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ශ්‍රී ලංකාවේ නිරිත වෙරළ ඉම බාදනගේ
කාලීන හා අවකාශීය වෙනස්කම්**

අංකුඹුරේ ගෙදර අමරසිංහ

ශිෂ්‍ය ලියාපදිංචි අංකය : GS / Mphil / 95 / 459

දර්ශනපති උපාධිය සඳහා වූ
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භූගෝලවිද්‍යා දෙපාර්තමේන්තුව
පේරාදෙණිය විශ්වවිද්‍යාලය
පේරාදෙණිය

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Abstract

“Shoreline Denudation : Spatial and Temporal Variations of Coastal Erosion in South West Sri Lanka.”

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The broad objectives of this study were to examine the spatial and temporal variations of coastal erosion and the main causative factors. Findings of the current study may in many ways help for planners and policymakers to develop strategies to combat coastal erosion.

Field surveying methods were employed to collect data on shoreline changes. Cross sections were taken once a month during the South West Monsoon period in 1998 by using Height of Collimation (HOC) leveling method. New maps were drawn using the field data to superimpose on old large-scale maps drawn in 1936. These maps were analyzed to identify the long-term shoreline changes of the SW coastal sector. Characteristics of the deformational features of rocks, soil and land use pattern with human activities of the coastal zone were also observed in the field. Information on wave climate, geological features, human activities and other relevant data that causes coast erosion were collected from secondary sources of information.

“Microsoft Excel” and “Arcview” were the computer software packages that were used to computerize and analyze data. After preparing line graphs that represent the cross section of the shore of two consecutive months, horizontal changes of the coastline at the Mean Sea Level (MSL) was determined using monthly beach profile measurements. These data were utilized to determine the erosion and accretion trends in the short term. Old and new maps were superimposed to calculate the long-term changes of the coast line. Statistical methods were also used to identify the trends in shoreline erosion.

The mean erosion rates of the monsoon period of 1998 were estimated for Mahainduruwa, Panadura, Korlawella, Patabandimulla, Balapitiya and Narigama were the erosive coastlines. The erosion rates of these areas were recorded as 3.94, 2.60, 1.58, 0.50, 0.39, 0.35 and 0.28 meters respectively. It was found that the Mahainduruwa was the most erosive area and Kaikawala was the least erosive region.

The overall trend of erosion rate in monsoon period of this coastal zone is obvious. Erosion increases from April to July as the monsoon progresses. And also the accretion increases gradually from July to September during period of weakening influence. Another feature is that erosion and accretion occurred in the same alternatively.

The long term pattern of the shoreline erosion shows that the number of eroding localities and rates are increasing from South to North. When considering the past 65 year period up to 1998, erosion rate at Ahangama, Egodaunya, Angulana and Mt. Lavinia were 9.55, 18.00, 0.56 and 9.40 meters respectively. Maximum accretion rate is reported from Dehiwala - Mt. Lavinia stretch and the minimum is also recorded in the same region.

Human activities and sediment balance of the coast are the main factors that determine the spatial and temporal variation of erosion of the SW during both long and short term. It is clear that the shoreline erosion is high when a river mouth of the South Western coast is about 2.5km South from the corresponding region and the areas where the human activities are high. These results emphasize that the coastal erosion controlling measures should center on human activities and the sediment supply of the respective shoreline stretches. At the same time this study reveals the necessity of scrutinizing the physical processes of the coastline erosion before implementing the erosion controlling measures whether soft or hard. On the other hand, the necessity of further research on the physical process of shoreline erosion and its spatial and temporal variation are highlighted from this study.