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Reducing the impacts of drought in Morocco

How the MENAdrought project is supporting Morocco to enhance its water and food security



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Morocco: Key water facts

Water audit

- Droughts have increased in frequency, from once to three times a decade.
- Evapotranspiration has increased.
- Precipitation has decreased.

Impacts

- Lower rainfall is affecting both rain-fed and irrigated agriculture.
- The reduced availability of water is limiting Morocco's ability to grow citrus and horticultural crops in the agricultural heartland of Souss-Massa.
- Growing fewer crops is, in turn, affecting Morocco's food security and ability to gain foreign currency from international markets.

How the increasing occurrence of drought is affecting Morocco

As climate change disrupts historical weather patterns, droughts are increasingly likely to have detrimental impacts on water and food security in the Middle East and North Africa (MENA) region. In Morocco, the change is already noticeable. In the past, the country experienced spells of drought about once every decade. But since the 1970s, extreme drought has become a more regular element of Morocco's climate.

During dry periods, rainfall comes late or not at all, wreaking havoc on farmers' harvests, rural livelihoods and food prices, and also affecting water and food supply to urban areas. For a country reliant on agriculture as the backbone of its economy, such times bring financial hardship to the nation. In the past, this has played out in many challenging responses, including waves of rural-to-urban migration.

Over the last 50 years, the severity, duration, spatial distribution, extent and frequency of drought spells have all increased. On average, drought periods now occur around three times each decade. Evapotranspiration has increased, precipitation has decreased, and wet years spanning the whole territory have become unusual.

The northern part of the country, where the bulk of staple rain-fed crops are grown, is particularly affected by a lack of precipitation during critical crop planting and growth stages. But the 15% of land that is cultivated using irrigation also suffers, as water levels in dams and aquifers dwindle. The impacts of drought are particularly significant in the Souss-

Massa region. This area, characterized by vast plains that stretch from the Atlantic coast to the foot of the Anti-Atlas Mountains, grows many citrus fruits and horticultural crops for export. Reduced water availability in this river basin has severely affected Morocco's revenue from exports.

Current management approach

Since the mid-1990s, serious efforts have been made by the Moroccan government to move away from a crisis-response approach to one of drought-risk management. However, public policy has yet to capture the specific vulnerability of rural communities and businesses in times of drought. Approximately half of Morocco's people live in rural areas, and two out of three countryside dwellers work in farming or agro-processing. The detrimental impacts of drought on employment can bring daunting consequences for families and communities.

Drought interventions are controlled by pre-developed legal guidelines and strategies. These outline the conditions requiring official drought declarations, and clearly state actions to be taken in different situations, with responsibilities for both national government agencies and local river basin authorities. Difficulties around declaring droughts, limits on information-sharing before crisis stage is reached, and other complexities in drought-management efforts bring scope for enhancing and updating supporting systems.

How the MENAdrought project is supporting nations to manage drought

Led by the International Water Management Institute (IWMI), the MENAdrought project aims to empower Morocco, Lebanon, and Jordan with the tools to anticipate, prepare for and mitigate the worst impacts of drought. In Morocco, in collaboration with officials from the government, IWMI and partners will develop a drought framework encompassing institutional planning and the work of a task force on drought management. The technology and framework will initially be developed for the economically and socially important Souss-Massa and Oum Er-Rbia river basins, which have many sectoral water users – from cities to agriculture. The work will then be scaled up across the nation. As well as working to support agriculture, the MENAdrought team aim to develop drought maps for pastoral use for the whole of Morocco. This will support the enforcement of laws on rangeland and transhumance management.

Promoting effective drought management within Morocco

The project focus is on strengthening in-country capacity and locally led developments to create an environment where improved drought management can flourish. The aim is to enhance the self-reliance capacities of the nation – so it can effectively manage drought and reduce its impacts – and to support ownership of the drought-management responses with the help of open-source data and software. The project also aims to catalyze sustainable, enterprise-driven enhancement of drought resilience by focusing on the three pillars of integrated drought risk management.

Project aims across the MENA region

Spearheaded by IWMI, the MENAdrought project aims to empower decisionmakers and practitioners in Morocco, Lebanon, and Jordan with the tools and action plans needed to anticipate, prepare for, and mitigate the impacts of drought. With increasing climate disruption, the detrimental effects of droughts on water and food security are having a greater impact on economic sectors and communities across the MENA region. The countries are increasingly prone to unpredictable rainfall, and higher temperatures and evapotranspiration rates. The environmental, economic, political, and social settings, all influence how droughts are managed and experienced within a country. The project seeks to support the three countries to be more self-reliant in managing the impacts of drought on water and food security.

Three pillars of action for change

Pillar 1: Monitoring and early warning systems

IWMI has developed a map-based monitoring system using an enhanced Composite Drought Index (eCDI) to expose drought impacts on both irrigated and rain-fed water resource systems. Maps generated through the system are already being published online by the Moroccan government, enabling analysis of the data by government departments and scientific institutes. In parallel with this, the project is establishing an early warning system to predict the likely onset of drought conditions. This will enhance farmers', water and agricultural managers' and policymakers' resilience and preparedness through forward planning. The mapping and monitoring tools are being put into operation within relevant ministries to create long-term sustainability beyond the project life cycle. They are an important component for developing official drought definitions and determining triggers for the actions of Pillar 3.

Pillar 2: Assessments of vulnerability to drought

If policy and planning actions are to be targeted and effective, it is crucial to know which communities, economic sectors and environments are most affected by droughts, and why they are particularly vulnerable. Insights from examining the economic, environmental, and social costs of past droughts

in Morocco will be used to inform and orient investments in the infrastructure, institutions and information systems needed to enhance drought management. To add important detail to this assessment, IWMI is conducting case study analyses in the important Souss-Massa and Oum Er-Rbia river basins – complex water-resource systems servicing both agriculture and urban communities.

Pillar 3: Mitigation, preparedness and response

Pillar 3 focuses on mitigation, preparedness and response. The findings of Pillars 1 and 2 are the starting points for co-designing policy and planning interventions. The monitoring technology of Pillar 1 provides critical evidence used for triggering actions. And Pillar 2 assessments capture the drivers, vulnerabilities and systemic interlinkages of drought impacts within a country – from which targeted, cost-effective and sustainable mitigation policies and responses can be developed. For mitigation, the aim is to develop water and agricultural technology packages that can help build resilience to drought in the context of the focus river basins. To enhance preparedness, IWMI is working closely with multi-ministerial, interdisciplinary teams from across the Government of Morocco and at various levels – from technical drought monitoring to policy and management planning. This involves working sessions and ‘write shops’ that bring together ideas, experiences and insights from many different stakeholders. The insights gained will be used to define Drought Action Plans that will define the actions, roles and responsibilities needed for drought response.

Project	MENAdrought
Participating countries	Morocco, Lebanon, and Jordan
Timeframe	August 2018 – September 2022
Donor	United States Agency for International Development (USAID)
Partners	<p>International Water Management Institute (IWMI); National Drought Mitigation Center, University of Nebraska-Lincoln; Daugherty Water for Food Global Institute, University of Nebraska; Goddard Space Flight Center, National Aeronautics and Space Administration (NASA); and Johns Hopkins University.</p> <p>National leader: Moroccan Ministry of Agriculture, Fisheries, Rural Development, Water and Forests (MAFRWF).</p> <p>National partners: National Department of Meteorology (DMN); Ministry of Equipment, Transport, Logistics and Water; various regional directorates of agriculture (DRA); various river basin agencies (ABH); various regional offices for agricultural development (OMRVA); and Hassan II Institute of Agronomy and Veterinary Medicine.</p> <p>In consultation with the USAID Morocco country office.</p>
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