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Kathmandu, Nepal 14–16 November

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Climate Responsive Land Governance and Disaster Resilience: Safeguarding Land Rights



Land Cover Change Before and After the Sendai Framework of Disaster Risk Reduction

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Introduction

Land Cover Change

- An indicator of environmental health and sustainability.
- Urbanization and climate change amplify disaster risks
- To achieve SDGs by 2030, these risks need to be addressed.

Sendai Framework for Disaster Risk Reduction (2015-2030)

- Goal: Improve resilience and disaster preparedness
- Theme “Build Back Better” after a disaster.

Priority of Sendai Framework



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Objectives

- To analyze the land cover change in alignment with the Sendai Framework for Disaster Risk Reduction (2015)
- To highlight the significant shifts in land cover patterns (2000 to 2015 and 2015 to 2021) and its probable causes



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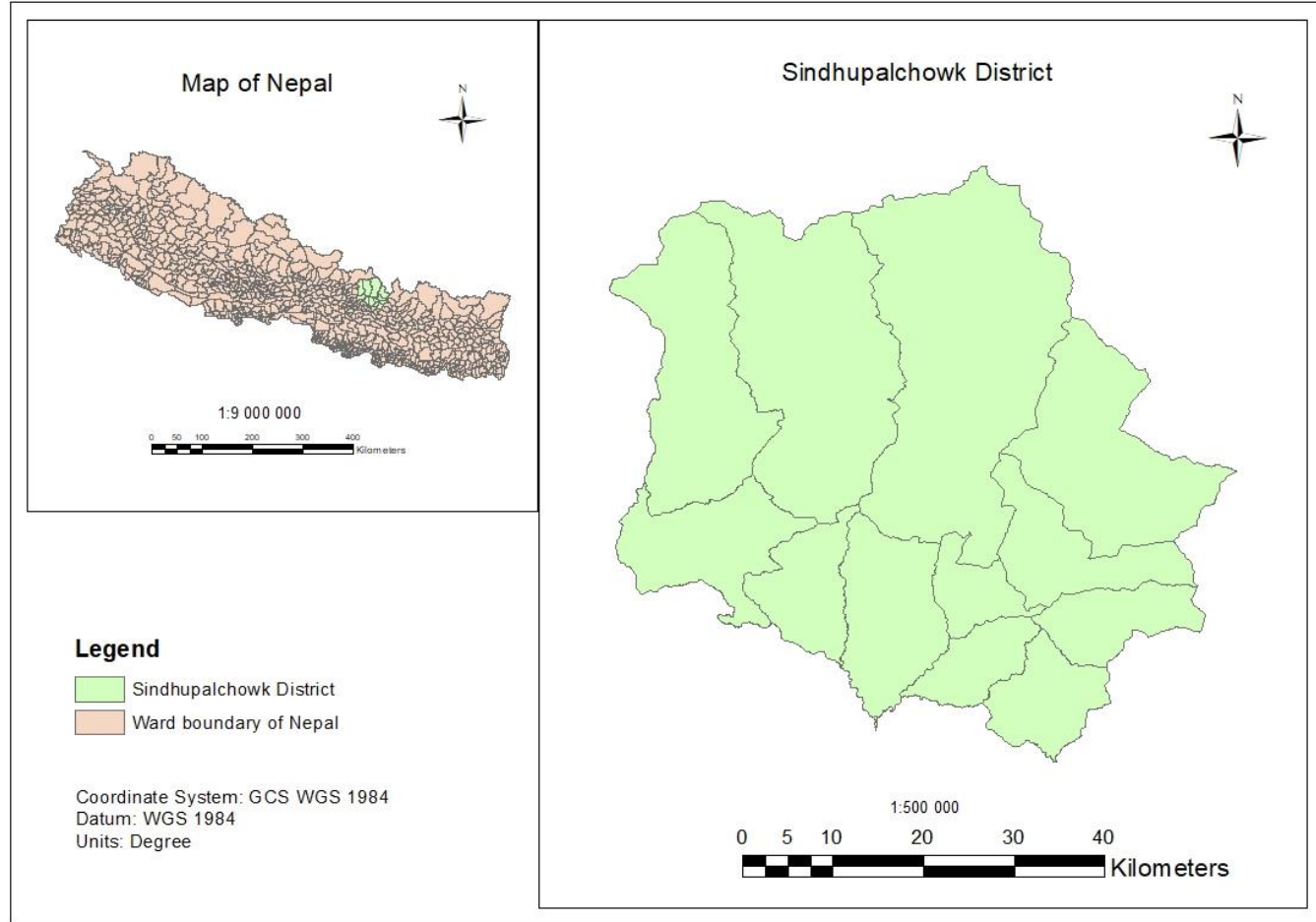
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Study Area

- Nepal's Vulnerability is ranked 4th globally for climate-related hazards (Maplecroft, 2010)
- Policies targeting the Sendai Framework (e.g., Disaster Risk Reduction and Management Act, Monsoon Preparedness and Response Plan).





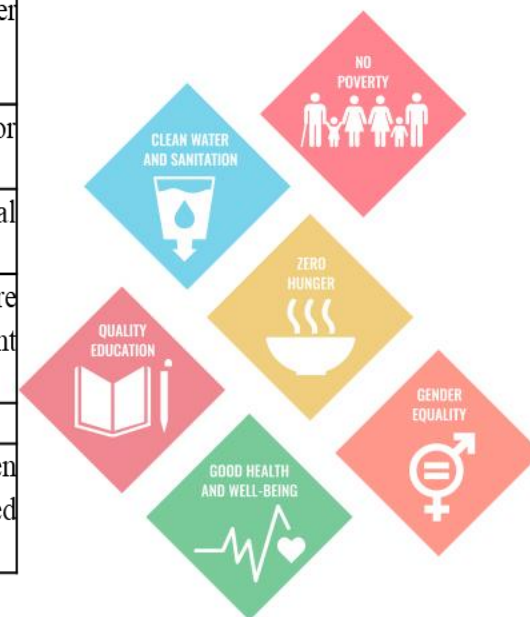
Methodology

Data Used

- ICIMOD land cover datasets from RDS (Regional Database System)

Land Cover Types:

Main Land cover class	Description
Waterbody	Rivers are natural flowing water bodies and typically have elongated shapes, lakes, and ponds are potential standing water bodies.
Snow and Glacier	This class describes perennial snow(persistence> 9 months per year) and Perennial ice in movement
Forest	Land spanning more than 0.5 ha with trees higher than 5 m and a canopy cover of more than 10% that is predominantly under agriculture or urban land use.
Riverbed	A tract of land without vegetation surrounded by the water of an ocean, lake, or stream, it usually includes any accretion in a river course.
Built-up area	Built-up areas refer to artificial structures such as towns, villages, industrial areas, airports, etc.
Cropland	This category includes arable and tillage land and agroforestry systems where vegetation falls below the thresholds used for the forest land category, consistent with the selection of national definitions.
Bare rock	Non-vegetated areas with rock surface.
Grassland	Areas covered by herbaceous vegetation with cover ranging from closed to open (15-100%). This category includes rangeland and pasture that is not considered cropland.



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Methodology Cont.

Change Detection Methods

- Categorical Change Detection
- Pixel Value Change Detection

Pixel-Based Categorical Change Detection



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Result

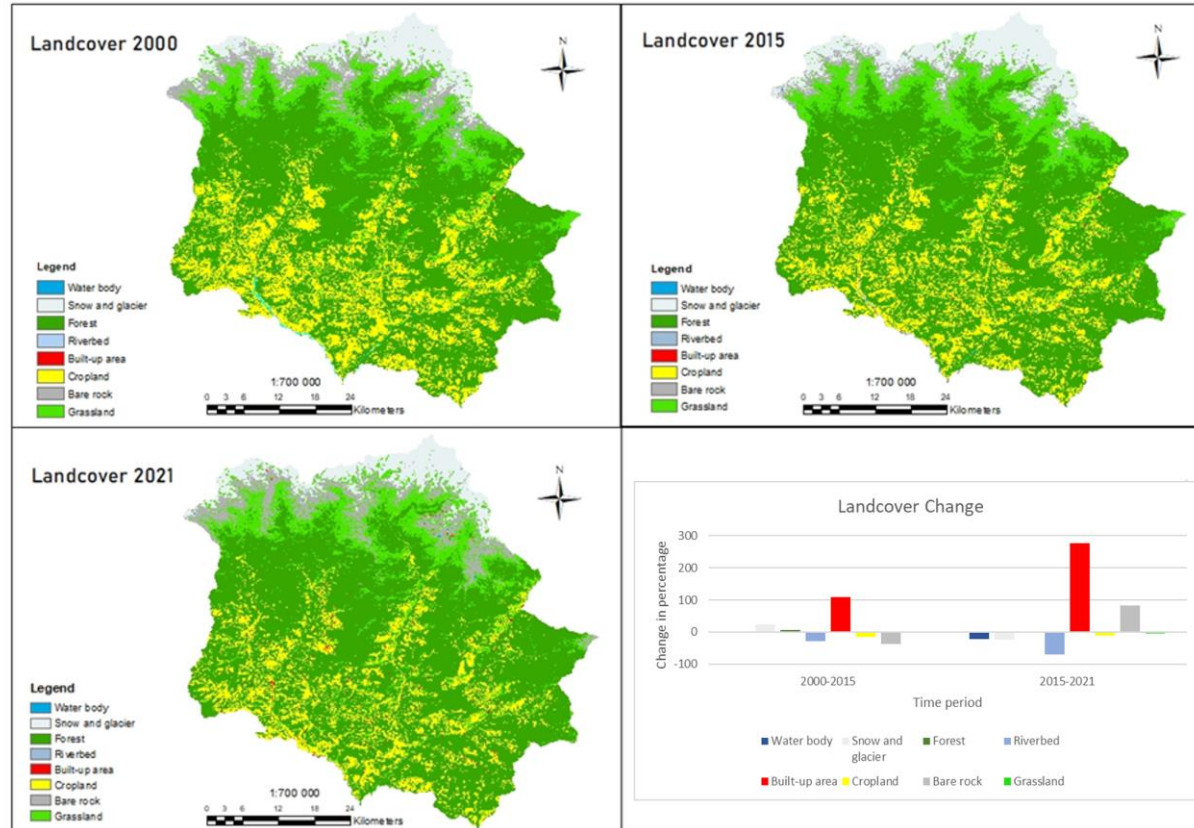


Figure: Land cover at different years and change





Result

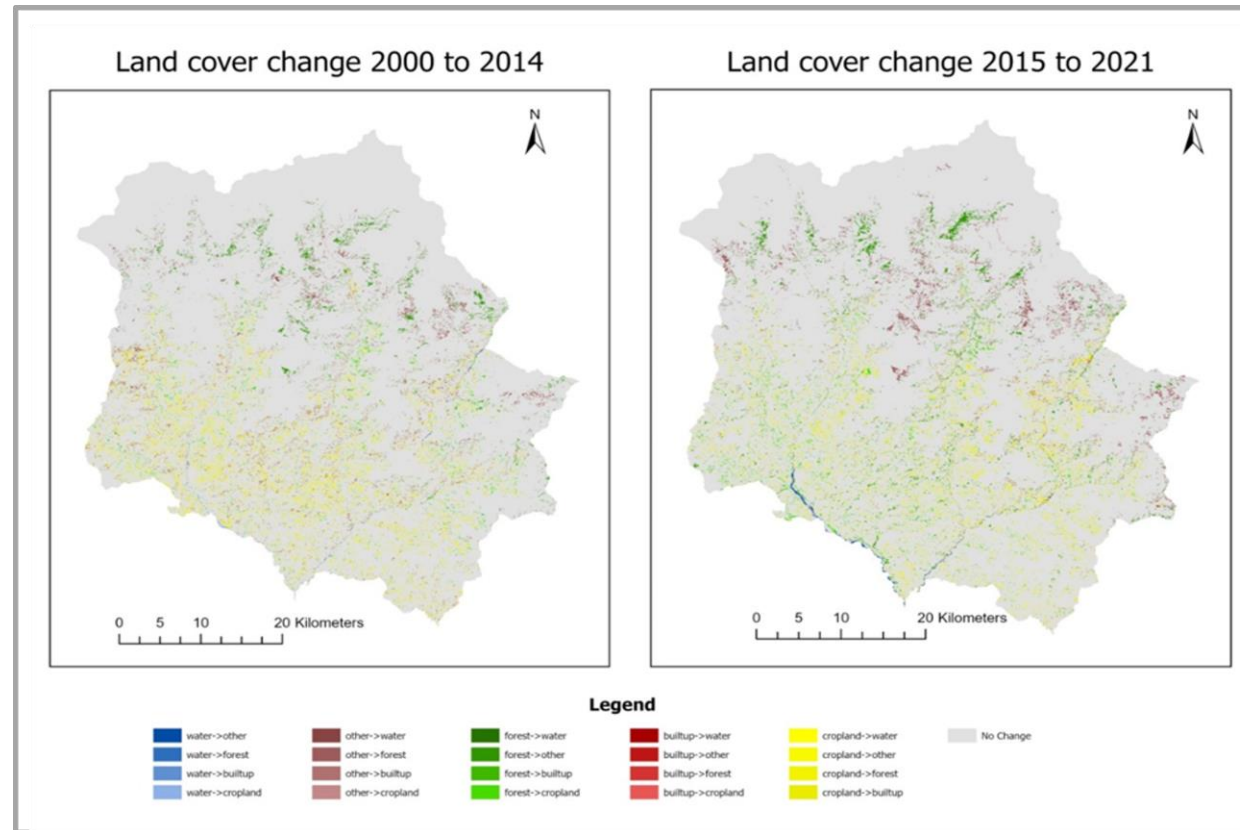


Figure: Land cover change with respect to the Sendai framework



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Monitoring the change



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Discussion

- There is an increase in forest cover with a 6.76% increase till 2015 to a 2.08% increase till 2021
- Increase in the built-up area by twice after 2015 resulting from rapid urbanization.
- Increase in area of bare rock resulting from activities like landslides and floods after 2015, also triggered by the Gorkha Earthquake in 2015.
- Local people's willingness to live near riverbeds, increasing the vulnerability.
- Multi-criteria analysis has proven effective planning of constructional activities.



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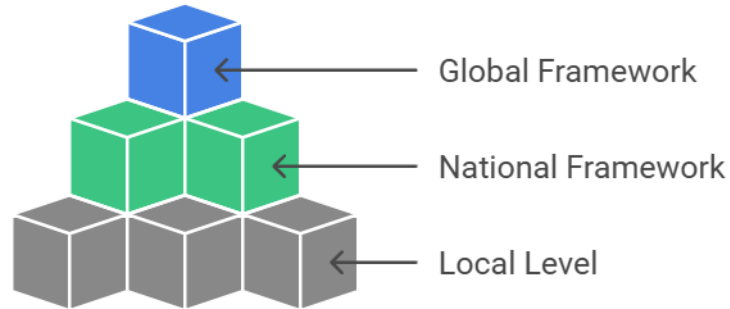
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Conclusion

- Achieving the Sendai Framework’s target requires integrating scientific methodologies with local stakeholder involvement.
- Spatial planning and nature-based solutions.



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Thank You!



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