

# Mapping Land Use & Land Cover: A Case Study of Jhajjar District, Haryana

Mohan Lal\*

Student, Department of Geography, Rohtak

**Abstract** – Land use refers to man’s activities on earth, which are directly related to land, whereas land cover denotes the natural features and artificial constructions covering the land surface. Land use practices of a region are influenced by a number of parameters namely physical and chemical environments, socio-economic factors and needs of the masses. This study involved secondary data collection mainly from Indian remote sensing satellite- IRS LISS III satellite data.

**Key Words:** Land Use, Land Cover, Change

-----X-----

## INTRODUCTION

The terms land use and land covers are not synonymous and the literature seeks attention to their differences so that they are used properly in studies of land use and land cover change. “Land covers are biophysical state of the earth’s surface and immediate subsurface” (Turner et al. 1995). It describes the physical state of the land surface; e.g., cropland, mountains or forests. Land cover deals with, for example, the quantity and type of surface vegetation, water, and earth materials (Meyer and Turner, 1994).

“Remotely sensed imageries provide an efficient means of obtaining information on temporal trends and spatial distribution of urban areas needed for understanding, modelling and projecting land changes” (Elvidge et al. 2004).

The term land cover originally referred to the type of vegetation that covered the land surface but has broadened subsequently to include other aspects of the physical environment also, such as soils, biodiversity and surfaces, and groundwater (Moser, 1996).

## STUDY AREA

The origin of name of Haryana is controversial and has many diverse interpretations. According to imperial Gazetteer of India, Haryana is probably derived from the word, Hari and thus it reminds us of times when the land of this region was rich and fertile. Thus, this name points out that there was a time when this land was treasury of greenery and prosperity.

The location of every place on earth has two types. The first is absolute and second relatively. The absolute location of Haryana state is 27° 39' N to 30° 55' 5" N latitudes and 74° 27' 8" east to 77° 36' 5" E longitudes. This state constitutes a significant part of Great Plains of India. The state covers an area of 44212 km<sup>2</sup> and comprised of 21 districts at the time of 2011. Along the eastern margin of state, it is bounded by the river Yamuna.

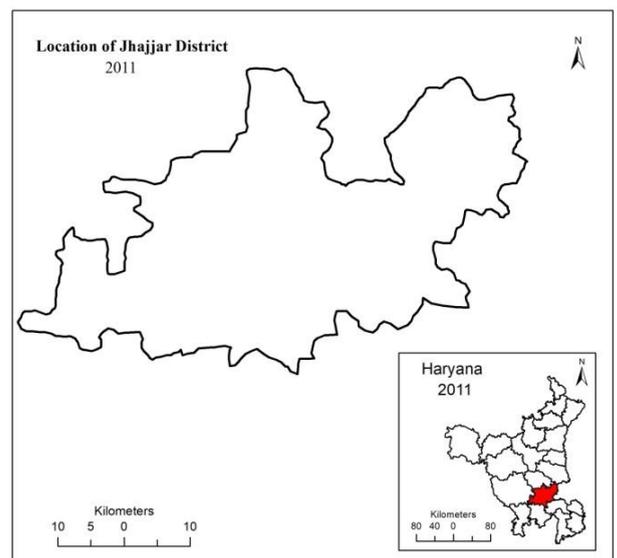


Fig.1.1 Location Map of Study Area

## DATABASE AND METHODOLOGY

GIS technology can be integrated into any enterprise information system framework. The processing of geographically referenced data is the unique feature of GIS. Geographical data shows

both the location and characteristics of spatial features on earth. Therefore two data components are involved in GIS. The data for the present study has been taken from both primary and secondary sources. A brief description of data used in present study is given below: Secondary data sources are IRS LISS- III Map (1:50,000) and Administrative Map of Jhajjar District from survey of India.

**OBJECTIVE**

- To map the land use/ land cover of Jhajjar District in Haryana

**RESULT AND ANALYSIS**

**Urban Land Use/Land Cover**

The first objective of the study, e.g. to prepare LULC map of Jhajjar District using map prepared by IRS based on LISS-III data (2018), has been obtained for this chapter. This map shows the features of the first level as depicted the classification scheme. It includes the features of built-up urban, wasteland, agriculture land, water bodies, transportation, vacant land, wetland features.

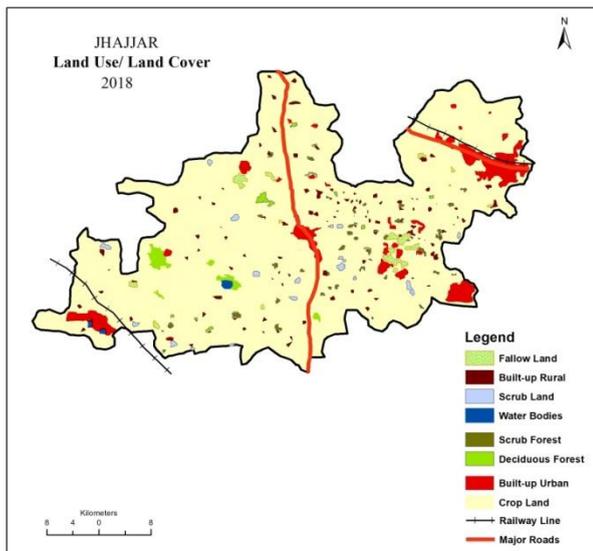


Fig.1.2

**Table 1.3: Land Use/Land Cover Profile of Jhajjar District**

Land Use/Land Cover	Area (in km <sup>2</sup> )	Area (in %)
Crop Land	1730.20	94.92
Fallow Land	9.40	0.52
Wasteland	24.86	1.36
Water Bodies	8.80	0.48
Grass Land	15.10	0.82
Forest	4.47	0.25
Built-up, Rural	9.30	0.52
Built-up, Urban	20.70	1.13
Total	1822.83	100

Source: Computed by Author

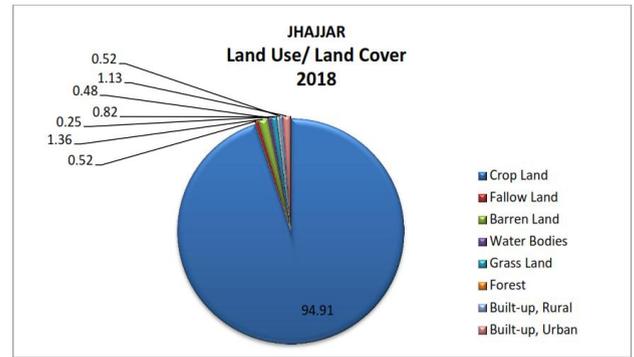


Fig 1.3: Land use/ Land cover Pattern of Jhajjar District, 2018

**ANALYSIS OF LAND USE AND LAND COVER CLASSES**

**Built-Up Land**

It is an area of human habitation developed due to non-agricultural use and that has a cover of buildings and transport and utilities in association with water, vegetation, and vacant lands. The study area LULC map consists of 3 classes under built-up viz., urban, rural and transportation.

It includes residential areas, mixed built-up, recreational places, public / semi-public utilities, communications, public utilizes/facility, commercial areas, reclaimed areas, vegetated areas, transportation, industrial areas and their dumps, and ash/cooling ponds. The urban built-up area of Jhajjar district has been analyzed with the help of remote sensing and GIS. The Urban built-up area alone covers 20.70 km<sup>2</sup> out of 1822.83 km<sup>2</sup> of the total area of Jhajjar district (1.13%). It is an area of human settlements comprising the residential area, transportation and communication lines, industrial and commercial complexes, utility and services etc. collectively cities, towns, and habitations are included under this category. These are the lands used for the human settlement of size comparatively less than the urban settlements of which the majority of the population is involved in the primary activity of agriculture (more than 25 per cent of workers are engaged in agricultural activities). These are the built-up areas, smaller in size, mainly associated with agriculture and allied sectors and non-commercial activities. They can be seen in clusters non- contiguous or scattered. Rural built up area alone covers 9.30 km<sup>2</sup> out of 1822.83 km<sup>2</sup> of the total area of Jhajjar district (0.52 per cent).

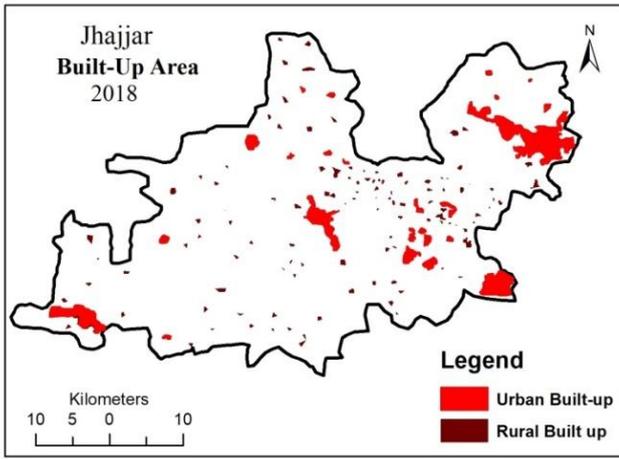


Fig.1.4

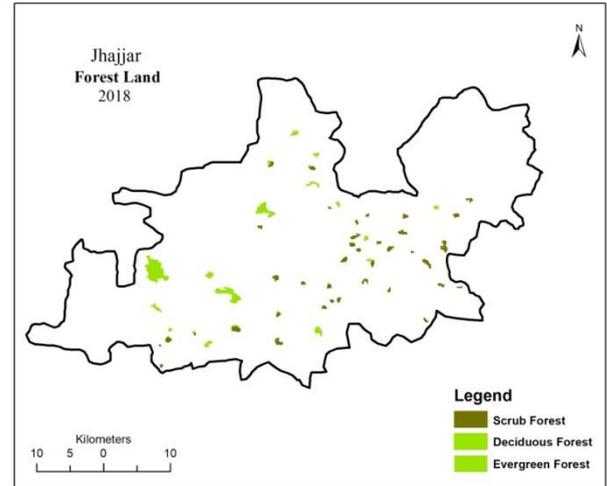


Fig.1.5

## FOREST

The forest area refers to the land with a tree canopy cover of more than 10 percent and area of more than 0.5 ha. Forests are determined both by the presence of trees and the absence of other predominant land uses. The trees should be able to reach a minimum height of 5 m (MOEF, 2011). Only 0.25 per cent of the total area is covered by forest. It consists of: It consists of the phenology of perennial plants that are leafless for a certain period of the year (Ford-Robertson, 1971). The leaf shedding usually takes place simultaneously in connection with the unfavorable season (UNESCO, 1973). These kinds of forest are predominantly composed of species, which shed their leaves once a year, especially during summer. It also includes tree clad area with tree cover lying outside the notified forest boundary areas that are herbaceous with a woody appearance e.g. bamboos, palms, tree ferns etc. These are the forest areas which are generally seen at the fringes of dense forest cover and settlements, where there is biotic and abiotic interference. Most times they are located closer to habitations. Forest blanks which are the openings amidst forest areas, devoid of tree cover, observed as openings of assorted size and shapes as manifested on the imagery are also included in this category.

## Wasteland / Water Bodies

All submerged or water-saturated lands, natural or man-made, inland or coastal, permanent or temporary, static or dynamic, vegetated or non-vegetated, which necessarily have a land-water interface, are defined as wetlands. It consists of:

### Wasteland

Degradation of land is caused by biotic and abiotic pressures. An increasing population places enormous demands on land resources. The wasteland has only 1.36 per cent of the Jhajjar district geographical area. It has 24.86 km<sup>2</sup> area out of 1830 km<sup>2</sup>.

### Water Bodies

This category comprises areas with surface water in the form of ponds, lakes, tanks, and reservoirs. 8.80 km<sup>2</sup> area out of 1822.83 km<sup>2</sup> lies under water bodies which consist 0.48 per cent area.

## CONCLUSION

The study demonstrates the importance and potentiality of Satellite Remote Sensing and Arc GIS technique for preparation land use/land cover for future planning, management, and development of any area. Present study is based on interpretation of map of land use/land cover mapping prepared by IRS based on LISS-III data

This Study revealed eight major land use/land cover categories in the study area which are - built-up, agricultural land, wasteland, water bodies, grassland, scrubland etc. Out of study total area 94.92 per cent is come under cropland whereas 1.13 per cent is used for urban built-up land and 0.52 per cent in rural built-up area. Residential and Industrial are the major land use in the built-up

area. Some other category in the study area like a forest, water body and grassland which occupied 0.25, 0.48, and 0.82 per cent respectively of the study area.

## REFERENCES

- Elvidge, C. D. et. al. (2004). Land change science: Observing, monitoring, and understanding trajectories of change on the earth's surface Dordrecht, Netherlands: Kluwer Academic publishers, 315-328.
- Lillesand, T. M. et. al. (2009). Remote Sensing and Image Interpretation: India, Publication Wiley.
- Meyer, W.B. and B.L. Turner, eds. (1994). Changes in Land Use and Land Cover: A Global Perspective. Cambridge: Cambridge University Press.
- Meyer, W.B. and B.L. Turner (1996). Land-Use/Land-Cover Change: Challenges for Geographers, *Geojournal*, 39(3): pp. 237-240.
- Moser, S.C. 1996. A Partial Instructional Module on Global and Regional Land Use/Cover Change: Assessing the Data and Searching for General Relationships. *Geojournal*, 39(3): pp. 241-283.
- Turner, B.L. II, D. Skole, S. Sanderson, G. Fischer, L. Fresco, and R. Leemans (1995). Land-Use and Land-Cover Change; Science/Research Plan. IGBP Report No.35, HDP Report No.7. IGBP and HDP, Stockholm and Geneva.

---

### Corresponding Author

**Mohan Lal\***

Student, Department of Geography, Rohtak

[kaushikmohan3048@gmail.com](mailto:kaushikmohan3048@gmail.com)