

**INVESTIGATION OF THE LAND USE CHANGING PATTERNS IN
MORAGAHAKANDA DEVELOPMENT PROJECT SITE
FROM 2002 TO 2021**

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This study was conducted to study the land use changing pattern in *Moragahakanda* reservoir and the surrounding area to assess the land-use changes from 2002 to 2021 using remote sensing and GIS techniques. Land uses of the study site at six-time points (2002, 2006, 2011, 2015, 2018 and 2021) was obtained from the satellite images (Maxar Technologies, CNES/Airbus, LANDSAT 07 and Sentinel Level-2A). These images were used to classify the land use patterns using the supervised classification technique. Radiometric and geometric corrections of the satellite images (LANDSAT 05, LANDSAT 07 and Sentinel Level-2A) were performed using the standard procedures. The current and historical land use land cover (LULC) maps were prepared using ISO cluster unsupervised classification (ISOUC) technique. The Kappa statistics were calculated based on 100 random points to assess the accuracy of each LULC map. Six land uses, i.e., forest, transportation, Moragahakanda project area (MPA), open areas, water bodies and residential areas, were identified using supervised classification. Decreasing trends were observed in the forest (66.75% in 2002 to 51.88% in 2021), open area (29.17% in 2002 to 1.1% in 2021), and residential area (6.34% in 2011 to 2.9% in 2021) at the study site. Increasing trends were observed in transportation (0.01% in 2002 to 0.18% in 2021), MPA (0.09% in 2011 to 0.9% in 2021) and water bodies (4.07 % in 2002 to 43.03% in 2021) at the study site. Major three land uses, i.e., forest, open areas, and water bodies were identified and revealed a considerable accuracy in the LULC maps prepared using ISOUC, the calculated overall accuracy and Kappa statistics values were over 78% and 0.56, respectively. It can be concluded that a considerable change in land uses occurred due to the *Moragahakanda* development project. Moreover, temporal changes in the major land uses can be reliably investigated by implementing the ISOUC technique for the relevant current and historical satellite images.

Keywords: Geographic information system (GIS), Land use and land cover (LULC) maps, Remote sensing, Supervised and unsupervised classification