

DETERMINATION OF GROUNDWATER RECHARGE ZONE USING
THE INTERPRETATION OF GEOGRAPHICAL INFORMATION
SYSTEM AND REMOTE SENSING METHOD

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**Thesis submitted to the Universiti Teknologi MARA Malaysia
in partial fulfillment for the award of the degree of the
Bachelor of Surveying Science and Geomatics (Honours)**

AUGUST 2023

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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ABSTRACT

Groundwater is one the important elements in improving the quality of life and environment as it serves the role as dependable water resources that mainly utilize in residential needs, agricultural implementation, and even in industrial sector. Therefore, it is necessary to ensure that there will be enough groundwater with good quality to support the demand in water resources needs. Groundwater recharge is one of the important keys in sustaining the groundwater resource. This study aims to determine the groundwater recharge area using Multi Criteria Decision Analysis (MCDA) techniques in Kedah. There were nine (9) parameters that have been determined which were land use, soil, lithology, rainfall, slope, lineament density, drainage density, geomorphology, and tube-well distribution. Analytical hierarchy process (AHP) and Multi-Influencing Factors (MIF) method were used to evaluate the relative importance of the parameters. AHP consists of a process of calculation in hierarchical structures that includes the matrix pairwise comparison, assign weight and assessment of matrix consistency. Meanwhile MIF method requires the relationship determination between factors, assign score and weight calculation. The groundwater recharge zone has been classified into high, moderate and low recharge potential. It was proven that AHP identifies recharge potential area better compared to MIF at 0.835 and 0.823, respectively. The findings of this study are useful to the authorities for water management to make an efficient planning and development as it is cost effective for the purpose of ensuring the sustainability of water resources in the future.

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