

Analysis of the impact of built environment growth in coastal zone – a case study in West coast of Sri Lanka

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Coastal ecosystems are naturally evolved to maintain environmental sustainability with the support of mangroves, swamps, sand bars and coastal vegetation. However, the spread of built environment over the natural environment has caused destruction of such ecosystems and environmental degradation thereafter. In order to achieve sustainable development in the coastal zone, the resources in coastal areas should be carefully managed, while conserving the environment in the best way possible along the 1,700 km coastline of Sri Lanka. Identifying the impacts of shoreline constructions and impacts of built area growth are the main objectives of this study. A 30 km long coastal stretch from Moratuwa to Kalutara with a landward width of 1 km was chosen as the study area. Coastline variations over the period between 2004 and 2021 were analyzed using satellite imagery available on Google Earth in order to find the impacts of shoreline constructions. Digitized shorelines were exported to ArcGIS and analyzed shore area variations to identify the contribution of revetments, groynes and breakwaters towards coastline stability. In order to analyze the built area growth of the study area, supervised classification was performed using ‘maximum likelihood’ technique in ArcGIS on georeferenced images extracted from Google Earth from 2004 and 2021. The analyses found significant growth in both features; installment of shoreline structures and built area development within the considered coastal area. It was noted that shoreline constructions have increased the shore area and stabilized the coast in many places. With respect to built-up area analysis, it was noted that the least urbanized areas have a natural coastline while the coastlines in densely built-up areas have been heavily engineered by shoreline structures. The analyses showed that the natural character of the coastline is under threat of disappearing due to the growth of the built environment.

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