

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 **by January 30th, 2026**, after which it will undergo final review by the Co-Chairs of the 11th Forum Thematic Process.*

- Theme Number: **Theme 6**
- Theme Title: **Value of Water**
- Topic Number: **Topic 6B**
- Topic Title: **Advancing Efficiency in Water Management in Different Sectors**
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I. Topic Overview

Rationale and Context

As global populations grow, urbanization accelerates, and the impacts of climate change intensify, the pressure on water resources has become increasingly severe. Different sectors—such as public water services, agriculture, and industries—have unique water demands and challenges.

At both global and regional levels, inefficiencies in agricultural irrigation, urban water systems, and industrial and energy water use exacerbate stress on water resources and strain public finances. In Latin America, Asia and other regions likewise, water-use inefficiencies are evident in high levels of non-revenue water in urban systems, uneven irrigation performance in agriculture, and limited incentives for industrial water reuse and efficiency. Climate change further amplifies these challenges through recurrent droughts and extreme events, affecting water resource availability and threatening water systems' reliability. Regions and countries face significant disparities in institutional capacity, infrastructure, and access to finance. Many cities and rural areas are experiencing high water losses, limited monitoring, and fragmented governance. These challenges highlight the central role of national and subnational institutions (such as line ministries, basin authorities, regulators, utilities, and local governments) in defining, implementing, and sustaining context-specific efficiency measures that reflect local hydrological, socio-economic, and institutional realities. All these contribute to inefficient water management.

Improving water-use efficiency—such as repairing distribution system leaks, adopting less water-intensive crops, and investing in innovative water technologies—can lead to more sustainable food production and industrial processes. Water savings also result in energy savings, as less water needs to be extracted, treated, transported, or heated. These measures enhance the economic value derived from water use. Enhancing efficiency is thus a strategic response to water scarcity, climate variability, demographic pressures, and increasing competition among water users. Efficiency gains are most effective when they build on local and traditional knowledge systems, including community-managed irrigation practices, locally adapted cropping patterns, and place-based water stewardship approaches, combined with modern technologies and data systems

However, the concept of water efficiency needs to extend beyond mere water use and economic value to a broader framework that encompasses environmental and socio-economic impacts and promotes resource sustainability. Reducing water use/consumption decreases environmental pollution as less wastewater is discharged into the environment. Responsible water use helps preserve ecosystems and maintain environmental flows, by leaving more water for ecosystems and reducing water withdrawals that lead to environmental degradation in the long-term if managed in unsustainable ways. Accordingly, improving efficiency in water management across sectors not only conserves water and boosts economic productivity, but also reduces environmental impacts, supports ecosystem health, enhances climate resilience, and promotes social equity.

Effective water management is, thus, vital for the sustainability of the world's water resources, healthy environment, and equitable socio-economic development. Promoting efficiency is therefore not just a technical challenge of reducing withdrawals and encouraging responsible use but also a socio-economic and environmental imperative.

A comprehensive approach to water efficiency encourages cross-sector collaboration, promotes integrated resource management and nexus, and fosters innovation. It is central to climate resilience and adaptation strategies and must incorporate gender-responsive and youth-inclusive approaches. Digital innovations, data analytics, artificial intelligence (AI), and smart monitoring systems have significant potential to advance efficiency in water management across sectors. Strong partnerships and sustainable financing mechanisms are essential for scaling up solutions, enabling large-scale implementation and ensuring their long-term viability.

Consequently, Topic 6B, "Efficiency in Water Management Across Different Sectors," emphasizes a broader, comprehensive approach to advancing efficiency in water management, while promoting water resource sustainability, enhancing climate resilience, and supporting equitable societies, in alignment with global frameworks such as the Sustainable Development Goals (SDGs) and the Paris Agreement on Climate Change. Beyond SDG 6 "Clean water and sanitation" and Target 6.4 "Increasing water-use efficiency across sectors", efficient water management is essential for achieving SDG 2 "Food security", SDG 3 "Health and well-being", SDG 5 "Gender equality", SDG 9 "Industry, innovation and infrastructure", SDG 10 "Reducing inequalities", SDG 13 "Climate action", and SDG 15 "Ecosystems and biodiversity".

Objectives of the Topic

Topic 6B aims to promote a broader concept of efficiency in water management, encompassing all dimensions from resource efficiency and economic value to environmental and social sustainability.

The key objectives include:

- Facilitating a global dialogue on **revisiting and refining the concept of efficiency in water management** to include resource use sustainability, including various sources of water such as non-conventional water resources, economic considerations, environmental impacts, and social dimensions. This broader perspective will also involve establishing benchmarking standards and criteria for efficiency across various sectors.
- Sharing examples and exploring opportunities to scale up **best practices, existing technological solutions, nature-based solutions, circulars economy approaches** that enhance efficiency in water use and management. Special emphasis will be placed on showcasing context-specific solutions for sectors such as agriculture (e.g., irrigation efficiency), industry (e.g., circular economy and water recycling), urban services (e.g.,

smart urban water systems), and energy. Addressing sector-specific challenges is essential to building resilient water management systems capable of meeting current and future demands.

- **The Water–Energy–Food (WEF) Nexus** provides a critical framework for tackling complex resource challenges in an era of climate change, population growth, and competing demands. Efficient water use is central to this approach, as improvements in water productivity directly strengthen energy systems and food security while reducing environmental pressures. This session will explore practical strategies and governance mechanisms that enhance water efficiency across sectors, unlocking co-benefits for energy and agriculture. By bringing together policy-makers, researchers, and practitioners, the discussion aims to advance actionable pathways that deliver resilient, sustainable, and efficient resource management at scale. The objective is also to identify metrics and indicators for nexus-based decision-making
- Exploring the potential of **digital innovations and artificial intelligence (AI) technologies to improve efficiency in water management** across sectors. This includes advancements in monitoring systems, data management, smart water systems, and decision-support tools that enable more effective water resource management.
- Examining **governance frameworks, financing mechanisms, partnerships and community engagement strategies conducive to improving efficiency in water management** across sectors. Discussions will focus on coherent policies and regulations that incentivize responsible water use, facilitate cross-sector coordination, and link basin-level planning with local implementation. Enhancing capacity-building by strengthening the technical and institutional capabilities of national and subnational actors, fostering knowledge exchange through peer learning, South–South and triangular cooperation, and communities of practice that enable two-way knowledge flows between local, national, regional, and global levels, and actively involving women and youth as key drivers of innovation and implementation.

II. Key Issues, Opportunities, and Scope

Key Challenges

- Persistent inefficiencies in water use across sectors, particularly in agriculture, industry, and urban water services, limiting economic, social, and environmental performance.
- Data gaps and limited monitoring systems, including insufficient use of standardized indicators and digital tools to support smart irrigation, water reuse, and efficient urban planning.
- Fragmented governance and institutional or regulatory constraints at national and subnational levels, including unclear mandates, limited coordination among line

ministries and basin or local authorities, and capacity gaps that hinder effective cross-sector coordination, stakeholder engagement, and the scaling-up of efficient and circular water-use practices.

- Climate-related pressures and limited access to sustainable financing, constraining investments in efficiency, resilience, and long-term system modernization.

Opportunities and Strategic Importance

- Scaling up efficient and circular water-use practices across sectors.
- Using digital innovation and data systems to improve monitoring and decision-making.
- Strengthening integrated policy and governance approaches, while expanding partnerships and innovative financing to accelerate investment.
- Leveraging nationally led reform processes and decentralized implementation mechanisms, through utilities, municipalities, basin organizations, and sector agencies to anchor efficiency measures in policy, regulation, and long-term institutional practice.

Proposed Priorities of the Topic / Guiding Questions

- How to understand the concept and indicators of water efficiency for evaluation and management, considering economic, social, and environmental factors and their balance?
- How can efficient and circular water-use practices be scaled up across sectors and contexts?
- How can digital tools and data systems improve water-use efficiency and accountability?
- What policy and governance frameworks best incentivize efficiency and coordination?
- What partnerships and financing models can enable large-scale implementation?

Proposed Sessions of the Topic

Sessions under Topic 6B

1. Measuring efficiency in water management: Conceptual advances, benchmarking, and sustainability indicators.
2. Best practices of efficient water management and use as a climate resilience strategy in agriculture, urban areas and industry: Technical and nature-based solutions, circular economy approaches
3. Water-Efficient Energy and Food Systems: A nexus approach to sustainable water management. This may be linked to water security and energy efficiency
4. Governance, financing, and partnerships for advancing efficiency in water management: Policy frameworks, community engagement, capacity building, private sector engagement, and multi-stakeholder collaboration

Possible additional joint session jointly with Topic 5A. Hydro-informatics and AI Tools for Water Management:

5. Leveraging the potential of digital innovation, data tools and AI to advance efficiency in water management

III. Expected Outcomes and Deliverables

Policy and Strategic Outcomes

- Policy recommendations to advance water-use efficiency and circular water management across agriculture, urban services, industry, and energy sectors.
- Policy recommendations and strategic guidance co-developed with national authorities and aligned with existing national water, climate, agriculture, industry, and urban development strategies, ensuring relevance, ownership, and uptake.
- Strategic guidance framework linking water-use efficiency with climate resilience, sustainable development, and integrated water resources management.
- Policy options and regulatory enablers to incentivize water reuse, smart irrigation, and efficient urban planning.
- Roadmap for cross-sector coordination, supporting alignment among water, energy, food, and urban policies at national and subnational levels.

Technical and Knowledge Deliverables

- Compilation of case studies and good practices on water-use efficiency and circular water management across sectors and regions.
- Guidance note on indicators, methodologies, and digital tools for measuring, monitoring, and benchmarking water-use efficiency.
- Synthesis report highlighting lessons learned, enabling conditions, and pathways for scaling up efficient water-use practices.
- Knowledge-sharing platforms or toolkits designed to support peer learning among national and subnational policymakers, utilities, practitioners, and other stakeholders, integrating locally generated case studies, operational tools, and data, and enabling continuous exchange between local, national, and global communities of practice.

Partnerships and Financing Outcomes

- Strengthened partnerships with development banks, international organizations, and national and local authorities to support investments in water-use efficiency.

- Increased private sector engagement, including technology providers and utilities, to accelerate innovation and implementation of efficient and circular water-use solutions.
- Identification and promotion of innovative financing models, such as blended finance, performance-based incentives, and results-oriented funding mechanisms.
- Formation of multi-stakeholder coalitions or initiatives focused on scaling water-use efficiency across sectors and regions.

Actions and Initiatives for Implementation

- Identification of potential pilot and demonstration projects on water-use efficiency and circular water management in priority sectors and territories. These pilots and demonstration initiatives will be nationally led or nationally endorsed, with structured learning loops to inform policy reform, regulatory adjustment, and scaling through national and subnational systems.
- Development of basin-level or city-level initiatives linking efficiency measures with climate resilience, reuse, and integrated planning.
- Facilitation of collaboration agreements or among public authorities, utilities, private sector actors, and knowledge institutions.
- Initiation of innovation challenges or network coalitions to accelerate the adoption and scaling of efficient water-use solutions.

Communication and Visibility

- Clear key messages positioning water-use efficiency and circular water management as core elements of the Value of Water.
- Public communication products and outreach opportunities, including sessions highlights, briefs, and digital content to engage diverse stakeholders.
- Contributions to the World Water Forum declarations and official outputs, reflecting the importance of efficiency across sectors.
- Visibility of good practices and success stories to support replication and scaling across regions.

IV. Monitoring and Post-Forum Action

The outcomes of this topic will contribute to a long-term Forum legacy by informing future initiatives and dialogues, while positioning water-use efficiency and circular water management as core elements of the Value of Water agenda. They will support follow-up initiatives toward the 12th World Water Forum by fostering continuity, learning, and the scaling of effective practices through national institutions, while contributing to global agendas, including SDG 6 and climate-related processes, via sustained partnerships, nationally anchored knowledge-sharing, and monitoring mechanisms beyond the Forum.

V. Proposed Cross-Process Dialogue Areas

- Water-use efficiency and climate resilience, linking efficiency measures with adaptation strategies across sectors and ecosystems.
- Efficient and circular water management across sectors, connecting water-use efficiency with urban planning, food systems, and sustainable production.
- Policy incentives, regulatory frameworks, and national commitments to advance water-use efficiency and circular water use.
- Territorial and basin-level implementation of efficiency measures and cross-sector coordination.
- Water-stressed and arid or semi-arid regions, where efficiency gains are essential for resilience and sustainability.
- Rapidly urbanizing regions, particularly in Latin America, Africa, and Asia, facing growing demand and infrastructure pressures.