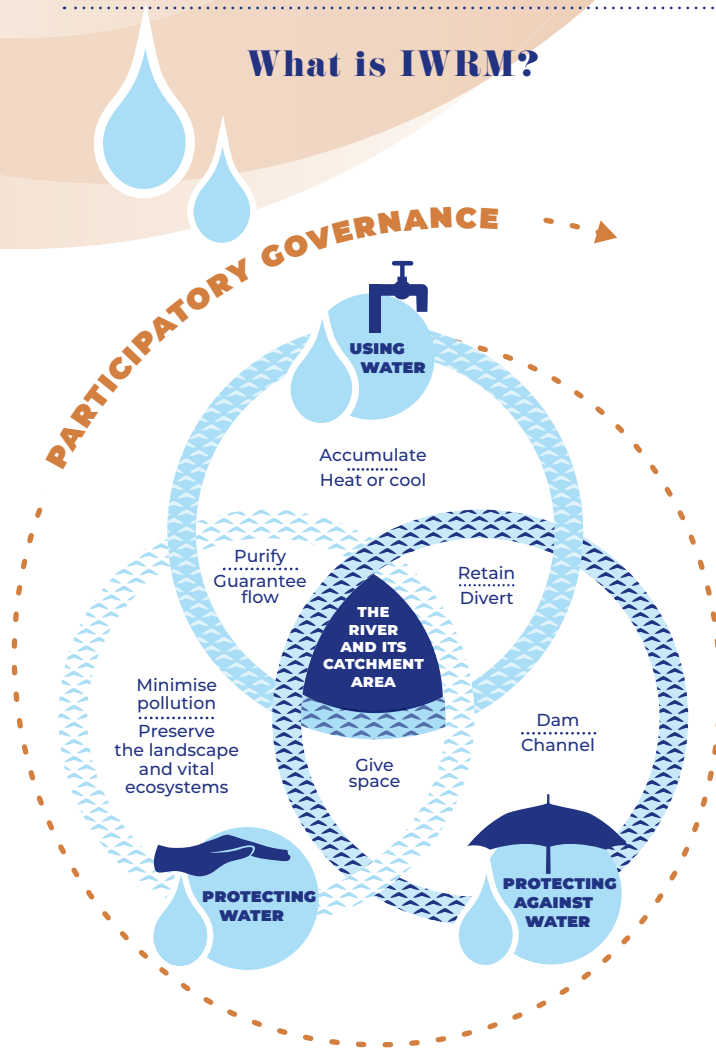


Integrated water resources management

To sustainably protect regions, economies, and the most vulnerable parts of the population

What is IWRM?



Water is one of the main resources affected by climate change. Greater consideration must therefore be given to the impact of climate change on the management of water resources at regional level and development strategies.

Climate change exacerbates water-related risks, whether owing to too much water (flooding) or too little (with consequences for agriculture, food production, industry, and energy production). There are also gaps in our understanding of resources, impacts, and consumption.

Integrated Water Resources Management (IWRM) was initiated by the Global Water Partnership (GWP) in 2000 and is promoted by the international organisation. In 2002, the World Summit on Sustainable Development called for the development of IWRM and water efficiency plans.

IWRM aims, within an appropriate regional framework, to incorporate multiple different stakeholders, uses, and competing factors in order to ensure long-lasting water resources. It also promotes participatory governance in order to take into account the many different interactions and interdependencies between all of those components.

This document presents two of the five initiatives undertaken by Adapt'Action to support IWRM in a context of climate change, and outlines some of the key lessons learned so far.

IWRM is "a process which promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment" (GWP, 2000).



Tunisia

Improving reuse of treated wastewater

The water situation in Tunisia can be characterised as tense. Surface water and groundwater resources are limited and are shared unequally throughout the country. In dry years, the availability of conventional water resources is barely enough to cover all needs. In the future, climate change and economic development may lead to greater tensions by increasing water use and thus reducing available resources.

Finding ways to utilise wastewater treated at water treatment plants is therefore of strategic importance for Tunisia. But treated wastewater is currently only partially reused, even though it could satisfy nearly 10% of water demand (all uses combined).

Adapt'Action is working with the Tunisian government to develop a **master plan for the reuse of wastewater** in Tunisia covering the period through 2050 ("Water Reuse 2050"), which aims to guide public policy and future investment by providing Tunisia with a strategy comprising operational plans for developing the reuse of treated wastewater.

To do so, the master plan that is currently being developed is based on three complementary approaches (see below).

The Water Reuse 2050 master plan is in line with the **"Water 2050" strategy**, which is also currently being developed and is a broader national strategy for the integrated management of all water resources in Tunisia.

Objectives and lines of action for the "Water Reuse 2050" plan

OBJECTIVE 1
Incorporate development of the sector within IWRM, and take the Water Reuse plan into account in all project phases.

OBJECTIVE 2
Make the existing institutional framework operational, promote the emergence of new projects, and ensure effective and transparent monitoring of existing projects.

OBJECTIVE 3
Tailor water quality to the different uses that Tunisia wants to develop, and ensure water availability.

OBJECTIVE 4
Develop the reuse of water while limiting any risks relating to human health and the environment.



MULTIDISCIPLINARY



SOCIAL



ECONOMIC



INSTITUTIONAL



TECHNICAL



REGULATORY



HEALTH AND ENVIRONMENTAL

- Favour a participatory approach to supporting the emergence of projects by users and producers of treated wastewater (TWW)
- Have an integrated approach during the project definition stage and renovation of wastewater treatment plants (WWTP)
- Analyse the social, environmental, and economic feasibility of Water Reuse/WWTP projects
- Favour farming models that are adapted to irrigation with TWW
- Strengthen campaigns to raise awareness among users/consumers
- Revise pricing for TWW to align prices more closely with real costs. Identify sustainable funding options for the sector
- Find solutions for indirect reuse in order to propose projects with financial benefits
- Use purification techniques that consume less energy, and develop renewable energies
- Make the existing institutional framework operational
- Systematise agreements (rights and duties) between TWW producers and users
- Strengthen partnerships between administrations and researchers
- Share data on water quality
- Continue to build/renovate WWTP
- Set up additional treatments
- Ensure compliance of effluent entering into WWTP
- Develop techniques for dealing with irregular demand in terms of TWW quantities
- Revise the standards for the different uses
- Ban connections with certain industries
- Develop the framework for remedies and penalties in the event of non-compliance
- Incorporate the main aspects of the Water Reuse plan into the Water Code
- Systematise the monitoring of groundwater and soil quality
- Estimate the risks for each use, and systematise best practice guides
- Strengthen the role of research
- Ensure compliance with health rules, and reduce users' contact with TWW
- Strengthen and take charge of vaccination campaigns for people in contact with TWW

The three approaches of the master plan

- An integrated approach that incorporates treated wastewater into Tunisia's water-resources mix taking into account all possible uses, and that seeks to create a suitable institutional and organisational framework;
- A territorial approach that takes into account regional and local issues;

- A participatory approach that involves dialogue with all local stakeholders and that seeks to promote the development and adoption of projects in which those same stakeholders reuse treated wastewater.



Dominican Republic

Integrated water resources management in the Yaque del Sur catchment

The Yaque del Sur catchment area is the third biggest in the Dominican Republic, and is one of the poorest regions in the country. Although the catchment is already in a water deficit, climate change could add even more stress: By 2050, the annual water deficit could reach 390 million cubic metres. Those challenges are aggravated by the relative importance of agriculture in the local economy and in local society.

The people living in the Yaque del Sur catchment area have low incomes and little education, and they are very sensitive to climate conditions, as their subsistence is largely dependent on agriculture. Limited access to land ownership for many farmers prevents them from investing in sustainable farming. Potential responses such as agricultural expansion and deforestation, as well as resource-induced conflicts, can also increase vulnerability.

Adapt'Action is working with the Secretariat for Social Affairs, the Ministry of Environment and Natural Resources, the Ministry of Planning, the National Council for Climate Change, and the Sur Futuro Foundation to come up with an integrated response combining **social protection with improved and sustainable resource management** in the Yaque del Sur catchment.

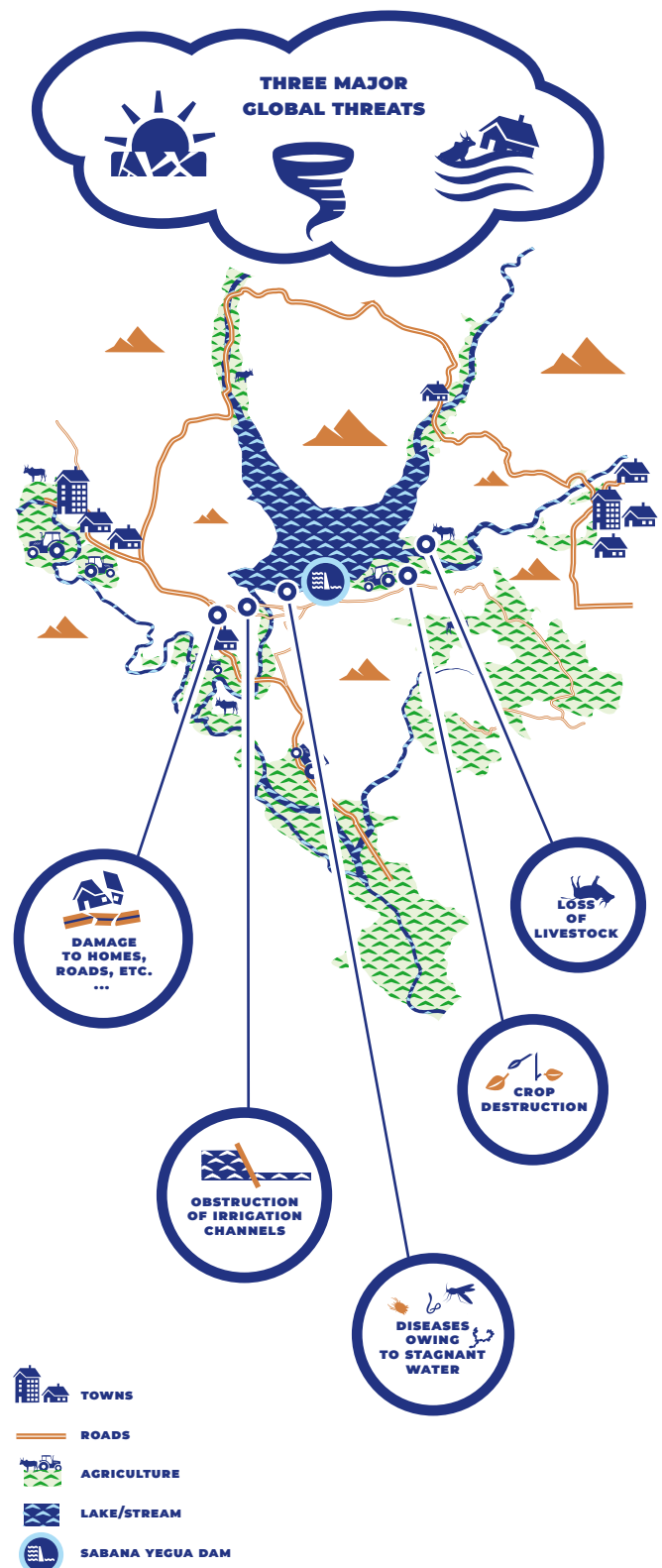
Integrated social protection programmes combine social aid instruments and measures for **promoting means of subsistence**, such as the development of skills, support for entrepreneurship, better access to funding, and index insurance.

When incorporated into adaptation measures and measures for reducing disaster risks, those instruments can help socially marginalised groups and groups in precarious situations become better able to adapt to present and future climate risks. Social programmes can encourage beneficiaries to **practise climate-smart farming** and integrated natural resource management, particularly by focusing on reforestation, collection of rainwater, soil and water conservation, and drought-resistant gardening.

This impact may be even stronger if the provision of money or productive assets is accompanied by additional measures, such as professional training, to help **diversify sources of income** and create new opportunities, thus reducing dependence on means of subsistence that are highly exposed to shocks.

The study thoroughly examines these hypotheses through an in-depth **consultation process** involving associated stakeholders within the catchment area (mayor's office, decentralised services, social workers, local committees, development agents, technical entities, etc.).

Climate risks in the Yaque del Sur catchment area





Lessons learned

Water is among the main resources affected by climate change. Dwindling availability of water resources and episodes of excessive water are already affecting, and will continue to affect more and more, the most vulnerable regions, economies, and parts of the population. Improving integrated water resources management in a way that takes into account flood management is the first pillar of support provided by Adapt'Action to its partner countries. Several lessons can be learned from those initiatives.

- ▶ Pressure on water resources is due to a projected decline in available water as a result of climate change, coupled with a global increase in water demand and a growing number of human uses owing to population growth and economic development. Adaptation solutions must therefore **coordinate between on the one hand protecting water resources and the water ecosystems they depend on in order to increase water availability, and on the other hand regulating water use** in order to ensure efficient and sustainable practices. In an integrated manner between those two components, attention must be focused on uses that do not exceed the renewal capacities of the water systems, in order to satisfy, as a priority, basic needs depending on water availability.
- ▶ IWRM can combine support for **innovations to improve water availability** with joint water management. Those innovations may involve retreating wastewater, such as in Tunisia, or ecosystemic services to help preserve water resources by supporting sustainable farming (anti-erosion practices), such as in the Dominican Republic.
- ▶ IWRM must be developed at **suitable regional scales**. It is organised at national level in the case of Tunisia, and in the case of the Dominican Republic it incorporates the entire Yaque del Sur catchment, both upstream and downstream of the Sabana Yegua dam.
- ▶ In order to ensure that projects are efficient and sustainable, IWRM must respond to the **demands of locale users**, strengthen their confidence regarding the quality of water resources, and support training and awareness-raising initiatives by responding first and foremost to needs at grassroots level.
- ▶ In combination with water availability, IWRM needs to allow for action through **joint management** (compromise and conflict resolution) with regard to the economy and the regulation of competing uses.

Adapt'Action

Since 2017, Adapt'Action has been helping 15 countries and regional organisations particularly vulnerable to climate change implement adaptation strategies. Adapt'Action provides technical assistance and capacity-building to help strengthen climate governance, ensure better integration of adaptation strategies into public policies, and support the creation of structural projects to promote adaptation.

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For more information

- BRLI reports for Adapt'Action as part of support for the development of the National Master Plan for the Reuse of Treated Wastewater in Tunisia 'Water Reuse 2050'
- DAI reports for Adapt'Action on the integrated management of the Yaque del Sur catchment with an adaptive social protection component in the Dominican Republic
- Feasibility study by Artelia for a demo project aiming to sustainably improve the catchment area for wells in Senegal's Pout zone (in partnership with The Nature Conservancy and Catholic Relief Service).
- BRLI studies for the development of the master plan for the provision of drinking water to the city of Pointe-Noire (Republic of the Congo) within a context of climate change.

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