

Purdue University
Purdue e-Pubs

LARS Symposia

Laboratory for Applications of Remote Sensing

1-1-1980

Land Surface Feature Delineation of Rural Central Java Region Using Data Enhancement Techniques Applied to Digitized Landsat MSS Data

Kamlesh Lulla

Abu Rahman

Paul Mausel

Follow this and additional works at: http://docs.lib.purdue.edu/lars_symp

Lulla, Kamlesh; Rahman, Abu; and Mausel, Paul, "Land Surface Feature Delineation of Rural Central Java Region Using Data Enhancement Techniques Applied to Digitized Landsat MSS Data" (1980). *LARS Symposia*. Paper 369.
http://docs.lib.purdue.edu/lars_symp/369

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact epubs@purdue.edu for additional information.

Reprinted from

**Symposium on
Machine Processing of
Remotely Sensed Data
and
Soil Information Systems
and
Remote Sensing and Soil Survey**

June 3-6, 1980

Proceedings

The Laboratory for Applications of Remote Sensing

Purdue University
West Lafayette
Indiana 47907 USA

IEEE Catalog No.
80CH1533-9 MPRSD

Copyright © 1980 IEEE
The Institute of Electrical and Electronics Engineers, Inc.

Copyright © 2004 IEEE. This material is provided with permission of the IEEE. Such permission of the IEEE does not in any way imply IEEE endorsement of any of the products or services of the Purdue Research Foundation/University. Internal or personal use of this material is permitted. However, permission to reprint/republish this material for advertising or promotional purposes or for creating new collective works for resale or redistribution must be obtained from the IEEE by writing to pubs-permissions@ieee.org.

By choosing to view this document, you agree to all provisions of the copyright laws protecting it.

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

KAMLESH LULLA, ABU RAHMAN AND PAUL MAUSEL
Indiana State University

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display Landsat data in forms which highlight features of interest most effectively especially in areas with limited or outdated surface data.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.