Impact du changement climatique et des activités socio-économiques sur l'offre et la demande en eau dans le bassin versant du Ksob : Modélisation avec le modèle intégré WEAP

Oral Communication

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Abstract

The Ksob watershed, located between the provinces of Essaouira and Chichaoua within the Tensift hydrological basin, covers an area of 1,827 km² and plays a crucial role in water supply for a semi-arid region increasingly affected by climate variability and anthropogenic pressures. This study aims to assess, by 2050, the combined impacts of climate change and socio-economic dynamics on the balance between water supply and demand using the WEAP (Water Evaluation and Planning System) model. The model integrates climatic, hydrological, demographic, agricultural, and tourism data to simulate multiple prospective scenarios and explore possible trajectories of the basin's water system evolution. The results reveal a significant increase in water demand, rising from 20.7 million m³ in 2023 to more than 36 million m³ by 2050 under the most demanding scenarios, mainly driven by the expansion of irrigated agriculture, population growth (projected to reach approximately 267,000 inhabitants), and the rapid development of tourism. At the same time, water availability is expected to decline due to rising temperatures, increased evapotranspiration, and reduced precipitation, thereby exacerbating existing imbalances within the basin. Without the implementation of appropriate adaptation measures, the Ksob basin will not be able to sustainably meet future water needs. The study therefore highlights the urgency of adopting Integrated Water Resources Management strategies, including infrastructure modernization, the use of non-conventional water resources such as desalination and wastewater reuse, improved demand management, and strengthened governance to ensure the long-term resilience and sustainability of the basin in the face of increasing climatic and socio-economic pressures.

Keywords

Ksob watershed, Integrated Water Resources Management, Climate change, WEAP model