UNIVERSITI TEKNOLOGI MARA

ASSESSMENT OF TOPOGRAPHIC MAPPING BY USING DIGITAL METRIC CAMERA, DIGITAL CONSUMER GRADE CAMERA AND ASTER 30 IN TERM OF ACCURACY AND QUALITY IN KAMPUNG ASAM KUBANG, TAIPING, PERAK

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Thesis submitted in fulfillment
of the requirements for the degree of
Bachelor of Surveying Science & Geomatic
(Honours)

Faculty of Architecture, Planning & Surveying

January 2018

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

In this study were review if the accuracy of different sensor across platform and the quality that it can provide. The accuracy of the Unmanned Aerial Vehicle (UAV) that is fitted with small to medium format been said will be on par with the large format Digital Metric Camera (DMC). Therefore, this study will focus on the accuracy of the orthophoto and Digital Surface Model (DSM) for each platform. The study area is situated at Kampung Asam Kubang, Taiping, Perak. The aerial images are collected by the Ebee drone that is fitted with the Sony WX220 RGB that has been calibrated, DMC images that are supplied by JUPEM and the ASTER 30 images that are obtained on the web. The DMC image has been processed by the JUPEM which cover the Taiping area. For the UAV images, it covers the Kampung Asam Kubang area which has been chosen as study area because there is enough features to widespread the GCP throughout the area. The area covered is about 1.0504 km^2 with the altitude about 200m. The satellite imagery is covering the whole area in Malaysia with the 30m accuracy. The UAV images are processed with the Pix4D TM software which uses the SFM (Structure From Motion) algorithm. There are 12 GCP (Ground Control Points) that are spread throughout the study area that is measured with the static method by using a Trimble R4, R6 and Topcon GR5. For the VP (Verification Points), there is 30 points in total that is observed with Topcon GR5 by using the RTK (Real Time Kinematics) method. There also 3 BM (Benchmark) that is observed with the Trimble and Topcon instruments by using static method to control and reduce the ellipsoidal height to orthometric height. The result for mapping accuracy for UAV and DMC are based on the RMSE value which is northing 0.1455m and 2.1813. For easting for UAV and DMC is 0.0289m and 3.0133m. For vertical component the comparison would be with UAV (Researcher) and UAV (JUPEM) because the DMC did not supplied with the DTM (Digital Terrain Model), the result is for elevation is 0.1783m and 2.2497m. DSM (Digital Surface Model) also compared in the term of quality. The highest quality DSM is from the UAV which have the same resolution as the GSD (Ground Survey Distance). The final result of research shows that the data from UAV is more superior to the other data sources. Besides, the data from the UAV also can be used in other surveying use. In conclusion, the UAV data can be effectively applied in the surveying industries which provide efficient and effective practices for all sorts of surveying.

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