

UNIVERSITI TEKNOLOGI MARA

**SOIL MOISTURE MAPPING USING
SENTINEL-1A SAR DATA**

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Dissertation submitted in partial fulfillment
of the requirements for the degree of
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(Hons)**

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.


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ABSTRACT

The soil moisture content (SMC) is a key hydrological cycle element, it is related to natural hazards and serves as an indicator of drought and yield in agriculture. The effectiveness of crops influenced by soil water factors for plant nutrient growth. The study aimed to estimate and map soil moisture content using C-band Synthetic Aperture Radar (SAR) data. To achieve the aim, the following objectives are, to do data collection and plot soil moisture, to determine the relationship between the parameter and backscatter, and to determine C-band Sentinel-1A SAR data. An agricultural area at Jalan Rani Estate near UiTM Arau, Perlis was chosen as the study area. This study will use Sentinel-1A satellite imagery to map soil moisture using remote sensing techniques. Twenty-two (22) soil sampling near Harumanis mango tree collected using handheld Global Positioning System (GPS). The effect of soil moisture and local incidence angle on the backscattering coefficient was analyzed. Indeed, the backscattering coefficient and local incidence angle were able to be used to derive the soil moisture map and showed RMSE.

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