

UNIVERSITI TEKNOLOGI MARA

**ASSESSMENT MANGROVE CHANNEL
VULNERABILITY OF LANGKAWI USING
GEOSPATIAL APPROACHES**

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ABSTRACT

Mangrove forests and their channels being one of the beneficial marine ecosystems on Earth that provides unique habitat and biodiversity opportunities. However, it has rapidly degraded in recent decades and many remaining habitats are suffering from unsustainable use. Mangroves are tropical species generally found on sheltered coastlines and estuaries. The main objective of this study is to assess the mangrove vulnerability index (MVI) of the Kilim's River Langkawi Kedah, Malaysia. This MVI comprises five variables, i.e. river geomorphology, tidal range, mangrove species, DBH of mangrove and rate of sea level rise. The vulnerability levels are graded into five parts of vulnerability ranking for five managements unit of the mangrove channel vulnerability, which is very low, low, moderate, high and very high based on the rating values of the criteria. A thorough mangrove channel vulnerability index was derived by integrating the differential weighted rank values of the variables. The findings indicated that three parameter namely geomorphology, tidal range and mangrove species were categorized as high vulnerability level which is five. Meanwhile, DBH of mangrove and rate of sea level rise represent the low and high vulnerable category, respectively. In addition, the whole value of MVI is 50% which is moderate. Finally, the study's conclusion included a systematic framework that researcher, decision-makers, and relevant authorities may utilize to create and implement mitigation and adaptation policies to address the implications of climate change on mangrove channel regions.

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CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter for this research project included the research introduction, problem statement, significance of the study, aim and objectives, research questions, scope, and constraints..

1.1 Backgrounds of Study

The survival of Malaysia's indigenous coastal fishery sector depends on mangrove ecosystems. Fishery items taken from the mangrove habitat include a variety of shrimp species that are caught in the nearby coastal waters or in mangrove canals. The mangroves are rich in edible gastropods (*Cerithidea* spp.) and mud crab (*Scylla serrata*), while the mud flats are rich in cockles (*Anadara granosa*). When combined, they offer a significant source of commercial food. Mangroves in Peninsular Malaysia are expected to contribute RM650 million in annual economic output from the fishing industry alone. Malaysia's wetlands contribute directly or indirectly more than RM5 billion to the economy each year (Shukor, 2004 and Norhafizi, 2019)

If sea level rise (SLR) continues at the current century's rate due to climate change, some low-lying coastal plains could be inundated, increasing wave activity in near-shore areas, increasing erosion rates, and triggering coastline retreat (Refaat & Eldeberky, 2016). The majority of the 10% of the world's population who are at risk of considerable SLR live in low-lying areas 10 metres above sea level, including those in Asia (FitzGerald et al., 2008). On the other hand, mangrove deforestation is a significant issue in a 300-meter stretch of Malaysian mangrove, which is anticipated to be devastated as a result of the 0.90 cm/year increase in SLR.

The degree to which a person, group, or system is likely to suffer harm as a result of external stress exposure is known as vulnerability (Arun & Kunte, 2012). Vulnerability is defined as a set of conditions and procedures resulting from physical, social, economic, and environmental factors that make a community more vulnerable to the effects of disasters (Arun & Kunte, 2012). The CVI (Coastal Vulnerability Index) is one of the tools for determining how vulnerable coastal areas are to climate change.