
ICIMOD
Applications of land cover mapping
Kabir Uddin
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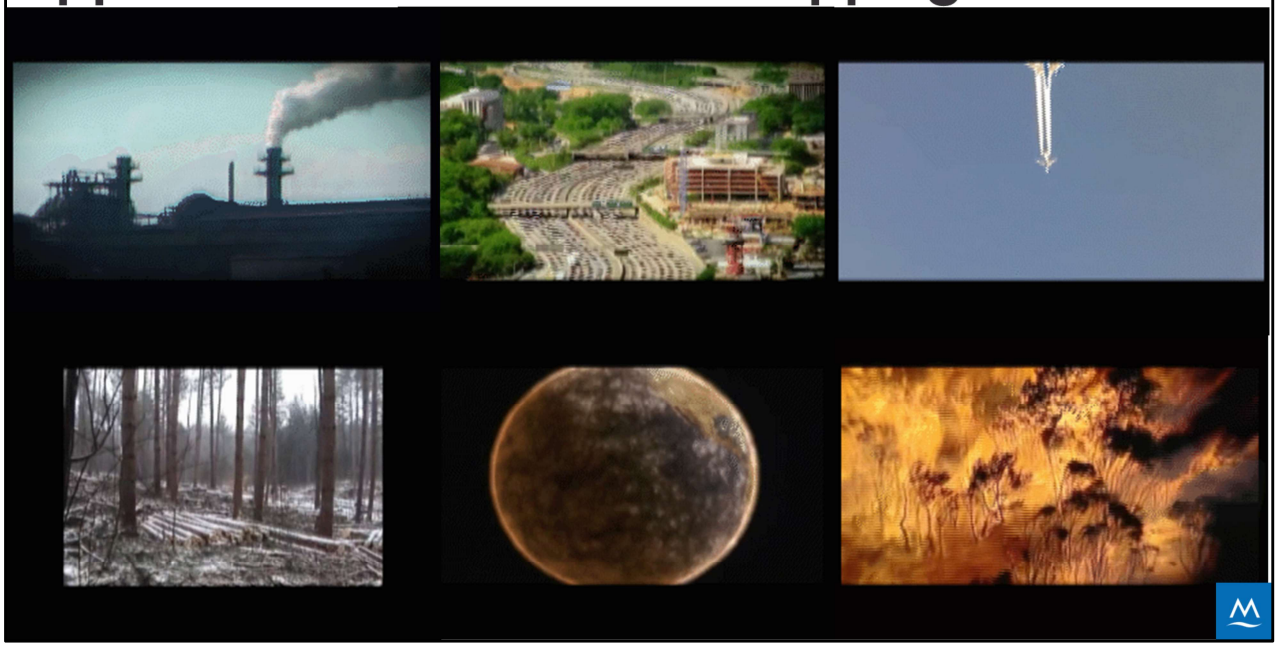
Applications of land cover mapping



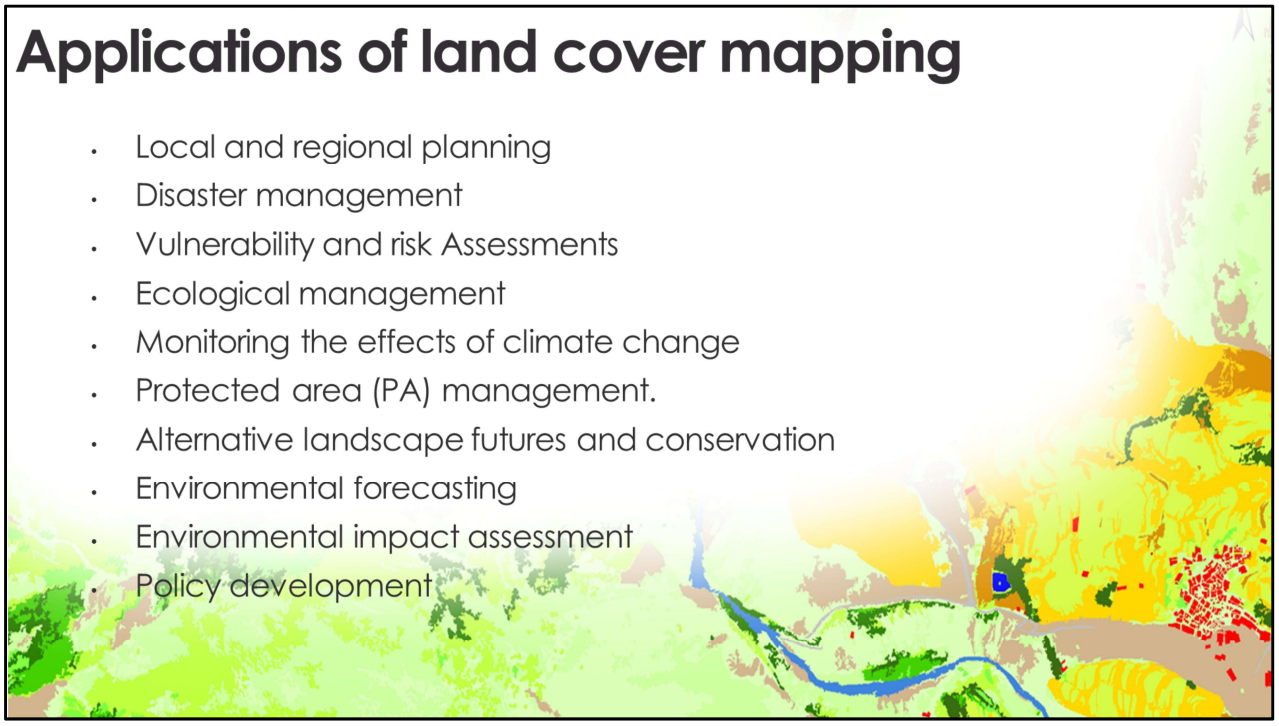
As you know land cover change is a significant contributor to environmental change. LULCC plays a major role in climate change at global, regional and local scales. At global scale, LULCC is responsible for releasing greenhouse gases to the atmosphere, thereby driving global warming.

Applications of land cover mapping

Biodiversity is often reduced dramatically by LULCC. When land is transformed from a primary forest to a farm, the loss of forest species within deforested areas is immediate and complete.
Changes in land use and land cover are important drivers of water, soil and air pollution. Vegetation removal leaves soils vulnerable to massive increases in soil erosion by wind and water, especially on steep terrain, and when accompanied by fire, also releases pollutants to the atmosphere. This not only degrades soil fertility over time

Applications of land cover mapping

- Local and regional planning
- Disaster management
- Vulnerability and risk Assessments
- Ecological management
- Monitoring the effects of climate change
- Protected area (PA) management.
- Alternative landscape futures and conservation
- Environmental forecasting
- Environmental impact assessment
- Policy development



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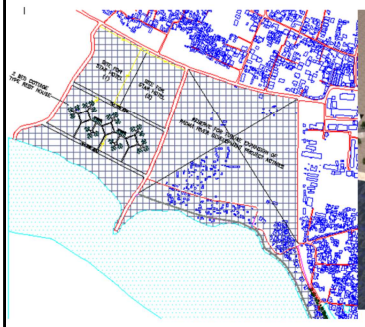
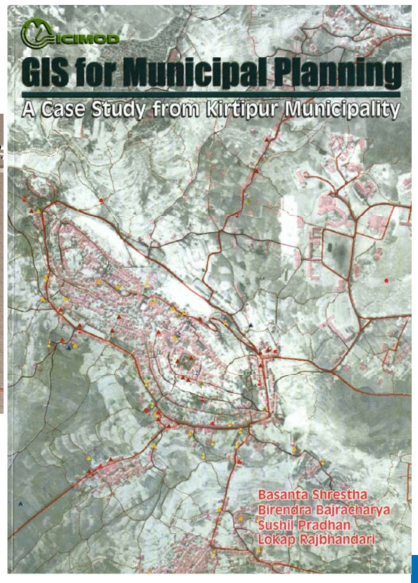
Local and regional planning





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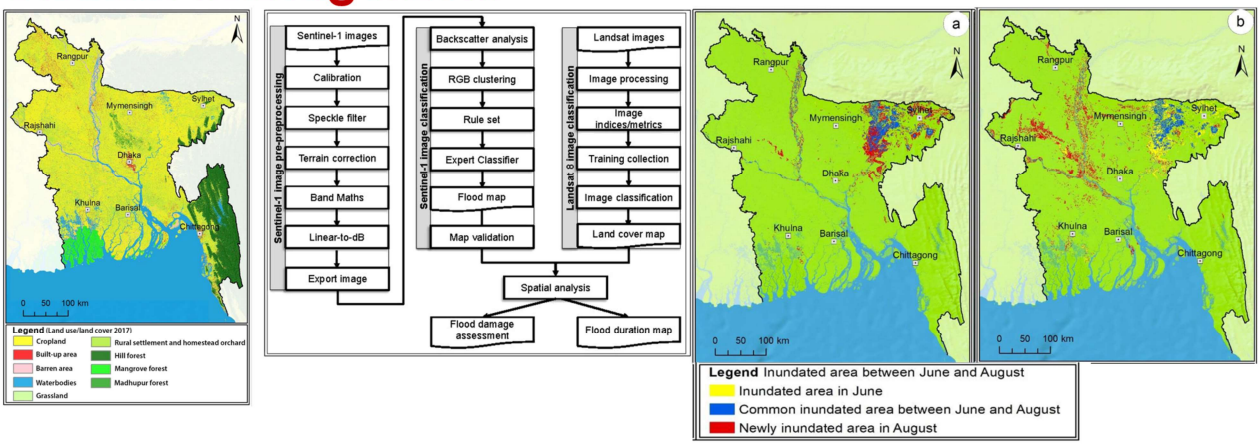
Disaster management



Flood recession and rise areas of Bangladesh, 2017 between (a) April and June, (b) June and August

Source: *Uddin, K., Matin, M. A., & Meyer, F. J. (2019). Operational flood mapping using multi-temporal sentinel-1 SAR images: a case study from Bangladesh. Remote Sensing, 11(13), 1581.*

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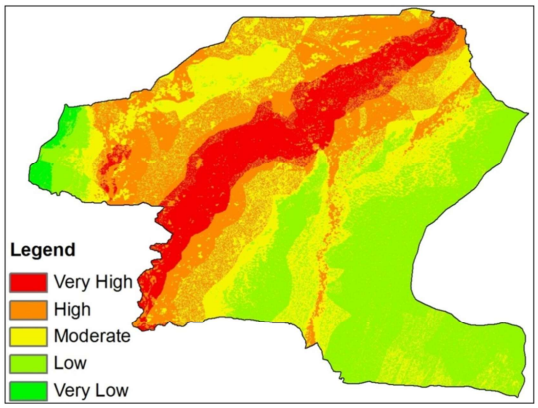
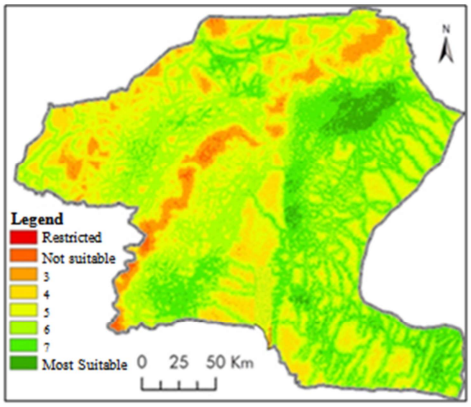
Vulnerability and risk Assessments



Flood hazard zoning map



Flood shelter suitability map

Source: *Uddin, K., Gurung, D. R., Giriraj, A., & Shrestha, B. (2013). Application of remote sensing and GIS for flood hazard management: a case study from Sindh Province, Pakistan. American Journal of Geographic Information System, 2(1), 1-5.*

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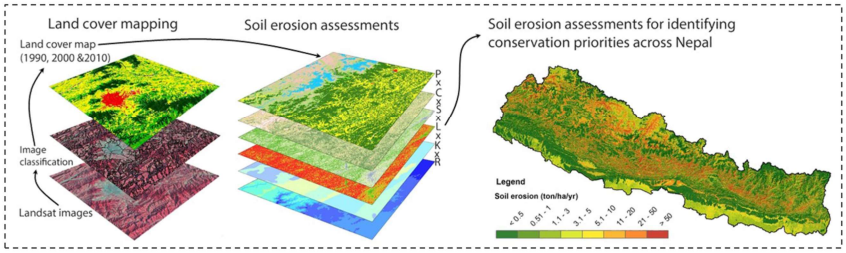
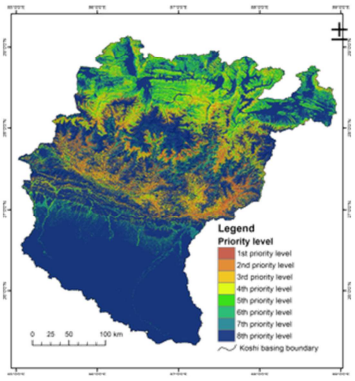
Vulnerability and risk Assessments



Soil erosion map of Nepal



Priority areas for erosion control in Koshi basin

Sources: *Uddin, K., Abdul Matin, M., & Maharjan, S. (2018). Assessment of land cover change and its impact on changes in soil erosion risk in Nepal. Sustainability, 10(12), 4715.*

** Uddin, K., Murthy, M. S. R., Wahid, S. M., & Matin, M. A. (2016). Estimation of soil erosion dynamics in the Koshi basin using GIS and remote sensing to assess priority areas for conservation. PloS one, 11(3).*

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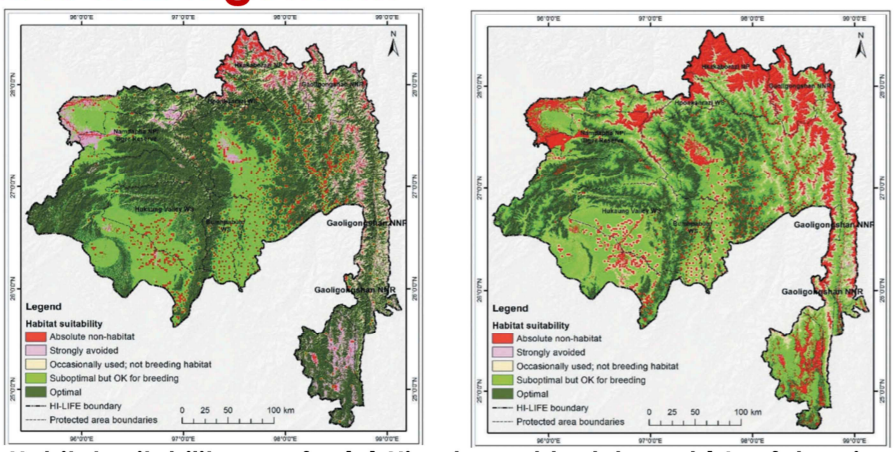
Ecological management



Habitat suitability map for (a) Himalayan black bear b) Leaf dear in far Eastern Himalayas, Nepal

Source: *Uddin, K., Chettri, N., Yang, Y., Lodhi, M. S., Htun, N. Z., & Sharma, E. (2019). Integrating geospatial tools and species for conservation planning in a data-poor region of the Far Eastern Himalayas. Geology, Ecology, and Landscapes, 1-16.*

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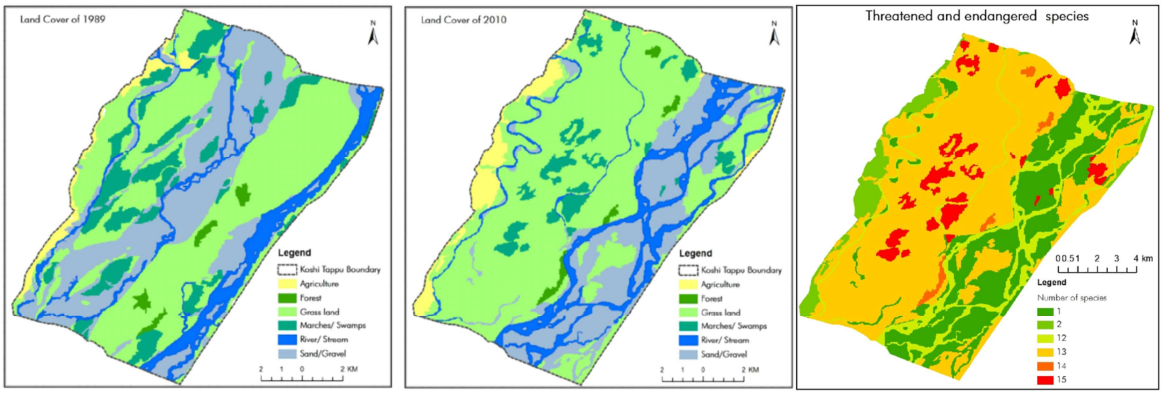
Monitoring the effects of climate change



Distribution and habitat use pattern by 20 threatened species in Kosi Tappu Wildlife Reserve (KTWR) as a result of LULC change

Source: *Chettri, N., Uddin, K., Chaudhary, S. and Sharma, E., 2013. Linking spatio-temporal land cover change to biodiversity conservation in the Koshi Tappu Wildlife Reserve, Nepal. Diversity, 5(2), pp.335-351.*

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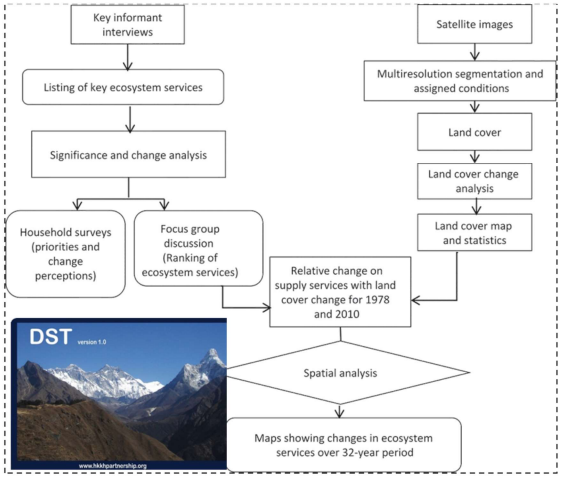
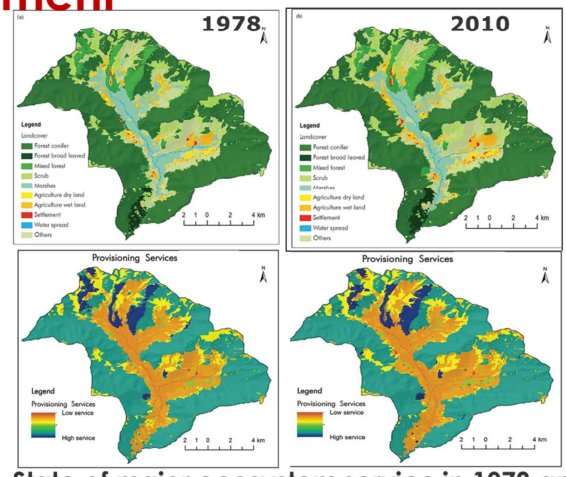
Protected area (PA) management





State of major ecosystem service in 1978 and 2010 as a result of LULC change

Source: *Chaudhary, S., Tshering, D., Phuntsho, T., Uddin, K., Shakya, B., & Chettri, N. (2017). Impact of land cover change on a mountain ecosystem and its services: case study from the Phobjikha valley, Bhutan. Ecosystem Health and Sustainability, 3(9),*

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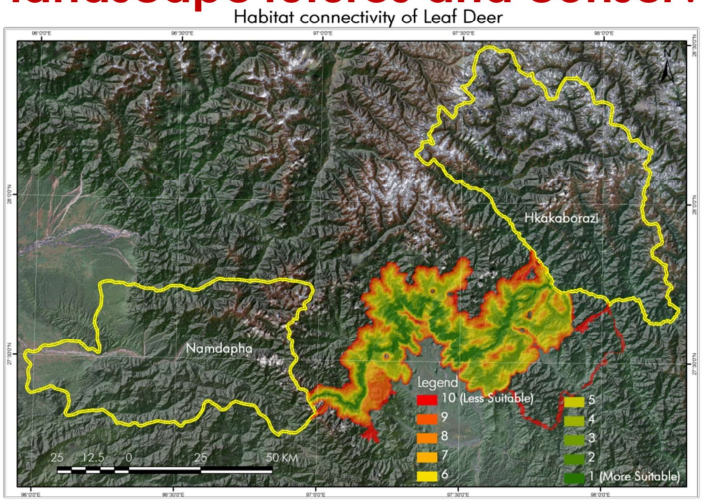
Alternative landscape futures and conservation



Habitat connectivity of Leaf Dear showing low to high suitability regions

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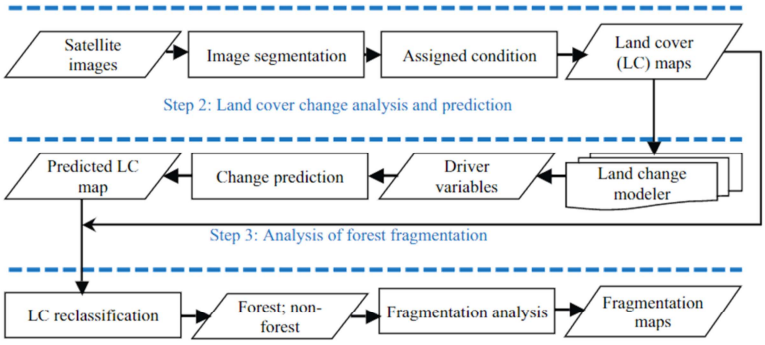
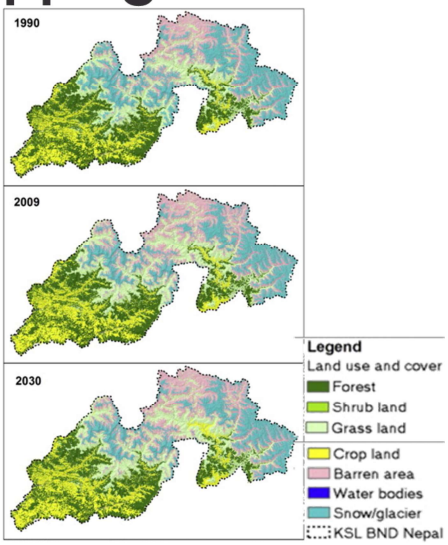
Environmental forecasting



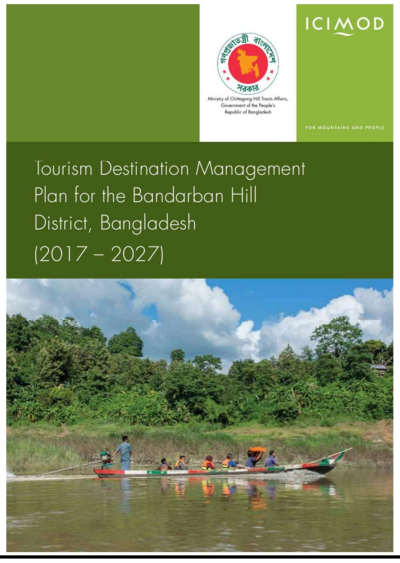


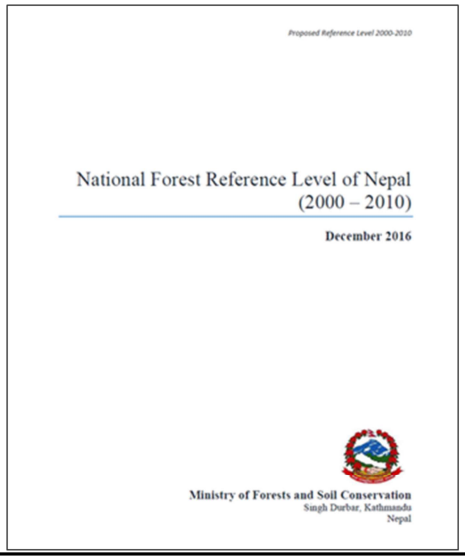
Land cover of the Kailash Sacred Landscape—Nepal for 1990, 2009, and 2030

Source: *Uddin, K., Chaudhary, S., Chettri, N., Kotru, R., Murthy, M., Chaudhary, R. P., ... & Gautam, S. K. (2015). The changing land cover and fragmenting forest on the Roof of the World: A case study in Nepal's Kailash Sacred Landscape. Landscape and Urban Planning, 141, 1-10.*

Applications of land cover mapping

Policy development





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Satellite mapping fights corruption

Location of markets is checked by GPS

By Alfred Hermida
BBC News Online in Bangladesh

Digital maps of Bangladesh are proving invaluable in the fight against sleaze in a country branded as one of the most corrupt in the world.

The maps are used together with a computerised national database to decide where new roads or schools should be built.

The aim is to ensure that tough decisions about development priorities and spending are governed by local needs rather than the whim of politicians.

"It has become an excellent planning tool to plan and identify priorities, said Quamrul Islam Siddique, who pioneered the scheme. "This

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