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COMPARISON OF ROUTE SURVEY PROFILE INFORMATION (LONGITUDINAL SECTION) USING DIFERENT PERCENTAGE UAV DATA SIDE- LAP AND END-LAP

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ABSTRACT

This study investigates the achievable accuracy for route profile (longitudinal section) using UAV data captured at different percentages of side-lap and end-lap. Hence, objectives designed includes; i) to perform UAV data collection at different side lap and end lap (30%,60% and 70%,80%); ii) to extract from orthophoto image the Digital Terrain Model (DTM) for route survey profile information (longitudinal section) and; iii) to compare the route profile information (longitudinal section) between ground survey and orthophoto surface model image. Data was captured using multi-rotor UAV at 50-meter altitudes and ground data collected using total station and GPS instrument. Orthophoto and extraction of DTM was processed in Agisoft Metashape and profile information created in ArcGIS 10.8. The profiles information (in all three dimensions, x, y and z) was compared with ground data. The findings indicated that 70%,80% of side-lap and end-lap gives more accurate results when compared to ground survey data with average accuracy of 0.060meters in z direction and profile data closer to ground survey values. Thus, these findings provide positive potentials of UAV data capture to be implemented in route survey.

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

This research was brought everything together in this chapter, including the background study, problem statements, research question, aim and objectives, study area, and significanceof the study. It can assist the researcher in learning more about this research.

1.2 Background of Study

According to Lubis et al (2017) that state in a technique known as photogrammetry, several photographs collected from different angles and at different scales can be used to examine an object and its surroundings to their maximum scale. Aerial and terrestrial photogrammetry are the two most used methods. These two methods are the most popular useof aerial photogrammetry to contribute the creation of maps. Aerial photographs can be used to build precise topographic maps (W. Udin, A. Ahmad, 2014). In aerial photogrammetry, Unmanned Aerial Vehicles (UAV) or known as drone is a flying machine that may be controlled remotely or autonomously by the pilot and can carry a camera image loading. UAV have lately been employed to capture and record data from objects set in the ground in various photogrammetric mapping methodologies.

A UAV or drone connected with GPS can be significantly more efficient and cost- effective than using an aeroplane for a survey. As compared to satellite systems, particularly high-resolution satellite imagery, drones in geospatial science are now in high demand due to their ease of use and lower cost of operation (Colomina, & Molina, 2014). Apart from that, there are other findings based on a ground survey by using total station provides us as well. Engineering works such as motorways, transmission lines, pipelines, canals, and railroads require route surveying, which covers all the necessary survey procedures. A route survey includes a topographic survey and a longitudinal section of the route (Desa., et al. (2019).