

# **Integrating Spatial Data and Technology for Climate-Responsive Planning: Monitoring Land Use Changes and Temperature Dynamics in Nepal**

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**Key words:** Access to land; Cadastre; Cartography; GNSS/GPS; Implementation of plans; Land management; Low cost technology; Remote sensing; Risk management; Spatial planning; Urban renewal; Climate planning action; GIS; Climate adaptation

## **SUMMARY**

Urban areas face increasing challenges due to climate change impacts, including altered land use patterns, temperature variations. This study focuses on leveraging spatial data and technology to enhance climate action planning and assess disaster vulnerability, risk, and tenure insecurity in Nepal, with a specific emphasis on monitoring land use and land cover changes alongside temperature fluctuations. Urban planning in Nepal faces significant challenges due to rapid urbanization, compounded by climate change impacts such as urban heat islands (UHI) and increased disaster risks. Understanding the dynamic interplay between land use patterns, temperature variations, and their implications for urban planning is crucial for fostering sustainable development and resilience in urban areas.

Using remote sensing and geographic information systems (GIS), this research aims to map and monitor temporal changes in land use and land cover, concurrently with temperature fluctuations. By analyzing historical trends and current data, the study will identify hotspots of urban growth, land degradation, and temperature anomalies across different urban regions in Nepal. The integration of GNSS/GPS technology will enhance spatial accuracy in data collection and facilitate real-time monitoring of urban dynamics.

The impacts of these changes on urban planning will be assessed through spatial analysis techniques, evaluating how shifts in land use and temperature affect infrastructure development, green spaces, and community resilience. The findings will inform strategies for effective climate action planning, including disaster risk management, urban renewal, and affordable housing initiatives. Key focus areas include enhancing access to land through cadastre modernization, implementing low-cost technology solutions for sustainable urban development, and fostering community engagement in planning processes.

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