# FLOOD SUSCEPTIBILITY MAPPING USING ANALYTICAL HIERARCHY PROCESS AND GEOGRAPHIC INFORMATION SYSTEMS WITH VALIDATION USING AREA UNDER CURVE IN TERENGGANU

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# ABSTRACT

This study aims to develop a flood susceptibility map for the entire state of Terengganu using Geographic Information Systems (GIS) and Analytical Hierarchy Process (AHP). The selected influencing factors include slope, elevation, rainfall, distance from streams and drainage density. These factors were evaluated using AHP to rank their contributions to flooding. The AHP results indicate that the flood hazard in Terengganu is mainly influenced by rainfall with 48%, followed by elevation with 24%, slope with 17%, distance from streams with 7% and drainage density contributing 4%. These weights were assigned to each factor based on the AHP results, and the layers were combined using the Weighted Overlay tool in ArcGIS to create a composite flood susceptibility map, highlighting areas with varying degrees of flood risk. High flood susceptibility was recorded as the highest percentage of area at 36.43%, followed by moderate with 30.12%, very high with 18.77%, low with 14.34% and very low with 0.34%. The Area Under Curve (AUC) method was used to further validate the results, requiring the flood susceptibility map and historical flood inventory data. The calculated AUC result was 0.5, indicating low accuracy and suggesting that while the map provides some insights, there is significant room for improvement in predicting flood risks.

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