

UNIVERSITI TEKNOLOGI MARA

**SINKHOLE SUSCEPTIBILITY
MAPPING USING ANALYTICAL
HIERARCHICAL PROCESS (AHP)
AND PROBABILISTIC METHOD: A
CASE STUDY OF KUALA LUMPUR
AND AMPANG JAYA**

MOHD ASRI HAKIM BIN MOHD ROSDI

Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science
(Built Environment)

Faculty of Architecture, Planning and Survey

October 2022

ABSTRACT

Since 1968, the increasing numbers of sinkhole disaster have been reported in Kuala Lumpur and the vicinity areas. As the results, it gives a serious threat for human being, assets and structure of the country especially in the capital city. In order to tackle this situation, a Sinkhole Hazard Model (ShM) was produced with integration of GIS environment by applying Analytical Hierarchical Process (AHP) method and probabilistic method to generate a sinkhole susceptibility hazard map for the particular area. There are five consecutive criteria chosen namely Lithology (LT), Soil Types (ST), Land Use (LU), Groundwater Level Decline (GLD) and Proximity to Groundwater Wells (PGW). Based on the calculation of AHP weightage, LT and GLD give the highest impact to the development of this disaster which is 0.46 and 0.30 respectively while according to probabilistic calculation, GLD and LU give the greatest effect of the sinkhole development which is 4.74 and 3.12 respectively. A sinkhole susceptibility hazard zones for both methods was classified into five classes namely none, low, medium, high and very high. The results obtained were validated with the previous inventory data of 33 sinkholes. From the analysis, it shows that the accuracy assessment of the model indicates 45.45% and 15.16% for AHP method of the sinkhole development fall within high and very high hazard regions respectively. For probabilistic method, the accuracy assessment of the model indicates 36.37% and 39.39% of sinkhole formation fall within high and very high hazard zones respectively. Based on this final outcome, it clearly shows that the integration of GIS, AHP and probabilistic approach is useful to predict natural disaster such as sinkhole hazard development.

ACKNOWLEDGEMENT

Firstly, I wish to thank God for giving me the opportunity to embark on my MSc and for completing this long and challenging journey successfully. My gratitude and thanks go to my main supervisor Sr Dr Aion Nisa Binti Othman that always give their expertise, knowledge and experience. Not forget to my second supervisor Prof Sr Dr Zulkiflee Bin Abd Latif that always give me strength and motivation word in order to finished this thesis. Without both of them, the process to completing this thesis will not going smoothly.

My appreciation goes to the IPSIS staff and coordinator of postgraduate's student that always take care and remind all the students in various aspects to make sure the students don't miss any latest information. Special thanks to my colleagues and friends for helping me with this thesis and always give the greatest motivation words to myself.

Finally, this thesis is dedicated to the person that I love most which is my mother and my father for the vision, their prayers, expenses incurred and determination to educate me. Not to forget my wife who has always given me great enthusiasm in finishing this thesis. This piece of victory is dedicated to all of you. Thank you so much.

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