Analysis of Topographic Effects on Tea Yield in Sri Lankan Tea Estates Using Geomatics

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Abstract

This research paper investigates the potential impact of hill shade on tea yield at the Dambatenne tea estate using unmanned aerial vehicles (UAVs). Drones were used to take high-resolution aerial photos of the location that was selected. The data were processed using Pix4D software to generate accurate 3D surface models, ortho mosaic maps, and vegetation indices. Additionally, the main goal of this study was to evaluate the impact of hill shade on tea yield. By analysing the obtained data, including vegetation indices derived from the multispectral imagery, the correlation between hill shade and tea yield was examined. Various mapping techniques and statistical analyses were employed to investigate this relationship. The findings suggested that there may be a relationship between hill shade and tea yield and that different levels of shading brought on by topographic characteristics may influence the development and production of tea. The findings from this research contribute to the understanding of how hill shade affects tea yield and provide insights for sustainable tea estate management practices. The results of this study are significant for tea estate owners and managers, as it highlights the importance of considering hill shade factors in optimising tea cultivation and maximising yield.

Keywords: Hill shade, Image processing, Topographic features, Unmanned aerial vehicles, Vegetation indices