

Water Demand and Use: Algeria

The challenge

Effective agricultural water management in Algeria is hindered by limited access to high-resolution data. Algerian officials recognize that tackling water scarcity requires more precise monitoring. The Mitidja West Irrigation Scheme near the capital Algiers is equipped with a telemetry system that provides ground measurements of water flow in the irrigation scheme network. However, understanding the spatiotemporal dynamics of irrigation water use requires near real-time data. High-resolution satellite data can offer valuable information to improve water allocation and support informed decision-making in the scheme.

The solution

The Water Use Tool (WUT) helps address these challenges by assessing seasonal irrigation water consumption using the Water Productivity through Open access of Remotely sensed derived data (WaPOR) portal to provide dekadal, monthly, seasonal and yearly data on precipitation (P), actual evapotranspiration and interception (AETI) and irrigation water use across different scales in the scheme (Figure 1). The tool's Dynamic Dashboard integrates historical and real-time statistics through interactive maps and charts, offering non-technical decision-makers an accessible interface for monitoring irrigation water use.

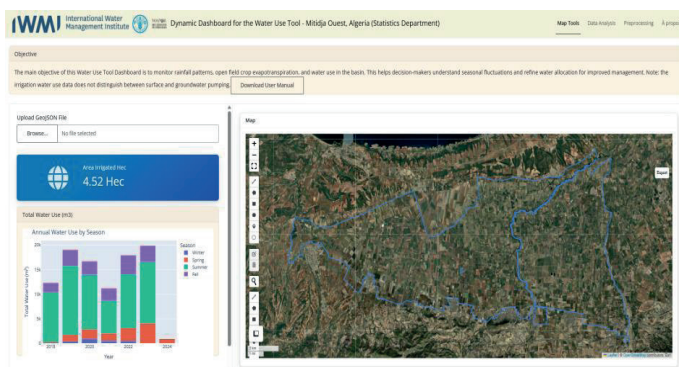


Figure 1: The dashboard of the Water Use Tool (WUT) for Algeria.

Key technical features

The tool operates through a five-stage algorithm. It segments the irrigation scheme into parcels for targeted analysis; automatically processes WaPOR and other data for streamlined data collection; identifies irrigation seasons to determine periods of active water use; classifies irrigated versus rainfed areas; and calculates dekadal water use to identify general irrigation features at plot, sector and basin level. The tool uses WaPOR's Level 3 (20 m resolution) AETI and Climate Hazards Group InfraRed Precipitation with Station (CHIRPS) rainfall data, and unsupervised clustering via Simple Non-Iterative Clustering (SNIC)-segmentation to automate irrigation mapping and distinguish between irrigated and rainfed parcels. The tool is accessible in French.

Current use and main users

The tool's main user is the WaPOR Digital Unit (*Cellule de Numérisation WaPOR, CNW*), which was established as the WUT Task Force within the Department of Statistics and Strategies (DSS) at the Ministry of Agriculture and Rural Development (*Ministère de l'Agriculture et du Développement Rural, MADR*). The WUT Task Force is chaired by the Algeria National Agronomic Research Institute (*Institut National de la Recherche Agronomique d'Algérie, INRAA*). The Ministry of Public Works, Hydraulics and Basic Infrastructure (*Ministère des Travaux Publics, de l'Hydraulique et des Infrastructures de Base, MTPHIB*) is another key user. The tool is hosted by the DSS at MADR.

Key stakeholders and beneficiaries

The WUT Task Force at MADR is the main beneficiary of the tool. Other stakeholders include five other institutes, directorates and agencies affiliated with MADR and MTPHIB, which form a joint steering committee, together with representatives from the WUT Task Force.

The co-creation process

The co-creation process involved multiple meetings with the WUT Task Force to define dataset needs, methodology and the features of the WUT Dynamic Dashboard. After a tailored capacity building program, the WUT and its Dynamic Dashboard technology were transferred to the Task Force during a hands-on workshop in September 2024.

Key outcomes and impacts

The tool enables water managers to monitor agricultural conditions within the Mitidja West Irrigation Scheme and make informed decisions to balance agricultural and municipal water needs.

Sustainability and scaling potential

An AI-driven downscaling approach was developed to generate high-resolution data, ensuring the sustainability and scalability of the WUT. The tool has significant scaling potential in other irrigation schemes in Algeria's Mitidja Basin, including in the central grain fields and eastern areas where vegetables are dominant. The tool could also be customized for use with cereal and potato crops in the south.

The WaPOR portal

The publicly accessible Water Productivity through Open access of Remotely sensed derived data (WaPOR) portal of the Food and Agriculture Organization of the United Nations (FAO) supports agricultural water productivity monitoring at continental, national and basin scales. With new information produced every 10 days, the portal helps users make informed policy and investment decisions.

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