LAND USE LAND COVER CHANGE MAPPING USING REMOTE SENSING AND GIS: A STUDY ON EASTERN DELTA OF KRISHNA DISTRICT, ANDHRA PRADESH.

Nekkanti. Haripavan[1], Sonti. Karunasri[2], Tadisetti. Satyatejasrinivas[3]
Assistant professor[1], Student[2], Student[3]
Gudlavalleru Engineering College[1], Gudlavalleru Engineering College[2],
Gudlavalleru Engineering College[3]

Abstract

Due to variety of socio economic and environmental factors, most of the land use practices and land cover management are in a constant change at various spatial and temporal scales. The land use/land cover pattern of any region is an outcome of natural and socio-economic factors and their utilization by man in time and space. The transformation of Indian agriculture from mere subsistence to commercially oriented scientific crop cultivation in a span of last five decades has few parallels in the world. Land is becoming a scare resource as per capita availability of land is drastically reducing due to explosive population growth particularly in the last seven decades. The ever increasing demand of agricultural/food production has resulted in the over-exploitation of land and water resources. Further, the increasing in land use and land cover change is scalar dynamic. The change in land cover occurs even in the absence of human activities. Land use/land cover change has been reviewed from different perspectives in order to identify the drivers of land use and land cover change.This change phenomenon on land use/land cover can be effectively addressed by using the state-of-art technologies like geospatial technologies that include remote sensing, GIS and GPS.

Keywords: RS- Remote sensing
GIS- Geographic Information System
GPS- Global Positioning System

1.Introduction

Thus the study of land use and land cover of Krishna eastern delta has been attempted to identify the change phenomenon of land use/land cover. The outputs of the present study
Help in understanding the spatial extent of various land use/land cover categories and associated water systems in this region. Remote sensing and GIS technologies can be effectively used in mapping and creating an updated spatial data base on land use/land cover.

Land cover data documents how much of a region is covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types. Water types include wetlands or open water. Land cover can be determined by analysing satellite and aerial imagery. Land use cannot be determined from satellite imagery. Land cover maps provide information to help managers best understand the current landscape. Land use denotes the human employment of the land, so that a change in land use at any location may involve a shift to a different type of use, for instance, from farming to residential, or a change in the intensity of use.

1.2Advantages of land use& land cover:

- Routing and logistics planning for seismic/exploration/ resource extraction activities
- Damage delineation (tornadoes, flooding, volcanic, seismic, fire& terrorist activities).

1.3Study area:

Eastern delta of Krishna district.
Remote sensing is the art and science of making measurements of the earth using sensors on airplanes or satellites.These sensors collect data in the form of images and provide specialized

capabilities for manipulating, analysing, and visualizing those images.

Presently, an important subject before the engineering and scientific community is the processing scene of earth's tracts as viewed from above. The basic processing goal is to locate "objects", identify and map them.

1.4Applications of remote sensing:

1. Large area coverage: Remote sensing allows coverage of very large areas which enables regional surveys on a variety of themes and identification of extremely large features.
2. Remote sensing allows repetitive coverage which comes in handy when collecting data on large area coverage: Remote sensing allows coverage of very large areas which enables dynamic themes such as water, agricultural fields and so on.
3. Remote sensing allows for easy collection of data over a variety of scales and resolutions.

Geographic Information System (GIS) is a computer system build to capture, store, manipulate, analyse, manage and display all kinds of spatial or geographical data. GIS applications are tools that allow end users to perform spatial query, analysis, edit spatial data and create hard copy maps.

A Geographic Information System (GIS) is a computer-based information system for input, management, analysis, and output of and other resources at all scales ranging from local to global. GIS capabilities include the overlay of information provided by different thematic maps according to user specified logic as well as derivative map output.

- Better decision made by government people
- Improve decision making with the help of layered information

2. Methodology:

In the present study we have used mainly two types of data. These are topographic map and remote sensing data. The data is geo referenced with latitudes and longitudes using the ArcGIS software and spatial analyst tools and demarcated the boundary of study area. Before the pre-processing and classification of satellite imagery began an extensive field survey was performed throughout the study area using Global Positioning system (GPS) equipment. This survey was performed in order to obtain accurate location point data for each land use and land cover class included in the classification scheme as well as for the creation of training sites and for signature generation.

The satellite data was enhanced before classification using histogram equalization in ERDAS Imagine 8.7 to improve the image quality and to achieve better classification accuracy. In supervised classifications spectral signatures are developed from specified locations from the image. The specified locations are given a generic name "training sites" and are defined by user. Generally a vector layer is digitized over raster scene.

The vector layer consists of various polygons overlaying different land use types. The training sites will help to develop spectral signatures for the outlined areas.The land use maps pertaining of two different periods were used for post classification comparison, which facilitated the estimation of changes in the land use category and dynamism with changes. Post classification comparison is the most

Commonly used quantitative method of change detections with fairly good results. It involves independently produced spectral classification results from different data sets, followed by a pixel-by-pixel or segment-by-segment comparison to detect the changes in the classes.

Conclusions:

Based on the results obtained by the employment of RS and GIS techniques it was concluded that from our Land use and Land cover detection study in the north side of study area there is an increment of Mangroves forest in the context of area. On the other hand on the south side there are several encroachments in the Kolleru Lake due to the conversion of it into Aqua ponds at some areas. The result of these encroachments can be found out by the decrement of previous 5' (≈1.5m) contour to 3' (≈0.9m) contour.

The Lucrative Business of aquaculture made for reaching consequences on the habitual land use in the Lake area. Encroachments in the wild life sanctuary and conversion of rice paddies to aquaculture farms appear to be a common story in kolleru region. Hence we need to protect the natural resources available.

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