Water4All
Water security for the planet

European Partnership

OUTLOOK OF EXISTING FINANCIAL / DEVELOPMENT PROGRAMMES

Deliverable D4.14 – November 2025

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List of acronyms

Acronym	Full name
Cat bond	Catastrophe Bonds
CER	Critical Entities Resilience
DIB	Development Impact Bond
EBRD	European Bank for Reconstruction and Development
EFSI	European Fund for Strategic Investments
ESG	Environmental, Social, and Governance factors
EU	European Union
EUR	Euros (€)
ICMA	International Capital Market Association
IDA	International Development Association - World Bank
MFI	Microfinance institution
MS	Member State
NBS	Nature Based Solutions
OBC	Outcome-Based Contract
OECD	Organisation for Economic Co-operation and Development
PCP	Pre-Commercial Procurement
PES	Payment for Ecosystem Services
PPI	Public Procurement of Innovative solutions
PPP	Polluter Pays Principle
PPPs	Public-Private Partnerships
R&D	Research and Development
R&I	Research and Innovation
SFDR	Sustainable Finance Disclosure Regulation
SIB	Social Impact Bond
SME	Small and medium-sized enterprise
SWEEP	California State Water Efficiency and Enhancement Program
TRA	Technology Readiness Assessment
TRL	Technology Readiness Level
UNDP	United Nations Development Programme
UN SDGs	United Nations Sustainable Development Goals
VSLA	Village Savings and Loan Associations
WASH	Water, sanitation and hygiene
Water4All	European Partnership on Water Security for the Planet
WFD	Water Framework Directive
WOLLs	Water Oriented Living Labs

Glossary[1]

Action Plan: the European Action Plans define the agenda to accomplish a determined objective. They contain all the actions with this orientation.

Bank lending: a form of financing whereby a company borrows funds from a bank and commits to repay them in full over a defined period at a specified interest rate. Bank lending can be presented in different forms and products. however, for the purpose of this report it is being classified into two key areas of financing: financing investment costs and financing working capital.

Blue Economy: Blue Economy refers to any economic activity relating to oceans and seas. It covers a broad range of established and emerging sectors.

Bootstrapping: a process that involves establishing and building a business with personal savings, earnings from initial sales, and borrowed or invested money from family and friends. This is a way to build a small business without giving up equity or taking out substantial bank loans.

Business angel: a private individual, often with a high net worth, and usually with business experience, who directly invests part of their assets in new and growing private businesses. Business angels can invest individually or as part of a syndicate where one angel typically takes the lead role.

Crowdfunding: an emerging alternative source of financing. It refers to open calls to the public, generally via the Internet, to finance a project through either a donation, or a monetary contribution in exchange for a reward, product pre-ordering, lending, or investment. Any type of project can launch a crowdfunding campaign: Small and Medium-sized Enterprises (SMEs), artists, innovative start-ups, and social entrepreneurs may all benefit from different forms of crowdfunding. Crowdfunding – this alternative form of fundraising that is collective, participatory, and interactive – is becoming increasingly important. It has the potential to bridge the financing gap many start-ups face and to stimulate entrepreneurship.

Delegated act: a legal instrument that is subordinate to a European Union (EU) regulation or directive. Delegated Acts are used to specify and implement the technical details of legislation, providing more specific rules and guidelines on how a particular law should be applied. These acts are typically used to fill in the gaps or provide further clarification on the provisions of the main legislation. Delegated Acts are a way for the European Commission, which is responsible for proposing and implementing EU legislation, to have the authority to adopt rules or measures that are needed to ensure the effective application of a given regulation or directive. However, these acts are subject to control and scrutiny by the European Parliament and the Council of the European Union, which can object to a Delegated Act within a specified period if they believe it exceeds the Commission's implementing powers or is not in line with the EU's.

EU Green Bond Standard: this initiative aims to establish a unified standard for green bonds within the EU. Green bonds are to be used to finance environmentally friendly projects, and a common EU standard under development is expected to increase transparency and trust among investors.

Grants: a type of financial assistance typically given by a government or an organisation to a wide range of beneficiaries such as private individuals, companies, public institutions, or non-profit organisations. Grants are typically awarded in support of a specific policy or purpose that serves some larger good. For example, education, research, innovation, culture, social welfare, environment, economic development,

[1] This glossary will be updated and completed in further deliverables. It provides standard definitions to support dialogue between innovators and investors.

or humanitarian aid. Grants assistance is channelled for projects that are characterised by high-risk and/or long-term benefits. Unlike loans, grants do not have to be repaid. Increasingly, grant funding is combined with a variety of other public and private finance (so-called 'blended finance').

Greenwashing refers to the practice of making misleading or false claims about the environmental benefits of a product, service, or company in order to present it as more environmentally friendly or sustainable than it actually is. This deceptive marketing tactic is used to capitalize on the growing consumer demand for eco-friendly and sustainable products and services. In essence, it involves painting a false "green" image to attract environmentally conscious consumers and boost sales.

Growth capital: a form of venture capital used to consolidate the company's financial structure for the next stage of its growth, including acquisitions, internationalisation, or the development of new product ranges, for example. Growth capital funds will only invest in companies with a recurring cash flow.

Net zero: net zero emissions describe the state where emissions of carbon dioxide due to human activities and removals of these gases are in balance over a given period.

Private equity: refers to capital that is directly invested in private companies. Private equity consists of taking minority or majority stakes in private companies (which are not listed on stock exchanges). The two most common types of private equity investment are Growth capital and venture capital.

Startup: an independent organization, which is younger than five years and is aimed at creating, improving, and expanding a scalable, innovative, technology-enabled product with high and rapid growth.

Scaleup: a company seeing accelerated growth after demonstrating a product or service-market fit, which is looking to grow in market access, revenues, and the number of employees.

Spinoff: not a company or an independent organization but a part of an institutional organization, e.g. university, school of economics, or an organization.

Sustainability linked loan: a type of loans that are available exclusively to those entities that can accomplish the environmental objectives of the investor.

Sustainable Finance Disclosure Regulation: the Sustainable Finance Disclosure Regulation (SFDR) is an EU regulation designed to enhance transparency and disclosure of sustainability-related information within the financial sector. It requires financial market participants, including investment managers, to disclose the Environmental, Social, and Governance (ESG) factors that may impact their investment decision-making processes. The SFDR also establishes specific disclosure obligations for financial products, such as funds and investment portfolios, to inform investors about the sustainability characteristics of those products. By providing this information, the SFDR aims to ensure that investors can make informed decisions and allocate capital to investments that align with their sustainability preferences. It is part of the EU's broader efforts to promote responsible and sustainable financial practices and increase the flow of investments into sustainable activities and projects.

Taxonomy Regulation: the Taxonomy Regulation is a regulatory framework within the EU that aims to set up a unified and standardized classification system for economic activities that can be considered environmentally sustainable. It provides clear criteria and definitions for what constitutes a "green" or environmentally friendly activity. The Taxonomy Regulation serves as a foundation for sustainable finance by helping investors, companies, and financial institutions identify and promote investments that align with the EU's environmental and sustainability objectives. It contributes to the EU's goal of

facilitating sustainable economic growth and transitioning to a more environmentally responsible financial sector by providing clarity on which activities are considered sustainable.

Technology Readiness Level (TRL): a method for estimating the maturity of technologies during the acquisition phase of a program. TRLs enable consistent and uniform discussions of technical maturity across different types of technology. TRL is determined during a Technology Readiness Assessment (TRA) that examines program concepts, technology requirements and demonstrated technology capabilities. TRLs are based on a scale from 1 to 9 with 9 being the most mature technology.

Venture capital: Venture capital can take several forms, for example from seed funding to scale from a prototype to a product or service, to early-stage funding to help entrepreneurs grow a company and expand working capital, to late-stage to contribute to market expansion. This type of investment is mainly directed at spinoffs and startups seeking financing, primarily for new, innovative, and disruptive technologies and services.

Abstract

This deliverable is the **seventh release** of a biannual series of regular **updates on the Outlook of the Financial Programmes for Water Investments**. The outlook is part of the demonstration activities included in **Water4All's Pillar D** aimed at connecting innovators to development/investment programmes to support an enabling environment for a wider and faster implementation of water innovations.

The **first deliverable**[2] provided an **overview of perspectives of investments in water development and water innovation** and, after making the balance of the size of the effort required in the current decade, presented an **analysis of the opportunities and challenges these financial perspectives represent for the progressive uptake of innovative solutions**.

The **second deliverable**[3] took stock of the **challenges** mentioned in the previous one and continued with **mapping the main financial opportunities available for water innovations from idea to market uptake and scaleup**. This report explored the connection between financial tools and strategies with water innovation, highlighting key financial methods and opportunities available for innovators to progress through the innovation process, starting from the seed stage and advancing to market uptake and scale-up. It also provided a map of funding opportunities for water-related investment projects, within the framework of the European Union's (EU) recovery instrument Next Generation EU (e.g. the Recovery and Resilience Facility, the Programme InvestEU -including the new Strategic Investment Facility, the European Fund for Strategic Investments (EFSI)- and Structural Funds -and Cohesion policy programmes).

The **third deliverable**[4] assessed the recent developments in EU **Sustainable Water Financing**, offering a comprehensive framework and strategy to **align investor priorities with** the **EU Green Deal objectives**. The key aims of the **EU Sustainable Finance Agenda** are to incentivize the mobilization of private financial resources, in conjunction with public funds, to support the EU's sustainability objectives, particularly in the sustainable use and protection of water and marine resources. The report provided an overview of the **EU sustainable financing agenda** and its primary initiatives, including the **EU taxonomy for sustainable activities**, highlighting its relevance for mobilizing financial resources in the water sector, reducing financing for environmentally and socially detrimental activities, and improving transparency and disclosure of sustainability-related information for informed investment decisions.

The **fourth deliverable**[5] offered a general map and a comprehensive overview of the **financial instruments accessible for innovation within the water sector,** delineated across three key dimensions: their **function in the innovation process, geographic applicability**, and **thematic scope**. The referred map will be instrumental for forthcoming releases of the Outlook of Financial/Development Programs for categorizing existing financial opportunities for water innovation in the three aforementioned dimensions

The **fifth release**[6] was focused on the **recent progresses made towards the compliance of the goal of the European Union Mission: Restore Our Ocean and Waters**. In the last few years, a series of actions have taken place with relation to this mission, defining the European approach towards the fulfilment of the water objectives. This information was therefore of relevance for innovators in the sector, as these European actions define the framework in which their activity must be oriented.

[2] OUTLOOK OF EXISTING FINANCIAL/ DEVELOPMENT PROGRAMMES. Deliverable D4.1 - November 2022
[3] OUTLOOK OF EXISTING FINANCIAL/ DEVELOPMENT PROGRAMMES. Deliverable D4.2 - May 2023
[4] OUTLOOK OF EXISTING FINANCIAL/ DEVELOPMENT PROGRAMMES. Deliverable D4.3 - November 2023
[5] OUTLOOK OF EXISTING FINANCIAL/ DEVELOPMENT PROGRAMMES. Deliverable D4.8 - May 2024
[6] OUTLOOK OF EXISTING FINANCIAL / DEVELOPMENT PROGRAMMES. Deliverable D4.12 - November 2024

The **sixth release**[7] detailed the **criteria related to the successful procurement of resources from different types of financial instruments** with relevance to the water sector and complemented the second and fourth edition of the outlooks by deepening in what is needed to obtain financing depending on the financial instruments and also in defining the **key success elements** when applying to them. This is of particular relevance to investors, as it enables them to **make informed decisions** about the most suitable instrument for accessing resources (especially taking into account, as highlighted by the fifth release, that one of the primary objectives of recent **European water initiatives is to encourage the mobilisation of private capital towards achieving European environmental objectives**).

This seventh release contains a structured portfolio of financial and economic instruments to support water security, resilience, and sustainable management, grouped into categories such as market-based trading, pricing tools, collaborative co-financing, results-based mechanisms, risk-management tools, and debt/equity solutions. Each entry includes a clear definition, main advantages and disadvantages, and detailed guidance on when and how it is most efficient to use. The collection serves as a practical decision-support tool for comparing and selecting financing approaches, particularly valuable in the Water Oriented Living Labs (WOLLs) context, where dependence on subsidies is high and there is a pressing need to diversify funding. By showcasing alternative pathways — from blended finance to performance-based contracts and innovative risk-transfer tools — it provides WOLLs and stakeholders with practical options to attract private capital, improve financial sustainability, and test innovative funding models that can be scaled in the coming years.

About Water4All

Water4All is a Research and Innovation Partnership set up in Horizon Europe. It aims at enabling water security for all in the long term by boosting systemic transformations and changes across the water research and innovation pipeline, fostering the matchmaking between problem owners and solution providers. In addition to the launch of calls for research and innovation (R&I) proposals, **Water4All** offers a portfolio of additional activities including the alignment of water programmes, demonstration projects, international cooperation, the wide transfer and dissemination of activities and results, networking, and capacity building.

The Partnership will provide relevant outcomes for a better understanding of water processes in several scientific fields, and it will support European and international policy-oriented initiatives, notably the European Green Deal and the United Nations Sustainable Development Goals (UN SDGs). At the date of publication of this deliverable, the consortium counts 90 partners stemming from national research funding agencies, public authorities including local authorities, research performing organisations, water associations, and networks at European, national, or regional levels. Partners have decided to join forces to address the big challenge of water for all. The Partnership is structured around five operational pillars looking at strategic issues (Pillar A), development of knowledge through calls for proposals (Pillar B), science – policy – end-users' interface (Pillar C), demonstration (Pillar D), and international cooperation (Pillar E).

[7] OUTLOOK OF EXISTING FINANCIAL / DEVELOPMENT PROGRAMMES. Deliverable D4.14 - May 2025

OUTLOOK OF EXISTING FINANCIAL / DEVELOPMENT PROGRAMMES

Presentation

The six previous releases of the Outlook of Existing Financial/Development Programmes evaluated the financial challenges faced by the water sector on mobilizing the investments required to reach the policy objectives (**Deliverable D4.1**)[8], mapped the financial instruments and opportunities available to support the innovation process from the creation of the idea to the full deployment in the market (**Deliverable D4.2**)[9], studied the efforts to align investors priorities with those dealing with the sustainable use and protection of water resources through the EU Sustainable Water Financing initiative (**Deliverable D4.3**)[10], proposed a structure of map of financial instruments based on three dimensions as are the stage of the innovation development process, the thematic of the innovation and the geographic scope of the instrument (**Deliverable D4.8**)[11], showed the recent European progresses towards the compliance of the goal of the European Union Mission: Restore Our Ocean and Waters (**Deliverable D4.12**)[12] and illustrated the criteria related to the successful selection and application of financial instruments (**Deliverable D4.13**)[13].

This deliverable is structured into three main sections. The first, Water Resilience and Financial Sustainability, sets the scene by outlining the challenge of achieving water resilience in the face of climate change, rising demand, and environmental pressures. It explains why water resilience is essential, why current financial models reliant on public subsidies are insufficient, and why innovative financing approaches are needed in the water sector.

The second and central section, Financing and Economic Instruments for Water Security and Resilience, presents a portfolio of tools grouped into six categories: market-based trading, pricing tools, collaborative co-financing, results-based mechanisms, risk-management tools, and debt/equity solutions. Each instrument entry provides a definition, pros and cons, and guidance on when and how it is most efficient to use, offering a practical framework for selecting and combining financing strategies. Special emphasis is placed on their potential application in Water Oriented Living Labs (WOLLs) to diversify funding sources and reduce grant dependency. Annex 1 provides a consolidated summary table of all instruments described, facilitating comparison and reference

The final section, Final Remarks and the Way Ahead, highlights the usefulness of the compiled knowledge as a reference for strategy design and financial decisions. It outlines next steps, focusing on evaluating the potential of selected instruments in WOLLs over the coming years, generating evidence, and adapting models for wider adoption to strengthen water resilience and financial sustainability.

[8] OUTLOOK OF EXISTING FINANCIAL/ DEVELOPMENT PROGRAMMES. Deliverable D4.1 - November 2022
[9] OUTLOOK OF EXISTING FINANCIAL/ DEVELOPMENT PROGRAMMES. Deliverable D4.2 - May 2023
[10] OUTLOOK OF EXISTING FINANCIAL/ DEVELOPMENT PROGRAMMES. Deliverable D4.3 - November 2023
[11] OUTLOOK OF EXISTING FINANCIAL/ DEVELOPMENT PROGRAMMES. Deliverable D4.8 - May 2024
[12] OUTLOOK OF EXISTING FINANCIAL / DEVELOPMENT PROGRAMMES. Deliverable D4.12 - November 2024
[13] OUTLOOK OF EXISTING FINANCIAL / DEVELOPMENT PROGRAMMES. Deliverable D4.14 - May 2025

1. Water resilience and financial sustainability

Water resilience is vital for guaranteeing future water security, enabling climate adaptation and sustaining the social, economic and environmental well-being of populations, especially considering the current status of the European Water Bodies. However, there are many challenges to achieve Water Resilience in Europe:

- Implementation and enforcement of existing legislation: Strengthening compliance towards EU regulations is essential, but long-standing gaps persist among Member States (MS), requiring intensified regulatory effort and monitoring[14].
- Climate change impacts and water scarcity: Europe is experiencing increasing droughts, floods, and heatwaves that threaten water availability and quality. Around 20-30% of the population live in areas affected by water stress annually, with southern regions especially vulnerable[15].
- Governance fragmentation and cross-border cooperation: Water management requires improved coordination at EU, national, regional, and local levels, with better collaboration across river basins and between countries[16].
- Modernization of critical water infrastructure: New EU resilience and cybersecurity obligations for critical water infrastructure (via CER and NIS2 Directives) demand enhanced risk assessment, contingency planning, and operational safeguards[17].
- Investment gaps: Europe needs substantial additional financing to modernize infrastructure, deploy nature-based solutions (NBS), and build digital capabilities. Current spending is insufficient, with examples like Spain needing to triple investment levels to close resilience gaps[18].
- Need for innovation and digital integration: Leveraging technology such as smart metering, AI, and digital twin projects is essential for efficient water usage, monitoring, and crisis response[19].
- Balancing water demand and supply amid competing uses: Ensuring fair and sustainable allocation of water across agriculture, industry, households, and ecosystems remains a complex challenge, exacerbated by regional disparities[20].
- Preparing for increasing water-related disasters: Floods and droughts are becoming more frequent and intense, necessitating robust risk management, early warning systems, and emergency preparedness[21].

All these challenges require effort, innovation and investment. One of these challenges is the investment deficit, and one of the key issues facing Europe is the difficulty in obtaining sufficient funding to overcome obstacles. There are several reasons behind the investment gap:

- Governance Fragmentation: Ineffective, uncoordinated governance hampers strategic planning and risk management[22].

[14] https://www.squirepattonboggs.com/en/insights/publications/2025/07/the-european-commissions-2025-water-resilience-strategy-emerging-regulatory-landscape-and-implications-for-businesses
[15] https://www.europarl.europa.eu/topics/en/article/20250428STO28142/europe-s-waters-key-challenges-and-eu-solutions
[16] https://errin.eu/news/news-eu-blue-policies-water-resilience-strategy-and-ocean-pact-are-out
[17] https://www.squirepattonboggs.com/en/insights/publications/2025/07/the-european-commissions-2025-water-resilience-strategy-emerging-regulatory-landscape-and-implications-for-businesses
[18] https://www.bbvaresearch.com/en/publicaciones/europe-towards-effective-water-resilience-in-europe-and-spain/
[19] https://www.wbgu.de/en/publications/publication/eu-wasserpolitik
[20] https://www.wbgu.de/en/publications/publication/eu-wasserpolitik
[21] https://www.realinstitutoelcano.org/en/commentaries/european-water-resilience-in-changing-times/
[22] https://www.weforum.org/stories/2024/11/7-facts-about-the-global-water-crisis-that-cop29-leaders-should-know/

- Transparency & Standardization: Lack of harmonized reporting and standardized Environmental, Social, and Governance (ESG) criteria complicates risk assessment and comparability for investors[23].
- Mobilizing Private Finance: Only a tiny fraction (about 1.4%) of private development finance currently goes to water and sanitation. Engaging the private sector is essential for innovation and scaling solutions[24].
- Risk Perception & Uncertainty: Escalating climate-driven water disasters increase perceived risks, making long-term investments more challenging to secure[25].
- Undervaluation of Water: Chronic undervaluation of water as an economic asset leads to underinvestment and weak incentives for sustainable management[26].

The public sector alone cannot meet all the necessary investment required in the water sector. However, the potential risks and benefits of various water services do not make for an attractive investment proposition, which limits the presence of private capital in the sector. Therefore, it is essential to conduct an adequate assessment of the costs, benefits and risks associated with each project or investment in order to determine the total costs, the financial and environmental benefits that will be generated, and the risks that will exist and how they will be addressed. Investment alternatives can then be explored and a sustainable financial strategy designed to ensure the project's implementation. The financial instruments included in this deliverable have the potential to improve financing in the water sector, but their application depends on having the necessary information to determine their appropriateness and efficiency. This deliverable therefore provides details on various financial alternatives, enabling the most efficient option to be selected for each case.

2. Financing and Economic Instruments for Water Security and Resilience

This section presents a comprehensive set of financial and economic instruments that can be applied to advance water security, improve resilience to climate and demand pressures, and ensure sustainable management of resources. These instruments range from market-based and tariff mechanisms to collaborative finance models, results-based approaches, risk-management tools, and debt/equity solutions.

Each instrument is described using a concise, uniform format, highlighting its definition, advantages and disadvantages, and the conditions under which it is most efficient to use — along with key design and implementation considerations. Diverse examples illustrate how these instruments can be adapted to diverse contexts, helping WOLLs determine which specific instruments may be applicable to their particular situation.

A. Market and Trading Instruments

Market and trading instruments in water management establish systems where water rights, credits, or efficiency gains can be bought, sold, or exchanged. By introducing market mechanisms, water can be reallocated between users and sectors according to demand and value, while incentivising conservation and

[23] https://www.oecd.org/content/dam/oecd/en/publications/reports/2022/03/financing-a-water-secure-future_27cd3a4c/a2ecb261-en.pdf
[24] https://www.weforum.org/stories/2024/11/7-facts-about-the-global-water-crisis-that-cop29-leaders-should-know/
[25] https://www.weforum.org/stories/2024/11/7-facts-about-the-global-water-crisis-that-cop29-leaders-should-know/
[26] https://www.fao.org/platforms/water-scarcity/Outreach/blog-on-water-scarcity/blog-detail/rachael-mcdonnell/2025/03/17/advancing-sustainable-financing-for-water-security--treating-water-as-an-asset-class/en

investment in sustainable practices. At the end of this section, BOX 1 provides examples for each of the Market and Trading instruments presented below.

Water rights markets[27] [28] [29] [30]

Water rights markets create a regulated market where entitlements to use water can be bought, sold, or leased between users. This system allows water to move from lower- to higher-value uses in response to scarcity, price signals, and demand changes, while maintaining legal allocations and environmental safeguards.

Advantages:

- Enables efficient reallocation of scarce water resources, maximising overall economic and social benefits.
- Provides clear economic incentives for conservation and investment in efficient technologies.
- Can incorporate provisions to protect environmental flows and avoid over extraction.

Disadvantages:

- Requires a robust legal framework, accurate measurement, and transparent governance to prevent misuse.
- If poorly designed, may disadvantage vulnerable users or lead to unintended environmental impacts.
- Stakeholder resistance may arise due to concerns about commodifying water.

Water rights markets are most effective in basins or regions where water scarcity creates a strong incentive for reallocation to higher-value uses, and where legal frameworks clearly define water entitlements, transfer rights, and environmental safeguards. They work best when there is sufficient diversity in water use values (e.g., agriculture, industry, environment) to generate active trading, and when physical infrastructure allows water to be delivered to where it is needed. Transparency in market information — prices, volumes, available rights — is key to building trust and encouraging participation.

Safeguards should be in place to prevent negative environmental or social outcomes, such as over-extraction, loss of environmental flows, or disadvantage to vulnerable users. Administrative systems must ensure that trades are accurately recorded and enforced, and that they align with broader allocation plans. Combining trading schemes with measures for monitoring water use, public disclosure of transactions, and dedicated environmental reserves can maximise both economic efficiency and sustainability. Pilot programmes in specific catchments can help refine rules and build capacity before scaling up.

Water quality credits[31] [32] [33] [34]

Water quality credits create markets where pollution reduction credits can be bought or sold among regulated entities. Facilities or landowners that reduce nutrient or sediment loads beyond required limits can generate

[27] https://www.globalwaterforum.org/2016/11/21/on-the-marketisation-of-water-the-murray-darling-basin-australia/
[28] https://www.sciencedirect.com/science/article/abs/pii/S0378377413003338
[29] https://www.pc.gov.au/research/supporting/water-trade
[30] https://www.ecologic.eu/sites/default/files/publication/2015/epiwater_2014_guidance_on_use_of_epi_in_water_management.pdf
[31] https://www.eepecobank.co.uk/what-is-pes/overview-of-water-quality-trading/
[32] https://efc.web.unc.edu/2018/04/26/three-strengths-and-weaknesses-of-water-quality-trading-policies/
[33] https://www.numberanalytics.com/blog/water-quality-trading-101-ag-490
[34] https://www.ecologic.eu/sites/default/files/publication/2015/epiwater_2014_guidance_on_use_of_epi_in_water_management.pdf

credits, which others purchase to meet water quality compliance more cost-effectively. These schemes incentivise cost-effective pollution control, flexibility, and innovation in achieving watershed goals.

Advantages:

- Offer facilities flexible, lower-cost compliance pathways compared to traditional on-site technology upgrades or command and control rules.
- Foster investment in conservation practices, bringing broader environmental and social benefits (e.g., stream buffers, wildlife habitat).
- Can help nonpoint sources participate voluntarily in improving water quality, expanding solutions beyond regulated sources.

Disadvantages:

- Depend on robust systems for monitoring, measurement, and verification to ensure credits reflect real water quality improvements.
- Risk inequitable outcomes or environmental "hot spots" if trades are not well regulated or transparency is lacking.
- Programs may face low trading volumes or stakeholder reluctance if rules are complex or perceived risks outweigh benefits.

Water quality credits are most effective in catchments where multiple pollution sources affect water quality and where regulatory limits or caps on pollutants are in place, creating a demand for cost-effective compliance options. They work well when there is significant variation in the marginal cost of pollution reduction among sources — for example, where agricultural best management practices can achieve nutrient reductions at lower cost than industrial or municipal upgrades.

A credible scientific and regulatory basis is essential to quantify pollutant loads and reductions, set trading ratios (to address location or delivery-time differences), and ensure that trades result in real, measurable, and verifiable water quality improvements. Programmes should include transparent registries, independent verification, and mechanisms to address potential "hotspots" where local water quality could worsen despite overall load reductions. Early engagement with stakeholders — including regulators, dischargers, and affected communities — helps build trust and encourages voluntary participation. Linking trading schemes to watershed restoration efforts or complementary conservation funding can increase both environmental and social benefits.

Water efficiency credits[35] [36] [37] [38]

Water efficiency credits are tradable units representing verified water savings achieved through measures such as improved irrigation efficiency, rainwater harvesting, or water reuse. These credits can be bought by users or entities needing to offset their water consumption or meet regulatory efficiency targets, creating a market-based incentive for conservation.

Advantages:

- Provides financial rewards and incentives for adopting water-saving technologies and practices.

[35] https://watercareservices.org/sustainability-and-water-credits/
[36] https://www.indiawaterportal.org/governance-and-policy/water-credits-a-market-driven-approach-to-water-conservation
[37] https://www.waterguard.co.uk/blog/achieving-breeam-wat03-water-credits/
[38] https://www.usgbc.org/articles/conserving-water-all-people-through-leed-v41

- Encourages innovation and investment in water efficiency across sectors.
- Supports flexible and efficient allocation of water savings to meet demand and sustainability goals.

Disadvantages:

- Depends on accurate measurement, monitoring, and verification to ensure that savings are real and additional.
- Risks such as double-counting or non-additionality if governance and oversight are weak.
- Market demand for credits may be limited without clear regulatory or commercial drivers.

Water efficiency credit schemes are most effective in water-scarce regions or basins where there is both a regulatory framework and a clear market demand for offsetting consumption or meeting conservation obligations. They are particularly suited to contexts with measurable savings potential—such as irrigation modernisation, industrial efficiency upgrades, or large-scale reuse projects—where the benefits can be verified and traded transparently.

To succeed, programs must ensure that credits represent real, additional, and permanent savings, supported by robust measurement and auditing protocols. Aligning the scheme with broader water management policies helps prevent rebound effects and ensures that efficiency gains lead to tangible reductions in overall extraction and long-term resource sustainability.

Innovation and pre-commercial public procurements[39] [40] [41] [42] [43]

Innovation procurement refers to using public procurement processes strategically to stimulate the development and uptake of new or significantly improved products, services, or processes. It can be divided principally into two types:

- Pre-Commercial Procurement (PCP): Public buyers procure research and development services to create solutions that do not yet exist commercially. It is used to commission innovation development sharing risks and benefits with suppliers before commercial scale-up.
- Public Procurement of Innovative solutions (PPI): The public sector acts as an early adopter by purchasing innovative products or services that are new to the market but available in small quantities. PPI helps scale up and deploy innovations with defined quality and price requirements.

Advantages:

- Encourages development of technologies and services not yet offered in the market.
- Reduces innovation risks for both public buyers and private developers.
- Can align procurement directly with strategic water management needs

Disadvantages:

- Requires specialised procurement expertise and clear legal frameworks.
- Development timelines can be long, with uncertain outcomes.
- Costs and risks may be higher than conventional procurement if not well managed.

[39] https://watereurope.eu/new-call-for-interest-assistance-for-preparing-innovation-procurement-in-the-water-sector/
[40] https://twistproject.eu/wp-content/uploads/2021/06/E-4.1.1_Training-materials-for-IPP_vFinal_EN-2.pdf
[41] https://research-and-innovation.ec.europa.eu/strategy/support-policy-making/shaping-eu-research-and-innovation-policy/new-european-innovation-agenda/innovation-procurement/public-procurement-innovative-solutions_en
[42] https://www.interregeurope.eu/good-practices/programme-for-innovation-procurement-pip
[43] https://www.upphandlingsmyndigheten.se/en/innovation-in-procurement/

Innovation and pre-commercial procurements are most effective when the market cannot meet urgent or specific water sector needs with off-the-shelf solutions — for example, in the face of emerging pollutants, climate-driven water scarcity, or advanced monitoring requirements. They work well when there is a clear problem definition, a willingness to engage industry early, and scope to share R&D risks.

Successful initiatives often use a phased approach: starting with market dialogue, moving to prototype development, and then to large-scale deployment if results meet performance criteria. Collaborative procurement by multiple public buyers can pool demand, lower costs, and increase market impact. Transparency, flexible contractual terms, and consistent stakeholder engagement help maintain trust and ensure that the resulting innovations are relevant, cost-effective, and scalable.

Grant-based financial incentives[44] [45] [46] [47] [48]

Grant-based financial incentives are direct transfers of public or philanthropic funds provided to organisations, communities, or individuals to support water-related projects without the requirement of repayment. In the water sector, grants and subsidies can cover part or all of the capital and/or operational costs of initiatives such as infrastructure upgrades, water efficiency improvements, ecosystem restoration, or technology adoption. They are typically awarded through competitive calls, application programmes, or as part of broader policy measures to encourage behaviours or investments that deliver public environmental and social benefits.

Advantages:

- Reduces or eliminates upfront costs, making essential projects financially viable.
- Can target high impact initiatives that would otherwise be commercially unattractive.
- Flexible in design to address specific policy goals, geographies, or beneficiary groups.

Disadvantages:

- Long term dependence on external funding if not paired with sustainable revenue streams.
- Potential for inefficient allocation if selection and monitoring processes are weak.
- Limited availability and competition for funds can exclude worthy projects.

Grant-based incentives are most effective for projects that generate significant public goods — such as ecosystem services, water quality improvements, or equitable access — but lack sufficient revenue potential to attract private capital. They work well to catalyse early-stage pilots, de-risk innovative approaches, or support vulnerable communities that cannot bear full project costs.

Success depends on transparent, competitive allocation processes aligned with clear policy objectives, and on robust monitoring to ensure funds are used effectively and deliver measurable outcomes. To maximise impact, grants should ideally be time-limited and paired with capacity-building or co-financing requirements that help beneficiaries transition towards financially sustainable models. Integrating environmental and social safeguards will enhance benefits, while periodic evaluations can support adaptive management and continuous improvement.

[44] https://dl.tufts.edu/concern/pdfs/wh247518c
[45] https://calclimateag.org/wp-content/uploads/2016/05/SWEEP-Report.pdf
[46] https://calclimateag.org/wp-content/uploads/2018/09/SWEEP-Policy-Brief-CalCAN-9-11-18.pdf
[47] https://www.cdfa.ca.gov/oars/sweep/
[48] https://www.climate-chance.org/en/best-pratices/state-water-efficiency-and-enhancement-program-sweep/

BOX 1. Market and Trading Instruments EXAMPLES

Market and trading instruments use market mechanisms to allocate water resources more efficiently and encourage sustainable usage. The following examples illustrate how these approaches can create incentives for conservation and reallocation through transparent, rules-based transactions.:

- **Water rights markets**: Australia's Murray–Darling Basin[49] operates one of the most advanced water trading markets globally. Since the 1990s, farmers, industries, and governments have traded billions of liters annually across state boundaries, reallocating water from low- to high-value uses and securing environmental flows. In 2010, the market value reached about AUD 2.8 billion.
- **Water quality credits**: the Virginia's Nutrient Trading Program in the USA[50] is a well-known case. Virginia's program has allowed municipal wastewater plants to meet nutrient limits more cost-effectively by purchasing credits from agricultural best management practices, resulting in earlier nutrient reductions and secondary ecological benefits.
- **Water efficiency credits**: In India, the concept of water credits is being developed to incentivize farmers and industries to adopt sustainable water management practices[51]. The "Trading Blue Gold" framework proposes valuing and trading water savings to offset consumption, promoting conservation amid growing water stress. Water credits generated from enhanced irrigation efficiency, rainwater harvesting, and wastewater reuse can be sold to offset water footprints of commercial users. This mechanism supports equitable water use and long-term resource sustainability.
- **Innovation and pre-commercial public procurement**: The Water PiPP Project (Public Innovation Procurement Policies), funded by the European Commission, supports public authorities and utilities in Europe to prepare and launch joint PCP and PPI initiatives targeting water sector innovation. For example, Water PiPP[52] has helped cities and regions identify innovation needs, engage suppliers early, and collaboratively procure research services and innovative solutions addressing water efficiency, treatment, and monitoring.
- **Grant-based financial incentives**: The California State Water Efficiency and Enhancement Program (SWEEP)[53] offers grants to agricultural water users to implement on-farm irrigation improvements that reduce greenhouse gas emissions and save water. Farmers receive financial incentives to adopt technologies like drip irrigation, soil moisture sensors, and efficient pumps. The program accelerates water conservation and climate resilience while reducing costs and environmental impacts.

B. Tariff, Fee and Pricing Instruments

Tariff, fee, and pricing instruments set the cost of water services—such as supply, treatment, and distribution—through structured rates or charges. These economic tools aim to recover costs, guide consumption, and promote sustainability. Pricing can vary by volume used, user category, or social needs, and covers household, agricultural, and industrial water users. At the end of this section, BOX 2 provides examples for each of the Tariff, Fee and Pricing instruments presented below.

[49] https://www.globalwaterforum.org/2016/11/21/on-the-marketisation-of-water-the-murray-darling-basin-australia/
[50] https://www.epa.gov/npdes/water-quality-trading
[51] https://www.indiawaterportal.org/governance-and-policy/water-credits-a-market-driven-approach-to-water-conservation
[52] https://watereurope.eu/new-call-for-interest-assistance-for-preparing-innovation-procurement-in-the-water-sector/
[53] https://www.cdfa.ca.gov/oars/sweep/

Polluter-pays fees or water abstraction charges[54] [55] [56] [57] [58]

Polluter-pays fees and water abstraction charges are economic instruments designed to internalize the environmental costs of water use and pollution. Under the Polluter Pays Principle (PPP), entities that pollute water bodies or abstract water resources must bear the costs associated with environmental damage and resource depletion. Water abstraction charges impose fees for withdrawing water from natural sources, while pollution fees charge for pollutants discharged into water systems. These fees incentivize users to reduce pollution and water consumption, promoting sustainable water management and cost recovery.

Advantages:

- Creates a direct economic signal that encourages more efficient use and reduced pollution.
- Generates revenue for water management, infrastructure maintenance, and ecosystem restoration.
- Internalises environmental costs, aligning user behaviour with sustainability objectives.

Disadvantages:

- May face political and social resistance, especially in regions where water charges are perceived as new taxes.
- Requires robust monitoring, metering, and administration to ensure fairness and compliance.
- If poorly designed, may disproportionately impact vulnerable users without achieving environmental goals.

Polluter-pays fees and abstraction charges are most effective where water resources are under stress, pollution pressures are significant, and regulatory frameworks clearly define usage rights and obligations. They work well when combined with strong monitoring systems, transparent calculation methods, and reinvestment of revenues into environmental protection or water efficiency measures. Charging structures should reflect both the volume of water used and its environmental impact, while integrating safeguards to maintain affordability for essential use and vulnerable groups. Linking charges to measurable performance indicators can strengthen their incentive effect. Acceptance improves when stakeholders see transparency in how revenues are used and understand the link between the fees paid, the services provided, and the environmental improvements achieved.

Tiered tariff systems[59] [60] [61] [62] [63]

Tiered tariff systems charge different rates for water based on consumption levels, typically with increasing rates as use goes up, to ensure affordability and equity. The lowest tier covers essential water needs at an affordable price to ensure access and equity, while higher tiers charge higher rates to encourage conservation and reflect the higher cost or scarcity of additional usage. This structure aligns pricing with social equity and

[54] https://www.wareg.org/articles/european-water-pricing-principles/
[55] https://www.era-comm.eu/Introduction_EU_Environmental_Law/EN/module_2/module_2_11.html
[56] https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/05/the-implementation-of-the-polluter-pays-principle-in-the-context-of-the-water-framework-directive_35a945b2/699601fc-en.pdf
[57] https://www.lse.ac.uk/granthaminstitute/explainers/what-is-the-polluter-pays-principle/
[58] https://www.ecologic.eu/sites/default/files/publication/2015/epiwater_2014_guidance_on_use_of_epi_in_water_management.pdf
[59] https://www.cityofsthelena.gov/FAQ.aspx?QID=139
[60] https://waterinthewest.stanford.edu/news-events/news-press-releases/pricing-water-conservation-using-tiered-water-rates-structures-qa
[61] https://climate-adapt.eea.europa.eu/en/metadata/case-studies/the-eco-social-water-tariff-in-dunkerque-france
[62] https://www.numberanalytics.com/blog/water-tariff-structures
[63] https://www.sciencedirect.com/science/article/abs/pii/S0957178719303285

environmental sustainability goals by balancing affordability for basic consumption with incentives to reduce excessive use.

Advantages:

- Protects low-income or essential water users by providing affordable baseline water access.
- Encourages water conservation by imposing higher charges on discretionary or excessive consumption.
- Supports financial sustainability of utilities through increased revenues from higher usage tiers.

Disadvantages:

- Complexity in rate design and billing can increase administrative costs and customer confusion.
- Political and social resistance can occur around rate increases for higher consumption tiers.
- Risk that high-tier charges disproportionately affect large families or particular user groups if not carefully designed.

Tiered tariff systems are most effective when there is a diverse user base with varying consumption patterns and affordability concerns. They require reliable metering and billing systems to accurately track consumption and apply rates. For success, tariff levels must be set transparently with stakeholder input to balance social equity, encourage conservation, and ensure utilities' financial viability. Special provisions or discounts may be needed to protect vulnerable populations. Communication and education are essential to help users understand tariff structures and their benefits. These systems work best as part of integrated water management policies combining demand management, cost recovery, and social protection goals.

Dynamic pricing based on supply-demand or quality parameters[64] [65] [66] [67] [68]

Dynamic water pricing involves adjusting water prices in real time or over short periods based on variations in water supply, demand, or water quality parameters. Unlike static or tiered rates, dynamic pricing reflects the actual costs or scarcity signals at different times—such as higher prices during peak demand hours or periods of low supply, and lower prices during off-peak or abundant supply times. This is often enabled by smart metering technology that allows monitoring and billing based on hourly or near-real-time consumption.

Advantages:

- Encourages users to shift consumption away from peak times, reducing pressure on infrastructure and lowering operating costs.
- Can promote conservation during scarcity by directly linking prices to availability.
- Improves operational efficiency by smoothing demand and aligning use with system capacity.

Disadvantages:

- Requires advanced metering infrastructure, data systems, and billing capabilities.
- May face resistance if users perceive pricing changes as unpredictable or unfair.

[64] https://eprints.whiterose.ac.uk/id/eprint/149619/1/Design%20and%20assessment%20of%20an%20efficient%20and%20equitable%20dynamic%20urban%20water%20tariff.%20Application%20to%20the%20city%20of%20Valencia,%20Spain..pdf
[65] https://ascelibrary.org/doi/abs/10.1061/JWRMD5.WRENG-6738
[66] https://riunet.upv.es/entities/publication/f37c8433-78c2-434c-b9d0-46f614bb65ed
[67] https://www.sciencedirect.com/science/article/abs/pii/S2212428420300141
[68] https://escholarship.org/content/qt22h445ts/qt22h445ts_noSplash_1d7e079349ec6b2b8ab0b90c9a9a2e09.pdf?t=ssy994

- Needs careful design to avoid disproportionate impacts on users with limited flexibility in consumption patterns.

Dynamic pricing works best in service areas with significant variability in daily or seasonal demand, where infrastructure capacity is stretched during peak periods, or where water quality fluctuates and can be factored into pricing. It is particularly effective when utilities have the technical capacity to measure consumption in near real time (e.g., through smart meters) and communicate pricing changes clearly to customers. To succeed, the system must ensure transparency in how prices are set, provide predictable adjustment windows, and offer consumer tools such as usage alerts or off-peak incentives to encourage voluntary shifts in demand. Safeguards should be built in to protect essential household consumption and vulnerable users, ensuring affordability while still sending strong price signals to manage non-essential use. Integrating dynamic pricing with broader demand-management measures—such as conservation campaigns, rebate programmes, or infrastructure upgrades—can amplify its effectiveness and public acceptance.

Green or sustainable tax incentives[69] [70] [71] [72] [73]

Green or sustainable tax incentives are fiscal policies and tax benefits designed to encourage investments and behaviours that support water conservation, sustainable water management, and environmental protection. These incentives can take the form of tax credits, deductions, exemptions, or reduced rates for activities such as groundwater conservation, installation of water-efficient technologies, or adoption of sustainable agricultural practices that reduce water use.

Advantages:

- Encourages voluntary adoption of sustainable practices by reducing net costs for the investor or landowner.
- Can stimulate private sector participation in environmental conservation without direct subsidies.
- Rewards long term stewardship of water resources while leveraging the tax system for policy objectives.

Disadvantages:

- Fiscal benefits may primarily attract participants with sufficient taxable income or financial capacity, limiting reach to vulnerable groups.
- Effectiveness depends on clear eligibility rules, robust verification, and sufficient awareness among target beneficiaries.
- Potential loss of tax revenue if not balanced with broader economic and environmental gains.

Green or sustainable tax incentives are most effective when there is political commitment to integrate environmental goals into fiscal policy and when market adoption of water-friendly practices is constrained by cost barriers. They work best in contexts where desired actions—such as conservation easements, aquifer recharge projects, or pollution control installations—are well defined, measurable, and linked to clear

[69] https://www.circleofblue.org/2023/supply/water-management/tax-incentives-find-new-purpose-for-conserving-water-in-american-west/
[70] https://www.calt.iastate.edu/article/tax-rules-implementing-conservation-or-climate-smart-practices
[71] https://conservationfinancecenter.org/federal-soil-water-tax-deduction/
[72] https://watercareservices.org/sustainability-and-water-credits/
[73] https://www.ecologic.eu/sites/default/files/publication/2015/epiwater_2014_guidance_on_use_of_epi_in_water_management.pdf

environmental benefits. Designing them to be performance-based, with benefits proportional to the scale or quality of the outcome achieved, can enhance cost-effectiveness.

Coordination with other policy tools, such as grants, low-interest loans, or regulatory measures, can broaden uptake and ensure inclusivity. For credibility and long-term impact, tax incentives should be transparent, time-bound, and supported by verification systems that confirm the claimed environmental outcomes, while allowing adjustments to reflect evolving water management priorities.

BOX 2. Tariff, Fee, and Pricing Instruments EXAMPLES

Tariff, fee, and pricing instruments apply economic signals to influence water consumption, recover costs, and promote fairness in access. The following examples show how different pricing structures can balance efficiency, sustainability, and affordability:

- **Polluter-pays fees or water abstraction charges**: The European Union implements the Polluter Pays Principle through the Water Framework Directive (WFD) and associated legislation[74]. Many MS apply abstraction charges and pollution fees to industrial, agricultural, and municipal water users. For instance, the Netherlands uses water extraction charges as part of its water management policy, incentivizing efficient use and funding water quality improvements. Similarly, Germany applies pollutant discharge fees to wastewater emitters under national and EU law, promoting pollution reduction investments[75].
- **Tiered tariff systems:** The French city of Dunkerque[76] applies an eco-social three-tiered tariff system that sets a low price for basic household water consumption to cover essential needs, higher rates for moderate use, and the highest rates for large consumption. The system also provides additional discounts for vulnerable groups such as social benefits recipients to ensure affordability. The tiered pricing effectively balances equity and conservation while supporting utility cost recovery.
- **Dynamic pricing based on supply-demand or quality parameters:** A study in Japan[77] of dynamic water tariffs implemented in a community of nearly 1,900 households demonstrated shifts in consumption from peak hours (morning and evening) to off-peak hours (late night and early morning), reducing peak loads on water systems. For example, tariffs were higher during morning peak (6-10 AM) and evening peak (5-10 PM), and lower during off-peak periods, resulting in a sustained peak shift even after the intervention. Such schemes help utilities optimize operations and reduce costs by smoothing demand patterns.
- **Green or sustainable tax incentives:** In the San Luis Valley, Colorado, the introduction of groundwater conservation easements with associated tax credits has encouraged farmers to reduce groundwater pumping in exchange for substantial state income tax credits[78]. This approach has proved successful in sustaining aquifer levels and promoting permanent conservation commitments through legal easements. Additionally, in the United States, the Soil and Water Conservation Deduction under the Internal Revenue Code allows farmers to deduct costs related to soil and water conservation practices, supporting sustainable agriculture.

C. Collaborative and Co-Financing Instruments

Collaborative and co-financing instruments bring together multiple stakeholders — such as public authorities, private companies, NGOs, and communities — to jointly finance and implement water projects. They pool resources, share risks, and align objectives to deliver solutions that might be difficult for a single actor to

[74] https://www.era-comm.eu/Introduction_EU_Environmental_Law/EN/module_2/module_2_11.html
[75] https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/05/the-implementation-of-the-polluter-pays-principle-in-the-context-of-the-water-framework-directive_35a945b2/699601fc-en.pdf
[76] https://climate-adapt.eea.europa.eu/en/metadata/case-studies/the-eco-social-water-tariff-in-dunkerque-france
[77] https://ascelibrary.org/doi/abs/10.1061/JWRMD5.WRENG-6738
[78] https://www.circleofblue.org/2023/supply/water-management/tax-incentives-find-new-purpose-for-conserving-water-in-american-west/

achieve alone. This category covers various models, from blended finance platforms to community-based savings groups. Public-Private Partnerships (PPPs) and crowdfunding mechanisms are also part of this group but are already described in detail in the Sixth edition of the Outlook. At the end of this section, BOX 3 provides examples for each of the Collaborative and Co-Financing instruments presented below.

Co-investment funds pooling public and private capital[79] [80] [81] [82] [83]

Co-investment funds are financial mechanisms that pool capital from multiple public and private investors to finance water-related projects and infrastructure. These funds leverage public resources to attract private investment, sharing risks and strengthening the financial capacity needed for large-scale water sustainability and conservation initiatives. By combining different sources of capital, co-investment funds amplify impact, support innovative water projects, and enhance bankability and scalability.

Advantages:

- Mobilises diverse funding sources, increasing the total capital available for water initiatives.
- Shares risks and responsibilities among partners, improving project viability.
- Enhances legitimacy and buy in through multi stakeholder participation.

Disadvantages:

- Complex governance and decision-making structures can slow implementation.
- Requires strong coordination and clear agreement on objectives and returns.
- Potential for conflicting priorities between public and private actors.

Co-investment funds work best for large-scale or basin-wide projects where financial requirements exceed the capacity of any single actor and where diverse partners share common long-term goals, such as watershed restoration, infrastructure modernisation, or climate adaptation. They require transparent governance, clear rules for cost- and benefit-sharing, and defined exit or repayment mechanisms for investors. Public participation often plays a catalytic role, reducing investment risks and encouraging private sector engagement. Success depends on aligning environmental, social, and financial objectives from the outset, supported by monitoring systems that track both investment performance and the achievement of water management outcomes.

Blended finance platforms[84] [85] [86] [87] [88]

Blended finance platforms are financing mechanisms that strategically combine different types of capital—typically grants, concessional loans, and equity investments—from public, philanthropic, and private sources

[79] https://pacinst.org/creative-co-funding-for-positive-water-impact/
[80] https://www.nature.org/media/freshwater/latin-america-water-funds.pdf
[81] https://emerald.vc/emerald-invests-in-kilimo-to-accelerate-corporate-investment-in-water-conservation/
[82] https://www.greenclimate.fund/insights/global-water-crisis-call-action-climate-and-water-initiatives
[83] https://www.eib.org/en/projects/pipelines/all/20150063
[84] https://prism.sustainability-directory.com/term/blended-finance-for-water/
[85] https://www.oecd.org/content/dam/oecd/en/publications/reports/2019/08/making-blended-finance-work-for-water-and-sanitation_ce59dbca/5efc8950-en.pdf
[86] https://watercentre.org/blog/blended-finance-for-wash-what-is-it-and-why-do-we-need-it/
[87] https://www.worldwatercouncil.org/sites/default/files/World_Water_Forum_09/WWC-Successful-Blended-Finance-Projects_WEB_EN.pdf
[88] https://water.org/documents/269/Making_Blended_Finance_Work_for_Water_and_Sanitation_Unlocking_commercial_fina_auhf3Xs.pdf

to fund water-related projects. These platforms aim to leverage limited public or donor funds (often in the form of grants or concessional financing) to attract greater amounts of private sector capital by reducing risk, improving financial viability, and enhancing bankability of water infrastructure, technology, or conservation investments. This multi-layered funding approach enables the delivery of projects that would otherwise be too risky or capital-intensive for private investors alone.

Advantages:

- Leverages public and philanthropic funds to mobilise larger volumes of private investment.
- Shares risk and improves project bankability, enabling investment in contexts or sectors that would otherwise struggle to attract finance.
- Aligns financial returns with social and environmental objectives.

Disadvantages:

- Complex structuring and due diligence processes can prolong preparation times and increase transaction costs.
- Requires strong governance and transparency to manage multiple stakeholders' expectations.
- Risk of dependency on concessional elements if not designed for long term financial sustainability.

Blended finance platforms are most effective for capital-intensive water projects with substantial public benefits but limited immediate commercial appeal, such as wastewater treatment plants, rural water supply systems, flood protection infrastructure, or large-scale NBS. They work well in contexts where private investors require risk-mitigation measures to participate, and where the concessional component can address barriers such as high perceived risk, long payback periods, or lack of credit history.

For success, the concessional finance should be used strategically to crowd in private capital—rather than replace it—by addressing clearly identified gaps. Clear agreements on roles, returns, and risk-sharing, coupled with transparent reporting on both financial and impact performance, are essential. Aligning investment criteria among partners and ensuring that environmental and social safeguards are met will help sustain credibility and scale. Early engagement with local stakeholders and regulatory authorities further increases long-term viability and acceptance.

Community-based savings and credit groups[89] [90] [91] [92]

Community-based savings and credit groups (such as Village Savings and Loan Associations - VSLAs) are grassroots financial institutions where community members pool their savings regularly and have access to small loans from the accumulated fund. These groups typically operate on trust, transparency, and collective management principles, enabling members to save money, access credit, and build financial resilience. In the water sector, such groups often mobilize resources to finance the maintenance, repair, and enhancement of communal water infrastructure, ensuring sustainable water access.

Advantages:

- Builds local ownership and accountability for water infrastructure and service provision.
- Mobilises internal community resources, reducing reliance on external funding.
- Strengthens trust, financial literacy, and organisational capacity at local level.

[89] https://nextbillion.net/sustainable-water-through-savings-groups/
[90] https://sswm.info/planning-and-programming/implementation/financing/community-based-savings-
[91] https://aquaya.org/how-village-savings-and-loans-associations-can-improve-water-management-in-uganda/
[92] https://www.ircwash.org/sites/default/files/202.8-00FI-16126.pdf

Disadvantages:

- Limited ability to finance large, capital-intensive projects.
- Group sustainability can be affected by member turnover, conflicts, or poor governance.
- Requires training and facilitation to establish effective structures and transparent management.

These models are particularly effective in rural or peri-urban areas where communities have some capacity to mobilise resources but limited access to formal financial services. They work well for financing regular operation and maintenance costs, small repairs, and incremental improvements to water facilities. Success relies on transparent governance, clear rules for savings and lending, and inclusive participation, ensuring that all community groups—especially women and vulnerable households—benefit. External support in the form of training, facilitation, and light-touch monitoring can help build skills in record-keeping, conflict resolution, and financial management. Linking savings groups to formal microfinance institutions or development programmes can expand their lending capacity while preserving local autonomy. When integrated into broader water governance frameworks, these groups can significantly improve service reliability and foster a culture of shared responsibility.

Crowdsourcing platforms linked to rewards[93] [94] [95] [96] [97]

Crowdsourcing platforms linked to rewards are digital or mobile-based systems that engage a community or "crowd" to contribute information, data, ideas, or actions related to water conservation and management. These platforms incentivize participation by providing rewards or recognition—such as monetary payments, discounts, badges, or social acknowledgment—to contributors who submit valuable inputs, such as water quality data, innovative solutions, or conservation efforts. The model leverages widespread connectivity and volunteer engagement to enhance data collection, innovation, and public awareness at lower costs and broader scale.

Advantages:

- Mobilises wide participation and diverse expertise at relatively low cost.
- Increases public engagement and awareness of water issues through active involvement.
- Can accelerate innovation by sourcing solutions from outside conventional actor networks.

Disadvantages:

- Variable quality of contributions, requiring review and validation processes.
- Sustaining participant motivation over time can be challenging without clear incentives.
- May require significant coordination and communication to manage large contributor bases.

Crowdsourcing platforms are most effective when the challenge or task can be clearly defined, segmented into manageable contributions, and opened to a large or diverse pool of participants. They are particularly suited for awareness-raising campaigns, environmental monitoring (citizen science), or innovation challenges where unconventional ideas are valuable. Reward structures should align with the desired type and quality of

[93] https://www.thecgo.org/research/crowdsourcing-conservation-how-to-use-community-science-to-advance-public-and-private-conservation/
[94] https://news.mongabay.com/2019/01/for-conservationists-crowdfunding-sites-raise-both-funds-and-awareness/
[95] https://www.space4water.org/news/crowdsourcing-and-citizen-science-data-water-resources-management
[96] https://www.herox.com/blog/1081-top-5-crowdsourcing-platforms-for-your-next-projec
[97] https://www.fundsforngos.org/all-questions-answered/what-are-the-best-crowdfunding-platforms-for-environmental-projects/

contribution, balancing intrinsic motivations (e.g., community pride, environmental stewardship) with extrinsic ones (e.g., prizes, public recognition).

Effective implementation requires transparent rules, accessible participation channels, and feedback mechanisms to keep contributors engaged and informed about how their input is used. Partnering with schools, NGOs, or local authorities can broaden outreach, while combining crowdsourcing with professional verification ensures that outputs meet technical or scientific standards. This approach is especially powerful when integrated into broader engagement strategies, multiplying both the reach and impact of water initiatives.

Self-enforcing financial agreements[98] [99] [100] [101]

Self-enforcing financial agreements are arrangements made between parties (such as municipalities, countries, or water users) in which compliance is sustained through the incentives and structure of the agreement itself, not relying on external enforcement or costly monitoring. These agreements use mutually beneficial terms and mechanisms—often linked to repeated interactions or transparent exchange—to encourage all parties to abide by the contract and deter reneging, even when circumstances (like droughts or price changes) might make non-compliance tempting. Their effectiveness comes from clearly negotiated benefits, penalties for defection, and adaptability to changing water conditions.

Advantages:

- Reduces the need for costly external enforcement by aligning interests and making cooperation the most beneficial option.
- Builds trust and long-term collaboration between stakeholders.
- Allows flexibility to adapt terms to evolving water availability, costs, or priorities.

Disadvantages:

- Requires careful design to ensure benefits, costs, and risks are balanced for all parties.
- Can weaken if underlying incentives erode or external shocks change the cost–benefit balance.
- Complex to negotiate where interests are highly divergent or trust is low.

These agreements are most effective in contexts where stakeholders interact repeatedly over time—such as shared basin management, joint infrastructure use, or recurring water exchanges—and where mutual dependency creates a natural incentive for cooperation. They work best when the economic, social, or service benefits of staying in the agreement clearly outweigh those of withdrawal, and when these benefits are maintained under a range of foreseeable conditions.

Essential considerations include transparent benefit- and cost-sharing formulas, clear triggers and processes for renegotiation, and automatic, credible consequences for defection that deter breaches without excessive legal intervention. Building in adaptive mechanisms to respond to hydrological variability, price shifts, or demand changes increases resilience. Early trust-building measures, open communication channels, and involvement of neutral facilitators during negotiation can further enhance long-term stability and acceptance.

[98] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1489303
[99] https://ideas.repec.org/p/ags/feemdp/54292.html
[100] https://www.sciencedirect.com/science/article/abs/pii/S0095069613000429
[101] https://www.academia.edu/1129716/Use_competition_and_water_exchange_in_Marina_Baja

BOX 3. Collaborative and Co-Financing Instruments EXAMPLES

Collaborative and co-financing instruments mobilise resources through partnerships that share risks, responsibilities, and benefits across public, private, and community stakeholders. The following examples highlight how cooperation can unlock financing and strengthen commitment to shared water goals:

- **Co-investment funds pooling public and private capital:** A recent example in the Colorado River Basin[102] brought together more than a dozen corporations with public and philanthropic funders to co-finance a $38 million water conservation project supporting reservoir levels in Lake Mead. Corporate contributions of $4 million complemented federal infrastructure funds and private investments, demonstrating how co-investment funds can scale water stewardship at basin-wide levels. Another notable model is Water Funds promoted by The Nature Conservancy in Latin America, which pool capital from water utilities, hydropower companies, agricultural associations, and governments in trust funds to finance watershed conservation efforts, building long-term financing and governance capacity.
- **Blended finance platforms:** The WaterCredit initiative by Water.org[103] exemplifies blended finance in action by using philanthropic grants and guarantees to enable microfinance institutions to provide affordable small loans for water and sanitation connections in developing countries. This approach unlocks private capital while ensuring social impact. Another example includes multi-sector blended finance platforms coordinated by development banks like the World Bank and African Development Bank, which combine concessional loans, grants, and private equity to fund water infrastructure projects that improve access and resilience. The OECD report and various global blended finance water funds demonstrate the growing adoption of such platforms globally.
- **Community-based savings and credit groups:** In Uganda[104], over 200 savings groups based on the Village Savings and Loan Association (VSLA) model have helped communities manage water point maintenance more sustainably. These groups have achieved high water point functionality (95%), accumulated significant assets averaging $1,386 per group annually, and built reserve funds for repairs. The groups' regular meetings, savings, and loan cycles have enhanced trust and motivated timely payment of water user fees, resulting in improved service reliability for about 250 community members per group. This model has been scaled successfully across districts in western Uganda and is recognized for strengthening both financial and organizational capacity in water management.
- **Crowdsourcing platforms linked to rewards:** The Billion Oyster Project in New York[105] mobilizes thousands of volunteers who contribute to oyster reef restoration and water quality monitoring, incentivizing participation through community involvement and educational rewards. Platforms such as HeroX host innovation challenges with prize money to crowdsource new water technologies or efficient solutions.
- **Self-enforcing financial agreements:** In Marina Baja, Alicante, Spain, there is an agreement between the municipality (and citizens) and irrigators to exchange water volumes between urban and agricultural uses[106]. The city of Benidorm provides reclaimed water and financial compensation to irrigators in exchange for natural water, so that the city gets a guaranteed water supply without affecting the irrigators' activity.

D. Results-Based Instruments

Results-Based Instruments tie funding or investor returns directly to the achievement of pre-defined, measurable water-related outcomes. Payments or returns are disbursed only when independently verified results — such as reduced pollution loads, increased water savings, or improved service quality — are achieved.

[102] https://pacinst.org/creative-co-funding-for-positive-water-impact/
[103] https://water.org/documents/269/Making_Blended_Finance_Work_for_Water_and_Sanitation_Unlocking_commerical_fina_auhf3Xs.pdf
[104] https://aquaya.org/how-village-savings-and-loans-associations-can-improve-water-management-in-uganda/
[105] https://www.thecgo.org/research/crowdsourcing-conservation-how-to-use-community-science-to-advance-public-and-private-conservation/
[106] https://www.academia.edu/1129716/Use_competition_and_water_exchange_in_Marina_Baja

These instruments are designed to enhance accountability, encourage innovation in delivery, and align incentives between funders and implementers. By shifting the focus from activities to outcomes, they reward effectiveness and efficiency and are particularly suited for contexts where performance metrics can be reliably measured and attributed. At the end of this section, BOX 4 provides examples for each of the Results-Based instruments presented below.

Payment for ecosystem services[107] [108] [109] [110] [111] [112]

Payment for Ecosystem Services (PES) is a voluntary, market-based approach where beneficiaries of ecosystem services—such as clean water, flood regulation, or watershed protection—provide financial incentives to those who manage land or resources to maintain or enhance these services. In the water context, PES programs reward upstream landowners, farmers, or communities for adopting practices that improve water quality, regulate flows, reduce erosion, or conserve natural areas, thereby securing valuable water-related ecosystem services for downstream users.

Advantages:

- Creates a clear economic incentive for conservation and sustainable land water management.
- Encourages long-term resource stewardship by turning ecosystem benefits into a predictable income stream.
- Can be designed to address multiple objectives, such as water security, climate resilience, and biodiversity

Disadvantages:

- Requires robust monitoring and verification to ensure the promised ecosystem services are delivered.
- May marginalise stakeholders if land tenure or resource rights are unclear.
- Effectiveness can be undermined if payments are insufficient, unreliable, or not linked to actual outcomes.

PES schemes are most effective where clear cause-and-effect relationships between upstream management practices and downstream water benefits can be identified and measured, such as in watersheds facing sedimentation, pollution, or reduced base flows. They work well in contexts with stable funding sources—whether through utility tariffs, government budgets, or private sector contributions—and where stakeholder relationships allow for fair negotiation and benefit-sharing. Clear eligibility criteria, transparent governance, and legal recognition of resource rights are critical for credibility and equity. Monitoring frameworks should track both environmental outcomes and socio-economic impacts to ensure payments are tied to real, additional, and lasting improvements. Combining PES with capacity-building, technical support, and complementary policies (e.g., land-use planning, restoration incentives) can increase impact and sustainability.

[107] https://www.cifor-icraf.org/publications/pdf_files/Books/BFripp1401.pdf
[108] https://www.cifor-icraf.org/publications/pdf_files/Books/BFripp1401.pdf
[109] https://droughtclp.unccd.int/node/111/printable/print
[110] https://wwf.panda.org/discover/knowledge_hub/where_we_work/black_sea_basin/danube_carpathian/our_solutions/green_economy/pes/
[111] https://www.iied.org/markets-payments-for-environmental-services
[112] https://www.ecologic.eu/sites/default/files/publication/2015/epiwater_2014_guidance_on_use_of_epi_in_water_management.pdf

Early engagement of communities and intermediaries helps align programme design with local needs, fosters trust, and ensures long-term participation.

Outcome-based contracts[113] [114] [115] [116] [117]

Outcome-based contracts (OBCs) (e.g., water savings, pollution reduction), also known as performance-based contracts, are agreements where payment is contingent on achieving predefined, measurable results rather than on performing specific tasks or delivering inputs. In water management, this means contractors or service providers are paid based on actual outcomes such as water savings, reduction in pollution levels, improved water quality, or enhanced operational efficiency. OBCs incentivize innovation and efficiency by aligning the contractor's profits with achieving meaningful impacts instead of merely fulfilling prescribed activities.

Advantages:

- Ensures accountability by tying payments to concrete, verifiable results.
- Encourages innovation and efficiency, as providers have flexibility in how goals are achieved.
- Aligns incentives between funders and implementers, focusing on impact rather than inputs.

Disadvantages:

- Requires robust monitoring, reporting, and verification systems to measure agreed outcomes.
- Can involve longer preparation phases to define metrics, baselines, and contract terms.
- Performance risk can discourage participation if targets are unrealistic or external factors are unpredictable.

OBCs are most effective when desired results can be clearly defined, quantified, and measured within a reliable monitoring framework—for example, in energy-water savings retrofits, nutrient reduction projects, or service quality improvement programmes. They work best when both funder and implementer agree on realistic performance targets, clear payment schedules, and credible verification processes carried out by independent third parties.

Success depends on accurate baseline data, transparent rules for calculating achievements, and fair allocation of external risks such as weather variability or market price shifts. Piloting the approach on a small scale before full deployment can build trust and refine contract terms. These contracts are particularly well suited to multi-year projects where flexibility in delivery methods and a focus on sustainability are important. Combining them with technical assistance, stakeholder engagement, or blended finance can enhance effectiveness and broaden participation.

[113] https://www.awa.asn.au/resources/latest-news/business/assets-and-operations/is-outcomes-based-procurement-right-for-the-water-sector
[114] https://sustainability-directory.com/term/outcome-based-contracting/
[115] https://golab.bsg.ox.ac.uk/documents/FINAL_GO_Lab-Ecorys_Systematic_review-Environmental_OBC.pdf
[116] https://iwa-network.org/projects/performance-based-contracts-for-non-revenue-water-market-development/
[117] https://www.iwa-network.org/wp-content/uploads/2015/12/1464301513-PBC-IWA-19Nov12-v4.pdf

Impact investing funds targeting water resilience outcomes[118] [119] [120] [121]

Impact investing funds focused on water resilience channel capital into projects and companies that strengthen water security, improve water quality, promote climate adaptation, and support nature-based or innovative water solutions. These funds aim to generate measurable environmental and social outcomes alongside financial returns, addressing water scarcity, aging infrastructure, pollution, and ecosystem degradation while building the resilience of communities and ecosystems.

Advantages:

- Mobilises private capital for water projects that generate both impact and financial returns.
- Focuses on measurable outcomes, increasing transparency and accountability.
- Can unlock scalable and replicable solutions by supporting financially viable models.

Disadvantages:

- Measuring and verifying water related outcomes can be complex and costly.
- May prioritise projects with clearer revenue streams, limiting reach to some high impact but less commercially viable initiatives.
- Requires strong governance to balance impact goals with investor profit expectations.

Impact investing funds are most effective when there is a pipeline of water-related projects or enterprises that can generate steady financial returns while delivering verifiable environmental and social benefits. They are particularly suited to financing innovative business models—such as decentralised water treatment, efficiency technologies, water reuse systems, or watershed restoration services—that can be monetised through tariffs, savings, or ecosystem service payments.

Success depends on clear impact measurement frameworks, ideally aligned with recognised standards (e.g., SDG 6 indicators or IRIS+ metrics), and on transparent reporting to investors. Partnerships with development finance institutions or philanthropic actors can help de-risk investments and broaden the scope to include higher-impact projects. Strong local market understanding, due diligence on regulatory and environmental compliance, and engagement with affected communities improve both the resilience and acceptance of funded initiatives. Embedding adaptive management mechanisms ensures that investment strategies can be adjusted as market conditions, climate risks, or stakeholder needs evolve.

Development impact bonds and social impact bonds[122] [123] [124] [125] [126]

Development impact bonds (DIBs) and social impact bonds (SIBs) are innovative financial instruments where private investors provide upfront capital to fund social or development projects, and repayment (typically with a financial return) is contingent on achieving pre-agreed measurable outcomes or impacts. These contracts

[118] https://www.weforum.org/stories/2024/12/investing-in-water-resilience-untapped-opportunity/
[119] https://www.globalcompactusa.org/news/starbucks-ecolab-gap-inc-reckitt-and-dupont-join-with-u-s-government-to-invest-nearly-140-million-in-water-access-fund
[120] https://www.eib.org/en/press/all/2025-291-eib-group-backs-more-than-eur15-billion-in-new-investment
[121] https://addendacapital.com/en-ca/insights-news/water-featured-as-a-new-theme-in-the-impact-fixed-income-fund
[122] https://www.quantifiedventures.com/dc-water-eib-results
[123] https://coast.noaa.gov/digitalcoast/training/hampton.html
[124] https://www.oecd.org/content/dam/oecd/en/events/2025/04/twelfth-meeting-of-the-roundtable-on-financing-water/background-paper-leveraging-bond-finance-for-sustainable-water-investments.pdf
[125] https://www.sciencedirect.com/science/article/pii/S1877343523001434
[126] https://www.franklintempleton.lu/articles/2024/fixed-income/banking-on-water-impact-bonds-benefits-barriers-and-beyond

involve multiple parties: investors, service providers implementing the project, and outcome payers (often governments or donors) who pay back if results are met. They encourage efficiency, accountability, and focus on measurable results in areas such as water resilience, sanitation, or pollution reduction.

Advantages:

- Links payments directly to tangible, verified outcomes, increasing accountability.
- Attracts private capital to high impact projects by sharing risks between investors and public or philanthropic funders.
- Encourages innovation and adaptive approaches, as implementers have flexibility in delivery methods.

Disadvantages:

- Requires robust metrics, baselines, and independent verification systems, which can increase preparation costs and timelines.
- Structuring is complex, involving legal, financial, and technical expertise.
- May exclude interventions with important but hard to measure benefits.

DIBs and SIBs work best where the desired outcomes—such as measurable pollution reduction, verified water savings, or expanded safe water access—can be clearly defined, reliably measured, and causally attributed to the intervention. They are particularly effective when there is a committed outcome funder willing to pay upon success, and when suitable investors are prepared to shoulder execution risk.

These instruments can help scale innovative projects that need impact validation before attracting conventional finance. Success requires a well-designed contract specifying indicators, timelines, verification methods, and risk-allocation arrangements for external shocks (e.g., droughts or extreme weather). Small-scale pilots can help refine measurement and contract terms before wider deployment. Combining DIBs/SIBs with technical assistance, blended finance elements, or community engagement can enhance both impact and acceptance.

BOX 4. Results-Based Instruments EXAMPLES

Results-based instruments link funding or investor returns directly to the achievement of measurable water-related outcomes. The following examples demonstrate ways to enhance accountability, foster innovation, and focus resources on verified performance:

- **Payment for ecosystem services (PES)**: Costa Rica's national PES program[127] is a globally recognized example whereby landowners are paid to conserve forests and watersheds that provide water purification and supply services. Upstream farmers receive payments funded by downstream water users and government agencies, leading to improved water quality and biodiversity conservation. Similarly, water utilities in the United States (e.g., New York City Watershed Agricultural Council) pay farmers to implement best practices that reduce pollution and protect reservoir water quality, reducing the need for expensive filtration infrastructure.
- **Outcome-based contracts:** A joint UNDP and World Bank program introduced a model contract between water service providers and consumers across 56 water utilities in Albania[128]. This legally binding contract clarified consumer rights and provider obligations, integrating national consumer protection laws and environmental regulations. The initiative improved service quality, consumer protection, and environmental stewardship. It established complaint management systems, enhanced inter-institutional cooperation, and raised consumer awareness. As a result, the program positively impacted 3 million

[127] https://www.iied.org/markets-payments-for-environmental-services
[128] https://www.sdgfund.org/case-study/better-water-and-sanitation-services-through-consumer-rights-based-contract-albania

BOX 4. Results-Based Instruments EXAMPLES

Albanian water users by ensuring better water and sanitation services and more responsible water management.

- **Impact investing funds targeting water resilience outcomes**: Founded by Water.org, the WaterEquity Funds [129] direct private capital into water and sanitation financing in emerging markets, improving resilience for low-income populations while delivering returns to investors.
- **Development impact bonds and social impact bonds:** One pioneering example is the DC Water Environmental Impact Bond (2016) in the United States [130]. This bond raised capital to fund green infrastructure projects aimed at reducing stormwater runoff by capturing and infiltrating runoff to prevent overflow into waterways. The bond was repaid based on achieving targeted stormwater runoff reductions, verified via rigorous monitoring. This was one of the first Environmental Impact Bonds (a form of SIB/DIB focused on environmental outcomes) demonstrating risk sharing between investors and the utility while delivering measurable water resilience benefits. The project reduced stormwater runoff by nearly 20%, met performance targets, and provided additional community benefits such as green space and local jobs.

E. Risk Management Instruments

Risk Management Instruments help public and private actors anticipate, absorb, and financially manage the shocks and stresses associated with water-related hazards — from droughts and floods to infrastructure failures. They transfer or share risk between stakeholders, provide predictable financing for recovery or adaptation, and can incentivise investments in resilience. These instruments include insurance products, catastrophe or resilience bonds, risk-pooling schemes, and guarantee mechanisms. Effective deployment requires robust hazard data, clear trigger conditions, and integration into broader disaster-risk-reduction and resilience strategies. At the end of this section, BOX 5 provides examples for each of the Risk Management instruments presented below.

Insurance products linked to water risks[131 132 133 134 135 136]

Insurance products linked to water risks are financial tools designed to help individuals, businesses, communities, and governments manage the financial impacts of water-related extreme events such as droughts and floods. These include traditional indemnity insurance covering specific damages as well as innovative parametric insurance that pays out based on predefined triggers like rainfall levels or water availability indices, rather than assessed losses. The products provide risk transfer and financial resilience against climate-driven water scarcity, crop losses, property damage, and business interruptions.

Advantages:

- Strengthens resilience by providing rapid financial relief after water related shocks.
- Encourages proactive risk management and investment in preventive measures.

[129] https://waterequity.com/
[130] https://www.quantifiedventures.com/dc-water-eib-results
[131] https://www.verzekeraars.nl/en/insurance-themes/climate-proof-insurance/flood-and-drought
[132] https://descartesunderwriting.com/solutions/drought
[133] https://www.zurich.com/knowledge/topics/global-risks/drought-will-impose-growing-costs
[134] https://www.iwmi.org/success-stories/how-hi-tech-insurance-is-helping-farmers-survive-floods/
[135] https://www.weforum.org/stories/2025/01/what-is-parametric-insurance-and-how-is-it-building-climate-resilience/
[136] https://www.ecologic.eu/sites/default/files/publication/2015/epiwater_2014_guidance_on_use_of_epi_in_water_management.pdf

- Can be tailored to specific hazards and linked to climate and hydrological data for accuracy.

Disadvantages:

- Premium costs may be high in high-risk areas, limiting uptake.
- Requires reliable data and modelling to set fair and accurate triggers or coverage terms.
- Risk of "basis risk" in parametric products, where payouts may not perfectly match actual losses.

These products are most effective in regions exposed to recurring water-related hazards, where predictable funding is needed for recovery and continuity—such as agricultural areas prone to drought, coastal zones vulnerable to flooding, or municipalities managing essential water supply infrastructure. They work well when integrated into broader risk-management strategies, alongside mitigation measures like flood defences, water storage, or drought-resilient cropping systems. For parametric insurance, transparent and agreed-upon triggers based on reliable, independently verifiable data are essential to maintain trust and avoid disputes. Bundling insurance with incentives for risk-reduction investments—such as premium discounts for improved infrastructure—can enhance both uptake and impact. Public–private partnerships may help improve affordability and coverage, particularly for vulnerable communities. Careful communication of product terms and limitations is vital to avoid misunderstandings and ensure that payouts fulfil the intended role of maintaining financial stability and accelerating recovery.

Catastrophe bonds or resilience bonds[137] [138] [139] [140] [141]

Catastrophe Bonds (CAT Bonds) are risk-linked securities issued to transfer the risk of natural disasters (such as floods, hurricanes, or earthquakes) from insurers or governments to investors. If a specified disaster event occurs above a predetermined threshold, bondholders may lose part or all of their principal, which is then used to cover disaster relief costs. CAT Bonds provide post-disaster financial liquidity and risk transfer to capital markets.

Resilience Bonds are a newer financial innovation building on CAT Bonds but with a proactive emphasis on financing resilience and risk reduction projects before disasters occur. Resilience Bonds link the bond's coupon payments to measurable risk mitigation investments that reduce expected future losses. The savings from avoided losses create a "resilience rebate," which lowers the cost for bond issuers and funds further resilience building. Thus, Resilience Bonds create incentives to invest upfront in infrastructure or ecosystem projects that reduce disaster impacts.

Advantages:

- Provides large scale, pre-arranged funding for disaster recovery or resilience upgrades.
- Transfers extreme event risk to capital markets, diversifying funding sources.
- Can be structured to incentivise investment in resilience measures before events occur.

Disadvantages:

- Requires sophisticated modelling and data to set fair triggers and pricing.

[137] https://prism.sustainability-directory.com/term/resilience-bonds/
[138] https://www.preventionweb.net/news/why-climate-resilience-bonds-can-make-significant-contribution-financing-climate-change
[139] https://www.sciencedirect.com/science/article/abs/pii/S2212420924000803
[140] https://privatebank.barclays.com/insights/assessing-the-risks-of-catastrophe-bonds-06-2025/
[141] https://www.aluko-oyebode.com/wp-content/uploads/2024/09/Strengthening-Resilience-Catastrophe-Bonds-and-Emerging-Risks-1.pdf

- Preparation and issuance can be complex and incur significant transaction costs.
- If triggers are not perfectly aligned with actual losses, there is a risk of mismatch (basis risk).

Catastrophe and resilience bonds are most effective in regions with significant exposure to high-impact, low-frequency water-related disasters where rapid access to large amounts of funding is critical for recovery or adaptation. They are well suited when government budgets or donor funding cannot fully cover potential losses and where transparent, objective event triggers (e.g., river discharge thresholds, rainfall indices, satellite flood-extent data) can be agreed upon. Resilience bond structures can link part of the financing costs to quantified reductions in risk achieved via infrastructure upgrades or ecosystem restoration, thereby lowering premiums or bond coupons over time.

Successful implementation requires early engagement with investors, careful calibration of triggers to minimise basis risk, strong legal frameworks, and integration into a broader disaster-risk-management strategy. Public–private collaboration, potentially with multilateral development bank support, can improve affordability and investor confidence.

Risk pooling or guarantee mechanisms[142] [143] [144]

Risk pooling and guarantee mechanisms are financial tools designed to reduce or share risks associated with water sector investments, making projects more attractive to private investors or commercial lenders. Risk pooling aggregates risks from multiple entities or projects to diversify exposure, while guarantees (usually provided by public or philanthropic entities) cover potential losses or defaults, thus lowering investment risks and improving access to credit or capital.

Advantages:

- Improves access to finance by lowering risk perception among private lenders and investors.
- Can reduce borrowing costs and extend loan tenors for project developers.
- Enables aggregation of smaller projects into larger, more bankable portfolios.

Disadvantages:

- Requires strong governance and adequate capitalisation of guarantee facilities.
- Moral hazard risk if borrowers or lenders rely excessively on guarantees and reduce their own due diligence.
- Administrative complexity in structuring, monitoring, and claim management.

Risk pooling and guarantee mechanisms are most effective in contexts where viable water infrastructure or service projects exist but face financing barriers due to perceived high risk—such as municipal utilities in emerging markets, rural water supply schemes, or innovative technologies without a track record. They work well when there are credible intermediaries (e.g., development banks, specialised funds) to manage the facility, assess project quality, and enforce performance standards. Pooling schemes can aggregate risks across regions or sectors, improving diversification and lowering the cost of coverage.

Key design considerations include clear criteria for eligibility, risk-sharing ratios that leave sufficient incentive for prudent lending, and transparent processes for triggering guarantees or payouts. Combining guarantees

[142] https://www.linkedin.com/pulse/what-does-de-risking-mean-water-sector-ircwash-7rgne
[143] https://documents1.worldbank.org/curated/en/099525005302562548/pdf/IDU-0859323a-953b-4392-b819-58fa0bec9c6d.pdf
[144] https://www.wur.nl/en/project/risk-pooling-and-institutional-innovation-for-sustainable-water-service-transitions-riskpool.htm

with technical assistance can strengthen project preparation and borrower capacity, further reducing default risk. Public–private partnerships are often essential for sustainable funding and credibility, while periodic reviews should adapt coverage terms to shifting market or climate conditions. When aligned with broader water investment strategies, these tools can significantly expand private sector participation and accelerate delivery of critical water resilience projects.

BOX 5. Risk Management Instruments EXAMPLES

Risk management instruments help anticipate, transfer, or reduce the financial impacts of water-related hazards, supporting faster recovery and long-term resilience. The following examples illustrate how such mechanisms can provide predictable funding for response and adaptation.

- **Insurance products linked to water risks:** Descartes Underwriting's parametric drought insurance[145] uses satellite data and IoT to insure agribusinesses and governments worldwide against drought risk based on rainfall and soil moisture data.
- **Catastrophe bonds or resilience bonds:** The European Bank for Reconstruction and Development (EBRD) issued a $700 million resilience bond in 2019[146] to raise capital for increasing asset resilience, blending commercial banks, central banks, and insurers as investors.
- **Risk pooling or guarantee mechanisms:** The India Water Infrastructure Guarantee Fund[147] is a partial credit guarantee mechanism that enabled commercial banks to lend to municipal water infrastructure projects, unlocking private finance in markets with limited track records.

F. Debt and Equity Instruments

Debt and equity instruments are financing tools that provide capital for water-related projects in exchange for repayment (debt) or ownership stakes (equity). They can be issued by public institutions, private companies, or partnerships, and are often used to fund infrastructure, technology deployment, or large-scale conservation initiatives. In this category we focus on specialised applications such as green and sustainability bonds, concessional loans, and microfinance products tailored for water security and resilience. Standard equity investments and conventional loan structures are already described in detail in the Sixth edition of the Outlook. At the end of this section, BOX 6 provides examples for each of the Debt and Equity instruments presented below.

Blue bonds[148] [149] [150] [151] [152]

Blue bonds are specialized fixed-income financial instruments designed to raise capital specifically for projects that improve water sustainability and management. Blue bonds typically fund initiatives related to freshwater ecosystem restoration, water efficiency, sanitation, and pollution prevention, but also marine and coastal water resources, including wastewater treatment and ocean conservation. These bonds mobilize public and

[145] https://descartesunderwriting.com/solutions/drought
[146] https://www.preventionweb.net/news/why-climate-resilience-bonds-can-make-significant-contribution-financing-climate-change
[147] https://www.linkedin.com/pulse/what-does-de-risking-mean-water-sector-ircwash-7rgne/
[148] https://www.amwa.net/article/climate-bonds-initiative-releases-water-climate-bonds-standard-criteria-0
[149] https://www.climatebonds.net/files/documents/Water_Criteria_Document_August-2022.pdf
[150] https://www.climatebonds.net/files/documents/Water_Infrastructure_Criteria_Brochure_2021.pdf
[151] https://www.climatebonds.net/our-expertise/climate-bonds-standard-and-certification-scheme/sector-criteria/waste-infrastructure
[152] https://www.thegpsc.org/sites/default/files/water-infrastructure-criteria-under-climate-bonds-background.pdf

private investment for infrastructure upgrades, NBS, and innovative technologies that enhance water security and resilience.

Advantages:

- Mobilises large amounts of capital from institutional investors for water sustainability projects.
- Enhances issuer credibility and visibility by aligning with environmental objectives.
- Can attract investors seeking ESG compliant opportunities.

Disadvantages:

- Requires robust project selection, monitoring, and reporting frameworks, which may increase issuance costs.
- Market acceptance can depend on adherence to credible green bond standards (e.g., International Capital Market Association (ICMA) Green Bond Principles).
- Risk of "greenwashing" if projects lack clear, measurable environmental benefits.

Blue bonds are most effective for well-defined project portfolios with significant capital needs and demonstrable environmental benefits—such as upgrading sanitation networks, building water reuse plants, or restoring degraded wetlands. They work best when issuers have the institutional capacity to manage proceeds transparently and report regularly to investors.

Success depends on aligning the bond framework with reputable standards, securing third-party verification, and clearly communicating the water-related impacts to the market. Investor appetite can be strengthened by linking projects to broader policy commitments (e.g., SDGs, climate adaptation strategies) and by demonstrating co-benefits such as job creation or biodiversity gains. Competitive pricing may be achieved when bonds are part of a larger sustainable finance strategy that builds the issuer's ESG credentials. Integrating performance indicators—like pollution load reduction or water savings achieved—into post-issuance reports can further enhance market confidence and long-term funding potential.

Soft loans or concessional financing[153] [154] [155] [156] [157]

Soft loans or concessional financing are loans extended on terms substantially more generous than market loans, typically offered by development banks, international financial institutions, or green funds. These loans feature lower interest rates, longer grace periods, and extended maturities, aimed at facilitating investments in water infrastructure, sustainable water management, and climate resilience projects that may not attract purely commercial financing due to higher risks or lower returns in the short term.

Advantages:

- Reduces financing costs, making essential water projects more affordable for utilities, municipalities, or communities.
- Can catalyse additional investment by improving project bankability.

[153] https://www.ifc.org/content/dam/ifc/doc/2010/smart-lessons-water.pdf
[154] https://financeincommon.org/sites/default/files/2021-09/Global%20Study%20Role%20of%20National%20Public%20Development%20Banks%20in%20Financing%20the%20Water%20and%20Sanitation.pdf
[155] https://openknowledge.worldbank.org/server/api/core/bitstreams/b3c99116-be36-5fa5-991b-390e62856dca/content
[156] https://www.oecd.org/content/dam/oecd/en/publications/reports/2019/08/making-blended-finance-work-for-water-and-sanitation_ce59dbca/5efc8950-en.pdf
[157] https://coebank.org/media/documents/Water_Security_Financing_Report_2024.pdf

- Provides longer time horizons for repayment, easing fiscal pressure during early project years.

Disadvantages:

- Availability is often limited to eligible countries, sectors, or project types.
- Application and approval processes can be lengthy and administratively demanding.
- Risk of dependency on concessional finance if projects are not structured for long term self-sufficiency.

Soft loans are most effective for capital-intensive water projects that generate significant public goods—such as expanding access to safe water and sanitation, building flood protection infrastructure, or rehabilitating degraded watersheds—but which cannot attract sufficient commercial financing due to low or uncertain financial returns. They are especially valuable in low- and middle-income countries or underserved regions where affordability is a key constraint.

Success requires aligning concessional terms with realistic revenue-generation or cost-recovery plans, ensuring that repayment obligations remain manageable over the long term. Pairing concessional loans with technical assistance can help strengthen project preparation, implementation, and financial management capacity. Co-financing with grants, private investment, or climate-adaptation funds can further extend impact and enable larger-scale or more innovative projects. Transparent eligibility criteria, rigorous due diligence, and monitoring of both financial performance and water-related outcomes are critical to protect lenders, borrowers, and public interests. Embedding environmental and social safeguards will also help ensure long-term sustainability and resilience.

Microfinance and impact microloans[158] [159] [160] [161] [162]

Microfinance involves providing small loans and financial services to low-income individuals or households who typically lack access to traditional banking. Impact microloans for water focus specifically on enabling access to safe water and improved sanitation by financing household-level or small-scale water supply, sanitation facilities, or related services. These microloans empower families to invest in water taps, toilets, rainwater harvesting, or local water infrastructure, often through partnerships with microfinance institutions (MFIs).

Advantages:

- Expands access to safe water and sanitation for low-income households that lack upfront capital.
- Builds repayment history, improving borrowers' access to other financial services.
- Can be combined with hygiene promotion, technical assistance, or group lending models to enhance impact.

Disadvantages:

[158] https://waterequity.com/financing-the-frontlines/

[159] https://www.convergence.finance/api/file/07af42d7c074452b87c1dd458ac8e813:93341d9e54dc5bd50f0e2ba940685e7f0ddd2d6fda6737f1468fefeb4cb5679b77a6a9840f115216b4249ccb54005accb3c2c3e73fae419209877fb810a8fc687925ed042ddc97dc1916cbb16b1fca8064eafaecc9b528f653a896a9a08e7ed7aa04adf0954c78b6e70defa07ddd06803a054cee67d543c8509e0b7ef7dbbd7c

[160] https://smartwatermagazine.com/news/waterequity/waterequity-maximizes-its-impact-integrating-financial-resources-local-knowledge

[161] https://watercentre.org/wp-content/uploads/2024/04/Blended-Finance-for-WASH-Lessons-for-Development-Partners-Final-Report-Public.pdf

[162] https://blogs.worldbank.org/en/water/microfinance-water-and-sanitation-how-one-small-loan-makes-huge-difference

- Interest rates, while lower than informal credit, can still be relatively high due to small loan sizes and administrative costs.
- Risk of over indebtedness if repayment capacity is not assessed accurately.
- Requires strong local delivery partners with knowledge of both microfinance operations and WASH (Water, Sanitation and Hygiene) needs.

Microfinance is most effective where basic water and sanitation services exist or can be extended, but households cannot afford the upfront connection or installation costs. It works well in areas with established MFIs or community lending groups capable of managing loan portfolios sustainably.

Key success factors include tailoring loan products to seasonal income cycles, offering flexible repayment terms, and ensuring loan amounts match the actual cost of the intended WASH solution. Partnerships between MFIs, local authorities, and technical service providers can ensure that the financed facilities meet quality standards and are correctly installed. Blending microloans with targeted subsidies for the poorest households can increase inclusivity, while linking repayment obligations to demonstrated functionality of services helps sustain long-term benefits. Strong borrower education on financial management and hygiene practices can further enhance outcomes. Impact monitoring should capture both repayment performance and improvements in water access, health, and livelihoods.

BOX 6. Debt and Equity Instruments EXAMPLES

Debt and equity instruments provide capital for water projects through borrowing or investment arrangements that align with sustainability and resilience objectives. The following examples show how targeted financing can deliver projects with strong social, environmental, and economic benefits:

- **Blue bonds**[163]: The World Bank Blue Bonds for Ocean Conservation and European Investment Bank's Green Bonds include water projects in their portfolios. In 2020, the European Investment Bank issued a multi-billion euro blue bond funding numerous water infrastructure projects across Europe, supporting modernized sanitation, water reuse, and ecosystem restoration. Kenya's pioneering sovereign blue bond included blue water projects aimed at enhancing water security and resilience in vulnerable regions.
- **Soft loans or concessional financing:** The World Bank's International Development Association (IDA)[164] provides concessional loans for rural and urban water supply projects in low-income countries with long maturities and low interest rates.
- **Microfinance and impact microloans:** Microfinance institutions like Grameen Bank (Bangladesh)[165], SEWA Bank (India), BRI (Indonesia), and VBSP (Vietnam) provide household loans to finance water connections and sanitation facilities.

3. Final Remarks and the Way Ahead

The compilation and structured analysis of these financing and economic instruments provide Water Oriented Living Labs (WOLLs) with a clear, comparative framework for identifying the most suitable tools to advance water security, resilience, and sustainability objectives. By detailing definitions, advantages, limitations, and conditions for effective use, the document serves as both a knowledge base and a practical reference to support decision-making. It can help policy-makers, water utilities, private investors, NGOs, and community

[163] https://www.worldbank.org/en/topic/environment/publication/accelerating-blue-finance-instruments-case-studies-and-pathways-to-scale
[164] https://ida.worldbank.org/en/financing
[165] https://www.britannica.com/money/Muhammad-Yunus

leaders to align financial strategies with environmental priorities, accelerate implementation, and foster collaboration across sectors.

In the coming years, the real-world potential of these instruments within the WOLLs will be explored in the framework of the Water4All's Pillar D subtasks D3.1, D3.2 and D3.4. The WOLLs are collaborative environments where stakeholders can co-develop, pilot, and refine approaches — generating evidence, best practices, and scalable models that can inform wider application across regions and contribute to long-term water resilience strategies. In other words, WOLLs are a type of entity whose characteristics allow for the evaluation of alternative financial strategies for the water sector that enable progress towards water resilience and sustainability.

Annex 1. Summary Table of Financing and Economic Instruments

A. Market and Trading Instruments

Instrument	Advantages	Limitations	Applicability
Water rights markets: regulated markets for buying or leasing water entitlements.	Promotes efficient allocation, conservation, and investment in efficient technologies.	Requires strong legal, monitoring, and governance systems; may affect equity; water commodification concerns.	Water-scarce basins with clear entitlements, active demand, and transparent trading frameworks.
Water quality credits: markets for pollution reduction credits among regulated entities.	Reduces compliance costs, fosters innovation, and encourages conservation practices.	Relies on robust verification and fair regulation; risks uneven benefits or local pollution.	Catchments with diverse pollution sources and regulatory caps creating credible trading demand.
Innovation and pre-commercial public procurement: public purchasing to foster new solutions.	Stimulates R&D, reduces risks, and aligns innovation with public water management needs.	Requires expertise, legal clarity, and long timelines with uncertain outcomes.	Contexts lacking market-ready solutions and allowing cooperation among public buyers.
Water efficiency credits: tradable units for verified water savings or reuse measures.	Creates financial incentives for efficiency, reuse, and conservation investments.	Requires precise verification; weak oversight may cause double counting or low trust.	Water-stressed regions with measurable savings potential and market demand for credits.
Grant-based financial incentives: non-repayable funding for water efficiency, restoration, or innovation.	Reduces upfront costs and enables projects with high environmental or social value.	Dependency on external funds; inefficiency if project selection and monitoring are weak.	Projects delivering public goods, early-stage pilots, or actions supporting vulnerable groups.

B. Tariff, Fee, and Pricing Instruments

Instrument	Advantages	Limitations	Applicability
Polluter-pays fees and water abstraction charges: economic instruments internalising environmental costs of use and pollution.	Encourages efficient water use, reduces pollution, and generates revenue for management/ restoration.	Requires strong monitoring and administration; may face social resistance or inequitable impacts.	Regions with stressed water resources, defined usage rights, and transparent regulatory systems.
Tiered tariff systems: progressive rates charging higher prices for greater consumption to ensure affordability and equity.	Protects essential access, promotes conservation, and supports utilities' financial sustainability.	Involves complex design and billing; may face social resistance and affect large families unfairly.	Areas with reliable metering, diverse users, and affordability concerns requiring social safeguards.
Dynamic pricing based on supply-demand or quality parameters: variable tariffs reflecting real-time scarcity or demand.	Optimises demand, links prices to resource conditions, and improves operational efficiency.	Requires advanced metering and data systems; may be perceived as unpredictable or unfair.	Service areas with fluctuating demand, strong digital infrastructure, and informed consumers.
Green or sustainable tax incentives: fiscal benefits encouraging investment in water-efficient and sustainable practices.	Stimulates private investment and long-term stewardship through cost reductions and fiscal rewards.	Benefits wealthier actors; depends on clear rules, verification, and awareness among stakeholders.	Contexts where market adoption of water-friendly practices is constrained by cost barriers.

C. Collaborative and Co-Financing Instruments

Instrument	Advantages	Limitations	Applicability
Co-investment funds pooling public and private capital: financial mechanisms pooling multiple investors to finance water projects.	Mobilises diverse capital, shares risks, and strengthens financial capacity for large initiatives.	Involves complex governance and coordination; may face conflicting public-private priorities.	Large-scale or basin-wide projects requiring shared financing and long-term cross-sector goals.
Blended finance platforms combining grants, loans, and equity: structures merging public, donor, and private funds to de-risk projects.	Leverages concessional capital, improves bankability, and aligns social and financial outcomes.	Demands complex structuring and transparency; risks dependency on concessional finance.	Capital-intensive projects with public benefits but low commercial returns needing risk mitigation.
Community-based savings and credit groups: local associations pooling savings and offering micro-loans for water services.	Builds local ownership, accountability, and financial resilience for small-scale projects.	Has limited capacity for major investments; depends on governance and member stability.	Rural or peri-urban communities with limited formal credit access but strong local networks.
Crowdsourcing platforms linked to rewards: digital systems engaging public contributors for data, ideas, or actions.	Expands participation, awareness, and innovation at low cost through collective engagement.	Produces variable data quality; sustaining motivation requires effective incentives.	Awareness campaigns, citizen science, or innovation challenges with large, connected audiences.
Self-enforcing financial agreements: contractual arrangements relying on internal incentives for compliance.	Reduces enforcement costs, builds trust, and supports adaptable long-term cooperation.	Requires balanced benefits and credible deterrents; complex when interests diverge.	Shared basins or recurrent exchanges where mutual dependency sustains ongoing collaboration.

D. Results-Based Instruments

Instrument	Advantages	Limitations	Applicability
Payment for ecosystem services schemes: voluntary mechanisms rewarding land or resource managers for sustaining ecosystem services.	Creates economic incentives for conservation and long-term resource stewardship.	Requires clear rights, robust verification, and reliable funding to ensure real outcomes.	Watersheds where upstream practices directly affect downstream water quality or supply.
Outcome-based contracts: agreements linking payments to verified, measurable results (e.g., water savings, pollution reduction).	Ensures accountability, promotes efficiency, and aligns incentives with performance.	Demands strong monitoring, baseline data, and clear metrics; preparation can be lengthy.	Projects with quantifiable results, such as pollution reduction or water efficiency gains.
Impact investing funds targeting water resilience outcomes: investment funds supporting projects delivering measurable impact and returns.	Mobilises private capital and scales solutions combining financial and social benefits.	Requires complex measurement, high due diligence, and balance between impact and profit.	Markets with viable business models delivering measurable environmental and social outcomes.
Development impact bonds or social impact bonds: contracts where private investors fund projects repaid upon verified success.	Links returns to outcomes, attracts private capital, and drives innovation and efficiency.	Involves complex structuring and verification; may exclude hard-to-measure interventions.	Contexts with clear, measurable outcomes and committed outcome funders sharing risks.

E. Risk Management Instruments

Instrument	Advantages	Limitations	Applicability
Insurance products linked to water risks: financial tools transferring losses from water-related shocks (drought, flood).	Provides rapid recovery funding and incentives for proactive risk management.	Premiums can be high; needs reliable data and may face basis-risk mismatches.	Regions exposed to recurrent droughts or floods requiring predictable recovery finance.
Catastrophe bonds or resilience bonds: securities transferring disaster risk to investors while funding resilience.	Delivers large-scale liquidity and links financing to measurable risk reduction.	Demands complex modelling and setup; basis-risk and transaction costs may arise.	Areas highly exposed to infrequent but severe water disasters needing rapid capital access.
Risk pooling or guarantee mechanisms: mechanisms reducing investment risks to ease credit access.	Improves bankability, lowers borrowing costs, and mobilises private finance.	Requires strong governance and capitalisation; moral-hazard and admin burdens possible.	Markets with viable projects facing high perceived risk or limited financing track record.

F. Debt and Equity Instruments

Instrument	Advantages	Limitations	Applicability
Green and sustainability bonds specifically earmarked for water projects: fixed-income tools mobilising capital for water sustainability.	Mobilises large-scale capital and enhances issuer credibility with ESG-focused investors.	Requires strong governance, reporting, and adherence to credible green standards.	Large portfolios with measurable environmental gains and transparent project selection.
Soft loans or concessional financing from development banks or green funds: loans offered on below-market terms to support water projects.	Lowers financing costs, improves affordability, and attracts complementary investment.	Limited availability; lengthy approval and potential long-term dependence.	Capital-intensive projects in low-income or high-risk regions needing affordable finance.
Microfinance and impact microloans: small-scale loans expanding access to safe water and sanitation for low-income users.	Increases household access, builds credit history, and supports inclusive service delivery.	Interest rates can remain high; requires strong local partners and borrower assessment.	Communities with limited banking access and viable small-scale WASH investment needs.

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