IFFAT HAIMAN BIN SYUKRI

BACHELOR OF SURVEYING SCIENCE AND GEOMATICS (HONOURS)

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VARIATION OF CONDITIONING PARAMETERS FOR GROUNDWATER POTENTIAL AREA AT EASTERN SELANGOR AND KUALA LUMPUR USING SUPPORT VECTOR MACHINE

IFFAT HAIMAN BIN SYUKRI

2022855732

SCHOOL OF GEOMATICS SCIENCE AND NATURAL RESOURCES

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2022855732

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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.

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Name of Student	: Iffat Haiman bin Syukri
Student's ID No	: 2022855732
Project/Dissertation Title	: Variation of Conditioning Parameters for Groundwater Potential Area at Eastern Selangor And Kuala Lumpur Using Support Vector Machine.
Signature and Date	:

Approved by:
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).

Name of Supervisor	: Sr Hjh Sharifah Norashikin binti Bohari
Signature and Date	:

ABSTRACT

Groundwater is a crucial resource for sustaining life and supporting agriculture where groundwater provides a reliable supply that is often of higher quality than surface water. In areas like Selangor, water shortage and the excessive withdrawal of groundwater has raised concerns about long-term sustainability. The main objective of this study is to analyse the influenced of different parameters towards groundwater potential using Support Vector Machine (SVM) method. Considering Malaysia condition and arid/desert influenced environment, 16 conditioning parameters used to analyse its influence including slope, elevation, aspect, geomorphology, topographic wetness index (TWI), drainage density, curvature, lineament density, land use land cover (LULC), lithology, fault, tubewell, rainfall, geology, major soil group and aquifer using SVM. A total of 281 tubewells separated into 70:30 for training and validation datasets. The identified groundwater had been categorized into high, medium and low. About 43.49% identified as medium Groundwater Potential Area (GWPA), mostly covers at Sepang, 30.67% low GWPA extensively covers at Hulu Langat while 25.84% high GWPA primarily addresses at Petaling. It was found that Receiver Operating Characteristics - Area Under the Curve (ROC-AUC) for Malaysia environment parameters at 66%, while 69% for arid/desert countries environment conditioning parameters. The outcomes of the study, which are groundwater potential maps, will help the decision-makers, government agencies, and private sectors for sustainable planning of groundwater in the area.

Keywords: groundwater, conditioning parameters, groundwater potential areas (GWPA), Support Vector Machine (SVM), Receiver Operating Characteristic (ROC) - Area Under the Curve (AUC), groundwater potential map

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