

Comparison of Geospatial Technologies for Monitoring and Evaluation of Irrigation Networks

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Abstract: National and communal irrigation systems are important for the Philippines to achieve its agricultural self sufficiency goal. Hence the Philippine government invests heavily in such developments. Monitoring and evaluation of these critical infrastructures, specifically in their development stage, is critical to determine actual physical compliance. In this study we aim to compare various geospatial techniques and technologies in mapping, identifying, and characterizing irrigation infrastructures such as canals, gates, culverts, among others. Studies for irrigation canal detection and mapping are lacking and this project aims to fill this gap by using remote sensing techniques and analysis that were used for road, water, and object detection and adapting these methods to suit the research and validate and compare the canals through as-built surveys and geotagging protocols. The research utilized multiple datasets such as high resolution LiDAR derived Digital Elevation Models (DEM), various satellite and UAV imagery. We compare the capabilities and shortcomings of each approach. Initial results suggest that high resolution imagery is enough to map and identify these canal structures, however high resolution DEM data, such as those derived from UAV missions, is needed to be able to characterizing certain canal types.

Keywords: Irrigation, Remote Sensing, LiDAR, DEM, Satellite Imagery