GIS FLOOD SUSCEPTIBILITY MAPPING FROM SENTINEL 1-SAR USING ANALYTIC HIERARCHY PROCESS (AHP) MODEL: STUDY AREA SELANGOR, MALAYSIA

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DECLARATION

I declare that the work on this project/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA (UiTM). This project/dissertation is original and it is the result of my work, unless otherwise indicated or acknowledged as referenced work.

In the event that my project/dissertation be found to violate the conditions mentioned above, I voluntarily waive the right of conferment of my degree of the Bachelor of Surveying Science and Geomatics (Honours) and agree be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

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I certify that I have examined the student's work and found that they are in accordance with the rules and regulations of the School and University and fulfils the requirements for the award of the degree of Bachelor of Surveying Science and Geomatics (Honours).

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ABSTRACT

Floods have a lot of negative effects on the environment and society. Overflowing water from floods submerges the landmass, destroying infrastructure, built environments, and agricultural fields. Understanding the contributing elements and developing a precise map for flood susceptibility are the flood susceptibility problems. The aim of this research is to assess the frequent floods event at Selangor, Malaysia using Analytical Hierarchy Process (AHP) model and Sentinel-1 SAR image. Thus, the objectives of this study are to determine flooded area based on flood marks related to Department of Irrigation and Drainage (DID) rainfall volume and water level record (2020-2022), determine flooded area using Sentinel-1 imagery and evaluate the susceptible area of flooded using AHP and Sentinel-1 SAR. About 818 points of floodmarks in 3 years (2020-2022) were used. There were 6 factors affecting flooded area: elevation, slope, rainfall, land use, topographic wetness index (TWI) and flow accumulation. The flood susceptibility was assessed using Geographic Information System (GIS) and assigned parameter's weights through (AHP). The flood susceptibility map was validated using area under curve (AUC). The result of AUC between AHP and floodmarks was 0.626 that shows satisfactory values for susceptibility area. The AUC value of 0.689 between AHP and Sentinel indicates satisfactory accuracy in identifying flood prone area. The result of this research producing high precise map illustrating susceptibility to flooding for the flood-prone area. This study can be a useful tool for determining flood risk areas and planning flood mitigation and control strategies.

Keyword: Geographic Information System (GIS), Analytic Hierarchy Process (AHP), Sentinel 1-SAR, Susceptibility Mapping, Area Under Curve (AUC)

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