International Water Management Institute

WaPOR

Tool Series

Drought Monitoring: Sudan

The challenge

Sudan's Gedaref State is a strategic food security center, hosting large agricultural projects, mechanized farming and substantial grain storage facilities. However, the vast rainfed areas lack a drought monitoring system, which limits the ability to effectively assess and respond to drought conditions.

The solution

The Sudan Drought Monitoring Tool (SDMT) uses Water Productivity through Open access of Remotely sensed derived data (WaPOR) to monitor drought conditions and assess agricultural yield gaps in Gedaref State (Figure 1). The tool generates key drought indices that help identify drought-prone areas over different time scales.

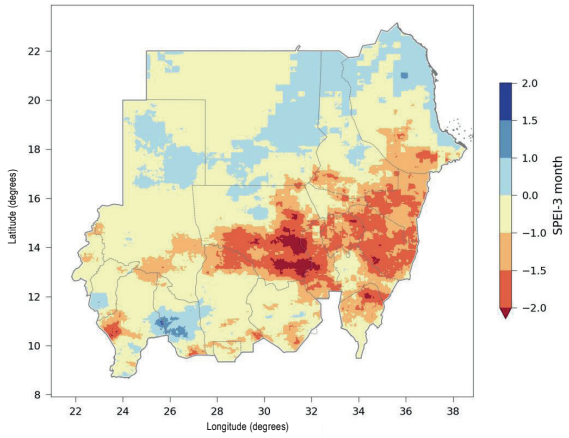

Figure 1: Map used in the Sudan Drought Monitoring Tool (SDMT) showing Standardized Precipitation Evapotranspiration Index (SPEI-3) for August 2023.

Key technical features

The tool uses Level 2 WaPOR datasets at 100 m resolution – including actual evapotranspiration and interception (AETI), reference evapotranspiration (RET), precipitation (P) and net primary production (NPP) – and other relevant data from the Food and Agriculture Organization of the United Nations (FAO) repository (e.g., crop type map, crop parameters). Drought indices generated by SDMT include standardized precipitation index (SPI), standardized precipitation evapotranspiration index (SPEI) and evaporative stress index (ESI) at various temporal and spatial scales. At the front end, a Jupyter notebook displays these drought indicators via interactive maps and graphs, allowing users to assess drought severity. The tool is available in English.

Current use and main users

A beta version of the tool has been developed but has yet to be deployed. Main users include the Sudan Meteorological Authority, which hosts the tool, the Ministry of Agriculture and Forests and its state-level departments, the Ministry of Irrigation and Water Resources, farmers and humanitarian aid organizations.

Key stakeholders and beneficiaries

The key stakeholders are the users mentioned above. The main beneficiaries are farmers, humanitarian aid organizations, government agencies, decision-makers and policy analysts.

The co-creation process and sustainability

Diverse stakeholders were involved in the co-creation process, ensuring that the tool has a user-friendly interface, meets local needs and integrates with national systems. Stakeholder mapping and participation in a joint drought monitoring workshop enriched the process, incorporating diverse perspectives and expertise into the tool development process. To ensure long-term sustainability, users from different stakeholder groups receive on-the-job training to learn how to use, maintain and update the tool.

Key outcomes and impacts

The tool helps monitor drought in Gedaref State in Sudan, assess its impact on crops, and support timely interventions. By promoting science-based monitoring and forecasting, the tool strengthens water management, enhances food security and informs policies for future drought risk mitigation.

Scaling potential

As the tool incorporates widely recognized drought monitoring indices, it is compatible with established drought assessment methodologies and suitable for scaling.

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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