

EVALUATING THE IMPACT OF COASTAL EROSION AND HUMAN ACTIVITIES ON THE SUSTAINABILITY OF KALUTARA CALIDO BEACH, SRI LANKA

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Sri Lanka's coastal regions play a vital role in sustainable development, supporting tourism, economic growth, and ecological balance. The western coast, including Kalutara Calido Beach, faces significant challenges due to climate change, coastal erosion, and human activities. This study aimed to assess the environmental and human activity challenges facing Kalutara Calido Beach, to provide an understanding of the sustainability of Calido Beach, and to make recommendations for coastal management practices to reduce erosion and protect the natural landscape for future generations. The study used secondary sources including environmental assessments, academic research, Google Earth Pro and Arc GIS software to assess the seasonal changes of the coastline, focusing on the impact of natural forces and anthropogenic factors such as urbanization, tourism, coastal development, and sand and vegetation removal to the coast. Assessing coastal erosion and human impacts on Kalutara Calido Beach using Descriptive, SWOT, Spatial, and Temporal analyses for sustainable management solutions. The results indicate that Calido beach erosion is strongly affected by seasonal climate variations, especially during the southwest monsoon when wave energy and sediment transport are intensified. Sandy regosols in the region are another cause to increase coastal erosion risk. Human intervention such as the widening of the Kalu Ganga estuary and the removal of the beach sand bar due to the significant floods experienced by Sri Lanka in 2017 have exacerbated this erosion. Also, due to hotels built near the beach, irresponsible tourism, housing complexes, shacks, and slums, unsafe wells, sand dredging along the Kalu Ganga, and the removal of natural barriers such as mangroves, coastal erosion has worsened. Engineering solutions such as pumping sand from the deep sea to construct artificial beaches have only provided temporary relief. This study concludes that a combination of geotechnical solutions, institutional awareness, and climate adaptation strategies are essential for long-term sustainable coastal management.

Keywords: Calido Beach, Coastal Erosion, Sustainable Coastal Development, Kalutara, Human activities

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