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# LAND SURFACE FEATURE DELINEATION OF RURAL CENTRAL JAVA REGION USING DATA ENHANCEMENT TECHNIQUES APPLIED TO DIGITIZED LANDSAT MSS DATA

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The use of rotated and non-rotated principal component and vegetation (green biomass) indices to enhance original four band Landsat MSS data has a potential to improve delineation of surface features particularly in underdeveloped regions of the world which have a paucity of organized ground truth. It is vital to analyze and display Landsat data in forms which highlight features of interest most effectively especially in areas with limited or outdated surface data. Principal component and biomass ratio forms of Landsat data have proven to have the ability to identify selected land surface features better than using original Landsat data, consequently improving the potential for accurate surveying, mapping, or resource inventories of large area ecosystems of underdeveloped parts of the world.

Research at the Indiana State University Remote Sensing Laboratory (ISURSL) has been conducted which applies transformed Landsat MSS data in principal component and biomass ratio formats for a synoptic rural survey in a central Java study area. The study area is comprised of a variety of features including complex lowland and upland crop ecosystems, dry crop ecosystems, numerous agricultural rural settlements, forest and grass cover of various types differentiated vertically along volcanic mountain slopes, edaphic zones, and water. The micro-level complexity of this environment coupled with very limited ground information makes Landsat analysis of this region very difficult particularly using the raw data.

Utilizing Landsat data (Scene #106702145, 28 September 1972) in principal component and biomass ratio forms for supervised and unsupervised classification resulted in better delineation of agricultural soil features which were not clearly identified using

original four channel data. It was also found that the vegetation indices led to better identification of vegetation cover when compared to original data. Also, the use of vegetation indices in combination with the principal component data is found useful in the overall land surface identification process. The utility of principal component and vegetation indices for data enhancement is thus, recommended for land surface feature identification and delineation in the underdeveloped regions of the world.