

Changes in Agricultural Land Use and Cropping Patterns Before and After Sinkhole Events at Armala, Kaski

Prejika Thapa and Hari Adhikari (Nepal)

Key words: Capacity building; Cartography; Engineering survey; Geoinformation/GI; GNSS/GPS; History; Implementation of plans; Land management; Remote sensing; Risk management; Spatial planning; Keyword 1; Keyword 2; Keyword 3

SUMMARY

Abstract

This study will investigate the impact of sinkholes on agricultural land use and cropping patterns in Armala, Kaski. Sinkholes, which result from the collapse of surface layers due to the dissolution of soluble underlying rocks, present significant challenges to agriculture. This research will adopt a multi-faceted approach, combining spatial data analysis, field surveys, historical record reviews, and the development of adaptive strategies to address these challenges.

The study will utilize high-resolution satellite imagery from Landsat 8 OLI/TIRS and Sentinel-2 MSI to map changes in land use before and after sinkhole events. Preprocessing of this imagery will involve radiometric correction and georeferencing to ensure accurate analysis. The research will employ NDVI to assess vegetation health and land use changes over time, and land use classification will be performed using supervised classification methods.

Field surveys will gather qualitative and quantitative data from local farmers using structured questionnaires, interviews, and focus group discussions. These surveys will capture detailed information on changes in cropping patterns, agricultural practices, and the socio-economic impact of sinkholes. GPS mapping will document the locations of sinkholes and affected farmlands, providing ground-truth data to complement satellite analysis.

Historical records will be reviewed to establish a timeline of sinkhole occurrences and correlate these events with shifts in agricultural productivity. Sources will include local government archives, the Municipality Office, the Nepal Geological Society, and the Department of Mines and Geology. Additional historical data will be sourced from the Central Library at Tribhuvan University, and

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FIG Regional Conference 2024 - Nepal
Climate Responsive Land Governance and Disaster Resilience: Safeguarding Land Rights
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relevant remote sensing data from USGS Earth Explorer and Copernicus Open Access Hub.

The study will propose adaptive strategies for land use planning and agricultural management, integrating sinkhole risk assessments. Recommendations will be developed for local authorities and policymakers to improve land use resilience and disaster management plans. The outcomes will be compiled into a comprehensive report and disseminated through presentations, publications, and online platforms.

By providing a detailed understanding of sinkhole impacts and offering actionable recommendations, this research aims to enhance agricultural resilience and inform better land management practices in sinkhole-prone areas.

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