FLOOD INUNDATION MAPPING USING HEC-RAS AND ARCVIEW GIS

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DECLARATION BY THE CANDIDATE

I (Noorhaliza Hany Binti Samat, 2001615669) confirm that the work is my own and that appropriate credit has been given where reference has been made to the works of others.

(……..)

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ABSTRACT

Flood is one of the phenomenons of Mother Nature and it is treated as hazard if it has potential threat to human and their welfare, and the risk of floods treated as probability of the specific hazard occurrence. Thus, flood risk mapping can be used to identify the flood prone areas. In this study, the modelling tools that have been used were HEC-RAS model and ArcView GIS. HEC-RAS model was used to perform one-dimensional (1D) hydraulic calculations for a full network of natural and constructed channels. To perform the hydraulic model using HEC-RAS, the required data were geometric data, flow data and the boundary conditions of the stream. All these data were needed to perform the calculation of hydraulic water surface. To create floodplain map, GIS has been used because GIS are an efficient and interactive spatial decision support tool for flood risk analysis. The ArcView GIS extension was written in an Avenue Script language and Dialog Designer with a series of point and click option. It has the capability of analyzing the computed water surface profiles generated from HEC-RAS model and producing related flood map of the study site. The study site that has been chosen in this study was Pari River because it had experienced the recurring floods and it also has complete data to be applied in HEC-RAS model. As a result, HEC-RAS model showed that the possibility of flood to occur at the specific area were at the duration rainfall of 60 and 120 minutes for ARI 100 years. The process of developing these floodmaps helped users to automate and simplify the floodplain in detail and faster. The presentation of the floodplain in digital GIS format allows the floodplain data to be easily compared with other digital data and the floodmap also can be updated frequently, as changes in hydrologic and hydraulic conditions warrant.