

**GRAIN SIZE CLASSIFICATION OF SEDIMENTS IN A COASTAL CURRENT MIXING PROGRADING ZONE ON THE SOUTHEAST COAST OF SRI LANKA**

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Southeast (SE) coast of Sri Lanka has been identified as a progressive type beach, which is located in a coastal current mixing zone of the Indian Ocean. Although studies on the ocean current circulations have been carried out, sedimentological characterization on the coastal sediments has been less studied despite their significance. The present study aimed to investigate the grain size and related textural parameters of surface sediments in order to interpret the deposition environment and transportation dynamics of such a coastal current mixing zone. A total of 124 sediment samples (each ~ 5 kg) were collected from a pit on the berm zone (50 cm depth) at an interval of 500 m covering a distance of 68 km, from Oluvil to Panama coast from October, 2019 to January, 2020. A field survey and grain size distribution (GSD) analyses were carried on each sample using GRADISAT software. The resulted bulk unimodal GSD patterns reveal that the environment is dominated with medium to fine sands (92.7%) indicating a moderate to low energy conditions for the regional sedimentation. Sediment distributions are dominant with moderately well sorted to moderately sorted near symmetrical skewness indicating uniform sedimentation characteristics of each sampling site. Grain size statistical parameters indicate that the geomorphological variations of the coast slightly affect the sedimentation where river inputs and lagoonal environments are present. As evident from the scatter plots of mean size, sorting, kurtosis and skewness, the majority of the sediments have a fluvial origin. Linear discriminatory functions of the samples showed that the sediment deposition was prominent at an agitated shallow marine environment. Passega diagram unravels that the SE beach environment interacts with tractive current depositional agent through bottom suspension and rolling sediment transportation modes. The merged results deduce that the local river inputs have been reworked in the same region due to the energy controls of the coastal currents. The sedimentary environment is characterized with bottom suspended rolling sedimentation in the low energy shallow marine environment. Hence, it can be concluded that the SE ocean current mixing zone controls the sedimentation of the coastal environments by reducing the energy of the terrestrial inputs.

**Keywords:** Grain size distribution, Prograding beach, Sediment mixing zone, Sediments depositional environment, Southeast coast of Sri Lanka