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FUNDING WATER SECURITY

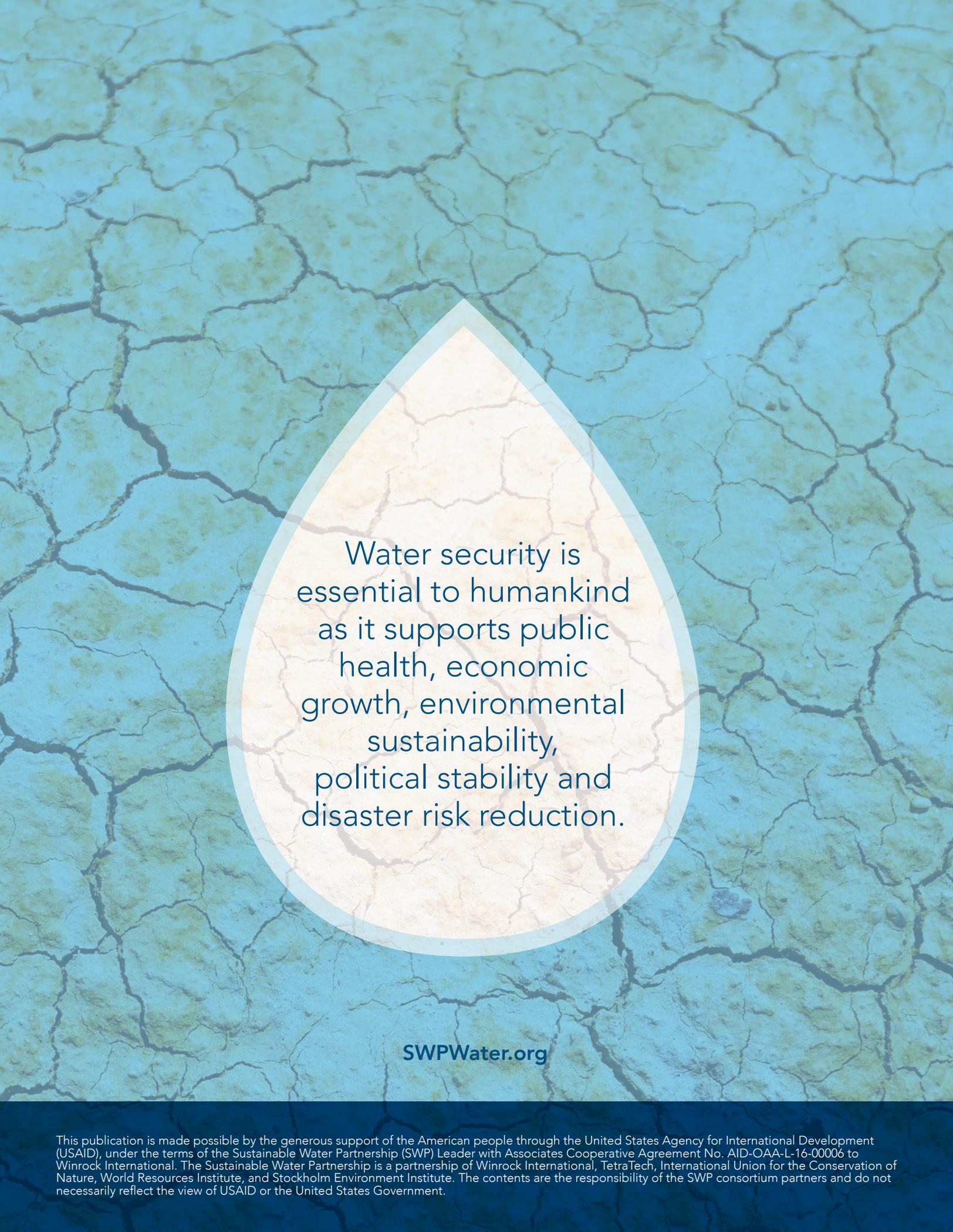
Toolkit #4



This series of toolkits presents an effective and efficient process to address risks to water security, both long-term water stresses that constrain socioeconomic development and threaten political stability, as well as sudden shocks that can endanger the health and livelihoods of vulnerable populations. These toolkits aim at disseminating the practice of water management. Local decision-makers as well as development specialists should use these toolkits as guidelines to engage water users in a collaborative process that results in improved water resources management.



The CEO Water Mandate



Water security is essential to humankind as it supports public health, economic growth, environmental sustainability, political stability and disaster risk reduction.

SWPWater.org

PREFACE

Water Security Is Essential to Life and Humankind, by Supporting:



Public health: Safe drinking water, sanitation, and hygiene (WASH) are the most fundamental human needs.



Economic growth: Income generation and poverty alleviation heavily rely on water availability for agriculture, energy production, transportation and other livelihood activities.



Environmental sustainability: Natural ecosystems rely on water; they rapidly deteriorate when deprived of natural flows, directly affecting public health and livelihoods.



Political stability: When basic health and livelihood needs are not met, the strain on populations affects the legitimacy and sustainability of governing authorities and can lead to civil unrest.



Disaster risk reduction: Floods, landslides, droughts, tsunamis, and harmful algal blooms can be catastrophic events that claim lives, affect local economies, and may multiply due to climate variability and change.

Population growth, urbanization, industrialization, rising living standards and Westernized diets are likely to further increase the over-extraction and pollution of water resources. This will raise insecurity and uncertainty over water access and the vulnerability of communities and infrastructure to natural disasters.

This **series of toolkits** presents an effective and efficient process to address water risks, including long-term water stresses that constrain social and economic development and sudden shocks that can quickly jeopardize the health and livelihoods of vulnerable populations.

Improving water security is about focusing actors and resources on key water risks. It is also about collaboratively planning and implementing specific activities to mitigate risks and provide tangible benefits to water users. Water security activities should combine gray and green infrastructure (including improved operation and maintenance of existing infrastructure), awareness raising and behavior change campaigns, management as well as policy and institutional improvements (such as better data and better informed decision-making).

Improving water security must be a cross-sectoral theme. Development strategies and investments that ignore water security usually fall short of their objectives when water issues and conflicts undermine political and social cohesion, supply and value chains, public and environmental health, and service delivery and infrastructure operation.

The Water Security Improvement (WSI) Process



Confirm and initiate



STEP 1

Define geographic/technical/institutional/temporal space (Toolkit #1)



STEP 2

Assess water risks (Toolkit #2)



STEP 3

Prepare water security action plan (Toolkit #3) and fund it (Toolkit #4)



STEP 4

Implement water security actions (Toolkit #5)



STEP 5

Monitor, evaluate and adapt (Toolkit #6)



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Water security is the adaptive capacity to safeguard the sustainable availability of, access to, and safe use of an adequate, reliable, and resilient quantity and quality of water for health, livelihoods, ecosystems, and productive economies.

EXECUTIVE SUMMARY

Funding is essential to translate the WSI process into activities that provide tangible benefits to water users. Funding must be identified and secured early to:

1. Cover the costs of the assessment and planning steps

2. Be the “reality check” for action planning (only funded activities will be implemented)

Financing can come from government taxes, user tariffs, international aid transfers, and private-sector investments. The type of water security activity often determines the type of financing that will be most readily available.

FUNDING TYPE	DESCRIPTION	ADVANTAGES	DISADVANTAGES
<p>Government spending (mostly from taxes)</p> <p>From citizens and companies (income, VAT, customs, etc.) paid to government entity</p>	<ul style="list-style-type: none"> • Mostly fund construction/rehab. of water/irrigation networks/structures (capital investments for public utilities/agencies) • Also fund operations and maintenance (O&M) costs (e.g., staff, maintenance, spare parts) as subsidies to public utilities/agencies • Used for some management activities (e.g., water monitoring), but rarely for green infrastructure or awareness-raising 	<ul style="list-style-type: none"> • Main funding; enables availability of basic water/irrigation services and water management activities • Used as a form of social welfare 	<ul style="list-style-type: none"> • Depends on fiscal health of country, which can vary and be unreliable • Subject to poor or corrupt water sector governance • May distort market value
<p>Tariffs/User fees</p> <p>Paid to water/irrigation utility by customers</p>	<ul style="list-style-type: none"> • Mostly cover some to all O&M costs of water utilities and irrigation agencies • Rarely contribute to capital investments or other activities 	<ul style="list-style-type: none"> • Enable direct economic valuation of water services • Reduce reliance on government subsidies 	<ul style="list-style-type: none"> • Depending on tariff and fee amounts and structures, can encourage or discourage better water use behaviors
<p>Transfers: International funds</p> <p>Loans, grants, donations from multilateral and bilateral donors and foundations</p>	<ul style="list-style-type: none"> • Usually complement government spending, notably to fund capital investment projects • Often used for construction/rehabilitation of water and irrigation structures and networks 	<ul style="list-style-type: none"> • Available to financially constrained countries • Often integrated projects that cover activities other than infrastructure 	<ul style="list-style-type: none"> • May create a culture of dependency and room for official corruption • Cannot cover recurrent O&M costs
<p>Private-sector investments (private infrastructure, concessions, water bonds)</p>	<ul style="list-style-type: none"> • Build-operate-transfer, concessions, service contracts, and other private-sector outsourcing for construction/rehabilitation and O&M of water networks and structures 	<ul style="list-style-type: none"> • Large source of water sector investment; decreases the tax burden on traditional funding source 	<ul style="list-style-type: none"> • Expect returns on investment • May ignore poor areas/neighborhoods • Require solid regulation and creditworthiness
<p>Philanthropy or corporate social responsibility; other funds expecting non-financial returns</p>	<ul style="list-style-type: none"> • Sometimes used to fund construction/rehabilitation of small water infrastructure • Can improve O&M of water utilities through twinning and technology transfer solutions 	<ul style="list-style-type: none"> • Makes new funds available for the water sector; can develop long-term partnerships 	<ul style="list-style-type: none"> • Usually limited amounts • Expects returns on branding/image

Engaging potential financiers early in the WSI process is essential because:

The clarification of financial capacity focuses the WSI process accordingly to develop affordable water security activities.

Many financiers articulate the types of actions (e.g., gray and green infrastructure, social or institutional improvements) they are willing to support.

Most financiers require specific analyses and justifications to provide funding, and these elements must be part of the design, review and selection of water security activities.

Furthermore, as water stakeholders realize the expected benefits of water security activities, they may be able to attract or set up additional financing sources.

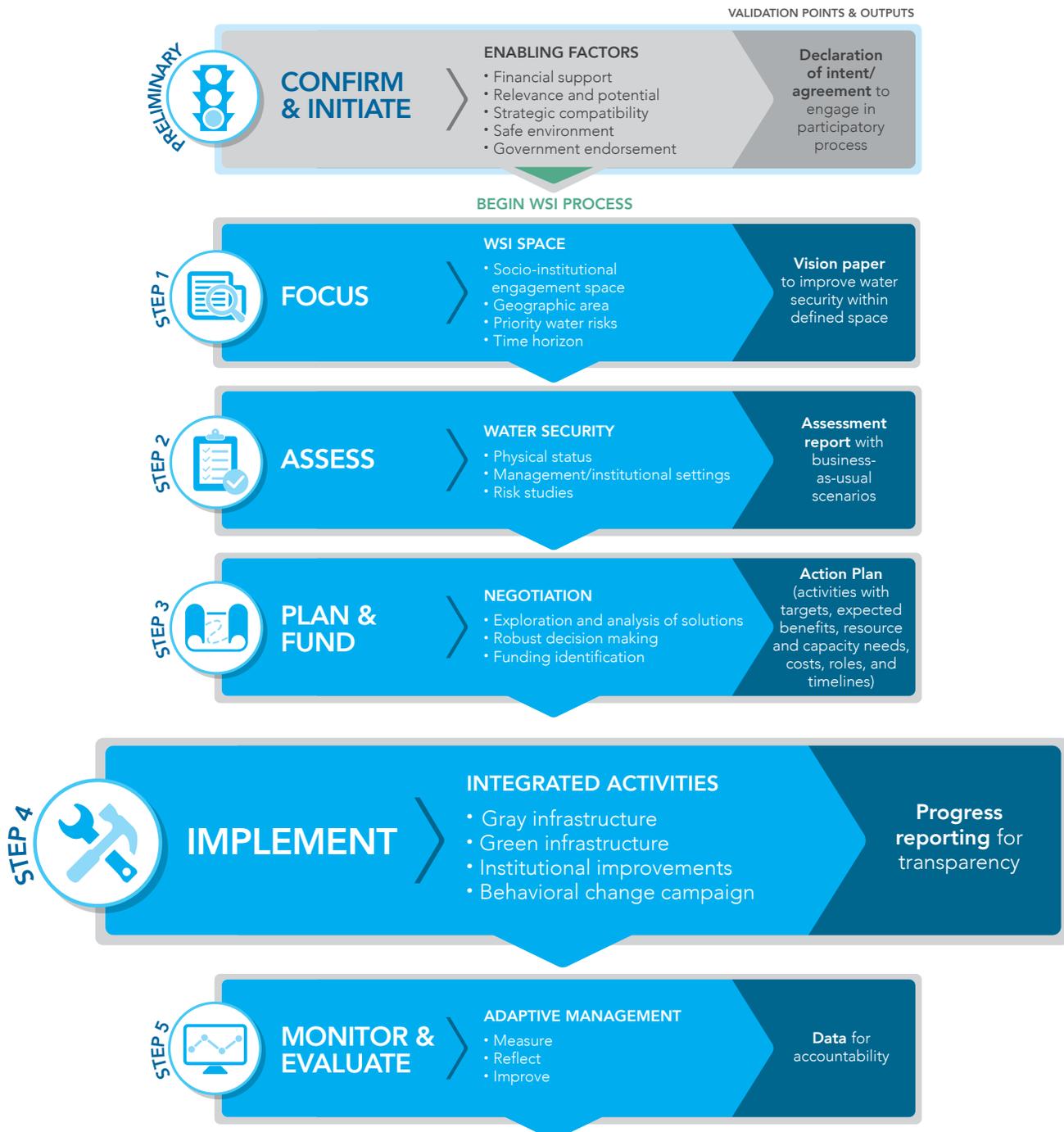
Charging for water services—even water management services such as monitoring—allocates water costs to water users. It also changes perceptions such as “water is or should be free” and behaviors leading to waste and pollution.



INTRODUCTION

The WSI process involves the inception phase and five steps: define the WSI space; assess the situation; plan and secure financing; implement water security activities; and monitor progress. This toolkit covers Step 4: Funding and is designed to improve stakeholder capacity to investigate and evaluate the current and possible sources for funding water security activities in a geographic focus area. This toolkit **has three objectives:**

1. Discuss water security funding
2. Describe the main funding sources and their availability for the different types of water security activities
3. Explain how to justify funding through a review and assessment of costs and benefits



– REPEAT, DISSEMINATE, SCALE UP –

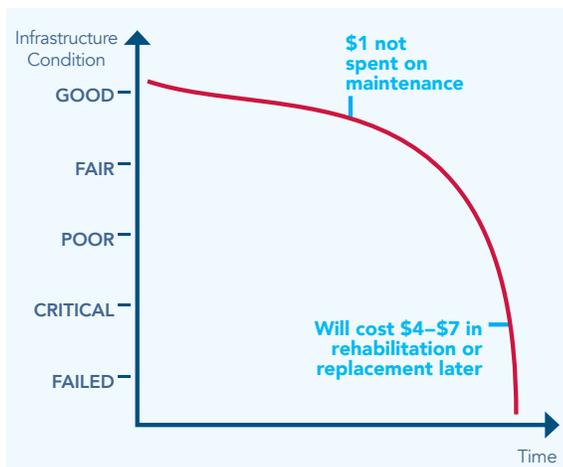


FUNDING WATER SECURITY ACTIVITIES

Regardless of the type of water security activities, all require the mobilization and use of staff, capacities, equipment, and, most critically, financial resources.

Comparative Costs of the Four Types of Water Security Activities

1. **Gray infrastructure** tends to be the most common response to water security risks, but it is also the most expensive, with frequent construction overruns and recurring O&M costs to prevent rapid decay of the structures. Insufficient O&M budgeting results in inadequate maintenance, or no maintenance at all, which leads to rapidly decreasing performance and much higher rehabilitation or replacement costs.
2. **Green infrastructure** can be more cost-effective (e.g., retention and infiltration ponds are simpler and more affordable than conventional piped stormwater drainage) and usually requires much less maintenance.
3. **Behavior change**, especially in terms of water demand management, is much less expensive than increasing the supply through additional storage, diversion, and conveyance structures. Similarly addressing polluting practices is cheaper than expanding wastewater treatment capacities.
4. **Institutional and management improvements** can significantly mitigate water risks by optimizing the use of existing assets. For example, involving water users in the development and implementation of water security activities reduces the cost of data collection, focuses funds and resources on the most significant issues, secures support for implementation, and reduces operations and maintenance issues.



TYPE OF ACTIVITY	ILLUSTRATIVE FUNDING NEEDS
GRAY INFRASTRUCTURE: construction and O&M of diversion (weirs, barrages), storage (dams), conveyance (canals, pipes) and distribution structures (gates, valves), water and wastewater treatment plants, and desalination systems	<ul style="list-style-type: none"> • Costs of design, planning, and compliance (administrative, environmental, and engineering standards) • Capital investment for construction • Running costs for operations (staff salaries, benefits, and training; facilities; equipment) and maintenance (equipment, spare parts, fuel and other consumables)
GREEN INFRASTRUCTURE: agroforestry, afforestation, and forest conservation; wetland/ecosystem restoration and conservation; vegetation/bio-structural engineering; rain gardens, bioswales, permeable cement, and green roofs	<ul style="list-style-type: none"> • Costs of design, planning, and compliance (administrative, environmental, and engineering standards) • Capital investment for implementation • Running costs for monitoring (staff salaries, benefits, and training; facilities; equipment) and maintenance (equipment, spare parts, fuel and other consumables)
POLICY/INSTITUTIONAL AND MANAGEMENT: enforcement of water and related laws, decrees, bylaws, policies; preparation/implementation of water strategies and plans; water resource monitoring; collection of water taxes, tariffs, and fees; enforcement of water and land rights and water permits; regulation of water services	<ul style="list-style-type: none"> • Costs of design, review, promulgation, and dissemination • Running costs for enforcement (staff salaries, benefits, and training; facilities; equipment) and maintenance (equipment, spare parts, fuel and other consumables)
SOCIAL AND BEHAVIORAL: awareness-raising and social marketing campaigns; capacity-building of water users; collective action; education and curriculum development	<ul style="list-style-type: none"> • Costs of design, review, and material production • Running costs for implementation and monitoring (staff salaries, benefits, and training; facilities; equipment) • Grants programs

Funding Gap

In many countries, the costs of providing reliable and adequate water to users significantly exceed the available funding, which usually comes from 1) government budget and 2) tariffs and fees. For example, the cost of achieving universal access to safe, affordable water and sanitation services by 2030 (Sustainable Development Goals 6.1 and 6.2) has been estimated at more than \$1 trillion, or more than \$100 billion per year. This is three times the current level of worldwide spending (according to the 2017 UN-WHO Global Analysis and Assessment of Sanitation and Drinking-Water Report). This necessary investment represents only the cost of household water security. It does not address the broader costs of water management, such as monitoring, allocating, and preserving water resources; improving water use efficiency (notably for food and energy production); and protecting populations and ecosystems from water risks and natural disasters.

Securing additional funding for improving water security must rely on a combination of:

- Improved public finance management
- Increased cost recovery (to be balanced with fair pricing for poor user groups)
- Amplified private sector investments
- Better public understanding and acceptance that water services have costs

Securing additional funding for improving water security ultimately relies on improving the technical, operational, and commercial efficiency of public agencies and utilities to:

- Address the vicious cycle of low financial viability and degrading infrastructure
- Improve the quality of water services, which will raise customers' willingness to pay (as well as collection rates and acceptance of higher tariffs)
- Increase the attractiveness of the water sector for private lenders and entrepreneurs





SOURCES FOR FUNDING WATER SECURITY ACTIVITIES

Traditionally, funding for water security activities comes from four broad sources:

1. Government/public spending (i.e., income, property, sales, and corporate taxes paid by the public): These can be capital investments for infrastructure construction or subsidies such as governmental budget allocations to water utilities or irrigation agencies, as well as tax relief (waived taxes from credits and deductions).
2. User tariffs and fees: These are paid by customers to utilities and other service providers for delivery of drinking water, sewage, and/or irrigation services (metered or connection charges), as well as water use charges for abstraction, effluent release, or recreational permits (e.g., boating and fishing).
3. International aid transfers (e.g., loans, grants, and donations from multilateral and bilateral donor organizations): These are often used as capital for large construction projects.
4. Private (commercial and philanthropic) investments in the water sector: These can be a significant source of funding for infrastructure, technology, and services, but investors will expect returns on investment (e.g., profits or branding/image benefits).

Water as a Resource and/or Service

There are different perspectives about how to mobilize water funding, depending on if the water is considered as a resource or a service, a right or a commodity:

1. Water as a (public) resource to be managed, developed, and subsidized for the benefit of all users
2. Water as a (private) service to be provided to and paid for by specific users/customers

Funding for water security activities often combines both perspectives and depends on government priorities and policies:

- Building a drinking water supply network or a sewer system provides a service but also contributes to public health and supports socioeconomic development; construction can be entirely or partially subsidized, or partially or entirely recovered through tariffs.
- Funding the O&M of such a system is also a policy decision. It is often considered good practice to have users pay for most if not all O&M costs, considering that the service improves their wellbeing and livelihoods, thus ensuring their capacity to pay.
- Building/improving and operating/maintaining an irrigation system provides a service, but subsidizing construction investment and some O&M costs can be justified by the need to ensure food security and other concerns.

There are two additional policy questions:

1. Should all water expenses be covered by water revenues? Increasing cost recovery is desirable, but full recovery of both capital and operating costs is often challenging due to the limited financial capacity of populations (notably in peri-urban and rural areas) and the social dimension of water. As noted above, some water security activities (e.g., planning, allocation, flood protection, monitoring water resources and ecosystems, and disaster risk reduction) are public in nature because they benefit all, not specific customers. These activities are generally covered through government funding (coming from direct and indirect taxes and other sources of revenue).
2. Should water revenues be earmarked for water expenses? This is also desirable because it allows greater transparency and accountability by comparing revenues and expenses. It also prevents appropriation of water revenues for non-water purposes.

Government/Public Funding

Although government funding should ensure more equitable coverage of all users, it tends to:

- Get lost in generic governmental budgets without clearly showing how much goes where
- Be insufficient and unreliable, as public funding is stretched and faces competing priorities
- Be presented as subsidies but not be sufficiently targeted toward needy populations
- Lead to water user complacency ("free water") in the form of wastage and pollution



Tariffs and Fees

Tariffs and fees are more direct, predictable sources of revenues. Tariffs and fees should use a block structure or targeted rebates to ensure service for poor disadvantaged groups. A step block tariff includes different volumetric rates, with lower rates for small levels of consumption (less than 5-10 m³/ month/ household), and higher and increasing volumetric rates over that. Assuming proper service and metering, this pricing structure provides cross-subsidies from larger users (assumed to be better off) toward smaller users (supposedly poorer).

Tariffs and fees also provide incentives to influence the behaviors of customers to conserve and preserve water resources. The “user pays” and “polluter pays” principles can achieve longer-term, sustainable water security by emphasizing cost recovery. “User pays” increases appreciation for water supply and management costs, and “polluter pays” ensures accountability for negative impacts to outside parties. Increased cost recovery can attract private-sector investments, but also requires regulation to balance quality of services and profits.

“User or Polluter Pays” Principles

- User pays: The water user pays the full cost of the water service (O&M, and possibly capital investment).
- Polluter pays: The water polluter pays the full cost of treating its wastewater effluent. This transfers the cost of depollution to the responsible parties to compensate for negative externalities (i.e., impacts to others).

TARIFF/FEE	PURPOSE	MODALITIES
Household water tariffs	<ul style="list-style-type: none"> • To cover costs of utility to extract, treat, convey, and deliver drinking water (capital and O&M costs) • May also include wastewater component (cost of collecting and treating) 	<ul style="list-style-type: none"> • Can be flat, volumetric, or block/tiered (varying with time and amount of use) • Can include fixed charges (to recover capital costs) and initial connection costs
Irrigation tariffs	<ul style="list-style-type: none"> • To cover costs of irrigation entity to extract, convey, and deliver water (capital and O&M costs) 	<ul style="list-style-type: none"> • Can be flat, per area, possibly adjusted per crop type (as some crops require more water) or volumetric
Abstraction/release fees/permits	<ul style="list-style-type: none"> • To cover costs of water management (monitoring, allocation) and side effects (wastewater treatment, increasing scarcity) 	<ul style="list-style-type: none"> • Can be surcharge to water transactions (% on customers’ water bills) • Can be specific permit for withdrawing raw water, releasing untreated effluents, etc. • Can be for non-consumptive uses (recreation and tourism, such as fishing, boating, water sports)

Water Management in Morocco

Nine river basin agencies are responsible for the management of water resources in Morocco.

Their responsibilities include:

- Authorizing water abstractions and wastewater discharges
- Providing financial help and technical assistance to service providers for the prevention of water pollution and the efficient use of water resources
- Monitoring the quality and quantity of surface and groundwater, and managing water-related emergencies
- Increasing public awareness about water resources

To fund their activities, the river basin agencies collect charges for abstraction (from municipal utilities and irrigation agencies, which add these to the tariffs they charge their customers) and effluent discharges. Both are based on the “user pays” and “polluter pays” principles. However, these fees are insufficient to fund the agencies, which remain subsidized by the government.

Donor Funds

International fund transfers (i.e., development aid) can be grants or donations from bilateral agencies or NGOs and foundations, as well as soft loans (i.e., loans with grace periods and rates below market levels) from multilateral banks. These funds can be conditioned by donor priorities more than the actual needs of the receiving countries. They may also require the recipient agencies or governments to make institutional and policy adjustments prior to the disbursement.

Private Funding

Entrepreneurs and lenders are always searching for business or lending opportunities. They of course look for profits and want to minimize risks. A sound water sector can provide reasonable profits with manageable risks, but requires reliable funding flows, clear institutional roles and responsibilities, operating legal and judicial systems, and proper regulations to ensure reasonable profits and high-quality water services. Therefore, improving the technical operational and administrative performance of public water services is a prerequisite to attracting private funding.

Private actors may also fund water security interventions without direct financial returns. Examples include addressing risks to supply and value chains (e.g., risks of conflicting water access or decreasing water quality), or conducting activities for philanthropic or branding purposes. Corporate social responsibility is about funding visible charitable activities that provide image/branding benefits that will make customers more likely to favor the funding company and purchase its products or services.

A different type of private financing is “Payment for Environmental/Ecosystem Services”. These are incentives (conditional payments to voluntary providers) offered to farmers or landowners in exchange for managing their land to preserve ecological services (e.g., soil retention, groundwater recharge, water purification, regulation of natural resources, fresh air and water, natural medicines, cultural/recreation services, etc.) by reforestation, protecting biodiversity, favoring native plant species, and reducing intensive farming.

Blended Finance

Attracting private funding often requires first engaging public and/or donor funding to then leverage commercial finances. This means building the O&M and financial creditworthiness of potential borrowers (i.e., water utilities) and improving the awareness and technical savviness of lenders. Revolving funds, described in the box below, have been a successful blended finance approach.

The table on the next page summarizes the five types of funding. It shows their advantages and disadvantages, and their application to the four types of water security activities.

Payments for environmental/ecosystem services (PES)

Most notable examples of PES programs are:

- The United States’ Conservation Reserve Program, which pays about 750,000 farmers and landowners \$2 billion a year to keep about 35 M acres (140,000 km²) under “long-term, resource-conserving covers to improve water quality, control soil erosion and enhance habitats for waterfowl and wildlife.
- The Chinese ‘Grain of Green’ program, which involves 125 M people in 25 provinces and covers 15 M ha of farmland and 17 M ha of barren mountainous wasteland that were converted back to natural vegetation as “environmentally-sensitive land”.
- Costa Rica’s PES program, *Pagos por servicios ambientales (PSA)*, the first PES program to be implemented on a national scale in 1997. It recognizes four environmental services: mitigation of greenhouse gas emissions, hydrological services, biodiversity protection, and provision of scenic beauty. It is for example estimated that forest cover area increased by over 2 M ha as a result of this program.



EXAMPLES OF WATER SECURITY ACTIVITIES TO BE FUNDED

TYPE & DESCRIPTION	WATER SECURITY GRAY INFRASTRUCTURE	WATER SECURITY GREEN INFRASTRUCTURE	WATER SECURITY BEHAVIOR CHANGE AWARENESS-RAISING
<p>GOVERNMENT SPENDING (MOSTLY FROM TAXES) From citizens and companies (income, VAT, customs, etc.) paid to government entity</p>	<ul style="list-style-type: none"> • Mostly fund construction/ rehab. of water/irrigation networks and structures (capital investments for utilities and other govt. agencies) • Also fund O&M costs (staff, maintenance, spare parts) as subsidies to public utilities/agencies 	<ul style="list-style-type: none"> • Rarely used to fund green infrastructure due to lack of capacity to design and implement and disbelief in the benefits from natural structures 	<ul style="list-style-type: none"> • Rarely used to fund communication and awareness-raising due to lack of capacity and belief in benefits from water user behavior change • Some utilities and public agencies have their own communication programs
<p>TARIFFS/USER FEES Paid to water/irrigation utility by customers. Also "user/polluter pays" fees to water mgt. entities (e.g., river basin agencies) for withdrawal/release permits</p>	<ul style="list-style-type: none"> • Rarely contribute to capital investments; cover some, most, or all O&M costs of water utilities and irrigation agencies 	<ul style="list-style-type: none"> • Rarely used to fund green infrastructure, but possible to use to protect upstream water sources (e.g., through reforestation) 	<ul style="list-style-type: none"> • Rarely used to support communication costs, but some water utilities and irrigation agencies have their own communication/ awareness programs
<p>TRANSFERS: INTERNATIONAL FUNDS Loans, grants, donations from multilateral and bilateral donors and foundations</p>	<ul style="list-style-type: none"> • Usually complement govt. spending, notably to fund capital investment projects • Often used for construction/rehabilitation of water and irrigation structures and networks 	<ul style="list-style-type: none"> • Can fund activities (e.g., erosion control, reforestation, soil and land management) in conjunction with or separate from other types of activities 	<ul style="list-style-type: none"> • Often fund community mobilization and capacity-building, and information, awareness-raising, and behavior change campaigns in conjunction with or separate from other types of activities
<p>PRIVATE SECTOR INVESTMENTS (PRIVATE INFRASTRUCTURE, CONCESSIONS, AND WATER BONDS) Often large investments, usually focused on water infrastructure</p>	<ul style="list-style-type: none"> • Build-operate-transfer, concessions, service contracts, and other private-sector outsourcing for construction/ rehabilitation and O&M of water networks and structures 	<ul style="list-style-type: none"> • Rarely fund green infrastructure, except possibly to secure/protect the water source 	<ul style="list-style-type: none"> • Can fund some information/awareness raising as part of water utility communications towards customers
<p>PHILANTHROPY OR CORPORATE SOCIAL RESPONSIBILITY (CSR) OTHER WATER FUNDS, EXPECTING NON-FINANCIAL BENEFITS Payment for Ecosystem Services (downstream users/entities paying upstream users for preserving water quality/ quantity)</p>	<ul style="list-style-type: none"> • Sometimes used to fund construction/ rehabilitation of small water infrastructure • Can improve O&M of water utilities through twinning and technology transfer solutions 	<ul style="list-style-type: none"> • Can fund small-scale green structures (e.g., for water source protection, reforestation, erosion control) 	<ul style="list-style-type: none"> • Usually funds some information/awareness-raising activities but focused on improved branding/image as return on investment • Can fund some awareness-raising activities (e.g., improved land use/management, agricultural best practices)

WATER SECURITY INSTITUTIONAL IMPROVEMENTS	ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • Somewhat fund water monitoring (surface and groundwater, quantity and quality), but often underfunded • Rarely provides substantial funding for strategic planning or forecasting, regulation and enforcement, water rights management, or staff training 	<ul style="list-style-type: none"> • Main funding; enables availability of basic water/irrigation services and water management activities • Used as a form of social welfare 	<ul style="list-style-type: none"> • Depends on country's fiscal health, which can vary and be unpredictable • Subject to poor or corrupt water sector governance • May distort market value of water services
<ul style="list-style-type: none"> • Can be used by water utility/agency to train staff 	<ul style="list-style-type: none"> • Provide for a more straightforward & economic valuation of water services • Reduce need for public subsidies, provide more reliable revenues • Can incentivize better water use practices 	<ul style="list-style-type: none"> • Depending on tariff and fee amounts and structures, may or not ensure cost recovery, and may or may not encourage better water use behaviors
<ul style="list-style-type: none"> • Often fund discrete efforts (e.g., strategic planning or staff training) in conjunction with or separate from other types activities • Rarely cover long-term costs such as regulation and enforcement, water rights management 	<ul style="list-style-type: none"> • Available to financially limited or constrained developing countries • Often integrated projects that cover activities other than infrastructure 	<ul style="list-style-type: none"> • Create culture of dependency and room for official corruption • Must be spent according to donor priorities • Cannot cover recurrent O&M costs • Can vary, not reliable
<ul style="list-style-type: none"> • Can fund some strategic planning and staff training as part of improved water utility operations 	<ul style="list-style-type: none"> • Large potential source of water sector investme 	<ul style="list-style-type: none"> • Expect returns on investment • May focus on well-to-do areas & ignore poor neighborhoods • Requires solid regulation to ensure service quality and compliance • Requires credit-worthiness
<ul style="list-style-type: none"> • Can fund training, study tours, water monitoring (e.g., of corporate water withdrawal/release activities) • Can support management efficiency gains 	<ul style="list-style-type: none"> • Makes new funds available for the water sector • Can develop long-term partnerships 	<ul style="list-style-type: none"> • Usually limited amounts • Expects returns on branding/image

FUNDING JUSTIFICATION

Any water security activity can only get funded when there is clear justification that the expected benefits significantly exceed the costs. Different types of cost-benefit analyses can be performed, but eventually these all rely on a proper inventory and evaluation of costs and benefits directly or indirectly generated by the given activity. Such analyses are also useful when comparing and selecting water security options to optimally allocate limited funding resources.

Discussing funding and engaging potential financiers in the WSI process is essential because:

- **DETERMINING AVAILABLE FUNDING ALLOWS TO FOCUS THE WSI PROCESS ACCORDINGLY** and develop action plans that are commensurate with funding.
- **MANY FINANCERS ARTICULATE THE TYPES OF ACTIVITIES** (e.g., gray and green infrastructure, social or institutional improvements) they are willing to support.
- **MOST FINANCERS REQUIRE SPECIFIC ANALYSES AND JUSTIFICATIONS TO PROVIDE FUNDING**, and these elements must be part of the design of solutions or be carried out subsequently.



If funding is limited, the magnitude of water risks and of expected benefits from specific activities may lead the stakeholders to reach out, attract or set up additional financing sources to support implementation.

Types of Costs of Water Security Activities

Beyond the initial costs of supporting the WSI process (e.g., consultants, experts, and facilitators), implementing water security activities involves initial and running costs. Initial financial costs include:

- Study (e.g., feasibility, environmental/safety compliance) and design
- Construction (infrastructure activities, as well as land acquisition) and procuring materials and equipment
- Information, awareness-raising, and training/capacity-building

Running costs occur over time and include:

- Operations: staff salaries and benefits; possibly accommodations and training; facility rental and utility costs; and other input costs (e.g., office furniture and supplies, vehicles, and fuel)
- Maintenance costs, (e.g., inspection, care, and servicing of equipment, including procurement of materials and spare parts)

Examples of Negative Externalities

- A dam is a straightforward but expensive solution to store water for dry spells, protect against flooding, and generate energy. However, reservoirs inundate fertile valleys, trap sediments that clog the reservoir and no longer fertilize downstream fields, reducing fishing and other income-generating/recreational opportunities. Some communities will benefit from the increased water supply, but will they use it efficiently? What about those communities who will lose their livelihoods?
- An embankment protects from floods, but where does floodwater go when the embankment prevents it from expanding? What if floodwaters breach the embankment?
- A sewer collects and evacuates wastewater, but what happens downstream of the discharge point?
- A desalination plant provides fresh water, but what about the brine?
- Lining an irrigation canal reduces leaks, but what happens to farmers irrigating from an aquifer fed by these losses?
- Converting from flood to drip irrigation saves water and labor, but what happens to landless laborers?

Beyond financial costs, which require direct funding, any activity also incurs economic costs, that is implicit costs that impact the economy and should be considered from an economic optimization perspective. These include:

- **OPPORTUNITY COSTS:**

Foregone benefits due to the activity (e.g., agricultural production returns from fields used to build a wastewater treatment plant); opportunity costs are zero when there is plenty of water (no alternative use), but increase when there is scarcity; economic misallocation occurs when opportunity costs are high and larger than the benefits from the activity (it means that another allocation or another activity would have provided higher returns)

- **NEGATIVE SOCIOECONOMIC EXTERNALITIES:**

Negative impacts to other parties, communities and entities besides the intended beneficiaries (e.g. effect of untreated wastewater on downstream users)

- **NEGATIVE ENVIRONMENTAL EXTERNALITIES:**

Negative impacts to ecosystems, wildlife, vegetation in other areas besides the intended benefitting areas





Types of Benefits from Water Security Activities

Water security activities provide different types of benefits, both direct and indirect. Direct benefits from improved water security include:

- Financial benefits such as increased agricultural or industrial productions
- Economic benefits such as better access to and quality of drinking water services, which directly improves public health, and livelihoods; and increased resilience to natural disasters such as floods and droughts
- Generic socioeconomic benefits such as poverty alleviation, employment/livelihood, food security, and religious or cultural occupations
- Environmental benefits such as preservation and enhancement of ecosystems, wildlife, vegetation which can preserve water and air quality, regulate natural resources, buffer flooding, provide soil nutrients, natural medicines, cultural/recreation services, etc. and improve public health, local livelihoods and economies

Most of these benefits can be quantified and valued, through increased incomes or through health parameters such as decreased disease and mortality rates. The benefits of disaster risk reduction can be valued in terms of avoided damage, such as loss of life, the cost of lost crops, property damage, and immediate and delayed losses for economic activities and livelihoods.

Indirect benefits are positive socioeconomic and environmental externalities such as for example, livestock watering from irrigation canals; groundwater recharge from irrigation losses, return flows or drainage; real estate value increase from river clean-up or restoration, etc. A specific example is how better access to water supports girls' attendance to school and thus education, which lowers the fertility rate and, therefore, population growth.

Some of these benefits can be difficult to quantify and value.

Benefits over time

Water services provided by gray infrastructure tend to degrade and require additional investments to continue operation. An interesting outcome from "soft" water security activities such as green infrastructure, behavior change campaigns, and policy/institutional improvement, is that their benefits may grow over time. For example, reforested areas will grow in impact and value, water users who adopt improved practices will convince their neighbors to do the same, and new water agencies will operate more effectively and efficiently, and carry out more functions.

Economic Analyses

Costs and benefits occur over time, so it is important to use a proper time frame for analysis. The duration of the activity (or the lifetime for infrastructure) is the most common time frame. Expected costs and benefits should be valued as best as possible and discounted in present value terms. Different types of analyses can then be used, such as cost-benefit (comparing costs and benefits) or cost effectiveness (comparing only costs to achieve a specific outcome).

Assessing water security activities in terms of quantified costs and benefits can provide justification in the form of economic efficiency. But this may fail to address other sustainability dimensions, such as social equity (*who pays and who receives benefits?*) or environmental soundness (*what will the impacts on ecosystems be?*). Ultimately, comparing and prioritizing these diverse and sometimes conflicting objectives is judgment call for accountable leaders.

RESOURCES

[Acteon \(2010\). Notes on Financing Water Resources Management: Background Report for the OECD Expert Meeting on Water Economics and Financing,](#)

Drawing on various examples from across the world, this background report uses the past experiences of countries and regional organizations with financing different sized water resources management projects to explain, or “illustrate”, the fundamentals of water resources management financing.

[Bennet, G. & Ruef, F. \(2016\). Alliances for Green Infrastructure: State of Watershed Investment 2016.](#)

This report captures the size, scale, and scope of market mechanisms for green infrastructure for water. The diversity and often local scale of such watershed investments sometimes obscures their true impact: Although there is not a unified market for transactions for watershed protection (unlike a compliance carbon market, for example), the value of these transactions is much larger, reaching nearly \$25 billion in 2015. As global leaders struggle to meet the challenge of minimizing and adapting to climate change while lifting 1.2 billion people out of extreme poverty this century, the programs tracked in this report offer critical lessons for addressing water risk in a sustainable, cost-effective, landscape-scale manner.

[EPA \(2012\). The Economic Benefits of Protecting Healthy Watersheds.](#)

[EUWI-FWG and Global Water Partnership \(GWP\) \(2012\). Unlocking Finance For Water Security: Building Capacities and Raising Awareness.](#)

This document reports on a series of regional workshops that were held to raise awareness of water professionals and officials of the tools and sources of finance needed for the range of water related interventions such as water supply, sanitation, water for sector uses (e.g. agriculture and energy), water resources management and ecosystems, that together provide ‘water security’.

All workshops had the following objectives: (1) To raise awareness on financing issues and build bridges between water management/water supply/sanitation and finance officials and experts; (2) To share knowledge and experiences of different types of finance by highlighting new mechanisms for financing and explaining linkages between finance and governance; (3) To find solutions by identifying economically and financially viable alternatives in multiple-objective water programs in order to meet social and political expectations; and (4) To devise follow-up mechanisms by identifying next steps to be taken at sub-regional, basin or national levels to enhance prospects for sustained investments.

[Global Water Forum Discussion Paper \(2013\). Water Finance: Preparing for the Next Critical Juncture.](#)

[GWP & OECD \(2015\). Securing Water, Sustaining Growth.](#)

This report is meant to guide investment in water security by: (1) Analyzing the economics of water security and growth, (2) Quantifying water-related risks, opportunities and trajectories, and (3) Illustrating and assessing pathways of investment in water security.

[GWP & World Water Council \(WWC\) \(2003\). Financing Water for All: Report on the World Panel on Financing Water Infrastructure.](#)

This report investigates how to find the appropriate financial resources for the achievement of the two Millennium Development Goals (MDGs) for water access and sanitation. It argues that such targets cannot be separated from the consideration of the financial needs of all different aspects of the water sector. These include all water uses, such as household water and sanitation, wastewater collection and treatment, irrigation and drainage, industrial water use,

hydropower and navigation, as well as resource management questions, such as watershed and river basin management, flood control, environmental protection, data gathering and climatic prediction.

GWP Technical Committee (2008). [Water Financing and Governance.](#)

Arguing that a more coordinated, coherent approach to water financing is essential if the water needs of millions of people are to be met on a sustainable basis, this report focuses on two related themes:

- Funding all of the water resources management functions needed to maximize the sustainable benefits from the water resource base,
- Examining the potential relationship between the different governance and organizational structures in the sector and the ability to secure the finance needed to provide essential water goods and services.

OECD (2013). [Water Security for Better Lives: A Summary for Policymakers.](#)

OECD (2012). [A Framework for Financing Water Resources Management.](#)

This report provides a framework to assess and strengthen the financial dimension of water resources engagement. It proposes four principles to frame financing strategies for water management. It also highlights implementation issues and outlines a staged approach to assess the financial status of water policies and to design robust financial strategies.

UNICEF & World Bank (2017). [Sanitation and Water for All: How Can the Financing Gap be Filled.](#)

This discussion paper covers the following aspects:(1) Estimating the costs and benefits associated with the SDG targets for WASH; (2) Using existing financial resources more effectively; (3) Accessing new resources; and (4) Taking action to close the SDG financing gap. It presents the three types of financial sources: taxes, tariffs, and transfers and also discusses the “user pays” and “polluter pays” principles.

UN-Water & WHO (2017). [UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water \(GLAAS\) 2017: Financing Universal Water, Sanitation and Hygiene Under the Sustainable Development Goals.](#)

This report analyses the current WASH finance situation in developing countries, with an assessment of funding gaps to reach targets, financial planning and government budgets, as well as different sources of WASH financing (taxes, transfers and tariffs) and expenditure allocations. The report considers how the targeting and use of existing financial resources can be improved as well as what cost recovery and pro-poor affordability schemes and measures can be deployed to reach those under threat of being left behind. It also discusses the distinction between water as a resource and water as a service.



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