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Shoreline changes along the Barrier-Lagoon coast of Nigeria - a potential threat to beach front

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Abstract

The Barrier-Lagoon Coast is the most commercially thriving coast in Nigeria and borders her most densely populated state – Lagos. The Coast has the largest seaport in Nigeria. Extensive dredging and engineering construction carried out between 1905 and 1912 to enhance seaport activity and further effects of urbanisation, introduced instability in the shoreline of this region. This study is aimed at assessing the extent of coastal erosion within the Barrier – Lagoon Coast. Landsat Imagery data were used to delineate shorelines of various years namely 1987, 2000, 2010 and 2018. End Point Rate of change (EPR) and Linear Regression Rate of Change (LRR) were performed at 500 m interval using Digital Shoreline Analysis System (DSAS) to determine the rate of change. The determined rates were followed up with field verification. Five zones (A-E) were delineated based on the statistical results. Zone A showed EPR and LRR results that ranged from -4 m/yr. to -10 m/yr. EPR values in Zone B ranged from 23 m/yr to 51 m/yr while LRR values varied from 16 m/yr to 61 m/yr. In Zone C, EPR and LRR ranged from -9m/yr. to -16m/yr. Zone D EPR values ranged from -2 m/yr to 12 m/yr while LRR was from -2 m/yr to 13 m/yr. Only 29% of the shoreline in Zone D is erosive. In Zone E, EPR values ranged from -4 m/yr to -26 m/yr and LRR from -2 m/yr to -21 m/yr. The results show that 74 % of the 236 km Barrier-Lagoon Coast is threatened by erosion at rates ranging from 1- 26 m/yr. Using calculated rate of change, a 20-year shoreline position was predicted. Over 26.1 km² of beach front is estimated to be lost by 2038.

Keywords

Shoreline, Beach, Erosion , Rate