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Author: Ms. Sona Guliyeva
Politecnico di Torino, Italy

Prof. Piero Boccardo
Politecnico di Torino, Italy

Mr. Elman Alaskarov
Azercosmos, Space Agency of Republic of Azerbaijan, Azerbaijan

SPATIOTEMPORAL ANALYSIS OF DROUGHT VULNERABILITY IN AZERBAIJAN THROUGH
SATELLITE DATA INTEGRATION

Abstract

During the era of global climate change, natural hazards such as drought pose significant challenges globally, impacting lives and socio-economic development. Proactive steps are required to mitigate this natural hazard, such as precise forecasting to lower vulnerability. In this endeavor, Earth observation satellite data are crucial as they facilitate the continuous monitoring of sustainable development progress and provide valuable insights for decision-making processes. This paper presents a study utilizing satellite data to comprehensively assess drought severity in Azerbaijan, a country prone to climatic variations and water scarcity. By integrating data from Aqua (MODIS) and Planetscope satellites, the research provides insights into the spatial and temporal dynamics of drought impacts, thereby contributing to Sustainable Development Goal (SDG) 15: "Life on Land." These insights enhance our understanding of drought interactions with local environments, crucial for achieving SDG 15's target of combating desertification, restoring degraded land and soil, including land affected by desertification, drought, and floods, and striving to achieve a land degradation-neutral world by 2030. According to the analysis, a significant drought affected about 22% of Azerbaijan's surface area in 2023. Through the integration of Planetscope's high resolution data with MODIS's broad coverage, the study provides comprehensive insights into the effects of drought on both local and national levels. The findings show various impacts on different types of land cover and the overall condition of the vegetation, demonstrating areas that require focused solutions. It's also consistent with SDG 17, "Partnerships for the Goals," which emphasizes data collaboration and collaboration in addressing global challenges. Moreover, the study sets its conclusions in the larger context of climate change adaptation, highlighting the necessity of comprehensive strategies to mitigate the effects of drought and promote sustainable development, which supports several SDGs, specifically interlinked SDG 13 "Climate Action." It emphasizes the urgency of holistic approaches to mitigate drought impacts and foster sustainable development, contributing to multiple SDGs. By integrating satellite data into disaster preparedness and emergency response strategies, stakeholders can bolster resilience and enhance adaptive capacity in the face of drought-induced crises, thereby advancing progress towards sustainable development. In conclusion, by harnessing satellite technologies and analytical methodologies, the study contributes to navigating the multifaceted challenges posed by drought, advancing towards a more resilient and sustainable future, fortified against disaster risks and emergencies, and contributing to the achievement of global sustainability.