B-28: A Methodology for ground data collection in supervised classification of satellite imagery

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Ground data collection is required to relate spatial signatures of a satellite image with the corresponding ground features. Field data are used in training spatial signatures, determining the *priori* weightings, assessing accuracy of classifications and also in obtaining direct expansion estimates.

The objective of this study was to apply a methodology for ground data collection required for supervised classification of Indian Remote Sensing (IRS) LISS II satellite imagery. The area-frame sampling methodology described by Taylor & Eva (1992) was adopted for Upper Mahaweli Catchment Area classification. Thirty eight unaligned systematic random samples were chosen with 1 km^2 fixed sized ground segments in each 10km^2 grid area and it gives a sampling frequency of 1.22%. The False Colour Composite of band 1, 3 and 4 (RGB) was used after resampling to 20 m through Cubic Convolution. A 400 m boundary was allowed to make the recognition of ground features easy and comparable. A transparency overlay of 1:10,000 map and prepared performa were used to record field data and GPS was used for navigation. Visits were made for each segment and land use/cover boundaries were identified in the field and drawn up on the trnnsparency overlay over the image.

Ground data sets were digitised and areas were estimated for each land use. A mosaiced image was created by extracting all ground segments. The average digitising error was ±0.256% of the 1 km^2 of true area in each ground segment.

The sum of each land use in all segments provided the *priori* weightings for supervised classification. Two comparisons viz. digital classification with direct expansion results and supervised classification of eclual weightings and classification based on *a priori* probabilities were made.

The proposed new methodology provides a proper account of ground data both qualitatively and quantitatively. The accuracy of classification and direct area estimates can further be enhanced by improving the sampling fraction. Water bodies are not properly spatially segregated and that influences the overall accuracy significantly. Most of the land use classes wore estimated by direct expansion with less than 25% error margin. The same ground data set can be used in accuracy assessment and that prevents 2 stage ground data collection before and after classification.