

2026 United Nations Water Conference

Interactive Dialogue Concept Paper

Theme f: Investments for Water: Financing, Technology and Innovation and Capacity-Building

I. Introduction (500 words)

Water is the main primary avenue through which that climate change affects humanity. From severe floods to extended droughts, from saltwater intrusion to glacier retreat, the fast-growing climate crisis is greatly disrupting water systems around the world. The need to create climate-resilient water systems is more urgent than ever. This dialogue focuses on a key goal: making water systems strong enough to succeed in an uncertain climate through innovation, inclusion and investment.

The 2023 UN Water Conference was a turning point in global water governance. It produced the Water Action Agenda, which includes over 800 voluntary commitments. However, there is still a significant gap between these commitments and actual implementation. Current investment levels are far from what is necessary. The World Bank estimates that to achieve universal access to safely managed water and sanitation by 2030, we must triple current investment to USD 114 billion a year.¹ Meanwhile, the impacts of climate change are worsening faster than expected. Recent assessments show that water-related disasters have increased by 70% since 2000.² Structural inequities, weak recognition of customary water rights and lack of community authority over water resources compound climate impacts and undermine long-term resilience. Ensuring equitable governance is therefore a central problem driver.

This concept paper highlights that achieving climate-resilient water systems demands a fundamental change in perspective, moving away from reactive and fragmented efforts toward integrated, system-wide strategies that draw on diverse expertise across sectors. The key idea is that resilience cannot be built with infrastructure alone; it must grow from reimagined water governance that supports innovation, empowers local communities, draws in strategic financing, develops flexible knowledge systems and enacts bold policy reforms.

Five connected pillars support this approach. First, knowledge and innovation must use cutting-edge technologies, such as artificial intelligence, remote sensing and digital twins, along with traditional and local knowledge systems to create responsive, adaptable water infrastructure. Second, partnerships must go beyond traditional boundaries, promoting collaboration among governments, private companies, civil society, research institutions and communities. Third, empowering communities through education, skill-building and fair participation allows resilience strategies to be designed with the input of those most affected by water insecurity. Fourth, new financing methods must secure climate-aligned funding from public, private and combined sources, ensuring that investment reaches both large infrastructure projects and grassroots initiatives. Fifth, planning frameworks must incorporate climate uncertainty into all aspects of water policy, design and investment, creating systems that are flexible and ready to handle future challenges.

¹ World Bank. (2023). *Achieving universal access to water and sanitation by 2030: The role of blended finance*. World Bank.

² World Meteorological Organization. (2024). *State of global water resources 2023*. World Meteorological Organization.

These pillars directly support the 2026 UN Water Conference theme on investments for water. They highlight that financial resources alone are not enough; we also need advancements in technology, innovation and human capacity.

This concept paper collects emerging evidence, best practices and innovative solutions from around the world, presenting actionable ways to transform water systems for a climate-uncertain future.

II. Status and Trends (1000 words)

The global water crisis is worsening due to climate change, population growth and unsustainable consumption. Current indicators show alarming trends that need immediate attention and action.

Climate change impacts on water systems

The World Meteorological Organization reports that the number of people affected by droughts has increased by 29% since 2000 and flood-related disasters have jumped by 134%.³ Glacier and snow-dependent water systems are facing serious threats. Himalayan glaciers, which provide water for nearly 2 billion people, could lose up to 80% of their current volume by 2100 if high emission scenarios continue.⁴ Coastal regions are dealing with the dual problems of rising sea levels and saltwater pushing into freshwater aquifers. About 40% of the global population lives within 100 kilometers of the coast, with millions facing drinking water contamination from salt.⁵

Intensifying pressures on agricultural water resources in a changing climate

Climate change is placing unprecedented pressure on water supplies for agriculture, which already accounts for around 70% of global freshwater withdrawals. Rising temperatures together with increasing crop water requirements compound at a time when water availability is decreasing. More erratic rainfall is disrupting planting seasons, reducing soil moisture and increasing reliance on irrigation in regions where groundwater is already overdrawn. Droughts and heatwaves are contributing to sharp declines in yields of staple crops such as wheat, maize and rice, while floods are destroying agricultural land and damaging irrigation infrastructure. In many regions, including parts of sub-Saharan Africa, South Asia and the Mediterranean, climate projections show a likely 10–30% reduction in renewable water resources by mid-century, threatening food security and rural livelihoods. These pressures increase competition among sectors, heighten the risks of conflict and underscore the need for climate-resilient water management practices in agriculture, including efficient irrigation, soil moisture conservation and diversification of crops and farming systems.

Investment trends and financing gaps

Despite rising needs, water investments are critically underfunded and unevenly distributed. Global investment in water and sanitation reached about USD 30 billion annually in recent years, which falls short of the USD 114 billion needed to achieve universal access to safe water and sanitation.⁶

³ World Meteorological Organization. (2024). *State of global water resources 2023*. World Meteorological Organization.

⁴ International Centre for Integrated Mountain Development. (2024). *Climate change and water resources in the Hindu Kush Himalaya*. International Centre for Integrated Mountain Development.

⁵ United Nations Educational, Scientific and Cultural Organization. (2024). *The United Nations world water development report 2024: Water and climate change*. United Nations Educational, Scientific and Cultural Organization.

⁶ World Bank. (2023). *Achieving universal access to water and sanitation by 2030: The role of blended finance*. World Bank.

Investment distribution heavily favors high-income countries, while sub-Saharan Africa receives less than 10% of global water infrastructure funding, despite facing severe water insecurity.⁷

Private sector involvement in water infrastructure has grown, representing about 5–7% of total investment, mainly focused on urban water supply and wastewater treatment in middle-income countries.⁸ Blended finance, which combines public, private and philanthropic funding, is on the rise, with transactions increasing by 45% between 2019 and 2023.⁹ However, this still does not close the investment gap.

Climate finance earmarked for water adaptation is disappointingly low, making up only 3–5% of total climate finance flows.¹⁰ This disconnect between water's importance for climate adaptation and its minimal funding represents a major policy failure that needs urgent correction.

Technological and nature-based solutions

A positive trend is the quick rollout of water technologies and innovations. Smart water management systems that use Internet of Things sensors, artificial intelligence and data analysis are changing how water utilities operate. Cities like Singapore and Copenhagen have achieved non-revenue water rates below 5% through advanced leak detection and real-time monitoring.¹¹

Nature-based solutions are gaining recognition as effective ways to improve water resilience. The global market for these solutions reached USD 3.7 billion in 2023, with expected growth to USD 8.2 billion by 2030.¹² Uses range from urban green infrastructure for managing stormwater to watershed restoration for improving water quality and reducing flooding.

Governance and policy developments

Water governance frameworks are changing, but implementation often lags behind ambition. After the 2023 UN Water Conference, 148 countries updated or launched national water policies, with 89 incorporating climate resilience goals.¹³ Transboundary water cooperation has improved, although 60% of transboundary aquifers still lack cooperative management.¹⁴

The adoption of Integrated Water Resources Management (IWRM) is expanding, with 81 countries reporting advanced implementation stages as of 2024.¹⁵ However, coordination between water, energy, food and climate policies is still fragmented in most areas, which limits the effectiveness of integrated approaches.

⁷ African Development Bank. (2024). *African water investment programme 2024–2030*. African Development Bank.

⁸ Organisation for Economic Co-operation and Development. (2024). *Private sector participation in water infrastructure: Trends and challenges*. Organisation for Economic Co-operation and Development.

⁹ Convergence. (2024). *The state of blended finance 2024*. Convergence.

¹⁰ Climate Policy Initiative. (2024). *Global landscape of climate finance 2024*. Climate Policy Initiative.

¹¹ Public Utilities Board Singapore. (2024). *Smart water grid: Innovation in water management*. Public Utilities Board Singapore.

¹² Markets and Markets. (2024). *Nature-based solutions market: Global forecast to 2030*. Markets and Markets.

¹³ UN-Water. (2024). *SDG 6 synthesis report 2024*. UN-Water.

¹⁴ UNESCO International Hydrological Programme. (2024). *Transboundary aquifer resources management: State of practice*. UNESCO International Hydrological Programme.

¹⁵ UN-Water. (2024). *SDG 6 synthesis report 2024*. UN-Water.

Equitable and inclusive resource governance

Effective resilience requires that governance reforms do more than consulting communities; they must guarantee decision-making authority, legal recognition of customary rights and access to funds and data. This includes recognizing customary water rights and establishing clear mechanisms for co-management that bring together statutory and customary systems. It also requires the application of mandatory Free, Prior and Informed Consent processes for any project affecting Indigenous and local territories, supported by independent verification and accessible avenues for redress. In addition, transparent benefit sharing provisions such as revenue sharing arrangements, payments for ecosystem services and employment quotas should be incorporated so that resources and opportunities flow directly to affected communities.

These measures need to be embedded in national water strategies, project appraisal criteria and donor financing requirements so that they function as core conditions for approval.

Capacity and knowledge gaps

Human capacity limits remain a significant barrier to water system resilience. UNESCO estimates that the global water sector is short about 2.5 million trained professionals, particularly in engineering, data science and water governance.¹⁶ Indigenous and traditional knowledge systems, which have supported water management for thousands of years, are often undervalued and not integrated into formal planning.

III. Challenges and Emerging Issues (2000 words)

Building climate-resilient water systems faces several connected challenges that have grown more urgent since the 2023 Water Conference. To tackle these issues, it is essential to understand their systemic nature and the links between various SDG targets.

Challenge 1: The accelerating pace and uncertainty of climate change

The impacts of climate change on water systems are occurring faster and more severely than earlier predictions suggested. The 2024 IPCC special report on water and climate showed that tipping points in key water systems, like the Amazon Basin, the Mediterranean region and Asian monsoon systems, may be nearer than we thought.¹⁷ This speed creates a dilemma of "planning under deep uncertainty." Traditional infrastructure, made for past climate conditions, can become outdated before it's even finished, while future conditions remain highly unpredictable.

Moreover, compound and cascading climate events present unique challenges. The 2024 Horn of Africa crisis highlighted how successive years of drought, followed by intense flooding, overwhelmed water systems that were designed for single hazards. Projections show that these multi-hazard events could rise by 60–80% by mid-century, while most water infrastructure is still built for only one type of hazard.¹⁸

¹⁶ UNESCO-IHE Institute for Water Education. (2024). *Global water professional capacity assessment*. UNESCO-IHE Institute for Water Education.

¹⁷ Intergovernmental Panel on Climate Change. (2024). *Special report on water and climate change*. Intergovernmental Panel on Climate Change.

¹⁸ World Resources Institute. (2024). *Aqueduct water risk atlas 2024*. World Resources Institute.

Challenge 2: Chronic underinvestment and misaligned financial flows

The gap in water investment is one of the biggest barriers to resilience. The previously identified USD 84 billion annual shortfall does not fully capture the issue, as these estimates assume current spending is efficient. In reality, 30–40% of water investment in developing countries results in poor outcomes due to inadequate planning, maintenance and governance issues.¹⁹

Several structural factors keep underinvestment going. Water services usually generate low financial returns, which discourages commercial investors even with high social returns. In most countries, water tariffs do not cover the actual costs of providing services and subsidies often benefit higher-income users rather than those who need them most.

Risk perception also limits private investment. Currency, political and hydrological risks combine to form risk profiles that restrict commercial financing, especially in the least-developed countries where needs are the greatest. Credit enhancement mechanisms and risk-sharing tools for water projects are still not well-developed compared to other infrastructure sectors.

The structure of climate finance adds to these challenges, the distinction between "adaptation" and "development" financing creates unnecessary barriers, as climate-resilient water infrastructure can deliver both outcomes together. Grant funding for water in the least-developed countries has fallen by 23% since 2015, even as needs have grown.²⁰ This shift toward loans increases debt for countries already tight on resources, creating a cycle where debt service prevents crucial water investments.

Challenge 3: Technology access and innovation gaps

While technological innovation holds great promise, significant gaps in access remain. The "technology divide" shows up in many ways. Proprietary technologies are often too costly for low-income countries and intellectual property rules can hinder technology transfer. A 2024 study noted that licensing for advanced water treatment technologies can count for 40–60% of total project costs in the least-developed countries, which is too high for many utilities.²¹

The need for digital infrastructure adds more barriers. Smart water systems need reliable electricity, internet access and digital skills which is often missing in water-scarce areas. This creates a paradox where communities facing the worst water challenges have the least ability to use advanced solutions.

The innovation ecosystem for water is also lagging behind other sectors. Water R&D gets less than 0.5% of total global R&D spending, while energy receives 8%.²² Venture capital investment in water technology reached only USD 2.1 billion globally in 2023, a small piece of the USD 329 billion put into energy technology.²³ This underinvestment in innovation limits the development of critical solutions needed for long-term resilience.

¹⁹ World Bank Water Global Practice. (2024). *Water investment efficiency study*. World Bank Water Global Practice.

²⁰ Organisation for Economic Co-operation and Development. (2024). *Development aid to water: Trends 2015–2024*. Organisation for Economic Co-operation and Development.

²¹ United Nations Conference on Trade and Development. (2024). *Technology transfer and intellectual property in the water sector*. United Nations Conference on Trade and Development.

²² International Energy Agency. (2024). *World energy investment 2024*. International Energy Agency.

²³ Pitchbook. (2024). *Water technology venture capital report 2024*. Pitchbook.

Challenge 4: Institutional fragmentation and governance deficits

Water governance struggles with serious institutional issues that hinder resilience efforts. There are still many sectoral silos, with water managed separately from agriculture, energy, urban planning and climate policy. This fragmentation leads to conflicting policies across sectors.

The water-energy-food nexus illustrates governance challenges. Agriculture uses 70% of global freshwater, with irrigation often funded by cheap energy and water.²⁴ Tackling water scarcity necessitates coordinated changes across these sectors, yet such coordination is rarely facilitated by current institutional structures. The 2025 Central Valley crisis in California showed how fragmented governance delayed necessary adaptation, even with clear warnings provided years in advance.²⁵

Multi-level governance issues also exist, with authority for water often spread across national, local and regional levels without clear coordination. River basin organizations, which should support integrated management, often lack regulatory power, sufficient funding, or political backing to carry out their responsibilities.

Regulatory capacity issues hamper enforcement of water laws and standards. Although many countries have robust water legislation, they often cannot implement or enforce them due to lack of resources. Water allocation systems tend to rely on outdated permits that do not reflect current hydrological realities or climate forecasts.

Challenge 5: Capacity deficits and knowledge gaps

Limits in human capacity restrict resilience efforts across the board. While traditional civil engineering expertise is critical, it does not fully prepare professionals for climate-resilient systems that need skills in climate science, data analysis, social science, ecosystem management and financial engineering.

Developing countries struggle with even greater capacity issues. Water utilities in sub-Saharan Africa face average non-revenue water rates of 45%, partly due to inadequate skills in system operation and maintenance.²⁶ Rural water services suffer from severe capacity shortages, with few technical supports for community management.

Knowledge systems for managing information related to climate adaptation are lacking. Historical hydrological data, once the foundation for water infrastructure design, is less useful in non-stationary climate conditions. Yet the ability to develop and use climate projections in water planning is still limited. A 2024 survey found that only 32% of water utilities in developing countries use climate projections, mainly due to capacity issues and not a lack of data.²⁷

Indigenous and local knowledge systems are often overlooked. These systems hold centuries of experience in adaptation and contain valuable strategies for climate resilience. However,

²⁴ Food and Agriculture Organization. (2024). *AQUASTAT: Global water statistics 2024*. Food and Agriculture Organization.

²⁵ California Department of Water Resources. (2025). *Central Valley water crisis: Lessons for adaptive governance*. California Department of Water Resources.

²⁶ African Water Association. (2024). *Performance indicators for African water utilities 2024*. African Water Association.

²⁷ Alliance for Global Water Adaptation. (2024). *Climate adaptation capacity survey 2024*. Alliance for Global Water Adaptation.

mechanisms to integrate this knowledge into formal planning processes are rare. Cultural biases in technical institutions often devalue non-Western knowledge systems.

Challenge 6: Social equity and community participation deficits

Water insecurity hits marginalized populations the hardest and resilience efforts often worsen existing inequalities. Infrastructure investments tend to focus on urban areas and wealthier communities, widening the access divide.

Indigenous Peoples and ethnic minorities encounter specific water justice challenges. Water grabs for commercial agriculture, mining, or tourism often target indigenous territories, typically with insufficient consultation or consent. Climate change worsens these injustices, particularly affecting indigenous lands in polar, mountain and tropical areas.

Community participation in water planning often feels superficial, limited to consultations rather than true co-creation of solutions. These processes frequently miss the voices of the most marginalized, focusing instead on local elites. Moreover, participation without the transfer of authority and resources, where communities are consulted but lack the power to implement their choices, leads to cynicism and disengagement.

IV. Solutions (2000 words)

Building climate-resilient water systems involves various challenges that call for integrated solutions in technology, finance, governance and capacity development.

Solution Area 1: Leveraging knowledge and innovation

Technology and data-driven solutions

Artificial intelligence and machine learning are changing water management with better forecasting, optimization and decision support. The Singapore Public Utilities Board's Smart Water Grid uses AI-driven analytics to optimize water distribution. This effort reduced non-revenue water to 5% and improved the system's resilience against supply disruptions.²⁸ The system collects data from 300,000 sensors and employs machine learning algorithms to predict pipe failures days in advance, allowing for preventive maintenance.

Remote sensing and satellite technology enable large-scale monitoring of water resources. The European Space Agency's Copernicus program provides free satellite data for real-time monitoring of water bodies, soil moisture, snow cover and flood extent. Countries like Morocco and Tunisia have incorporated satellite data into drought early warning systems, leading to timely actions that cut agricultural losses from drought by 35%.²⁹

Digital twin technology allows for scenario testing and optimization without physical risks. The Netherlands' Deltares Institute created digital twins for several river basins, enabling planners to simulate thousands of climate scenarios and infrastructure setups to find the best adaptation strategies. Australia's Murray-Darling Basin and Vietnam's Mekong Delta have adopted this approach.³⁰

²⁸ Public Utilities Board Singapore. (n.d.). *Smart water grid*. Public Utilities Board Singapore.

²⁹ European Space Agency. (2024). *Copernicus for water resources management: Case studies*. European Space Agency.

³⁰ Deltares. (2024). *Digital twins for climate adaptation: Implementation guide*. Deltares.

Nature-based solutions

Nature-based solutions are cost-effective and offer multiple benefits compared to traditional grey infrastructure. New York City's watershed protection program invested USD 1.5 billion in natural infrastructure instead of a USD 10 billion water treatment plant.³¹ This approach delivers high-quality water while supplying benefits like biodiversity, recreation and carbon sequestration. It has inspired over 100 cities worldwide to invest in watershed protection.

Urban green infrastructure changes stormwater management while also tackling heat islands and air quality issues. Philadelphia's Green City, Clean Waters program is investing USD 2.4 billion over 25 years in green stormwater infrastructure.³² This initiative manages rainfall using rain gardens, green roofs and permeable pavements, providing USD 2.7 billion in benefits by avoiding flooding, improving water quality and raising property values.

Restoring wetlands offers an affordable way to enhance flood protection and water quality. China's Sponge Cities initiative is currently implemented in 30 pilot cities that serve 100 million people. It combines wetlands, rain gardens and permeable surfaces to manage stormwater. Monitoring shows a 30–40% decline in the frequency and severity of urban flooding.³³

Integration of traditional and indigenous knowledge

Indigenous water management methods offer strong resilience strategies that have evolved with local conditions over centuries. Peru's pre-Incan “amunas”, channels that capture wet-season flows to support dry-season water needs, are being restored alongside modern infrastructure. A five-year study found that restored amunas boosted dry-season water availability by 33% with little maintenance required.³⁴

Australia's Indigenous water governance models, created with Aboriginal community input, incorporate cultural values and indigenous knowledge in planning for river basins. The Murray-Darling Basin Plan allocates water for cultural and environmental purposes identified through community consultations, showing institutional acknowledgment of indigenous knowledge.³⁵

Solution Area 2: Strategic partnerships for systemic action

Multi-stakeholder platforms

The Global Water Partnership's regional water partnerships highlight the importance of multi-stakeholder platforms for effective water management which enable knowledge sharing, policy discussions and collaborative actions.³⁶ Successful examples include transboundary cooperation frameworks in West Africa and water-energy-food nexus initiatives in Central Asia. Public-private partnerships (PPPs) are evolving from traditional concession models to arrangements that align private sector goals with public results.

³¹ Natural Resources Defense Council. (2023). *Valuing nature's services: The NYC watershed case*. Natural Resources Defense Council.

³² Philadelphia Water Department. (2024). *Green City, Clean Waters: Implementation review*. Philadelphia Water Department.

³³ World Bank. (2024). *China's sponge cities: Progress and lessons*. World Bank.

³⁴ Forest Trends. (2024). *Andean water funds: Traditional infrastructure meets modern finance*. Forest Trends.

³⁵ Murray-Darling Basin Authority. (2024). *Indigenous water and climate resilience*. Murray-Darling Basin Authority.

³⁶ Global Water Partnership. (2024). *Annual report 2024: Partnership in action*. Global Water Partnership.

South-South cooperation

South-South cooperation supports the transfer of relevant knowledge and technology among developing nations facing similar challenges. The Brazil-Africa Agricultural Innovation Marketplace facilitates the transfer of water-efficient irrigation technology from Brazilian research institutions to African nations, tailored to local needs.³⁷ Through this platform, over 15,000 smallholder farmers in seven countries have adopted drip irrigation systems, leading to a 40% increase in yields while cutting water usage by 60%.

Academic-practitioner partnerships

University-utility partnerships speed up the adoption of innovations while enhancing research capacity. The Singapore-MIT Alliance for Research and Technology (SMART) places academic researchers in utility operations to develop solutions for real-world challenges and train graduate students. Technologies developed through SMART, like advanced membrane materials and microbial electrochemical systems, have been successfully commercialized, showcasing the path from research to practical application.³⁸

Solution Area 3: Community empowerment and co-creation

Participatory planning and co-design

Active community involvement reshapes infrastructure design and long-term sustainability. Nairobi's participatory slum upgrading program uses co-design methods, allowing communities to identify their needs, set priorities and design solutions with professional support. Water systems led by communities exhibit 80% functionality compared to just 45% for top-down installations, highlighting ownership and alignment with local needs.³⁹

Community-based monitoring and accountability

Citizen science and community-based monitoring enhance the efficiency and coverage of water monitoring systems. Kenya's Sustainable WASH Systems Learning Partnership trains locals to conduct water quality tests and monitor functionality. This generates data that helps utilities with maintenance planning while enhancing local capacity.⁴⁰ The approach reduces monitoring costs by 70% while improving data quality and timeliness.

Strengthening resilience requires community monitoring systems to be formally recognized and adequately funded so they can operate alongside utility data and satellite observations. Effective community-based monitoring should provide low-cost testing tools, training for local data stewards and simple mobile or offline applications, supported by a clear protocol for integrating community generated information into basin level dashboards. Monitoring efforts should track service functionality, equitable access across genders and household types, time required to collect water, affordability and the flow of benefits from payments for ecosystem services or other revenue streams.

³⁷ Brazilian Agricultural Research Corporation. (2024). *South-South agricultural innovation platform*. Brazilian Agricultural Research Corporation.

³⁸ Singapore-MIT Alliance for Research and Technology. (2024). *Urban water systems research: 2019–2024*. Singapore-MIT Alliance for Research and Technology.

³⁹ UN-Habitat. (2024). *Participatory slum upgrading: Nairobi case study*. UN-Habitat.

⁴⁰ Sustainable WASH Systems. (2024). *Community-based monitoring in Kenya: Impact evaluation*. Sustainable WASH Systems.

Solution Area 4: Mobilizing innovative financing

Mobilizing innovative finance is essential for building climate resilient water systems, as it expands the pool of available capital, reduces investment risks and directs resources to where they are most effective.

Blended finance models are already demonstrating strong leverage, with initiatives such as Water Credit using relatively small amounts of concessional funding to unlock large volumes of commercial investment,⁴¹ while regional facilities like the Asian Development Bank's Water Financing Partnership Facility combine grants and concessional lending to attract private capital at scale.⁴² Results based financing is improving performance and accountability, as seen in Kenya where tying subsidies to verified service delivery has significantly increased functionality rates. Payment for ecosystem services is gaining prominence as a mechanism that aligns financial incentives with watershed protection, exemplified by Ecuador's SocioPáramo programme which has improved rural livelihoods while conserving critical ecosystems. Progressive tariff structures, such as Uruguay's social tariff system, demonstrate how affordability and revenue generation can be balanced to sustain long term investments.

At the same time, streamlined climate finance processes and dedicated project preparation support are helping smaller adaptation initiatives secure funding more effectively. Expanding direct financing for communities through instruments such as resilience bonds, locally administered micro grants, direct payment models for ecosystem services and revolving community funds can ensure that resources reach frontline actors. Together, these innovations form a comprehensive approach for scaling investment in water resilience and ensuring equitable access to finance.

These solution areas, carried out together, highlight the path toward climate-resilient water systems. Scaling effective practices while adjusting to local contexts is the main challenge in implementation.

V. Recommendations and Conclusions (2000 words)

Building climate-resilient water systems for the future requires significant action on many fronts. This section outlines strategic recommendations for Member States, UN agencies, financial institutions, private sector actors, civil society organizations and research institutions, summarizing the challenges and solutions identified throughout this concept paper.

Recommendations for Member States

1. Elevate water in national climate strategies

Member States should prioritize water resilience in Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs). These should include specific targets and allocated budgets. Governments should require climate risk assessments for all water infrastructure investments and create national adaptation pathways that include various climate scenarios.

2. Transform Water Financing

Member States should increase public investments in water infrastructure to levels that meet needs, aiming to triple current investments as indicated by the World Bank. This requires innovative

⁴¹ Water.org. (2024). *WaterCredit impact report 2024*. Water.org.

⁴² Asian Development Bank. (2024). *Water financing partnership facility annual report 2024*. Asian Development Bank.

domestic resource mobilization strategies, such as progressive water tariffs, polluter-pays initiatives and watershed protection fees. Additionally, governments should reduce harmful subsidies for water-intensive activities and redirect these resources to improve water efficiency and conservation.

Governments should create dedicated water resilience funds that combine domestic and international resources, ensuring easier access for subnational authorities and community organizations. Credit enhancement strategies, including sovereign guarantees and first-loss tranches, should be used to attract private investments in viable water projects.

3. Mandate technology and data standards

National data policies should ensure open access to water resources and quality data, adhering to FAIR + CARE principles (refer to Annex 1). Governments should invest in monitoring infrastructure, including automated sensors, satellite data integration and data platforms, viewing these as essential public goods. Procurement frameworks for technology should prioritize proven solutions appropriate for local contexts, avoiding technology solutionism.

4. Institutionalize community participation

Legal frameworks should guarantee that communities have the right to participate meaningfully in water planning and decision-making. This is especially important for marginalized groups like women, Indigenous Peoples, and ethnic minorities. Genuine co-creation is needed, allowing communities to have the authority and resources to implement their own priorities.

Governments should create mechanisms to recognize and incorporate indigenous and traditional knowledge into water planning, ensuring this is done through free, prior and informed consent with Indigenous Peoples, and local communities.

5. Strengthen transboundary cooperation

When transboundary water resources are involved, Member States should prioritize the development or strengthening of cooperative management frameworks. This includes forming river basin organizations with the necessary authority, skills and financial resources. Joint climate adaptation planning for shared water resources should become standard practice since unilateral actions often result in poor outcomes.

7. Mainstream water–climate–food–energy nexus approaches

Member States should integrate water–food–energy system interactions into national climate planning. Many adaptation and mitigation measures fail due to siloed design. Governments should adopt nexus-based planning tools, require cross-sectoral impact assessments before approving climate projects and ensure that mitigation actions do not undermine adaptation priorities for water security.

8. Strengthen early warning systems and climate information services for water.

Member States should operationalize early warning systems that integrate hydrological forecasting, drought monitoring, flood risk mapping and seasonal climate services. Governments should ensure that warnings are gender-responsive, locally accessible and linked to anticipatory action protocols (e.g. funding triggers, evacuation procedures and agricultural advisories).

9. Suggested checklist to be made mandatory for projects seeking climate or adaptation finance

Projects should demonstrate compliance with minimum social and cultural safeguards consistent with UNDRIP and international Free, Prior and Informed Consent (FPIC) guidance. This includes documented and independently verified FPIC for Indigenous peoples, along with clear anti-displacement commitments and fully budgeted livelihood restoration or resettlement plans where relocation cannot be avoided. Projects must outline cultural heritage protection measures and establish community oversight panels to monitor implementation. A gender impact assessment is required, supported by gender-transformative budgeting that includes targeted allocations and measurable indicators. An accessible and independent grievance redress mechanism, separate from the project implementer, must also be in place before approval.

Recommendations for international financial institutions

10. Reform climate finance architecture for water

Multilateral development banks and climate funds should significantly raise their allocations for the water sector, recognizing its crucial role in climate adaptation. Simplified access procedures, lower transaction costs and clear recognition that water infrastructure equally delivers adaptation and development outcomes are essential. Dedicated financing windows for nature-based solutions should be established, acknowledging their unique characteristics compared to traditional infrastructure.

Grant financing for water projects in the least-developed countries should be increased to counteract recent declines. Additionally, debt sustainability should guide decisions about financing methods to prevent unsustainable debt levels.

11. Develop innovative financial instruments

Development finance institutions should routinely apply risk mitigation tools, including guarantees, first-loss tranches and currency hedging, to spur private investment in water projects. Results-based financing approaches should be expanded, focusing payments on verified service delivery outcomes rather than just infrastructure construction.

Institutions should support the creation of regional or sub-regional water infrastructure financing facilities, combining technical assistance with funding to tackle project preparation challenges.

Recommendations for Private Sector

14. Increase water technology investment and transfer

Technology companies and investors should significantly boost R&D investment in water innovations, especially solutions suited for resource-limited settings. This includes creating business models that provide technology access in low-income areas, such as pay-as-you-go models, shared service arrangements and technology leasing. Companies should commit to responsible technology transfer, incorporating open-source approaches when relevant and focusing on capacity building for operation and maintenance.

15. Adopt water stewardship practices

Companies across various sectors should embrace comprehensive water stewardship. This includes assessing water risks throughout supply chains, implementing water efficiency strategies and investing in cooperative efforts to improve watershed health. Industry-specific guidance, such as the Alliance for Water Stewardship standard, provides frameworks for systematic implementation.

Companies in water-scarce regions should create water management plans aligned with science-based targets and the carrying capacity of local watersheds.

16. Engage in innovative financing

Institutional investors should allocate more funds to water infrastructure as an asset class, recognizing its potential for stable, long-term returns with significant social and environmental benefits. Commercial banks should develop tailored financing offerings for the water sector, such as green loans, sustainability-linked financing and project finance structures suitable for water projects. Insurance and reinsurance companies should expand parametric insurance products for water-related climate risks to facilitate quick responses to droughts and floods.

Recommendations for research and academic institutions

19. Prioritize practice-relevant research

Research institutions should focus water research on practical challenges faced by managers and communities. This approach requires researchers to collaborate with practitioners throughout the research process, ensuring that questions address actual needs and findings can be put to use. Interdisciplinary research that looks at social, technical and institutional factors of water resilience should be favored over narrowly focused technical studies.

20. Develop next-generation workforce

Universities should reshape water education to produce professionals with diverse skills that include engineering, climate science, data analytics, social science, finance and governance. Curricula should emphasize systems thinking, climate uncertainty, nature-based solutions and community engagement. Experiential learning opportunities through partnerships with utilities, community-based projects and international exchanges should be central to educational approaches.

Scholarship programs targeting underrepresented groups and students from water-stressed regions should be expanded to cultivate diverse leadership in the water sector.

Conclusions

Building climate-resilient water systems is one of humanity's biggest challenges and greatest opportunities. The accelerating climate crisis makes the usual ways of doing things not just ineffective but disastrous.

However, this moment also brings unique opportunities. Technological advances give us tools we could not have imagined a generation ago. There is a growing awareness of nature-based solutions that can improve resilience and offer multiple benefits. New financing methods can gather resources on an unprecedented scale. Most importantly, communities worldwide have the knowledge, creativity and determination to tackle water issues if they have the resources and authority.

The needed shift from reactive, disjointed approaches to systemic approaches requires us to rethink water governance to welcome innovation while respecting traditional knowledge. We must empower communities while coordinating efforts at different levels, gather funding while ensuring fairness and plan for uncertainty while taking firm steps.

The 2023 UN Water Conference made important commitments through the Water Action Agenda. The upcoming 2026 Conference needs to spark a major implementation breakthrough that turns commitments into on-the-ground change. This will involve a truthful evaluation of progress, honest recognition of limitations and a renewed commitment to speed up actions.

Water connects all life. Creating climate-resilient water systems means building strong futures for humanity and the ecosystems we rely on. We have the technical knowledge. We can gather the financial resources. New social innovations are starting to emerge. What we need now is a united commitment to act with the urgency this challenge demands.

The 2026 UN Water Conference presents a crucial opportunity to establish that commitment and set a course toward water-secure futures for everyone.

VI. Guiding Questions (1000 words)

The following questions are designed to stimulate dialogue, identify priorities and generate actionable commitments during the interactive session. They address the five core pillars of building climate-resilient water systems while encouraging participants to reflect on implementation pathways, partnerships and accountability mechanisms.

Knowledge and innovation

- Technology access and transfer: What methods can speed up appropriate technology transfer to developing countries while respecting intellectual property rights? How can we make sure that advanced technologies, like AI-driven water management systems, benefit those communities that need them most, not just those who can afford them?
- Digital divide: For communities lacking reliable electricity and internet access, what steps can help them benefit from digital water innovations? What role should offline-capable, low-tech solutions play in resilience strategies?

Strategic partnerships

- Transboundary cooperation: In areas of geopolitical tension, what strategies promote cooperation on shared water resources? How can the international community assist countries in viewing transboundary waters as opportunities for collaboration rather than sources of conflict?

Innovative financing

- Closing the investment gap: Given the \$84 billion annual water investment gap, what mix of domestic resource mobilization, international finance and private capital can help close this gap by 2030? What specific commitments can Member States, development banks and private investors make?
- Climate finance access: Only 3-5% of climate finance goes to water-specific projects, despite water's central role in adaptation. What reforms to the climate finance system, application processes and eligibility criteria would increase water's share? Should specific water windows be created within major climate funds?

Planning for climate uncertainty

- Nature-based solutions: Even though nature-based solutions are cost-effective and provide co-benefits, they make up only a small part of water infrastructure investment. What barriers limit their adoption and what policy changes, funding strategies and capacity-building initiatives can speed up their implementation?

Cross-cutting

- Just transition: As water systems adjust to climate change, how can we ensure transition paths are fair and equitable, avoiding the displacement of vulnerable groups and job losses in water-dependent sectors? What social safety nets should accompany water adaptation initiatives?
- Urgent action: Given that climate impacts are intensifying more quickly than expected and that infrastructure developed today will be in use for decades, what "no-regret" actions should all Member States take right away, regardless of detailed planning processes? What rapid implementation methods can speed up the rollout of proven solutions?

These questions are meant to inspire reflection, debate and concrete commitments. Participants are encouraged to bring specific examples from their experiences, share lessons learned from successes and failures and outline tangible actions their institutions are willing to take. The interactive dialogue should conclude with clear commitments, partnerships formed and accountability measures established to ensure that the 2026 Water Conference leads to significant breakthroughs toward climate-resilient water systems for everyone.

Annex 1: Data Governance Charter: FAIR + CARE for water

Data Governance Charter for Climate-Resilient Water Systems

1. Adopt Findable, Accessible, Interoperable, Reusable (FAIR) technical standards for interoperability and CARE principles (Collective Benefit, Authority to Control, Responsibility, Ethics) for people-centred governance. FAIR ensures machine-actionability; CARE ensures communities' authority and benefits from data.
2. Require project proposals to submit a Data Use and Benefit Plan indicating who controls data, how communities' access and own data, benefit flows, privacy and cybersecurity safeguards and exit/archiving rules.
3. Fund community data hubs and training (local servers, offline dashboards, community data stewards).
4. Make participation in national/ basin data platforms conditional on compliance with CARE (FPIC for Indigenous knowledge) and documented community consent.

All project-level data practices must be FAIR-compliant and must meet CARE requirements for Indigenous and community data. Project approval will be contingent on an independently verified Data Use and Benefit Plan.