

# LAND USE AND LAND COVER CHANGES IN MAJOR TANK CASCADE SYSTEMS ASSOCIATED WITH NACHCHADUWA TANK IN MALWATHU OYA RIVER BASIN, SRI LANKA

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Tank cascade systems (TCS) in the dry zone of Sri Lanka play an important role in ecosystem sustainability by ensuring water availability for human and environmental needs. The TCS have been exposed to land use and land cover (LULC) changes, resulting deterioration of TCS. Hence, this study was conducted to assess the LULC changes from 1994 to 2020 in *Mahakanumulla*, *Thirappane* and *Ulagalla* (598 km<sup>2</sup>) which are major cascade systems in *Nachchaduwa* tank. Landsat 8 image was used to develop a land use map for 2020 while Landsat 5 images were used to produce land use maps for 2007 and 1994 using ArcGIS. The user accuracy, producer accuracy, and overall accuracy of each classification were over 85%. The study showed a forest cover gain (7.0 km<sup>2</sup>) from 1994 to 2007 and a forest cover loss (15.8 km<sup>2</sup>) during the 2007 to 2020 period. Agricultural land area decreased (2.6 km<sup>2</sup>) from 1994 to 2007 and increased (6.4 km<sup>2</sup>) from 2007 to 2020. Built-up areas increased in both periods and the rate of increase is higher from 2007 to 2020. Classified images confirmed that the area of surface water resources is highly affected by the LULC changes as the area of available water decreased in both time durations. Therefore, it is essential to prioritize the conservation activities for the identified most vulnerable areas for LULC changes that affect the sustainability of the *Malwathu oya* river basin.

**Keywords:** Accuracy assessment, Geographic information system, Land use and land cover, Tank cascade systems