A COMPARATIVE ESTIMATE FOR RUBBER TREE PLANTATION AREA USING THAICHOTE SATELLITE DATA

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Abstract

With rapid expansion of rubber tree plantation in North East Thailand since over the past 2 decades, rubber tree replaced ecological forests and traditional crops. For developing strategic land use plan and a better understanding its consequences on ecological and economic trends, timely and spatial information on rubber tree growth is necessary. In this study, we used Thaichote satellite data acquired on February, 10 2009 for an estimate for rubber tree distribution with objective of comparatively evaluating per-pixel vs. object-based classification of different age groups of rubber tree plantation. The study area, Amphur Kutchap, Udon Thani province, covers an area of approximately 44,333 ha. and is a flourishing rubber tree plantation with relatively high rainfall. For per-pixel base, Thaichote multispectral bands, the Normalized Difference Vegetation Index (NDVI) and Principal Component Analysis (PCA) were used as input parameters for a maximum likelihood classifier. The object based classification was based on the input parameter of Thaichote multispectral bands. To assign the rubber tree age groups to segmented object used and membership function, the nearest neighbor classifier was applied. To validate the result of classification, the resultant maps were checked against the ground truth, and evaluated using Kappa statistic and overall accuracy. Among the input parameters used in per-pixel method, multispectral bands with NDVI provided the better result in discriminating the rubber tree stands. While the object-based classifier is highly capable of resolving the rubber stands and better than those of the per- pixel method.

Keywords: Rubber tree, Thaichote satellite, Object-based classifier, Nearest neighbor