

Topic Concept Note Template

Thematic Process, 11th World Water Forum

This template should be completed through collaborative discussions among Topic Coordination Group Members under the leadership of each Topic Coordinator, and submitted to Theme Coordinators, after which it will undergo final review by the Co-Chairs of the 11th Forum Thematic Process.

- **Theme Number:** 3
- **Theme Title:** Water for Humans and Nature
- **Topic Number:** 3C
- **Topic Title:** *Protecting and Restoring Water Ecosystems and Aquatic Biodiversity*
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I. Topic Overview

Rationale and Context

Water is a critical resource for both humans and nature. We depend on healthy, functioning ecosystems for our water resources and ultimately our water security, which is threatened by a range of drivers including climate change. The degradation of freshwater ecosystems inevitably leads to acute problems affecting aquatic biodiversity but also human livelihoods and health. Unfortunately, due to the ever-increasing pressures of human activity on water resources and related ecosystems, freshwater biodiversity is degrading fast. We estimate that 24% of freshwater species are in danger of becoming extinct (Sayer, C.A., Fernando, E., Jimenez, R.R. *et al.*, 2025).

As highlighted by the IPBES, pressures such as water pollution, contamination, water availability variability due to climate change, land-use change such as rapid urbanization, over-exploitation of the water resources and the introduction of invasive species are endangering aquatic ecosystems and the numerous services they provide to human societies at every level of the river basin. A critical pathway to meeting collective goals such as the SDGs and other targets set by multilateral processes such as the Kunming-Montreal Global Biodiversity Framework or the Paris Climate Agreement, is to prioritize the conservation and restoration of freshwater ecosystems and biodiversity.

These goals, while set at the global level, depend on regional, national and local application. Indeed, protecting and restoring healthy ecosystems has to be done at every scale:

local actors might know the specifics of the watershed better than national ones, but national and regional partnerships might be necessary for concerted and impactful transboundary action. Moreover, regional differences in the drivers of risk, from damming and agriculture to deforestation and illegal mining, highlight the need for coordinated global and local action to prevent irreversible ecological loss.

Freshwater ecosystems are tightly interconnected across scales: upstream pollutants affect downstream biodiversity and human uses, downstream projects impacting ecological continuity affect upstream ecosystems. It follows that the response to pressures on ecosystems must be coordinated across scales at every level of the watershed, with special attention being paid to ecological continuity and Nature-based Solutions. Restoration interventions—like environmental flow management, wetland rehabilitation, riparian zone restoration, and improved wastewater treatment—offer practical solutions used across various regions to enhance resilience and restore ecological balance.

These challenges are technical, financial, but are also governance challenges: preserving and restoring ecosystems will require considering the needs of many stakeholders, and integrating different sources of knowledge about these ecosystems. Innovations in data collection and monitoring, scientific knowledge and traditional knowledge systems should be integrated in decision making at all scales. However, traditional systems of governance and customary rights are subject to social, economic, cultural and legal changes, making it more difficult for Indigenous Peoples and local communities to exercise control and conservation in the respect of their cultural values, including the spiritual values of ecosystems.

Protecting water ecosystems directly addresses today's urgent water issues, including declining water quality, increasing droughts and floods, biodiversity loss, and the spread of emerging contaminants such as microplastics and industrial chemicals. Restoration interventions—like environmental flow management, wetland rehabilitation, riparian zone restoration, and improved wastewater treatment—offer practical solutions used across various regions to enhance resilience and restore ecological balance.

This topic advances SDG 6, especially its targets 6.6 and 6.3, but also SDG 2 on food security through sustainable fisheries and irrigation systems, SDG 11 on resilient cities, which can reduce the impacts of climate change through Nature-based Solutions, SDGs 13, 14 and 15, as thriving freshwater ecosystems have been proven to mitigate CO₂ emissions and benefit biodiversity conservation both on land and under water.

This topic offers opportunities to tackle cross-cutting dimensions such as climate resilience through sustainable land management alongside sustainable water management, and thanks to Nature-based solutions for climate adaptation such as restored rivers and wetlands that can act as buffers during floods, store carbon and recharge aquifers. Sustainable water ecosystems stewardship also offers opportunities to improve gender and youth inclusion through participative initiatives. Moreover, digital innovations such as satellite imagery, GIS and drones can be used to improve implementation, quantify and monitor progress, and showcase the benefits of ecosystem restoration and conservation. This is particularly important when relating to finance: blended finance, nature credits, climate funds, green bonds, and payment for ecosystem services are all potential solutions to overcome the challenge of sustainable long-term funding for ecosystem protection and restoration projects. Finally, implementing these solutions will require strong partnerships between a great variety of actors

(governments, NGOs, private sector, Indigenous peoples, research institutions) across scales, from local communities to international organizations.

Objectives of the Topic

Technical objectives

- Disseminating relevant tools, methods and approaches for Nature-based solutions and sustainable ecosystem and water management, such as innovations (GIS, satellite imagery, AI)
- Sharing examples of new and traditional governance models (breaking silos, stakeholder engagement, improving inclusion of underrepresented communities, integrated river basin management).
- Improving the understanding of Forum participants on the linkages between water management, biodiversity protection, climate resilience and human livelihoods and well-being, demonstrating the multiple co-benefits of ecosystem restoration and protection.
- Improve implementation of Nature based Solutions related to wetlands, grasslands and forests conservation to restore and preserve freshwater ecosystems and provide multiple socio-economic benefits.

Policy and institutional objectives

- Promoting restoration and protection of aquatic ecosystems as solutions for increased human resilience and health.
- Promoting integrated management models which improve transversality in planning and management, integrating water policy and biodiversity protection at every level of governance in a holistic manner.
- Showcasing successful examples of youth, gender, Indigenous peoples and local communities' inclusion in restoration and conservation projects.
- Highlighting the regulatory frameworks and governance models that improve the implementation of Nature-based Solutions in water management to the benefit of both Nature and Humans.

Capacity and knowledge sharing objectives

- Promoting knowledge sharing platforms across regions facing similar challenges regarding water management, biodiversity loss and climate impacts.
- Highlight training programs led by youth groups, women and IPLCs on ecosystems restoration, protection and management.
- Improve the links between water management training modules and ecosystems restoration and protection training plans.
- Showcasing the importance of working with multiple knowledge systems and facilitating interaction of science, social sciences and engineering in co-designing projects for long-term community engagement.

II. Key Issues, Opportunities, and Scope

Key Challenges

- Funding and capacity limitations
- Low political visibility and attractivity of both biodiversity and water topics
- Fragmented governance of biodiversity and water resources, lack of policy coherence
- Emerging challenges regarding water availability and quality (climate change, pollutants, green water accounting, competing uses)
- Emerging opportunities for monitoring, early-warning systems and decision-making tools (eDNA, remote sensing, proxy data and AI)
- Institutional and regulatory barriers, including outdated water quality standards, weak enforcement, and limited inter-agency coordination.

Opportunities and Strategic Importance

Creating and maintaining an active coalition of stakeholders within the Topic which would participate in relevant sessions at major international conferences, such as the CBD COP and the UN Water Conference, to ensure continued dissemination of key messages.

Nature technology is poised to be the fastest-growing opportunity area within biodiversity. In the upcoming years, the development of new tools to enhance data collection and improve outcome-based metrics will change the way decision-making is done at all scales of governance.

Innovative finance mechanisms, such as biodiversity credits, will continue to gain traction, and represent both an opportunity and a challenge for project leaders and regulation makers to make sure they are targeting the right projects and incentivizing the right behaviors.

Social innovation will provide opportunities for improved governance, for example, innovative methodologies for engagement, inclusion of customary governance, and multiscalar decision-making. Successful people-focused projects benefiting both human livelihoods and the environment exist, and should be scaled up and shared during the Forum.

Proposed Priorities of the Topic / Guiding Questions

How can policies and legal frameworks be harmonized to treat water quantity, water quality, and the health of aquatic ecosystems as a unified governance challenge, grounded in science-based decision making?

Which ecological restoration strategies are most effective and sustainable for each type of aquatic ecosystem (rivers, lakes, wetlands, mangroves, springs) in varied political, climatic and social context?

Which digital tools and innovative methods can improve monitoring, evaluation, and intervention planning for the resilience and integration of ecosystems and communities?

What mechanisms can support education, awareness-raising, and capacity building at all governance levels, especially to improve inclusivity and equity in ecosystems restoration and protection projects?

Which innovations and strategies for mobilizing and diversifying funding (public, private, cross-sectoral partnerships) can sustainably support ecological restoration?

Proposed Sessions of the Topic

- Financing the restoration of ecosystems for humans and nature - innovative approaches and old tools used in new ways
- Green water - exploring the ecosystems, soils, and atmosphere nexus
- Data aplenty - making sense of new tools for monitoring, co-construction and decision-making, as well as new tools to improve impacts evaluation (ecological, social and economic impacts) in a nexus approach

Crosscutting topics

- Health - water quality, watershed protection and human well-being
- Holistic Governance - Creating our Common water future (IWRM and innovative governance approaches, inclusion of different knowledge systems, multi-level governance, integration of voices), institutional hurdles and policy headaches: harmonizing our frameworks for holistic approaches
- Education & capacity-building - New training needs for an integrated model of water governance
- Sanitation - How can we transition from "disposal-oriented" sanitation to "resource-oriented" management that uses treated effluent to restore and create wetlands and maintain environmental flows, particularly in water-scarce regions?

III. Expected Outcomes and Deliverables

Policy and Strategic Outcomes

- Development of a guidance note based on the Topic's sessions presentations to integrate the protection and restoration of aquatic ecosystems into national, basin and regional agendas on water, biodiversity, and climate. / Guidance note on mainstreaming aquatic biodiversity considerations in river basin and coastal zone planning
- **Technical and Knowledge Deliverables**
- Creation of a toolkit for the dissemination of existing tools, databases and methodologies for ecological restoration, Nature-based Solutions implementation and

hydrological monitoring, including good practices, case-studies, and tools such as GIS, remote sensing, and artificial intelligence.

Partnerships and Financing Outcomes

- Valorization of existing multi-stakeholders partnerships bringing together governments, local communities, NGOs, the private sector, regional and international institutions.
- Compendium of engagement tools and models for private sector participation in conservation financing (e.g., water stewardship, nature credits, blue bonds).

Actions and Initiatives for Implementation

- Setting up a network for raising awareness of the topic within the international community through the participation to other international events
- Valorization of existing pilot projects and basin-level or transboundary initiatives for ecological restoration and conservation of priority biodiversity areas, environmental flow assessment, and pollution reduction.

Communication and Visibility

- Sharing the outcomes via the working group members' existing platforms and dissemination of results and best practices at international conferences, such as the COPs on climate and biodiversity, the UN Water Conferences, Ramsar forums, and other water and biodiversity regional and international platforms.
- Development of key messages and communication campaigns to raise awareness among policymakers, civil society, and the general public on the importance of aquatic ecosystems.
- Contribution to Forum declarations and strategic documents, enhancing visibility of actions and stakeholder engagement.
- Public communication campaigns during the Forum (media, digital content, storytelling on successful restoration cases).

IV. Monitoring and Post-Forum Action

As Topic group members continuously join major international conferences such as the UN Water Conferences, the CBD COPs, UNFCCC COPs, and the Ramsar Conference, the network established through these sessions will work together continuously and deepen collaboration, forming a basis for the 12th WWF.

As the Topic aligns with the actions with SDG 6 (clean water), SDG 14 (life below water), and the Kunming–Montreal Global Biodiversity Framework, the Topic group members and session contributors will contribute to push for the continuation of these targets in the post-2030 Global Agenda.

The policy recommendations, practical guides, and digital tools presented during the Topic sessions will serve as a lasting reference for policymakers, practitioners, and local communities, facilitating the planning and implementation of long-term conservation and restoration initiatives. Pilot projects and multi-stakeholder initiatives presented will serve as replicable models in other river basins and regions worldwide, consolidating the Forum's legacy in terms of concrete and actionable solutions.

Technical results and shared knowledge will feed into preparatory sessions and regional consultations for the 12th Forum, ensuring continuity of discussions and follow-up on recommendations.

The Topic coordination group, along with willing Sessions organizers and speakers, will organize a virtual event to maintain the post-Forum momentum and coordinate follow-up actions with links to the UN Water Conferences and the 12th World Water Forum.

V. Proposed Cross-Process Dialogue Areas

Policy, tools, and changing ways of thinking aquatic resources which could be jointly developed with 4B (4B. Strengthening Political Will and Coordination), 4C (New Instruments for Water Sustainability Policy Consensus) to develop approaches for integrated water–ecosystem governance, cross-sector alignment, and long-term policy harmonization.

Redefining Aquatic Ecosystems as Natural Capital: Joint dialogue with 6E to explore valuation methods, economic accounting frameworks, and investment models that recognize rivers, wetlands, and coastal ecosystems as national assets supporting water security and climate resilience.

Biodiversity and Food Security – Explore jointly with group 1E the agriculture and food-related themes how the restoration of aquatic ecosystems contributes to food security, particularly through sustainable fisheries and aquaculture.

Integrated Water Management and Climate Change Adaptation – Engage with group 1C on themes of climate resilience and hydrological risk management to identify solutions that combine ecosystem conservation with adaptation to climate hazards (floods, droughts, coastal salinization).

High-Level Policy Dialogue on Mainstreaming Aquatic Ecosystem Protection: On integrating aquatic biodiversity into national water laws, climate policies, and investment programmes, emphasizing enforceable standards and cross-sector mandates. Could be organized with the Ministerial or the Parliamentary segments.

Basin-Level Cooperation for Restoration and Environmental Flows: organized jointly with Basin Authorities and/or Local/Regional Authorities to advance transboundary and sub-national collaboration on river restoration, wetland rehabilitation, early-warning systems, and ecosystem-based basin planning.

Financing Commitments for Nature-Based Solutions in Water Management – with Local Authorities. Public Private Partnerships (PPP) discussions to foster finance mechanisms (blue

bonds, blended finance, ecological contributions to Nature) supporting large-scale aquatic ecosystem restoration.

Wetlands Dialogue: Strengthening legal and institutional recognition of aquatic ecosystems, particularly wetlands, develop a joint dialogue with ministerial, parliamentary, and basin authorities to harmonize legislative frameworks, integrate wetlands into land-use planning, and promote their protection as essential natural infrastructures for climate resilience and hydrological regulation.

Youth engagement and community inclusion in water and aquatic ecosystem governance – Work closely with national and local parliaments, regional authorities, and basin organizations to institutionalize the participation of youth, women, and local communities. This dialogue would aim to create or reinforce formal mechanisms for co-decision, participatory monitoring, and youth leadership in restoration and sustainable management initiatives.

Strong emphasis should be given to the countries of the hosting region, as they are likely to be present and contribute massively to the dialogues and exchanges during the session. This topic is also well-suited to be discussed by any regional process, as Nature is an ever-present, although varied and multi-faceted, component of societies all around the world. It is therefore important to include all regions, and especially the MENA region, in these discussions.

1. Asia-Pacific Region

Home to some of the world's most threatened aquatic ecosystems, including major river basins (Ganga-Brahmaputra-Meghna, Mekong, Yangtze). This Region's rich diversity of ecosystems and species are severely affected by rapid urbanization, pollution, hydropower expansion, and climate impacts. Strong ongoing regional collaborations (ESCAP, ASEAN, APAN, Mekong River Commission) can support joint monitoring, restoration, and policy innovation.

2. Africa

The African continent hosts critical freshwater ecosystems such as the Nile, Niger, Congo, and Lake Chad basins, including mangroves, deltas, lagoons and floodplains, facing degradation through increasing variability in water quantity, decreasing water quality, and biodiversity loss. High vulnerability to climate change makes ecosystem-based approaches essential for resilience, food security, and livelihoods. Growing interest in Nature-based Solutions, wetland restoration, and transboundary cooperation offers strong alignment with the Topic. Strong existing continental frameworks (African Water Vision 2025, AMCOW, regional economic communities) provide opportunities for coordinated action.