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Research Paper Geography

Landuse/ Landcover Mapping of Kamalapuram Surrounding Area ,Andhrapradesh, India, Using Unsupervised Classification Technique

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ABSTRACT

Land use and land cover has become a central component in current strategies for managing natural resources and monitoring environmental changes. To maintain the present natural resources and to understand the causes and consequences of over exploitation of soil and water resources the land use, a land cover mapping was done in the study area i.e. Kamalapuram ,Kurnool District. In this study, satellite image for March 2013 were used for LULC (Land Use/ Land Cover) Un Supervised classification. For the classification purposes, seven LULC classes were decided. The most extensive land cover category of the Study area is land with/without scrub i.e. 32.34%. The second most extensive land cover category is Forest, 26.98%.

KEYWORDS : Landuse, Land cover, Liss-3 Data, Satellite imagery, Unsupervised classification technique.

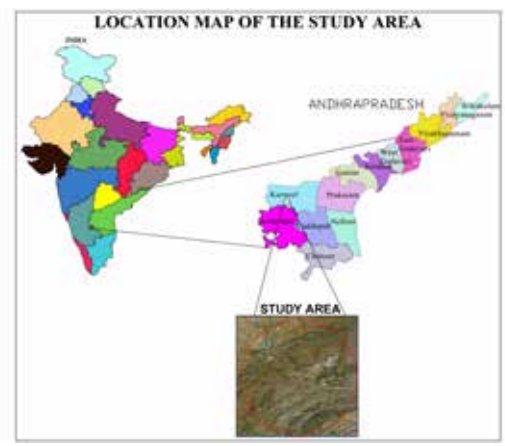
Introduction

Satellite Remote Sensing has become an important tool for Monitoring and management of natural resources and the environment. Remotely sensed data are widely used in land use / land cover classification. Land cover relates to the discernible Earth surface expressions, such as vegetation, soil, water or anthropogenic features, and thus describes the Earth's physical state in terms of the natural environment and the man-made structures (Xavier Baulies and Gerard Szejwach, 1998). Essentially, land cover can have only one class or category at a given time and location, and can be mapped using suitable remote sensing data with spectral signatures. land use is an expression of human uses of the landscape, e.g. for residential, commercial, or agricultural purposes, and has no spectral basis for its unique identification. Thus it cannot be explicitly derived from image data, but only inferred by visual interpretation or assessed in the framework of object-based contextual analysis Land use is obviously constrained by environmental factors such as soil characteristics, climate, topography and vegetation. But it also reflects the importance of land as a key and finite resource for most human activities including agriculture, industry, forestry, energy production, settlement, recreation, and water catchments and storage. land is a fundamental factor of production, and through much of the course of human history, it has been tightly coupled with economic growth. Often improper Land use is causing various forms of environmental degradation for sustainable utilization of the land ecosystems, it is essential to know the natural characteristics, extent and location, its quality, productivity, suitability and limitations of various land uses. Land us e is a product of interactions between a society's cultural background, state, and its physical needs on the one hand, and the natural potential of land on the other (Balak Ram and Kolarkar 1993). In order to improve the economic condition of the area without further deteriorating the bio environment, every bit of the available land has to be used in the most rational way.

As a result of technological advancements, changes of the earth's surface have become visible by satellite imagery as a result remote sensing has become the most effective tool for assessing and monitoring all these transition (Deer,1995) Therefore satellite remote sensing has become a major data source for different change detection applications, because of the repetitive data acquisition capabilities, digital format suitability for computer processing and lower cost than those associated with traditional methods (Coppin et al. 2002; Deer 1995; Lu et al. 2004)

II. Study Area

Kamalapuram village located at kurnool Andhrapradesh state, India. Study area lies between 15°15′ to 15 25′N and 77°50› to 7800′E ,falls under the survey of India toposheet No 57 E/15 The Study area is bounded by Anantapur, kadapa, Prakasam Districts of Andhra pradesh and Mahabubnagar district of Telangana Study area Occupying total area of 31,406.2 hectares



Location Map of the StudyAreata Used

Data Used

I. SOI T oposheet
2.SatelliteData

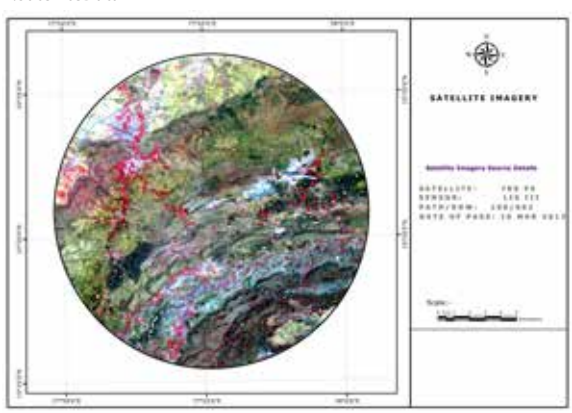


Figure 1.2: IRS LISS-III satellite image of the study area

III. Aim and Objective

Preparation of various thematic data such land use and Land cover using LISS-3 Data.

Create a land use land cover map from satellite imagery using unsupervised classification.

To analyzing the disturbance gradient in the Biosphere and development of wildlife information base including inventory data on habi-

tats and species.

IV. MATERIALS AND METHODS

The following materials were used for the present study IRS P6 LISS III digital data of March 2013 and Survey of India toposheets No: 57 E /15. As the digital data did not have any real earth coordinates, data were geometrically corrected using ground control points viz. road-road intersection, road-rail intersection, canal-road intersection, etc. were taken from the toposheet using ERDAS IMAGINE 8.5 image processing package. False Colour Composite of the kamalapuram was generated with the band combinations of 3, 2, I in Red Green Blue LISS III data (Fig. I.2). The displayed image with the above classes was spectrally enhanced by histogram. Equalization method. Laud use land cover map of Kamalapuram was then prepared by on-screen visual interpretation method using ERDAS IMAGINE 85.

Data Processing

Analysis and interpretation of satellite data will be done by digital image processing as depicted process generally includes Three steps:

1.IMAGE PRE PROCESSING
2.IMAGE ENHANCEMENT
3.IMAGE CLASSIFICATION

Different land use/land cover classes like agriculture, settlement with vegetation, fallow land, plantation, sand, Forest etc. were then identified using visual interpretation keys such as colour, tone, texture, pattern, size and shape Land/land cover map with the above classes was then transferred to base map of 1:50,000 scale, which was used for ground truth collection. Based on the ground truth data, land use/land cover map of Kamalapuram and its surroundings were corrected and finalized.

Field Surveys

Field Surveys will be conducted within the study areas to determine the major types of land use and land cover. Such data would be used in two aspects of the mapping of land use land cover. Firstly it will aid in land use and land cover classification, by associating the ground features of a specific type of land use and land cover with the relevant imaging and spectral characteristics. Secondly, ground data will be used for accuracy assessment of the developed land use and land cover maps.

V. Result:

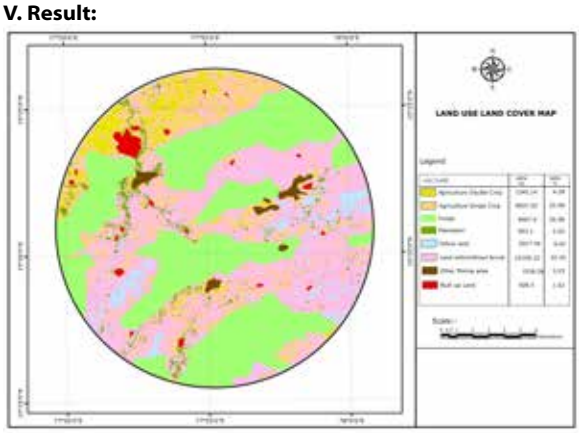


Figure2: Land use and Land cover details of the study area

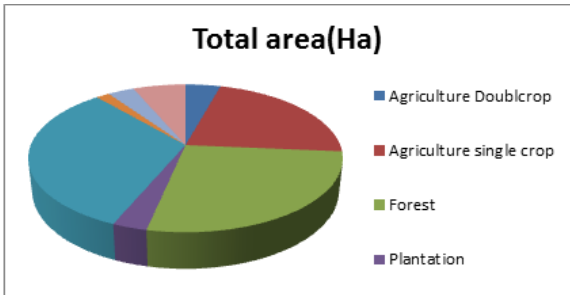


Figure 3: landuse landcover Statistics of Area

The land use and land cover Imp clearly shows that area of Land with/ without scrub is higher than others. Forest occupies second while Agriculture hold the third p lace in given map.

Name of the features	Total area(Ha)	Area %
Agriculture Doublcrop	1345.14	4.28
Agriculture single crop	6937.02	22.08
Forest	8467.4	26.98
Plantation	953.1	3.03
Landwith / without Scrub	10160.32	32.34
Built up land	509.5	1.62
Other mining area	1016.26	3.23
Fallow land	2017.46	6.42

VI. Accuracy Assessment

The classification accuracy is most important aspect to assess the reliability of maps, especially when comparing different classification techniques. During this study the accuracy assessment method were used. Accuracy assessment, automatic random point to be selected by software. This method shows above 90% accuracy of map.

VII. Conclusion

This study shows how to classify land use and land cover map from Multispectral satellite imagery using unsupervised classification technique. In this method we calculated land use and land cover classes and their area using image interpretation keys and their unique spectral signature, the land use and land cover map clearly shows that area of Forest is higher than others. The present study supports their results by achieving highest accuracy even in case of land use land cover mapping.

The classification accuracies were interpreted in terms of

(a) Effect of spatial resolution with same bandwidth.
(b) Comparison of three band set with MIR as either an additional Band or a replacement,
(c) Effect of date of acquisition

REFERENCES

Karwariya Sateesh, Goyal Sandip (2011). Land use and Land Cover mapping using digital classification technique in Tikamgarh district, Madhya Pradesh, India using Remote Sensing. INTERNATIONAL JOURNAL OF GEOMATICS AND GEOSCIENCES Volume 2. No 2.2011. | [2] Ram Chandra, T.V. S Uttam Kumar (2005): from Abstract of their paper presented at Imp India; geo uedia 2005, Image fus ion in GRDSS for land use trapping. | [3] Xavier Baulies and Gerard Szejwach, 1998 | [4] S.Sudhakar et, a l. (1999). Techniques of Classification for Land use/Land cover with special reference for Forest type trapping in Jaldapara Wild life Sanctuary. Joumalof the Indian society of Remote Sensing, Vol. 27.No.4, 1999. | [5] AlVik, J.H. 1997. A review of remote imag ing source provider. Modem Agriculture, joumal for site-specific crop management. | [6] Grenzdorffer, G. 1997. Remote sensing and geographic inforrnation system for site-specific farm management system In IV. Stafford (ed) Precision Agriculture. | Books | [1] Lilles and, J.M. and Kiefer, R W., «RellDte sensing and image interpretation | [2] Jenson, IR., 1986 «Digital image processing. | [3] Jenson, IR, 2002«Digital image processing. |