Goldschmidt 2025 Abstract
https://doi.org/10.7185/gold2025.25361

Spatiotemporal Analysis of Climate Variability and Land Use Dynamics in the Lakhdar Watershed (High Atlas, Morocco)

MS. FATIMA ZAHRA SBABOU, PHD[1], ABDELAZIZ LAHMILI[1], FATIHA AIT EL HAJ[1], VICTOR ONGOMA[2] AND OUALID HAKAM[2]

[1]Mohammadia School of Engineers, Mohammed V University, Rabat, Morocco

[2]Mohammed VI Polytechnic University, Benguerir, Morocco

Climate change poses a major threat to land-use patterns, exacerbating soil erosion and threatening the sustainability of ecosystems. The Lakhdar watershed, situated in the central High Atlas of Morocco, represents a critical environmental area, where these changes are dramatically shifting landscape features. This study assesses historical climate trends, particularly in terms of precipitation and temperature, and analyzes their implications for land-use dynamics in this sensitive watershed. An integrated methodological approach is employed, combining outputs from CMIP6 global climate models with remote sensing analyses. Historical climate simulations are used to assess past trends in temperature and precipitation variability across the sub-basin. In parallel, multispectral imagery is processed to detect land cover transitions over recent decades. A correlation analysis is then carried out to quantify the relationships between climatic variables and land-use changes, thereby identifying spatial patterns of vulnerability to environmental degradation. The results will serve as a scientific basis for future land-use projections under changing climate scenarios, supporting long-term adaptation strategies and informing sustainable resource management in climate-sensitive regions.