

DEVELOPMENT OF PANCHAYAT RESOURCE INFORMATION SYSTEM USING GEOINFORMATICS

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ABSTRACT

The process and practice of planning are getting decentralized to lower area units to make them area specific and responsive to needs of local people. The XIth five year plan (2007-12) lays emphasis on drawing up of development plans by grass root Institutions, capacity building of these institutions and requirement of sharing developmental information with the beneficiaries. The Gram Panchayat is the foundation of the Panchayat System and it is extremely important to empower Gram Panchayat in terms of resource database creation and use of the same for better future. The land, water and the environmental issues related with development attain more importance at the grass root level. The non-availability of reliable information of these precious natural resources and its spatial distribution is a major issue in drawing out developmental plans at the grass root level. The present day planning is mainly dependent on the non-spatial and secondary information. Spatial information of the available resources is a pre-requisite for developing grass root level developmental plans, attaining the goals and for the time bound completion of the developmental-plans. A new wave of technological innovation is allowing us to capture, store, process and display an unprecedented amount of spatial information about natural resources and infrastructure development. Geospatial Resource Information System is designed for the identification and mapping of the local resources spatially and understanding the problems and potentialities of each resource. It provides the basic details in GIS format which serves as a base for planning the development activities of the Departments like Planning, Agriculture, Soil Survey, Soil Conservation, Irrigation, Ground water, Rural Development etc. Geospatial plan helps in upkeep of existing infrastructure, identifying gaps in the existing facilities and planning establishment of an asset based on geo-spatial analysis of various variables including terrain, topography, action plan generation for rural development works, check duplicity of works, measure and monitor distribution of beneficiaries and regional and sub-regional imbalances

1. INTRODUCTION

Recent technological advances in domain of spatial technology are making considerable impact in planning related activities. Timely and reliable information on cost effective manner in spatial and temporal domain, which can act as a reliable base line information on natural resources at scale ranging from regional to micro levels, can be generated by Geographic Information System (GIS), which can help for integrated analysis of natural resources inventory, management and planning the strategy for sustainable development and stand as a power effective administrative and management tool for decision making. The GIS provides an added dimension to data analysis which brings us one step closer to visualizing the complex patterns and relationships that characterize real-world planning and policy problems. In the view of above, a project was undertaken to develop Panchayat Resource Information System of Pujarli Panchayat of Mashobra Block of Shimla District of Himachal Pradesh using geo-informatics. (Ambasta, 2010; Manikkumaran, 1997; Mukherjee, 2011; Scaria and Vijayan 2012).

The Pujarali Panchayat of Mashobra District of Himachal Pradesh has total population of 3450 persons (Male 1750 and Female 1700) respectively. Different State and Centrally sponsored rural development schemes have been implemented in this Panchayat. The detailed spatial (location at the earth) information about land use, terrain features, water resources as well as assets and infrastructure created under these schemes has been maintained in the Panchayat Spatial Resource Information System (PSRIS).

MATERIALS & METHODOLOGY

1.1 Study Area

The Pujarli Panchayat selected for the present study lies in the Mashobra block of Shimla district and is adjoining to the Shimla Urban Area. The elevation of the pujarli panchayat ranges between 1238-1983m meters. Topographically the panchayat is rugged and tough. It has narrow and steep sided valleys with high peaks and dense forests of Kail and Deodar. The climatic conditions of the study area vary due to the variations in altitude

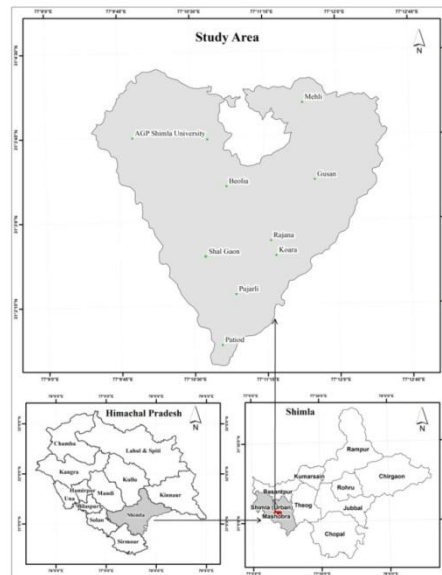


Figure 1 Location of study area

3.2 Data Used

The details of various spatial and non-spatial data used in this study area are given below:

3.2.1 Remote Sensing Data

Cartosat - I images/google images are the basic remote sensing data which has been used for mapping the Panchayats.

3.2.2 Ancillary/Collateral Data

- ✚ Administrative boundary of State, District , Block and Panchayat
- ✚ Panchayat Asset Registers

3.2.3 Ground Truth Data

The location of various natural and manmade resources was determined with the help of Maps and Global Positioning System.

3.3 Mapping & Creation of Geo-database

- ✚ Field Survey: - The Ground Control Points (GCPs) were taken using GPS Mobile (Samsung Wave 525)
- ✚ Geo-Referencing: The satellite data was geo-referenced in Arc GIS
- ✚ Layer Creation: The following raster and vector layers were created in Arc GIS
 - Land use/Land Cover
 - Digital Elevation Model,
 - Drainage,
 - Roads
 - Water Tanks
 - Educational Facilities,
 - Medical Facilities
 - Veterinary Institutions
 - Anganwaris

- Other Socio-economic structures

Map Creation:-The map outlay was created in Arc GIS

4. Results & Discussion

4.1 Land use/Land cover

The total sprawl of the study area is 32.07 sq. km. Approximately 14.37 sq. km, 3.63 sq. km., 12.65 sq. km. and 1.42 sq. km area falls under forest, agriculture and grassland and settlements respectively. The Catchment area of the Sargehen, Goasn and Beolia Villages of Pujarli Panchayat are extensively covered by the rich forests. Vegetables are mainly grown on agriculture area.

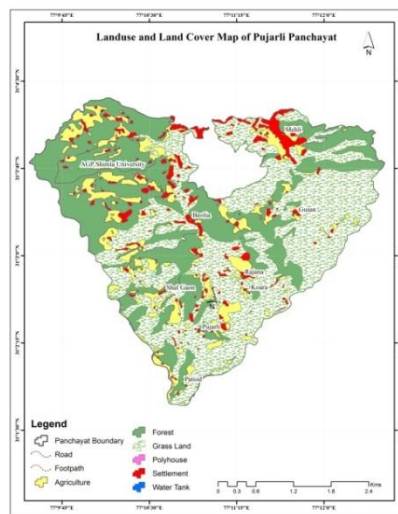


Figure 2: Land use/Land cover map of the study area

4.2 Digital Elevation Model (DEM)

The DEM represents the relief structure (elevation) of the study area. The elevation ranges between 1238-1983m in Pujarli Panchayat of Mashobra block of Shimla district

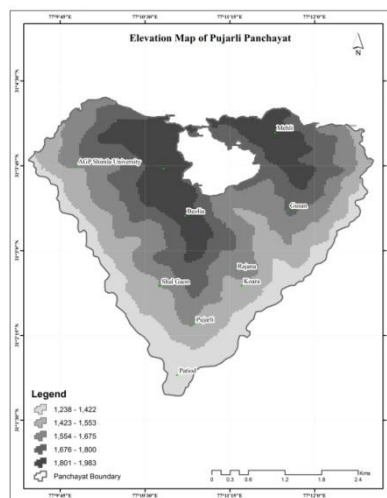


Figure3: Digital Elevation Model (DEM) of the study area

4.3 Drainage

There are three main streams in the study area. These carry excess rain water from hills in the rainy season.

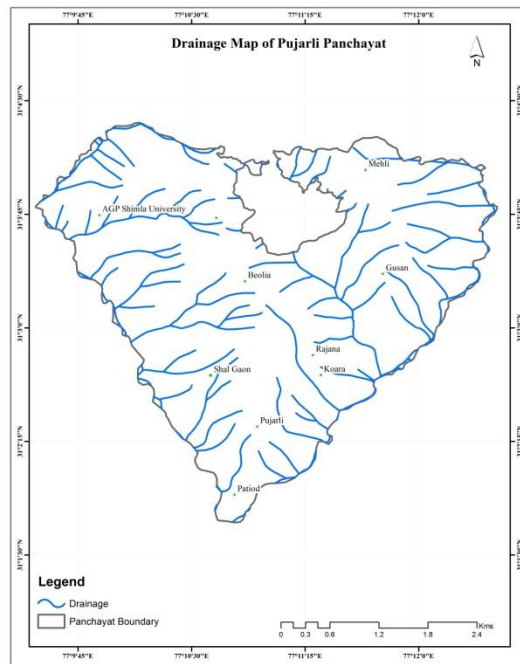


Figure 4: Drainage system in the study area

4.4 Water Tanks

The water tanks are mainly constructed under different State and centrally sponsored schemes. The water tanks are used for irrigation. The construction of water tanks have benefitted the villagers in two ways by providing the employment to the villagers under MNREGA scheme and by providing means of irrigation for growing vegetables on limited agriculture land.

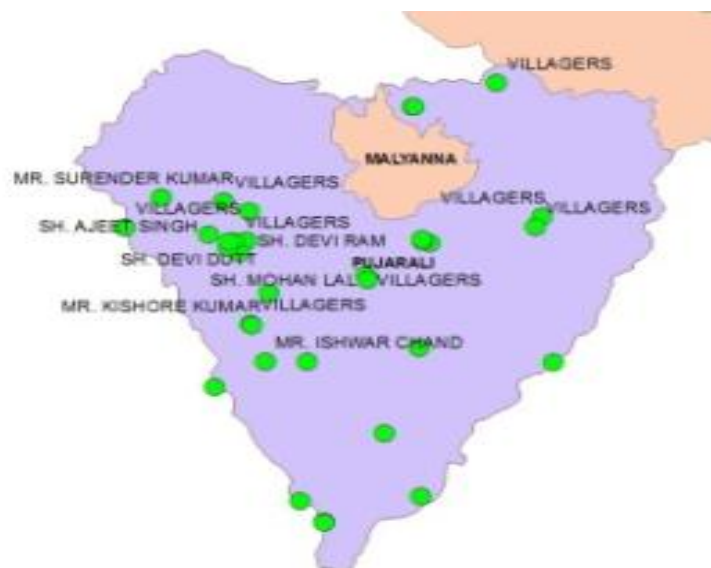


Figure 5 Water tanks in the study area

4.5 Roads

The Road and Pedestrian Way Network connect all the villages and panchayats with each other.

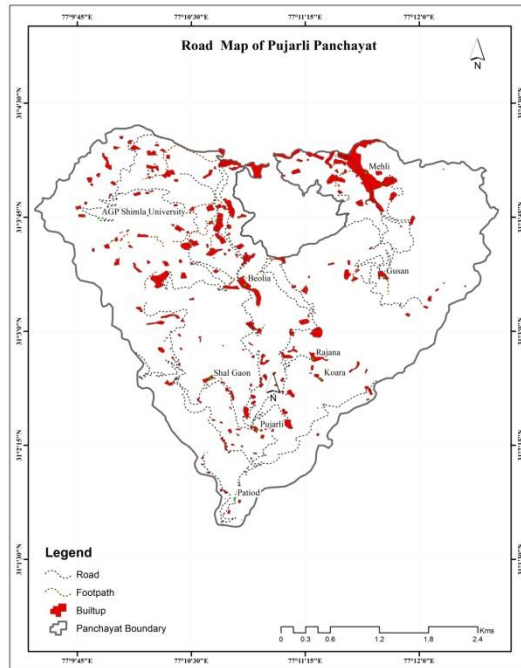


Figure 6: Road Map of the Study Area

4.6 Educational Institutions

There are five Govt. Primary Schools, one Govt. Middle School and one Govt. Senior Secondary School in the Pujarali Panchayat. Besides two private Universities.

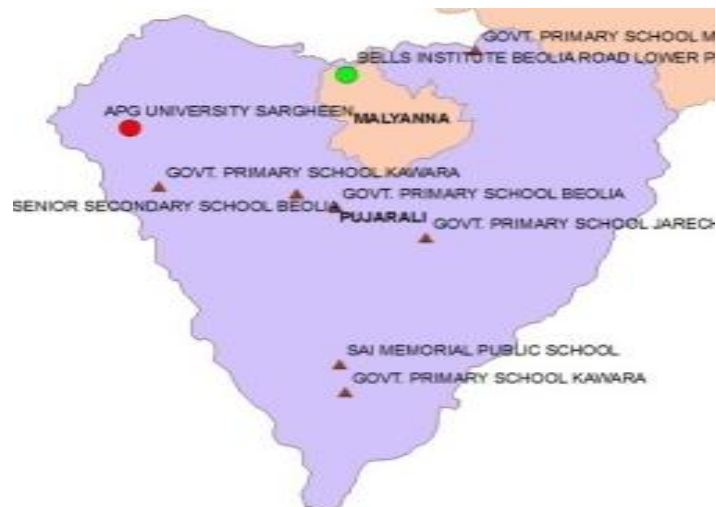


Figure 7: Educational Institutions in Study Area

4.7 Medical Institutions

The study area has one Primary Health centres at Kawara and one Ayurvedic Health Centres at Beolia providing the basic medical facilities and other medical aids to the villagers.



Figure 8: Medical Institutions in Study Area

4.8 Veterinary Institutions

There are two Veterinary Institutions located in the Pujarali panchayat at Dhamechi and Sargheen village.



Figure 9: Veterinary Institutions in Study Area

4.9 Anganwaris

There are two anganwaris located in the Pujarali panchayat at Dhamechi and Majjhar village.

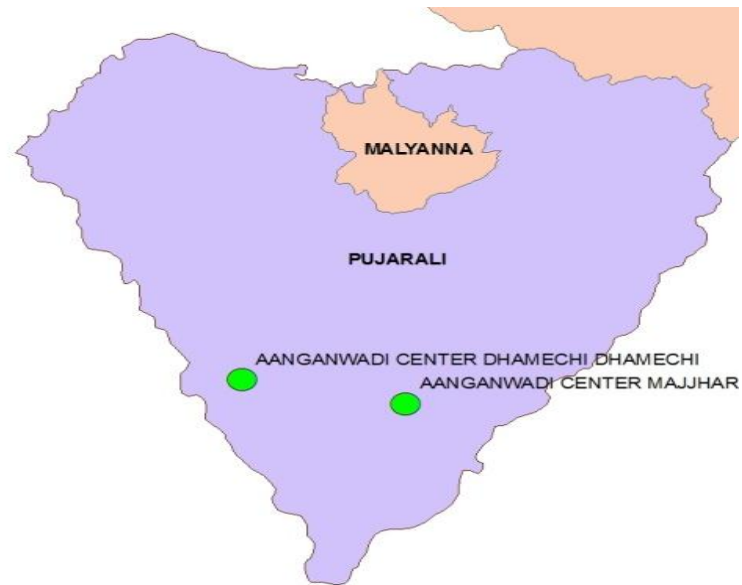


Figure10: Anganwaris in Study Area

4.10 Other Socio-economic structures

The map depicts various structures developed in Pujarali Panchayat like Rain shelters, Toilets, Mahila Mandal Bhavans, Polyhouses etc under various government schemes.

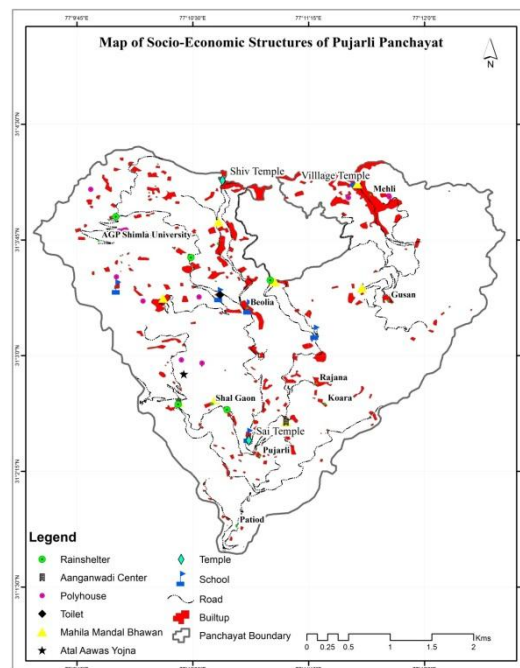


Figure11: Socio-economic structures in Study Area

6. Conclusions

The Panchayat Spatial Resource Information System developed for Pujarli Panchyat of Shimla district depicts status of land use, water resources, socio-economic facilities created under various government schemes. This information can be used by planners and administrators for

- ✚ Updating Data bank
- ✚ Generating Action Plans
- ✚ Calculating Budget Estimates
- ✚ Planning of micro drinking water schemes
- ✚ Planning of irrigation schemes
- ✚ Development of watershed programmes
- ✚ Extension of road network
- ✚ Visualizing developed and less developed pockets and thereof siting of new educational, health and other facilities in less privileged pocket.
- ✚ Monitoring of various projects & schemes
- ✚ Impact assessment of schemes

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