INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY
HYDERABAD

R&D SHOWCASE 2021

MODELING FOREST COVER DYNAMICS, A GEOSPATIAL APPROACH

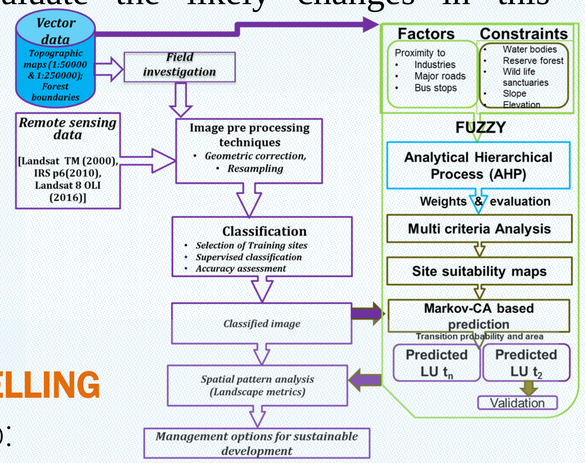
ABSTRACT

The landscape transition can be natural or anthropogenic. Land Use and Land Cover (LULC) are the basic measures to assess the health of a forested landscape. The comprehensive understanding of a forested landscape necessitates to derive the relationship among biophysical and socio-economic process acting, which also further aids in visualising likely changes through modeling. Spatio temporal LULC analysis through remote sensing data highlights the unplanned developmental activities and their influence on the ecological integrity. The Modeling of landscape dynamics in central Western Ghats region has been carried out evaluate the likely changes in this ecologically significant area.

METHOD

LAND USE ANALYSIS:

Spatio temporal land use analysis through Maximum likelihood classifier 1973-2019



SCENARIO BASED LANDSCAPE MODELLING

Historical (Linear) Growth Rate Scenario:

The Cellular Automata coupled with Markov chain has used for land use predictions based on transitional probability area matrix generated from 1973-1979; 1979-1999 respectively. The validation of the predictions was made considering the actual land uses (1999, 2018) with the simulated scenario. Then projected land uses of 2025 & 2035.

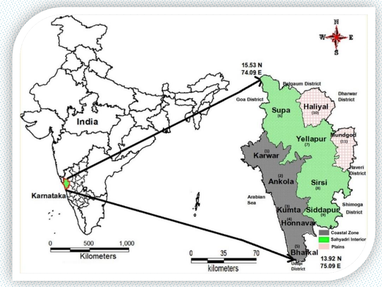
Non-liner Growth Rate Scenario:

Hybrid Fuzzy Analytical Hierarchical Process model has used to capture the non-liner growth in forested landscape with more user based constraints.

OBJECTIVE

- Quantification of spatio temporal Land use change;
- Scenario based land use modeling for capturing various growth rates

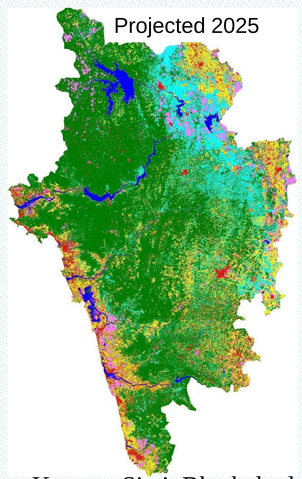
STUDY AREA

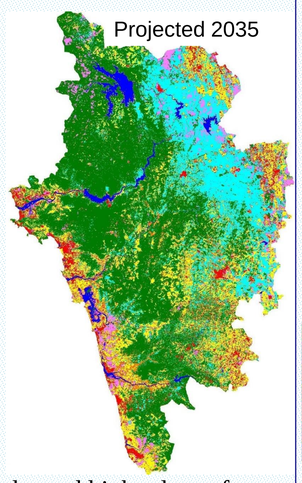


- Uttara Kannada district, Central Western Ghats
- Area: 10,291 km^2;
- Population: 14,37,169;
- Population density: 140 persons/km^2.

RESULTS

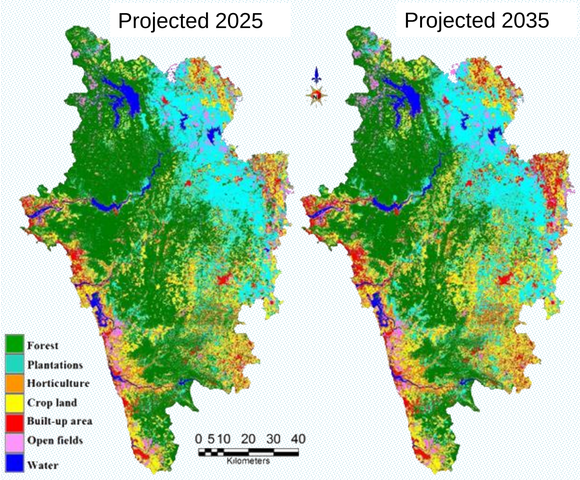
Historical Growth Rate Scenario:





- Karwar, Sirsi, Bhatkal taluks showed higher loss of forest cover
- Neighbor hood effect has resulted in low accuracy

Non linear Growth Rate Scenario:



- Projected change has incorporated the various drivers, depicted real picture of change

CONCLUSION

- Scenario1: Likely forest cover changes from **83** (1973) to 50 % (2035).
- Scenario 2: Likely forest cover changes from **83** (1973) to 42 % (2035), incorporated drivers.
- Many developmental activities have been proposed post 2000, which are eroding **NATIVE GREEN COVER.**

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