11th WORLD WATER FORUM
RIYADH 2027

Thematic Process

Theme 3:
Water for People and Ecosystems

Water for People and Ecosystems Concept Note

11th World Water Forum – Riyadh 2027

وزارة البيئة والمياه والزراعة
Ministry of Environment Water & Agriculture
Kingdom of Saudi Arabia المملكة العربية السعودية

WORLD WATER COUNCIL

Foreword

From drying farmlands and depleting aquifers to rising seas and polluted waterways, the global water crisis is no longer a future concern; it is a present and intensifying reality. Water lies at the heart of food security, public health, resilience, peace, and economic stability. Yet billions still face water extremes such as scarcity and flood risk, contamination, and unequal access.

The 11th World Water Forum, under the overarching theme “Action for a Better Tomorrow”, marks a pivotal moment that promotes dialogue and drives concrete action. It calls on governments, innovators, youth, and communities to move from dialogue to action: scaling solutions, mobilizing financing, and forging inclusive partnerships. This is a global rally to break silos, localize action, and generate lasting impact across every region, river basin, and generation.

As the World Water Forum returns to an Arab country for the first time since 1997, the Kingdom of Saudi Arabia offers a uniquely compelling setting: a nation shaped by extreme water scarcity due to its arid conditions, yet one that has emerged as a global leader, uniquely positioned to showcase its expertise in water policies, holistic governance, and efficient water management, including desalination, wastewater treatment, conservation technologies, and innovative water financing through Public-Private Partnerships.

This 11th World Water Forum is dedicated to fostering transformative discussions that move beyond theory to an action-oriented agenda, prioritizing policy implementation, cross-sector collaboration, regional problem-solving, and sustainable development.

As co-hosts, the Ministry of Environment, Water and Agriculture of the Kingdom of Saudi Arabia and the World Water Council will bring together the human and intellectual capital accumulated across the first ten editions of the World Water Forum and the expertise and experience of the host nation, to guide every track of the 11th World Water Forum toward the best possible outcomes.

The 11th World Water Forum calls on all stakeholders and custodians of water sustainability to unite in this mission, ensuring a water-secure future for generations to come.

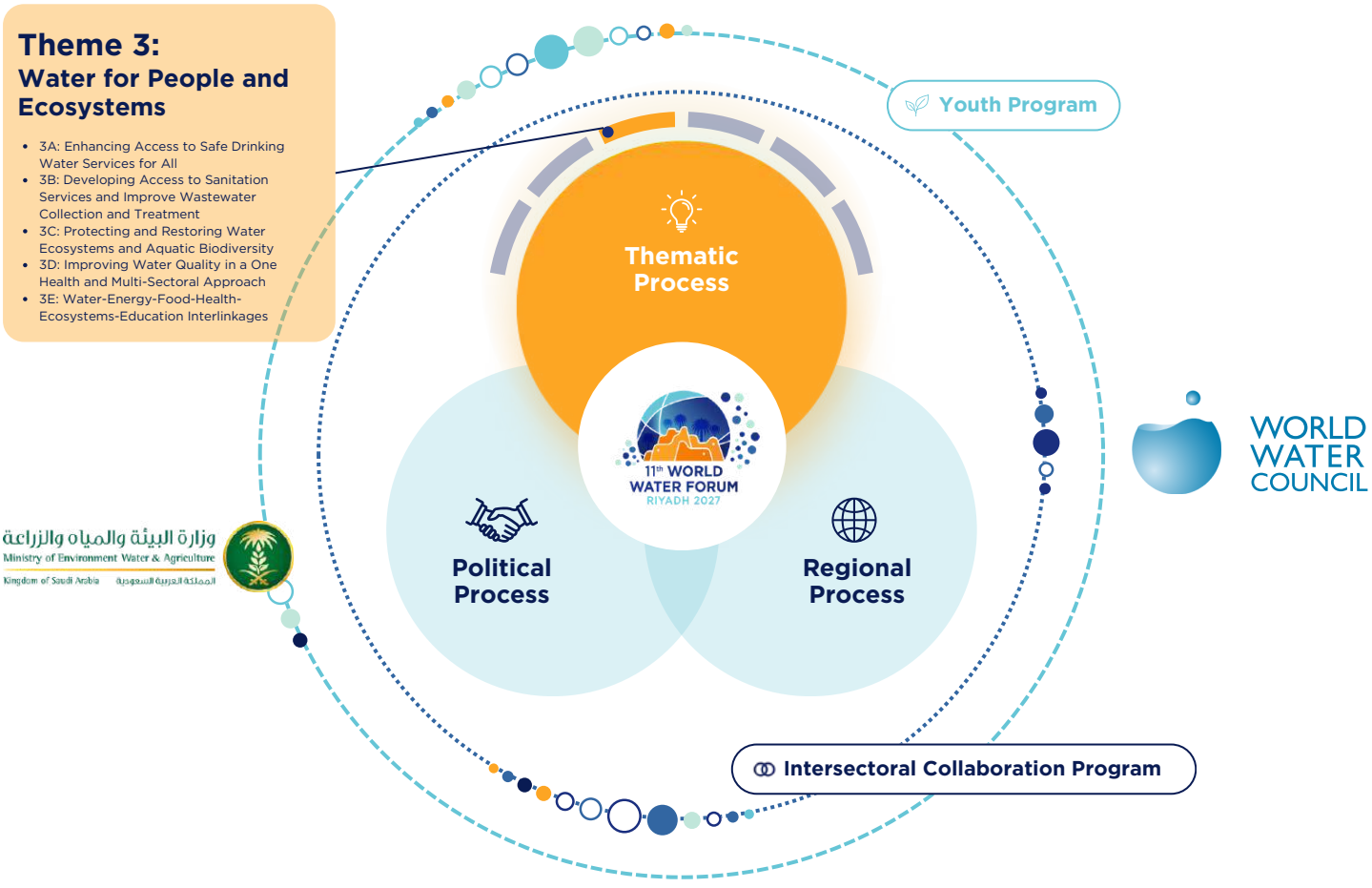
How the Forum Works

One Forum · Three Processes · Two Programs

Held every three years since 1997, the World Water Forum is the largest gathering of the global water community. Its 11th edition takes place in Riyadh from 21 to 25 March 2027 under the theme “Action for a Better Tomorrow”. It is the first World Water Forum hosted in the Gulf, in the year the Forum process turns thirty. It is co-hosted by the Kingdom of Saudi Arabia, through the Ministry of Environment, Water and Agriculture, and the World Water Council, which launched the Forum and carries its process from one edition to the next.

Three interlinked processes structure the 11th World Water Forum. The Political Process sets policy direction with four segments: Ministerial, Parliamentarian, Local & Regional Authorities, Basin & Watershed Authorities. The Thematic Process, divided into six Themes and thirty Topics, five per Theme, turns technical knowledge into evidence for political commitment. The Regional Process brings regional priorities and solutions into the global agenda. Two programs run across all three: the Youth Program and the Intersectoral Collaboration Program. Each concept note sets out the foundations of one part of this architecture.

This concept note presents the challenges addressed by Theme 3: Water for People and Ecosystems and introduces the five Topics that explore them in detail.



“Our goal is to create not just a forum for discussion, but a powerful platform for collaboration, innovation, and action.”

Abdulrahman Al Fadley
Minister of Environment, Water and Agriculture

“The 11th World Water Forum must be a platform for action, not just dialogue.”

Loïc Fauchon
President of the World Water Council



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Theme Overview

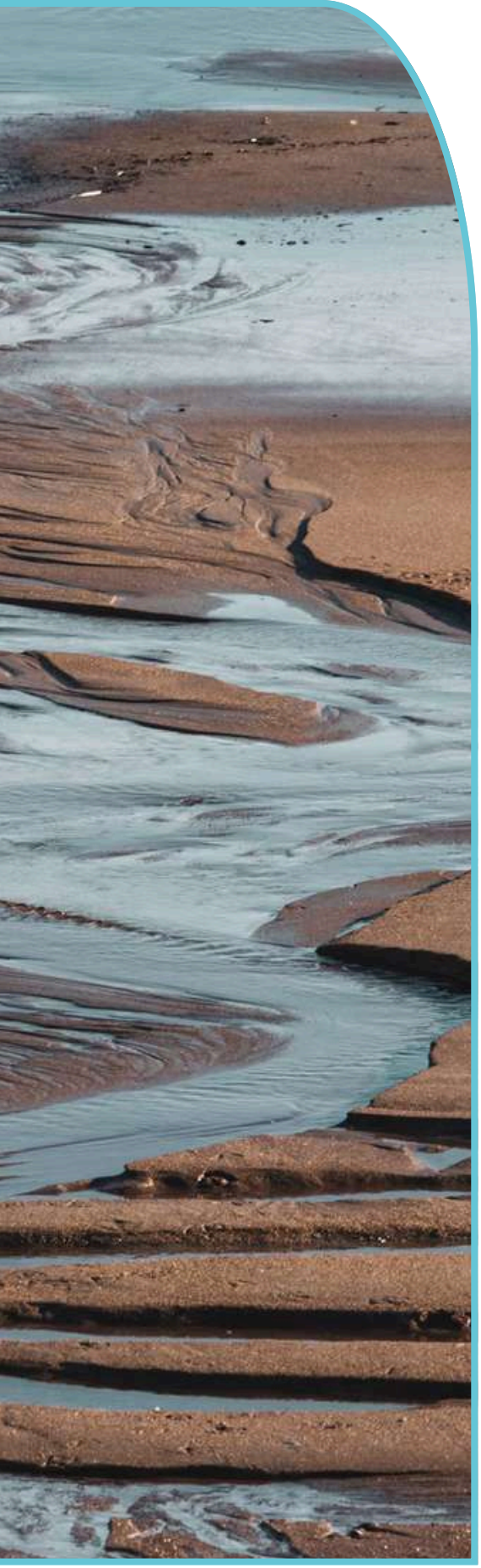
Water security for people and ecosystems is fundamentally interconnected. Access to safe drinking water and sanitation, healthy aquatic ecosystems, improved water quality, and integrated resource management collectively underpin public health, economic development, climate resilience, and biodiversity conservation.

Yet global water challenges remain severe: billions still lack safely managed water and sanitation services, freshwater ecosystems are under increasing stress, and climate variability is intensifying risks to water availability and quality.

Over 2.1 billion people still lack safely managed drinking water and nearly 3.4 billion people lack safely managed sanitation, with stark inequalities across income groups, fragile states, and rural areas. In low-income countries, progress must accelerate substantially, while in Africa and Asia climate change-driven droughts and underinvestment in resilient systems exacerbate access gaps, and sanitation progress remains particularly slow in sub-Saharan Africa and Oceania.

Freshwater biodiversity is degrading rapidly due to pressures including pollution and contamination, land-use change such as rapid urbanization, over-exploitation of water resources, invasive species, and increasing variability in water availability due to climate change.





At the same time, water quality risks are increasingly shaped by cross-sector contaminant pathways across health, agriculture, industry, urban development, and biodiversity, and by Water–Energy–Food–Health–Ecosystems–Education (WEFHEE) interlinkages that amplify cascading risks across sectors and scales.

This theme positions water not only as a service for human consumption but as a living system that sustains ecosystems, economies, and societal stability. It recognizes that a large proportion of wastewater remains untreated and that water quality risks are increasingly shaped by multi-sector pollution pathways and emerging contaminants such as microplastics and industrial chemicals. In response, this theme brings together a rights-based and systems-oriented approach to services with ecosystem protection and restoration, and a One Water–One Health perspective that connects the traditional silos of health, agriculture, industry, urban planning, and biodiversity conservation by mapping contaminant pathways and turning them into coordinated mitigation actions. It also recognizes Water–Energy–Food–Health–Ecosystems–Education (WEFHEE) interlinkages, emphasizing systems thinking and cross-sector coordination to deliver resilient and sustainable solutions.

The approach aligns directly with SDG 6 while supporting related goals including food security (SDG 2), health (SDG 3), sustainable cities (SDG 11), climate action (SDG 13), biodiversity protection (SDGs 14 and 15), and partnerships (SDG 17). In particular, it supports SDG 6 targets 6.2, 6.3 and 6.6 by advancing drinking water and sanitation access, improving wastewater collection and treatment (including fecal sludge treatment and resource recovery), and protecting and restoring water-related ecosystems.

Achieving these outcomes requires political will, effective policy implementation, strengthened local capacities, and supportive regulatory frameworks.

Hosting the 11th World Water Forum in the Kingdom of Saudi Arabia provides a timely opportunity to reflect on water challenges typical of arid and water-scarce regions.

These include heavy reliance on desalination, groundwater sustainability concerns, wastewater reuse expansion, ecosystem resilience under extreme climatic conditions, and the growing importance of innovation, circular water economy approaches, and digital water management.

These experiences can foster broader global dialogue, particularly among countries facing similar water scarcity conditions. This regional perspective is especially relevant as climate-driven droughts and underinvestment in resilient systems continue to exacerbate service gaps in many parts of Africa and Asia, while sanitation progress remains particularly slow in sub-Saharan Africa and Oceania.



Cross-Cutting Integration

The theme integrates key cross-cutting dimensions:

1

Climate resilience: adaptation to droughts, floods, ecosystem degradation, and extreme weather. Including Nature-based Solutions and ecosystem restoration to strengthen ecological continuity and watershed resilience.

2

Gender and youth inclusion: equitable access, leadership participation, and community engagement. Addressing persistent local disparities and the disproportionate burden on women and girls.

3

Digital innovation: AI, remote sensing, digital twins, and data-driven water governance supported by UWI, metagenomic wastewater analytics, open dashboards, and blockchain-based water quality credits for monitoring, early warning, and more reliable service delivery.

4

Partnerships: multi-stakeholder collaboration across governments, utilities, academia, and private sector. Enabling coordinated watershed and transboundary action, data sharing, and integration of scientific knowledge with traditional knowledge systems and the roles of Indigenous Peoples and local communities in decision-making.

5

Financing mechanisms: blended finance, climate funds, circular economy investments, and results-based instruments, such as water quality bonds and pathogen-reduction metrics, supporting sustainable services, wastewater treatment and resource recovery, and long-term ecosystem restoration.

Objectives

This theme aims to:

Technical Objectives

- Advance integrated water service delivery covering drinking water, sanitation, wastewater reuse, ecosystem protection, and water quality management. This includes Water Safety Plans, strengthened water quality monitoring with rapid testing and digital tools, sustainable groundwater management, and full sanitation value chain approaches including fecal sludge treatment and resource recovery/reuse for both on-site and sewerage systems.
- Promote innovative solutions including nature-based solutions, digital monitoring, reuse technologies, and resilient infrastructure. This includes the use of GIS, satellite imagery and AI, as well as used water derived intelligence (UWI), integrated multi-sectoral monitoring networks, pollutant source fingerprint libraries, and digital decision-support tools that translate data into actionable alerts. It also includes systems modeling and digital tools to improve resource efficiency and adaptability across Water–Energy–Food–Health–Ecosystems–Education (WEFHEE) interlinkages.

Policy and Institutional Objectives

- Strengthen governance frameworks linking water services, environmental protection, health, agriculture, and climate policy. This includes integrated governance models linking water policy and biodiversity protection, the adoption of a UN Water One Water–One Health Quality Framework, and the creation of a high-level One Water–One Health Water Governance Platform.
- Promote inclusive water policies recognizing water and sanitation as human rights while safeguarding ecosystems. This includes Citywide Inclusive Sanitation (CWIS), scalable service delivery models including hybrid public–private partnerships and community-based management, strengthened regulatory and financing frameworks, and the integration of results-based financing mechanisms. It also includes embedding gender-responsive and youth-inclusive regulatory clauses and advancing inclusive and rights-based governance with women's leadership.

Capacity and Knowledge Objectives

- Peer learning and knowledge-sharing platforms across regions facing similar challenges, mobilizing citizen science networks, and producing multilingual policy briefings and knowledge translation kits.
- Strengthen institutional capacity for integrated planning, digital transformation, and ecosystem stewardship. This includes targeted workforce training, a global curriculum on One Water–One Health water quality analytics, establishing regional Water Quality Innovation Hubs, strengthening links between water management training modules and ecosystem restoration training plans, and improving data availability and transparency. It also includes empowerment of communities and local institutions, and training programs led by youth groups, women and Indigenous peoples and local communities.



Key Challenges

1. Persistent gaps in access to safe drinking water and sanitation. Including persistent inequalities between urban and rural areas and the need to improve the full sanitation value chain, particularly fecal sludge evacuation and treatment for on-site sanitation.

2. Water quality deterioration affecting ecosystems and human health. This includes the impacts of untreated wastewater and emerging challenges regarding pollutants and water availability and quality.

3. Climate change impacts on water availability and ecosystem resilience.

4. Fragmented governance across sectors and institutions. Including insufficient coordination between sectors and administrative levels, and weak regulatory enforcement.

5. Financing gaps and infrastructure investment needs.

6. Limited integration of ecosystem considerations into water planning.

Opportunities

1. Rapid advances in digital water technologies. Including monitoring, early-warning systems and decision-making tools (eDNA, remote sensing, proxy data and AI), and used water derived intelligence (UWI).

2. Nature-based solutions supporting both ecosystems and climate adaptation. Including ecosystem restoration and conservation interventions for wetlands, grasslands and forests.

3. Circular economy approaches, particularly wastewater reuse. Including resource recovery and reuse in the sanitation chain and sludge valorization.

4. Cross-sector collaboration linking water, energy, agriculture, and health. Including regional platforms for technical and political dialogue and lessons learned from Citywide Inclusive Sanitation (CWIS) approaches.

5. Increased global commitment to sustainability agendas. Including innovative finance mechanisms such as blended finance, results-based financing, water quality bonds, and biodiversity credits.

Linkages with Global Agendas

This theme contributes to:

2030 Agenda for Sustainable Development (SDGs)

Paris Climate Agreement

Sendai Framework for Disaster Risk Reduction

Kunming-Montreal Global Biodiversity Framework

UN Water initiatives and global water governance platforms



Thematic Logic

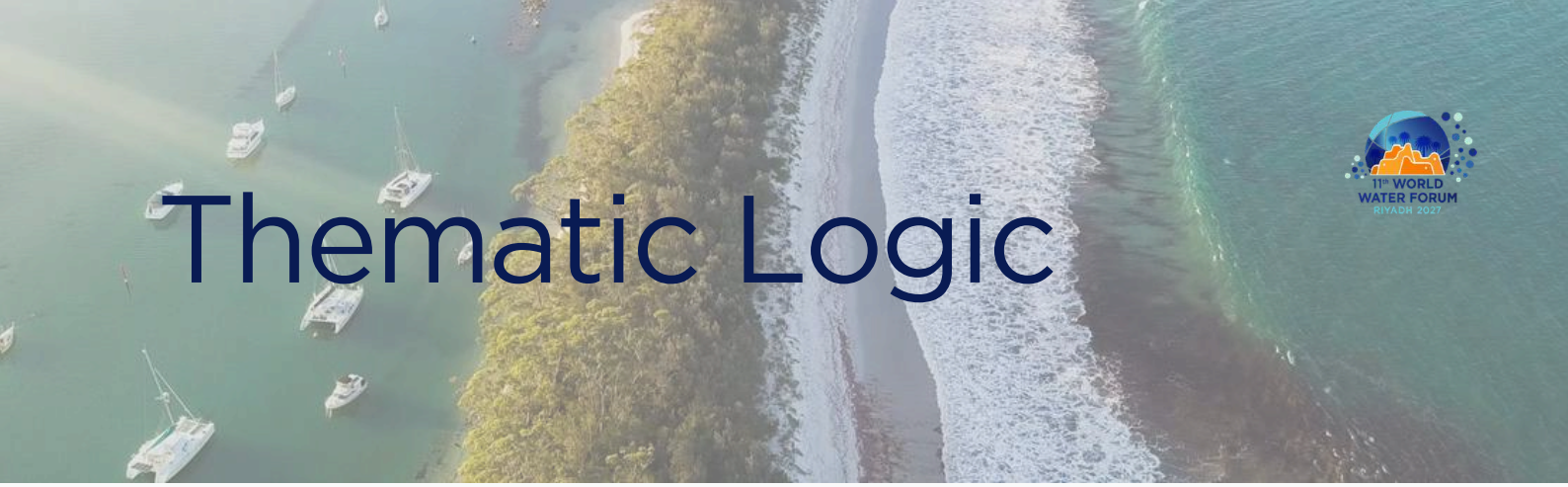
Together, the five topics align service delivery, ecosystem protection, water quality, and integrated management into a single thematic logic that supports SDG 6 targets 6.2, 6.3 and 6.6, while reinforcing climate resilience, inclusion, innovation, partnerships, and sustainable financing. The five topics form a coherent thematic direction by framing water security for people and ecosystems as one interconnected system, where progress in one area depends on progress in the others.

Topic 3A (safe drinking water) and **Topic 3B (sanitation and wastewater)** provide the foundation for public health, equity, and sustainable development, while also shaping water quality outcomes through reliable service delivery, wastewater collection, treatment, and resource recovery.

Topic 3C (ecosystems and biodiversity) emphasizes that freshwater ecosystems are essential for long-term water security, resilience, and livelihoods, requiring coordinated protection and restoration across watersheds.

Topic 3D (water quality under One Water–One Health) connects the traditional silos of health, agriculture, industry, urban development, and biodiversity by mapping contaminant pathways and translating them into coordinated mitigation actions supported by monitoring, digital tools, and governance.

Finally, **Topic 3E (WEFHEE interlinkages)** provides the systems-thinking lens that links all topics together, ensuring solutions reflect the interdependencies between water, energy, food, health, ecosystems, and education across scales.



Thematic Logic

Topic No.	Topic Title	Brief Focus Description
3A	Enhancing Access to Safe Drinking Water Services for All	Topic 3A focuses on equitable, resilient drinking water services, emphasizing public health, governance, financing, innovation, and climate resilience. It frames safe drinking water as a fundamental human right and a foundation for sustainable development, gender equality, and economic growth. It underlines the urgency of accelerating progress toward the 2030 Agenda. The topic promotes a modern, rights-based and systems-oriented approach that integrates resilience, inclusion, and effective service delivery to close persistent access gaps, especially for marginalized, rural, and climate-vulnerable populations.
3B	Developing Access to Sanitation Services and Improve Wastewater Collection and Treatment	Topic 3B addresses the full sanitation value chain including access, treatment, reuse, and circular economy approaches. It highlights sanitation and hygiene as essential for human well-being, health, the environment, and social and economic development, while recognizing persistent disparities across regions and between urban and rural areas. The topic emphasizes strengthening wastewater and fecal sludge treatment, reducing untreated wastewater, and advancing resource recovery to improve service outcomes and protect ecosystems. It also underlines the importance of political will, supportive regulatory frameworks, strengthened local capacities, and innovative technical, organizational, and governance approaches to accelerate implementation.



Thematic Logic

Topic No.	Topic Title	Brief Focus Description
3C	Protecting and Restoring Water Ecosystems and Aquatic Biodiversity	Topic 3C promotes ecosystem restoration, nature-based solutions, biodiversity protection, and integrated watershed management. It highlights that healthy freshwater ecosystems are essential for water security, human livelihoods, and well-being, and that freshwater biodiversity is degrading rapidly under multiple pressures. The topic emphasizes coordinated action across scales within river basins, including attention to ecological continuity and the interconnected impacts of upstream and downstream activities. It also recognizes technical, financial, and governance challenges, and the need to integrate innovations in monitoring with scientific and traditional knowledge systems, including the roles of Indigenous Peoples and local communities in decision-making.
3D	Improving Water Quality in a One Health and Multi-Sectoral Approach	Topic 3D integrates human, animal, and ecosystem health through improved water quality monitoring, governance, and innovative treatment solutions. It applies a One Water–One Health perspective that connects the traditional silos of health, agriculture, industry, urban planning and biodiversity conservation by mapping contaminant pathways and turning them into coordinated mitigation actions. The topic emphasizes that water quality is a cross-cutting driver of health, climate resilience, and ecosystem protection, supported by stronger data, governance, and financing tools. By uniting sectors under a One Health umbrella, it strengthens the ability to translate water quality intelligence into healthier, climate-smart, and economically viable systems.



Thematic Logic

Topic No.	Topic Title	Brief Focus Description
3E	Water-Energy-Food-Health-Ecosystems-Education Interlinkages	Topic 3E explores interdependencies among water, energy, agriculture, ecosystems, health, and education using systems thinking approaches. It examines the Water–Energy–Food–Health–Ecosystems–Education (WEFHEE) interconnected "system of systems" to drive resilient and sustainable water management strategies. By applying a One Health approach, it promotes interconnectivity across sectors and supports frameworks that protect both human and environmental health globally. Together, these topics form a comprehensive framework addressing water services, environmental sustainability, climate resilience, and integrated resource management.

Cross-Process Dialogue and Cooperation

1 **Water, Climate Resilience, and Nature-Based Ecosystem Solutions**
Collaboration with political and regional processes on climate adaptation strategies.

2 **Water Services, One Water–One Health, and Inclusive Development**
Dialogue linking the Ministerial, Local & Regional Authorities, and Basin & Watershed Authorities Segments.

3 **Innovation, Financing, and Circular Water Economy**
Focus on investment mechanisms, technology adoption, and sustainable infrastructure.

- Policy alignment across water, climate, biodiversity, and One Health supported by strategic guidance across water, sanitation, energy, and health, including rights-based and inclusive approaches (gender, youth, disability) and WEFHEE integration.
- Strengthened institutional partnerships across governance levels, including basin and transboundary coordination, multi-stakeholder coalitions, and knowledge exchange platforms.
- Identification of scalable investment opportunities including blended and innovative financing, responsible private sector engagement, and replicable tools and pilots (digital monitoring, UWI, nature-based solutions, wastewater reuse, and ecosystem restoration).

Proposed Timing and Venue or Online

- Stakeholders Consultation Meetings
- Regional preparatory events
- Hybrid online thematic workshops
- Ministerial / High-Level roundtables during Forum week
- Side events during Forum week
- Pavilion events during Forum week

Expected Outcomes and Deliverables

Each Theme and its Topics are expected to generate action-oriented, measurable, and lasting results showcased during and beyond the 11th Forum:

1. Recommendations for integrated water governance, including alignment across water, sanitation, health, climate, energy, and biodiversity, and contributions to the Ministerial, Parliamentarian, Local & Regional Authorities, and Basin & Watershed Authorities Segments.

2. Guidance on ecosystem-based water management, including Nature-based Solutions, environmental flows, and basin-level and transboundary restoration initiatives.

3. Policy frameworks supporting inclusive and resilient water services, including rights-based approaches and integrated water–health–social protection initiatives targeting vulnerable populations and child health outcomes.

4. One Water–One Health Water Governance Platform. A standing inter-theme body meeting bi-annually to coordinate policy, finance, and innovation actions and publish an annual “State of One Health Water Quality” brief.



5 Thematic synthesis reports summarizing progress, gaps, and inequalities, including service delivery, wastewater, ecosystems, and water quality risks.

6 Best-practice case studies. Including decentralized and hybrid service delivery models, basin-level initiatives, and pilot and demonstration projects.

7 Data platforms and methodological toolkits including digital monitoring and early-warning approaches, and practical guidance to support implementation and scaling.

8 Regional Water-Quality Innovation Hubs. Co-located with universities, utilities, and NGOs to incubate solutions, host hackathons, and provide technical assistance.

9 Global Citizen-Science Observatory. An online platform where volunteers submit verified water-quality observations, linked to the Ledger for real-time monitoring.

Partnership and Financing Outcomes

Multi-stakeholder partnerships including networks and coalitions to support implementation, scaling, and continued visibility beyond the 11th Forum.

Innovative financing models including blended finance and climate funds. Supporting resilient services, wastewater reuse, ecosystem restoration, and digitally enabled water management.

Collaboration with development banks and private sector. Including pathways for co-financing, responsible engagement, and investment in scalable solutions.

Financing contracts linked to measurable water-quality outcomes. Including performance-based instruments supporting pathogen reduction, nature-based infrastructure, and scalable One Water–One Health implementation.



Actions and Initiatives

Pilot projects on reuse, ecosystem restoration, and digital water management. Including equitable, climate-resilient, and digitally enabled drinking water demonstrations, and local and basin-level initiatives in diverse contexts.

Capacity-building programs. Addressing institutional, regulatory, and skills barriers to innovation adoption and long-term sustainability.

Regional knowledge exchange networks. Including partnerships that strengthen peer learning and continued dissemination through other international events.

Three flagship basin pilots. Implementing the full One Water–One Health stack (UWI, nature-based treatment, Ledger integration, financing contracts, and citizen-science networks) in selected basins.

Communication and Legacy

Contributions to the 11th Forum declaration. Including a dedicated commitment on One Water–One Health water quality, and strengthened language on universal access, ecosystem protection, and measurable follow-up.

Communication campaigns highlighting water-ecosystem linkages. Including public storytelling on successful restoration cases, key messages on equity, health, and climate resilience, and high-impact media and digital content released during the 11th Forum.

Post-Forum dissemination through global platforms. Including dissemination through COPs on climate and biodiversity, UN Water Conferences, and regional and international water and biodiversity platforms.

Visibility tools and legacy monitoring. Including audience-tailored key message suites, social-media amplification toolkits, live demonstrations and virtual tours, and an annual public impact report to track progress and accountability beyond the 11th Forum. Community engagement and education. Encouraging community-level action by promoting education, equity, and health resilience in water management

Monitoring and Post-Forum Action

The theme will contribute to lasting Forum legacy through:

- Continued partnerships leading toward the 12th World Water Forum. Including thematic working groups, pre-Forum consultations, and follow-up virtual events to maintain momentum and coordinate next steps.
- Integration into UN Water processes and global sustainability platforms. Including SDG reporting, UN Water dialogues, High-Level Political Forum inputs, and dissemination through global conferences and platforms (UN Water Conferences, UNFCCC COPs, CBD COPs, Ramsar Conference).
- Monitoring of commitments through thematic networks and reporting mechanisms. Including annual public reporting tools (e.g., One Health Water Quality Impact Report), real-time monitoring platforms (Global Citizen-Science Observatory, One Water–One Health Ledger), and indicators covering equity, governance, innovation, and resilience.
- Continued knowledge sharing on ecosystem-based and inclusive water management approaches. Including knowledge repositories of best practices, case studies, business models, open-source toolkits (UWI pipeline, data standards), and dissemination through basin networks and regional innovation hubs.



Theme and Topic Coordinators

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