

Monitoring Land Cover/Land Use Change in Rupandehi District by Optimising Remotely Sensed Image

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Abstract : Land use and land cover play a crucial role in preserving and managing Earth's natural resources. Various factors, such as economic, demographic, social, cultural, technological, and environmental processes, contribute to changes in land use and land cover (LULC). Rupandehi District is significantly influenced by a combination of driving forces, including its geographical location, rapid population growth, economic opportunities, globalization, tourism activities, and political events. Urbanization and urban growth in the region have been occurring in an unplanned manner, with internal migration and natural population growth being the primary contributors. Internal migration, particularly from neighboring districts in the higher and lower Himalayan regions, has been high, leading to increased population growth and density. This study utilizes geospatial technology, specifically geographic information system (GIS), to analyze and illustrate the land cover and land use changes in the Rupandehi district for the years 2009 and 2019, using freely available Landsat images. The identified land cover categories include built-up area, cropland, Das-Gaja, forest, grassland, other woodland, riverbed, and water. The statistical analysis of the data over the 10-year period (2009-2019) reveals significant percentage changes in LULC. Notably, Das-Gaja shows a minimal change of 99.9%, while water and forest exhibit increases of 34.5% and 98.6%, respectively. Riverbed and built-up areas experience changes of 95.3% and 39.6%, respectively. Cropland and grassland, however, show concerning decreases of 102.6% and 140.0%, respectively. Other woodland also indicates a change of 50.6%. The most noteworthy trends are the substantial increase in water areas and built-up areas, leading to the degradation of agricultural and open spaces. This emphasizes the urgent need for effective urban planning activities to ensure the development of a sustainable city. While Das-Gaja seems unaffected, the decreasing trends in cropland and grassland, accompanied by the increasing built-up areas, are unsatisfactory. It is imperative for relevant authorities to be aware of these trends and implement proactive measures for sustainable urban development.

Keywords : land use and land cover, geospatial, urbanization, geographic information system, sustainable urban development

Conference Title : ICGE 2024 : International Conference on Geomatics Engineering

Conference Location : Rome, Italy

Conference Dates : March 04-05, 2024