

VALUE OF LANDSAT TM DATA FOR MANAGEMENT OF UPCOUNTRY PLANTATIONS IN SRI LANKA

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This study investigates the potential use of Landsat TM data for the discrimination of forest cover types and to find whether relationship exists with forest stand parameters. In the study different Landsat TM data bands (except thermal band) and image transformations were used. The different image transformations used in the study are Vegetation Index (VI), Structural Index (SI), Normalized Vegetation Index (NDVI), Tasselled Cap transformation for greenness and first principal component analysis with variance of 82.4 percentage. Multispectral classification using the ILWIS GIS was used in the study. Multispectral classification is an information extraction process which analyses the spectral signatures (spectral reflectance characteristics) and then assigns pixels to categories based on similar characteristics. From the boxed classification (parallelepiped classification) and the maximum-likelihood classification applied it was found that maximum-likelihood classification gave the best results. Studies indicate that the most suitable combinations of bands to discriminate most of the cover types is a combination of TM 2, 3, 4, 5. However, this composite image cannot be used to discriminate different cover types especially in shadow areas due to variable illumination. The confusion matrix indicated an overall accuracy of 93 % which is higher than that recorded for the classification of forest classes of the entire country.

From the different TM bands and image transformations used TM 5 and first principal component gave the highest relationship. Poor relationship was recorded for the vegetation indices. The studies indicate that forest stand parameters can be estimated up to a certain critical limit beyond which spectral saturation seems to be a limiting factor.