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DISASTER RESILIENCE THROUGH EARTH OBSERVATION: A STUDY ON THE SOCIO-ECONOMIC IMPACTS OF NATURAL DISASTERS IN PAKISTAN

Abstract

This research paper provides an exploration of disaster resilience in Pakistan through the lens of Earth Observation (EO), focusing on the socio-economic impacts of natural disasters. Against the backdrop of an escalating frequency of disasters, the study aims to unravel the intricate dynamics between Earth Observation technologies, socio-economic vulnerabilities, and the overarching goal of enhancing resilience in the face of natural calamities. Commencing with an exhaustive examination of historical disaster events, the research utilizes EO data to map and analyze the spatial and temporal patterns of natural disasters across Pakistan. Satellite imagery is employed to assess the magnitude of events, emphasizing the ability of EO to provide timely, accurate, and comprehensive information crucial for disaster preparedness and response. Central to the study is an in-depth investigation into the socio-economic repercussions of natural disasters on vulnerable communities in Pakistan. Employing both quantitative and qualitative methodologies, the research assesses the short-term and long-term impacts on livelihoods, infrastructure, and overall well-being. Special attention is given to marginalized groups, recognizing their heightened susceptibility to the adverse effects of disasters.The paper critically examines the challenges inherent in integrating EO technologies into disaster resilience frameworks within the Pakistani context. Challenges include issues of accessibility, data sharing, technological capacity, and the need for cross-sectoral collaboration. The study presents an analysis of these challenges, offering insights into mitigating strategies for effective EO utilization in disaster risk reduction. Furthermore, the research synthesizes a set of recommendations for policymakers, disaster management authorities, and community stakeholders. Proposals include the development of an integrated EO-based early warning system, the establishment of community-based resilience initiatives, and the enhancement of technological infrastructure to facilitate rapid and informed decision-making during disaster events.By emphasizing the pivotal role of EO technologies in building resilience, the study advocates for an inclusive, technology-driven approach to disaster management, fostering a more resilient and adaptive society in the face of an evolving climate landscape in Pakistan.