CLASSIFICATION AND ACCURACY ASSESSMENT LANDUSE LAND COVER USING BY USING REMOTE SENSING

[1]Dr.Santhi Swarup Manugula, [2]Kranthi Kumar Karra, [3] K. Rama Rao, [4]J Sai Prudhvi
[1]Professor, [2,3,4] Students,
[1]Department of Civil Engineering,
[1]Gurunanak Institution of Technical Campus, Hyderabad, India

Abstract: This study has been undertaken to investigate the land use /land cover which is often used interchangeably, a real time work carried for the project. Land cover–refers to the characteristics and surface cover of Earth's Surface, as represented by natural elements like vegetation, water, bare earth, impervious surface and other physical features of the land.

When used together the phrase Land Use / Land Cover generally refers to the categorization or classification of human activities and natural elements on the landscape within a specific time frame based on established scientific and statistical methods of analysis of appropriate source materials. Land cover is the physical material at the surface of the earth. Land use is the description of how people utilize the land for the socio-economic activity –urban and agricultural land uses are two of the most commonly recognized high-level classes of use.

The finite land, minerals, water are currently under tremendous pressure in the context of highly competing, and often conflicting demands of an increasing population. So there is an urgent need to improve the productivity and the environment to meet the basic requirements of our growing population and to improve the quality of life.

The study area is located in Sangareddy district of, Telangana state. The input data used in this work is satellite Image Resource Sat 2 with LISS 4 Sensor of 5m resolution, and SOI toposheet.

The Remote Sensing and Geographic Information System have proved to be very important in assessing and analyzing land use and land cover. The methodology adopted for this thesis is total enumerated through digital analysis which was carried out with the help of ERDAS Imagine software. A detailed accuracy assessment is performed through field visit

IndexTerms **- LU/LC, satellite image, ERDAS Imagine, GIS, SOI**

I. INTRODUCTION

For any developmental planning information on existing land use / land cover and pattern of their spatial distribution forms the basis. One of the main purposes of satellite remote sensing is to interpret the observed data and classify features. In addition to the approach of photo interpretation, quantitative analysis, which uses computer to label each pixel to particular spectral classes (called classification), is commonly used. On actual land use/land cover the remote sensing provides information, while GIS enables an integrated evaluation on land potentialities to be made. These technologies demonstrated the value of spatial analysis in land use management is greatly enhanced by the use of GIS. Martinez and Stuiver [1] investigate the automated delineation of drainage networks and elementary catchments from digital elevation models. Based on their results, they concluded that automating the method for obtaining the spatial representation of all the elementary catchments and the drainage network features are important since these entities are terrain objects connects different aggregation level of hydrographic information.

Accuracy assessment is a very important indicator to draw an idea about the quality and reliability of results and the uncertainty information derived from remotely sensed data (Congalton and Green, 1999). In the landuse monitoring studies using the post classification comparison method, it is necessarily to pay attention to the classification accuracy of different classes since the classification error will affect the standard of 85% accuracy which is an acceptable level for digital image classification Congalton (1991), [2,3].

Introduction to digital image processing gives a detail understanding about levels of classification [4].The most commonly used supervised classification is maximum likelihood classification (MLC), which assumes that each spectral class can be described by a multivariate normal distribution. , Manugula S. S , 2017, [5,6]

II. STUDY AREA AND DATA USED

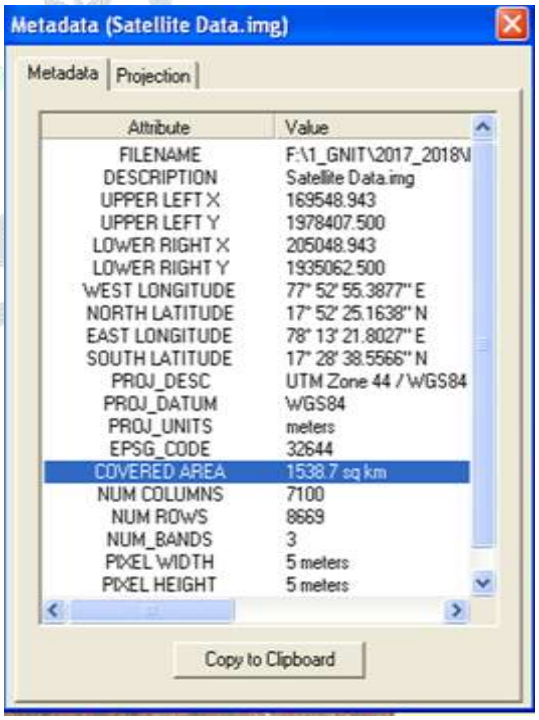
The study area is located in Sangareddy, district located in Telangena

Figure 2.1 Data superimposed on google earth

The extent of study area lies between longitude 77° 52' E to 78° 13‘21 E and latitude 17° 52' 25N to 17° 28‘ 38 N
AOI :- **1538.7 Sq km**

➢ Data used

The input data used in this work is Satellite Image i.e. (Resource Sat 2) with LISS 4 Sensor.
SOI toposheet No 56K/11
Hand GPS Instrument (Garmin Etrex)

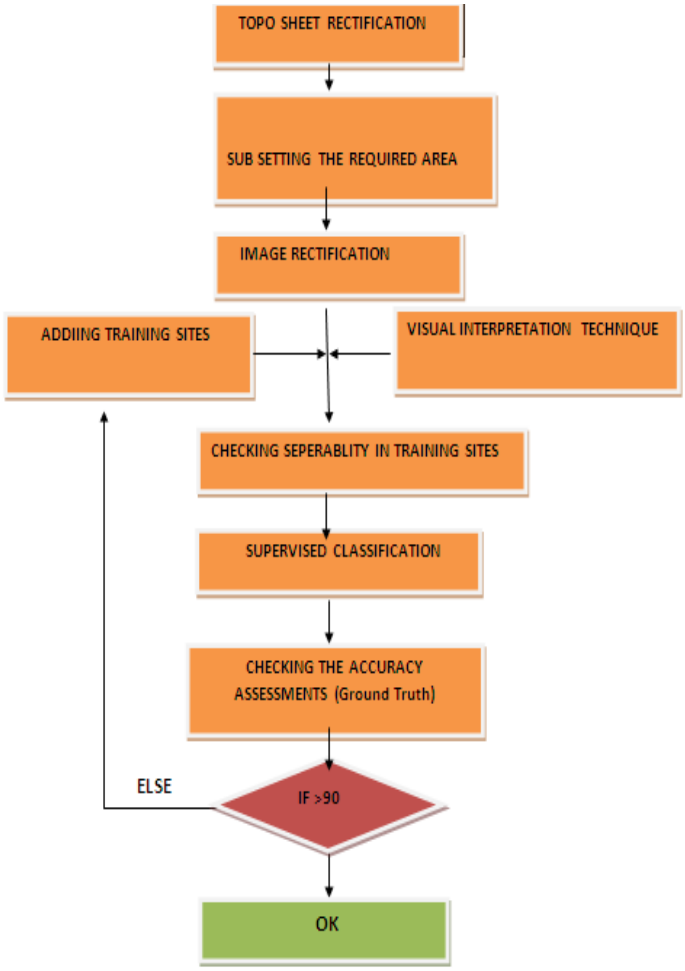


igure 2.2 Meta data

III. METHODOLOGY

1) The main objective is
   a) Classify the data
   b) Accuracy Assessment/ Field Verification

2) Methodology is explained in Flow chart



Process-- Flow chart

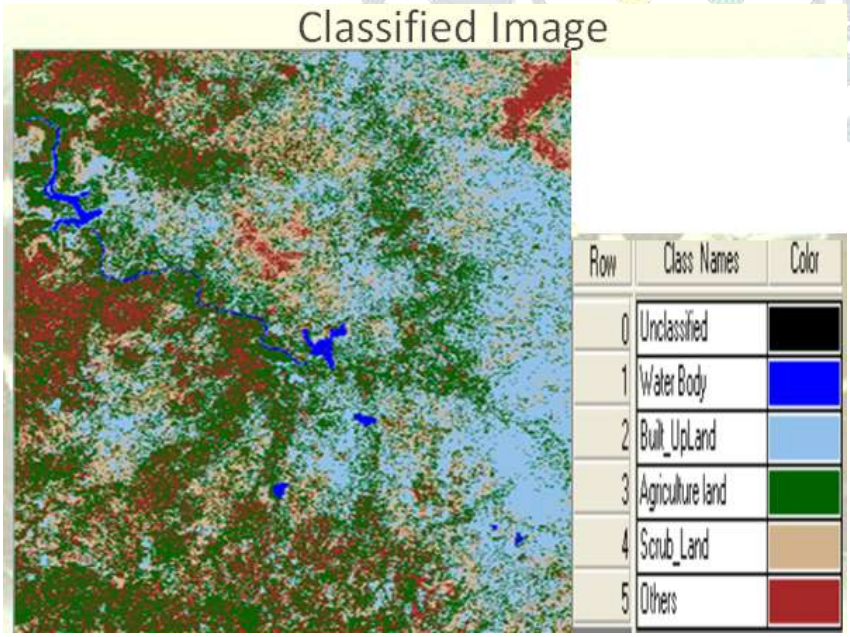
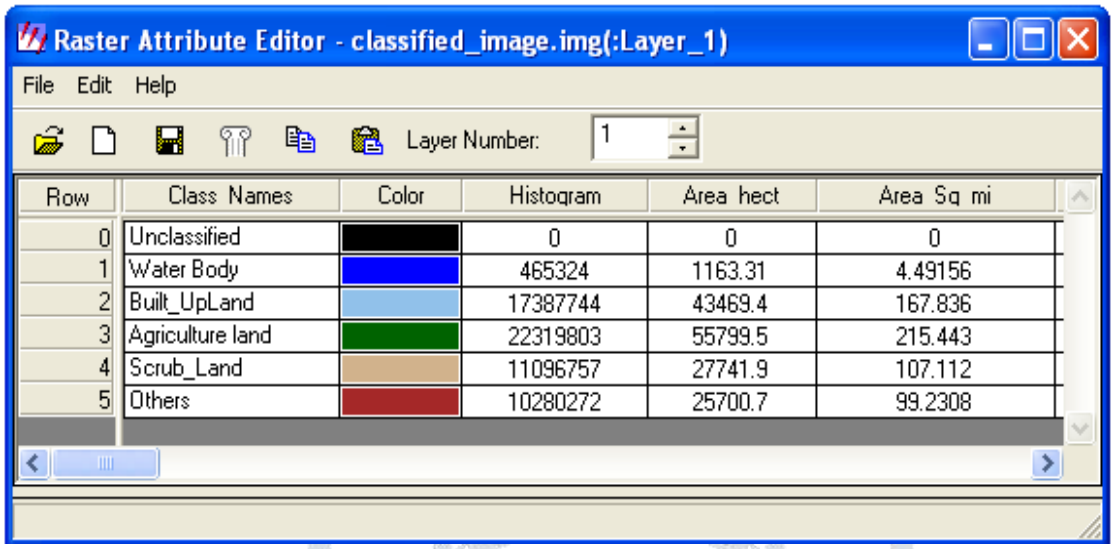


Figure 2.3 Classified satellite data

IV. RESULT ANALYSIS

4.1 Results of Descriptive Statics of Study Variables

Attribute Data of classified file as shown in the table



Row	Class Names	Color	Histogram	Area hect	Area Sq mi
0	Unclassified		0	0	0
1	Water Body		465324	1163.31	4.49156
2	Built_UpLand		17387744	43469.4	167.836
3	Agriculture land		22319803	55799.5	215.443
4	Scrub_Land		11096757	27741.9	107.112
5	Others		10280272	25700.7	99.2308

Table 4.1: Attribute data of classified image

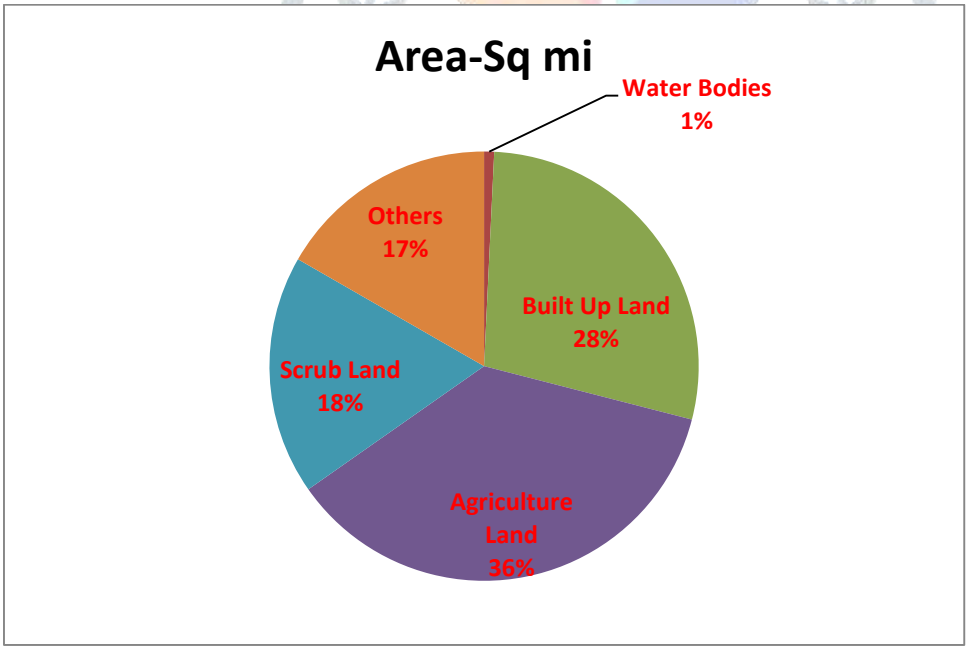


Figure 4.1 Pie chart showing % of land classified

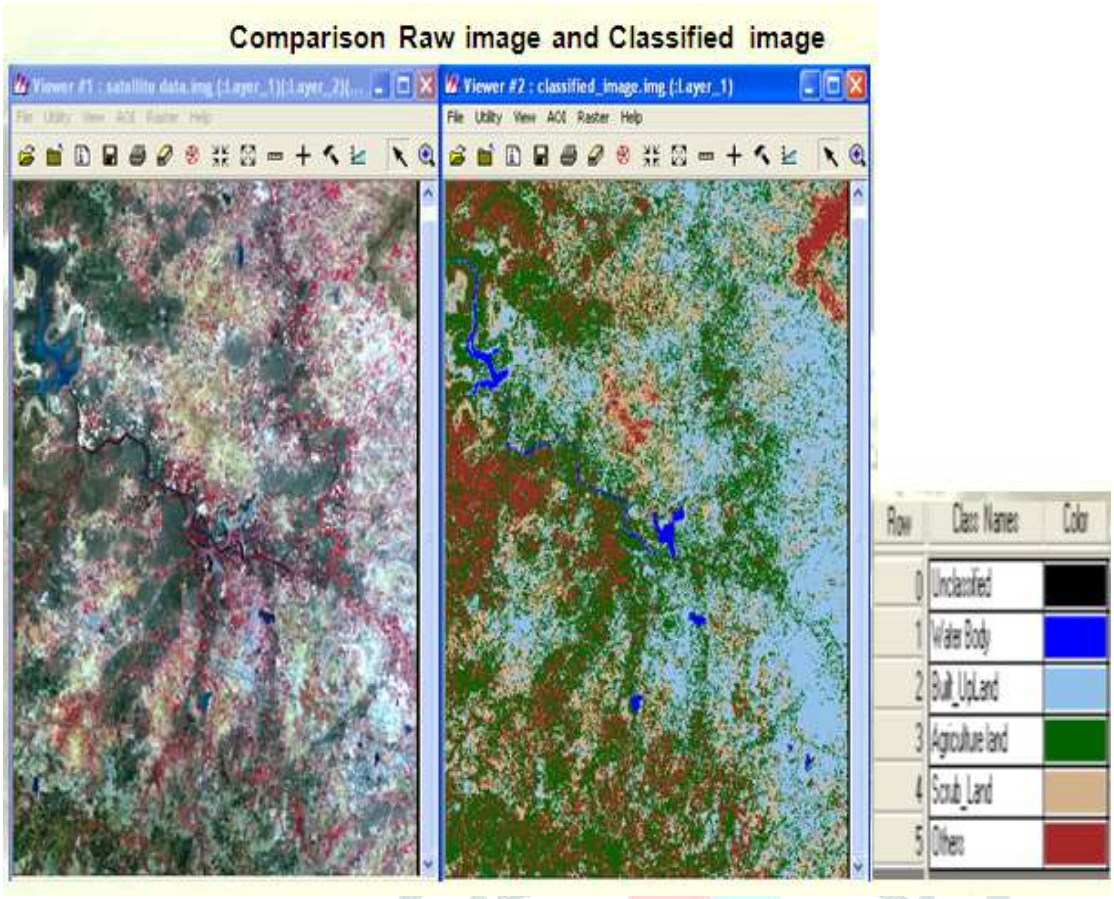


Figure4.2: Comparison Raw image and classified image

V. ACCURACY ASSESSMENT

5.1 Classification of Accuracy Assessment Report (System Generated)

CLASSIFICATION ACCURACY ASSESSMENT REPORT

Image File : f:/1_gnit/2017_2018/projects/under guidance/sec_2_2017-2018/classified_image.img
User Name : admin
Date : Mon Mar 19 22:52:35 2018

ERROR MATRIX

	Reference Data			
Classified Data	Unclassified	Water Body	Built_UpLand	Agriculture
Unclassified	0	0	0	0
Water Body	0	0	0	0
Built_UpLand	0	0	10	0
Agriculture land	0	0	3	5
Scrub_Land	0	0	0	0
Others	0	0	0	0
Column Total	0	0	13	5

Classified Data	Reference Data: Scrub_Land	Others	Row Total
Unclassified	0	0	0
Water Body	0	0	0
Built_UpLand	0	0	10
Agriculture land	0	0	8
Scrub_Land	3	0	3
Others	0	4	4
Column Total	3	4	25

----- End of Error Matrix -----

ACCURACY TOTALS

Class Name	Reference Totals	Classified Totals	Number Correct	Producers Accuracy	Users Accuracy
Unclassified	0	0	0	---	-
Water Body	0	0	0	---	-
Built_UpLand	13	10	10	76.92%	100.00%
Agriculture land	5	8	5	100.00%	62.50%
Scrub_Land	3	3	3	100.00%	100.00%
Others	4	4	4	100.00%	100.00%
Totals	25	25	22		

Overall Classification Accuracy = 88.00%

----- End of Accuracy Totals -----

KAPPA (K^) STATISTICS

Overall Kappa Statistics = 0.8256

Conditional Kappa for each Category.

Class Name	Kappa
Unclassified	0.0000
Water Body	0.0000
Built_UpLand	1.0000
Agriculture land	0.5313
Scrub_Land	1.0000
Others	1.0000

----- End of Kappa Statistics -----

VI. CONCLUSION AND FUTURE SCOPE

- Based on the statistical analysis the area is calculated one can analyze & monitor the need of water, Agriculture, forest, settlement requirement wrt increase in population
- Future scope the study results can be used for studying and implementing the Master Plan for suitable suggestions. The study can also be used for infrastructure development such as housing facilities developed by the government, institutional buildings etc.

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