USE OF UAV TECHNOLOGY AND GIS BASED APPLICATIONS FOR MANAGEMENT OF TEA PLANTATION

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Productivity of tea industry remains stagnant for years and identified reasons for this condition are high cost of production, low productivity cultivated lands and low re-planting rate. Use of UAV (Unmanned Aerial Vehicles) technology and GIS (Geographical Information System) based applications can be used to get the proper management decision for this condition. A case study at Nayapane estate in Pussellawa under Aitken Spence Plantation Management PLC was undertaken with the objectives of testing the applicability of UAV and GIS based applications for optimizing the input-output process of the tea plantation operations and for optimizing the land use efficiency. The orthomosaic map of the estate, all the boundaries of the estate, land use map of the estate, DEM (Digital Elevation Model) and contour data set were used and output of the drone-flight over the estate were further processed and analysed to fulfil the above mentioned objectives. Re-organizing the possible management practices such as fertilizer issuing based on the tea-covered area instead of the total area was done and huge cost saving and optimization of the inputs can be practiced by this. Identifying low productive tea fields using the BEV (Break Even Value) of a unit tea covered area was successfully done and figuring out the possible reasons for the low productivity of those fields. The accurate management decision can be taken using the results obtained. Water shed and slope map were derived from DEM and it facilitated to optimize the resources like usage of water bodies and application of proper soil conservation practices. Proper GIS data base helped to attend more efficient decision making process. Considering these things, it can be suggested that GIS and UAV techniques can be successfully used in tea sector for its managerial purposes for optimizing the inputs and the utilization of land resource.

Keywords: *GIS, UAV, Optimizing inputs, Land resource, DEM*