

# **Risk Exposure of coastal inundation from storm Surge in the Northern part of Malaysian Borneo**

## **ABSTRACT**

Coastal communities heavily rely on marine resources for their livelihoods. The rising occurrence of extreme weather events have affected both the coastal ecosystems and socioeconomic activities. One of the most prevalent extreme events in Malaysia is the storm surge. This study aims to assess the extent of coastal inundation based on three storm surge scenarios (categories by Meteorological Department of Malaysia) and to determine the risk exposure ranking of nine study sites. Field trips and interviews were conducted from March 2020 to March 2023 in Kudat located at the northern part of Malaysian Borneo. One hundred respondents were surveyed using semi-structured open-ended questionnaires to evaluate the risk exposure of coastal inundation caused by storm surges. The findings revealed that Category 1 flooded certain sites of west (Kimihsang) and east (Tajau Laut) sides of Kudat. The Category 2 have significantly flooded one site in the west side (Simpang Mengayau) of Kudat. While, for Category 3 of coastal inundation affected two sites in east sides of Kudat (Tanjong Kapor and Landung Ayang). These two sites in east sides of Kudat also experienced a high level of risk exposure due to the lack of diverse coastal ecosystems and high population density. While three sites in west side of Kudat (Kimihsang, Kelambu and Simpang Mengayau) faced significant impacts on social services, particularly within the tourism sector. Despite relying on multiple livelihoods, these sites were susceptible to storm surges. Additionally, the increasing development for tourism purposes posed a threat to the richness of the ecosystem. This study suggests that certain sites in east side of Kudat (Tanjong Kapor and Landung Ayang) are highly exposed to risk and require measures for adaptation and mitigation.