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## CONCLUSIONS AND KEY OUTCOMES

### Global workshop “Conjunctive Management of Surface Water and Groundwater: National to Transboundary Level” (16 – 17 October 2023, Geneva and online)

The Global workshop on Conjunctive Management of Surface Water and Groundwater<sup>1</sup> brought together more than 200 participants (in-person and online) and provided a space for exchange on the importance, needs and benefits of conjunctive water management and practical learning about the application of conjunctive water management in national and transboundary contexts. The key outcomes of the discussions, developed in cooperation with partners and consulted on with participants, are summarized as follows:

#### A. Increase understanding and awareness of the benefits of conjunctive water management, especially for climate change adaptation

Conjunctive water management can bring **numerous benefits**, including but not limited to optimization of the resources available for use, reduced risk of water shortages, increased water resources sustainability and greater water security. It can support the achievement of the SDGs thus resulting in larger environmental, economic and social benefits. Furthermore, conjunctive water management can reduce the potential for water associated conflicts at various levels.

<sup>1</sup> Documents and presentations from the meeting are available at <https://unece.org/environmental-policy/events/global-workshop-conjunctive-management-surface-water-and-groundwater>.

Conjunctive water management should be seen as an important ally in **climate change adaptation**, as it supports Integrated Water Resources Management (IWRM), enables better use of available water resources, including through better consideration of the natural water cycle, and contributes to the role of water in circular economy. While aquifers provide a natural resource for deployment in climate-change adaptation, strategic rethinking is required to ensure resource reliability in the face of climate change and increasing water demand, with increased investment in conjunctive use coupled with enhanced integrated water storage management, including through aquifer-based solutions, such as managed aquifer recharge and other technologies.

Increased understanding and **awareness of the benefits** of conjunctive water management among policy and decision makers still needs to be built. Increasing water scarcity and water stress call for stronger application of adapted conjunctive water management approaches and require engaging with decision makers, so that they would create the necessary frameworks and approve and finance implementation. In this regard, it is important to utilize the momentum created by the [United Nations 2023 Water Conference](#) (New York, 22-24 March 2023), the UN-Water Summit on Groundwater (Paris, 7-8 December 2022) and the recent reports by the Intergovernmental Panel on Climate Change ([AR6 Synthesis Report: Climate Change 2023](#)) and the World Meteorological Organization ([State of Global Water Resources 2022](#)), as well as the United Nations World Water Development Report 2022 "[Groundwater: Making the invisible visible](#)". It is critical to ensure that the fundamentals of the water cycle are central to discussions at the [Summit of the Future](#) (22-23 September 2024).

### **B. Move from spontaneous to planned conjunctive water management**

Surface water management and groundwater management have historically been approached from separate perspectives. Most examples of conjunctive water use are spontaneous or unplanned, with limited integrated management of the two resources. **Transition from spontaneous to planned conjunctive use and management should be supported** through the creation of enabling legal and regulatory frameworks. This would ensure that the use of surface water and aquifer resources is complementary and sustainable and brings cumulative economic, social and environmental benefits.

### **C. Create enablers for conjunctive water management**

The conjunctive management of groundwater and surface water requires understanding and knowledge of the functioning of the water system, whether or not there is a hydraulic connection between the two components, to avoid detrimental physical effects on the system and the resource components and also to prevent potential conflicts between users. The science of each of these helps to quantify the resources and using **ground-truth data**, collected and well analysed before implementation, is a key enabler. Various technical tools are widely available to support data collection and the actual transition to conjunctive water resource management. Data collection and monitoring should be followed by data analysis and communication efforts to support policy making.

A clear prerequisite for conjunctive water management and its techniques application is **better characterization of aquifers and groundwater** and their flows through dedicated assessment, and especially the assessment of interactions of groundwater systems with surface water and groundwater dependent ecosystems. These efforts require investment in assessment of aquifers and groundwater through data collection, monitoring and modelling. Conjunctive water management actions, activities and techniques are often poorly known and rarely applied at their full potential, lacking investments, especially because they involve groundwater.

To enhance the knowledge base, **open data policies** should be embraced so that surface water data, groundwater data, meteorological and other data become available to users and to those who are supposed to manage water resources in an integrated manner.

**Local knowledge** and, consequently, local user participation is key to support conjunctive management. Local interaction and arrangements between local communities can yield effective cooperation results.

Moreover, conjunctive management requires supportive **legal and regulatory frameworks and compliance assurance mechanisms at the domestic level**, as well as policy coherence and coordination to ensure the balance of surface water and groundwater use, also in support of commitments and actions to apply conjunctive management in a transboundary context. The lack of legal and regulatory frameworks should urgently be addressed using available best practices.

Another prerequisite for implementation of conjunctive water management is adequate **capacity** of institutions. The availability of trained and experienced hydrogeologists, hydrologists, engineers, sociologists, and economists is obligatory, as also the existence of effective coordination and cooperation mechanisms, especially in cases where surface waters and groundwaters have traditionally been managed by different authorities. It is important that institutional frameworks remain effective beyond the lifetime of individual projects.

**Different tools are available to enhance knowledge**, build capacity of institutions and officials and support the exchange of experiences such as the [GEF IW:LEARN Conjunctive Management Hub](#), [IGRAC's Transboundary Aquifers of the World map](#) and others. Capacity to use isotope tracers and groundwater flow models should be built, among others, to support the use of open-source integrated water balance modelling.

Adoption of conjunctive management requires **funding and investments**, in particular in aquifer identification, delineation, monitoring and related infrastructure. Awareness on the potential of conjunctive use technologies needs to be built, together with enhancing human capacities and governance and legal mechanisms for technology adoption and operation. Financial support to pilot and sustain conjunctive water management is crucial.

#### **D. Create frameworks for conjunctive management in transboundary contexts**

Conjunctive water management from national to transboundary context increases the complexity, due to the need for harmonisation of institutions and regulations and for coordination of national and international allocation of responsibilities and financing. This complexity is not insurmountable, and cases have been advanced to demonstrate potential **tangible shared benefits**. Equivalence between groundwater and surface water governance is a key issue to foster conjunctive management from pilot projects to national implementation and, ultimately, transboundary cooperation commitments.

**Joint bodies** such as basin commissions, bringing together technicians and political/administrative representatives of each party, can play a crucial role in advancing conjunctive water management in a transboundary context. To adopt conjunctive management approaches, river basin organisations need to receive a clear mandate for working on groundwater and on conjunctive water management, employ hydrogeologists / groundwater specialists and have access to groundwater and surface water data. Different models of institutional set-ups for conjunctive water management are possible depending on the interaction between surface waters and groundwaters and the availability of existing agreements and joint bodies. Promising steps include the creation of groundwater committees or working groups within river basin organisations, revision /development of Water Charters to integrate conjunctive management, integration of groundwater and conjunctive approaches in basin management plans, implementation of joint pilot projects on conjunctive water management, etc.

The two United Nations global water conventions, i.e. the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992 Water Convention) and the Convention on the Law of the Non-navigational Uses of International Watercourses (1997 Watercourses Convention), and the International Law Commission's Draft Articles on the Law of Transboundary Aquifers, can support conjunctive management through their provisions on cooperation, monitoring, exchange of data and information, joint planning, joint inventories etc. The 1992 Water Convention, through its intergovernmental platform, can further support countries through guidance development, capacity building and pilot projects. The Model Provisions on Transboundary Groundwaters adopted by the Meeting of the Parties to the Water Convention in 2012 support conjunctive water management in

transboundary settings by strengthening the legal frameworks for management of transboundary groundwaters. At the same time, specific **guidelines for conjunctive management** of transboundary waters do not exist and should be developed.

Although some progress with integration of conjunctive approach can be observed, few transboundary water agreements integrate conjunctive management in an in-depth manner. Riparian countries and basin organisations may undertake reviews of legal arrangements to better consider conjunctive management. Setting up specific conjunctive water management committees or working groups can further support the practical application of the concept.

### **E. Proposed next steps**

The 1992 Water Convention serves as a mechanism to strengthen national measures and international cooperation for the sustainable management and protection of transboundary surface waters and groundwaters. It promotes a holistic approach, which takes into account the complex interrelationship between the hydrological cycle, land, and flora and fauna, based on the understanding that water resources are an integral part of the ecosystem. The non-binding Model Provisions on Transboundary Groundwaters (2012) provide guidance in developing agreements for shared aquifers and in applying the Water Convention to transboundary groundwaters and call for cooperation on the integrated management of transboundary groundwaters and surface waters, recognising the need to progress towards conjunctive use of the two resources. As highlighted at the workshop, the Convention can therefore serve as a platform for building capacity, exchanging experience and providing guidance on conjunctive water management, supporting the creation of a community of practice. Establishment of a task force or expert group can be considered to support this work.

The needs in advancing conjunctive water management are significant, and the engagement of partner organisations is crucial to ensure comprehensive response, in line with the strengths of different organisations and the available resources. The GEF IW:LEARN global dialogues on conjunctive management of surface water and groundwater and the Conjunctive Management Hub offer valuable opportunities for building capacity and exchange of experience. All partner organisations are therefore invited to consider their possible contribution to the implementation of follow-up steps.

Possible follow-up action for the Water Convention and globally could include the following areas:

#### 1. Policy recommendations/guidance

- Develop legal, financial and technical guidance related to conjunctive management of water resources, with an emphasis on transboundary waters and without neglecting the domestic dimension;
- Develop policy recommendations on conjunctive water management for decision- and policy-makers;
- Update commentaries to the Model Provisions on Transboundary Groundwaters to reflect the global nature of the Water Convention and provide guidance on conjunctive water management (understanding that while common principles govern conjunctive water management, its application is highly context- and scale-specific);
- Develop benefit-risk sharing schemes for conjunctive management in transboundary context;
- Develop methodological approaches to the use of economic instruments for conjunctive management (taxes, subsidies, etc.).

#### 2. Best practices collection and dissemination

- Prepare an inventory of examples or case studies to make practical steps and good practices in implementation of conjunctive water management better known;
- Organise specialized meetings or sessions to promote conjunctive water management, especially in the framework of integrated water resource management meetings or initiatives;

- Organise high-level events to attract political attention to the benefits and opportunities of conjunctive water management.

3. Projects on conjunctive water management

- Pilot work on the ground to gain more experience with conjunctive water management;
- Organise field projects and studies to gather real-world experiences and data and support research, especially on groundwater and its interactions with surface water;
- Promote use of innovation and technical tools to enable conjunctive water monitoring, use, and management, including application of isotope technologies.

4. Capacity building and sharing of experience at global and regional levels

- Develop twinning initiatives on the topic;
- Support the creation of a community of practice on the topic;
- Establish a network or a database of experts (acting as a possible advisory panel) on the topic;
- Organise exchange of experience through global workshops;
- Organise trainings with regional focus to support regional dialogue on the topic.

5. Support to negotiation of agreements/arrangements and resource allocation

- Support the negotiation of agreements/arrangements with integration of conjunctive water management, including on the basis of the Model Provisions on Transboundary Groundwaters and the Draft Articles on the Law of Transboundary Aquifers, and promote integration of conjunctive water management in the activities of joint bodies;
- Support the provision of financial resources to projects that implement conjunctive water management schemes, including (joint) monitoring, data collection and information sharing.