EVALUATION OF SHORELINE CHANGES AT THE COASTAL AREA OF JERAM, SELANGOR

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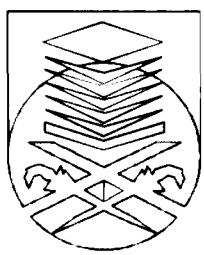

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ABSTRACT

The coastal zone of Jeram, Malaysia, is undergoing dynamic changes that warrant a comprehensive investigation to understand the evolution of its shoreline over the period from 2015 to 2023. This research utilises high-resolution Sentinel-2A satellite imagery to assess and analyse the spatiotemporal variations in the coastal landscape, focusing on the interplay between natural processes and anthropogenic influences. The study employs advanced remote sensing techniques and geospatial analyses to quantify shoreline changes, identify erosion and accretion patterns, and assess the impact of human activities on the coastal dynamics. The methodology involves the acquisition and processing of Sentinel-2A imagery at regular intervals, allowing for a detailed examination of seasonal and annual variations. Image classification techniques are applied to delineate the land covers. The digitization was used to identify the shoreline changes from 2015 to 2023. Study findings showed significant change in the Jeram shoreline, with discernible accretion in the study area. Natural factors such as tidal patterns, sediment transport, and wave dynamics are considered in interpreting these changes. Moreover, the impact of anthropogenic activities, including urban development, coastal infrastructure, and land use changes, is evaluated to elucidate their contribution to the observed shoreline alterations. Additionally, the role of climate change in exacerbating these effects is explored, considering sea-level rise and increased storm intensity as potential contributing factors. The study also addresses the implications of shoreline changes on the local ecosystem, including impacts on biodiversity, habitat loss, and potential threats to coastal communities.

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CHAPTER 1

INTRODUCTION

1.1 Background Study

As Malaysia moves forward through industrial modernisation such as near-seashore construction, shipyards, and resorts for tourism were created, the seashore undergoes eroding and changes throughout the years. The world's coastal zone is under increasing strain as a result of the development of industries, economic activity, tourist industry, and the resulting human population growth and migration (Nayak, 2004). Coastal erosion is a long-term phenomenon that occurs over long periods of time. Moreover, a 1 foot per year erosion rate can result in 25 feet in 25 years, and a major storm could indeed remove immediately 5 feet of the shore in a year averagely (O'Neill, 1985).

Peninsular Malaysia coastal zone and the Federal Territory of Labuan have divided into 175 coastal zone planning units. The coastal zone is a development zone that is rich in natural resources that are extremely useful in terms of life, economy, and preservation. In general, the coastal zone is defined as the land area impacted by the sea where the riparian zone exposed to tides and the sea regions influenced by land where the coastal waters influenced by land development (PLANMalaysia, 2021). The coastal zone is a dynamic and lucrative area rich in natural resources, and it plays an important part in our lives, economy, and conservation efforts. It is commonly described as the land area immediately impacted by the sea, which includes the shoreline and nearby land influenced by tidal action. It also includes maritime zones impacted by land growth and activity, such as rivers and estuaries, which contribute to the total coastal waters. This diversified zone is an important interface between terrestrial and marine ecosystems, sustaining a vast range of plant and animal species while also offering significant advantages to human societies.