

IMPACT OF LAND USE CHANGES ON ACTUAL EVAPOTRANSPIRATION IN *MALWATHU OYA* RIVER BASIN, SRI LANKA

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The *Malwathu Oya* river basin, located in the dry zone of Sri Lanka, plays a crucial role in regional water dynamics and ecosystem sustainability. Over time, this basin has undergone significant land use changes driven by urbanization, deforestation, and agricultural expansion. These transformations can impact the hydrological cycle, especially the Actual Evapotranspiration (AET). This study aimed to assess the impact of land use changes on AET in the *Malwathu Oya* river basin using satellite-derived datasets and advanced geospatial techniques. Land use maps for 2000, 2012, and 2022 were generated from Landsat 7 and Landsat 8 satellite images. The classification was performed using Google Earth Engine (GEE), with Google Earth Pro serving as a reference for training and validation. Further image processing and map development were conducted in ArcGIS 10.4, achieving an overall classification accuracy exceeding 88% for each map. AET distribution maps were then produced using annual AET data from NASA's MODIS product, and analyzed in both GEE and ArcGIS. The produced AET distribution maps were validated with the WaPOR database. Correlation analysis revealed that forested regions exhibiting higher AET values ranging from 680 - 1060 mm yr⁻¹ attributed to dense vegetation cover, while urban and some agricultural areas had lower AET values ranging from 305 - 650 mm yr⁻¹. The study highlights the significance of evapotranspiration in the hydrological cycle and suggests its potential as a critical tool for sustainable water management in river basins facing land use pressures. This comprehensive approach provides valuable insights into how landscape modifications influence water resource dynamics, informing future conservation and development planning.

Keywords: Geographic information system, Google Earth Engine, Land use