



UNICEF SUSTAINABLE WASH INNOVATION HUB

Managed Aquifer Recharge

unicef 
for every child

○ Turning floodwater into a sustainable and safe water source for children and their families

Managed Aquifer Recharge (MAR) is an innovative, low-cost approach to water conservation that has the potential to turn a hazard into a resource.

By slowing and storing floodwater during periods of higher seasonal rainfall, MAR can make it available for use in dry seasons and droughts. This is crucial because increasingly erratic rainfall, combined with population growth, has led the World Economic Forum to identify water scarcity as one of the top risks to development this decade.

In coastal regions, MAR can play a vital role in mitigating the risk of saline intrusion, a threat exacerbated by rising sea levels associated with climate change.

To combat these challenges, the Sustainable WASH Innovation Hub is championing MAR as a key innovation to provide children and families with access to safe, sustainable, and climate-resilient water supplies.

Building on successful pilots in Timor Leste, UNICEF is conducting a feasibility study in Dollow, Somalia, to test MAR to help provide long-term water security for refugees, internally displaced persons and host communities.

This initiative aligns with UNICEF's Global Innovation Strategy and WASH Strategy 2016-2030, which emphasize adaptive programming and innovative solutions for universal WASH access amidst climate change challenges.



WHY NOW?

- 450 million children live in areas of high or extremely high water vulnerability.
- Water scarcity and lack of access to safe drinking water threaten children's health and development, exacerbating malnutrition and affecting education, forcing children, especially girls, to drop-out of school to walk long distances to collect water.
- Water insecurity compounds inequality – including gender inequality – and reduces livelihood opportunities for the poorest families, fuelling conflict, migration, and negative coping strategies such as child labour and child marriage.
- Climate change is a leading contributing factor to extreme weather events such as droughts and flooding – and hotter, longer dry seasons – , affecting the availability, affordability and safety of water, placing children and their families at risk.
- Acting now to accelerate the scale-up of low-tech, nature-based, climate-resilient solutions such as MAR could help communities adapt to and cope with climate change.

A NATURE-BASED SOLUTION

In the face of increasing water scarcity and climate stress, MAR offers a powerful solution: transforming the challenge of excess surface water into the opportunity of a life-sustaining resource. MAR uses terraces, dams, retaining ponds and injection wells to purposely recharge aquifers, and is especially effective when paired with robust catchment rehabilitation efforts that enhance natural water regulation. MAR not only ensures access to safe drinking water but also supports healthy ecosystems in areas with distinct wet and dry seasons.

The range of MAR approaches includes everything from highly technical, large-scale schemes led by national governments to local, community-led local interventions. As a result, some MAR systems can be maintained by communities with periodic external support, while others require more engineered approaches.



INNOVATING TO TACKLE WATER SCARCITY IN DOLLOW, SOMALIA

UNICEF, with support from the Somali government, is pioneering MAR in a humanitarian context for the benefit of children and their families affected by conflict and climate change.

People in Dollow face recurring water shortages due to their reliance on seasonal shallow wells and rivers which leaves children vulnerable to disease outbreaks, water-related conflict and lost education .

UNICEF and partners are employing a range of approaches, including advanced groundwater mapping using geophysical geographic information system (GIS) surveys, to identify suitable groundwater sources, testing engineering solutions , and leveraging local knowledge to capture and conserve water during periods of seasonal rainfall.

This initiative is set to enhance the availability and quality of water for 210,000 residents, both for internally displaced persons and host community.

The MAR initiative in Dollow, is part of the Regional WASH Programme for Refugees, IDPs and Host Communities in East Africa (R-WASH) supported by UNICEF, UNHCR and Germany's KfW Development Bank. By improving existing infrastructure and working with local utilities to ensure a sustainable water service, R-WASH supports both immediate and long-term needs, helping to reduce reliance on emergency aid, empowering communities and improving social cohesion.

“For children, this project means less time spent fetching water and more time in school.”

— Mohamud Hussein

WASH Officer, UNICEF Somalia

BUILDING CONFIDENCE IN INNOVATIVE APPROACHES

The MAR programme in Dollow is part of the UNICEF Sustainable WASH Innovation Hub Portfolio and benefits from dedicated technical and financial support for accelerated scale-up. The Sustainable WASH Innovation Hub's approach centres on building capacity, nurturing connection and collaboration, and enabling access to innovative finance. With the project in Dollow, UNICEF has:

- nurtured collaboration by bringing together numerous academic and research institutions (including Dresden University of Technology , Aarhus University and ERIMOS – a research group linked to Cardiff University), local and national government in Somalia and Ethiopia, Dollow Water Company , non-governmental organizations (such as Arche Nova) and community group representatives.



- pioneered the MAR approach in humanitarian settings, one of the first to do so - applying expert knowledge, innovative approaches and evidence generation for long-term water security.

Drawing on the lessons learned from the design and implementation of the programme – as well as from UNICEF MAR projects in Timor Leste , Nepal, Pakistan, Bangladesh and Sudan – and leveraging knowledge from global MAR experts, UNICEF is creating a replicable model that can be applied to other regions and contexts.

SCALING UP FOR IMPACT

Once designed and implemented at scale, MAR has the potential to secure and supplement sustainable water services for tens of millions of children and their families, and reduce the impact of climate change in areas under increasing water stress. UNICEF is working to design and accelerate the scaling up and adoption of MAR approaches in new areas which are experiencing water insecurity by:

- assessing the feasibility of MAR in fragile and water scarce contexts, and replicating proven relevant approaches to MAR solutions;
- expanding MAR to new sites in Somalia and other fragile contexts;
- monitoring the effectiveness of current MAR schemes and generating evidence on success factors to facilitate expansion into other countries; and
- creating an enabling environment for evidence-informed and de-risked investment by establishing strong collaborations and partnerships with all stakeholders, including international and local academia, local authorities and other implementing partners.

As UNICEF expands MAR in Somalia, Iraq and Afghanistan, the Sustainable WASH Innovation Hub will continue to provide technical support and guidance, working closely with UNICEF's network of regional and country offices. Capacity building initiatives will also be conducted, providing local governments, institutions and communities with the resources required for sustainable management and successful implementation of MAR.

ABOUT US

The UNICEF Sustainable WASH Innovation Hub is a global home for accelerating the scaling of transformative and climate resilient water, sanitation and hygiene solutions for children and their families.

Learn more: <https://www.unicef.org/innovation/sustainable-wash-hub>

