



# Remote Sensing and Gis Based Land Use and Land Cover Information of Medchal Mandal of Medchal District

Kavita Singh, M. Anji Reddy, Naveen Kumar B

**Abstract:** It is exceptionally significant to use GIS and remote sensing application for proficient need in daily life. Upcoming and contemporary technologies like data processing, earth observation geodata processing and investigation are necessary for the researcher for the development of the society on a large scale. Remote sensing information data both in digital format and image format is utilized for retrieving the information about land resources by using (DIP) digital Interpretation Techniques and (VIP) Visual interpretation techniques Techniques. The foremost objective of the given study area is to Setup land use and land cover information system to evaluate land resources by by means of GIS Remote Sensing at Arc GIS10.2.1 platform of MedchalMandal. GIS and Remote Sensing information is the ultimate solution for the coverage of large area. Different types of layers are created from Remote Sensing images data and ArcGIS 10.2.1 Software. In the present study analysis is carried out by primary information which was generated from remote sensing data. GIS is Decision support system which helps planners and Decision makers to take correct decision for sustainable development, it also helps developers, engineers in environmental study, town planning and resource management.

**KEYWORDS:** Remote Sensing, GIS, landuse/Landcover, Resource management, Town Planning

## I. INTRODUCTION

It is exceptionally significant to use remote sensing and GIS application for proficient need daily life. Upcoming and modernized technology like earth observation data processing, geodata processing and analysis are necessary for the researcher for the development of the society on a large scale. The research study is contributed to built land use and land cover Information system of medchalmandal of Medchal district. Land use and Land cover is such a aspect and knowledge about landuse and landcover which has develop more and more increasingly important as the country plan to conquer the problems of deteriorating

environmental quality, uncontrolled development, haphazard, destruction of important wildlife habitat, wetlands and loss of fish quality, uncontrolled development, haphazard, destruction of important wildlife habitat, wetlands and loss of fish.

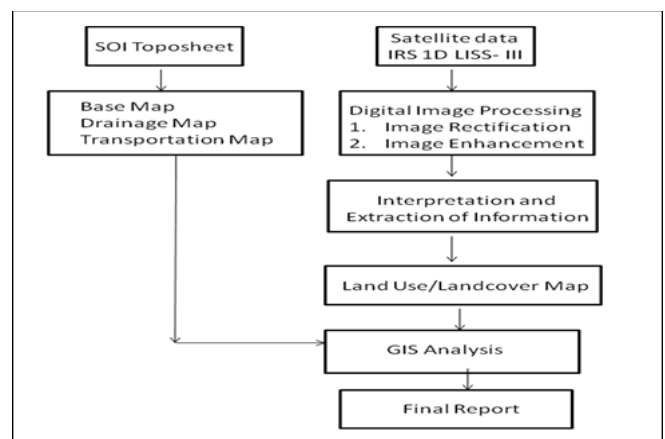
Landuse and landcover data is required for analyzing processes of environment and its problems. Using of GIS and Remote sensing techniques became gradually significant to recognize changes in landscape. This technique is useful in the areas with are not accessible.

The study is useful to recognize potential problems of an area to and to create a land resource database for development overall. Digital image like remote sensing is utilized to derive information.

## II. OBJECTIVES

1. Setup land information system to evaluate land resources by using Remote Sensing and GIS at Arc GIS platform.
2. To Prepare landuse/landcover, base, drainage and transport map of MedchalMandal of Medchal District By using( SOI) Survey of India toposheet at the scale of 1:50,000.

## III. METHODOLOGY OF THE STUDY AREA



Methodology flow chart of the study Figure 1

## IV. DESCRIPTION OF THE STUDY AREA

### IV.1 Location and Extent

Medchalmandal of Medchal district is located in state of Telangana, with the geographic coordinates of co-ordinates of 17° 38' North latitude and 78° 29' Eastern longitude.

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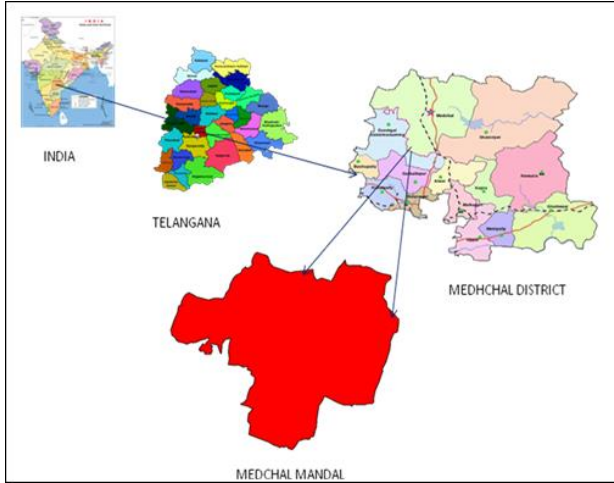
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# Remote Sensing and Gis Based Land Use and Land Cover Information of Medchal Mandal of Medchal District

MedchalMandal is situated in the in north and western part of the district with a geographical extent of approximately 347 sq. Km. Medchalmandal has 29 revenue villages.

In the study area georeferenced satellite imagery of IRS LISS-III and Toposheet No. 56K/6 ,56 K/10 on 1:50,000 scale. The image processing of the satellite image done by Earth Resource Data Analysis System (ERDAS Imagine 9.1) software and ArcGIS 10.2.1 are used to generate outputs of the present study area.

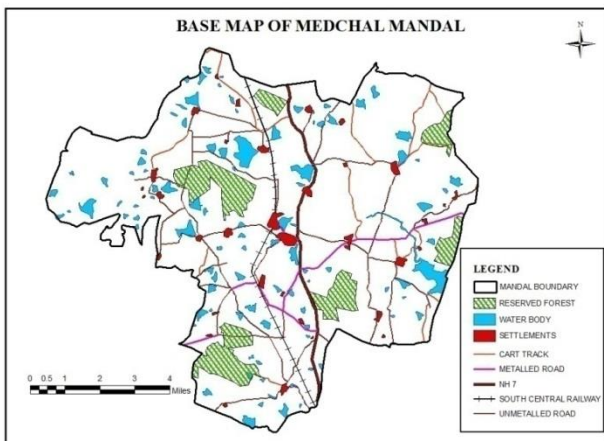


Location Map of the MedchalMandal Figure 2

## V. RESULT AND DISCUSSIONS

### A. Base Map of MedchalMandal

Base mappreparation necessary map of any given study area which gives baseline information using GIS and Remote sensing Techniques. Base map is used for demonstrating the theme wise thematic informationona given standardized scale. The foremostinformation like villages or town, reserved forest, water bodies, transportation network are delineated from the toposheet as base information. The base map of the MedchalMandal is prepared using (SOI) Survey of India Toposheets at 1:50000 scale. The base of the given study area is shown in (Figure no.3)

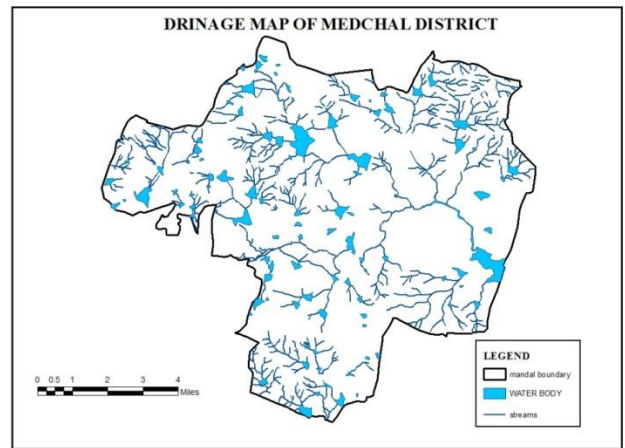


Base Map of MedchalMandal Figure 3

### B. Drainage Map

Medchalmandal is not having major rivers or its tributaries. There are minor and Major Cheruvu latter it has

been transformed into residential area. The density of the drainage is relatively higher in the hilly area compared to plain areas. Drainage map of MedchalMandal is prepared using survey of India Toposheet (SOI) at the scale of 1:50,000 scale. The detailed drainage map can be seen in figure no.4



Drainage Map of the MedchalMandal Figure 4

### C. Physiography

The Study area is have an elevation of an about 1975ft.(602 meters) above the mean sea level. MedchalMandal topography is plane with gentle slopes. The highest altitude point and the pattern of the drainage is easily spotted on toposheet and satellite imagery.

### D. Climate and Rainfall

The climatic condition of the medchalmandal is hot in summer season. The temperature rises slowly from the month of March and rises highest in the month of may The maximum temperature reaches 44° Centigrade. The normal rainfall annually recorded in the mandal is 842mm. The maximum volume of rainfall is received all the way through the south west monsoon for the period of June to September, where as some rainfall North –East and South-East Monsoon.

### E. Flora and Fauna

The terrain which falls on the north-western and north eastern part of the Mandal is covered with scrub area and the reserved forest. The other areas are covered with the agricultural activity like paddy, sunflower,mangoes and other plantations

### F. Agriculture

In the TodalMandal 60% of area is covered with agricultural activity and about 80% out of total population is directly dependent on the different activities of agriculture. The major Principle crops grown in the mandal are groundnut, paddy, Jowar, Bajara, sunflower Cotton, maize and Chillies.

### G. Land Use and Land Cover Mapping

Land Use and Cover are defined as observed economical physical features on the Surface of the Earth [6].

This procedure is basic fundamental in each and every Geographic Information System and it differentiates with reference to the model (vector or raster) and the origin of data [7].The data input methods area.

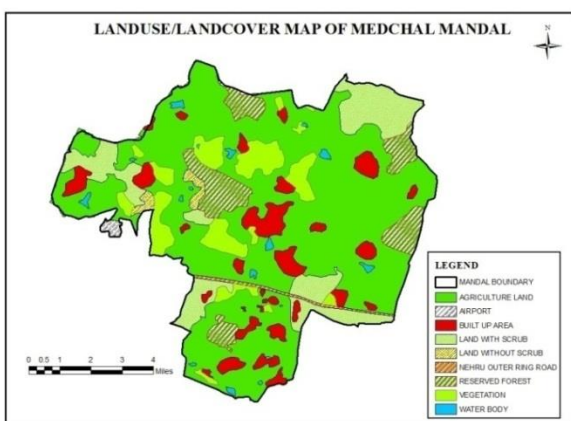
1. Surveying and other ground measurements.
2. Digitizing and scanning of existing maps.
3. Remote sensing, and Photogrammetry,
4. GIS data transfer from other GIS in specific formats.

**H. Land Use Planning**

Planning of land use in rural area has received inadequate concentration in association with town planning until in recent times [8].India is predominately agricultural country. The development of land use planning is not recent in its origin but its practice is truly recent [9]. The Landuse/Landcover map gives comprehensive clear depiction to the decision makers and planners for determining future planning of agricultural and urban sector in order to maintain land potentials. Planning of Land use for sustainable future use and meeting the needs of the society. Satellite data for the large areas are available to determine the natural resources and investigation surveys within short phase of time has forced us to use the information for development and planning. [10].

**I. Land Use and Land Cover Information of the Mandal**

In the study area the land use and land cover is categorized in eight classes i.e., agricultural lands, water bodies, vegetation, reserved forest, land with scrub, airport, land without scrub, Nehru Outer Ring Road etc shown in figure no. 5 and Table No.1. Gives the categories of land use and land cover.Study area categorized into eight classes i.e., agricultural lands, built-up area, water bodies, forest scrub and others as shown in the Table 1. The table gives details about these classes of land along with their areal extent.

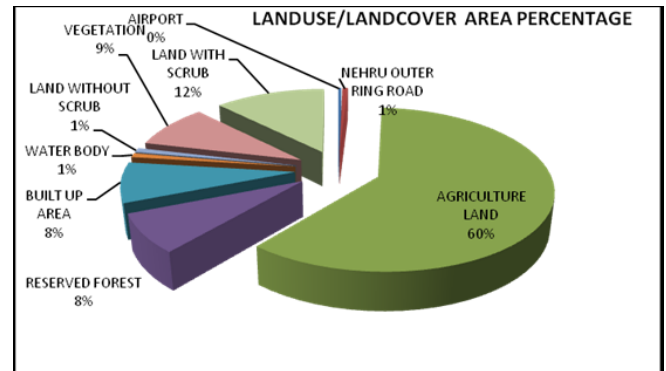


**Land use/Land cover Map of the MedchalMandal  
Figure 5**

**Table 1 Showing Land Use/landcover classes with Area in sqkm and Hectares**

S.No.	FEATURE	(Sq.Km)AREA	AREA (hectatre)
1	AIRPORT	1.22	122.207
2	NEHRU OUTER RING ROAD	2.14	214.859
3	AGRICULTURE LAND	208.8	20887.6
4	RESERVED FOREST	26.8	2685.09
5	BUILT UP AREA	28.12	2812.58
6	WATER BODY	3.05	305.205

7	LAND WITHOUT SCRUB	3.14	314.262
8	VEGETATION	30.81	3081.4
9	LAND WITH SCRUB	42.8	4288.52
10	TOTAL AREA	347sq. Km.	34711.72



**Showing percentage of Area covered in the Mandal  
Figure 6**

**Water Bodies**

The lakes, reservoirs and tanks are incorporated in water bodies category. All of the tanks are varying in different sizes within the MedchalMandal. The water bodies present in the mandal are utilized for drinking and Irrigation purpose. The water bodies in mandal cover an area 3.05 km<sup>2</sup>

**Agricultural Land**

Agricultural land are mainly utilized for producing fibre, food, horticultural and commercial crops. The land in the given study area supports both Rabi and Kharif crops. Maximum area is covered as agricultural area. In MedchalMandal out of total area of 208.8 sq km is covered as agriculture area.

**Land with Scrub**

The areas which are covered with land with scrub are chemically degraded shallow, moderate-to-steep slope and mostly spread over with densities and variation in heights. In this category the total area covered is 42.8 km<sup>2</sup>.

**Forest and Vegetation**

The forest category includes vegetated area and reserved forest. Total area covered with forest in the mandal is 26.8sq km and 30.81sqkm.

**Built up Land Area**

Built up land area are human settlements urbanized as a result of rigorous use of land other than agriculture. Mediciti Institute of Medical Sciences located at Ghanpur village and Few major Engineering college like CMR Group o Institutions in Kandlakoya village. Total Built up area in the mandal is 28.12 sqkm. Many of the industries are located in most of the villages. The major industries are ShanthaBiotechnics(P) Ltd. And Ultra Tile(P) Ltd. Located at Atevelle village and Kistapur village of MedchalMandal.



## VI. CONCLUSION

GIS and Remote Sensing technology data is the ultimate solution result for the coverage of large extent areas. Different types of layers are prepared from remotely sensed data and ArcGIS 10.2.1 version Software. In the present study analysis is carried out by primary information which was generated from remote sensing data. Digital data layers were generated for base map, drainage map and land use/land cover map. Different categories of land information are extracted by using satellite images from National Remote Sensing Centre (NRSC) and Toposheet data from Survey of India (SOI). GIS is Decision support system which helps planners of the infrastructure development and the decision makers to take correct decision for sustainable development and also helps developers, engineers in environmental study, planning of the town and resource management. In the present study area work applications of Remotely Sensed data and GIS data is applied accurately intended for depicting existing land use/ land cover classes in medchal mandal.

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