

VILLAGE INFORMATION SYSTEM – A CASE STUDY OF MUKLAN VILLAGE, HISAR, HARYANA (INDIA)

Sitender*

Satish Kumar**

Reena***

ABSTRACT:

The decision makers along with planners, policy makers and administrators feel helpless while planning the natural and social wealth of a region, in the absence of accurate information about all kinds of resources at village level. On the other hand planning is now widely accepted as a way to handle complex problems of resource allocation and decision making. For the purpose both spatial and non-spatial data is required. Remote sensing and GIS serves as a powerful tool for storage, handling, retrieving and analysis of spatially correlated data. A suitable information system is required at village level to serve all these requirements. Such information system can provide a more effective and meaningful direction to the planning and development of rural settlements. In this study, high resolution images from Google Earth server has been used for the preparation of large scale base map of Muklan village, Hisar district, Haryana at scale 1:3000 in GIS environment, supported with extensive field survey. Data related to different aspects like population and household size, landuse, type of housing, electricity, telephone facility, sanitation facility, vehicles, water facility, accessibility to water and occupation of the households is collected during field survey. This information is integrated with large scale base map and has been used to develop an information system in HTML environment. The online access to the information will be useful to assess the status of infrastructure facilities and social characteristics of Muklan village which is accessible using www.muklan.webstarts.com/index.htm web address.

Keywords: information system, VIS, hisar, remote sensing, GIS

* Research Scholar, Department of Geography, Kurukshetra University, Haryana (INDIA).

** Student, PGDRS, C.R.M. Jat College, Hisar, Haryana (INDIA).

*** Lecturer, Vaish Mahila Mahavidyalya, Rohtak, Haryana (INDIA).

INTRODUCTION:

In the absence of updated and accurate information about all kind of resources at village level, the government and people of the nation are handicapped in planning and controlling their own destiny (Khan et al, 2005). On the other hand, it is also very difficult to make full use of natural and social wealth that lies in these areas. Besides, planning is now widely accepted as a way to handle complex problems of resource allocation at regional level (Roy et al, 2006). A suitable information system is required at village level to give planning and development a more effective and meaningful direction, at micro level. Management of the information about the village in a web-based environment is called Village Information System (VIS). It deals with both spatial and non-spatial data at village level and comprises of all information related to facilities, infrastructure, population, building type etc. The emergence of remote sensing and geographic information system as a powerful tool for spatial analysis and storage has alleviated the problem by computerization of the spatial data (Ravindran, 2006). This new technology can reduce the time and cost for the development of an information system and help the planners in organizing the data to arrive at precise conclusion and decisions.

In the light of above discussed views, the present study aims at the development of a web enabled information system for Muklan village, Hisar District, Haryana. For this purpose, a large scale base map was prepared using RS and GIS techniques with integration of primary data collected through primary survey at household level to get the status of infrastructure facilities and social characteristics at village level.

STUDY AREA:

The village Muklan lies between 29° 05' N to 29° 09' N latitude to 75° 62' E to 75° 67' E longitude covering an area of 2386.1 acres. It is situated on the Hisar-Rajgarh highway about 15 km from Hisar city, Haryana. Muklan village is inhabited by 2964 persons who are dominated by Jats. Agriculture is the dominant land use type in the village as about 89 percent land is devoted to this activity and is the prominent occupation of the villagers. Of the total 507 households about 76 percent household's livelihood depends on agriculture. About 97 percent population of the

village is settled with in lal dora (defined settlement boundary by revenue department) and only 1 percent lives in Dhani (hamlets).

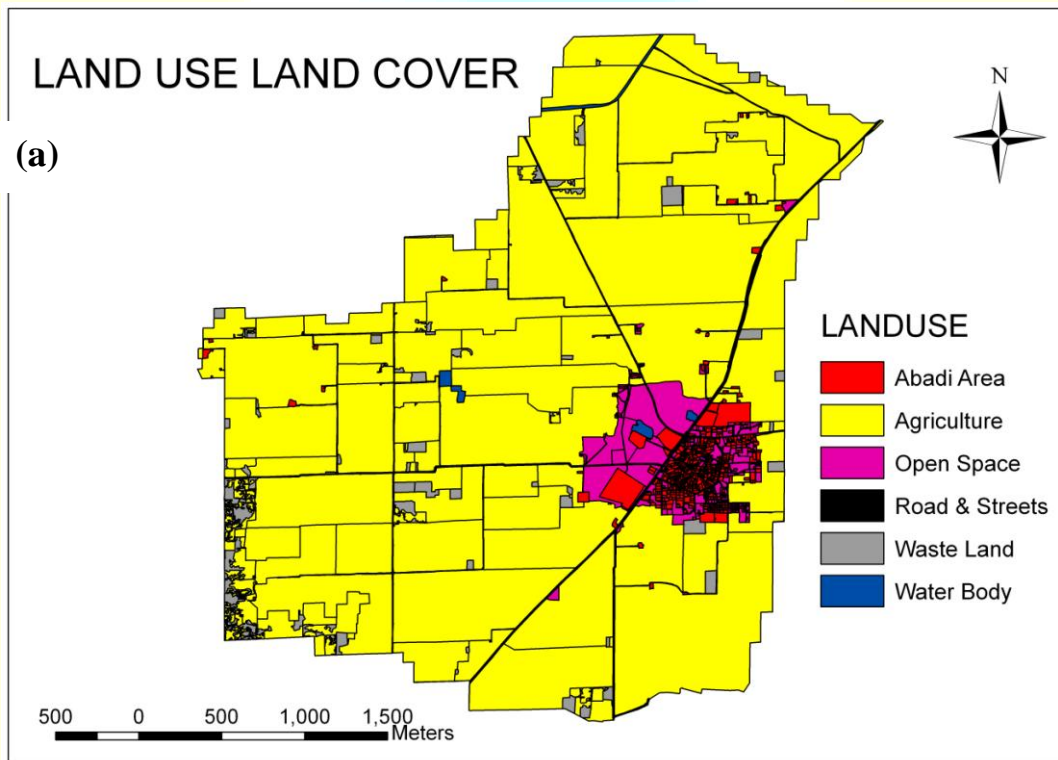
DATA USED METHODOLOGY:

In this study, both primary and secondary data is used to develop the information system. Secondary data like Survey of India toposheets and Sajra (Cadastral map of the village) was acquired from concerned departments. Satellite image are downloaded from Google Earth server on 12 July 2009 in 30 tiles. These tiles are then mosaicked using Adobe Photoshop and image to image registration is done using ERDAS with the help of PAN sharpen multi spectral LISS III image of the village. With the help of Sajra, boundary of the village was delineated and a subset of the village was carved out. Large scale base map of the village including the demarcation of individual buildings in abadi area (human settlement part), is prepared using basic elements of image interpretation and extensive field survey. The household level information related to population and household size, land use, type of housing, electricity, telephone facility, sanitation conditions of houses, vehicles, accessibility to water and occupation of the households was collected during field survey using questionnaire method and afterwards, transferred on the map. Information system of the village was developed in the HTML environment using Macromedia Dreamweaver MX software. All the required html files were created and linked with each other to develop the information system. These files were then uploaded on webstarts server to make this information system accessible, globally.

RESULT AND DISCUSSION:

Agriculture is the dominant land use type in the village as 88.89 percent area falls under this category (fig.1a). Main crops grown in rabi season is wheat and millet in kharif season. Apart from this, other crops sown are mustard, maize, cotton, fodder, etc. This land use is followed by abadi area which covers 8.93 percent land. Abadi area is further divided into residential buildings, commercial buildings, mixed (residential – cum – commercial), public services (baithaks, aanganwari, school, chopals etc), religious buildings, cattle sheds and vacant plots (fig.1b). Water bodies and roads/streets cover 0.52 percent and 1.66 percent area, respectively.

Total 507 households of Muklan village have a population of 2964 persons (including 1585 males and 1379 females), as enumerated through field survey, with a sex ratio of 870 which is almost equal to the state's average. Household size of the families varies from 1 to 21 and 4 is the average size of household. Jat is the dominant caste in the village which constitutes 52.97 percent of the total population. It is followed by dhanak (11.27 percent), chamar (10.22 percent), nayak (7.60 percent), pandit (4.40 percent), sunar (3.75 percent), khatri (2.56 percent) and khati (1.51 percent), nai (1.45 percent), baniya (1.20 percent), balmiki (0.86 percent), luhar (0.64 percent) and other caste like kumhar, chipi, darji and swami constitute 1.57 percent of the total population of village.



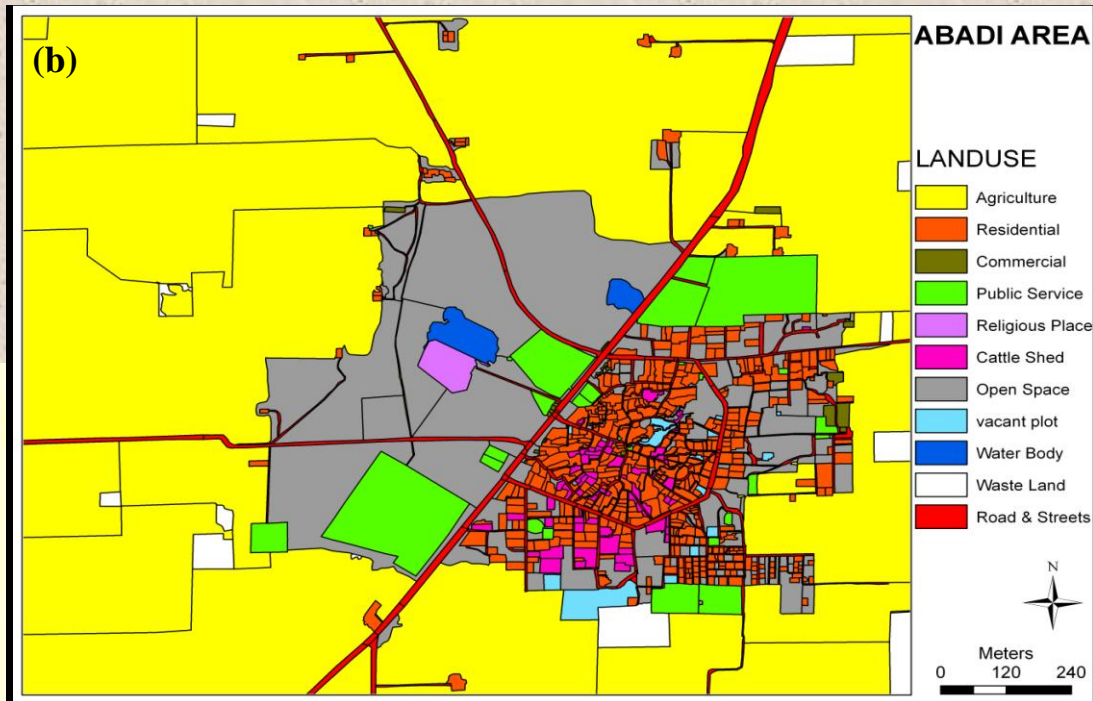


Figure 1 Land use Land cover Maps

In the village only 12.62 percent households do not have sanitary facility and the rest 87.38 percent households have sanitary facility either located inside the house or outside of the house (fig.2a). About 88.76 percent houses in the village have electricity connections while 11.24 percent uses some other modes of light (fig.2b). Majority of households in the village have water facility inside the house by means of government supply or hand pumps (93.90 and 2.36 percent). Rest 3.74 percent households fetch water from common taps installed in streets (fig.2c). In case of telephone facility, 75.54 percent households enjoy this facility out of which 2.76 percent households have only landline connections, 67.66 percent households have only mobile connections and 5.12 percent households have both landline and mobile connections while 24.46 percent households do not have access to any of this facility (fig.2d). Such households either use PCO's in the village or depend on the neighbored households to communicate with their relatives. Out of 507 households, 86.58 percent households have pacca house and 13.42 percent has semi pacca houses (fig.3a). Pacca houses have roofs made up of concrete material and bricks in the wall of such houses are layered using cement whereas bricks in the wall of semi pacca houses are also layered using cement but the roof of such houses is made up of mud and wood. If

we talk about roof type 81.46 percent households have pacca roofs made with concrete material and only 18.54 percent households have made their roofs with mud and wood but top visible part is pacca, which is considered under semi pacca category (fig.3b). There found two type of families in the village either nuclear (where single couple is living with their unmarried children) and joint families (where more than one couple is living under the same roof). Village Muklan is inhabited by 68.84 percent nuclear and 31.16 percent joint families (fig.3c). In the village 38.46 percent households do not have any type of vehicle at their house whether 61.54 percent owns some kind of vehicle in which cycle and motorbike are dominant. Few houses with enough land for agriculture have cars as mode of transportation. Farming is the leading occupation in the village because 47.53 percent households are engaged in this occupation and 28.21 percent households of the village depends on casual laboring for their livelihood. Most of them are agriculture laborers. While remaining 24.26 percent households are engaged in government service, private service or have their own business (fig.3d). Households with business as their main occupation are running their shops of daily uses goods in the village.

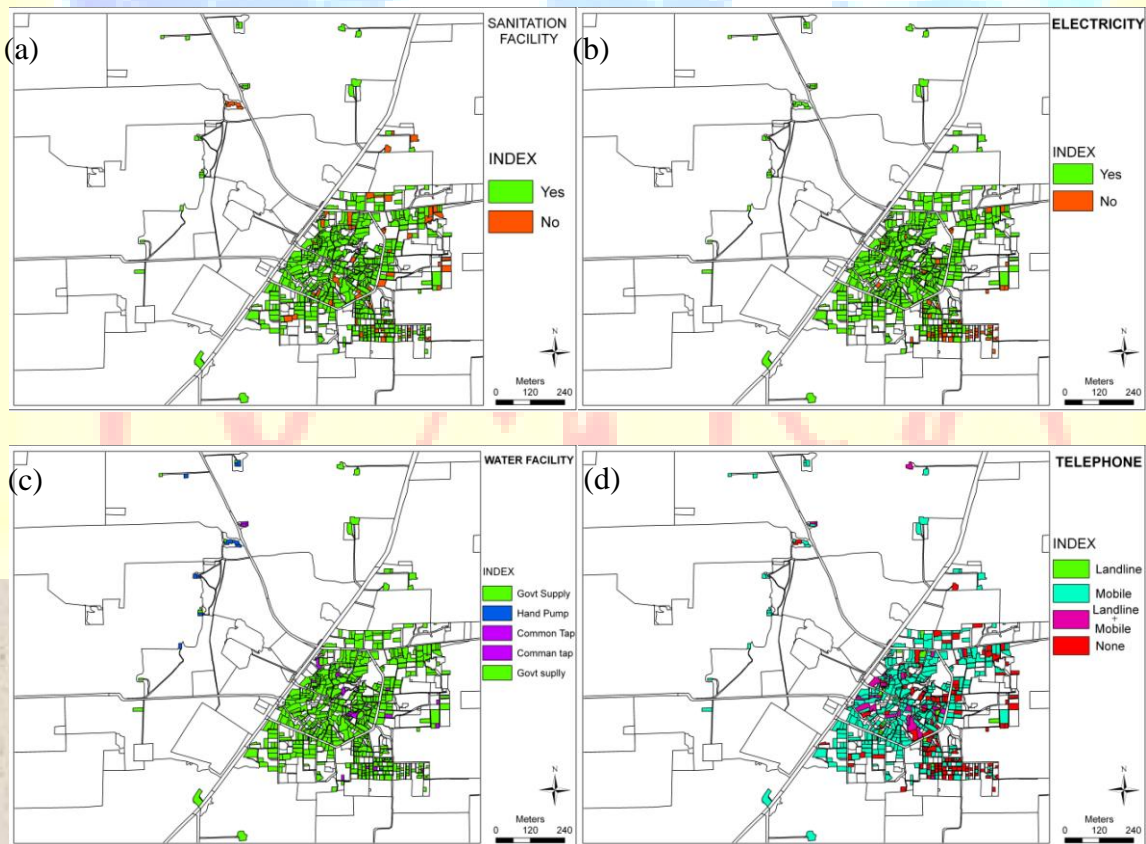


Figure 2 Physical Infrastructure Distribution Maps

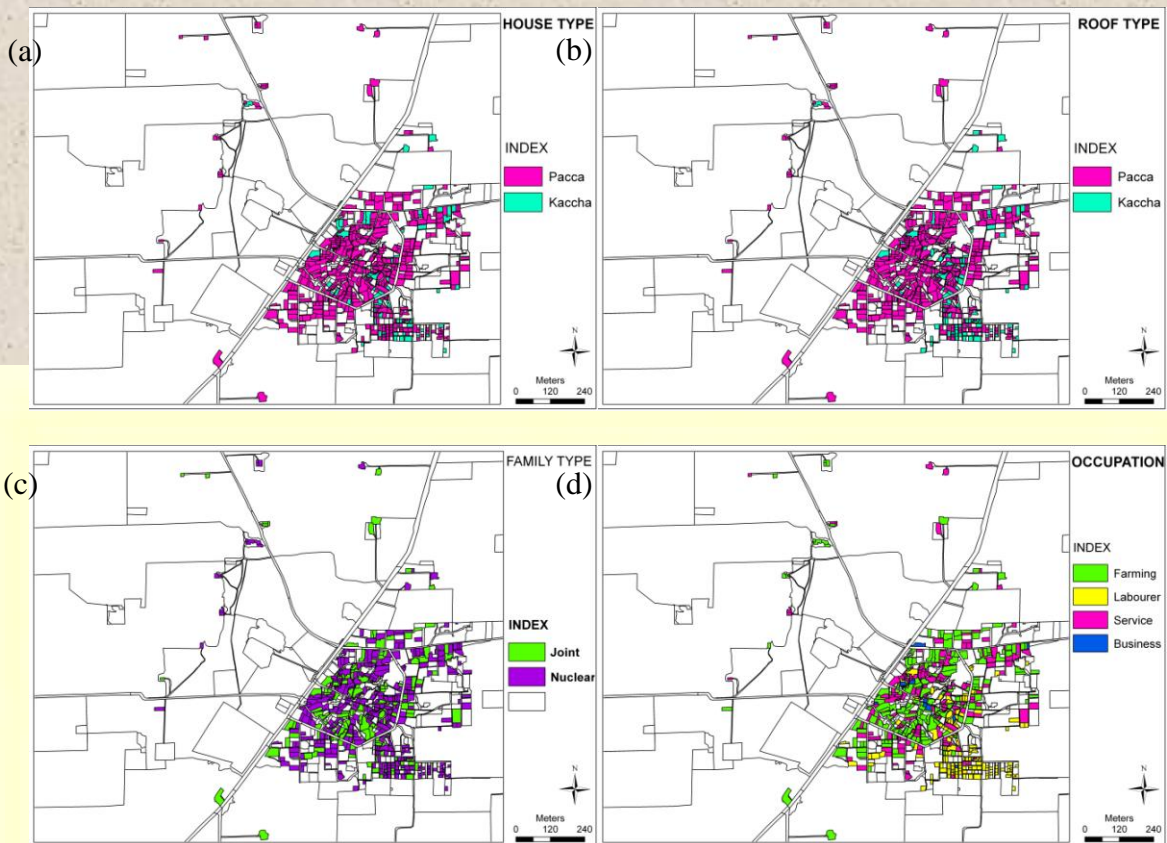


Figure 1 Social Infrastructure Distribution Maps

WEB BASED INFORMATION SYSTEM

A web enabled information system was developed for Muklan village which provides different kind of information about physical infrastructure and socio-economic status at village level. Database developed in GIS environment with the help of high spatial resolution image shows the great potential to investigate the existing scenario at village level. Home page of the information system carries a brief description of the village along with a link to access the base map of abadi area of the village (fig.4a). Single click on the animated text enables to open the zoomed in map of the village displaying individual houses along with house number (fig.4b). Single click on any house number will open the page with socio-economic information related to the clicked house number.

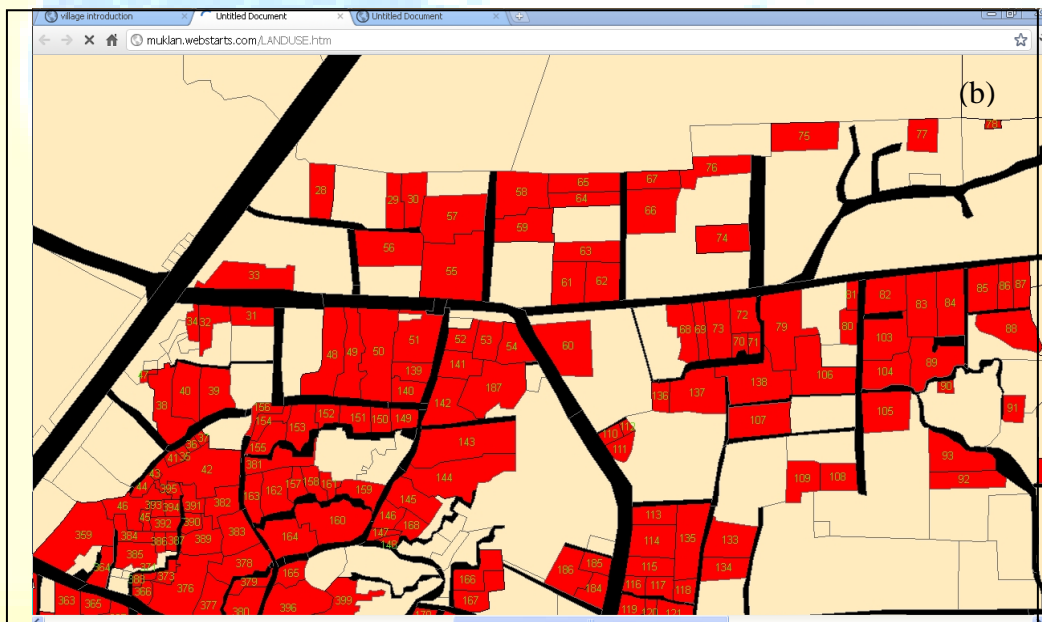


Figure 2 Web Pages of Information System

The information system of Muklan village developed here is accessible using the web address: <http://muklan.webstarts.com/index.htm>. This web enabled information system is designed in a way that rural planners and decision makers can get the information to understand the present scenario of the village for future development. It will also help in the execution of these plans.

Besides any person sitting anywhere in the world having access to internet can get information about the Muklan village in a short duration of time.

CONCLUSION:

For the development of a web based information system, large volume of data is gathered and integrated within geographic information system. Village information system is the study of village at micro level and technique of remote sensing and GIS make this work easier. The forming and sustaining of the information systems in an effective manner depends on construction of up-to-date and accurate base map in digital environment. High spatial resolution satellite data from Google Earth shows the potential in the development of parcel level base map, which is a common data source for information systems. It supports to fulfill a range of planning tasks in an appropriate way at blocks, districts and even at higher levels. The demand for rapid information is encouraging the development of new instruments and takes advantage of the rapid advancement in computer and information technology.

ACKNOWLEDGEMENT:

Authors express gratitude to the Principal, CRM Jat College, Hisar and Chairperson, Department of Geography, Kurukshetra University, Haryana (INDIA) for providing the data and necessary support to carry out this study.

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