

SPACE BASED TECHNOLOGY FOR LAND USE INFORMATION OF CHHACHHRAULI BLOCK

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Abstract— The Concept of the land use is closely interlinked with human community development. Patterns of human development and land use have shaped the environment locally and globally since prehistoric times. Land is a scarce resource, whose supply is fixed for all practical purposes. At the same time, with the increase in human population and economic growth the demand for land for various competing purposes is continuously increasing. This paper mainly elaborates the land use information of Chhachhrauli block using Cartosat-1(2.5 meter), LISS-IV (5.8 meter) and LISS-IV Mx Fused Image on 1:5,000 scales. Chhachhrauli block lies in north-east and eastern part of the block. Its geographical location between 30° 05' 15" N to 30° 27' 30" N latitude and 77° 16' 15" to 77° 36' 00" E longitude. It covers an area of 559.4 Km²

Index Terms— Land Information System, Legacy data

1) INTRODUCTION

Land Information System (LIS) is an implement for legal, economic decision making and administrative also an aid for development and planning. Planning aims at inclusive, participatory and coordinated approach for local area development to ensure that each Panchayat or local body is treated as a planning unit. India followed annual planning processes in earlier years ignored the role of local bodies such as Districts, Blocks, Panchayat, and Municipalities.

Land use is the human use of territory for economic, residential, recreational, conservational, and governmental purposes Land use involves the modification of natural environment and management or wilderness into built environment such as settlement and semi-natural habitats like pastures, arable fields, and managed woods. It also has been defined as "the total of activities, inputs, and arrangements that people obtain in a certain land cover type.

Major impact of Land use and land management practices on natural resources. To develop solutions for natural resource management issues Land use information can be used such as salinity and water quality. Recent significant effects of land use include soil erosion, urban sprawl, desertification, soil degradation, and salinization. Land-use change, together with use of fossil

fuels, is the major anthropogenic sources of carbon dioxide, a dominant greenhouse gas.

Present development model, together with natural environment features and the consequences of past development activities, determine future development opportunities, and also the need for enhancement or restoration of environmental resources.

2) STUDY AREA

Chhachhrauli block lies in north-east and eastern part of the block. Its geographical location between 30° 05' 15" N to 30° 27' 30" N latitude and 77° 16' 15" to 77° 36' 00" E longitude. It covers an area of 559.4 Km². It is bounded by Bilaspur block in west, Jagadhari block in south, Himachal Pradesh in north and Uttar Pradesh in east and south-eastern part of the block.

India census in 2001, Chhachhrauli had a population of 9720. Males constitute 51% and females constitute 49% of the total population. Chhachhrauli has an average literacy rate of 70%. The climate of the block is characterized by hot and dry summer, southwest monsoon season and a bracing cold season.

The southwest monsoon season commences late in June and continues up to about the middle of September. The average annual rainfall in the district is 1107 mm. About 81% of the annual rainfall in the block is received during June to September whereas about 9 percent is received in the winter month of December to February due to western disturbances. The location map of the study area is shown in figure- 1.

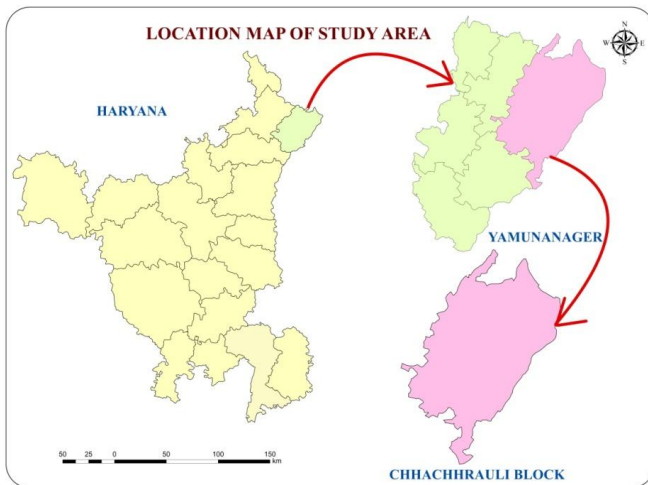


Figure-1

3) MATERIALS & METHODOLOGY

The present paper the Drainage, road and rail network maps were prepared with the help of High Resolution Ortho-Rectified Satellite data Cartosat-1(PAN) by on screen digitization on 1:10,000 scales and LULC maps of the study area was prepared with the help of Cartosat-1(PAN) and LISS-IV Mx merged product.

Legacy data viz. soil; slope, underground water quality & depth were already available for the respective themes as an output of previous mapping exercises. After the integration these layers with HRSI on 1:10,000 scale all legacy maps were composed.

4) RESULTS & DISCUSSION

The Chhachhrauli block, Yamunanagar district is selected as an example for land information system. Chhachhrauli covers an area of 559.4 Km². only. Based on the interpretation of IRS P6 LISS -IV & Cartosat -1 PAN merged data satellite data, the land use/ land cover, roads network, and drainage network were identified in this block. With the help of the legacy data the soils texture, ground water quality and the slope of the study area were also mapped.

This information enabled the local people and planning officials for grass root planning. Crop land is dominant category in Chhachhrauli block because the soils texture is fine in almost. In rural area peoples are mostly engaged in primary activities. The total area under the crop land, which cover 355.42 sq. km. and 62.58% area of the block.

Forest is second dominated category in the block. Forest cover, 108.8 sq. km. area and 19.6% total mapped area of Chhachhrauli block. It is an area of human habitation developed due to non-agricultural use and that has a cover of buildings, transport and communication, utilities in association with water, vegetation and vacant lands. This class is further divided into rural built up (villages, hamlets, mining/industrial & mixed settlement), urban built up (core urban & peri-urban).

The sub built classes like village (BURV) is covered an area 15.54 sq. km., Mining/Industrial (0.14) and Peri- urban (2.33) sq. km. area of the block respectively as shown in table-1. The land use / land use cover area like grassland and grazing land, agriculture plantation, lakes/ponds, forest plantation respectively shown in table-1.

5) CONCLUSION

❖ This paper study about how space based technology is important for land use mapping. The conclusions are as under:

❖ The main purpose of space based technology including all themes viz. LULC, drainage, road network was to create a database for planners to take decision at micro level figure shown as4.

❖ The Infrastructure layer identified state highway, city road, village roads, cart tracks and footpaths as shown in figure-3. This helped the local people and planners to make connectivity studies and proposed new roads in the Panchayat as well in the block.

❖ Drainage map at block level helped in identification of river, stream, drain, main canal, branch canal and distributaries. With the help of drainage map the planners and the local people could plan water harvesting structures and check dams for the study area. The planners can also Proposed canals could be taken up figure shown as 3.

❖ Ground water quality and soils map at block level helped the planners to suggest the sustainable land use plan, the soil is loamy and water quality is good so the famers can be adopt Agri- horticulture and horticulture plantation in that particular area as shown in figure- 6

6) REFERENCES

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TABLE-1: LAND USE/LAND COVER CLASSES OF CHHACHHRAULI BLOCK.

LU/LC Classes	Description	Area (Sq.km.)	Area (%)
AGCR	Crop Land	355.42	62.58
BUUP	Peri Urban	2.33	0.41
WBCN	Canal	7.2	1.27
BURV	Village	15.54	2.74
BUMN	Mining/Industrial	0.14	0.02
BURH	Hamlets	1.61	0.31
FRPL	Forest Plantation	26.24	4.62
WBRS	River	21.61	3.80
GRGR	Grassland/Grazing Land	1.21	0.21
WLSP	Scrub Land Open	9.12	1.61
WBRT	Reservoirs/Tanks	0.04	0.01
WBLP	Lakes/Ponds	0.46	0.08
WLSD	Scrub Land Dense	9.7	1.71
AGPL	Agriculture plantation	8.224	1.45
BUUR	Built Up Urban	0.33	0.06
FRDE	Forest	108.8	19.6

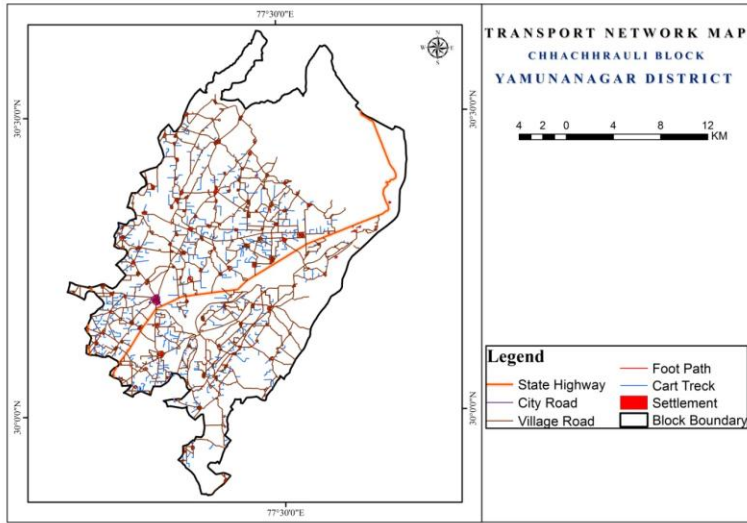


Figure-2

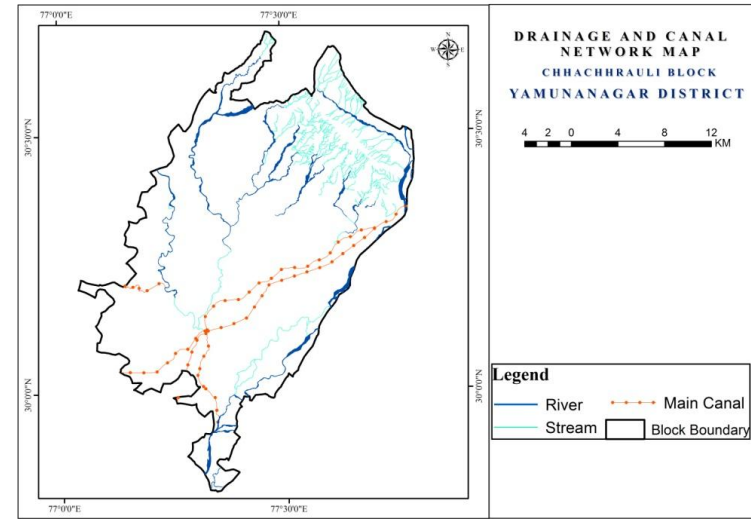


Figure-3

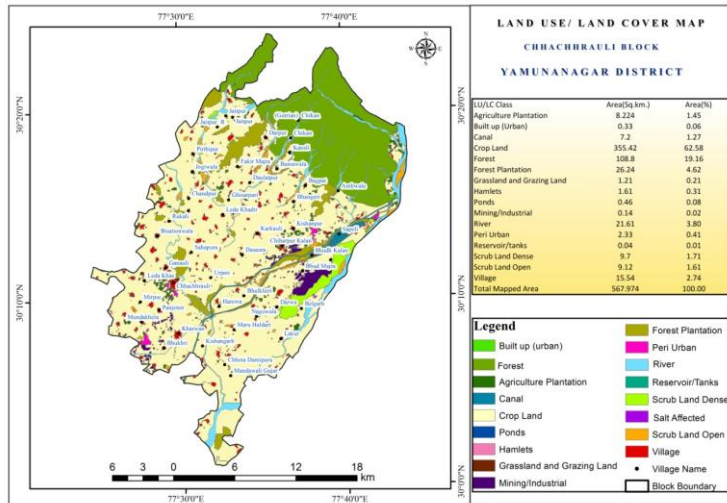


Figure-4

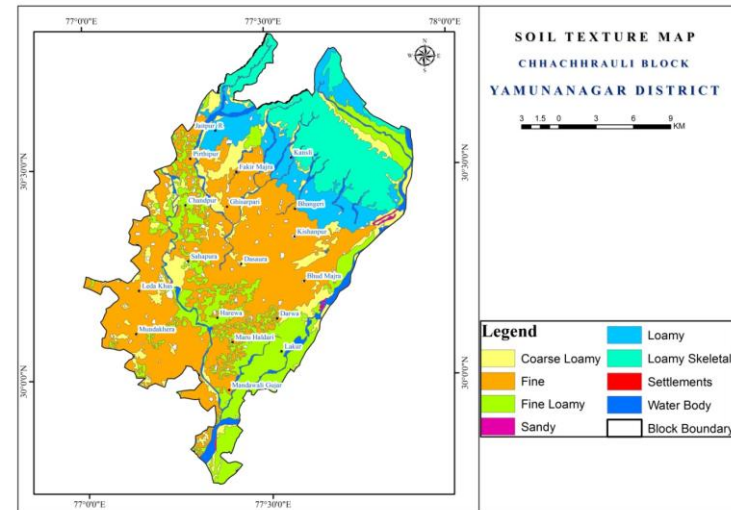


Figure-5

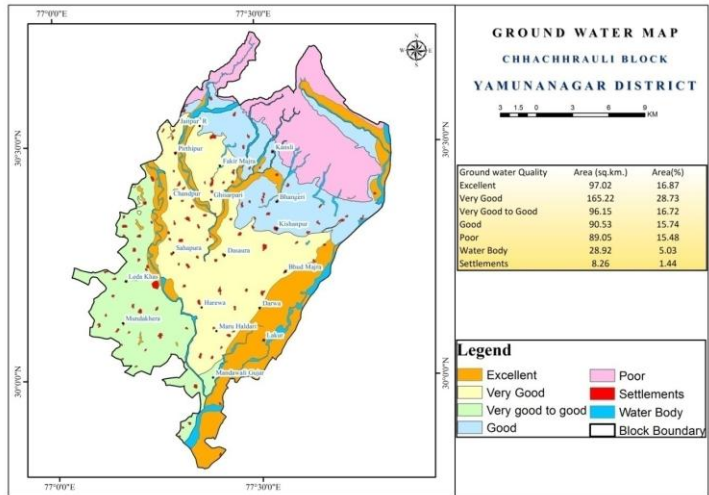


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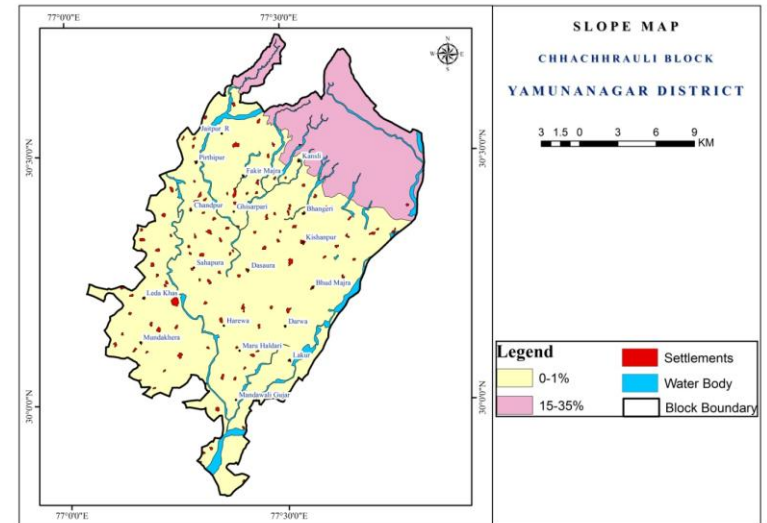


figure-7