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SATELLITE DATA BASED LANDUSE AND LANDCOVER CHANGE ANALYSIS IN SOUTHEASTERN PART OF PANCHKULA CITY, HARYANA

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Research Article

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ABSTRACT

Landuse refers to the use of land by human beings while the land cover refers to the natural cover on land. Landuse and land cover mapping is important for better developmental planning purpose. In the present time remote sensing satellite data, geographical information system (GIS) and global positioning system (GPS) are widely used in mapping of land use and land cover. In the present study landuse and land cover change analysis of southeastern part of Panchkula city have been done using Google Earth satellite data of 2002 and 2018. Satellite data downloaded from Google Earth and geo-referenced in ArcGIS 10.4 software.Landuse and landcover classes had been interpreted and field visit was done at selected location to check the interpreted data. Final maps were prepared and area of landuse and land cover classes were calculated. The study shows that during the year 2002 to 2018 built-up land area increased 95.01Hect, agriculture land area increased 1.24Hect., river course area decreased 20.35 Hect., vacant land area decreased 119.43Hect., park area increased 14.64 Hect., open scrub area decreased 7.82 Hect., road area increased 7.21 Hect.,water body area increased 0.02 Hect. and forest area increased 30.48 Hect. The study can be used for monitoring land use and land cover for planning purpose in the study area.

Keywords: Landuse, landcover, satellite data, Panchkula, Haryana.

INTRODUCTION

Water is important for survival of all the living beings on the Earth. The present developmental activities have put stress on water quantity and quality. Though water quantity and quality play vital role in the existence of living beings and infrastructure but the role of good quality water is more than quantity of water. In urban areas groundwater is deteriorated due to anthropogenic pollution sources like household sewage waste and industrial waste disposals. Prakash and Somashekar (2006), Deshpande and Aher (2012), Rao *et al*. (2013), Alhababy *et al*. (2015), Annapoorna and Janardhana (2015), Spanos *et al*. (2015), Srinivas *et al*. (2015), Madhav *et al*. (2018), Siddiqui *et al*. (2018), Hanumantharao, *et al*. (2019) have studied groundwater quality in urban areas.

STUDYAREA

The study area Baltanais a part of Zirakpur in Mohali district, Punjab and Sector-19 of Panchkula city in Haryana. Baltana is located at a distance of 2.7 kms from Chandigarh connected by the Zirakpur Panchkula-Kalka highway NH-5. The study area is falling between the latitude30°40'50.62"N to 30°40'6.91"N and longitude76°49'18.18"E to 76.50'5.61"Eand covers an area of9.649Km^2 (Fig 1).Baltana has changed from agriculture sector to residential and industrial sectors.

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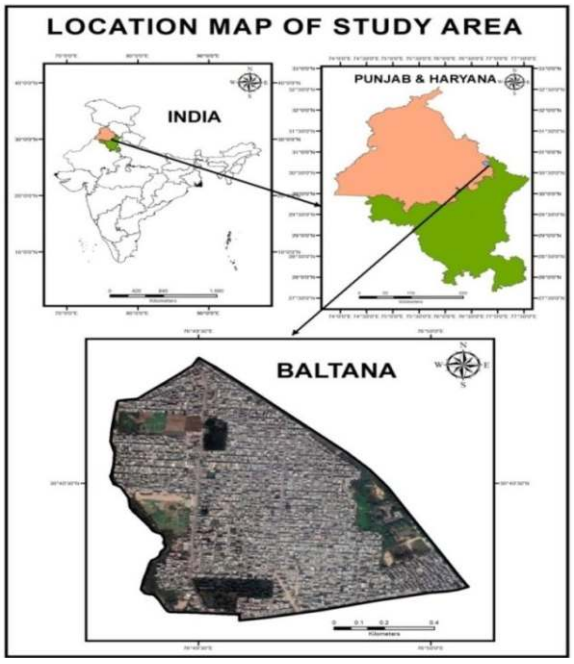

Fig.1: Location map of the study area.

OBJECTIVE

The main objective was to study land use and land cover change analysis in the study area.

MATERIALS USED AND METHODOLOGY

Google Erath satellite data for the year 2002 and 2018 and Arc GIS 10.4 software have been used in the study. Google Earth Free satellite data have been downloaded and geo-referenced in Arc GIS software. Satellite data have been interpreted for land use and land cover classes. Field visit was done to check the land use and land cover classes. Final land use and land cover maps have been prepared and area of each land use and land cover class also calculated. Land use and land cover area have been put in excel software and prepared the bar graph.

RESULTS AND DISCUSSION

The scenario of change in landuse and land cover in the study area aregiven below:

i. Agriculture Land

Agriculture land area was0.46 Hect.in 2002 and 1.70Hect. in 2018. Agriculture land area increased 1.24Hect. during 2002 to 2018 (Fig.3, Fig.4 and Table 1).

ii. Built-up Land

Built-up land area was62.35Hect in 2002 and 157.36 Hect in 2018. Built-up land area increased 95.01 Hect. during 2002 to 2018(Fig.3, Fig.4 and Table 1).

iii. Vacant Land

Vacant land area was295.52 Hect. in 2002 and 176.09 Hect. in 2018. Vacant land areadecreased 119.43Hect. during 2002 to 2018(Fig.3, Fig.4 and Table 1).

iv. Open Scrub

Open scrub area was49.68 Hect. in 2002 and 41.86 Hect.in 2018. Open scrub areadecreased 7.82Hect. during 2002 to 2018(Fig.3, Fig.4 and Table 1).

v. Park

Park area was1.35 Hect. in 2002 and 15.99Hect. in 2018. Park area increased 14.64 Hect. during 2002 to 2018(Fig.3, Fig.4 and Table 1).

vi. Forest

Forest area was37.61Hect. in 2002 and 68.09 Hect. in 2018. Forest area increased 30.48 Hect. during 2002 to 2018(Fig.3, Fig.4 and Table 1).

vii. Road

Road area was55.87Hect. in 2002 and 62.08 Hect. in 2018. Road area increased 7.21 Hect. during 2002 to 2018(Fig.3, Fig.4 and Table 1).

viii. Water Body

Water body area was **0.**21 Hect. in 2002 and 0.23Hect. in 2018. Water body area increased 0.02 Hect. during 2002 to 2018(Fig.3, Fig.4 and Table 1).

Table 1: Change in Land use/Land cover Area (2002 to 2018).

Land use/ Land cover Classes	Area in 2002 (Hect.)	Area in 2018 (Hect.)	Change in Area (Hect.) (2002-2018)
Agriculture Land Built-up	0.46	1.70	+1.24
Land	62.35	157.36	+95.01
Road	55.87	62.08	+7.21
Park	1.35	15.99	+14.64
Forest	37.61	68.09	+30.48
Water Body	0.21	0.23	+0.02
Vacant Land	295.52	176.09	-119.43
Open Scrub	49.68	41.86	-7.82
River	134.55	114.20	-20.35
Total	637.60	637.60	

ix. River

River area was134.55 Hect. in 2002 and 114.20 Hect. in 2018. River area decreased 20.35 Hect. during 2002 to 2018 (Fig.3, Fig.4 and Table 1).

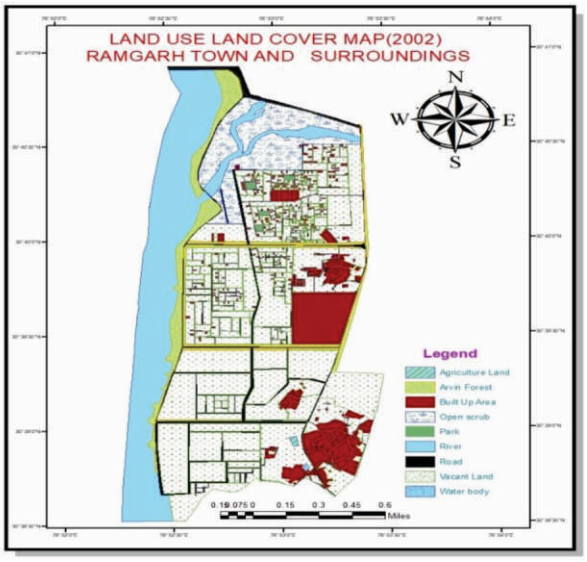

Fig.3: Landuse/landcover map (2002).

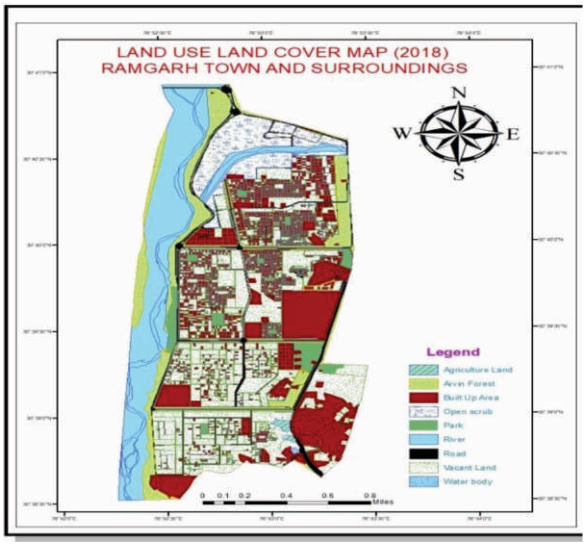

Fig.4: Landuse/landcover map (2018).

CONCLUSIONS

The study shows that during the year 2002 to 2018 agriculture land area increased 1.24Hect., river course area decreased 20.35 Hect., vacant land area decreased 119.43Hect., park area increased 14.64 Hect., open scrub area decreased 7.82 Hect., road area increased 7.21 Hect., built-up land area increased 95.01 Hect.,water body area increased 0.02 Hect.and forest area increased 30.48 Hect. The study is highly useful for monitoring land use and land cover for planning and management purpose.

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