

Unmanned aerial vehicle (UAV) for slope mapping at Perumahan Gambang Damai, Pahang: a case study

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ABSTRACT

This paper discusses the applications of unmanned aerial vehicle (UAV) for slope mapping and its important parameters including perimeter, area and volume of certain selected areas at Perumahan Taman Gambang Damai in Kuantan Pahang. Previous work of slope mapping using traditional survey equipment considered as time consuming and very challenging especially in hilly regions. This study also focused on determining the potential slope hazard based on slope angle. Modern UAV able to take high quality image which essential for the effectiveness and nature of normal mapping output such as Digital Elevation Model (DEM) and Digital Orthophoto. These photos captured by the UAV will later exported to Agisoft to generate full map of study area. With the help of Global Mapper, the measurement such as perimeter, area and volume of selected study areas can be determined easily and considered as the main interest in this study. Based on the results of the two slopes (slope A and slope B), slope B give a bigger volume which is 1469.7 m³ compare to slope A which is 1382.9 m³. The enclosed area for slope A is 1634.3 m² which is bigger compare to slope B which is 766.86 m². Besides, the perimeter of slope A is 162.28 m which is bigger compare to slope B which is 159.45 m. In addition, another outcome of this study is, this modern method of mapping helps researchers and engineers to study the possibility of slope hazard based on their respective slope angle. From the results, the angle for slope A is 47.35. while the angle for slope B is 54.75. . Both of the slopes considered as very steep slope. In conclusion, modern technology of UAV proves to be very effective for mapping in geotechnical engineering. Slope mapping using multi-rotor UAV help researchers and engineers to obtain slope measurement within short period of time compare to previous traditional method.

KEYWORDS

Soil Slope, Digital Orthophoto, Digital Elevation Model (DEM), Slope Hazard

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