Conjunctive Water Resources Management

A Comprehensive Approach to Achieving Water Security and Sustainable Development Goals

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PRESENTATION BRIEF

- Session number: T2E2
- Name of presenter: Mr. Abou Amani
- Institution: UNESCO-IHP
- Keyphrases:
  - Conjunctive Water Management integrates and combines surface water, groundwater, and other components, providing innovative solutions for water security.
  - Raising awareness and increasing investment in Conjunctive Water Management are crucial for achieving water security and climate resilience.

PRESENTATION STRUCTURE

- - Introduction
- - Definition and Benefits of Conjunctive Management
- - Conjunctive Water Management in Practice: Activities and Techniques
- - MAR: A Particular Example of Conjunctive Water Management
- - Conjunctive Management at the Transboundary Level
- - Examples
- - Key Messages and Way Forward

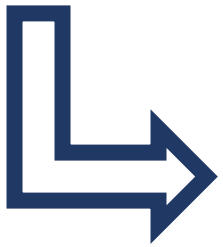
Conjunctive Water Management as a tool of Integrated Water Resources Management

WATER FOR SHARED PROSPERITY

Historically: Separation of surface and groundwater / Most conjunctive use is spontaneous/unplanned

Integrated Water Resources Management

- All users, stakeholders and sectors
- All water sources at basin level (including surface water and groundwater)



Conjunctive Water Resources Management

- subset of actions, activities and techniques comprised in IWRM (*usually not enough considered and supported*)

Conjunctive Water Management *is an approach to water resources management in which surface water, groundwater and other components of the water cycle are considered as one single resource, and therefore are managed in closest possible coordination, in order to maximize overall benefits from water at the short and at the long term (UNESCO-IHP, 2020).*

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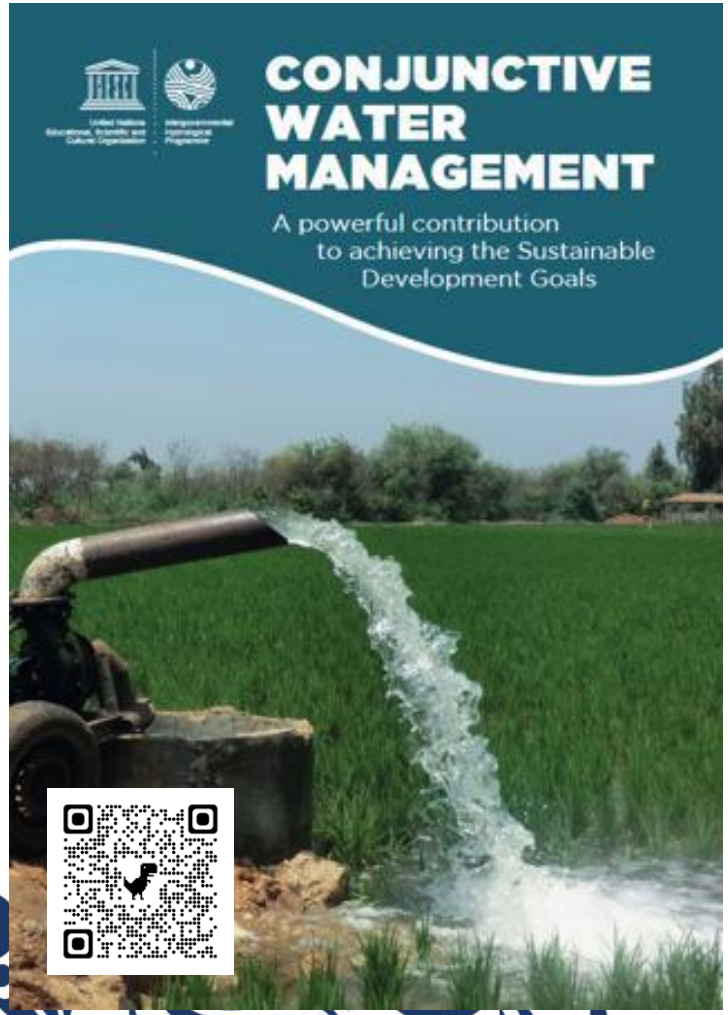
- Definition and

UNESCO expertise on groundwater and contribution to Conjunctive Water Management



Benefits:

- Optimization of the resources available for use and lower risk of water shortages
- Water resources sustainability
- Environmental, economic and social benefits (SDGs)
- Elimination or reduction of planning flaws and errors (e.g. double-counting of resources)
- Water security (creating reliable sources of drinking water)
- Enhance resilience to climate change. By combining different water sources, CWM ensures a more reliable and adaptable water supply
- Contribution to the water circularity and watershed management

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Conjunctive Water Management in practice: Activities and Techniques

WATER FOR SHARED PROSPERITY

Planning level	Implementation in the field		
Incorporating all water components / resources	**Optimal selection of source of supply**	**Resource augmentation**	**Environmental control**
• Exploring and analysing connectivities and exchanges of water	• Conjunctive use of surface water and groundwater	• Managed aquifer recharge (MAR)	• Restricting ground-water pumping to control surface water environmental flows
• Preventing 'double counting'		• Watershed management	• Groundwater level control to prevent flooding
• Identifying promising opportunities		• *Desalination*	
• Identifying hazards of harmful interaction		• *Recycling treated wastewater*	• *Managing wastewater*
		• *Improvement of irrigation efficiency*	

Water circularity and interactions

Additional approaches

(Source: UNESCO-IHP, 2020)

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Conjunctive Water Management in practice: Activities and Techniques

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<u>For most techniques:</u> Better data and governance, investments needed in Groundwater systems / aquifers and their interactions with surface water and ecosystems

(Source: UNESCO-IHP, 2020)

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Investments needed in groundwater infrastructure to support conjunctive management

WATER FOR SHARED PROSPERITY

- **Groundwater technology** helps overcome pollution of groundwater, lack of water storage, saltwater intrusion
- **Experience sharing** and **raising awareness on groundwater technology** enhance resilience to climate change
- **Major barriers also** remain lack of awareness on the potential of groundwater technologies, lack of human capacities and governance and legal mechanisms for technology adoption and operation

Groundwater Monitoring

"We Cannot Manage What We Don't See or Measure": Improving Monitoring for Informed Groundwater Management

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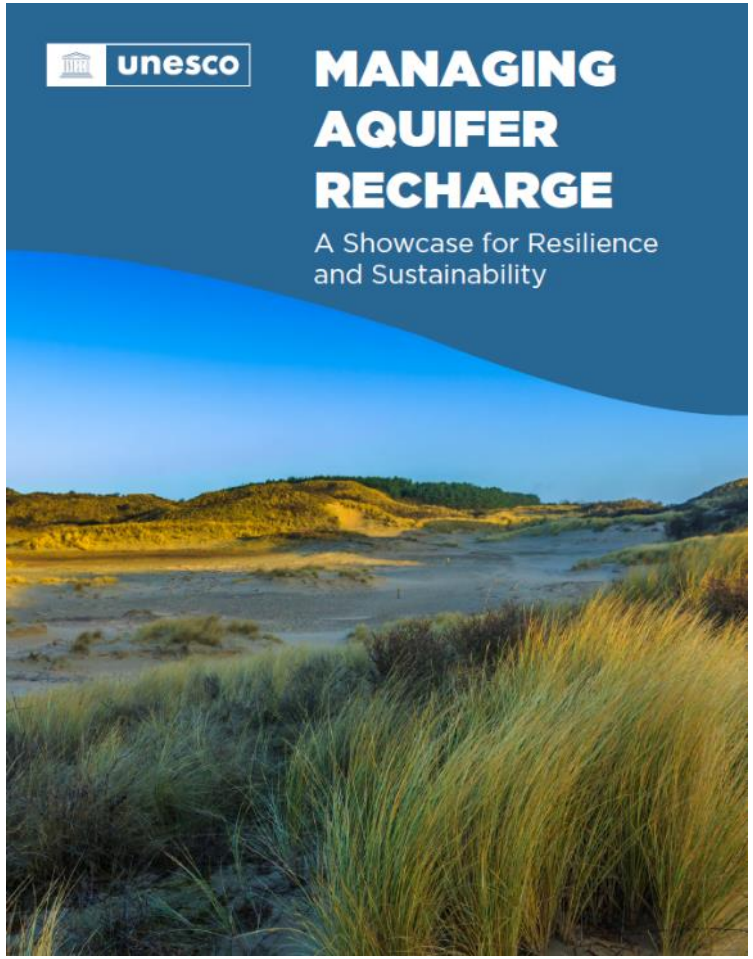
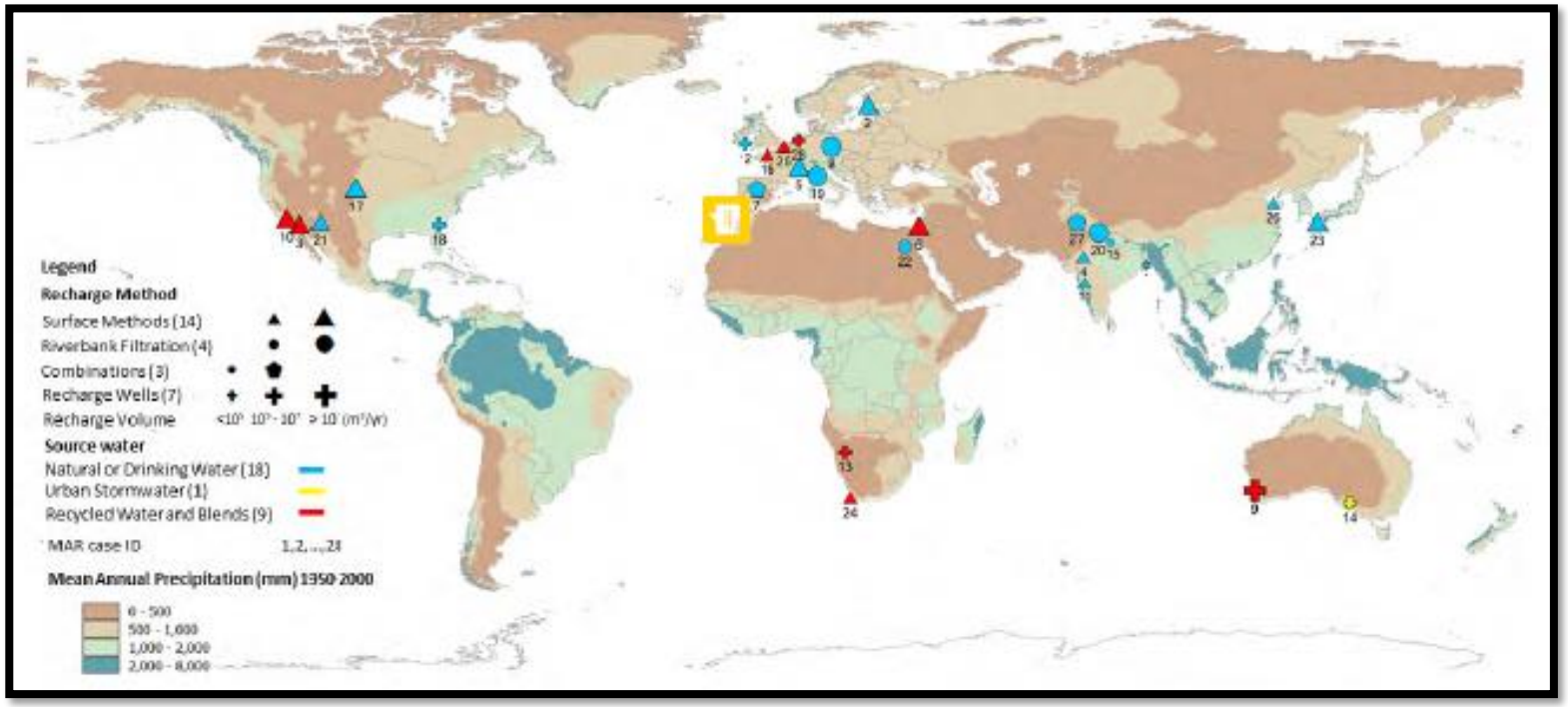
MAR: a particular example of Conjunctive Water Management





Zheng, Y., Ross, A., Villholth, K.G. and Dillon, P. (eds.), 2021. Managing Aquifer Recharge: A Showcase for Resilience and Sustainability. Paris, UNESCO.
https://unesdoc.unesco.org/ark:/48223/pf0000379962

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Conjunctive management at transboundary level

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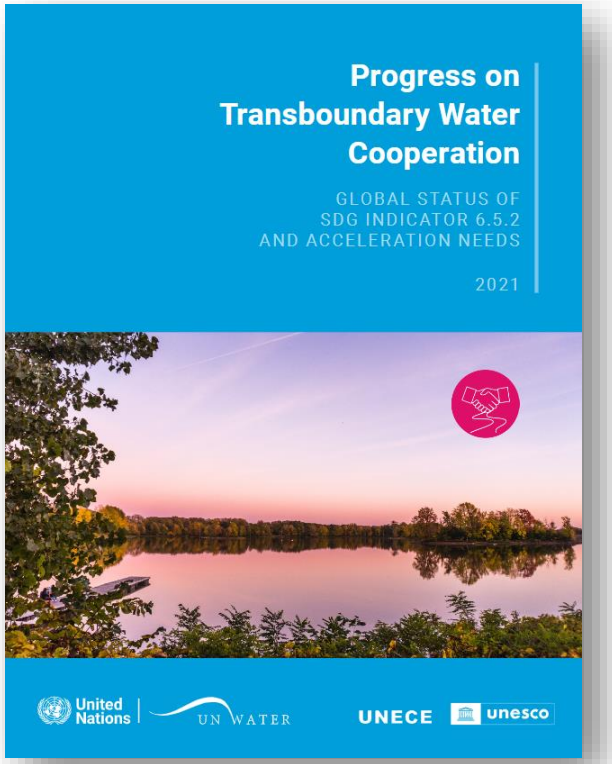
Current general situation (adapted from Villholth, 2023):

1. Agreements focusing on river basins (surface water)
2. There is a progression towards more groundwater integration in surface water-focused treaties
3. Similarly, transboundary aquifers increasingly considered through specific agreements, which in turn generally do not consider surface water
4. Implementation of conjunctive solutions are constrained by institutional and knowledge barriers



SDG Indicator 6.5.2: Proportion of transboundary basin area ***(rivers, lakes and aquifers)*** *with* ***an operational arrangement*** *for water cooperation (UNECE and UNESCO co-custodian agencies)*

An insight on how transboundary aquifers are covered by specific or river basin treaties and "enabling environment" for cooperation on groundwater
(new report in 2024)

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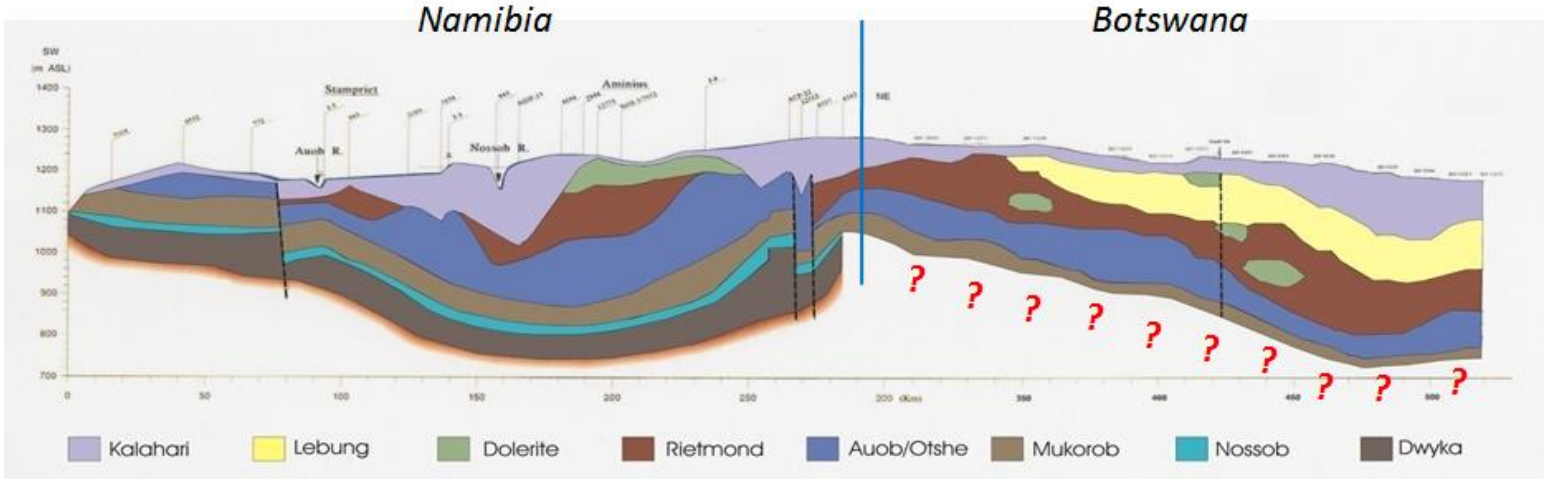
Stampriet Aquifer System – STAS (Botswana, Namibia, South Africa)

- **Key role of data sharing and information management systems.**
- **Establishment of a Multi-Country Cooperation Mechanism (STAS-MCCM) within the Groundwater Hydrology Committee of the Orange-Senqu River Commission (ORASECOM), which facilitates the application of IWRM**
- **Long-term vision: moving from data collection and exchange to the joint development of common strategies and advice to riparian countries**



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GEF MEDProgramme CP 2.1 – Component 2 on “Management of Coastal Aquifers and Related Ecosystems"

WATER FOR SHARED PROSPERITY

Training Course on “Conjunctive Management Solutions of Surface and Groundwater”

VALENCIA (SPAIN) - 17 to 19 May 2023

Initiatives like the “Management of Coastal Aquifers and Related Ecosystems” under the UNEP/GEF MedProgramme, which includes national dialogues for potential conjunctive management solutions, demonstrate practical applications and benefits.

Albania, Bosnia and Herzegovina, Lebanon, Libya, Montenegro, Morocco, Tunisia

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Key Messages and Way Forward

Importance of Raising Awareness

- Promote Conjunctive Water Management (CWM) as a powerful solution for water security.
- Highlight the need for increased investment in CWM initiatives and techniques.

Enhancing Global Cooperation

- Encourage transboundary cooperation and data sharing.
- Support the integration of CWM in international water management policies.

Building Resilience to Climate Change

- Emphasize the role of CWM in enhancing climate resilience.
- Advocate for the adoption of CWM techniques to mitigate climate impacts.

Call to Action

- Urge stakeholders to commit to promoting and financing CWM.
- Highlight the need for robust governance frameworks and capacity building.

"Embracing Conjunctive Water Management techniques is essential for our future. By integrating all water resources and developing innovative solutions, we can ensure water security and resilience in the face of climate challenges."

THANK YOU

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