# STUDY OF LAND USE AND LAND COVER OVER PANDAVAPURA TALUQ USING REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM

**Malini P.J.*, Manikiam M.B.**, Gouda K.C.*****
*KSRSAC Bangalore,
**(Retd) senior scientist ISRO Bangalore,
***Senior scientist CSIR-CMMACS NAL Bangalore

***Abstract***
*Karnataka is a state in south western region of India. Rapid population growth and anthropogenic activities on earth is changing the natural environment profoundly. Hence, an attempt has been made in this paper to determine and identify changes in Land use/Land cover over Karnataka their utilization by man in time and space. Hence, information on land use / land cover and possibilities for their optimal use is essential for the selection, planning and implementation of land use schemes to meet the increasing demands for basic human needs and welfare. This Information also assists in monitoring the dynamics of land use resulting out of changing demands of increasing population. Land use and land cover change has become a central component in current strategies for managing natural resources and monitoring environmental changes. In this study, Remote Sensing and Geographical Information System integration are used in order to analyze land cover of Karnataka city using Land sat 8 imagery. This paper discusses the land cover of study area using classification of image. Digital image pre processing and image processing techniques are used for classification of land cover analysis. After image pre-processing, supervised image classification has been performed to classify the image into different land categories using ARCGIS 10.3 and ERDAS IMAGINE.*

***Keywords:*** *Land use, Land cover, GIS, Remote sensing, Landsat Imagery, Population*

## Introduction

"Land use" is the term that is used to describe Land use is the term that is used to describe human uses of the land, or immediate actions human uses of the land, or immediate actions modifying or converting land cover. It includes such modifying or converting land cover. It includes such broad categories as human settlements, protected broad categories as human settlements, protected areas and agriculture. areas and agriculture. **"**Land cover**"** refers to the natural vegetative cover types that characterize a particular area. The land use/land cover pattern of a region is an outcome of natural and socio-economic factors and their utilization by man in time and space. The land use/land cover pattern of a region is an outcome of natural and socio-economic factors and their utilization by man in time and space. Land is becoming a scarce resource due to immense agricultural and demographic pressure. Hence, information on land use/land cover and possibilities for their optimal use is essential for the selection, planning and implementation of land use schemes to meet the increasing demands for basic human needs and welfare. This information also assists in monitoring the dynamics of land use resulting out of changing demands of increasing population. Land use and land cover change has become a central component in current strategies for managing natural resources and monitoring environmental changes. Over the past years, data from Earth sensing satellites has become vital in mapping the Earth's features and infrastructures, managing natural resources and studying environmental change. Remote Sensing (RS) and Geographic Information System (GIS) are now providing new tools for advanced ecosystem management. The collection of remotely sensed data

facilitates the synoptic analyses of Earth - system function, patterning, and change at local, regional and global scales over time; such data also provide an important link between intensive, localized ecological research and regional, national and international conservation and management of biological diversity. Therefore, attempt will be made in this, to study out land use and land cover and to map out the status of land use land cover of pandavapura region of 2015 and 2006 using remote sensing satellite data and geographic information system.

## Study Area

The present study area focuses on Pandavapura Taluq, a part of the Mandya district, in Karnataka State. It is located in a Latitude and Longitude of 12.5°N 76.67°E. It has an average elevation of 709 meters (2326 feet) respectively. It has a population of about of 20,399 of which 10,172 are males while 10,227 are females as per report released by Census India 2011.The Total geographical area of Pandavapura is about 249.45 hectares

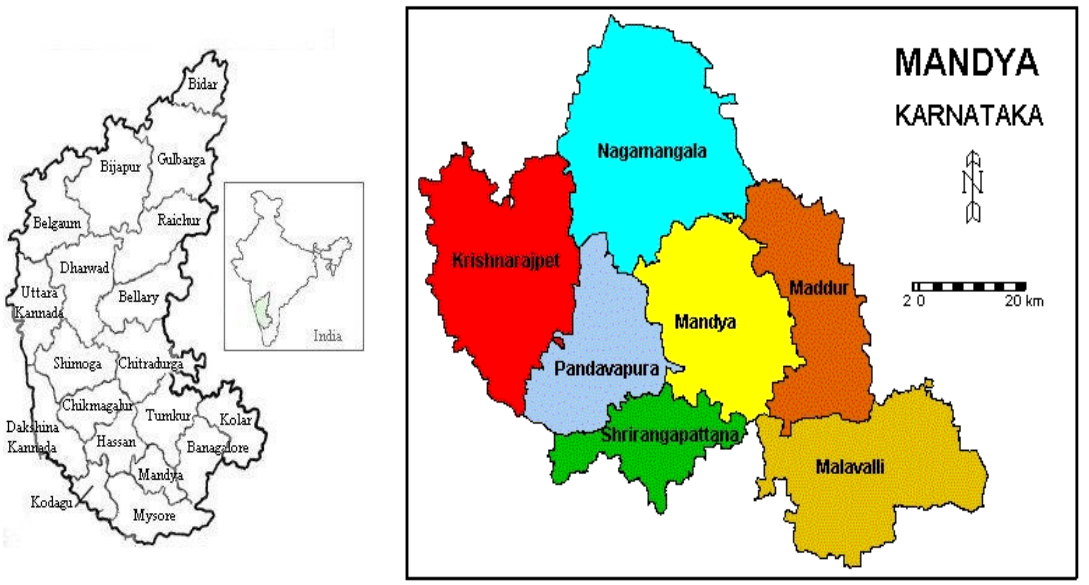


Figure 1. Location of Pandavapura Taluq

## Materials and Methodology

Landsat8TM and Landsat4TM data is used, This section presents the detail about the data and methodology adopted for the study. The brief methodology data flow diagram is presented below.

## Results and Discussion

Land use/land cover map for the year 2006 and 2015 have been created using ERDAS IMAGE. The steps followed for the analysis are: (i) Digitization of different classes using polygon tools. (ii) Displaying all the different classes in the same layer, (iii) Calculating the area of each class and, (iv) Generating land use/land cover map for the year 2006 and 2015.The study area includes the following dominant land use/land cover classes: Forest, Agriculture, Waste Land, Barren Land, Water bodies and Built up Areas. The results of these

thematic maps are shown in figures 3 and 4 respectively. From the study area is seen that the forest, waste lands , builtup lands have tremendously reduced. During the year 2006 and 2015, forest area have reduced by 4147.14 Hectares, Waste lands have been increased by 1926.19 hectares. However, built up areas have been increased by 6456.24 Hectares. The figure 3 shows the land use and land cover for the year of 2006. During this year the built-up regions covers an area of 11145.96 Hectares. During this year the waste land covers the largest area of about 11091.52 Hectares. Whereas the water bodies is increased by 375.34 Hectares The figure 4 shows the land use and land cover for the year of 2015. During this year the built-up regions covers an area of 4147.14 Hectares. which is about 42% of the total area. During this year the waste land covers an area of 82 %. This shows that the waste land have increased and the built-up areas have increased. The forest areas have reduce from 69% of the total study area. The Figure 5 presented the pictorial graph of 2006 and 2015 area distribution

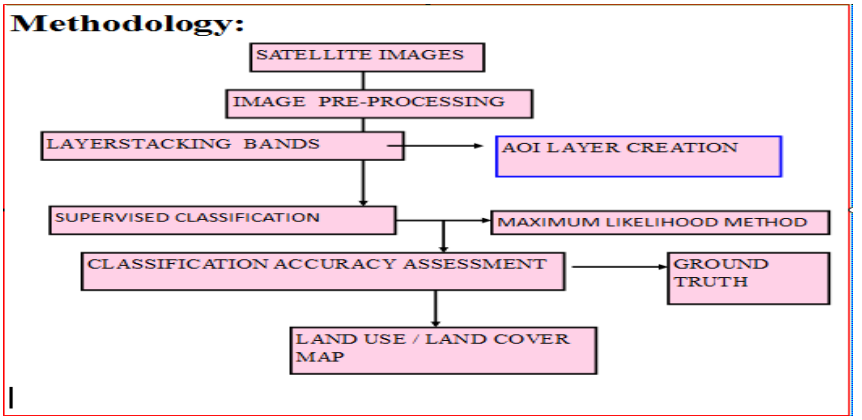


Figure 2. Methodology data flow chart

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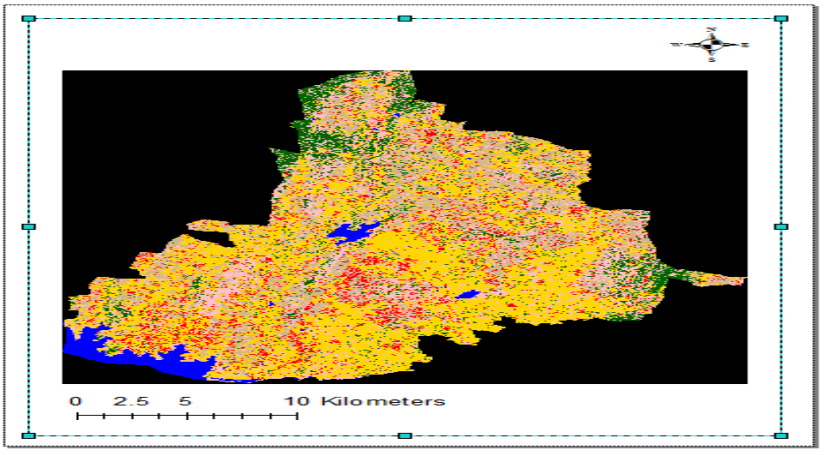


Figure3. Landuse/Landcover during the year 2006

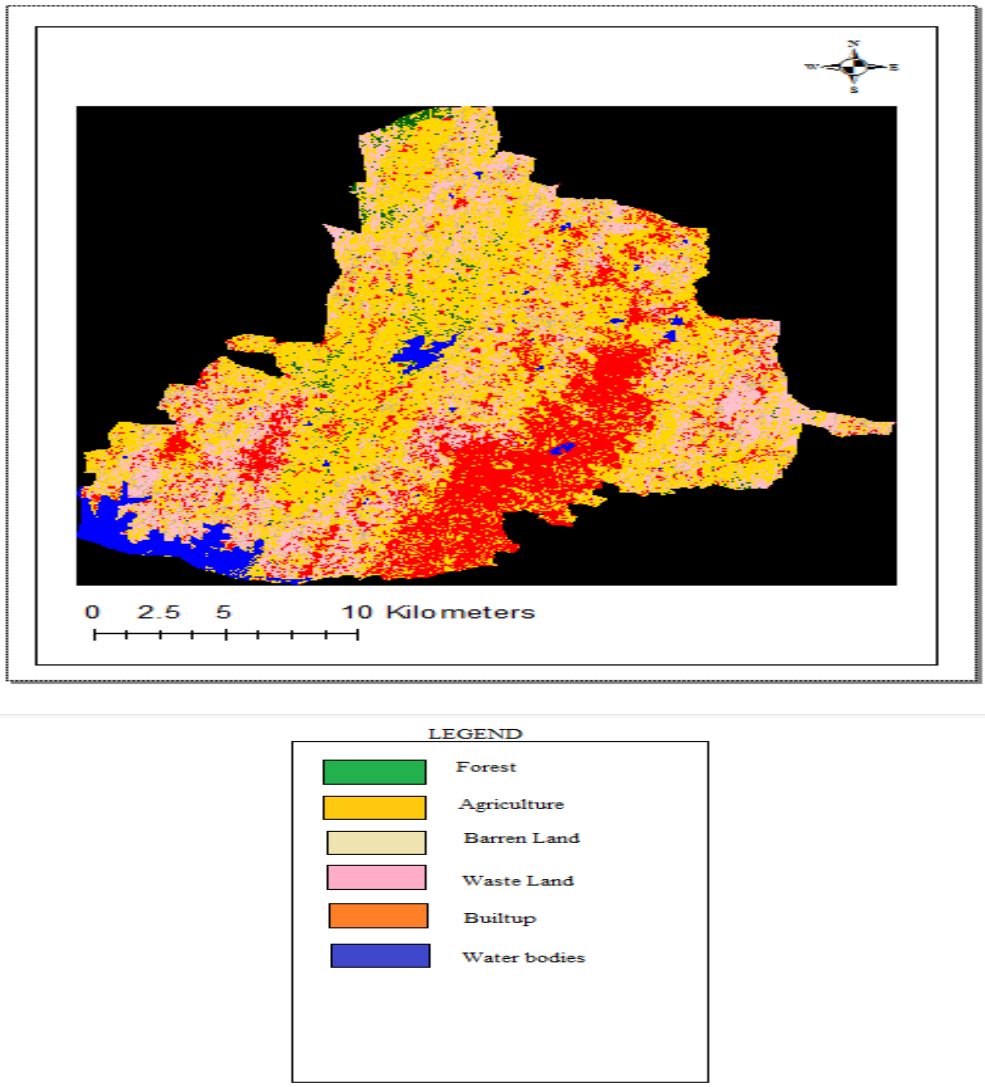


Figure 4. Landuse/ Landcover during the year 2015

## Conclusion

From this study it is inferred that the waste land should be used as pasture land. So that During the year 2006 and 2015, forest area have reduced by 4147.14 Hectares, Waste lands have been increased by 1926.19 hectares. However, built up areas have been increased by 6456.24 Hectares. During this year the built-up regions covers an area of 11145.96 Hectares and the waste land covers the largest area of about 11091.52 Hectares. Whereas the water bodies is increased by 375.34 Hectares. This shows that the waste land have increased and the built-up areas have increased. The forest areas have reduce from 69% of the total study area.

This may be due to environmental pollution caused by these developing places or levelling the land and building structures like roads, industries, etc. From this study we can conclude that the built-up areas are increasing rapidly whereas agricultural lands, forest and barren land are decreasing gradually. This may be due to rapid growth of population and development. The study recommends the use of satellite image for future environmental monitoring studies and suggested that some remedial measures should be taken to control the changes like giving suggestions to Urban Planning to control the degradation of various form of land.

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