

**CAUSE AND EFFECT ANALYSIS OF IMPACTS OF LAND COVER CHANGES  
ON BELIHULOYA MINI-CATCHMENT AREA**

**K.L.W.I. Gunathilake<sup>1</sup>, D.T. Jayawardhana<sup>2</sup> and C.M.K.N.K. Chandrasekara<sup>3\*</sup>**

<sup>1</sup>*Department of Geography, Faculty of Social Sciences, University of Kelaniya, Sri Lanka*

<sup>2</sup>*Department of Forestry and Environmental Science, Faculty of Applied Sciences,  
University of Sri Jayewardenepura, Sri Lanka*

<sup>3</sup>*Department of Geography, Faculty of Arts, University of Colombo, Sri Lanka*

*\*wathsalag@kln.ac.lk*

The rapid expansion of human activities has significantly transformed landscapes, leading to major impacts on water resources and ecosystem health. This study comprehensively assessed the transformations within the Belihuloya mini catchment, focusing on the effects of land use and land cover changes. The primary objectives included identifying changes, analyzing trends, and evaluating human perceptions of the impacts on the mini catchment. The study utilised remotely sensed data from 1959, 1988, 2000, and 2020 to assess land use and cover changes over time. A questionnaire survey was conducted among 60 randomly selected households across six Grama Niladhari Divisions within the catchment area. Correlation-based pair-wise analysis, paired t-test analysis, vulnerability value calculation, and interpolation mapping were employed to interpret the data. A cause-and-effect analysis was conducted using the Drivers-Pressures-State-Impacts-Responses (DPSIR) framework. The results revealed significant changes in land cover and use over the study period. Forest cover decreased dramatically, from 80% in 1959 to 33% in 1988, primarily due to the expansion of paddy fields and home gardens. Nine major driving forces were identified, highlighting the pressures on the natural environment and wildlife from land and forest clearance for construction. High-altitude areas surrounding the young Belihuloya river faces significant risk due to rapid land use changes, threatening the river's energy flow. The southern region, including Sabaragamuwa University and the Samanalawewa reservoir, is equally vulnerable, potentially compromising the mini-catchment's health. The findings underscore the urgent need for conservation efforts and informed land management practices to mitigate adverse impacts on the mini-catchment ecosystem and ensure sustainable development for future generations.

**Keywords:** Drivers-Pressures-State-Impacts-Responses, Land cover, Mini catchment, Vulnerability