

Hydro-agricultural potential of the southern region of Tlemcen with a view to sustainable management of steppe rangelands

Driss Haddouche and Mohammed El Amin Ennebati (Algeria)

Key words: Cartography; Geoinformation/GI; Land management; Remote sensing; Spatial planning; Sustainable development; K-means

SUMMARY

The Algerian steppe rangelands play a strategic role in the national agricultural economy. However, sustainable water resource management in these semi-arid areas remains largely insufficient and is often overlooked by local authorities, despite its critical importance for rural development.

This study focuses on a 3,200 km² area in the southern part of Tlemcen Province, covering five municipalities: Sebdou, Sidi El Djilali, El Gor, El Bouihi, and El Aricha. The main objective is to identify and characterize all existing water points (boreholes, wells, springs), based on parameters such as flow rate, depth, and geographic location. A total of 119 water points were inventoried and integrated into a Geographic Information System (GIS), forming a comprehensive spatial database.

Digital Elevation Models (DEM) and satellite imagery were used to produce thematic maps required for the analysis (e.g., hypsometric map, land use map, aspect map, etc.).

The K-means classification method was applied to group the water points according to their hydro-agricultural characteristics, allowing for the delineation of zones that reveal spatial disparities in water resource potential. These results offer a decision-support tool for local authorities in promoting more equitable and sustainable water management.

This work contributes to the goals of the Sustainable Development Agenda, particularly SDG 6 (ensuring equitable access to water) and Target 15.3 of SDG 15 (combating land degradation), by supporting the preservation of vulnerable steppe ecosystems.

Hydro-agricultural potential of the southern region of Tlemcen with a view to sustainable management of steppe rangelands (13771)

Driss Haddouche and Mohammed El Amin Ennebati (Algeria)

FIG Congress 2026

The Future We Want - The SDGs and Beyond

Cape Town, South Africa, 24–29 May 2026