Supervised Learning for Land-Use Mapping of Tea Plantation

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Abstract: Remote sensing offers efficient and reliable means to recognize the pattern of the real world and to provide source data for geographic information system. Supervised learning is traditionally used to classify remotely sensed imagery data in order to develop land-use mapping. The classifiers generate inconsequent classes since the complexity of the real ground features and the parametric variability of the decision rules. This study is for a new approach of remotely sensed image segmentation for land-use mapping of tea plantation. This paper discusses the used supervised classification approaches in the study, methodology, experiments, results and the future work of hypothesis testing for the conceptual methodology. To understand the existing tools several experiments are done through unsupervised and supervised image classifiers of ERDAS Imagine and RSI ENVI for a one sample image. Quick Bird-2008 Satellite imagery of Ganga Ihala Korale division in Kandy district, Sri Lanka is used in a subset of 5.73ha area. Although each approach generates different outputs the expected output values are not performed since inconsequent and compound classes. In contrast Maximum Likelihood classifier shows the highest accuracy for confusion matrix, Mahalanobis Distance classifier reached the best accuracy of the manual interpretation and ground truth process. The ongoing research is focused to modify and implement a threshold scheme for the supervised learning algorithm with Mahalanobis Distance classifier. The hypothesis is to test the capability of the classifier to apply spatial information as a threshold scheme. The algorithm is going to be evaluated using Octave. If the null hypothesis is rejected, the pixels will be classified by computing discriminant function for only the signatures corresponding to the spatial boundaries of land-use types. That means GIS data can be used to increase the complexity and reliability of hyperplane.