SCENARIO B Scenario 4C for the WWTP sanitation component, and Scenario 5B for the REUT agricultural component.

Financing Composition



Financing Context

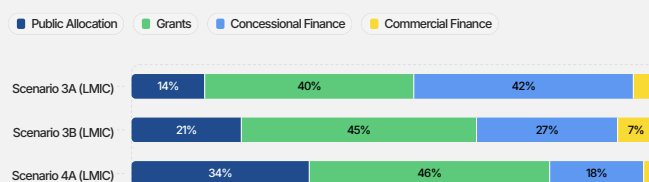
A hybrid PPP wastewater treatment plant combining public anchor financing with private design, build, finance, and operate sits at the Archetype 4 Scenario C boundary. The reference composition for the sanitation component (16% public, 18% grants, 53% concessional, 13% commercial) reflects the dominant role of concessional DFI finance in LMIC networked sanitation, the World Bank PISEA anchor (USD 200m IDA) provides the public and concessional base that makes private participation viable, while the private partner's equity and operating revenues contribute the commercial component. The REUT agricultural component operates under the Archetype 5 Scenario B logic: concessional finance (39%) supports the governance and infrastructure investment required before treated effluent offtake arrangements can be formalised, while emerging willingness to pay among Diender Valley irrigators (23% commercial) reflects the structurally sound demand that groundwater deterioration creates.

In Senegal's compact context, the financing logic for S2E depends on two enabling conditions sequenced across the compact period. First, the Water Code revision targeted for 2027 must incorporate a national water reuse regulatory framework, creating the legal basis for treated effluent to be sold as an agricultural input and unlocking the REUT revenue stream that strengthens the investment's commercial viability. Second, the ONAS PPP affermage completion targeted for 2028 progressively improves the sanitation tariff base that the private WWTP operator depends on for operational cost recovery. The investment is explicitly designed as a replication model: once the Tivaouane Peulh structure is proven, the national REUT pipeline covering the Dakar-Mbour corridor, Thiès, Saint-Louis, and Touba becomes financeable on progressively more commercial terms, shifting the 5B reference toward 5C across subsequent compact phases.

Programme: Consolidation of the OFOR/DSP model for professionalised rural water management. Six of eight DSP perimeters operational, 42% incorporation rate. Targets network efficiency improvement from 60 to 70% toward 85%, solarisation of 800 boreholes by 2030, and extension to 2,000 unserved communities. Addresses the fluoride crisis in the Groundnut Basin (aquifer concentrations at 4 to 5 mg/l, three times the WHO standard) through a large-scale water transfer from Malem Hodar currently at feasibility stage. Integrates rural sanitation into the OFOR/DSP model, which currently has no operator, revenue base, or service delegation mechanism. Scale: investment figure not explicitly stated in the compact; derived from sector arithmetic applied to the compact's financing framework table.

Dimension 1: Service Purpose	WATER SERVICE PROVISION (PRIMARY) SANITATION SERVICE PROVISION (SECONDARY)
Dimension 2: Service Geography	LOW DENSITY FORMAL (LD-F) LOW DENSITY INFORMAL (LD-I) Nucleated rural communities within existing DSP perimeters and last-mile dispersed settlements not yet incorporated. Groundnut Basin regions of Diourbel, Fatick, Kaffrine, and Kaolack are the priority fluoride zones. Community ASUFOR associations provide partial governance and payment accountability.
Dimension 3: Revenue Characteristics	DSP operators capture partial willingness to pay through borehole user fees. Tariff structure unchanged since 2015 and State subsidy funding at only 60% of intended levels between 2020 and 2024. Fluoride treatment adds significant cost with no attributable payment stream. Rural sanitation has no revenue base, no operator, and no cost recovery mechanism.
Dimension 4: Institutional Context	Developing. OFOR reform is professionalising rural management through private DSP operators, with ASUFOR community associations providing borehole-level governance and payment accountability below the DSP layer. A 42% DSP incorporation rate confirms the model is not yet at scale. Rural sanitation remains an institutional gap with no delegated operator or delivery mechanism in place.
Financial Viability Band	OFOR/DSP COMPONENT BAND 1 RURAL SANITATION COMPONENT BAND 1
Archetype Scenario Alignment	OFOR/DSP COMPONENT ARCHETYPE 3 SCENARIO A SCENARIO B RURAL SANITATION COMPONENT ARCHETYPE 4 SCENARIO A

Financing Composition



Financing Context

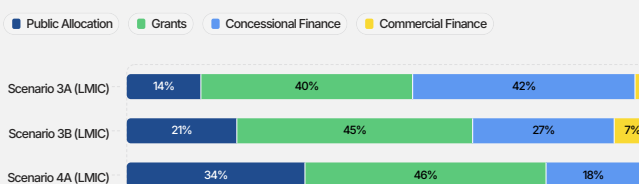
A dual-component rural programme combining DSP-managed water service provision on a professionalisation trajectory with rural sanitation at a pre-institutional baseline requires two distinct financing logics applied simultaneously. The rural water component sits at the Archetype 3 Scenario A to B boundary: the reference compositions (3A: 14% public, 40% grants, 42% concessional, 4% commercial; 3B: 21% public, 45% grants, 27% concessional, 7% commercial) reflect the grant and concessional dominance that characterises LMIC rural water programmes at all stages of professionalisation. Concessional MDB credits are the primary instrument in Scenario A, as earmarked IDA and AfDB facilities finance the infrastructure base that DSP operators then manage. As OFOR reform scales DSP incorporation beyond 42%, the composition progressively shifts toward 3B, with grants absorbing a greater share of institutional capacity costs and modest commercial contributions from stabilising DSP user fee revenues. The rural sanitation component sits in Archetype 4 Scenario A throughout the compact period: with no operator, no revenue base, and no delegation mechanism, the reference composition (34% public, 46% grants, 18% concessional, 2% commercial) reflects standard ODF and community sanitation programme financing, entirely dependent on government budget and donor grants.

In Senegal's compact context, the financing logic for S3 is conditioned on OFOR reform progress as the central variable. The 800-borehole solarisation target creates renewable energy eligibility for climate finance instruments that could reduce capital costs and attract GCF and bilateral climate grants beyond standard WASH windows. The Malem Hodar transfer, currently at feasibility stage, requires a separate financing architecture — likely a sovereign concessional facility given its large-scale infrastructure character and the absence of any cost recovery mechanism for fluoride remediation. The rural sanitation gap represents the most structurally underfunded element of the compact: without a delegation model, an operator, or a revenue stream, it is entirely dependent on public budget predictability and bilateral WASH grant availability throughout the compact period.

Programme: Consolidation of the OFOR/DSP model for professionalised rural water management. Six of eight DSP perimeters operational, 42% incorporation rate. Targets network efficiency improvement from 60 to 70% toward 85%, solarisation of 800 boreholes by 2030, and extension to 2,000 unserved communities. Addresses the fluoride crisis in the Groundnut Basin (aquifer concentrations at 4 to 5 mg/l, three times the WHO standard) through a large-scale water transfer from Malem Hodar currently at feasibility stage. Integrates rural sanitation into the OFOR/DSP model, which currently has no operator, revenue base, or service delegation mechanism. Scale: investment figure not explicitly stated in the compact; derived from sector arithmetic applied to the compact's financing framework table.

Dimension 1: Service Purpose	WATER SERVICE PROVISION (PRIMARY) SANITATION SERVICE PROVISION (SECONDARY)
Dimension 2: Service Geography	LOW DENSITY FORMAL (LD-F) LOW DENSITY INFORMAL (LD-I) Nucleated rural communities within existing DSP perimeters and last-mile dispersed settlements not yet incorporated. Groundnut Basin regions of Diourbel, Fatick, Kaffrine, and Kaolack are the priority fluoride zones. Community ASUFOR associations provide partial governance and payment accountability.
Dimension 3: Revenue Characteristics	DSP operators capture partial willingness to pay through borehole user fees. Tariff structure unchanged since 2015 and State subsidy funding at only 60% of intended levels between 2020 and 2024. Fluoride treatment adds significant cost with no attributable payment stream. Rural sanitation has no revenue base, no operator, and no cost recovery mechanism.
Dimension 4: Institutional Context	Developing. OFOR reform is professionalising rural management through private DSP operators, with ASUFOR community associations providing borehole-level governance and payment accountability below the DSP layer. A 42% DSP incorporation rate confirms the model is not yet at scale. Rural sanitation remains an institutional gap with no delegated operator or delivery mechanism in place.
Financial Viability Band	OFOR/DSP COMPONENT BAND 1 RURAL SANITATION COMPONENT BAND 1
Archetype Scenario Alignment	OFOR/DSP COMPONENT ARCHETYPE 3 SCENARIO A SCENARIO B RURAL SANITATION COMPONENT ARCHETYPE 4 SCENARIO A

Financing Composition



Financing Context

A dual-component rural programme combining DSP-managed water service provision on a professionalisation trajectory with rural sanitation at a pre-institutional baseline requires two distinct financing logics applied simultaneously. The rural water component sits at the Archetype 3 Scenario A to B boundary: the reference compositions (3A: 14% public, 40% grants, 42% concessional, 3% commercial; 3B: 21% public, 45% grants, 27% concessional, 7% commercial) reflect the grant and concessional dominance that characterises LMIC rural water programmes at all stages of professionalisation. Concessional MDB credits are the primary instrument in Scenario A, as earmarked IDA and AfDB facilities finance the infrastructure base that DSP operators then manage. As OFOR reform scales DSP incorporation beyond 42%, the composition progressively shifts toward 3B, with grants absorbing a greater share of institutional capacity costs and modest commercial contributions from stabilising DSP user fee revenues. The rural sanitation component sits in Archetype 4 Scenario A throughout the compact period: with no operator, no revenue base, and no delegation mechanism, the reference composition (34% public, 46% grants, 18% concessional, 2% commercial) reflects standard ODF and community sanitation programme financing, entirely dependent on government budget and donor grants.

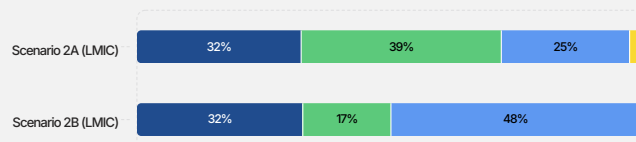
In Senegal's compact context, the financing logic for S3 is conditioned on OFOR reform progress as the central variable. The 800-borehole solarisation target creates renewable energy eligibility for climate finance instruments that could reduce capital costs and attract GCF and bilateral climate grants beyond standard WASH windows. The Malem Hodar transfer, currently at feasibility stage, requires a separate financing architecture — likely a sovereign concessional facility given its large-scale infrastructure character and the absence of any cost recovery mechanism for fluoride remediation. The rural sanitation gap represents the most structurally underfunded element of the compact: without a delegation model, an operator, or a revenue stream, it is entirely dependent on public budget predictability and bilateral WASH grant availability throughout the compact period.

Programme: Integrated flood risk management across 7 priority sites identified by the PGIS national risk mapping exercise. Touba is the most critical site with 36 billion FCFA in average annual damages and 93 billion FCFA of identified protection works. PROGEF 2 (USD 318 million, World Bank, already approved) has protected 220,000 people in Keur Massar. PGRI flood management plans cover 6 additional priority sites with identified works estimated at 187 billion FCFA. Institutional reform targets conversion of CNGI to CNGRI with legal anchoring of PGRI and PPRI frameworks. The State commits 14 billion FCFA per year for flood risk reduction. Scale: investment figure not explicitly stated in the compact for S6 in isolation; derived from PROGEF 2 and PGRI identified works.

Dimension 1: Service Purpose	WATER HAZARD MANAGEMENT
Dimension 2: Service Geography	MEDIUM DENSITY FORMAL (MD-F) HIGH DENSITY FORMAL (HD-F) Formal medium and high-density towns across 7 priority sites. Industrial and commercial zones in Dakar provide institutional anchoring for beneficiary identification within the protected perimeter.
Dimension 3: Revenue Characteristics	No direct revenues at system scale. Flood protection is a non-excludable public good with dispersed beneficiaries. Partial recovery potentially feasible in Dakar through a benefit assessment levy on industrial and commercial zones in protected areas. Parametric insurance mechanisms protect public budget allocations from the fiscal shock of major flood events rather than generating revenue.
Dimension 4: Institutional Context	Government mandate through DPGI but institutional fragmentation across DPGI, ONAS, ADM, ANACIM, DPC, and communes dilutes accountability and reduces investment effectiveness. The compact explicitly identifies this fragmentation as the primary governance risk. CNGI to CNGRI reform targeted for 2028 provides legal anchoring for PGRI and PPRI and establishes territorial flood management committees.
Financial Viability Band	BAND 1
Archetype Scenario Alignment	ARCHETYPE 2 SCENARIO A SCENARIO B Archetype 2 Scenario A to B boundary. National flood protection programme with predominantly public and climate grant funding, reflecting Scenario A, with partial urban beneficiary contribution potential in Dakar emerging toward Scenario B.

Financing Composition

Public Allocation Grants Concessional Finance Commercial Finance



Financing Context

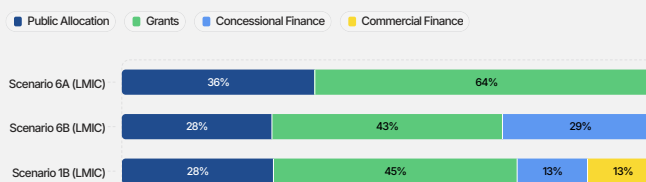
Integrated flood risk management across multiple urban priority sites with no direct revenue stream sits in Band 1 under Scenario 2A, with full dependence on public budget, climate grants, and concessional MDB borrowing. The reference composition for Scenario 2A (32% public, 39% grants, 25% concessional, 4% commercial) reflects the three-source financing structure that characterises LMIC national flood programmes. The 25% concessional share is the analytically important finding: the World Bank PROGEF 2 (USD 318m IDA credit, already approved) is the primary capital instrument for S6, correctly classified as concessional given its earmarked character. Grants at 39% reflect the disproportionate availability of GFDRR, GCF adaptation windows, and bilateral disaster risk financing to LMIC flood programmes. Commercial finance is negligible throughout Scenario 2A, consistent with the absence of any formalised levy mechanism.

Scenario 2B conditions emerge as the CNGRI reform is completed in 2028 and a benefit assessment levy on Dakar's industrial and commercial zones is formalised, shifting the composition toward 32% public, 17% grants, 48% concessional, and 2% commercial. The deepening concessional share in Scenario 2B reflects the more structured repayment environment that formalised urban beneficiary arrangements enable, attracting larger earmarked MDB facilities alongside a reduced but targeted grants component. In Senegal's compact context, reaching Scenario 2B conditions depends on two sequenced milestones: CNGI to CNGRI conversion providing the legal framework for coordinated multi-agency investment, and the operationalisation of a levy mechanism on identifiable urban beneficiaries. Until those conditions are met, S6 remains anchored in Scenario 2A, dependent on the predictability of the State's 14bn FCFA annual commitment and continued access to World Bank IDA and bilateral climate grant windows across the compact horizon.

Programme: Governance and resource management transformation across five levers: IWRM strengthening targeting GIRE index improvement from 55% to 70% (SDG 6.5.1); expansion of the real-time telemetered piezometer network from 50 to 500 stations; Water Code revision targeted for 2027; ARSE regulatory authority operationalisation targeted for 2027; and aquifer protection across 4 PISEA hotspots scaling the AFD and AdaptAction Pout recharge model. Blue Fund Sénégal targets USD 150 million capitalisation by 2030 across three windows: Private (DFI concessional lending, MIGA and IFC guarantees, Blue Bonds backed by SEN'EAU and ONAS cashflows targeted for 2029), Social (ESG contributions, State budget, institutional investors), and Climate Resilience (GCF, Adaptation Fund, GEF). Scale: investment figure not explicitly stated in the compact for S7 in isolation; derived from compact sector arithmetic and Blue Fund capitalisation target.

Dimension 1: Service Purpose	WATER GOVERNANCE & RESOURCE MANAGEMENT (PRIMARY) WATER ECOSYSTEM CONSERVATION AND RESTORATION (SECONDARY)
Dimension 2: Service Geography	SYSTEM WIDE (SW) Benefits are dispersed across all water services and users nationally. Aquifer protection concentrated around four identified hotspot zones. Blue Fund serves as a national financing aggregator across all geographies and investment types within the compact.
Dimension 3: Revenue Characteristics	No direct tariff revenue exists for either the IWRM and governance core or the aquifer protection sub-component; both are dependent on public budget and grant financing in the current period. The Blue Fund Private Window, backed by SEN'EAU water fee revenues estimated at 40 to 50 billion FCFA per year and future ONAS PPP cashflows, is the enabling mechanism that can unlock concessional DFI lending and credit enhancements for both components, but only once tariff reform and ONAS PPP operationalisation are confirmed. For aquifer protection specifically, a downstream PES arrangement with SONES as institutional offtaker creates indirect payment potential through aquifer contracts as the Pout recharge model is scaled to the four PISEA hotspot zones.
Dimension 4: Institutional Context	Reforming public institutions with strong political mandate from the Conseil interministériel of August 2024. Legacy institutional failures include a Conseil Supérieur de l'Eau created in 1997 and never operationalised and a Water Code in approval since 2014. The compact identifies three new factors making reform realistic: Prime Minister-level mandate with explicit deadlines, functional urgency created by the multi-operator water system requiring regulation, and cross-conditionality between PISEA disbursements and reform milestones.
Financial Viability Band	WATER GOVERNANCE COMPONENT BAND 1 WATER CONSERVATION COMPONENT BAND 2
Archetype Scenario Alignment	WATER GOVERNANCE COMPONENT ARCHETYPE 6 SCENARIO A SCENARIO B WATER CONSERVATION COMPONENT ARCHETYPE 1 SCENARIO B Archetype 6 Scenario A for the governance and IWRM core: system-wide, no cost recovery, public mandate. Archetype 6 Scenario B for the Blue Fund: performance-linked disbursements tied to verified institutional improvements. Archetype 1 Scenario B for aquifer protection: basin-adjacent with emerging downstream payer arrangements through aquifer contracts.

Financing Composition



Financing Context

Water governance reform and aquifer protection share a common financing baseline: both are currently funded entirely through public budget and grants, with no direct revenue stream and no repayable capital in place. The IWRM and governance core (Scenario 6A) operates on a 36% public, 64% grants composition, reflecting the structural dependence of LMIC governance reform on bilateral TA grants and multilateral capacity building windows. The aquifer protection component (Scenario 1B) carries a slightly different profile, grants at 45%, concessional at 13%, and commercial at 13%, where the concessional and commercial contributions reflect earmarked MDB credits and emerging PES payments from aquifer contract holders as the Pout model is scaled. Neither component carries commercial finance in its baseline state.

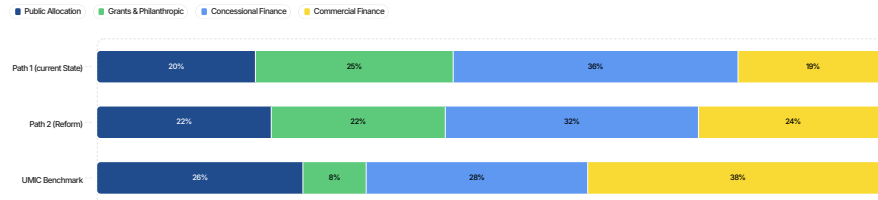
The Blue Fund is the mechanism that changes this. It does not constitute a separate investment component, it is the national financing vehicle that aggregates and channels capital into both IWRM and aquifer protection, unlocking higher financing bands for each as its windows are sequentially activated. The Climate Resilience window channels GCF, Adaptation Fund, and GEF resources directly into aquifer protection and IWRM grant financing. The Private Window, once activated, introduces performance-linked concessional DFI lending under Scenario 6B (28% public, 43% grants, 29% concessional) for institutional reform milestones. Activation depends entirely on upstream reform delivery: tariff reform must confirm SEN'EAU revenues and the ONAS PPP must generate operational cashflows before the Private Window can be credibly structured. S7 is therefore the compact's enabling architecture, the component on which every other financing structure ultimately depends.

Compact Level Analysis

Analytical Framework Output

The figures on this page are the output of applying the Water Finance Framework's viability band logic to Senegal's Water Forward Compact. They represent an analytical assessment of appropriate capital composition by investment type, not a financing plan, not a transaction recommendation, and not a reflection of Senegal's actual or intended financing arrangements. The only figure drawn directly from the compact is the USD 4.5 billion total investment requirement. All capital type disaggregations are framework-derived estimates.

Framework-Derived Capital Composition



Path 1 reflects current institutional conditions, before the compact's priority reform milestones are delivered. Path 2 (reform track) reflects the financing structure unlocked once those milestones are confirmed by 2029. The UMIC equivalent shows what the same investment types carry in upper-middle-income country contexts, providing a long-run structural benchmark.

What Drives the Shift

Reform delivery mobilises an additional USD 225 million in commercial finance while reducing the grant requirement by approximately USD 135 million. This is not a general improvement in Senegal's investment climate. It is the direct financial consequence of four named milestones, each of which unlocks a higher viability scenario for one specific investment component.

The SONES third-generation reform (2027)

Enables the GTE urban supply component to shift from Scenario 3B toward Scenario 3C, where SONES's contractually bankable offtake replaces the grant-heavy concessional structure that characterises reform-pathway utilities with full commercial project finance.

The Water Code revision incorporating a national REUT framework (2027)

Enables the Tivaouane Peulh treated effluent reuse component to shift from Scenario 5B toward Scenario 5C, where the legal sale of treated effluent to smallholder irrigators creates a contracted revenue stream that commercial finance can underwrite.

The CNGRI reform and urban benefit levy formalisation (2028)

Enables the flood resilience programme to shift from Scenario 2A toward Scenario 2B, deepening the concessional share as more structured MDB engagement becomes appropriate alongside identifiable urban beneficiaries.

The Blue Fund Private Window activation (2029)

Enables the IWRM governance component to shift from Scenario 6A toward Scenario 6B, introducing performance-linked concessional DFI lending against verified institutional milestones in place of unconditional grants.

The UMIC benchmark places the reform track in long-run perspective. Reform delivery takes commercial finance from 19% to 24%. The UMIC benchmark sits at 38%, with grants at just 8% against the reform track's 22%. The remaining 14-point commercial gap and 14-point grants gap do not close through compact-period reforms alone. They reflect a 10 to 15 year institutional trajectory in which utility governance, tariff structures, and domestic capital market depth develop sufficiently to attract commercial investors at scale without grant subsidy. The compact's reforms are the first steps on that trajectory, not its destination.

Key Insights

Concessional Finance - The Structural Constant

Across all three tracks, grants fall sharply and commercial finance rises as institutional conditions improve. Concessional finance barely moves. This reflects a structural reality: the investment types in this compact require patient, long-tenor capital that commercial markets do not supply at any stage of the financing spectrum. What changes is not whether concessional finance is present but what role it plays, filling the financing gap in Path 1, providing performance-linked capital that reform can service in Path 2, and anchoring co-investment alongside commercial partners at the UMIC benchmark. The DFI role is not a transitional feature that reform displaces. It is a permanent structural fixture whose character evolves as the financing conditions around it mature.

Reform as the Highest-Return Financing Intervention

The shift from Path 1 to Path 2 represents approximately USD 360 million in financing impact, USD 225 million of additional commercial capital mobilised and USD 135 million of grant financing released, generated by four named institutional milestones rather than by any new financial instrument or external capital source. No single facility in the compact approaches that impact. The compact's reform agenda is not a governance programme running alongside the financing programme. It is the financing programme, and its milestones belong in the capital stack as the enabling conditions on which everything else depends.

Glossary

Aggregation Mechanism A structured arrangement that consolidates multiple small or fragmented payment streams, such as farmer fees, household contributions, or small operator revenues, into a single more predictable cashflow capable of supporting repayable finance or results-based disbursements.

Affermage PPP A public-private partnership model in which a private operator manages and operates publicly owned utility assets under a lease contract, collecting user revenues and remitting a fee to the asset owner, while the public entity retains ownership and capital investment responsibility.

Aquifer Recharge The process of replenishing groundwater reserves through natural infiltration or managed injection, underpinning long-term water security for downstream users and ecosystems.

Benefit Assessment Levy Mechanism A charge applied to identifiable economic beneficiaries, such as industrial zones, commercial areas, or agricultural producers, to partially recover the costs of public resilience infrastructure from which they derive a measurable economic benefit.

Bottom-Up Financing Household and small-scale financing mechanisms, including microfinance, savings groups, and pay-as-you-go models, that capture willingness to pay outside formal utility billing structures.

Capacity Building Facility A grant-funded programme providing technical and institutional support to governments, regulators, and utilities to strengthen sector governance, planning, and financial management. Used primarily in Archetype 6 Scenario A.

Catchment The land area that drains into a common river, lake, or other water body. The primary geographic unit for watershed management and ecosystem conservation investments.

Commercial Debt and Project Finance Debt financing provided on market terms, typically through syndicated bank loans or project finance structures, secured against project cashflows and assets. Appropriate where revenues are predictable, enforceable, and sufficient to cover full lifecycle costs including debt service.

Community-Based Organisation (CBO) A locally formed group established by community members to manage shared water or sanitation services, collect user fees, and maintain service accountability in informal and rural settings where formal utility structures are absent.

Community-Led Total Sanitation (CLTS) A public health approach that mobilises communities to eliminate open defecation entirely through collective behaviour change and peer accountability, with the goal of achieving and sustaining open defecation free status.

Community Water and Sanitation Fund A pooled financing mechanism at community level through which user fees and contributions are accumulated to fund operation, maintenance, and small-scale capital works for shared water and sanitation facilities.

Concessional Debt (DFI) Repayable financing provided on below-market terms by a development finance institution, typically featuring lower interest rates, longer tenors, and grace periods. Appropriate where a credible revenue base exists but is insufficient to service financing on fully commercial terms.

Construction and Performance Risk Instruments Guarantees, bonds, and warranties covering the risk of construction delay, cost overrun, or post-completion underperformance. Used to protect lenders and investors in infrastructure project finance structures.

Contingent Credit Line (CAT-DDO) A pre-committed credit facility that can be drawn down rapidly following a defined trigger event such as a climate shock or declared disaster. Provides immediate liquidity to sustain service continuity without depleting routine budgets. The World Bank's Catastrophe Deferred Drawdown Option (CAT-DDO) is the primary example.

Credit Guarantee A guarantee instrument that covers a defined portion of a lender's credit exposure, reducing the risk premium required to extend financing where revenue streams are credible but not yet fully established. Distinct from a Partial Credit Guarantee in that it does not necessarily cover a defined percentage of principal.

Debt Service Reserve Account (DSRA) A ring-fenced liquidity reserve held to cover scheduled debt service obligations during periods of revenue shortfall or payment delay, reducing default risk in structured project finance transactions.

Degree of Urbanisation (DEGURBA) An internationally recognised classification system developed by the European Commission and UN that places settlements along an urban-rural continuum based on population density and contiguity. Used in this framework to characterise service geography across archetypes.

Delegated Service Provider (DSP) A private operator contracted by a government authority to deliver water or sanitation services within a defined perimeter, collecting user fees and maintaining infrastructure under a delegation agreement while the authority retains asset ownership and oversight.

Development Finance Institution (DFI) A publicly backed financial institution that provides concessional lending, guarantees, and risk-sharing instruments to support investment in developing and emerging markets. Examples include the International Finance Corporation (IFC), African Development Bank (AfDB), Asian Development Bank (ADB), and European Bank for Reconstruction and Development (EBRD).

Development Policy Lending (DPL) A programmatic lending instrument used by multilateral development banks to support government policy and institutional reform programmes, with disbursements linked to the achievement of agreed policy actions rather than specific project outputs.

Disaster Risk Pooling A mechanism through which multiple governments or entities pool resources to share the financial consequences of climate and disaster events, reducing individual exposure and improving access to rapid post-disaster liquidity.

Environmental Flows The quantity, timing, and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods that depend on them. A key outcome of water ecosystem conservation and restoration investments.

Faecal Sludge Management (FSM) The collection, transport, treatment, and safe disposal or reuse of faecal sludge from on-site sanitation systems including pit latrines and septic tanks. A critical but frequently underinvested service in informal urban settlements and rural areas.

First-Loss Tranche / Junior Equity Capital that sits below senior debt in the repayment waterfall and absorbs losses first, reducing risk for other investors. Typically provided by development finance institutions or impact investors in blended structures to crowd in senior concessional or commercial finance.

FSM Payment Mechanisms Structured payment arrangements for faecal sludge management services, including scheduled emptying contracts, community collection fees, and municipal service charges, used to generate revenue streams for FSM operators and treatment facilities.

FX Hedging Facility A financial instrument or dedicated programme that reduces exposure to currency volatility and convertibility risk, protecting hard-currency repayment obligations where project revenues are denominated in local currency. Particularly relevant in emerging market project finance.

Household Water and Sanitation Loans (Microfinance) Small, affordable loans extended to households through microfinance institutions or partner lenders to finance water connections, latrines, household plumbing, and on-site sanitation improvements. Captures household willingness to pay where formal utility connections are unavailable.

IBRD (International Bank for Reconstruction and Development) The World Bank's lending arm for middle-income and creditworthy countries, providing loans at market-linked rates with tenors of 15 to 30 years. Countries that have graduated from IDA eligibility borrow through IBRD on terms below commercial markets but significantly less concessional than IDA credits.

IDA (International Development Association) The World Bank Group's concessional financing facility for lower-income countries, providing grants and credits at near-zero interest rates with tenors of 25 to 40 years. IDA eligibility is a primary driver of capital stack composition, enabling earmarked sovereign borrowing on near-grant terms for public water investment.

Informal Settlement An unplanned urban or peri-urban community characterised by lack of formal land tenure, inadequate infrastructure, and exclusion from standard utility service delivery and cost recovery models. Recognised under the UN-Habitat SDG 11.1.1 framework.

Insurance-Linked Securities Capital market instruments, including catastrophe bonds, that transfer defined insurance risks to investors in exchange for a return premium. Relevant in Archetype 2 where urban resilience investments generate identifiable risk reduction benefits for an economic beneficiary base.

Integrated Water Resources Management (IWRM) A governance approach coordinating the development and management of water, land, and related resources across sectors and administrative boundaries to maximise social and economic welfare without compromising long-term ecosystem sustainability.

Local Administrative Unit (LAU) A standardised geographic unit used within the DEGURBA classification system to define cities, towns, suburbs, and rural areas for planning and statistical purposes.

LMIC (Lower-Middle Income Country) World Bank income classification for countries with a GNI per capita between approximately \$1,085 and \$4,466. LMIC governments typically retain access to bilateral ODA grants, IDA or blend concessional facilities, and climate finance windows, making grants and earmarked MDB credits the dominant capital sources for water investment.

Nature-Based Solutions (NbS) Approaches that protect, restore, or sustainably manage natural ecosystems to address societal challenges including water security, climate adaptation, and biodiversity loss. Relevant to watershed restoration, wetland conservation, and green-grey infrastructure investments.

Non-Revenue Water (NRW) Water produced and distributed by a utility that does not generate revenue, due to physical losses from leakage, apparent losses from theft or metering errors, or unbilled authorised consumption. A key indicator of operational efficiency and financial performance.

NRW Reduction Performance Contract A contract structure under which a service provider or operator is paid based on verified reductions in non-revenue water, linking repayment to operational performance rather than asset delivery. Strengthens utility creditworthiness and financial performance over time.

Offtake Agreement A contractual arrangement under which a buyer commits to purchasing a defined quantity of water, treated effluent, or another product from a service provider at an agreed price over a specified period. Establishes the revenue certainty required for structured project finance.

Offtaker / Counterparty Insurance Insurance or structured protection against non-payment by the downstream utility, municipality, or industrial buyer under a water supply or service contract. Used to protect project revenues in PPP and contracted service structures.

Open Defecation Free (ODF) A designation applied to a community that has completely eliminated the practice of open defecation across all households, achieved through behaviour change programmes and basic sanitation provision.

Output-Based Aid (OBA) A results-based mechanism in which subsidies or grant disbursements are triggered by the verified delivery of predefined service outputs, such as household connections, functioning latrines, or service coverage milestones, rather than inputs or activities.

Parametric Insurance Insurance that pays out based on a predefined objective trigger, such as rainfall levels, river flow volumes, or wind speeds, rather than assessed losses. Provides rapid liquidity following climate shock events, protecting public budget allocations from fiscal disruption.

Partial Credit Guarantee (PCG) A guarantee instrument that covers a specified percentage of a lender's principal exposure, reducing credit risk and enabling longer tenors and lower pricing. Widely used to crowd in concessional and commercial finance for investments with credible but not yet fully proven revenue streams.

Pay-As-You-Go (PAYG) A service model in which users pay incrementally for water or sanitation access based on consumption or usage, without requiring a lump-sum connection fee or formal contract. Enables revenue capture in informal and low-income contexts.

Payment for Ecosystem Services (PES) An arrangement in which downstream beneficiaries, such as utilities, municipalities, or agribusinesses, pay upstream land managers or communities to maintain or restore ecosystem functions that generate water security, water quality, or flood regulation benefits.

Performance-Linked Concessional Debt — Concessional financing where the terms, disbursement, or pricing are linked to the verified achievement of defined operational or service performance outcomes by the borrowing institution.

Performance-Linked Subsidy — A targeted subsidy disbursed against verified performance improvements, such as billing efficiency gains, service coverage expansion, or reduction in NRW, rather than against inputs or infrastructure delivery. Used to incentivise utility reform and efficiency within a public-led capital stack.

Political Risk Insurance (PRI) — Insurance covering losses arising from government actions or political events including expropriation, breach of contract, currency transfer restrictions, and political violence. Enables private debt and equity investment in higher-risk markets and supports long-tenor financing in PPP structures. Provided by institutions including MIGA and OPIC.

Results-Based Financing (RBF) A financing or funding mechanism in which disbursements are contingent on the verified achievement of predefined results or outcomes. Strengthens accountability, creates performance incentives, and enables financing where traditional project lending or grant structures are less effective.

REUT (Réutilisation des Eaux Usées Traitées) The treatment of wastewater or collected effluent to a standard suitable for beneficial reuse, typically for agricultural irrigation or industrial purposes. REUT investments create a secondary revenue stream for sanitation utilities and are classified at the Archetype 4 and Archetype 5 boundary.

Sanitation Marketing A demand-generation approach that applies commercial marketing principles to promote sanitation adoption and behaviour change, often combined with supply-side financing to increase household uptake of improved sanitation solutions.

SDG 6 Sustainable Development Goal 6: Ensure availability and sustainable management of water and sanitation for all. The primary global framework for water and sanitation investment, covering safe water access, sanitation, water quality, water use efficiency, integrated water resources management, and ecosystem protection, to be achieved by 2030.

Sector Budget Support A direct transfer of financing to a government's budget, typically from a multilateral or bilateral donor, to support sector-wide expenditure programmes. Disbursements may be linked to agreed policy milestones or institutional reforms.

Sector Reform Grant (Performance-Conditioned) A grant disbursed against verified progress on defined institutional or policy reform milestones within the water sector, used to incentivise governance improvements and support the transition to more sustainable service delivery models.

Sewerage Connection Financing Targeted financing, including subsidised loans or connection fee deferrals, to support household or building-level connections to existing sewerage networks, reducing the upfront cost barrier that prevents uptake even where network infrastructure exists.

Sovereign Fiscal Capacity The ability of a national government to borrow, generate revenue, and sustain expenditure commitments over time. Relevant to the cost of capital assessment for publicly funded water investments, where financing costs are displaced to the government balance sheet rather than the project level.

Technical Assistance (TA) Non-financial support, including advisory services, capacity building, training, and knowledge transfer, provided to governments, utilities, or project developers to strengthen institutional capacity and improve investment readiness.

Technical Assistance Facility A structured programme providing advisory, analytical, and capacity-building support to governments, utilities, or project developers, typically funded by donors or development finance institutions as a complement to investment operations.

UMIC (Upper-Middle Income Country) World Bank income classification for countries with a GNI per capita between approximately \$4,466 and \$12,535. UMIC governments have largely graduated from bilateral grant access and fund water investment primarily through national budget and IBRD or bilateral DFI borrowing, with greater commercial finance penetration compared to LMIC contexts.

Value-Chain Aggregation Finance Financing structured around aggregated revenues and institutional arrangements within an agricultural or commercial value chain, enabling upstream water service providers to access capital based on the demonstrated payment capacity of downstream buyers, processors, or cooperatives.

Viability Gap Funding (VGF) A targeted government subsidy provided to bridge the gap between the financial return available from a project and the return threshold required to attract private investment, used selectively where service fundamentals are otherwise credible and the investment gap is bounded and quantifiable.

Water Purchase Agreement (WPA) A long-term contract under which a creditworthy buyer commits to purchasing a defined volume of water or treated effluent from an independent producer at an agreed price. The WPA establishes the revenue certainty required to underpin commercial project finance in contracted agricultural and water service investments.

Water Stewardship Bond An emerging debt instrument through which downstream corporate or municipal water users raise capital to finance upstream ecosystem stewardship, with repayment structured around long-term water security obligations or corporate sustainability commitments.

Watershed The land area draining into a common river, lake, or other water body. Watershed protection and restoration investments maintain water quality and quantity for downstream users and are classified under Archetype 1 of this framework.



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