

Land cover change modeling in Kathmandu, Nepal

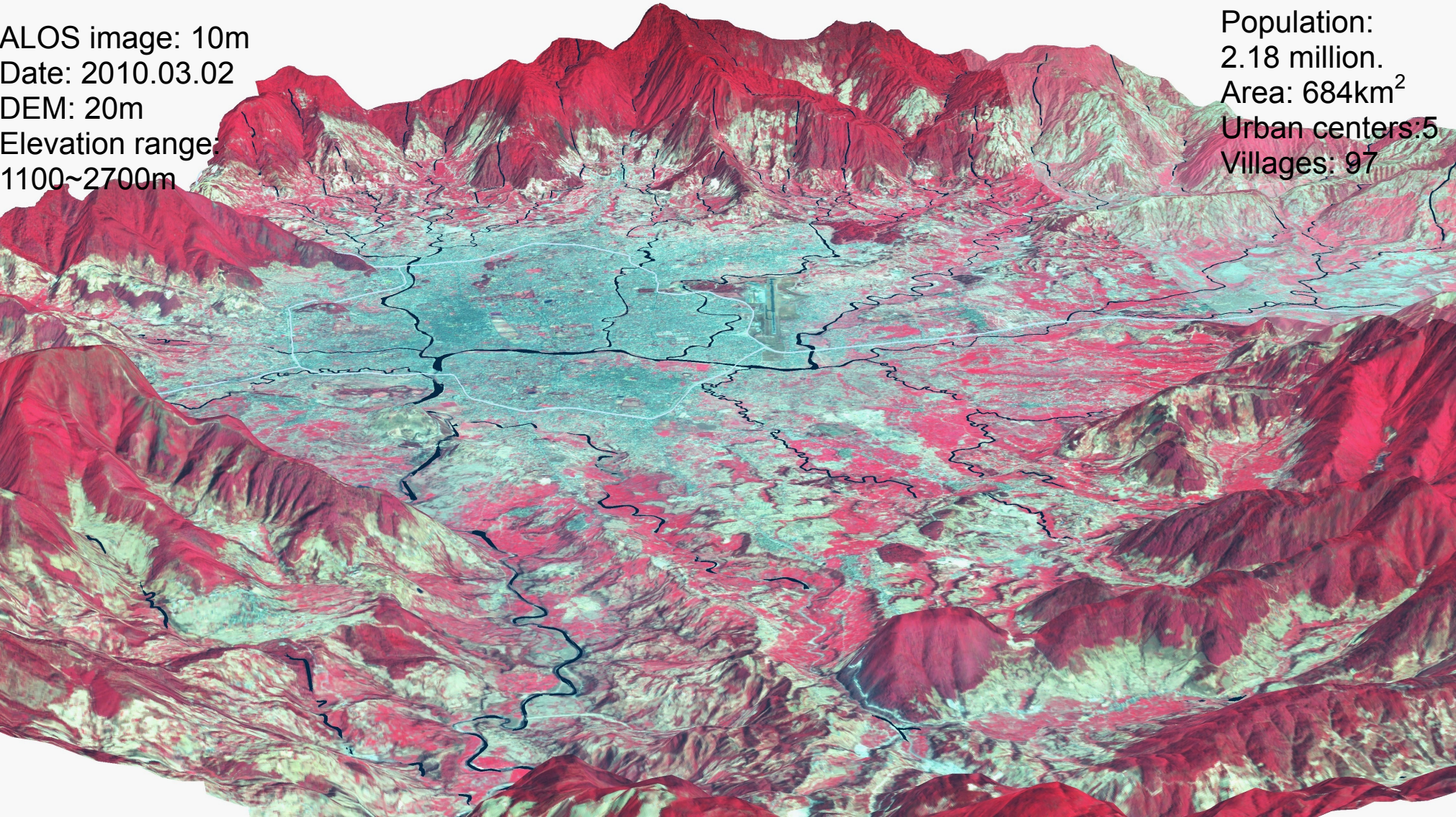
Rajesh Bahadur THAPA and Yuji MURAYAMA

Division of Spatial Information Science

Graduate School of Life and Environmental Sciences, University of Tsukuba

Motivation: This research aims to model land cover dynamics in the Kathmandu metropolitan region using weight of evidence and cellular automata techniques.

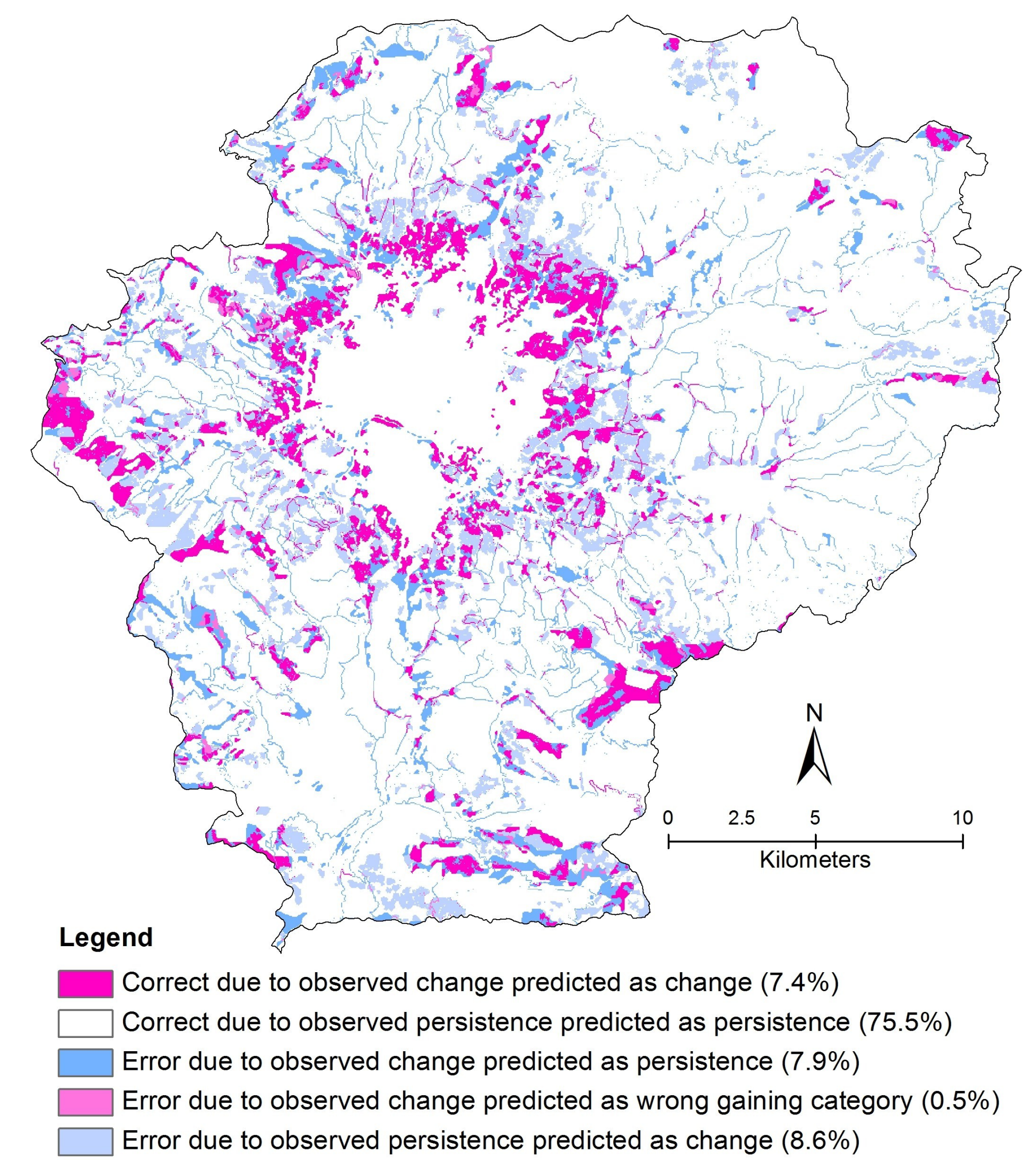
Study landscape: Kathmandu, Nepal



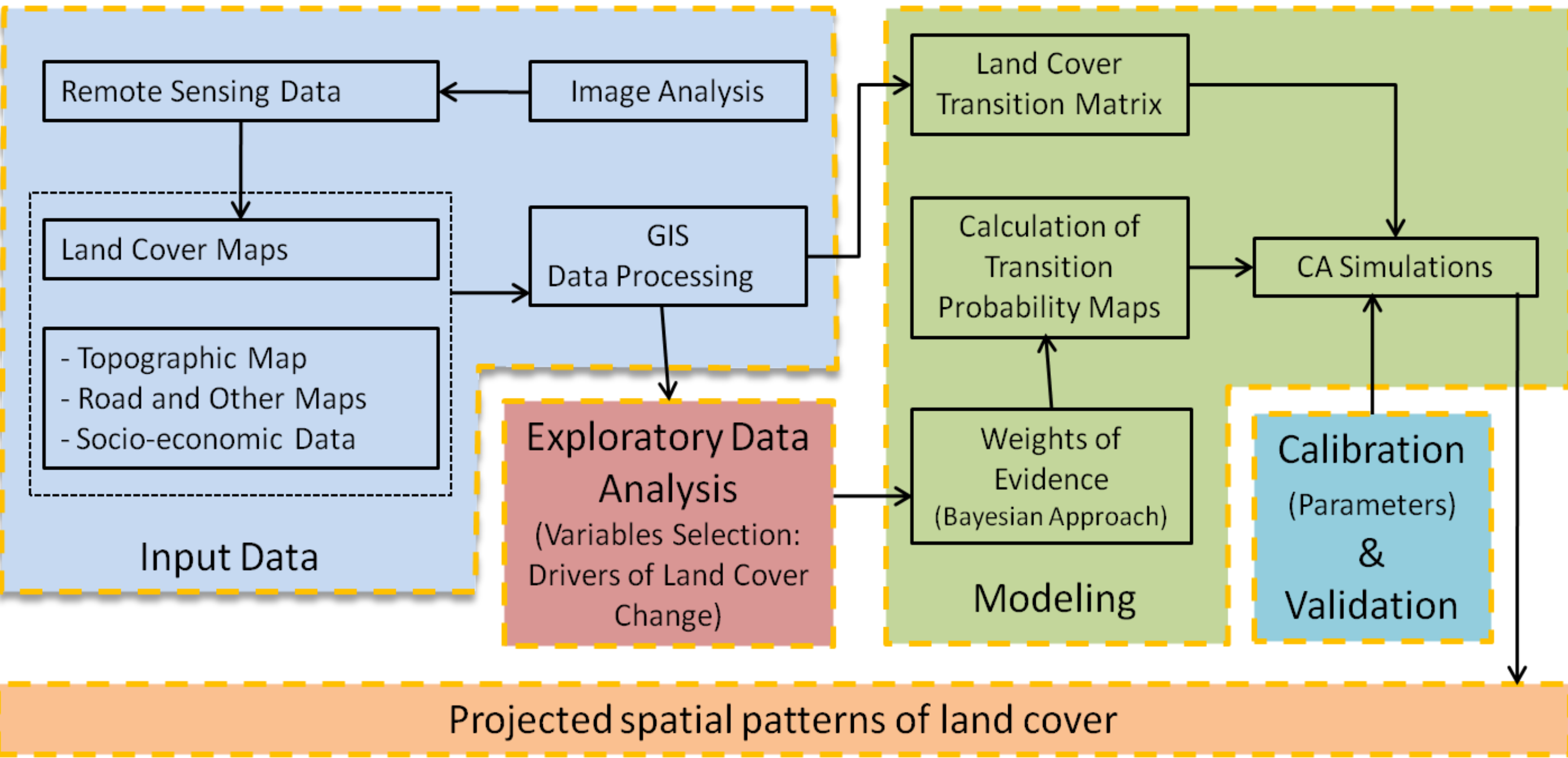
Land change drivers

(biophysical, infrastructure, and socioeconomic)	
Digital elevation model at 30m spatial resolution	1995
Slope in degrees	1995
Distances to rivers	2000, 2010
Distances to roads	2000, 2010
Distances to existing built-up surface	2000, 2010
Annual population growth rate	2001
Proportion of migrants	2001
Proportion of economically active population	2001

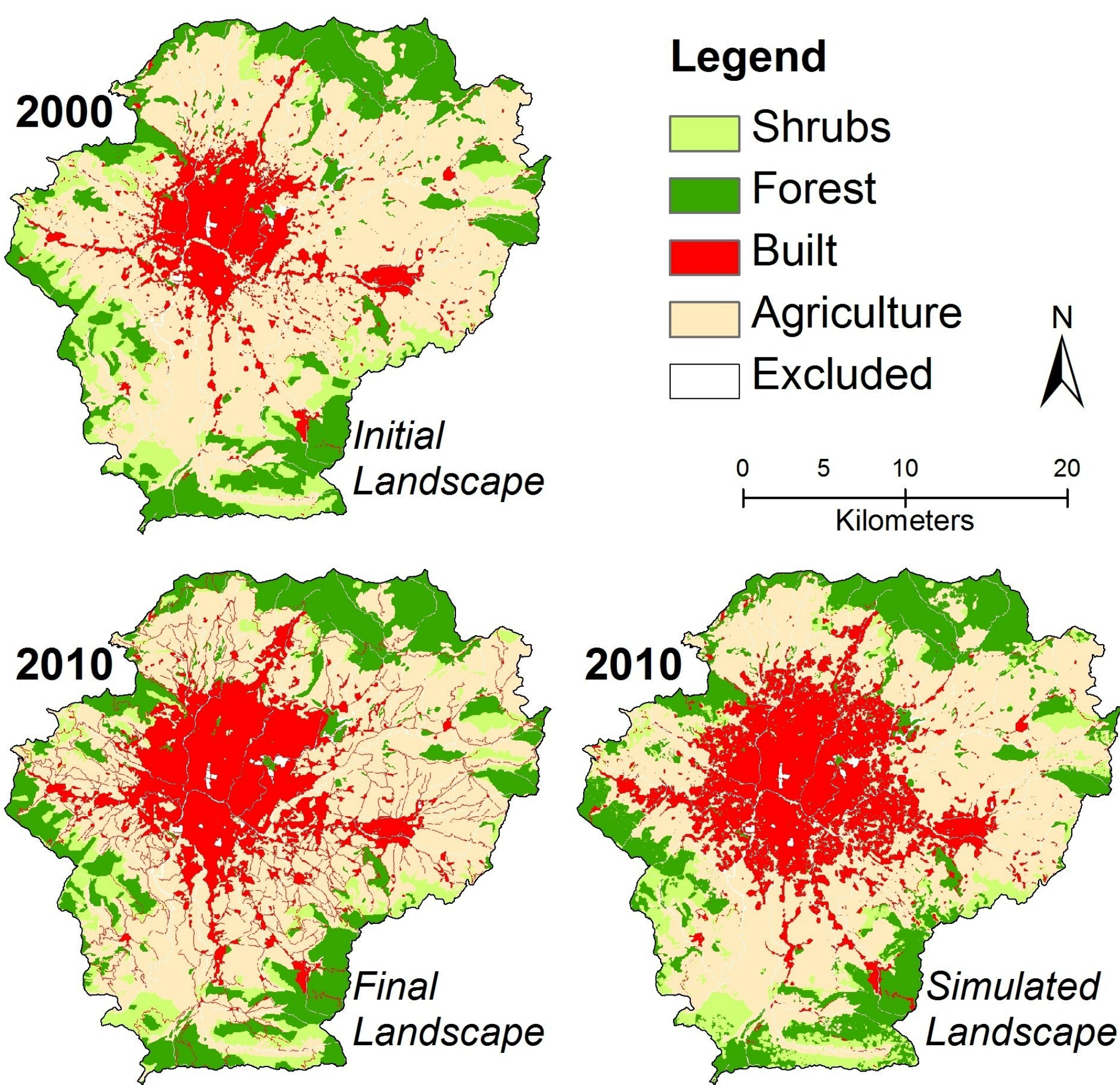
Error analysis



Modeling flow



Actual vs. simulated land



Data source:

ALOS Image, 2010.

ICIMOD/UNEP (2001). Kathmandu Valley GIS Database. Kathmandu, Nepal.

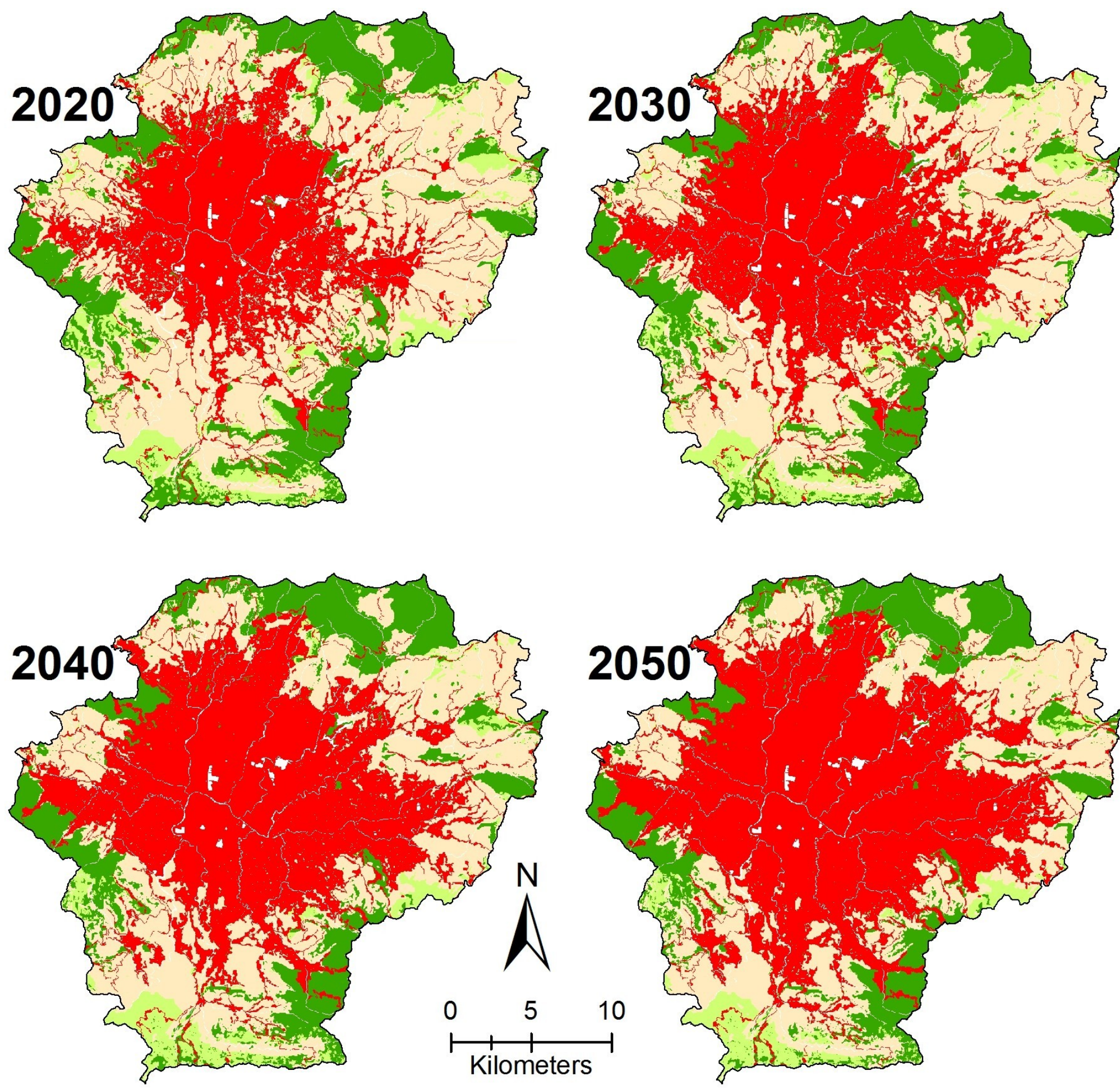
Thapa, R. B. and Murayama, Y. (2009). Examining spatio-temporal urbanization patterns in Kathmandu Valley, Nepal: Remote sensing and spatial metrics approaches. *Remote Sensing*, 1(3), 534-556.

Thapa, R. B. and Murayama, Y. (2009). Urban growth modeling of Kathmandu metropolitan region, Nepal. *Computers, Environment and Urban Systems* (in press).

To know more, drop an email at:
thaparb@yahoo.com / thaparb@gmail.com

You may visit:
<http://publicationslist.org/rajesh.thapa>

Extrapolation (2020-2050)



Concluding note:

The simulation estimates are based on extrapolation from historic processes which are not guaranteed to continue in the future but it mirrors spatial patterns of land cover in the metropolitan region if the historic process is not altered. In this case, the model has generated maps to show where and how the urban development in Kathmandu is heading in the next four decades from 2010.

Acknowledgements: The financial support for this research is from JSPS (Grant# 2109009) to study spatial process of urbanization and its impact on environment in Kathmandu, Nepal. The ALOS data received from the JAXA project "Monitoring spatiotemporal patterns of urbanization using satellite remote sensing data" – Team Leader: Rajesh Bahadur Thapa (PI#536), University of Tsukuba, Japan. Model is designed in DYNAMICA software.