

Uncover Resources: Alleviating global water scarcity through **unconventional water resources** and technologies

A global initiative by UNU-INWEH to inform future policy and investment decisions on innovative water resources management



The Challenge

While **SDG 6** calls for access to safe water and sanitation for all by 2030, more than two-thirds of the global population is expected to face water scarcity by the end of SDG era. The commonly used conventional water resources, such as rainwater or river runoff, will not be sufficient to meet the growing demand for water in water scarce areas. Increasing global water scarcity under changing climate and rainfall patterns may further impact water resources availability in dry areas.

The Solution

The limitation of conventional water resources to meet future needs amid changing climate calls for a sharper focus on advocacy, research, practice, and planning; and a paradigm shift to include 'unconventional water resources' and technologies in current and future water management strategies. Unconventional water resources are those that are generated as a by-product of specialized processes such as desalination; or that need suitable pre-use treatment; or pertinent on-farm management when used for irrigation; or need a special technology to collect/access water. Examples of these water resources include:

- Desalinated seawater and highly brackish groundwater;
- Groundwater in regions with no culture or experience in its large-scale use and groundwater confined in deep geological formations or in off-shore aquifers;
- Physical transportation of water through tankers and icebergs;
- Micro-scale capture of rainwater where it otherwise evaporates;
- Atmospheric moisture harvesting such as cloud seeding, fog water collection;
- Collection and treatment of wastewater, grey water, and storm water; and
- Collection and use of agricultural drainage water.

The first five types of unconventional water resources listed above can be considered 'new water' and the remaining two 'used water'.

The Project

While few and scattered, there are growing examples around the world, of the use of unconventional water resources and developing new technologies to boost water supplies with these resources, to address water scarcity. Yet, to date there is no coordinated initiative and global project to trigger international and regional cooperation across UN Member States to build and share a global vision to harness the potential of unconventional water resources and technologies. This global initiative and project, 'Uncover Resources', is being created to fill this gap.

The project supports UNU-INWEH's contribution to water related sustainable development in water scarce areas, particularly **SDG 2.3** on enhancing agricultural productivity and food security; **SDG 5.5** on ensuring women's full and effective participation and equal opportunities at all levels of decision-making; **SDG 6.3** on improving water quality; **SDG 6.a** on international cooperation and capacity-building support to developing countries in water-related activities, including water harvesting, desalination, water efficiency, wastewater treatment, and recycling and reuse technologies; and **SDG 13.1** on strengthening resilience and adaptive capacity to climate-related hazards and natural disasters. In addition, the project is associated with several action areas highlighted in the Canada's Feminist International Assistance Policy, particularly 'Environment and Climate Action'.

The project's goal is to build and share a global vision to trigger international and regional cooperation across UN Member States. It proposes to harness the following approaches and activities, and others, as the initiative evolves:

- Synthesis of global and regional databases such as FAO-AQUASTAT and Eurostat, in addition to national datasets on different types of unconventional water resources;
- Global study in the context of the role that unconventional water resources can play in addressing global sustainability processes;
- Assessment of the trade-offs of producing and using desalinated water to alleviate water scarcity in dry areas;
- Engagement with emerging international networks and partnerships focusing on accelerated but sustainable development of groundwater, including groundwater confined in deep geological formations;
- Review of the atmospheric moisture harvesting and micro-scale rainwater harvesting techniques;
- Global study on potential timeline and resource needs to completely eradicate untreated wastewater use in agriculture;
- Feasibility of potential business opportunities from saline agricultural drainage water;
- Capacity needs assessment for managing unconventional water resources, preparation of need based material, and implementation of capacity development activities through online courses, webinars, knowledge-bridging workshops, particularly for young and mid-career professionals.

The project plans to produce a range of useful and innovative outputs designed to inform future water policy and investment decisions:

- Global community of practice to build and share a global vision around unconventional water resources;
- Online datasets, maps, and atlas of unconventional water resources;
- Policy recommendations for implementing relevant science-based solutions in managing unconventional water resources;
- Research-based technological solutions to transform marginal-quality water resources into economic assets;
- A resource and risk assessment model (RRAM) associated with the environmental implications of using different types of polluted waters.
- Biophysical (e.g. environmental gains vs adverse impacts) and economic (e.g. cost vs benefits) trade-offs of producing new waters in water scarce environments; and
- Online course, knowledge-bridging workshop for young and mid-career professionals, webinar on unconventional water resources.

Considering social and cultural sensitivities, gender mainstreaming is important in the case of some unconventional water resources. The project will consider several factors that may affect gender mainstreaming such as gender responsive policies, lifestyles and customs, education status and presence of educational institutions, poverty level, and economic activities.

The project will also undertake an exploration of the relationship between gender and technology development for different types of unconventional water resources, in addition to assessing distribution of workload for male and female segments of the community to do time-consuming and laborious water collecting tasks. Additional gender dimensions may be explored while undertaking project activities.

The initiative's beneficiaries are policy makers and water resources planners, particularly those dealing with groundwater management, wastewater, agricultural drainage water, desalinated water, and ecosystem services; government officials working in water sector and its projects; academics working on water related aspects; young and mid-career water professionals and postgraduate students interested in unconventional water resources; and international and regional donors interested in water management projects in dry areas.

Initiated in July 2017, the project will contribute to UNU-INWEH's mission to help resolve pressing regional and global water challenges that are of concern to the United Nations, its Member States and their people. The project is expected to conclude by 31 December 2019.

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