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GEOSPATIAL TECHNIQUES APPROACH FOR LANDUSE AND LANDCOVER CHANGE ANALYSIS IN BALTANA OF ZIRAKPUR, PUNJAB AND PART OF SECTOR-19, PANCHKULA CITY, HARYANA

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Research Article

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ABSTRACT

In urban area information on landuse and land cover is important for monitoring, planning and management land resources. Remote sensing satellite data and Geographical Information System (GIS) are vital tools in mapping of land use and land cover in urban areas because of availability of historical high resolution satellite data. In the present study landuse and landcover change analysis have been done in Baltana area of Zirakpur of Punjab and part of Sector-19, Panchkula city,Haryana. The study area is located between the latitudes 30°40'50.62”N to 30°40'6.91”N and longitudes 76°49'18.18”E to 76.50'5.61”E. The study area covers an area of 96.49 Hect. Google earth satellite data for the years 2002 and 2018 have been used in the study for change analysis in land use and land cover. The study shows that during 2002 to 2018 built-up area increased 29.57 Hect., agriculture land increased 2.92 Hect., agriculture plantation area increased 1.48 Hect., park area increased 0.54 Hect, road area increased 7.53 Hect,, vacant land area decreased 41.30 Hect and drainage area decreased 0.74 Hect. This study is highly useful for planning and management of land use and land cover in the study area.

Keywords: Landuse, landcover, change analysis, satellite data, Baltana, Panchkula.

INTRODUCTION

In the present fast developmental era availability of latest information about natural and cultural resources is become important for better planning and management. Remote sensing satellite data are highly useful for mapping of latest status of natural and cultural resources. Geographical Information System (GIS) provides a better presentation of data in spatial form. For mapping of landuse and landcover and change analysis remote sensing satellite data and GIS are very important tools. Availability of historical satellite data and presentation in GIS makes the interpreted data a meaningful source for planning and management land resources. Anchan et al.(2018), Basha et al. (2018), Bazgeer et al. (2008), Bello et al. (2014), Borsah et al. (2018), Kleemann et al. (2017), Sarkar (2018), Muke and Haile (2018), Prakasam (2010), Ramamoorthy et al. (2016), Setiawan and Yoshino (2012), Vidhya and Thomas (2018) have done good work on mapping of land use and land cover using satellite data and GIS.

STUDY AREA

Baltanaarea of Zirakpur of Punjab and part of Sector-19, Panchkula city have been selected for the landuse and land cover change analysis. The study area is located between

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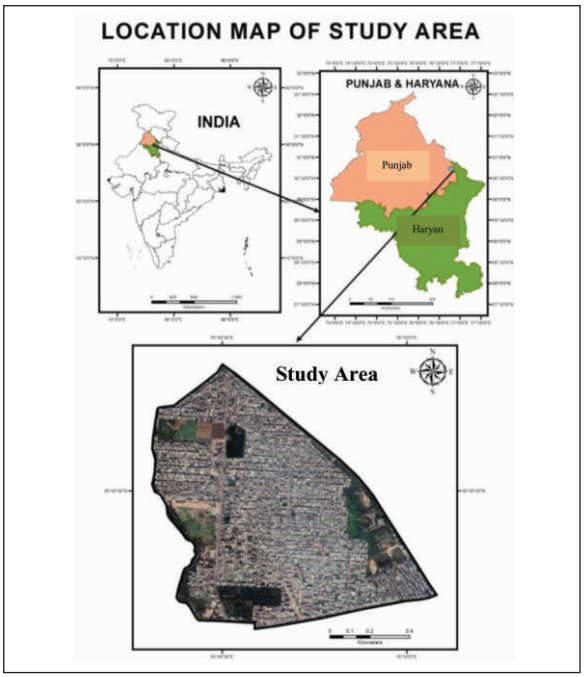

Fig.1: Location map of study area.

the latitudes 30°40'50.62"N to 30°40'6.91"N and longitudes 76°49'18.18"E to 76.50'5.61"E. The study area covers an area of96.49Hect. (Fig 1).

OBJECTIVE

The main objective was to study land use / land cover changes in the study area.

MATERIALS USED AND METHODOLOGY

Satellite data for the years 2002 and 2018 have been downloaded from Google Earth. ArcGIS 10.4 software has been used for data georeferencing, interpretation and presentation. Both dates satellite data have been interpreted for land use and land cover classes. At selected locations field visit was done to check the interpreted land use and land cover classes. Final land use and land cover maps have been prepared for the years 2002 and 2018. Area of each land use and land cover classes of 2002 and 2018 has been calculated and interpreted the results.

RESULTS AND DISCUSSION

Landuse (LU) and land cover (LC) change analysis during the years 2002 to 20018 in the study area are given below:

I. Built-up Land

In the study area built-up land covers an area of 24.59 Hect. in 2002 and 54.16 Hect. in 2018. The built-up land has increased 29.57 Hect during 2002 to 2018 (Fig.2,Fig.3 and Table1).

ii. Agriculture Land

Agriculture land covers an area of 7.13 Hect.in 2002 and 10.05 Hect. in 2018. Agriculture land has increased 2.92 Hect. during 2002 to 2018 (Fig.2,Fig.3 and Table1).

iii. Agriculture Plantation

Agriculture plantation is a form of commercial farming where crops are grown for profits. In the year 2002 there was no agriculture plantation while in the year 2018 agriculture plantation was in 1.48 Hect. Agriculture plantation area increased 1.48 Hect. in 2018 (Fig.2,Fig.3 and Table1).

iv. Drainage

In the study area in 2002 drainage covered an area of 1.38 Hect. and0.64 Hect in 2018. Drainage area decreased 0.74 Hect during 2002 to 2018 (Fig.2,Fig.3 and Table1).

v. Vacant Land

Vacant land was 58.09 Hect. in 2002 and 16.79 Hect. in 2018. Vacant land decreased 41.3 Hect during 2002 to 2018 (Fig.2,Fig.3 and Table1).

vi. Park

In the study area, park covered an area 0.16 Hect.in 2002 and 0.70 Hect.in 2018. Park area increased 0.54 Hect during 2002 to 2018 (Fig.2,Fig.3 and Table1).

vii. Road

Road covered an area of 5.14Hect. in 2002 and 12.67 Hect. in 2018. Road area increased 7.53 Hect during 2002 to 2018 (Fig.2,Fig.3 and Table1).

Table1: Land use/ land cover classes and area (2002 and 2018)

Land use/Land cover Classes	Area (Hect) in 2002	Area (Hect) in 2018	Change in Area (Hect) (2002-2018)
Builtup Land	24.59	54.16	+ 29.57
Agriculture Land	7.13	10.05	+ 2.92
Agriculture Plantation	0	1.48	+1.48
Park	0.16	0.70	+0.54
Road	5.14	12.67	7.53
Drainage	1.38	0.64	-0.74
Vacant Land	58.09	16.79	-41.3
Total	**96.49**	**96.49**	

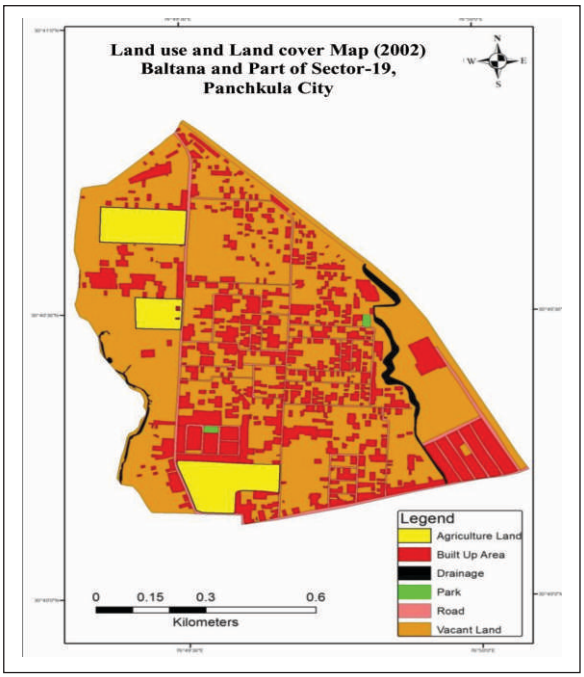

Fig.2: Land use/land cover map (2002)

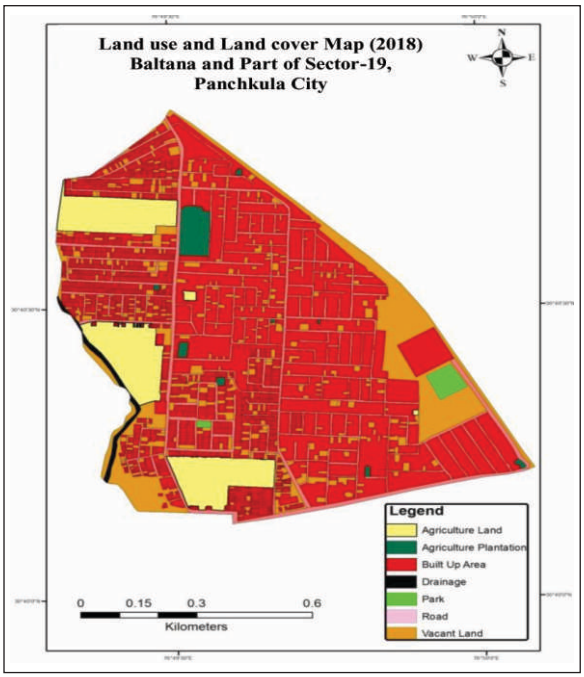

Fig.3: Land use/land cover map (2018).

CONCLUSIONS

The study shows that during 2002 to 2018 built-up area increased 29.57 Hect., agriculture land increased 2.92 Hect., agriculture plantation area increased 1.48 Hect., park area increased 0.54 Hect, road area increased 7.53 Hect,, vacant land area decreased 41.30 Hect and drainage area decreased 0.74 Hect. This study is highly useful for planning and management of land use and land cover in the study area.

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