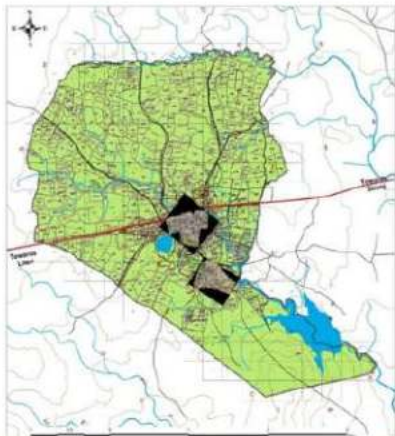


**MINISTRY OF PANCHAYATI RAJ
GOVERNMENT OF INDIA**

DECEMBER 2020

GRAM PANCHAYAT SPATIAL DEVELOPMENT PLAN MURWAS VILLAGE



**PREPARED AND PRESENTED BY
SCHOOL OF PLANNING & ARCHITECTURE,
BHOPAL**

Gram Panchayat Spatial Development Plan

Murwas Gram Panchayat

December 2020

For

**Ministry of Panchayati Raj
Government of India**



योजना एवं वास्तुकला विद्यालय, भोपाल

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Executive Summary

India still dominates with rural population though urban population has been slowly increasing over the decades. However, the urban influence in the rural areas has been widespread especially after the 1991 population Census. After the introduction of Census Town in 2001 by the Census of India, urbanisation has spread to rural areas as well, especially in terms of land use conversion of rural areas from that of agriculture to non-agricultural areas. This necessitated land use plans for the rural areas of India.

The earlier 73rd Constitutional Amendment Act though brought in the XI Schedule for planning of all aspects such as social, agriculture, environment etc, but short of Land Use Plan in rural areas. The efforts brought in by the Ministry of Panchayati Raj, in 2020 to attempt to develop land use plan for the rural areas of India integrated into the Gram Panchayat Development Plan is towards the organised land use plan for the rural areas on line of urban areas.

In 2016, Ministry of Panchayat Raj (MoPR) came out with a Rural Area Development and Plan Formulation and Implementation (RADPFI) Guidelines. Mainly focussed on peri-urban areas, the RADPFI came out with details of land use plan. However, it was short of linking to GPDP in terms of land use plan. The Svamitva programme of digitalisation of villages, the RURBAN MISSION are the programmes that are all moving towards developing rural areas of India. Apart from the land use plan, School of Planning and Architecture, Bhopal has attempted to bring in convergence along with spatial plan earlier in 2018 through a model village spatial plan near Bhopal.

However, the new initiative of the MoPR that attempted for digitalisation of villages and linking it to spatial planning along with NRSC and NIC has given this task of land use plan to various educational institutions across India on selected basis. School of Planning and Architecture, Bhopal (SPAB), a national level educational institution taken up for this task.

SPAB took up two villages namely: Bilkisganj (in Sehore District) and Murwas (in Vidisha district) of Madhya Pradesh State. Here, we present the detailed Spatial Village Development Plan for Murwas in Lateri Community Block, Vidisha District. With a population of 5271 in 2011, had 972 households. Apart from other aspects, Murwas is important from the point of past Persian route between Surat to Hyderabad – Sarai.

As a fast-developing village, Murwas is developing in terms of land use changes, agricultural change in terms of cropping, and use of technology in terms of MSME, etc. Using the various tools such as drone, remote sensing and other methods, SPAB analysed the Murwas in terms of social, spatial and economic changes and presented a vision to the villagers giving them an

opportunity to have a vision for the future. Based on this participatory approach, SPAB came out with a final spatial development plan for Murwas, which is presented here in this report. SPAB hopes this will give a key to do similar spatial village development plans for the rest of India.

1 Introduction

1.1 Introduction to Spatial Planning and its relevance to Rural Development

Rural development has always been an important issue in all discussions pertaining to economic development, especially of developing countries, which India is no exception. In India, rural mass comprises a substantial majority of the population, i.e., among population of 1,210,854,977 (1.2 billion), around 742,490,639 (61.32%) people are residing in rural areas, composed of 255,534 Gram Panchayats (Census of India, 2020). Although efforts have been made to improve the condition of rural areas after independence, a large majority of rural population continue to suffer from persistent poverty. With widening socio-economic disparities between rural and urban areas, tremendous pressure on the social and economic fabric has been observed. These factors, among many others, tend to highlight the importance of rural development.

Rural is an area, where the people are engaged in primary industry in the sense that they produce things directly for the first time in cooperation with nature. Development refers to growth, evolution, stage of inducement or progress. This progress or growth is gradual and had sequential phases. Rural development is the process of improving the quality of life and economic well-being of people living in rural areas. The United Nations defines Rural Development as a process of change, by which the efforts of the people themselves are united, those of government authorities to improve their economic, social and cultural conditions of communities into the life of the nation and to enable them to contribute fully to national programme. According to the Asian Centre for Development Administration (ACDA, 2004) “a process which leads to a continuous rise in the capacity of rural people to control their environment accompanied by a wider distribution of benefits resulting from such control is rural development”. Rural development designates the utilization of approaches and techniques under one single programme, which rally upon local communities as units of action. It provides a large umbrella to unite people engaged in the work of community organizations, community progress and community relation.

The term Rural development defines the process or progress involved in any rural activity over time whereas Spatial planning adds a dimension to it by distributing and allocating these activities into spaces. Traditional approach of rural development does not include spatial approach for development; rather it is based on statistics only. In the era of rapid urbanization, especially in the developing country like India, rural areas around city are highly influenced by urban areas. Apart from rural-urban-linkages in terms of functional interdependence, urban expansion beyond its urban administration limit in form of built-up growth, relocation of industrial

and commercial activities influences the rural areas. Some of the rural settlements get urban characteristics through the influence of adjacent urban area, which is figured in the statistics of 'Census Town' but fails to get an urban administration body and remains rural area in terms of administration with urban characteristics.

1.2 Classification of Rural Areas from the Spatial Perspective

With globalization, revolution in Information Technology, development of transportation and linkages, and overall development at national level, the dimension of rural areas has changed in terms of its morphology, economy, lifestyle etc. Locational factor always plays a major role in influencing any settlement in terms of its physical and economic growth, morphology, and standard of living of people. Existence of urban centre, major transport corridor plays an important role in transformation of rural settlements. Major urban centres, with its expansion beyond its administrative limit, through built-up and economic activity, influence largely its adjoining rural areas. With time, the activities of urban areas tend to expand to its periphery area, which changes the rural settlements dramatically in terms of livelihood activity, cropping pattern and land use pattern. Major transport corridor helps to expand urban influence more rapidly through urban sprawl. Apart from urban sprawl, major transport networks like National Highway and State Highway which connects several urban centres, has major impact on rural areas which are on and around it.

1.3 Rural-Urban Dichotomy

It is widely accepted that settlements can be differentiated in terms of rural and urban, but there is no consensus on what exactly defines a rural settlement and urban settlement. Although based on population size and occupational pattern, a standard for classification is there in India, but since long time it has not been updated and hence creating issues in defining urban areas. The settlements fail to fulfill the criteria to become an urban settlement, falls into category of rural settlement, although it may have few or many properties of urban settlement which may not fit into traditional approach for dealing with rural settlement. Thus, it is necessary to have modified approach to deal with the settlements having mixed characteristics, largely due to impact of major urban centers or major transport corridor.

1.4 Initiatives in Rural Development

For human development and sustenance, land is one of the very precious but limited resources. Land development and land management practices are very effectively adopted in urban areas in our country but this aspect is yet to be addressed in rural areas. Government authorities for rural development at central and state level launched several programs and schemes in last 70 years after independence, but village level spatial development and management practices are not being formally started. Panchayat system was empowered after the enactment of 73rd

Constitutional Amendment Act in 1992. As per the Article 243-G of the Act, Panchayats are responsible for preparation of plans for economic development and social justice in their jurisdiction. Spatial Planning was not explicitly mentioned in the 73rd CAA, though it found a place in 74th CAA under the District Planning.

Shyama Prasad Mukherjee National RURBAN Mission has ushered in a new thinking on rural development in which, spatial planning has become a major component in rural development, especially in transition zones. Shyama Prasad Mukherjee National RURBAN Mission (SPM-NRuM) for overall development of villages with vision of “Development of a cluster of villages that preserve and nurture the essence of rural community life with focus on equity and inclusiveness without compromising with the facilities perceived to be essentially urban in nature, thus creating a cluster of “RURBAN villages”. Accordingly, an integrated cluster action plan (ICAP) document is being prepared in identified clusters to ensure the time bounded scheme execution. A cluster boundary is delineated based on the process specified in the respective State/UT statutes to address the spatial planning needs under the ICAP report, but this approach is useful for regional or cluster level land allocation for various development purposes but cannot satisfy Gram Panchayat level requirement. However, the focus of RURBAN Mission is on convergence of various projects and programs, which are already in place, with minimum additions. Though the mission also says the clusters must be declared as area for development under the Town and Country Planning Act or any relevant act of the state, neither the Town and Country Planning Act nor the Panchayati Raj Act of the states except in a few states empower the Gram Panchayat to prepare a Spatial Development Plan. There is a big gap in the thinking and implementation of Spatial Development Plan at rural level in terms of concerned legal backing at various levels.

On the other hand, Gram Panchayat Development Programme (GPDP), initiated by the government covers elaborately various procedures in formulating GPDP, including for the first-time visioning and prioritization of development, still lacks spatial dimension. GPDP also details out the funding and plan implementation, monitoring etc. However, spatial planning is left out in the GPDP as well. Hence, a need to prepare spatial Development Plan at the Gram Panchayat level using various parameters outlined in GPDP and linking it with Spatial Development Planning Guidelines envisaged.

This is to support Gram Panchayats for planned and regulated development of villages for addressing the issues of local resource management and provisions of utilities and amenities within the Gram Panchayat area only. This will focus on public spaces, infrastructure provision (as per the standard given by various ministries), and how this spatial development can be linked to Cluster and District level.

1.5 Our Approach and Methodology

The main aim of the study is to prepare a spatial development plan for the selected gram panchayats- Bilkisganj and Murwas with focus on spatial planning using participatory approach. This targets to add spatial dimensions to the perceptions, inclusive of all-farmers (small & big), labours, marginalised people, officials of Bank and Panchayat, women, children and other stakeholders received through detailed interviews and discussions. Emphasis was given to stakeholder’s perception in visualizing the development needs of the GP so as to direct the spatial growth towards making it a progressive and sustainable village in years to come. The field survey included both qualitative and quantitative approach to make an inclusive spatial development plan for gram panchayats. The methodological framework for this approach would involve following stages of work as highlighted in Figure 1.

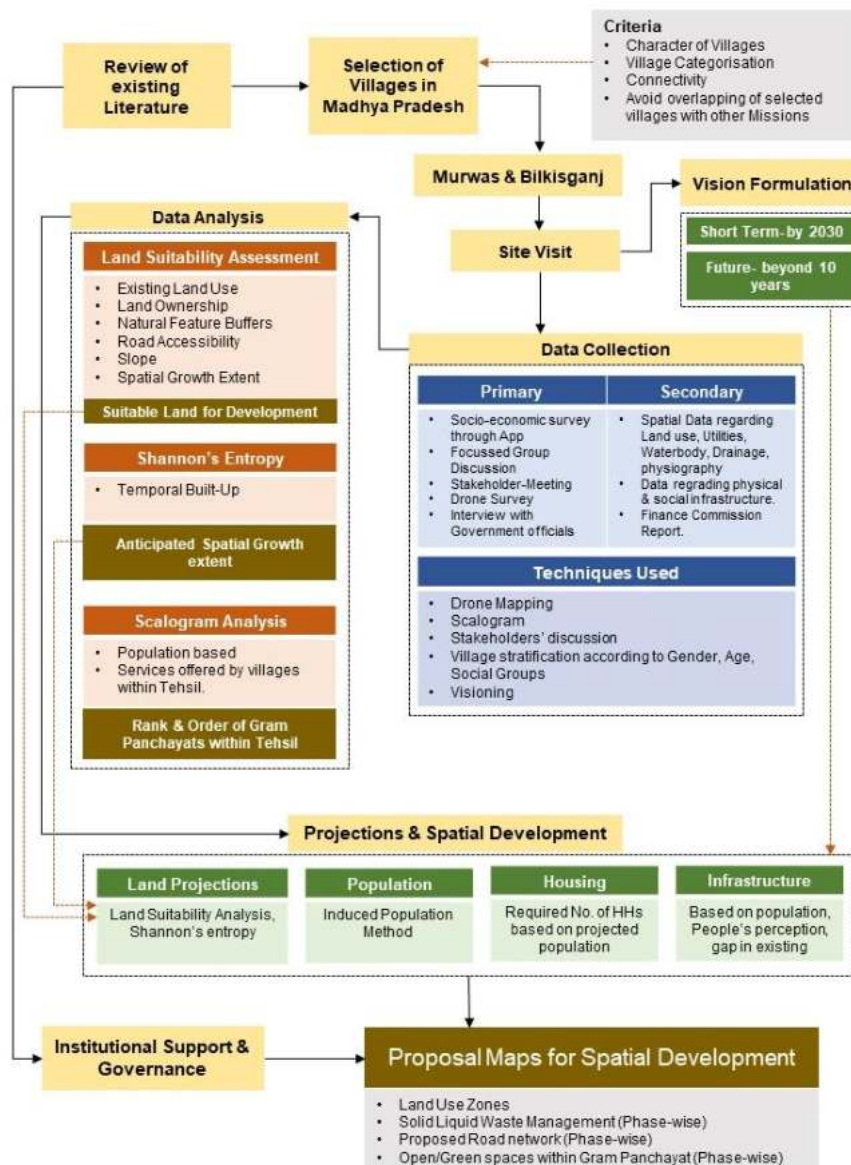


Figure 1 Methodology

1.5.1 Review of existing literature:

This stage involves review of literature related to government policy regarding preparation of GPSDP, financial policy etc. Apart from reviewing policy documents, this stage involved study and review of standard set by different ministries and organization to analyse the situation of Gram Panchayats.

1.5.2 Data collection:

This stage involved collection of data required for analysis to bring out the ground situation of the Gram Panchayats. The data collected is grouped among two broad categories, viz. Primary Data and Secondary Data.

1.5.2.1 Primary data:

- Data regarding socio-economic status which includes information regarding demography, household assets, housing condition, economic condition, and livelihood of villagers was collected through Socio-economic survey. The survey was conducted through Android Application 'Gram Manchitra', developed by National Informatics Centre, which fully integrates with GIS environment.
- Data regarding specific issues related to specific groups was collected through Focus Group Discussion. Special attention has been given to marginalized group, women, old people, youth.



Figure 2 Stakeholder discussion from Bilkisganj and Murwas Village during survey

- Data regarding specific issues of specific sectors like trade and commerce, industry, agriculture was collected through stakeholder meeting.
- Spatial data regarding land use, spatial pattern of infrastructure was collected through drone survey. Villagers were involved in identification of different land use and landcover in their own village through participatory GIS.

satellite imagery was collected from NRSC/NIC. Additional spatial data for further reference was obtained from Google Earth.

- Data regarding financial flow to Rural Local Bodies was obtained from Finance Commission report.
- Data for both physical and social infrastructure was obtained from respective government offices.

1.5.3 Data Analysis:

A series of thematic maps are prepared to analyse the baseline scenario of village. The spatial pattern of identified issues concerning to development, opportunity and potential offered by the village are mapped. These are:

- Land use and land cover maps of different time periods to detect land use dynamics.
- Land holding size and its spatial aspect.
- Housing distribution on basis of income and social status
- Water supply, sanitation and waste disposal system prevailing in villages
- Road network, its typology, width, walkability, and availability of street furniture.
- Travel behaviour and vehicular ownership
- Health and education facilities and its accessibility
- Social Mapping
- Existing and past government schemes and its implementation.

1.5.3.1 Land Suitability Assessment

Different thematic maps at village level are prepared to find the suitable land for planned development. These thematic maps are prepared using ArcGIS software with inclusion of people's perception or other qualitative data gathered during site visit. These maps include-

- Land Ownership
- Existing Land Use Land Cover (LULC)
- Buffer from Natural features like drains, waterbodies, etc., as per standards
- Road Accessibility
- Slope
- Spatial growth extent.

1.5.3.2 Shannon's Entropy:

Shannon's entropy analysis (spatial) is used to project the direction of temporal spatial growth extent of Murwas village settlement. ArcGIS software is used to conduct this analysis.

1.5.3.3 Scalogram Analysis

The analysis is used to classify the village clusters based on the level of services present and population into rank and order amongst villages in the Tehsil.

1.5.4 Projections & Spatial Development

1.5.4.1 Land Projections

The future projection of land use is based upon following factors-

- Existing land use pattern
- Analysed suitable land for development through Land Suitability Assessment.
- People's perception/need
- Existing spatial growth direction.

1.5.4.2 Population Projection

Induced Population Projection method is used to estimate future population projections to factor in the anticipated economic growth of the GP.

1.5.4.3 Housing:

Housing Projections include number of Households required according to projection population as well as typology of existing settlement.



Figure 6 Housing typology in Bilkisganj.



Figure 7 Housing Typology in Murwas.

1.5.4.4 Infrastructure

The main targeted infrastructure is Road network for connectivity to adjoining villages, Solid Liquid waste Management, infrastructure related to Education, Health infrastructure and open spaces and recreation lacking in the Gram panchayats.

1.5.5 Institutional Support & Governance

The whole process of spatial plan development of both gram panchayats is supported with related institutions and the governance involved.

1.5.6 Proposal Map for Spatial development

The proposal maps are prepared in phase-wise implementation of spatial development of both gram Panchayats and includes

- Land use zones for future spatial growth
- Phase-wise spatial plan of Solid Liquid Waste Management
- Phase-wise spatial plan of proposed Road Network for Village connectivity
- Phase-wise spatial plan of green spaces within Gram Panchayats.

1.5.7 Techniques Used:

To prepare spatial development plan, the techniques are selected to cover diverse facets from people to technology. This includes use of scientific methods, advance technology and people's perception which are discussed further in detail.

1.5.7.1 Use of Drone for Mapping – Advantage and Disadvantages

The rise of drone technology has brought a change in the survey techniques. With the use of this technology, it is possible to carry out surveys and process and deliver data in a timely, accurate and safe way. It is a time saving technique which can complete survey in hours, collect data and process imagery on the same day. The technology reduces data acquisition cost and has low cost as compared to satellite survey and manned aircrafts. It is easier to reach areas that are otherwise difficult and impossible to access like cliffs, rugged terrains, etc. It involves high spatial resolution i.e. has data accuracy and low altitude multi-angle shooting but lacks precision. Therefore, the aerial survey of both the gram panchayats have been carried out using this technique for mapping of settlements, land use/land cover, vegetation, infrastructure, etc. Apparently, the technique is weather dependent and have short flight time accuracy. To gather high quality of data, it requires particular skillset.

1.5.7.2 Use of Scalogram for Identifying Growth Centers

A scalogram analysis is used as an indicator of services provided by an area based on a region's ability. It develops a scale inclusive of services, functions, organizations, and establishments and also rank the settlements based on the number of functions present within them. Identification of hierarchy of settlements serves as an essential tool in helping to ensure that new development should take place in the most sustainable locations. It is required to identify those settlements that are capable of accommodating and sustaining growth, and to limit development in those smaller settlements that are not sustainable. It is a tool used to create strategy for balanced regional development. It draws attention of the government and planners towards regional disparities and imbalances in distribution of services so that policies could be based upon the existing hierarchy and act as a means of reducing regional economic imbalances and distributing government services in an equitable basis (Khan and Ahmad,

2013). This technique has been used in the study to find the ranking of the selected two Gram panchayats within their blocks.

1.5.7.3 Use of Stakeholders' discussion

Stakeholder's discussions are important to identify the requirements or constraints present at ground level within an area. It helps to understand ground reality and uncover the lacuna present in the system's functioning. There were exhaustive discussions with different stakeholders, people of all age groups specially marginalized groups of both the gram panchayats to comprehend the problems and issues faced by them. Even, the proposed plans are prepared keeping in mind their perception and are discussed with them for effective implementation.

1.5.7.4 Village Stratification according to Gender, Age, Social Groups

Stratified sampling technique is used for qualitative study of both gram panchayats. There are stratified representation of social groups and people of all age groups including both males and females within the sampling selected for qualitative survey. Both Gram Panchayats are analyzed as per their gender, age and social groups using this sampling technique.

1.5.7.5 Visioning

Visioning technique is used to develop a shared vision of future with support of group of stakeholders. It involves appraisal from the participants on where they are now and where they can realistically expect to be in the future. This technique helped in formulation of vision for the spatial development plan of both gram panchayats.

1.6 Case Study and its selection in Madhya Pradesh

The case study gram panchayats are selected based on their population size (>5000), level of services & facilities and accessibility to other areas using secondary data sources. The other selection criteria included villages which were not considered under any government scheme or mission. The selected two Gram Panchayats are Bilkisganj and Murwas. They fall under administrative division of two different districts-Sehore and Vidisha. Bilkisganj Gram Panchayat is situated in Sehore District and Murwas Gram Panchayat is situated in Vidisha District of the state of Madhya Pradesh (**Figure 8**).

1.6.1 Sehore District:

Standing in the foothills of Vindhya Range in the middle of Malwa region, Sehore District is a district of Madhya Pradesh state in central India. The district headquarters lies in Sehore town. Occupying 6,578 sq.km. area, it is composed of 8 Tahsils and 5 CD Blocks. It has 8 Statutory Towns among which there is 1 class I town, 1 class II town, 1 class III town, 4 class IV towns and 1 class V town, and 1,072 villages among which 1,031 are inhabited. According to the census of India, 2011 Sehore District has a population of 1,311,332 and population density of

199 persons per square kilometer. Its population growth rate over the decade 2001-2011 was 21.5%. The district has a sex ratio of 918 females for every 1,000 males, and a literacy rate of 70.1%. About 18.9 % of total population of the district live in urban area and 44.7% of total population is engaged in economic activities (DCO D. C., 2011).

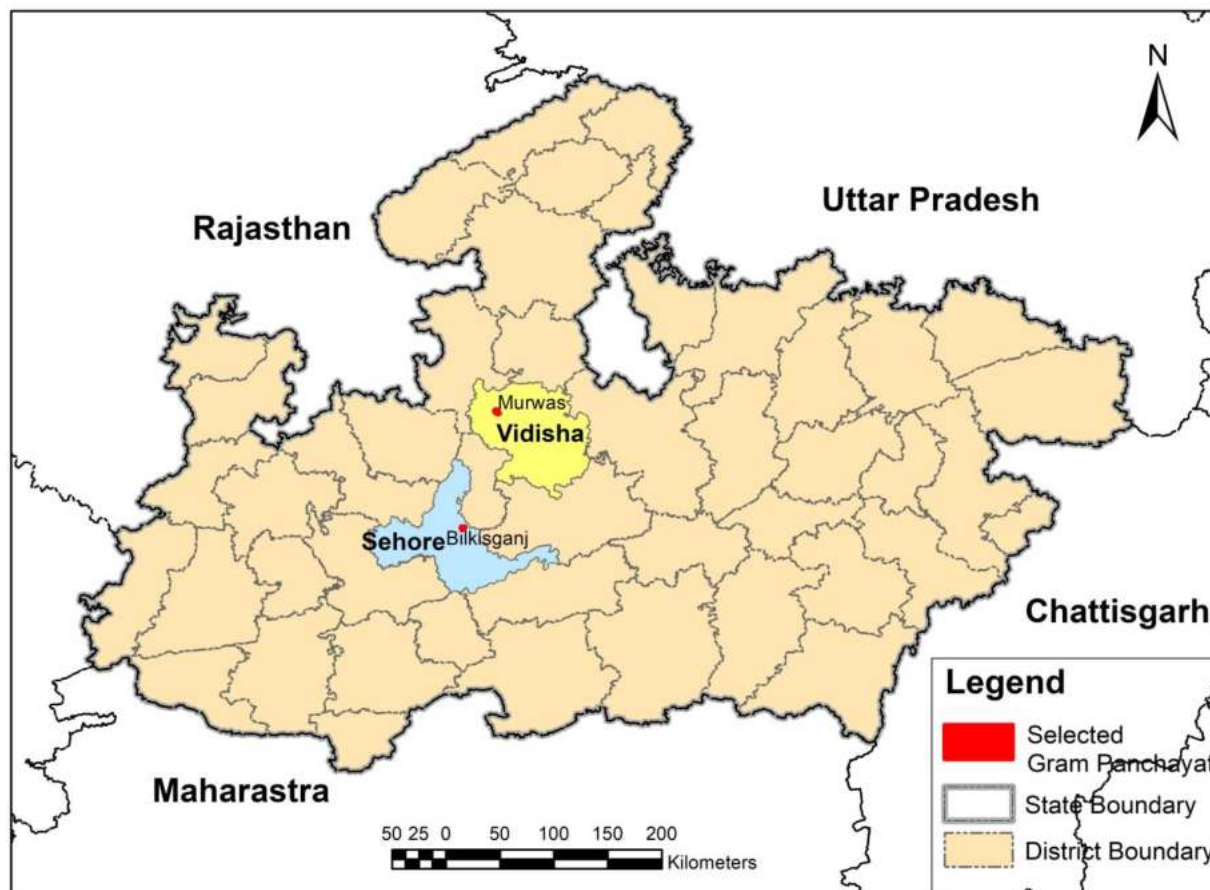


Figure 8 Location of Districts of both Gram Panchayats in Madhya Pradesh

1.6.2 Vidisha District:

Vidisha, a district of Madhya Pradesh state, lies on the Plateau of the main Vindhya Range, which throws several spurs towards North and North-East. The city of Vidisha is the administrative headquarters of the district. Occupying 7,371 sq.km. area Vidisha district composed of 10 Tahsils and 7 CD Blocks. It has 6 Statutory Towns and 1 Census Town among which there is 1 class I town, 2 class II towns, 3 class IV, and 1,614 villages among which 1,536 are inhabited. According to the census of India, 2011 Vidisha District has a population of 1,458,875 and population density of 198 persons per square kilometer. Its population growth rate over the decade 2001-2011 was 20.1%. Vidisha district has a sex ratio of 896 females for every 1,000 males, and a literacy rate of 70.5 %. Regarding urbanization 23.3 % population of total population of the district live in urban area. In terms of workforce participation 37.7 % of total population engaged in economic activities (DCO D. o., 2011).

1.6.3 Introduction to Study Area Gram Panchayats:

The selected Gram Panchayats are located near the state capital city Bhopal and hence subject to influenced by Bhopal city (Figure 9).

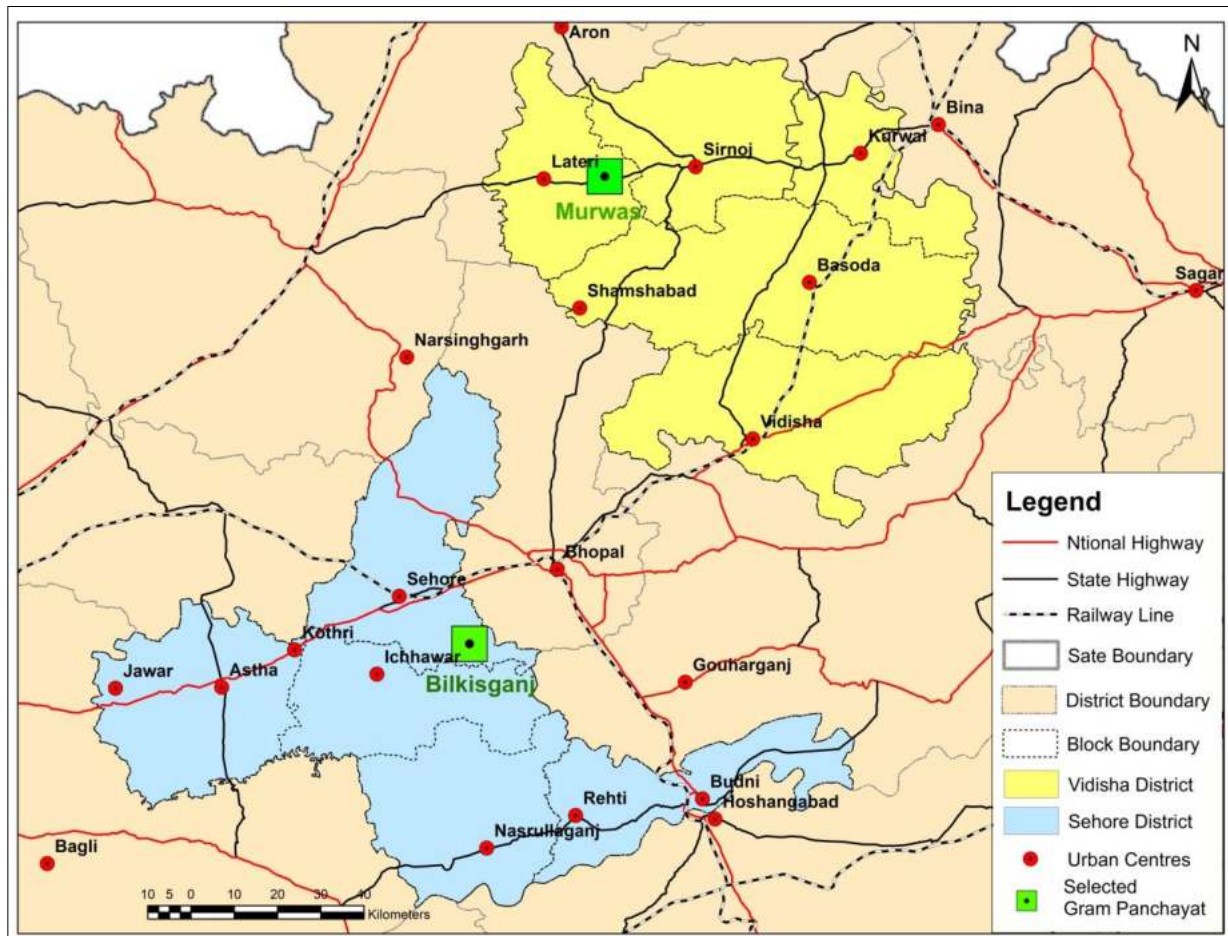


Figure 9 Locations of Gram Panchayat in districts

1.6.3.1 Bilkisganj Gram Panchayat:

Bilkisganj village is located in Sehore Tehsil of Sehore district in Madhya Pradesh (Figure 9 & Figure 10). It is situated 22 km away from Sehore, which is both district & sub-district headquarter. Bilkisganj is the Gram Panchayat of Bilkisganj village. It is a large village with geographical area of 1022.26 hectares and total household of 1286, with population of 6408 according to Census of India, 2011. Sex Ratio of Bilkisganj village is 719 which is much lower than Madhya Pradesh state average of 931 and Child Sex Ratio for the Bilkisganj as per census is 770, lower than Madhya Pradesh average of 918. The literacy rate of Bilkisganj village is 66.8% which is lower than state average of 70.6%. The cast composition includes 16.9 % Scheduled Caste population and 3.8% of Scheduled Tribe population (DCO D. C., 2011). About 30% of its total population is engaged in economic activity, among which 58% of total workforce is engaged in agricultural activities and rest of 42% engaged in non-agricultural activity.

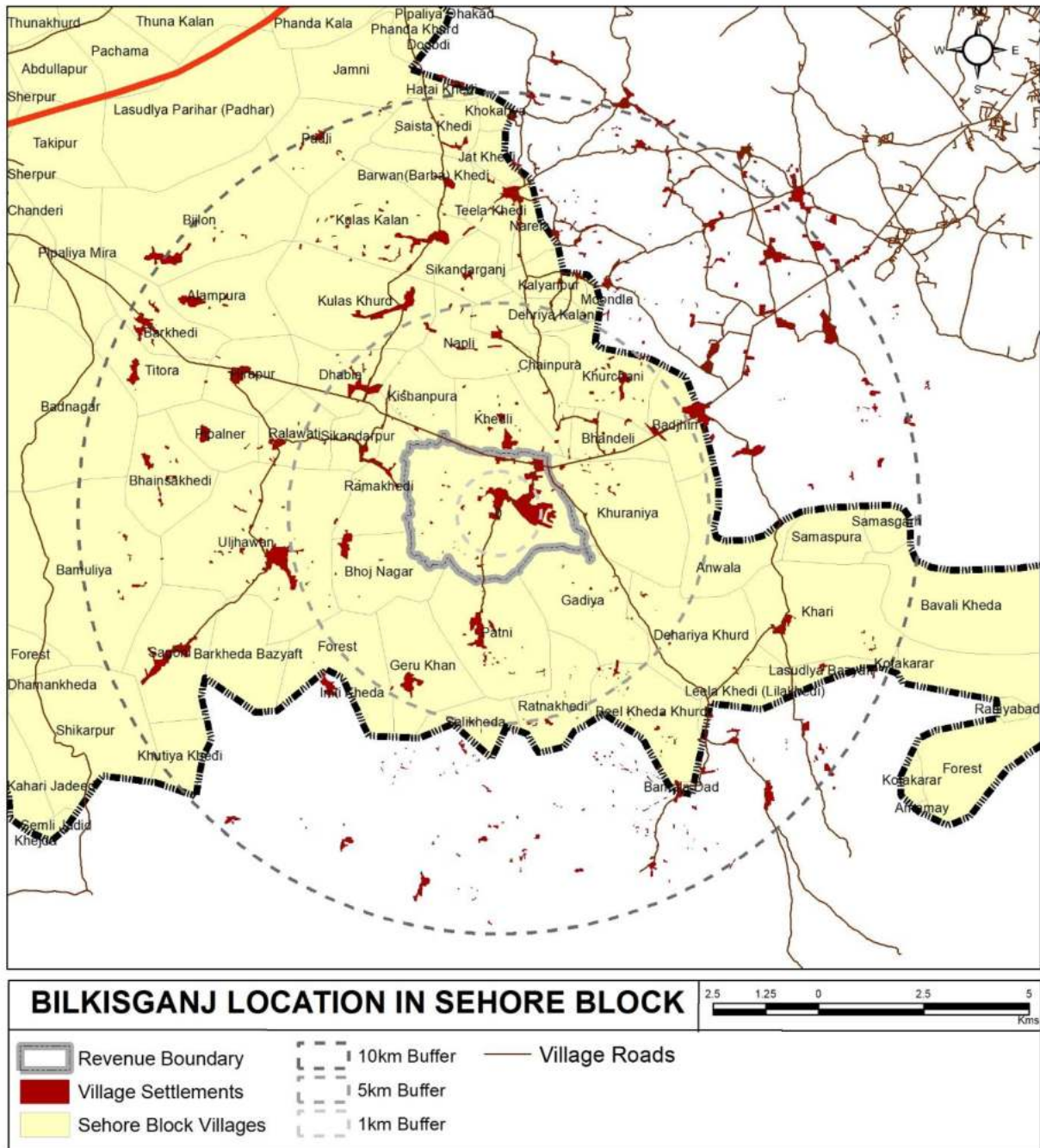


Figure 10 Location of Bilkisganj Gram panchayat

1.6.3.2 Murwas Gram panchayat

Murwas village is located in Lateri Block of Vidisha district in Madhya Pradesh (Figure 9 & Figure 11). It is situated 10 km away from sub-district headquarter-Lateri and 105 km away from district headquarter-Vidisha. Murwas is the Gram Panchayat of Murwas village. It is a large village with geographical area of 978.75 hectares and total household of 972, with population of 5,271 according to Census of India, 2011. Sex Ratio of Murwas village is 902.2 which is lower than Madhya Pradesh state average of 931. In contrast Child Sex Ratio for the Murwas as per census 2011 is 1013.2, much higher than Madhya Pradesh state average of 918 (District Census

GRAM PANCHAYAT SPATIAL DEVELOPMENT PLAN- MURWAS GRAM PANCHAYAT, 2020

Handbook Vidisha, 2011). The literacy rate of Murwas village is 46.44% which is much lower than state average of 70.6%. The cast composition of the village includes 12.1% of Scheduled Caste population and 0.5% of Scheduled Tribe population. About 35.5% of its total population is engaged in economic activity, among which 92% of total workforce is engaged in agricultural activities and rest of 8% engaged in non-agricultural activity.

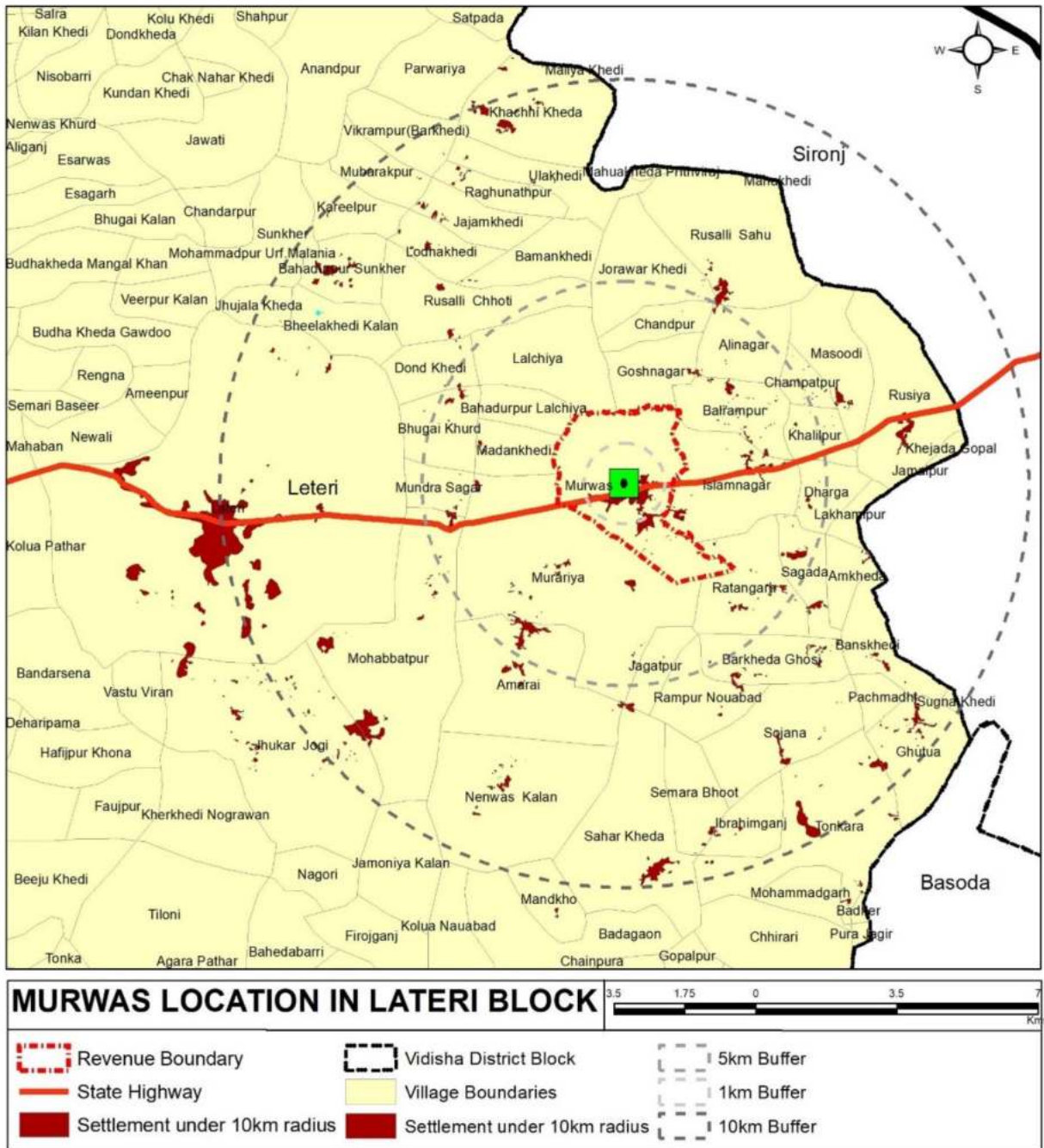


Figure 11 Location of Murwas Gram Panchayat

2 Categorisation of Villages for Planning

2.1 Categorisation of Villages

There is no clear definition of rural areas unlike urban areas. They are only considered as the areas which do not satisfy the urban parameters. These areas possess different characteristics according to their population size, proximity to and dependence on urban centre, topography, economic activities, social customs and traditional values. Hence, (Rural Area Development Plan Formulation and Implementation Guidelines (RADPFI), 2016) categorizes the rural areas/villages based on following criteria.

2.1.1 Villages within Planning Area of the delineated Metropolitan area/city/town

This category of villages is dependent on urban centre present in vicinity, for its economic activities and growth and not only have agricultural activities but may have diverse economic activities (non-farm). They sometime have transition in their village character and are part of 'Rural Urban Fringe'. Such villages are found to be present mostly adjacent to metropolitan city within planning area boundary. They may be connected to the city/town, by either a National Highway/State Highway/Major District Road or Other District road. Therefore, they can be further categorized as-

- Along the national/state highway and within the urbanisable limit of Municipal Corporation
- Not along a national or State highway, but within the urbanisable limit of the Municipal Corporation.

The villages present in Urban-Rural Fringe (URF) face the transition in land use, social and demographic characteristics. They are non-farming dwellings and have almost complete absence of occupations and land use. There is an incomplete range and penetration of urban utility services. These areas have uncoordinated zoning or planning regulations and areal extension beyond although contiguous with the political boundary of the central city. There is an actual and potential increase in population density, with the current density above that of surrounding rural districts but lower than the central city.

As per 74th CAA, Nagar Panchayat would act as ULB to provide development in these areas whereas URDPFI guidelines, 2014 suggests that

- The development plans can be prepared by the developmental body in consultation with the village authority and implemented jointly by the village authority or developmental body

- Village bodies may prepare the plan and such plans will be compiled and made part of overall development plan of the region by developmental body.

2.1.2 Villages adjacent to corridor development

The 'Economic corridors' forms 'network influence area' while connecting economic region. They affect all urban and rural areas falling into this economic region surging the land prices. The corridor development provides opportunities to these areas to participate in economic development due to anticipated industrial and economic growth along the corridor. The villages which are in vicinity to industrial areas have interdependencies with industry in terms of provision of employment and provision of raw materials. This will generate income for labour in return. There forms a peculiar work culture and economic activities in these villages and may experience huge amount of trickle-down effect rather than only experiencing backwash effect if planned properly.

As per RADPFI guidelines, Villages near industrial city should have following criteria:

- Direct connectivity to the industrial region
- People commuting from the village to the city for daily work in industry.
- At least more than 50% of village population depended on industry in the city, either through employment or by provision of raw material.

Villages present near investment regions are categorized as fast transforming villages. These villages shall have differential characterization and degree of development which needs spatial plans. Another pull factor for village development is tourism opportunities which provides employment and serve as a centre for village tourism. There is a need to prepare a spatial development plan for such villages in accordance with economic activities under village development plan.

2.1.3 Villages in the interior

This category of village represents the purely depended village on agriculture and allied activities or fishing and mining & quarrying activities. They also require spatial plans for development of such potential activities mentioning the basic requirements for betterment of quality of life of individual and to mitigate the outward migration to urban areas. These villages are categorised on following basis:

- More than 75% of population depended on primary activity
- Isolation from urban areas in terms of distance and accessibility.

The classification of these villages is dependent on physiographical conditions of the region.

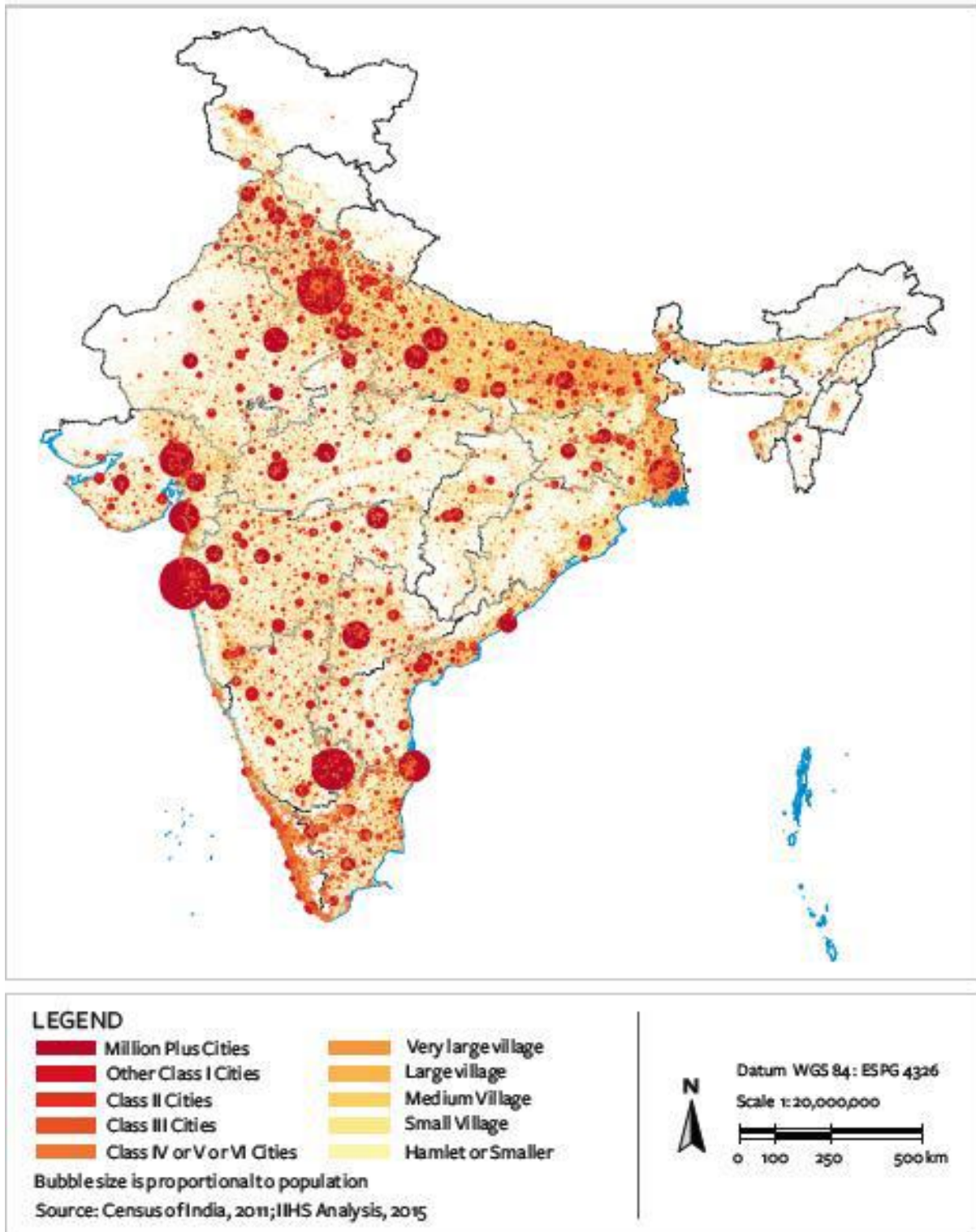


Figure 12 Population sizes in Rural and Urban India,
 Source: *Urban India 2015: Evidence*, Indian Institute of Human Settlement

2.2 Categorisation of Villages as per Population Size

The villages are also classified into seven classes based on their population size by the census of India (**Table 1**). The range includes villages with population less than 200 (Class VII) to population more than 10,000 (Class I). The Class VII villages having population less than 200 persons are preferred to make clusters due to their small size and given proper connectivity through integrated development. They are mostly located on hilly terrain, desert or tribal areas, with low density areas, such as Himalayan belt of India, North East India, tribal belt of Chhattisgarh, Jharkhand, Eastern and Western Ghats of South India. Spatial plans for cluster of such villages require socio-economic characteristics of the villages giving due consideration on the connectivity and sharing of resources amongst the villages. The spatial contiguity clusters can be formed with contiguous villages/gram panchayats within a radius of 5-10 km (or radius appropriate to the population density and geography of the region) around the identified growth center. The criteria for selection of cluster can be same as given by RURBAN guidelines for selection procedure. The initiative, Integrated Cluster Action Plan (ICAP) for clustering rural areas follows different approaches for Tribal and Non-tribal districts. It also mentions desired level of benchmark for Basic amenities, Social amenities, Economic amenities, and Digital amenities. The villages with population between 1000-5000 are ideal for preparation of Gram Panchayat Spatial Development Plan (**Table 1**) while spatial development plan for villages with population more than 5,000 are prepared based on URDPFI guidelines, 2014. The development plan for villages having population less than 1000 population shall depend on their location, physiographic conditions, and connectivity.

Table 1 Categorisation of Villages as per Population Size.

Class Size	Population Size	Total Villages	Total Population	% of rural population	Average population	Remarks
Class I	10000+	4,682	7,23,66,805	8.68	15456	Large villages which are likely to be urban in future, if near metropolitan areas. Large villages which may be purely depended on flourishing agricultural or other primary activities.
Class II	5000-9999	18,641	12,38,08,537	14.85	6642	Villages which are having population next

						to Class I village, and would also be urban, if near metropolitan areas.
Class III	2000-4999	96,388	28,86,37,987	34.63	2995	Medium sized villages which can be grouped together to form a cluster, if have geographical contiguity.
Class IV	1000-1999	1,39,136	19,74,96,806	23.70	1419	
Class V	500-999	1,41,761	1,032,91,220	12.39	729	Small sized villages where cluster plans would be feasible.
Class VI	200-499	1,14,726	39,68,3027	4.76	346	
Class VII	Less than 200	82,149	81,79,066	0.98	100	Isolated hamlet, where villages are located on hilly terrain, dessert or tribal areas, and spatial plans shall be based on connectivity and sharing of resources.
	Uninhabited	43,384	-	-		
	Total	6,40,867	83,34,63,448	100.00		

(source; RADPFI)

2.3 Need for Categorisation of Villages

There is a need for categorisation of villages due to following reasons:

- The evolution of unplanned development in vicinity of urban centers in the extended *Abadi* area of the village leads to unauthorized development which later require regularization and retrofitting.
- The interrelationship between metro cities and villages require the development plan for the provision of services and infrastructure.
- The anticipated spatial expansion of urban area makes it important to plan the rural areas in vicinity.
- The rise in real estate price leads to non-farm activities which requires infrastructural services due to connectivity of the villages to the nearby metro city.
- The planning of the activities to be permitted in the fast-transforming villages needs to be decided, for making a sustainable environment in the village.

2.4 Linking RADPFI and our Village Planning

RADPFI guidelines provide a methodological framework of spatial planning at village level to ensure integrated rural development. These guidelines focus on land use and spatial planning, formulate spatial standards for social service delivery and spatial connectivity through roads, public mode of transport and information technology. These aspects play a significant role in the process of development plan formulation while categorising the villages/cluster, spatial planning of priority areas and preparation of annual budget. The villages are selected for spatial planning based on these categorisation.

The spatial development plan prepared for Murwas and Bilkisganj Gram Panchayats is based on rural spatial standards formulated in these guidelines. Moreover, land use and infrastructure facilities provided in selected villages are in accordance with the RADPFI and Rurban guidelines. This is further strengthened by adopting a participatory approach with use of advanced technology to handle dynamic data. The changing character of villages requires dynamic spatial plans that can facilitate inclusion of dynamic data instead of existing static approaches.

3 Salient Features of Rural Area Development Plan Formulation and Implementation (RADPFI) Guidelines, 2016

3.1 Spatial approach to Rural Planning

There have been guidelines for spatial planning of urban areas in existence but none for rural areas. It is RADPFI guidelines only which identified the need for spatial development of rural areas. Villages possess different characteristics based on their culture, population size, topography, economic activities, interdependency on adjacent urban area and traditional values. The villages in the vicinity of urban area or urban fringe areas face unplanned development and possess neither purely urban character nor rural. These areas are interdependent on each other and still lack many infrastructure facilities. Similarly, some rural areas present along the economic corridor experiences backwash effect if not properly planned. There are also villages which are purely rural in nature but require spatial plans to boost their economic potential for betterment of life and stop outmigration. Due to all these reasons, categorisation of villages is used as one of the spatial approaches by RADPFI guidelines for rural planning.

3.2 RURBAN Mission and Spatial Planning – Cluster Approach

Most of the rural areas in India are present in group of settlements which are contiguous to each other. Such cluster of settlements often have potential for economic growth and possess locational and competitive advantages. These clusters are recognized by the government of India as 'Rurban clusters' under the Shyama Prasad Mukherji Rurban Mission in 2016. The cluster is formed from geographically contiguous villages having population of about 25000 to 50000 in plain and coastal areas and with a population of 5000 to 15000 in desert, hilly or tribal areas. The aim of the mission is *to preserve and nurture the essence of the rural community life with focus on equity and inclusiveness without compromising with the facilities perceived to be essentially urban in nature* (Ministry of Rural Development, 2016). The mission focuses on simulation of economic development, provision of basic services and formation of planned clusters. This cluster approach constitutes both Socio-economic & Infrastructure planning component as well as initiation of spatial planning. As a component of spatial planning, structure plan or land use plans are prepared for the RURBAN cluster along with the mechanism for implementation. These plans are prepared based on the planning norms laid down in the State Town and Country Planning Acts/similar Central or State statutes as may be applicable for the State.

3.3 Integrated District Plan and Examples

Under 74th CAA, article 243ZD of the Indian constitution mandated the establishment of District Planning Committee (DPC) to prepare District Development Plan from integration of development plans prepared by Panchayats and Municipalities (Planning Commission of India). The Manual for Integrated District Planning', prepared by Ministry of Panchayati Raj in 2008, elucidates "District Planning as participative and multidimensional process and hence gives guidelines for preparation of any District Plan which is inclusive of both urban and rural requirements, and perceives the District as a Region." In most of the cases, DPCs undertakes panchayats/villages-level planning. Different states have adopted different provisions for integrated planning like Karnataka, Tripura, Sikkim, Rajasthan, Haryana, etc. have modified their Panchayat Act to establish DPCs while states like Gujarat, Orissa, Madhya Pradesh, Maharashtra, etc., have separate legislation for formation of DPCs. Moreover, some states have also added panchayats/village planning in their Town & Country Planning Act.

Following the handbook by (Department of Town & Country Planning, 2007-2012), Kerala, the integrated District Development Plans are prepared with the inclusion of sectoral as well as spatial analysis (Figure 13). This is explained further through an example of Kollam District, Kerala (Planning Commission of India).

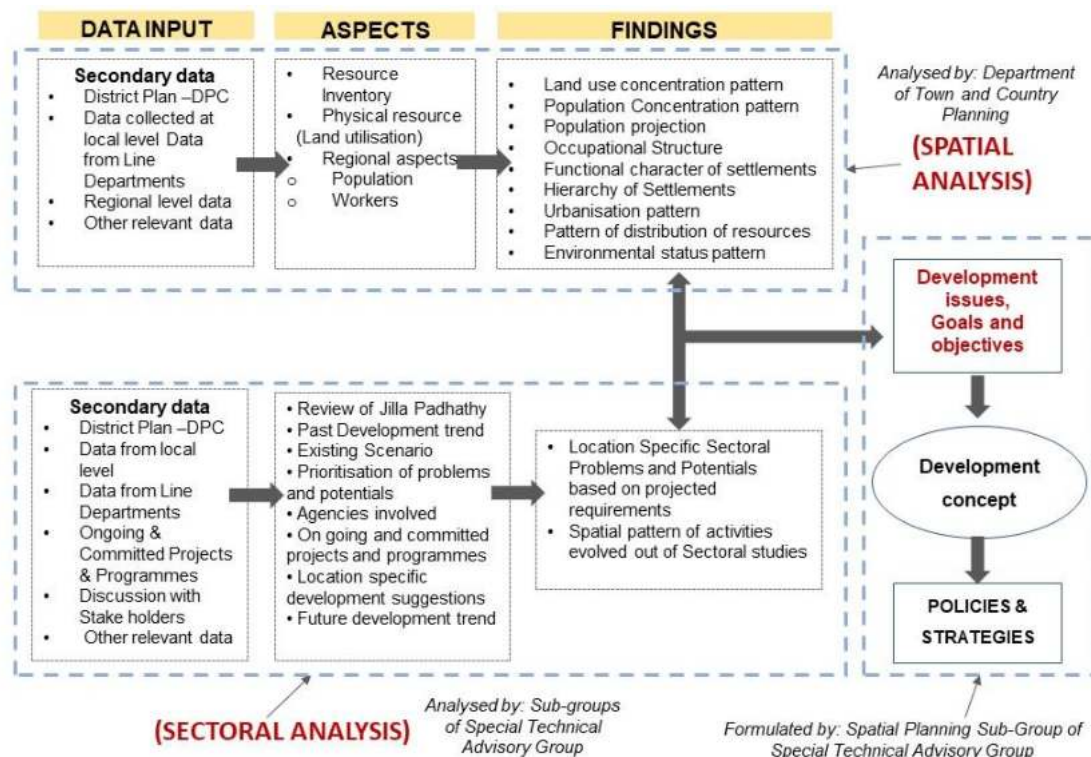


Figure 13 Integration of spatial and sectoral analysis in Integrated District Plan

Source: (Planning Commission of India)

3.3.1 Kollam District, Kerala

Kollam District Planning Committee prepared the Integrated District Development Plan of Kollam under State Planning Board, Kerala with main focus on spatial aspect. There is ecological diversity ranging from the Western Ghats to the Arabian seacoast within the district. The main objective of the plan was to integrate spatial aspect into other aspects of planning like data collection, presentation of data to decision makers in the District Planning Committee and Panchayats, and to help in visualizing and depicting the plan. All these planning activities were conducted and presented location wise with the help of Geographic Information System (GIS) technology which helped to transform all the data including cadastral data and socio-economic survey into spaces. Further, Sectoral analysis was done for 18 development sectors ranging from the primary sector, to basic services in health education, provision of water, poverty alleviation and rural development, infrastructure (roads, bridges, housing), forests, environment, mining and geology, social welfare, women and child development, power and telecommunication, tourism, culture, sports and youth affairs. As part of spatial analysis, both problems and initiatives were identified in each of these sectors and completed projects/programmes were analysed each with location specific details. In addition to this, human resource development and availability of finances were incorporated with their representation spatially. All these actions helped to incorporate stakeholder's suggestions on overall development and to take spatial decisions as part of decentralized planning process and participative planning. This integrated district development plan is a perspective plan prepared for 15-20 years for long term issues such as settlement patterns, district level policies for integrated development of urban and rural areas, best spatial strategy for optimum utilization of resources and to form long term perspective for regional infrastructure like water management, energy, transport network and tourism infrastructure. Following this, an execution plan is prepared and implemented. This approach provides opportunity to local governments, stakeholders and District Planning Committee to take decisions in accordance with spatial planning.

3.4 Integrating GPDP with RURBAN MISSION AND RADPFI

Gram Panchayat Development Plan (GPDP) is a comprehensive plan formulating a vision for a village, its goals and sets out action plan to achieve these goals. It promotes participatory planning in Gram Panchayats for socio-economic development covering 29 sectors enlisted in Eleventh schedule. The primary focus of GPDP is to identify the gaps related to development in delivery of public services, socio-economic sectors and needs of the marginalised and vulnerable population (MoPR, 2018). This extends to Economic Development and Poverty reduction, Human Development, Social Development, Sustainable Development Goals (SDGs), Ecological and Environment Development, Public Service Delivery, Good Governance, Skill

Building, Gender Responsive Governance, Child Protection and Development, Inclusion of Vulnerable Groups (such as SCs, STs, OBCs, NT-DNTs, elderly, people with disabilities, single headed women households, widow, destitute, homeless and others), Spatial Planning, E-enablement of Panchayats, Infrastructure Development and Renewable Energy. The spatial dimension of the GPDP is covered using norms and spatial standards from RADPFI guidelines whereas RURBAN mission identifies socio-economic & infrastructure planning component of the cluster and converges various government schemes at cluster level. Our study has also prepared the Gram Panchayat Spatial Development Plan (GPSDP) by integrating GPDP with spatial standards and land uses from RADPFI guidelines and also referred infrastructure facilities from RURBAN mission. The GPSDPs can be prepared using RADPFI guidelines which can further be integrated into Integrated Cluster Action Plan (ICAP) for spatial planning component.

3.5 Participatory Village Plans

One of the significant examples of participatory Village plans is 'Pani Panchayat', a model for groundwater management, formed in Naigaon village of Maharashtra (ACWADAM, 2010). The success of individual initiative to mitigate the drought situation in the village gained a representation in Village Level Pani Panchayat, upon completion. It attracted community and encouraged decentralization of decision making with public participation. This participatory planning initiative promoted equity, rights of landless, community participation, and sustainable use of water resource. Such reform in local level governance through an act, can help to make participatory plans at Panchayat level.

3.6 Norms and Standards for Spatial Planning

For the preparation of spatial development plans, RADPFI guidelines have illustrated following norms and spatial standards in rural areas.

3.6.1 Habitat Planning in Rural Areas

3.6.1.1 Norms for Low Income Housing development

Plot size	80 sq.m., Minimum
Density (Gross)	60 plots per hectare, Maximum
Minimum frontage	6 m
Ground coverage	33percent (subject to a maximum of 50 percent)
Floor area ratio (FAR)	2, Maximum
Open spaces	1.21 hectare open space for a village with 200 houses.

(Source: National Building Code, Doc: CED 46 (8064)WC, Nov 2015)

3.6.1.2 Norms for Residential development

S.No.	Plot Area in sq. m	Maximum ground coverage (in %)	FAR	No. of D/U	Max. height in metres	Setbacks (in metres)		
						Front	Side	Back
1.	Below 50	90	1.8	2	6	1.2	-	-
2	51 – 100	80	1.6	2	6	2.0	-	1.5
3.	101 – 150	75	1.5	3	9	2.0	-	2.0
4.	151 – 250	66	1.3	3	9	3.0	-	3.0
5.	251 – 500	60	1.2	3	9	4.5	1.5	3.0
6.	Above 501	50	1.0	3	9	4.5	3.0	3.0

Source: Model guidelines for Development and construction including safety provision for Natural Hazards in Rural Areas, GOI-UNDP Disaster Risk Management Programme, Ministry of Home Affairs, GOI, 2008.)

3.6.1.3 Norms for Commercial development

S. No.	Use	Ground Coverage (in %)	FAR	Maximum Height (in m)	Setbacks (in metres)	
					Front	Back
1.	Convenience Shops	75	1.0	6	2	-
2.	Local Shopping Centre	50	1.0	6	3	-
3.	Community (Gram Panchayat) Shopping Centre	40	1.2	9	4.5	-

*Minimum size of plot for above, 20 sq. metres.

(Source: pp-31, Model guidelines for Development and construction including safety provision for Natural Hazards in Rural Areas, GOI-UNDP Disaster Risk Management Programme, Ministry of Home Affairs, GOI, 2008.)

3.6.1.4 Norms for Industrial Use (Resource based cottage Industries, non-polluting industries and Non-hazardous industries except those permitted by the State/UTs)

No.	Plot Size (in sq. metres)	Ground Coverage (in percent)	FAR	Height	Setbacks (in metres)		
					Front	Side	Back
1.	100-400	60	1.2	8	3	-	3
2.	400-1000	55	1.1	8	4.5	-	3
3.	100-4000	50	1.0	8	6	3	3
4.	Above 4000	45	0.9	8	9	3	4.5

(Source: pp-31, Model guidelines for Development and construction including safety provision for Natural Hazards in Rural Areas, GOI-UNDP Disaster Risk Management Programme, Ministry of Home Affairs, GOI, 2008.)

3.6.1.5 Institutional and Community Facilities

Sl. No.	Plot Size (in sq. metres)	Ground Coverage (in %)	FAR	Height	Setbacks (in metres)		
					Front	Side	Back
1.	500-1500	40	1.2	9	4.5	3	3
2.	1001-2000	33	1.0	9	4.5	3	4.5
3.	2001-4000	30	0.9	9	6	3	4.5
4.	Above 4001	25	0.9	12	9	3	6

(Source: Adapted from Model guidelines for Development and construction including safety provision for Natural Hazards in Rural Areas, GOI-UNDP Disaster Risk Management Programme, Ministry of Home Affairs, GOI, 2008.)

3.6.1.6 Parking Norms

Sl. No.	Use	No. of ECS/EVS
1.	Residential	1 EVS for 100-200 sq.m. plot 1 ECS and 1 EVS for plots more than 201 sq.m
2.	Multi-Family Residential	1 ECS for 75-100 sq.m. built up area and 1.25 for more than 101 sq. metre built up area.
3.	Motel	1 ECS for every room
4.	Wholesale Mandi, Godown and Cold Storage	2 EVS for 550 cu. Metre storage, 2 ECS for 100 sq.m. built up area.
5.	Offices, Conference Hall, Banquet Hall	2 ECS for 100 sq.m. built up area
6.	Educational	1 ECS for 100 sq.m. built up area.
7.	Industrial	1 EVS, 0.5 ECS for 100 sq. metre built up area.

ECS stands for Equivalent car space which is 23sq.metres, if provided in open.

** EVS stands for Equivalent Vehicle Space, which is a more neutral term for the type of vehicle it proposes for parking. It is an inclusive term for Light Commercial Vehicle and tractors with trailers and non-motorised vehicles like Bullock Carts. The recommended space requirement for EVS in open is, 35 sq.m.

3.6.2 Road Infrastructure

The rural roads in India are commonly referred to:

- Other District Roads (ODR)- roads catering rural area of production and providing them with outlet to market centres, taluka/tehsil headquarters, block development headquarters or major district roads, and would serve to connect villages with population 1000 and above or cluster of villages.
- Village Roads (VR)- roads connecting villages or cluster/group of villages with each other and to the nearest road of a higher category.

Village Road type	Road Description	Minimum Road Width (in m)	Functions /remarks
R1	Link Roads	6 m	Inter village, ODR, highways connectors.
R2	Major Through Roads	7.5 m	Main village roads with drain on both sides to facilitate drainage system of the village
R3	Minor Through roads	4.5 m	Other village roads
R4	Minor Through Lanes	3.75 m	Village lanes

(Source: Draft National Building Code, Doc: CED 46 (8064) WC, Nov 2015; Rural Roads Manual, 2002, Indian Road Congress)

3.6.2.1 Control of building activities along Highways and roads

Type of Building Activity	National Highway or State Highway	Major District Roads	Village Roads (All sub categories)
Theatres, Industrial Units etc., Major Commercial Establishments	8 metre front set back	5 metre	3 metre
Residential	5 metre front setbacks	3 metre	3 metre
Institutional	8 metre front setbacks	5 metre	5 metre

(Source: pp-35, Model guidelines for Development and construction including safety provision for Natural Hazards in Rural Areas, GOI-UNDP Disaster Risk Management Programme, Ministry of Home Affairs, GOI, 2008.)

3.6.3 Social Facilities

Use	Standard/Population	Area (in hectares)	Distance from Habitation
Primary School	1 for 5000	0.4 to .6 ha	Within 500 metres
High School with Primary School	1 for 15000	1 ha	Within 1km
Dispensary/Health Centre	1 for 5000	.05 ha	Within 500 metres
Community Hall	1 for 5000	.05 ha	Within 1 km
Aanganwari	1 for 5000	.05 ha	Within 500 metres

(UNDP Disaster Risk Management Programme Ministry of Home Affairs, Govt. of India, 2008) The distance norms as well as population norms can be relaxed in case of hill areas/desert areas with low population densities/concentration.

3.6.3.1 Site Specific Norms for Education and Health Facilities

S.No.	Use	Minimum Plot Size (in sq. m.)	Ground Coverage (in %)	FAR	Height	Setbacks (in metres)		
						Front	Side	Back
1.	Nursery School/Anganwadi	5000-1500	33.3	1.0	10	4.5	3	3
2.	Primary School	1500-3000	30	0.9	10	6	3	6
3.	Senior Secondary	4000-10000	25	1.0	12.5	9	4.5	6
4.	Nursing Home,	250	35	0.7	6	3	-	3
5.	Dispensary	251-500	33.3	1.0	9	4.5	3	3
6.	Diagnostic centre	Above 501	30	1.0	12	6	3	4.5

(UNDP Disaster Risk Management Programme Ministry of Home Affairs, Govt. of India, 2008)

3.6.3.2 Socio Cultural Facilities

Category	Population Served per unit	Land Area Requirement (min.)
Crematorium	One per Block	0.5 ha
Cremation Ground	One per Gram Panchayat or 5000 Population	400 sq. metres
Burial Ground	5000 residents observing burial rituals in a Habitation or a Gram panchayat	500 sq. metres
Open Spaces/Parks	One housing area park per 5000 population and Neighbourhood Park for 15000.	0.50 ha and 1 ha respectively.
Playground /Ground for Fairs and Festivals	One per 5000 population	1.00 ha.
Religious Places	5000	400 sq. metres
Fire station	2 lakh population or 10 km radius	0.6 ha

(Sources: Derived from URDPFI Guidelines 2014; Green Burial Ground Project, PARD)

3.6.4 Water supply and Sanitation

3.6.4.1 Potable Drinking Water in rural Areas

As per RADPFI guidelines, 40 litres per capita per day (lpcd) is set as minimum in case of minimum supply for areas with extreme conditions of access of water resource. The division of this quantity is shown in **Table 2**.

Table 2 Quantity of Water use per capita.

Purpose	Quantity (lpcd)
Drinking	3
Cooking	5
Bathing	15
Washing utensils & house	7
Ablution	10

(Source: Accelerated Rural Water Supply Programme)

Moreover, 30lpcd is considered for animals in hot and cold desert/ecosystems. At the rate of 12 litres per minute, one handpump or standpost is appraised for every 250 persons. In case of an independent habitation/hamlet/Wadi/Tola/Majra/Mohra etc., one source may be provided for population below 250 persons and if there is no potable water source present in its location. A rural habitation not having any safe water source with a permanently settled population of 20 households or 100 persons, whichever is more, may be taken as the unit for coverage with funds under the Accelerated Rural Water Supply Programme. However, the State Government could cover any habitation regardless of its size/population/number of households.

The above is the minimum to be provided. Within walking distance of 50 meters, 70-100 lpcd is the recommended provision. Individual states can adopt higher norms of supplying above 100 lpcd.

3.6.4.2 Safe water standards

The recommended standards acceptable and cause for rejection for drinking water in India by WHO and BIS is as follows:

Table 3 Drinking Water Standards

Sl.No.	Characteristics	Acceptable	Cause for Rejection
1.	Turbidity (NTU)	1	10
2.	Colour (Units on Platinum Cobalt Scale)	5	25
3.	Taste and Odour	Unobjectionable	Objectionable
4.	PH	7.0 to 8.5	<6.5 or >9.2
5.	*Total Dissolved Solids (mg/l)	500	2000
6.	Total hardness (as CacCo3) (mg/l)	200	600
7.	Chlorides (Cl) (mg/l)	200	1000
8.	Sulphates (as So4) (mg/l)	200	400
9.	Fluorides (as F) (mg/l)	1.0	1.5
10.	Nitrates (as No3) (mg/l)	45	45
11.	Calcium (as Ca) (mg/l)	75	200
12.	Magnesium (as Mg) (mg/l)	30	150
13.	Iron (as Fe) (mg/l)	0.1	1.0
14.	Manganese (as Mn) (mg/l)	0.05	0.5
15.	Copper (as Cu) (mg/l)	0.05	1.5
16.	Arsenic (mg/l)	0.05	0.05

(source: RADPFI guidelines)

For determination of habitation with salinity problem, TDS limit (cause for rejection for rural areas) is fixed at present at 1500 mg/l against the recommended limit of 200 mg/l. As per the convention salinity is measured based on TDS characteristics. TDS has close co relation with salinity.

3.6.4.3 Sanitation

For proper sanitation in rural areas, dwelling units with individual conveniences shall have at least the following fitments:

- One bathroom provided with a tap,
- One water closet
- One nahani or sink raised from the floor with a tap.

Similarly, community toilets (for community residing in the village) or public toilets (for floating population) shall be provided as per norms listed in **Table 4**.

Table 4 Standards for Toilet Facility

Types of toilets	Toilet seats	Bath Units	Urinal units	Clothes washing area
Community toilets	One seat per 50 users	One unit per 50 users	One unit per 200-300 users	4 - 5 sq. metres per 10 toilet seats; min 1.5m x 1.2 m
Public toilets near railway stations (may be used at all hours)	One seat per 100 users	One unit per 70 users	One unit per 300-500 users	4 to 5 sq. metres per 30 toilet seats; minimum 1.5m x 1.2m.
Public toilets near market place/ offices (will mostly be used during working hr)	One seat per 100 users	One unit per 50 users	One unit per 200-300 users	4 to 5 sq. metres per 10 toilet seats; minimum 1.5m x 1.2m.

(Source: BIS, Code of Basic Requirements for water Supply, Drainage and Sanitation, 1993)

3.6.5 Solid and Liquid Waste Management

Solid and Liquid Waste Management is a major component required for improved sanitation of any area. This is a severe threat to public health and cleanliness in rural India. The rural areas have predominantly organic and biodegradable form of waste which is still a major problem in ecological balance.

3.6.5.1 Solid Waste Management

As per RADPFI guidelines, the per capita generation of solid waste in rural areas ranges between 50 gm/cap /day and 250 gm / cap / day as mentioned below:

- Rural (Peri-urban or Urban outgrowth) 150 to 250 gm / cap / day.
- Rural (Remote /Tribal) 50 to 150 gm / cap / day.

There are different methods to manage solid waste. Composting is one of the effective and preferable method for solid waste management in rural India. This can be done in various ways like Pile methods of composting, NADEP method, Bangalore method, Indore method,

Coimbatore method, Vermi-Composting, Thermophilic Composting and Biogas Technology. A composting site of one hectare has capacity to handle 83.33 tonnes of waste per day. This handling capacity varies with types of methods used (**Table 5**). The non-biodegradable waste like paper, plastic, metal can be recycled and sold off to recycling centres. The waste which cannot be re-use or recycle and has no value left can be sent for final disposal either in landfills or incinerator.

Table 5 Area Requirement for Waste Management technology.

Bio-methanation Process	1 hectare for 125 tonnes per day
Gasification/ Pyrolysis	1 hectare for 50 tonnes per day
Incineration	1 hectare for 125 tonnes per day

(source: RADPFI)

3.6.5.2 Liquid Waste Management

There are two types of liquid waste generated within the household- Black water (wastewater from toilets containing fecal matter) and Gray water or sullage (from bathrooms or kitchen). The various techniques available for treatment of liquid waste generated in settlements is illustrated in Annexure 1 and Sewage disposal standards are enlisted in **Table 6**.

Table 6 Sewage Disposal standards.

Parameters	Inland Surface water	Land for Irrigation
Suspended solids (mg/l). Max.	100	200
pH value	5.5 to 9.0	5.5 to 9.0
Oil and Grease (mg/l)., Max	10	10
Total residual Chlorine(mg/l)	1.0	-
Ammoniacal Nitrogen	50	50
Total Kjeldahl Nitrogen (mg/l)	100	-
Free Ammonia, (mg/l)	5	-
Nitrate Nitrogen (mg/l)	10	-
Biological Oxygen Demand, mg/l	10	-
Biological Oxygen Demand, Mg/l	30	100
Chemical Oxygen Demand, (mg/l)	250	-
Arsenic (As) (mg/l)	0.2	0.2
Lead (Pb), mg/l	0.1	-
Dissolved Phosphate (P) (mg/l)	5.0	-
Sulphide (S) (mg/l)	2.0	-
Phenolic Compound, (mg/l)	1.0	-

(source: RADPFI guidelines)

The wastewater can be treated and reused in horticulture or irrigation. The shallow surface drain is most suitable for carrying grey water along with storm water. Small bore/shallow sewers are the cost-effective sustainable solution for black water mixed with grey matter (sewage). They are designed alongside with interceptor tanks at the sources to receive liquid portion of household waste water for off-site treatment and disposal.

3.7 Environmental Sustainability and Disaster Management

The natural resources of land, water, vegetation and mineral are an integral part of rural areas. The natural landscape so formed act as a source of livelihood and sustenance for both rural and urban economies. They possess a unique value of ecological balance when sustainably used. Mostly, these natural resources are overused or degraded due to mushrooming unplanned and unorganized growth of rural settlements. This calls a need for Sustainable Rural Planning to achieve balance between social and economic development of human habitat keeping in mind environment, equity in employment, shelter, basic services, social infrastructure and transportation. The sustainable rural planning can be achieved through Integrated Rural-Regional Planning, adoption of Sustainable agriculture practices, promotion of Renewable Energy and providing Sustainable Rural infrastructure using reuse and recycling.

Another aspect to be considered for Environment Sustainability of rural areas is **Climate Change mitigation and Adaptation**. The change in the climate pattern has direct impact on rural lives and livelihood. The changing weather phenomena and long-term climate variability has impacted agriculture and pathogens affecting rural economic base. The International Panel on Climate Change (IPCC) Working Group-II's report (2013) highlighted the need for resilience of regions due to issue of food and water security. Therefore, Regional Plans and Development Plans must mainstream the impact of climate change and developing climate resilient rural areas. Moreover, '**Climate Proofing**' can be done to identify risks originating from investment plan or development plan or from people and their assets because of climate change. The different parameters and strategy adopted for Climate proofing and Community Resilience are represented in **Table 7**. These parameters help to identify **Vulnerability** of rural habitats due to climate change. Disadvantaged people, Fragile living and lack of services are indicators of vulnerable population as per RADPFI guidelines. The resilience of rural areas is expected to be achieved through Rural Disaster Resilience Planning (RDRP) approach considering rural communities. The strategical representation of this approach is shown in **Figure 14** and details of approach can be referred in RADPFI guidelines.

Table 7 Parameters and Strategy for Climate Proofing and Community Resilience

Parameters	Strategy
Housing	<ul style="list-style-type: none"> Guidelines for construction of buildings on slopes Structural Stability of buildings in hills for the entire Gram Panchayat. Soil Erosion and sedimentation control in Non-Hill areas.
Ecologically sensitive Rural Planning	<ul style="list-style-type: none"> Demarcate eco sensitive areas Bringing in principles of climate resilient rural development based on environmental parameters like conservation of natural ecosystems and watershed management.
Rural Infrastructure and Services	<ul style="list-style-type: none"> Augment water supply and water treatment in rural areas Water conservation and rainwater harvesting.
Disaster Resilience	<ul style="list-style-type: none"> Preventive health measures Public health management and surveillance system Emergency medical response

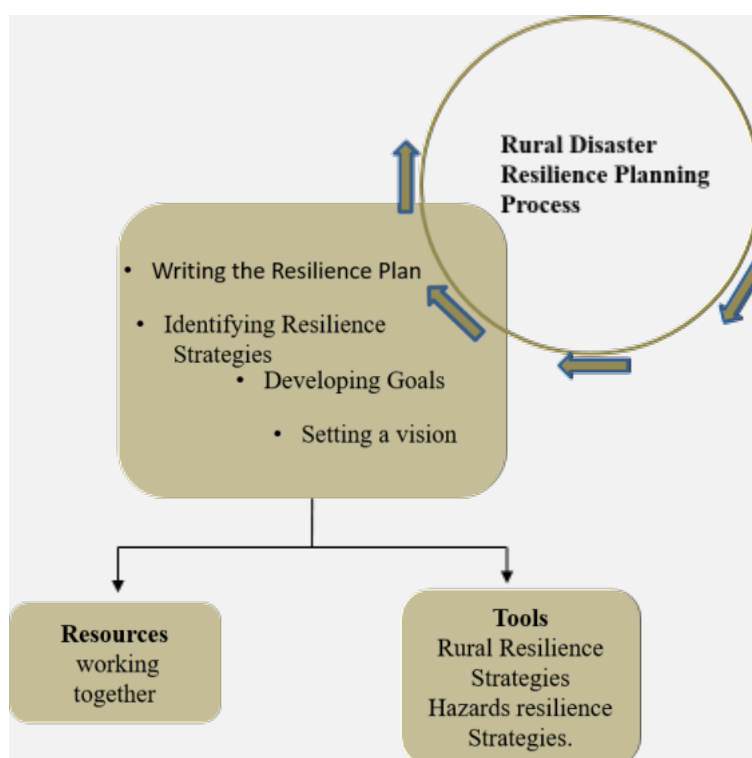


Figure 14 Rural Disaster Resilience Strategy and Plan

(Source: Rural Disaster Resilience Planning, Justice Institute of British Columbia last accessed from <https://rdrp.jibc.ca/step-3-building-a-resilience-plan> at 26.09.2016)

The Disaster Management Act, 2005 includes multi-tiered institutional system consisting of National Disaster Management Authority (NDMA), State Disaster Management Authorities (SDMAs) and District Management Authorities. The act visualizes community based and local level disaster management initiatives in accordance with district and state level disaster

management authorities. For **Disaster Management**, the RADPFI guidelines defines local authorities as Panchayati Raj Institutions (PRI), Municipalities, District and Cantonment Boards, and Town Planning Authorities for controlling and managing civic services. These institutional bodies shall be responsible for capacity building of their officers and employees for managing disasters, carry out relief, rehabilitation and reconstruction activities in the affected areas. The disaster management can be at Community Level as well as there can be Gram Panchayat/Village Disaster Management Plan. **Community Based Disaster Management**, a decentralized bottom-up approach, generate confidence, knowledge, awareness, partnership and ownership for planning. The participatory nature of this type of disaster management gives equity and inclusion to marginalized section of society and brings vulnerable groups to centre stage of implementation and planning. The development of **Village Disaster Management Plan (VDMP)** plays key role in the implementation of Community Based Disaster Risk Management. This plan includes lists of activities to follow during a disaster for the prevention of loss of life, livelihoods and property. It is further strengthened with inclusion of actions taken by individuals in the community beforehand. The suggested framework for developing SDMP, DDMP, VDMP and CDMP is represented in **Figure 15**. This VDMP shall be analysed spatially by carrying out Vulnerability mapping using GIS based tools, Remote sensing and Global Positioning System (GPS).

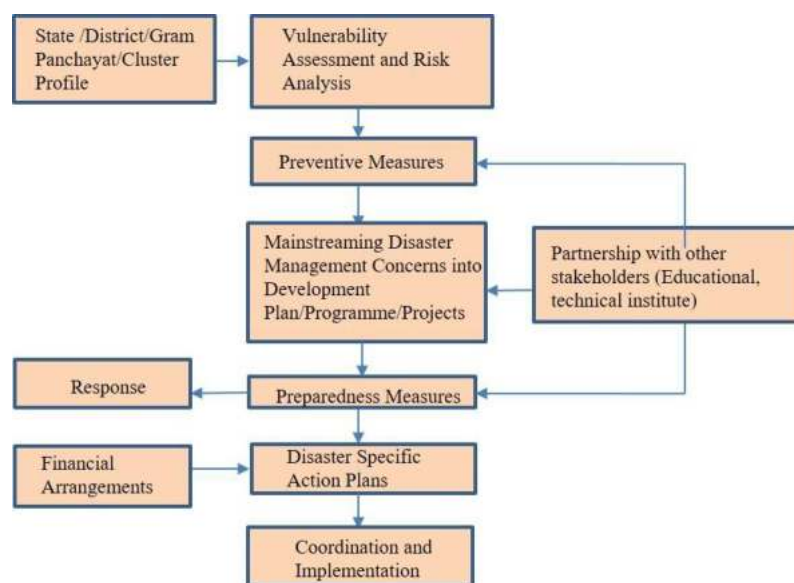


Figure 15 Suggested Framework for developing SDMP, DDMP, VDMP, CDMP

(Source: NDMA Guidelines, Preparation of State Disaster Management Plans)

4 Contents of the Gram Panchayat Spatial Development Plan

4.1 Panchayati Raj Institutional set-up in Madhya Pradesh

The enactment of 73rd Constitutional Amendment Act in 1992 devolves the governance to Panchayats in rural India to encourage participatory democracy at local level. They are the basic institution of rural local governance and are empowered to prepare development plans for social and economic growth of rural areas as per article 243G of Indian constitution. The state of Madhya Pradesh pioneered this enactment of act and passed Madhya Pradesh [Panchayat Raj Avam Gram Swaraj] Adhiniyam, 1993 institutionalizing three governing bodies- 'Panchayat' for a village, 'Janpad Panchayat' for a block and 'District Panchayat' for a district ((CHRI), 2006). There were several amendments in this act in response to the needs emerging from the field. In an amendment, M.P. Gram Sabha Adhiniyam 2001 envisages 'Gram Sabha', a constitutionally approved unit. This gives voting rights to all the major persons to elect Panch, Sarpanch, members of Janpad and members of District Panchayat. The Gram Sabha has power to approve works under annual budget of the village constituted with the elected members with a term period of five years.

Each of the governing bodies constituted at three different administrative levels perform different functions. The Village Panchayat at village level with its funds performs the execution of the disposal of discriminating articles, water supply, public works (roads, buildings, wells, tanks), market exchange, cooperation with governmental works, community health and development works. Similarly, Janpad Panchayat with its funds in its area works for community development and integration, agriculture, social, trade, cattle-breeding, fish-breeding, adult education, co-operatives, cottage industries, welfare, and employment-oriented programs (DCO D. o., 2011). The District Panchayat has the duty to supervise and control the Janpad and Village Panchayats. It also directs the development works and advises the State Government.

4.2 Panchayati Raj Institution in Vidisha District

4.2.1 Vidisha District

The apex body under Panchayati Raj Institution in Vidisha district is Zilla Panchayat located in Vidisha city. There are 7 Janpad panchayats under this apex body with a total of 580 Gram Panchayats (**Table 8**). The number of villages under each of the Gram Panchayats are shown in **Table 9**. This institutional set up also has reservation for Schedule Caste (SC) and Schedule Tribes (ST) at all levels depending on the population ratio. Women are also given one-third reservation in the institutional set up.

Table 8 Statistics of Vidisha District.

Particulars	2001	2011
Area (in sq. Kms.)	7,371.0	7,371.0
Number of Tahsils	7	10
Number of CD Blocks	7	7
Number of Towns	5	7
Statutory Towns	5	6
Census Towns	0	1
Number of Villages	1,616	1,614
Inhabited	1,533	1,536
Un-inhabited	83	78
No. of Revenue Villages	1,614	1609
No. of Forest Villages	2	5
No. of Other Villages	0	0
Total Population	1,214,857	1,458,875
Proportion of Rural population to total population	78.6	76.7

(source: District Census Handbook)

Table 9 CD Block details of Vidisha district.

Name of CD Block	Total No. of Villages	Total No. of Gram Panchayats
Lateri	194	61
Sironj	289	93
Kurwai	226	75
Basoda	285	101
Nateran	181	84
Gyaraspur	204	71
Vidisha	235	95

(source: DCHB)

4.3 Tehsil and Gram Panchayat and its interface/linkages

Tehsil is the geographical unit formed for the purpose of land revenue collection and levy taxes. It is headed by Tehsildar and come across both urban and rural areas. The villages within these tehsils form 'blocks' or 'Community Development blocks' for the purpose of rural development. In Madhya Pradesh, the institutional body formed at CD block level is called 'Janpad Panchayat' headed by Chief Executive Officer. The secretary of Gram Panchayat, appointed by State Government or the prescribed authority, is responsible for maintaining records of the Gram Panchayat. It is administratively responsible to the Chief Executive Officer of Janpad Panchayat. The annual plan for economic development and social justice of the Gram Panchayat area is forwarded to Janpad Panchayat after approval of the Gram Panchayat. There is also

reallocation of funds transferred by Central or State Governments related to works, schemes and projects to Janpad Panchayats and Gram panchayats by the Zila Panchayats. It is also mandatory to include information related to Gram Panchayat in Janpad Panchayat's report.

5 Murwas – Gram Panchayat Spatial Development Plan

5.1 Introduction

5.1.1 Location of Murwas – Regional Linkages

Murwas village is in Lateri Tahsil of Vidisha district in Madhya Pradesh (**Figure 16**). It is situated 10 km away from sub-district headquarter Lateri and 105 km away from district headquarter Vidisha. In terms of local administrative body, Murwas village is the Gram Panchayat. It is a large village with geographical area of 978.75 hectares and total household 972, with population of 5,271 according to Census of India, 2011. There is a state highway passing through the centre of the village connecting nearby towns Sironj (present on East of village) and Lateri (towards West of Village). The village is dependent on these towns for most of the infrastructure facilities (**Figure 17**).

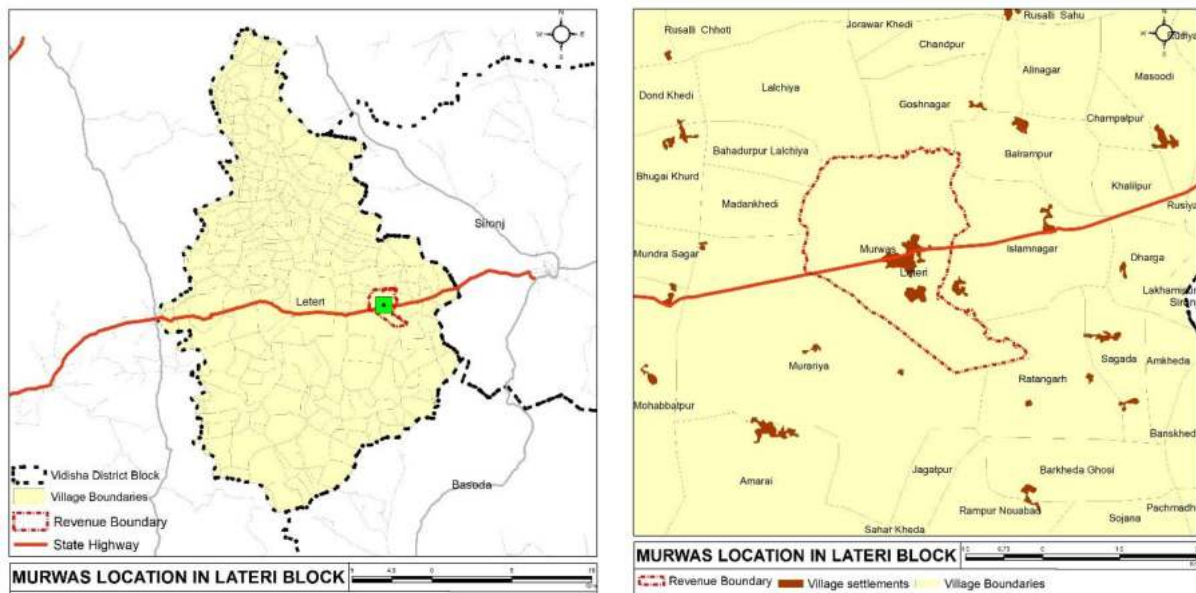


Figure 16 a). Location of Murwas in Tehsil, b). Adjoining villages

Source: Author

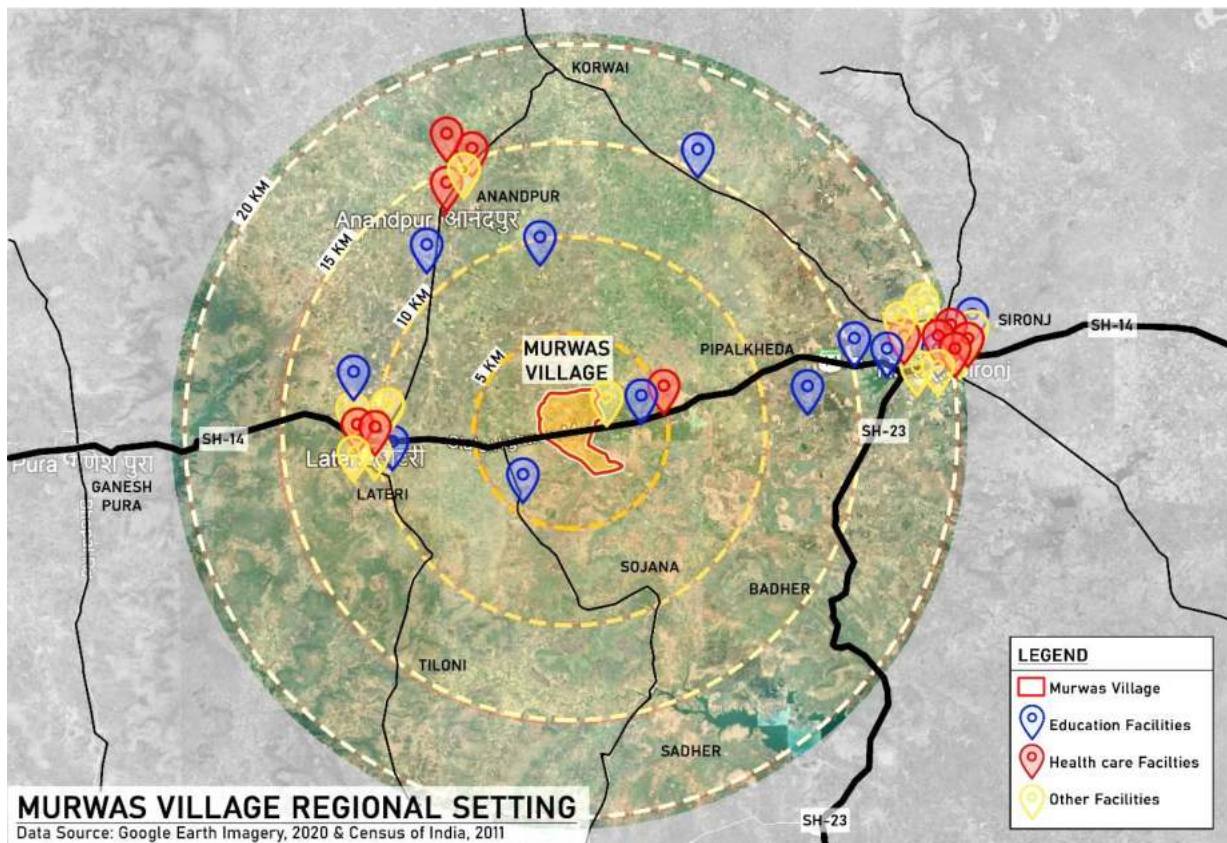


Figure 17 Murwas Regional Setting.

(source: Author)

5.1.2 Historical Importance and National Links

Murwas village has a rich historical background as it was located along the trade route from Iran via Rajasthan to Dhaka. The traders from West used to halt in Murwas and Sironj village for business purposes. This business activity shaped the type of architecture of the village. The oldest settlements of the village had different building typology. There used to be multi-storied shops with projected canopy to sell the products to passing by merchants sitting on a camel. This is still evident in the oldest settlement of Murwas and Sironj. The village has still maintained its relevance nationally by producing renowned 'Sharbati'¹ wheat which is sold across the world.

5.1.3 Physiography

The physiography of the village is flat land. There is a gentle slope of maximum 5 degree within the revenue area (**Figure 18**). These high degree slope areas are mainly present towards south east of the boundary and near *Abadi* area.

¹ A very good quality of wheat produced in this part of India. It is famous not only in India but also exported all over the world

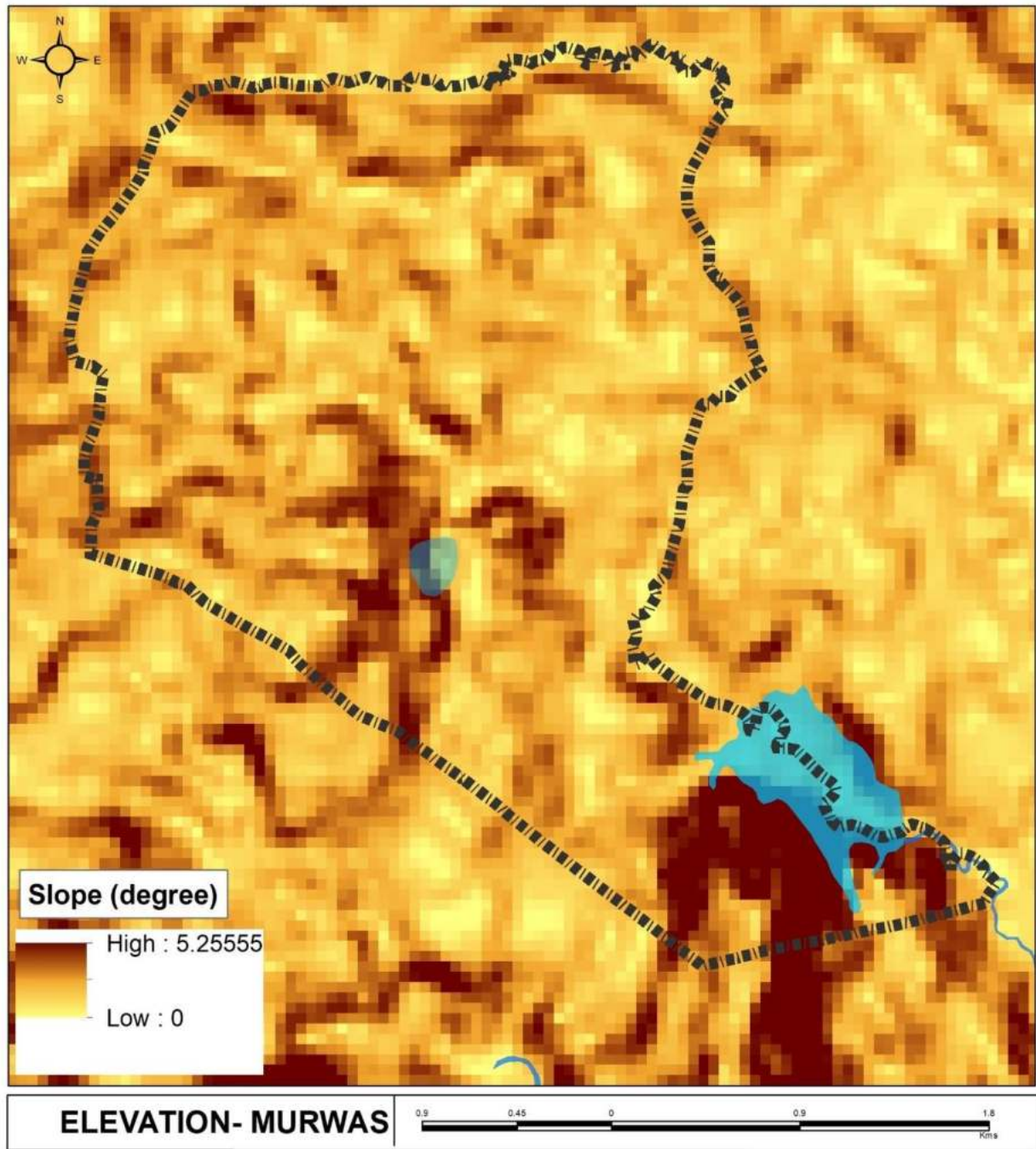


Figure 18 Physiography of Murwas Gram Panchayat.

(Data source: BHUVAN)

5.1.4 Murwas in the Tehsil/District- Scalogram

Settlement Hierarchy based on population and Guttman scalogram analysis was conducted for the Lateri tehsil (**Figure 19**). This analysis was conducted for the year 2011 based on Census of India data, and year 2041, with the projected population. Both of which have been discussed further in subsequent sections.

5.1.4.1 Based on Population

Settlements have been divided into classes based on their population and arranged into groups based on census of India (2011) which is already discussed in **Table 10**.

Table 10: Classes of settlement for rural settlements

Population Classes for Rural Settlements		
CLASSES	POPULATION	Remarks
Class I	Above 10000	Large villages which are likely to be urban in future, if near metropolitan areas. Large villages which may be purely depended on flourishing agricultural or other primary activities.
Class II	5000 to 9999	Villages which are having population next to Class I village, and would also be urban, if near metropolitan areas.
Class III	2000 to 4999	Medium sized villages which can be grouped together to form a cluster, if have geographical contiguity.
Class IV	1000 to 1999	
Class V	500 to 999	Small sized villages where cluster plans would be feasible.
Class VI	200 to 499	
Class VII	Less than 200	Isolated hamlet, where villages are located on hilly terrain, dessert or tribal areas, and spatial plans shall be based on connectivity and sharing of resources.

Source: RADPFI, GoI, 2016

5.1.4.2 Based on Guttman Scalogram

A Guttman scale (also known as cumulative scaling or scalogram analysis) is an ordinal scale where statements are arranged in a hierarchical order so that someone who agrees with one item will also agree with lower-order, easier, less extreme items. This scale is used for:

- To identify class of settlement in terms of social, administrative, transport, commercial and other facilities.
- To find regional disparity and imbalance in development if any.

In regional analysis the items are functions- services, facilities, infrastructure, organizations, and economic activities-which give settlement (cases) centrality in the spatial system. The scale is ordinal and items are divided into “yes” or “no” i.e., 1 or 0.

Guttman scale is a relatively easy way of examining both the functional complexity of settlements and the distribution of functions among communities within Lateri region.

Following are the Steps to conduct the Guttman Analysis:

Step 1: Classify the village data available in Census with respect to the facilities and services available of a given Tehsil (**Table 11**).

Step 2: Mark the availability of services in a village in terms of available or unavailable as 1 and 0 respectively.

Step 3: Calculate the sum of these services [Guttman score] for each village in the tehsil

Step 4: Rank the villages in order of the Guttman score to identify the order of service of the villages in the tehsil.

Table 11: Type of facilities w.r.t class of settlement

S No.	Class of Settlement	Type of facilities
1	First Order Service	Post Head office, Commissionerate, Fire Training Institute, Municipal Corporation, Railway station, APMC, University, Connectivity by railway, Civil Hospital, District cooperative, District milk collection centre, District Industrial centre, 24 x 7 water supply
2	Second Order Service	National Highway, Police Station, supply of treated water twice in a day, Bus Depo/Sub Bus depo, Market yard/ Sub APMC, MIDC, Post office, Engineering/Medical College, Municipal Council, Community Health Centre, Fire Station
3	Third Order Service	PHC/ Maternity/ Child Welfare/Family Welfare Centre, Nationalised Bank, SH, Sub post office, Senior Colleges (BSc, BCom), Daily Market, Veterinary Hospital, Medium & Large-Scale Industry, Fire post, Police chowki/post, Nagar Panchayat/Panchayat samiti, Treated water once in a day, Bus stand
4	Fourth Order Service	Treated water once in 4 days, Junior College, Bus stop, Weekly Market, Post Branch office, Small & Micro scale Industry, Warehouse / Godown, Commercial bank, Cooperative Bank, Dispensary, Major District Roads, Circle office
5	Fifth Order Service	Pre-Primary & Primary School, Secondary School, Gram panchayat, Post Office Counter without Delivery/ Letter Box, Common (Standpost/Handpump)/Private Well, Village Roads and ODR, Private Transport (jeep, auto), Primary Health Sub-centre, SHG, Shops/Mandi, Dairy, Household Industry

Source: URDPFI Guidelines

All villages of Lateri tehsil with their Guttman score are enlisted in Annexure 2. The existing and projected settlement hierarchy of Lateri tehsil based on Guttman scalogram is represented in **Figure 20**.

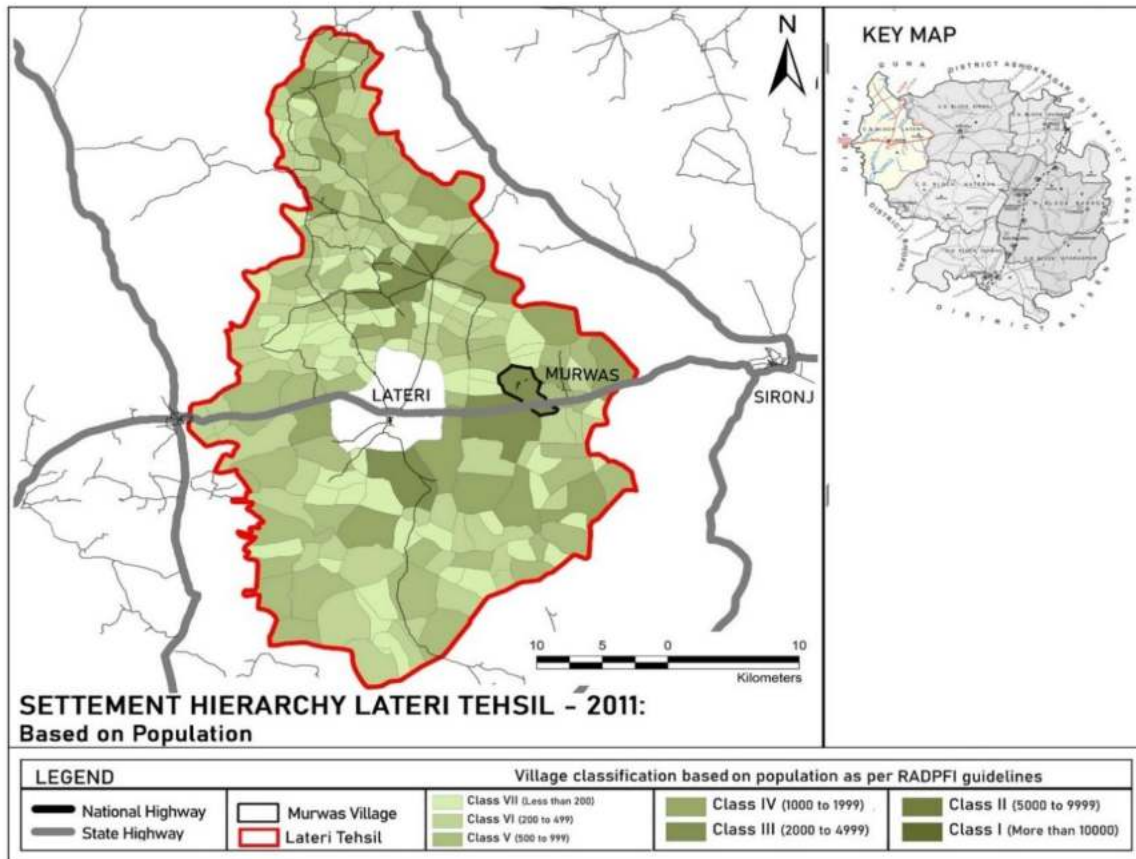


Figure 19 Settlement Hierarchy of Murwas based on population.

(source: Author)

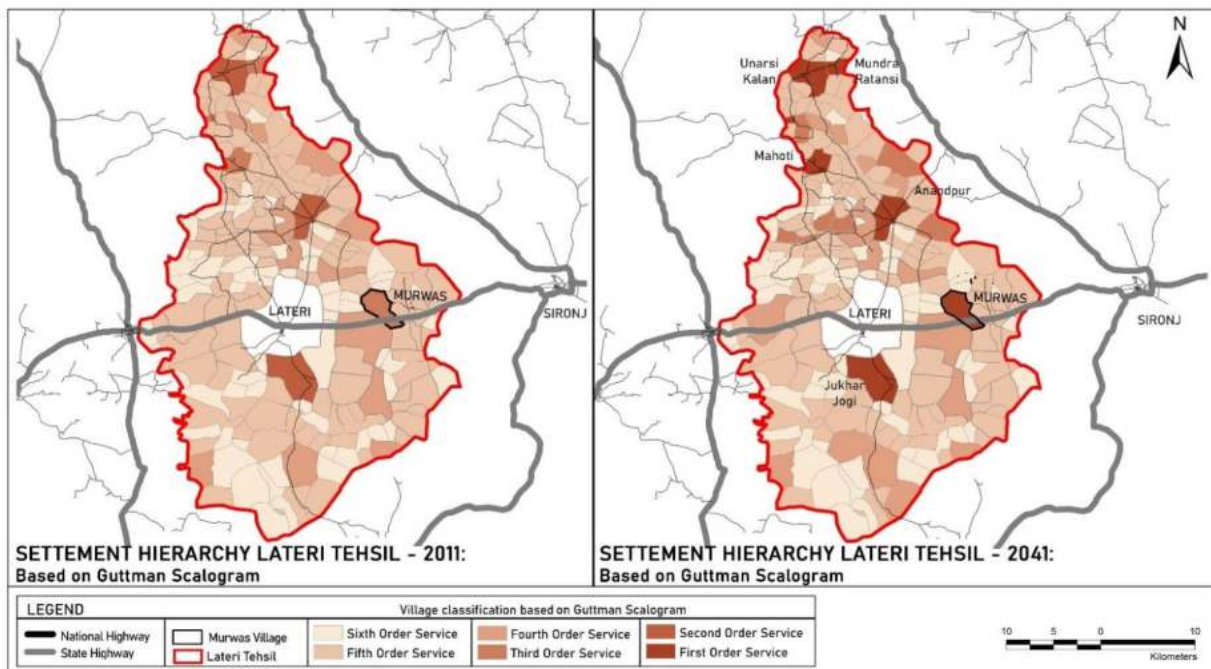


Figure 20 Settlement Hierarchy based on Guttman Scalogram.

Source: Author

5.2 Spatial Analysis of Current Scene

5.2.1 Spatial Extent Validation of Murwas Gram panchayat

Before proceeding to spatial analysis of the Murwas village, its spatial extent is validated. There found to be a shift in the boundary which was corrected using cadastral map of Murwas Gram Panchayat. Therefore, we are considering cadastral boundary for our spatial analysis (**Figure 21**)

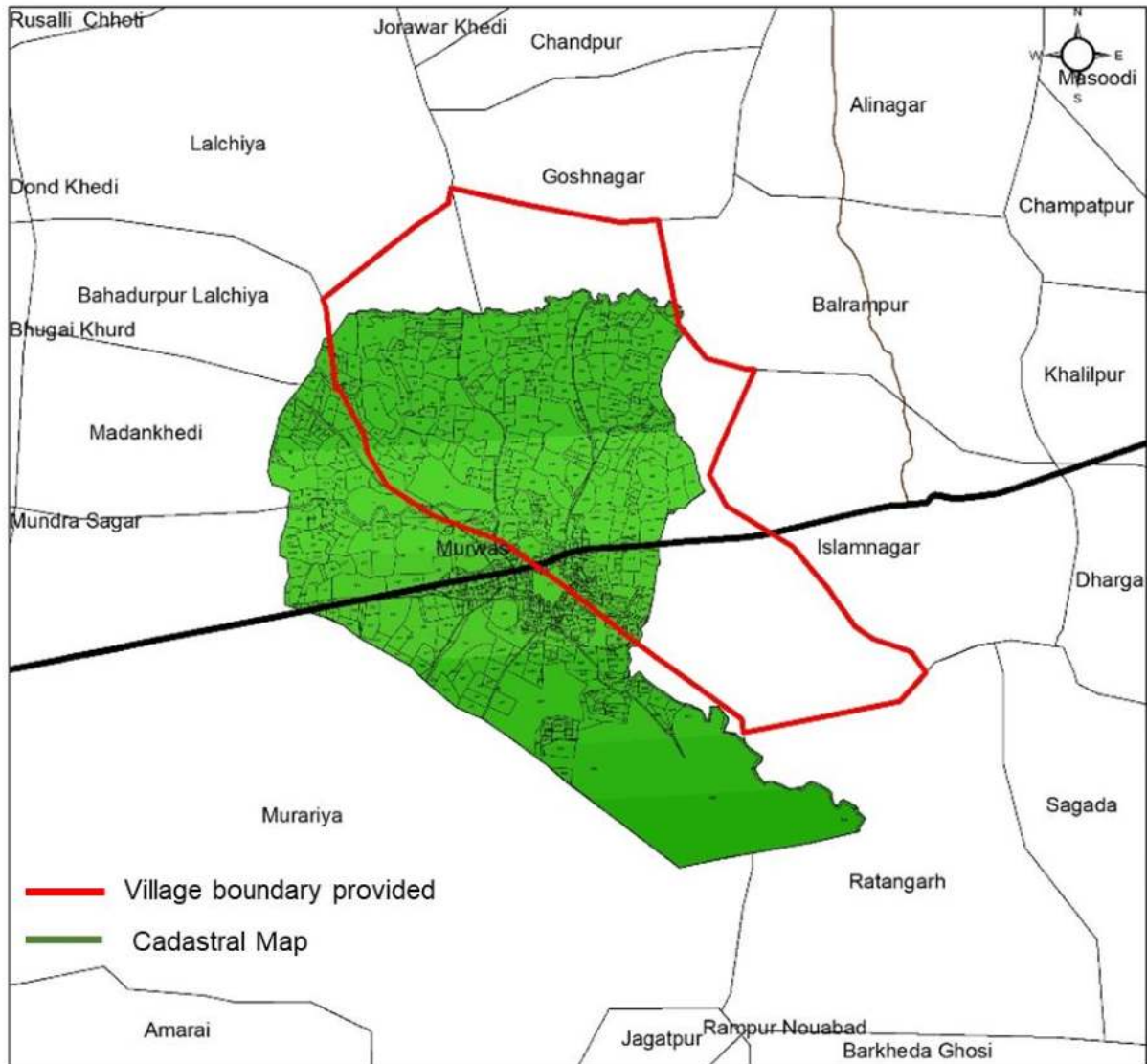


Figure 21 Spatial Extent Validation of Murwas Gram panchayat

Source: Author

5.2.2 Land Utilization

About 76% of land cover is under crop land (Figure 22 & Figure 23). There is only 12% forest coverage, 5% Abadi area, 4% scrub land and 3% water bodies of the total land area. The utilization of land areas as per census 2011 are represented in Table 12.

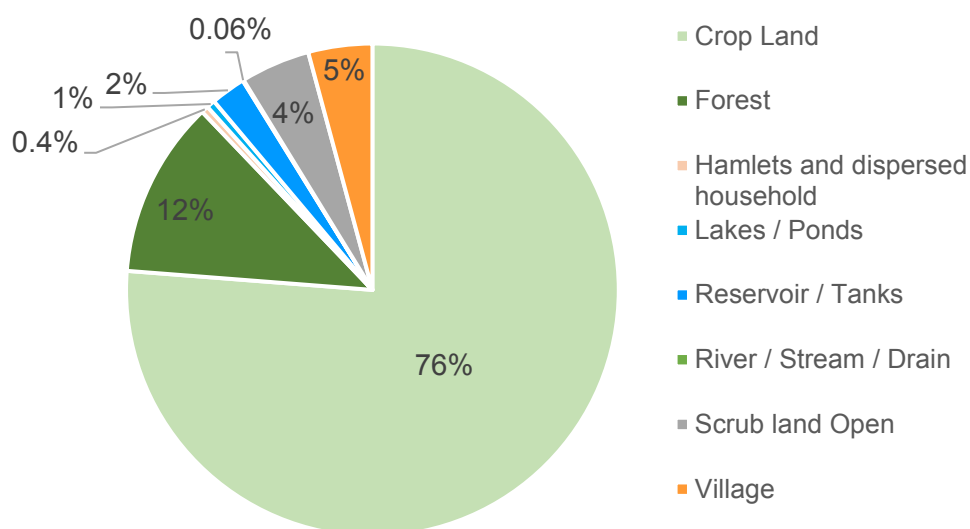


Figure 22 Percentage of Land use Land cover in Murwas Gram panchayat.

(source: BHUVAN)

Table 12 Land Area under different uses.

Forest Area (in Hectares)	179.9
Area under Non-Agricultural Uses (in Hectares)	68.99
Barren & Un-cultivable Land Area (in Hectares)	8.49
Permanent Pastures and Other Grazing Land Area (in Hectares)	8.36
Permanent Pastures and Other Grazing Land Area (in Hectares)	8.36
Culturable Waste Land Area (in Hectares)	4.05
Fallows Land other than Current Fallows Area (in Hectares)	1.8

(source: DCHB)

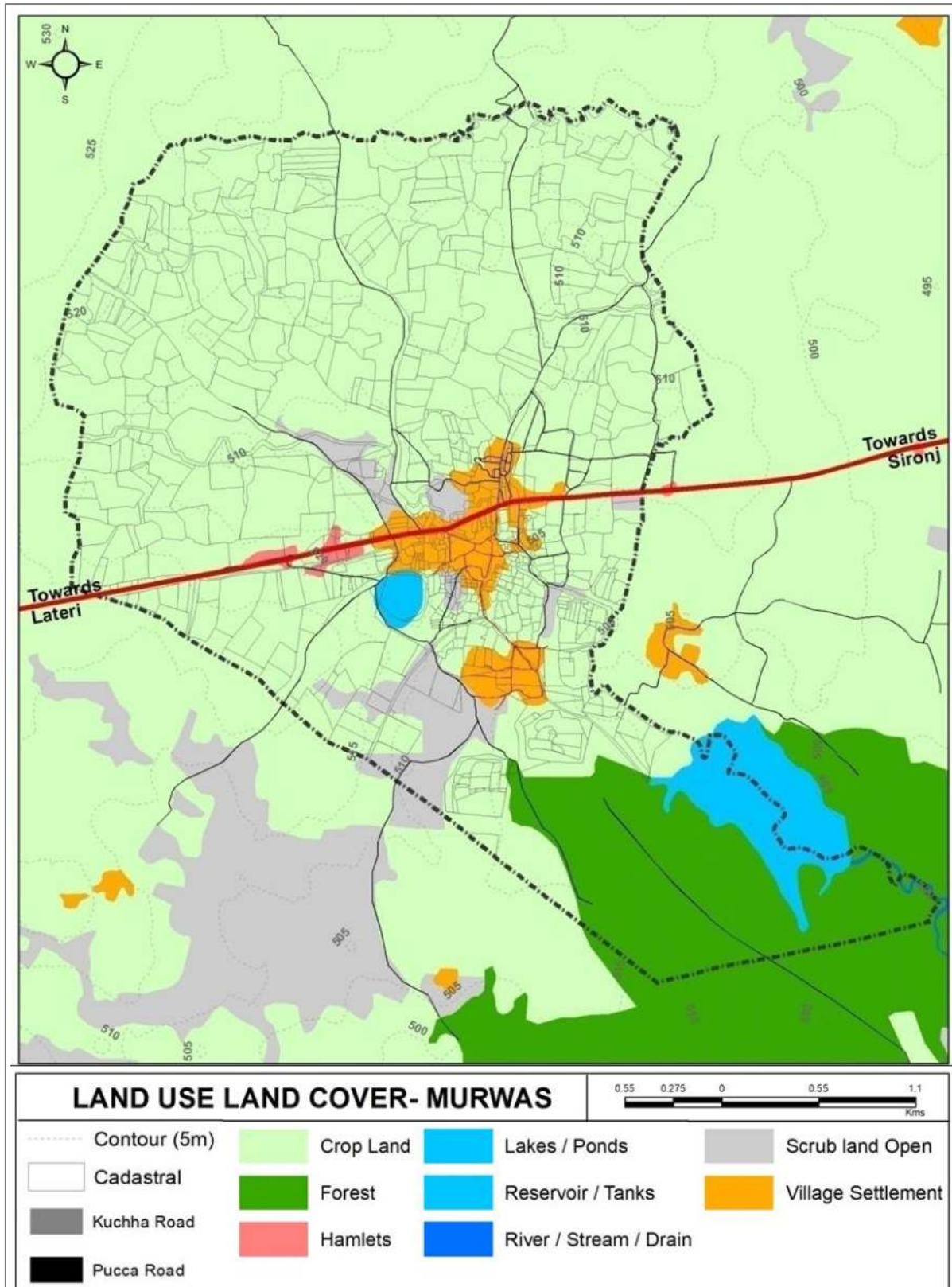


Figure 23 Land Use Land Cover of Murwas Gram Panchayat.

(source: BHUVAN)

5.2.3 Land use of *Abadi* Area (Human Settlement Area)

The *Abadi* area covers 5% of Murwas Gram Panchayat area and its land use is captured using drone technology. The settlement present within *Abadi* area is spread along the state highway having 14% of mixed land use on both the sides. The spatial pattern of land use in *Abadi* area is illustrated in **Figure 24**.

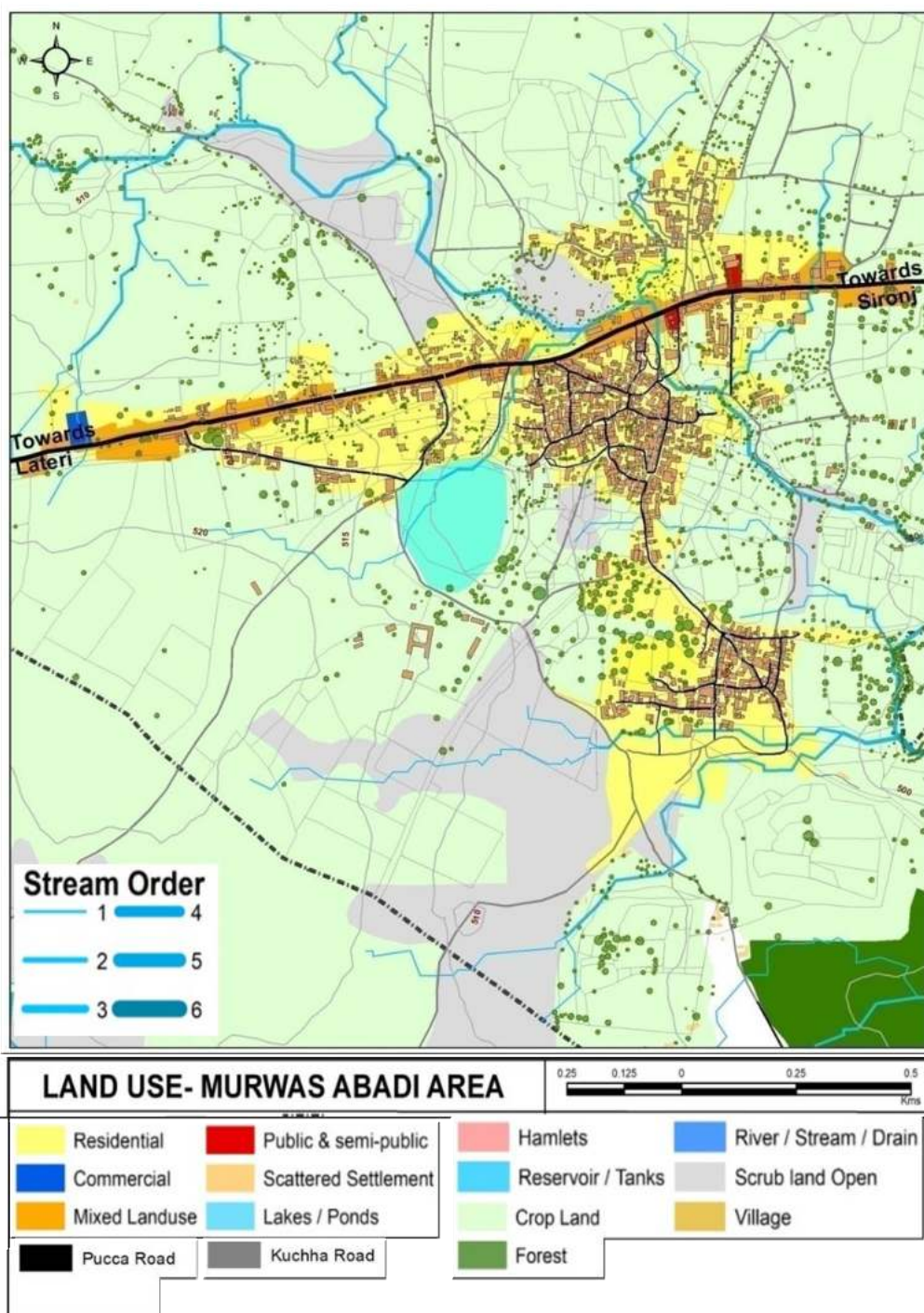


Figure 24 Land Use of *Abadi* Area.

(Source: Primary Survey, 2020)

About 76% of residential land use is spread across the *Abadi* area with only 0.4% of commercial land use towards Lateri in western side and 0.4% of public & semi-public land use (**Figure 25**).

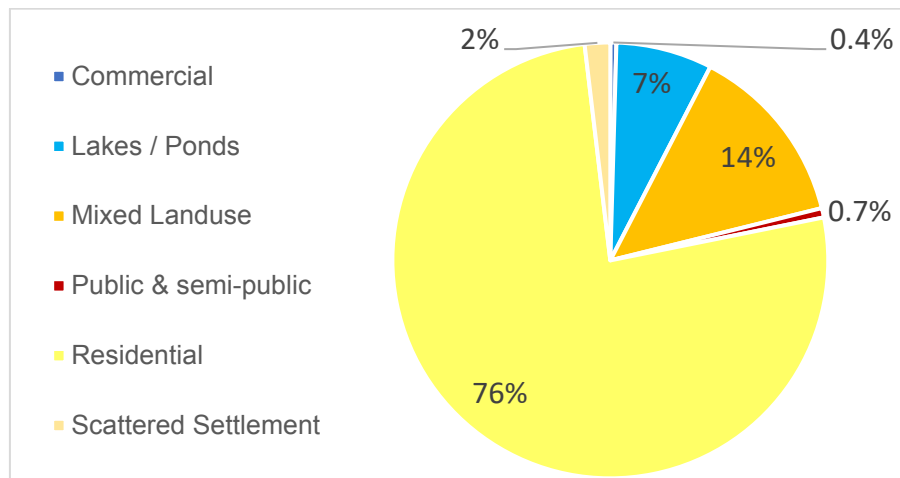


Figure 25 Percentage of Land Use of *Abadi* area.

(source: Primary Survey, 2020)

5.2.4 Land Ownership

There is a 1:3 ratio of government land to private land in the panchayat area. About 25% of land belongs to government while rest has private ownership (**Figure 26**). Maximum government land is present in South of the Panchayat area which is under forest land use. **Figure 27** shows the land ownership pattern. The land ownership of each land parcel as per cadastral map was verified through the web page of 'MPbhulekh' and assigned the same as attribute in GIS for mapping it spatially.

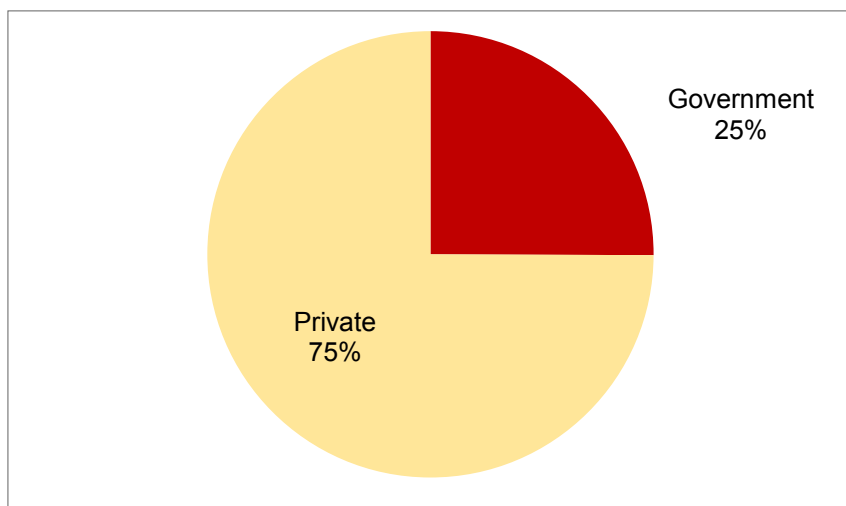


Figure 26 Land Ownership.

(source: MP Bhulekh)

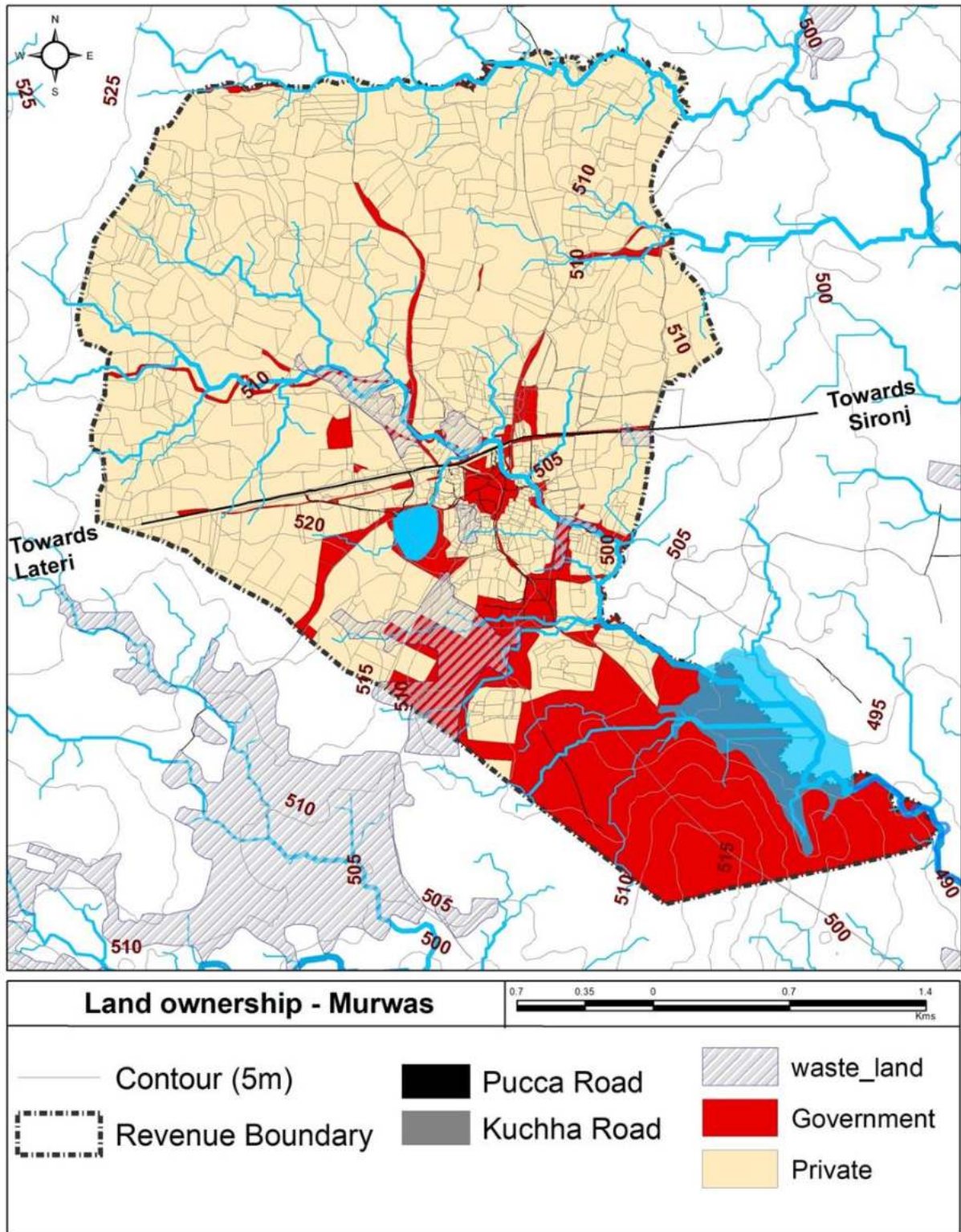


Figure 27 Spatial distribution of Land Ownership.

(source: MP Bhulekh)

5.2.5 Land Holding Pattern

The land holding pattern of Murwas gram panchayat as per the size of land parcels is shown in **Table 13**. The pattern of distribution varies between 0.04 acres to 45 acres. It shows that maximum land parcels have land less than 5 acres of area.

Table 13 Landholding Pattern.

Area (Acres)	No. of land parcels
0-5	613
5-10	102
10-15	21
15-20	7
20-25	5
25-30	1
30-35	2
35-40	0
40-45	1

(Source: MP Bhulekh)

5.2.6 Built-up area and its growth pattern

There is an increase of approximately 124 acres of built-up area from 1990s till 2020 (**Figure 28**). The growth pattern over time was mapped using Shannon Entropy analysis and is illustrated in **Figure 29**. From 1990 to 2001, the settlement has grown predominantly along the highway. From 2001 onwards, there is outward expansion of the existing built-up area. The growth of settlements has also reduced the green cover within the *Abadi* area.

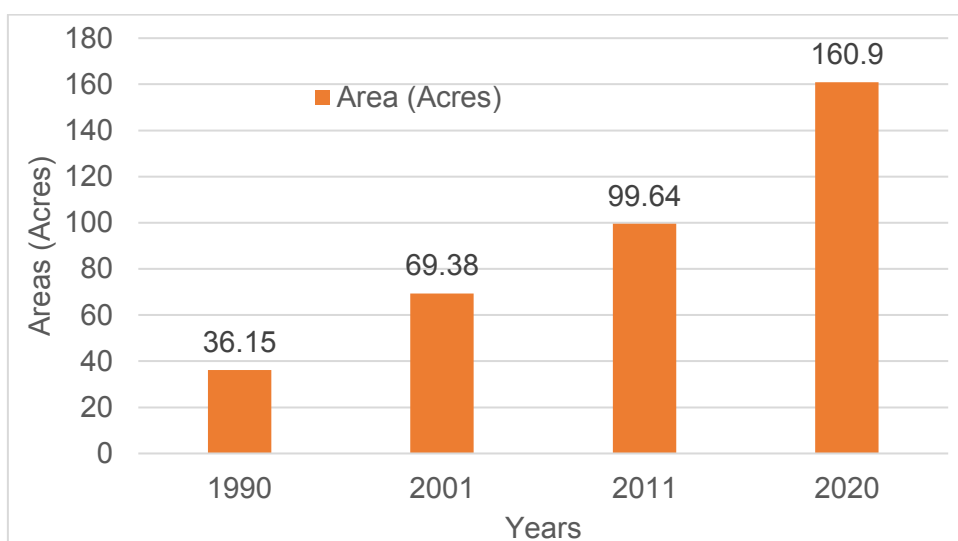


Figure 28 Temporal Built Up Area.

(source: Satellite Imagery USGS)

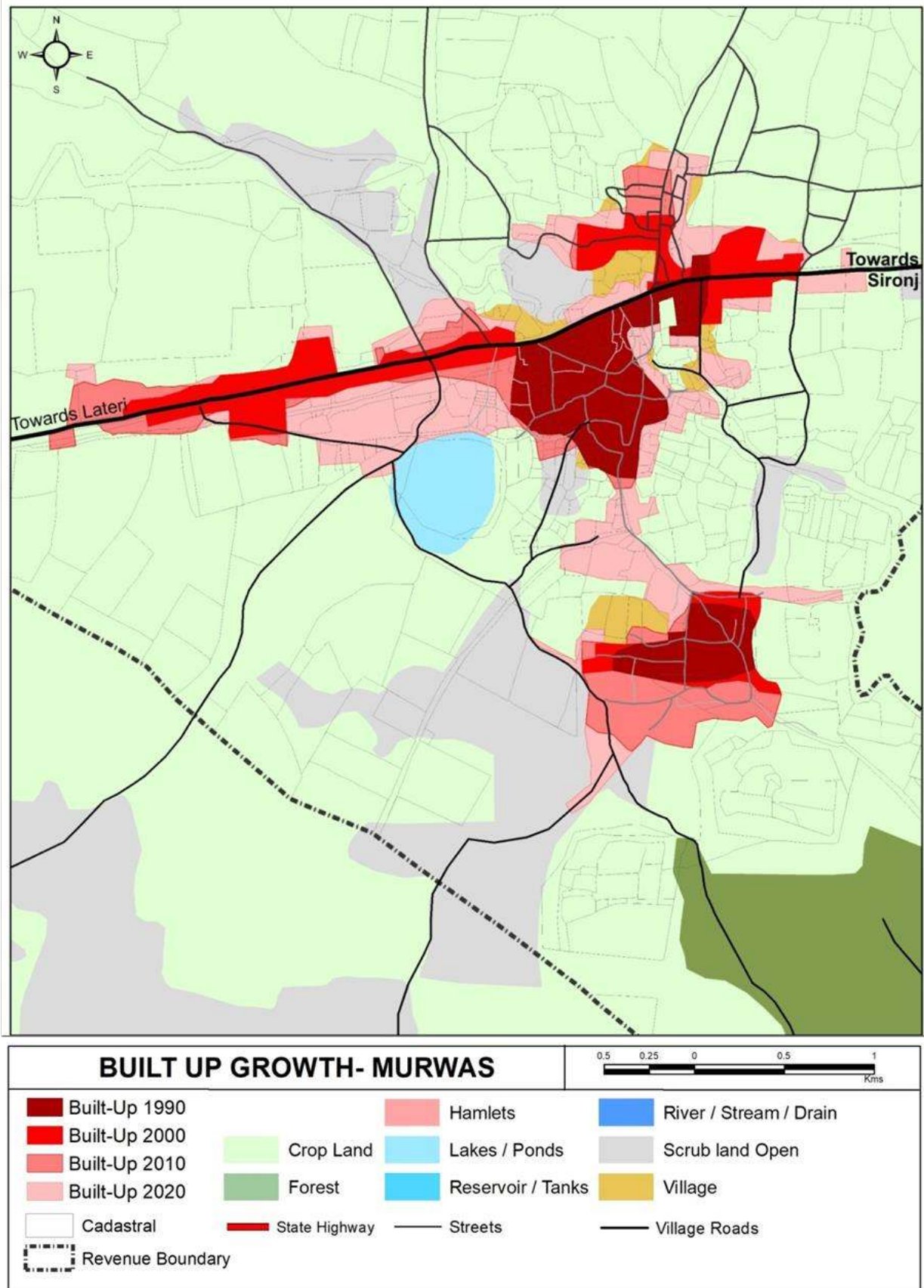


Figure 29 Spatial growth of Built-Up Area.

(source: Satellite Imagery USGS)

5.2.7 Land Value (Broad Pattern)

The village has highest land value of 20 lakhs per acre along highway whereas agricultural land has a value of only 5 lakhs per acre.

5.3 Socio-Demographic Dimensions of Murwas GP

5.3.1 Brief history of settlements

The settlement of Murwas Gram Panchayat was initially concentrated close to State Highway. It started growing outward along the highway post 2000. **Figure 29** illustrates the growth pattern of the settlement over time in various directions.

5.3.2 Socio-Cultural Dimension of Murwas GP

Based on Religious structure, there are people belonging to different beliefs of Hindu, Muslims and Jains in the village. From primary survey, it was found that there has always been a social harmony among them. The caste-based classification shows 12% SC population and 0.4% ST population as per census 2011 (**Figure 30**).

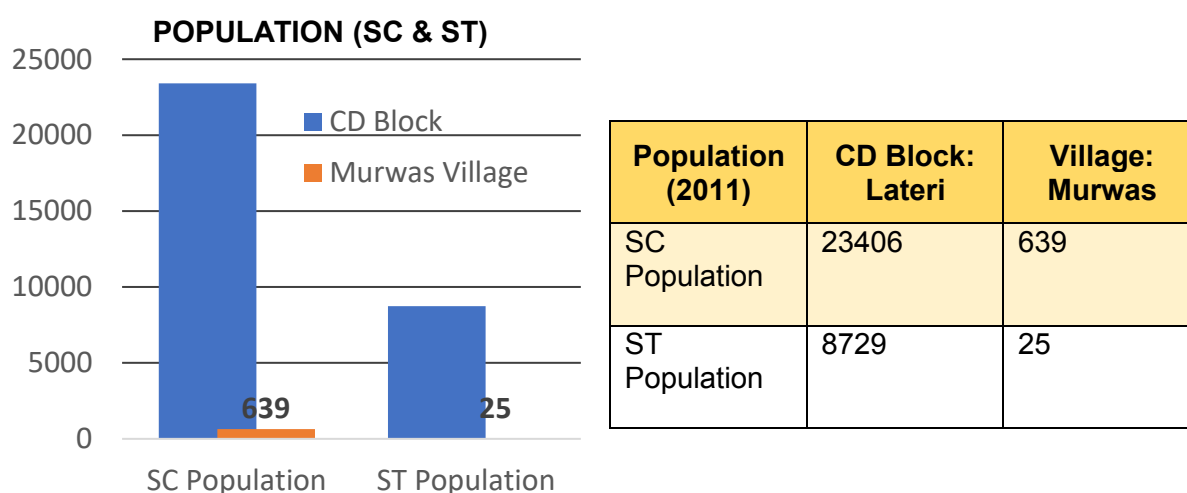


Figure 30 Population of SC & ST.

(source: Census of India)

5.3.3 Spatial Distribution of social dimension

5.3.3.1 Mohallas based on Religion

From primary survey, three mohallas are identified based on their religion. **Figure 31** illustrates the spatial distribution as per religion village residents. These mohallas are part of initial settlements while new built up are found to have mix of all religions.

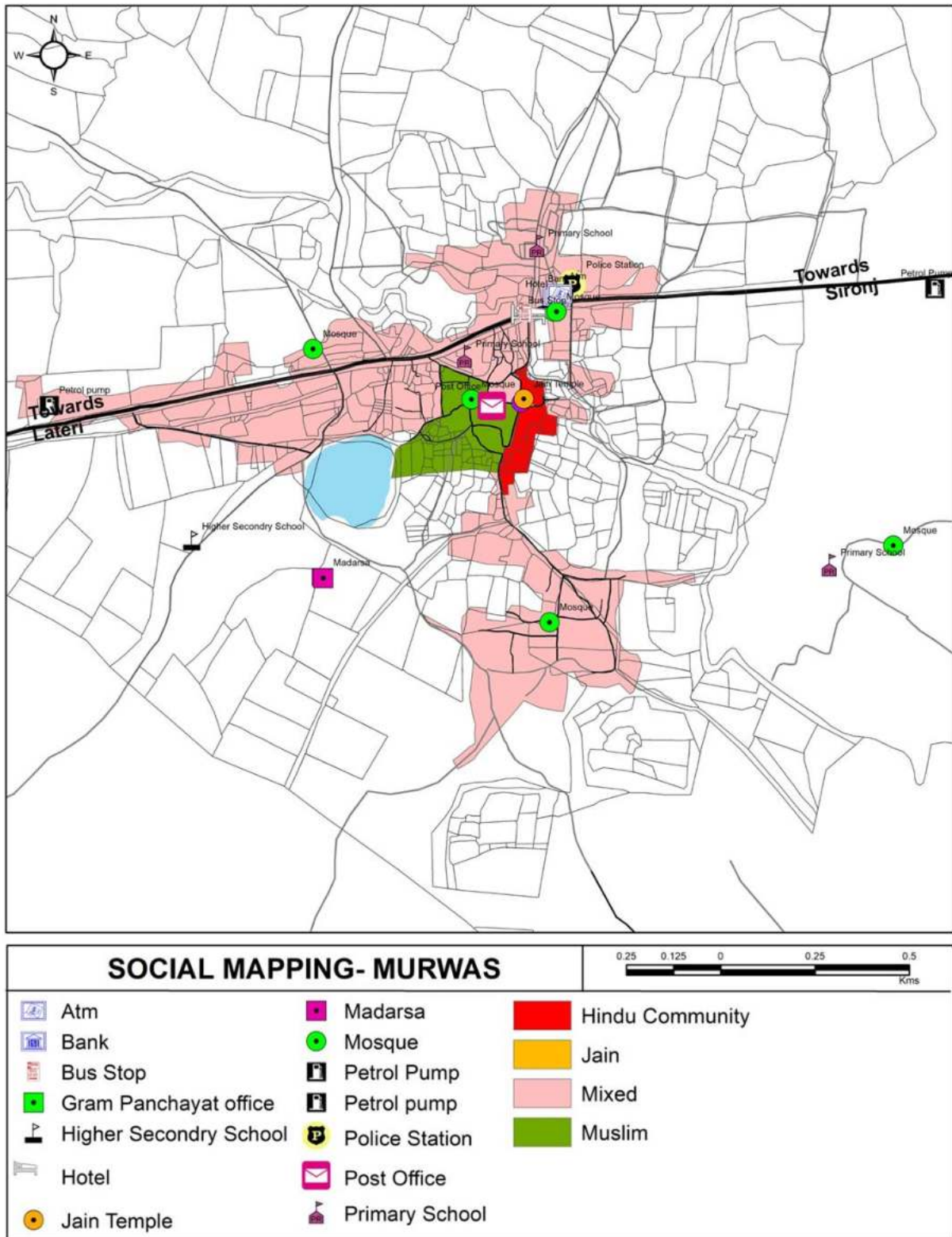


Figure 31 Spatial distribution based on religion.

(source: Google earth & Primary Survey:2020)

5.3.3.2 Social harmony

Social harmony is one of the opportunities found in Murwas gram panchayat. It was noted from primary survey that people live in harmony even during major riots happening in other parts of the country. They live in brotherhood without any quarrel. There is a sense of shared responsibility among them and celebrate each festival with enthusiasm. In an interview with a big farmer, it was highlighted that the village is safe from any thefts, one of the reasons for his migration to this village.

5.3.3.3 Emerging new Spatial areas

To prepare the spatial development plan, future growth of the village has been analysed using Shannon's entropy. As per the analysis, highest growth shall occur in NWW followed by SSE (**Table 14**). But the current development trend is towards NEE i.e., Sironj side where new plotted development is emerging with high numbers of buyers from Murwas and nearby villages as per discussion with stakeholders. Though this analysis (**Figure 32**) has less projected built-up growth in SWW direction but it has got potential for further expansion because of accessibility from main road, availability of government land and waste land. The SE direct has a constraint of forest area so the built-up growth is restricted there.

Table 14 Murwas Village spatial growth projection.

Year	Murwas Village Spatial Growth Projection (Area in Acres)								
	NEE	NNE	NNW	NWW	SEE	SSE	SSW	SWW	Total
1990	2.08	7.09	5.41	4.36	1.37	11.95	1.68	2.21	36.15
2000	5.58	13.77	7.1	20.08	1.7	14.73	2.27	4.15	69.38
2010	6.38	16.7	7.4	28.06	1.3	27.3	4.1	8.4	99.64
2020	13.7	24.6	11.6	40.03	4.2	37.6	9.66	19.51	160.9
2030	18.63	35.07	13.85	72.80	4.72	67.81	12.47	30.72	256.1
2040	25.34	50.01	16.53	132.38	5.31	122.29	16.11	48.37	416.3
2050	34.47	71.9	19.73	240.73	5.98	220.54	20.80	76.17	689.71

(source: Satellite Imagery USGS)

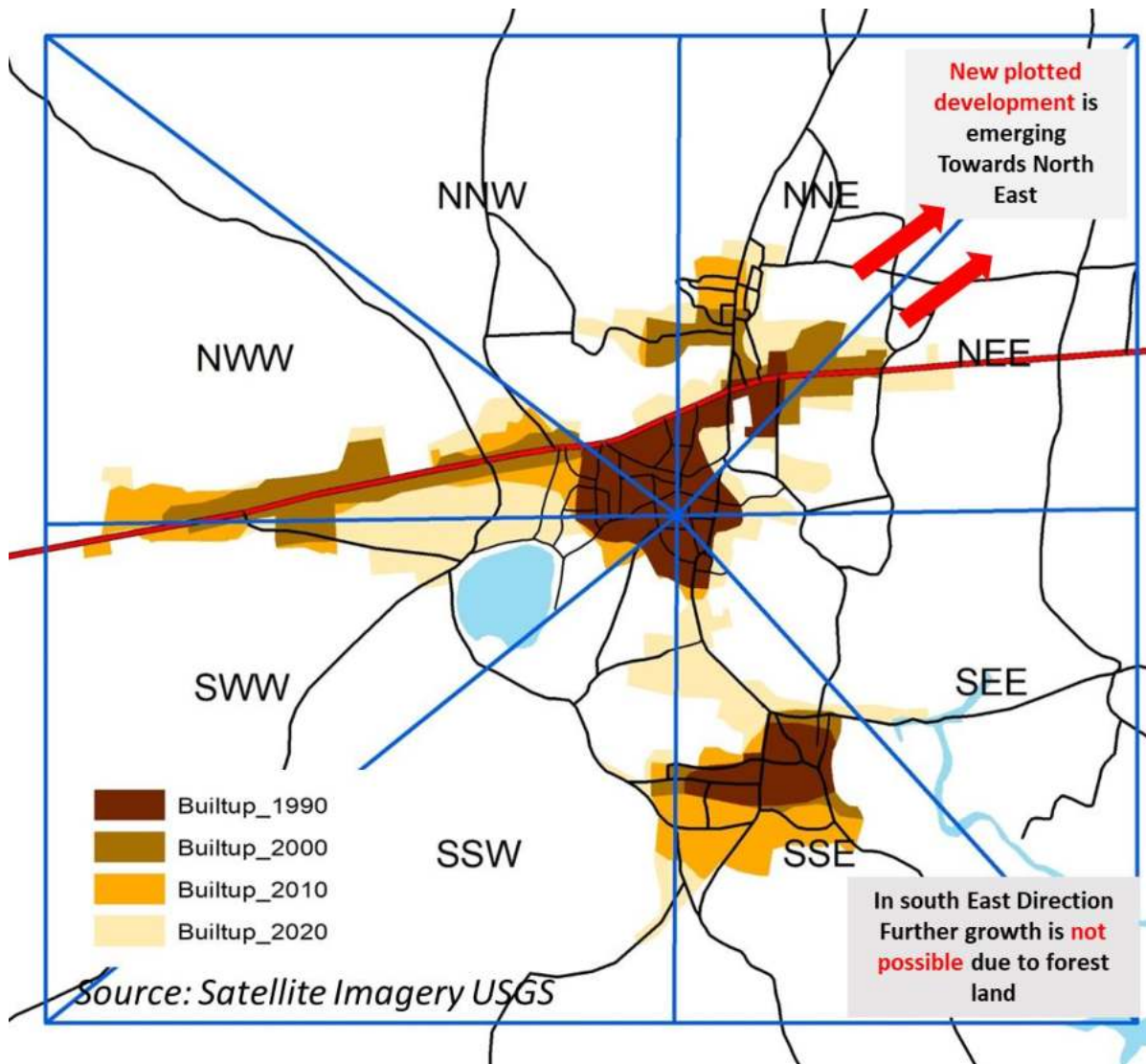


Figure 32 Spatial Growth Analysis using Shannon's Entropy.

(Source: Satellite Imagery USGS)

5.3.4 Population & its Growth Trends

The population trend and its growth rate are shown in **Table 15**. There is decline in growth rate with the increase in population from 1991 to 2020.

The total village population forms about 4% of the CD block population. SC population is 12% and ST population is 0.4% of the total village population. Sex Ratio of Murwas village is 902 which is lower than Madhya Pradesh state average of 931. In contrast Child Sex Ratio for the Murwas as per census 2011 is 1013.2, much higher than Madhya Pradesh state average of 918 (**Figure 33**).

Table 15 Population trend from 1991-2020.

Year	Population Trend	Growth Rate (%)					
		2001	2011	2020	1991-2001	2001-2011	2011-2020
Murwas Village	3286	4143	5271	6500	20.6	21.4	18.9

(source: Census of India)

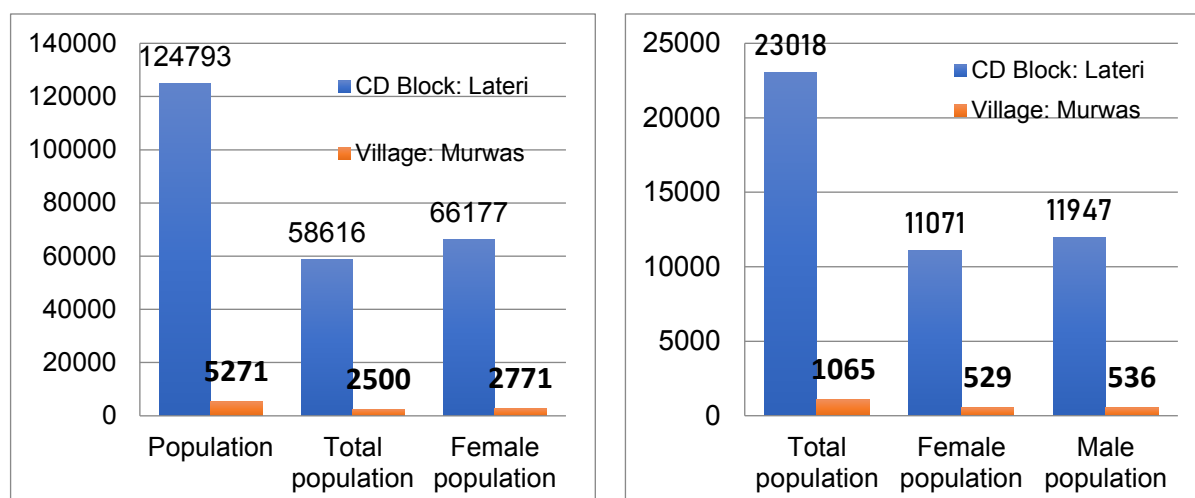


Figure 33 Share of Male, female and child (0-6 years) in Murwas and Lateri Block

(source: Census of India)

5.3.5 Family Size and its changes

As per census 2011, the family size of households was 5.4 persons which has now increased to 6.3 persons in 2020 (Table 16). This indicates the house hold size might show an increasing trend in future and need to be considered for estimating projected population for providing facilities.

Table 16 Family size and Households.

	2011	2020
No. of HHs	972	1030
Average HH size	5.4	6.3

(source: Census of India and GP)

5.3.6 Literacy and the institutions associated with Education

The literacy rate of Murwas village is 46.44% which is much lower than state average of 70.6% (Figure 34). Female literacy rate is 36.64% much less than male literacy rate of 55.28%.

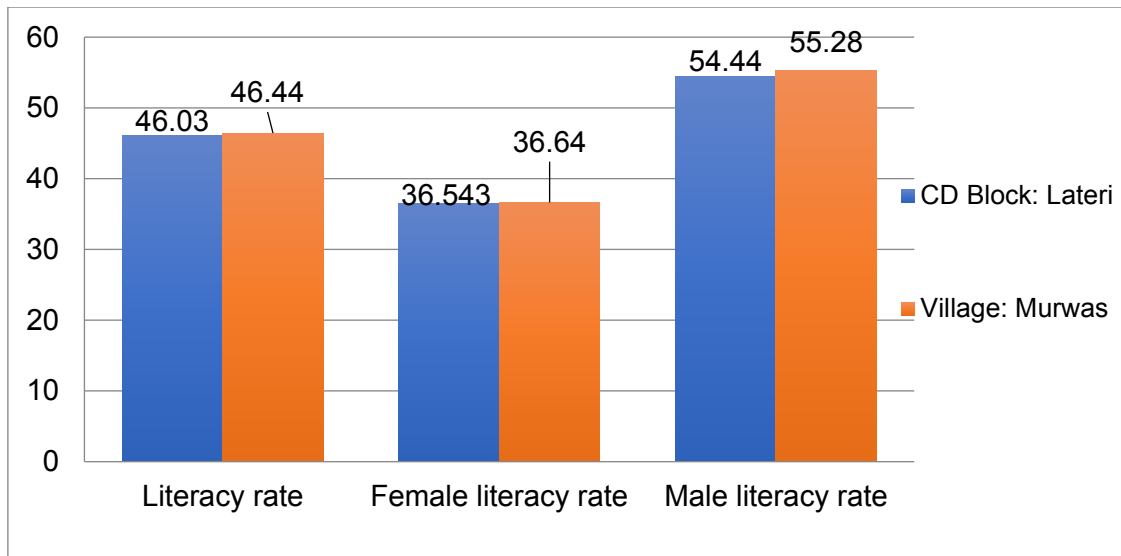


Figure 34 Literacy rate among males and females in Murwas.

(source: Census of India)

5.3.7 Workforce and Skill Sets in the Gram Panchayat

About 35.5% of its total population is engaged in economic activity, among which 92% of total workforce is engaged in agricultural activities and rest of 8% engaged in non-agricultural activity. The gram panchayat has maximum number of non-workers (Figure 35). There are 769 Agricultural laborers followed by 561 cultivators (Figure 36). This means that there are more dependent people than workers in the village.

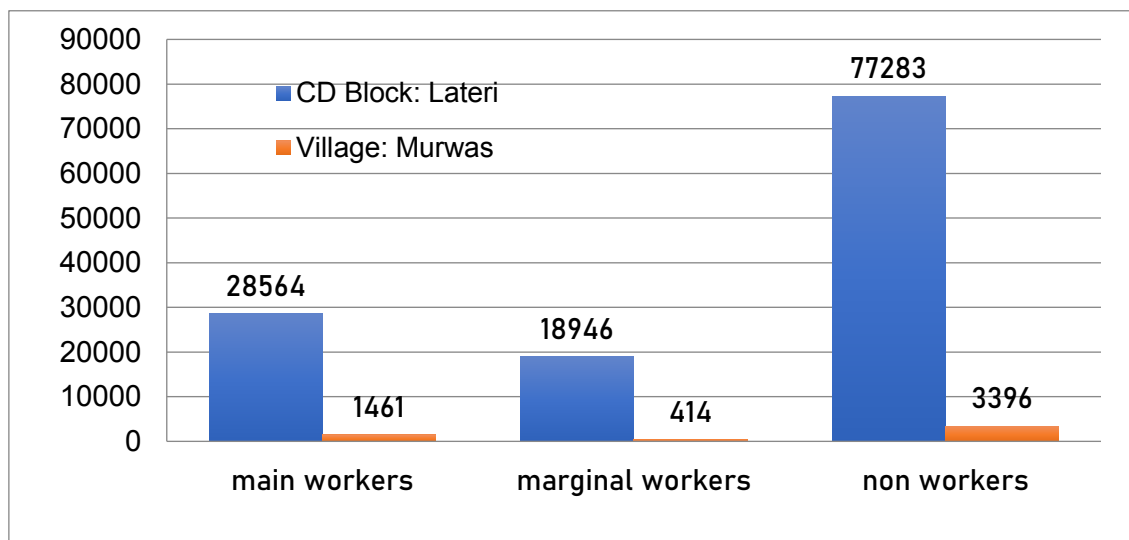


Figure 35 Workforce Participation ratio.

(source: Census of India)

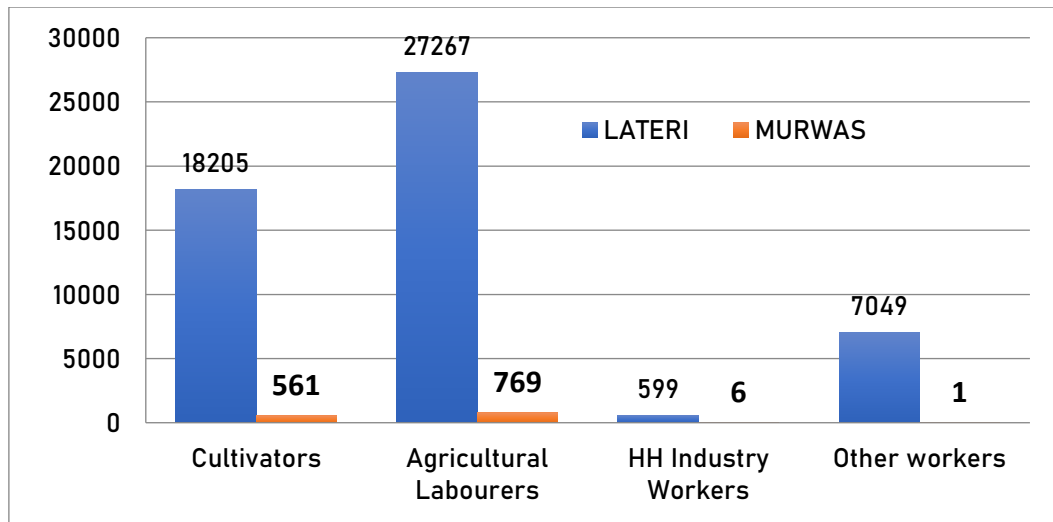


Figure 36 Category of Workers.

(source: Census of India)

5.4 Housing

5.4.1 Housing Conditions (Kuccha, Pucca and Semi-Pucca)-dilapidated

Village has maximum percentage of 58% of Kuccha houses whereas only 42% households are Pucca house (Figure 37). They are equally spread throughout the *Abadi* area Figure 38. From visual survey, it was found that some of the Kuccha houses are in dilapidated conditions that they require restoration. The cluster of dilapidated houses can be considered for redevelopment to accommodate residents within the *Abadi* area.

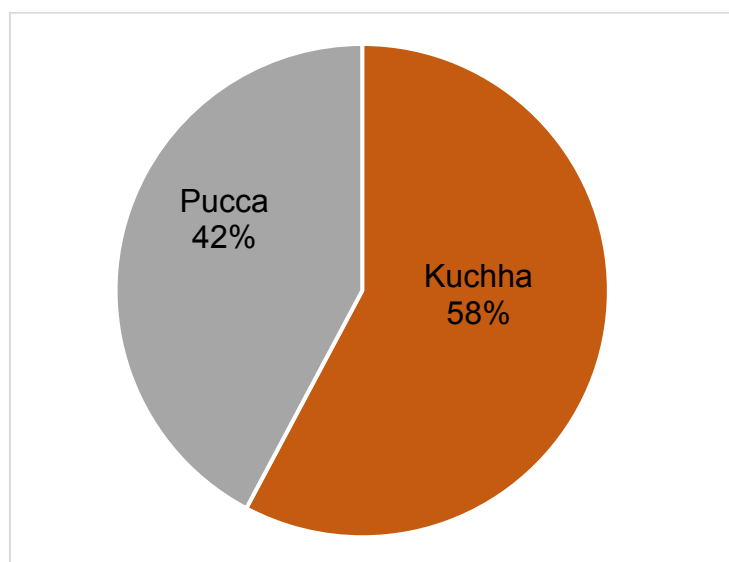


Figure 37 Percentage of Pucca & Kuccha houses.

(source: Drone Imagery:2020)

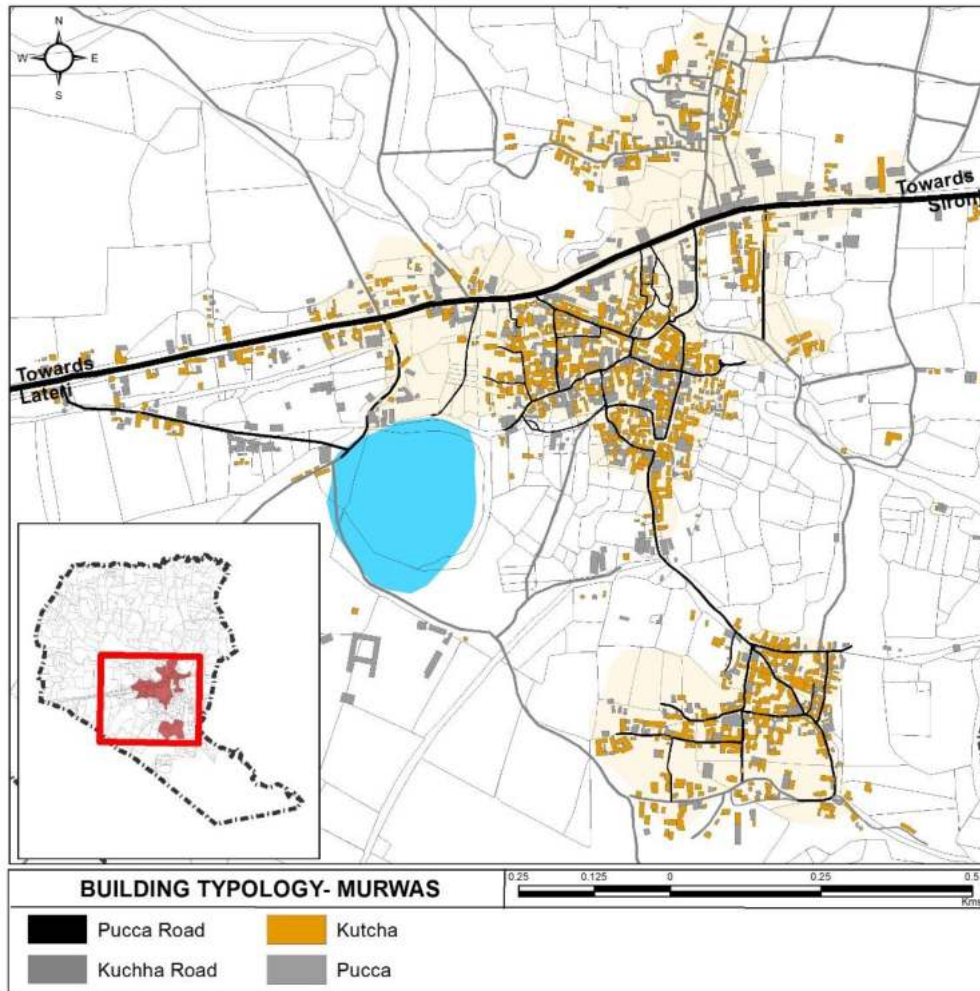


Figure 38 Spatial distribution of Housing typology.

(Source: Drone Imagery, 2020)

5.4.2 Housing Roof Typology

The maximum share of 46% of roof typology is for clay tiles followed by concrete roofs with 42% (Figure 39). Houses with thatched roofs (5%) and Tin roofs (7%) are seen in traces (Figure 40).

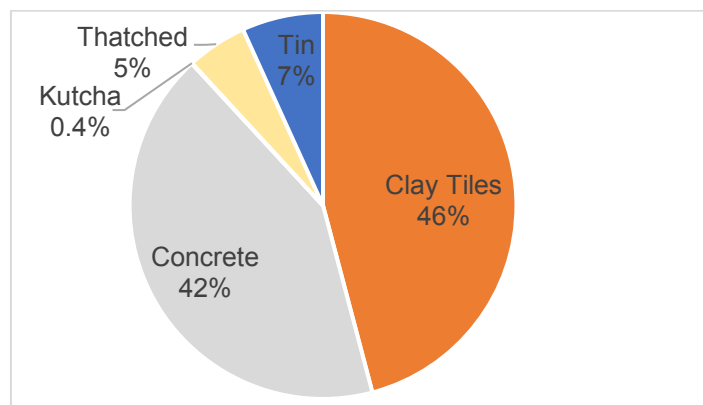


Figure 39 Percentage of Housing Roof Typology.

(source: Drone Imagery:2020)

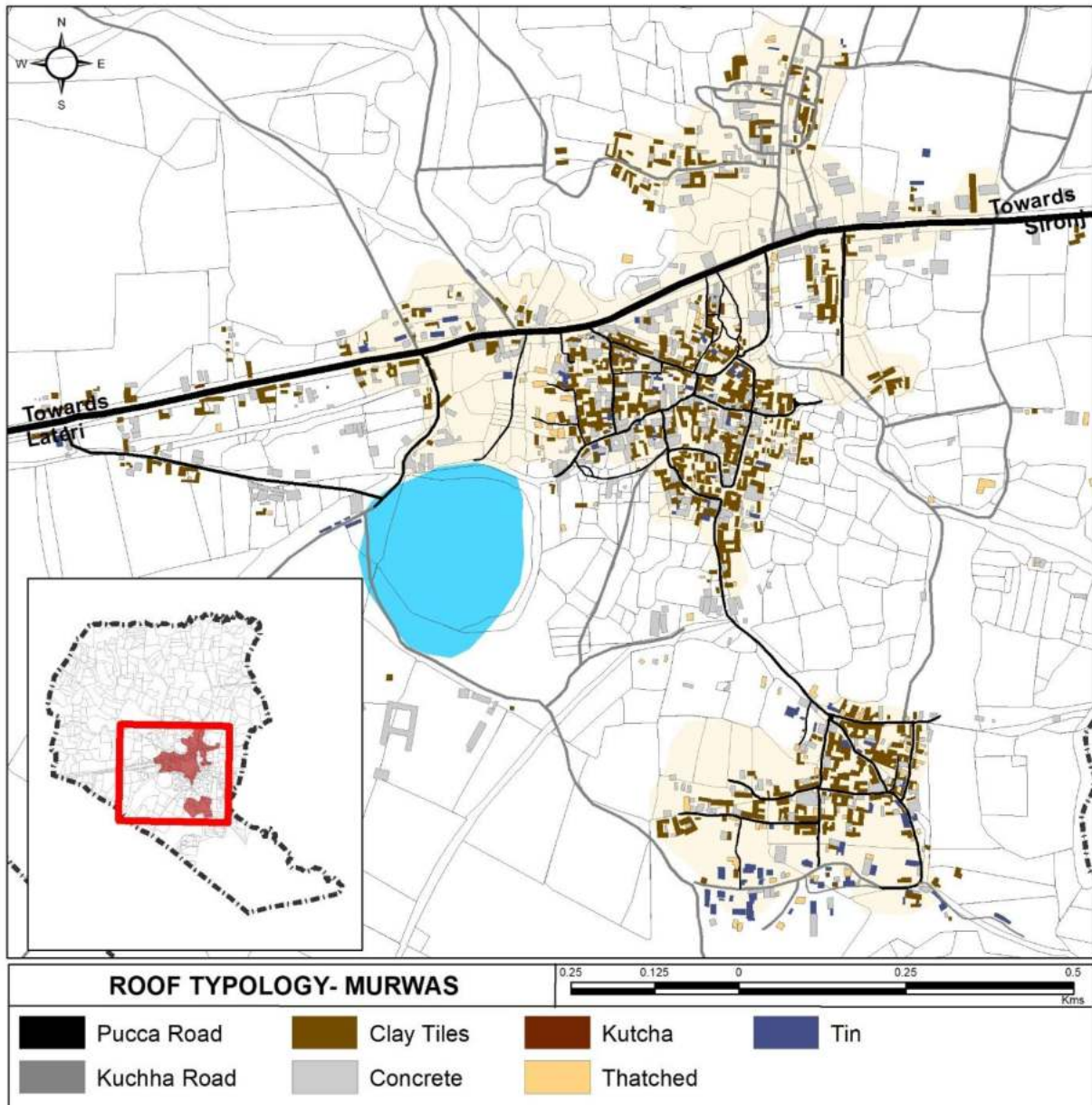


Figure 40 Spatial distribution of Housing Roof Typology.

(Source: Drone Imagery, 2020)

5.4.3 Housing Material usage in *Abadi* area

The old houses of gram panchayat are built using lime mortar and mud while new construction is using bricks and cement concrete. The material used in the village is shown in **Figure 41**.



Figure 41 Building material used in Murwas Village.

(Source: Author)

5.4.4 Spatial Distribution of settlements

There are four identified roadside clusters of settlements present in the gram panchayat. They are analysed with respect to slope of the area due to the existing problem of water logging. According to slope analysis, it was found that 5.1 acres of built up lies in low lying area while only 0.30 acres of built up lies in high slope areas as shown in **Figure 42**. This means there is a need for proper drainage system to avoid water logging.

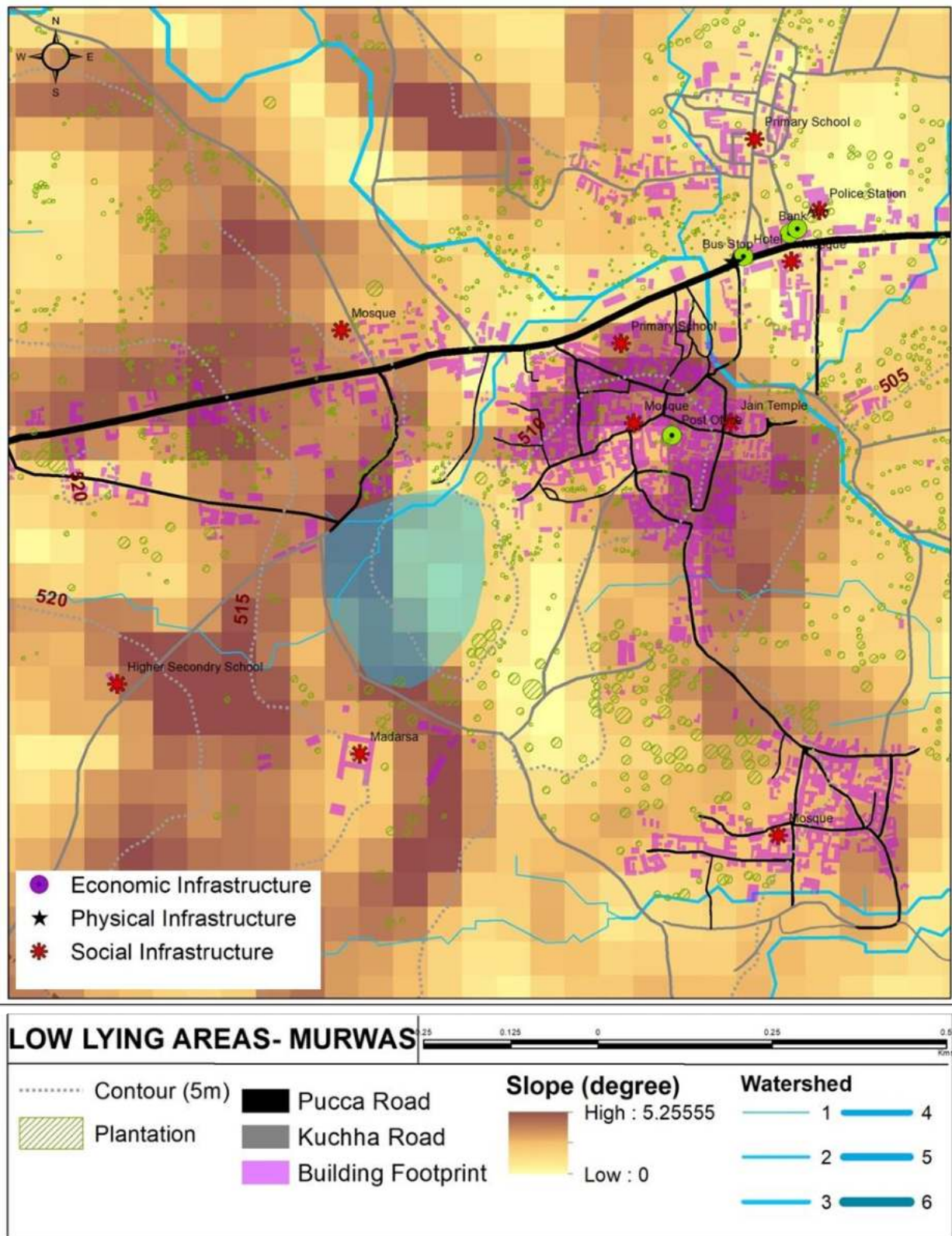


Figure 42 Settlements in Low lying areas.

(source: Google earth 2020 elevation data)

5.5 Economy Sector

5.5.1 Agriculture and Allied Sector

The Village has availability of Agriculture Society, as well as Public Distribution System Shop as per census 2011. One-day Weekly Market was also functioning in the village since 1991 on Thursdays and is more than 5-10km away from nearest Mandi as per Census 2011. This weekly market however is not functioning for last 10 months due to the Pandemic.

The village have separate facility of Power Supply for Agriculture Use and it can be evident from the census 2011, but in 1981, 1991, 2001 it shows the status of unavailability for separate use. In census 2011, it also shows that the village have the Power Supply for Agriculture Use Summer (April-Sept.) for 6 hrs. per day as well as in Winter (Oct-March) for 6 hrs. per day. As per 2011 census the first Agriculture commodities of the village is Wheat, while the second is Chana, and third Soyabean. Farmers of the village however suggested that the soyabean being a cash crop is much preferred by them and is slowly replacing the other crops such as Corn, Coriander, Masoor etc.

As per census 2011, the village has the Net Area Sown of 704 Ha, with 84.7 % area irrigated by source. Where increase in area irrigated can be easily shown in the following graph with its growth in the **Table 17**:

Table 17 Temporal variation in Irrigated Area.

Year	Total Area Sown (Ha)	Irrigated (Ha)	Percentage Irrigated Area	Irrigated Area - Growth rate (%)
2011	704.1	596.16	84.67	464.77
2001	667.0	100.00	14.99	307.43
1991	588.63	21.66	3.68	-29.29
1981	497.15	25.87	5.20	

Source: DCHB

5.5.1.1 Cropping Pattern and Intensity

All three types of cropping-single cropping, double cropping and triple cropping farming are practiced in Murwas. A total of 879 Ha of land area is cultivated for these cropping systems, area under each of them is shown in **Table 18**. Soyabean and wheat are the main crops of the village. Other crops include chana, coriander, pulses like Masoor. Wheat crop has highest sown area followed by Chana and Coriander (**Table 19**). There was a change in Cropping Pattern of village from wheat to Soyabean in early 1990's and now half of the land that was used to cultivate Corn as the yield of Soyabean has been reduced)

Table 18 Cropping System in Murwas.

Type of cropping system	Cultivable Land Area (Ha)
Single	309
Double	500
Triple	70
Total	879

(Source: GP)

Table 19 Types of crop sown.

Crops sown	Cultivable Land Area (Ha)
Wheat	360
Chana	310
Coriander (Dhaniya)	70
Other (Tevda, Battray, etc.)	50

(source: GP)

5.5.1.2 Productivity changes

Between the period of 2001 to 2011 the village has not only seen separate power supply for agriculture, but also a **drastic change** in its percentage irrigated land, which can be seen as **benefits of the separate electricity**, since there is change from only 5% irrigated land in 1981 to 85% in 2011 with a minimal decline in the period of 1981-1991 (**Table 20**). The **total area sown** although has shown almost a linear increase with a minor increase in the period of 2001-2011 in comparison to other periods between 1981-2001. Although the village does not have much of uncultivable land from the year of 1981, an exceptional decrease in it can be seen in the same period, which can be a sign of increased fertility too.

Table 20 Temporal change in Productivity from 1981-2011.

Year	Barren & Un-cultivable Land Area (Ha)	Growth rate (%)
2011	8.49	-88.68
2001	75.00	-0.83
1991	75.63	4.61
1981	72.3	

(source: GP)

5.5.1.3 Livestock and Dairy Farming

The village has a total of 2050 livestock among which buffaloes have the highest number (1200) followed by 400 cows (**Table 21**). As per interaction with locals, milk production from these livestock represents a significant fraction of their income. There is a need for dairy farming as per discussion with them as they found it is easier than crop farming.

Table 21 Livestock Population, 2020

Livestock	Nos.
Buffalo	1200
Cow	400
Goat	350
Pig	100
Total	2050

(source: GP)

5.5.1.4 Poultry, etc.

As of now, there is no poultry farming practiced at community level in the gram panchayat except few houses. However, people have shown interest in poultry farming during interviews.

5.5.2 Industrial Sector

There are as such no industries present in the village. It was brought to notice during primary survey that earlier there was a small enterprise of 'Chikki'² production. It was later shut down due to non-availability of funds.

5.5.3 Tertiary Sector

5.5.3.1 Banking

The village only has commercial bank facility and does not have cooperative bank (**Table 22**). Even basic electronic banking outlet (ATM) is also not present. People have to travel 5-10kms to nearby towns to avail the facility of withdrawal of money from ATM and for cooperative banks.

Table 22 Availability of Bank & Credit Societies in Gram Panchayat.

BANKS & CREDIT SOCIETIES	
The distance range of nearest place where ATM is available	5-10 Kms
Commercial Bank (Status)	Available
Cooperative Bank (Status)	NA
The distance range of nearest place where is Cooperative Bank available	5-10 Kms
Agricultural Credit Societies (Status)	Available

² A sweet made up of jaggery and peanuts

Self Help Group (Status)	Available
Public Distribution System (PDS) Shop (Status)	Available
Mandis/Regular Market (Status)	NA
The distance range of nearest place where Mandi is available	5-10 Kms
Weekly Haat (Status)	Available
Agricultural Marketing Society (Status)	NA
The distance range of nearest place where facility is available	5-10 Kms

(Source: DCHB)

5.5.3.2 Co-operative Federations

There is a Primary Agricultural Credit Cooperative Society (PACS) formed amongst eleven villages- Balrampur, Anandpur, Jagatpur, Bheela, Ratngarh, Islamnagar, Chanpur, Murariya, Mohabbatpur, Mudrasagar and Madankhedi) as marked in **Figure 43**.

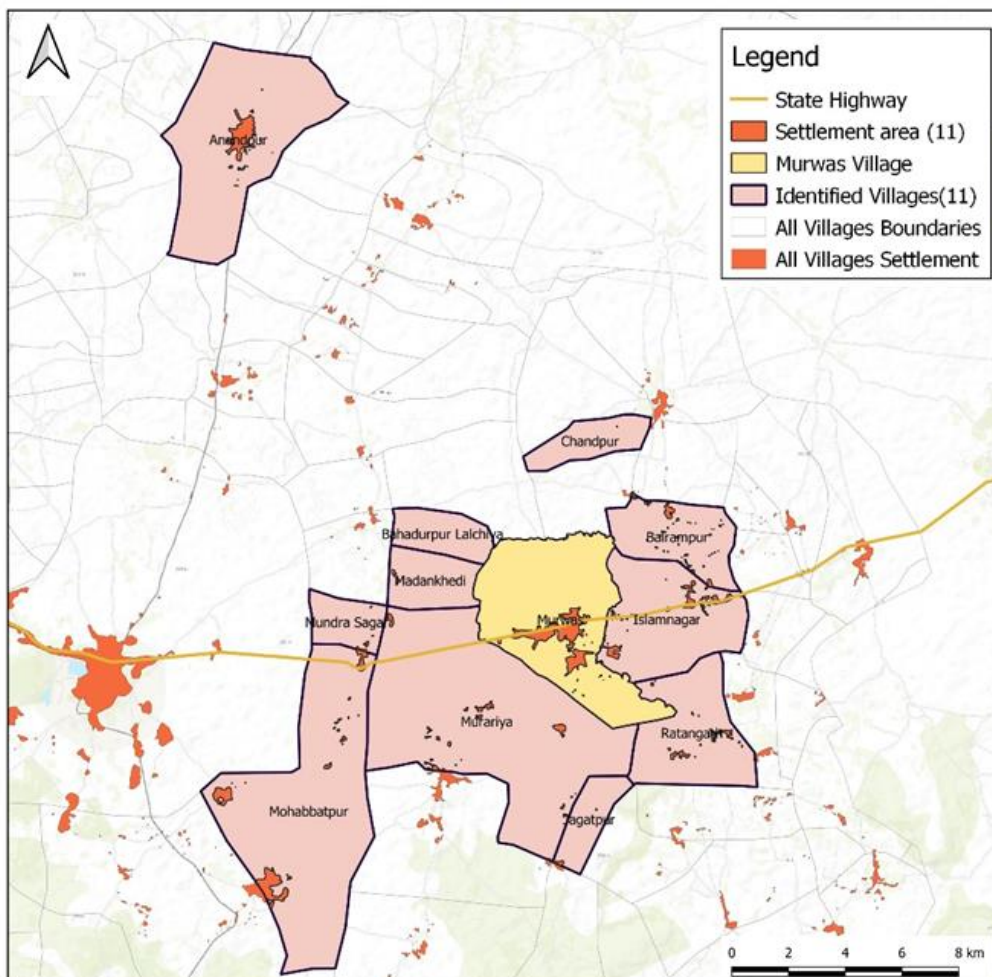


Figure 43 Spatial cluster of Villages forming Primary Agricultural Credit Cooperative Society.

(Source: Stakeholders' discussion, 2020)

5.5.3.3 Shops and Establishments

There are approximately 40 shops present within the settlement. Almost every street inside the settlement was found to have almost 2-3 shops whereas there is mixed land use present along the highway. An example of shops present within the settlement is shown in **Figure 44**.



Figure 44 Shop within settlement.

(Source: Author)

5.5.3.4 Special Weekly Markets and its reach

The village used to have weekly haat market which has completely shut down due to declining number of buyers from other villages.

5.6 Infrastructure

The different types of infrastructure facilities-Physical, Social & Economic, available in Murwas gram panchayat are shown in **Figure 45**

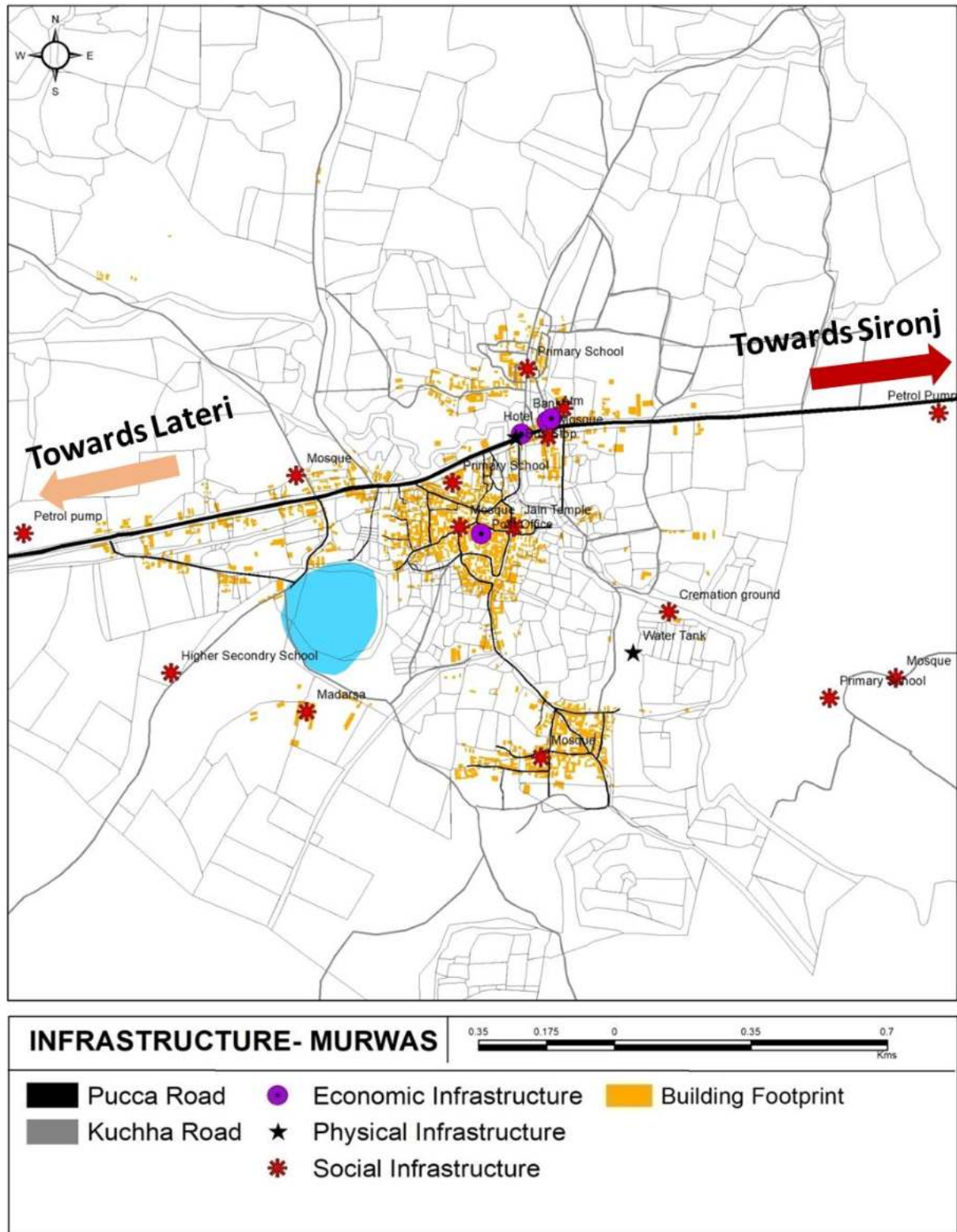


Figure 45 Spatial locations of Infrastructure within gram panchayat.

(source: Google earth & Primary Survey:2020)

5.6.1 Economy related Infrastructure

5.6.1.1 Market Yards and linkages

The village is devoid of market yards and is 90% dependent on Sironj town located 20 kms away from Murwas to sell their produce. Though Lateri town also caters to the 10% produce but due to lower rates as compared to Sironj Mandi, farmers prefer to sell major chunk of the produce in Sironj town. They also sell their produce in market yard of Basoda town but only for 'Masoor' because of good rates available there.

5.6.1.2 Warehousing

The village lacks the facility of Warehousing, but they desired to have one at the time of stakeholder discussions.

5.6.1.3 Irrigation network and other sources for agriculture

Gram Panchayat has 704.07 hectares of Net Sown area out of which 84.6% of area is irrigated by source whereas 15.33% is unirrigated land (**Table 23**). Groundwater is the only source of irrigation in the gram panchayat. The total irrigated land area is irrigated using tubewells.

Table 23 Details of Irrigated Area.

Net Area Sown (in Hectares)	704.07
Total Unirrigated Land Area (in Hectares)	107.91
Area Irrigated by Source (in Hectares)	596.16

(Source: Author)

5.6.1.4 Procurement Centers

The farmers usually keep aside a part of produce for seeds due to high cost of market seeds. However, for good quality of soyabean seeds, they often go to Maqsdangarh located 30kms away from Murwas.

5.6.2 Social Infrastructure

5.6.2.1 Educational Services

The village avail the facility of three primary schools, one each, Middle school, Secondary school and Senior secondary school (**Table 24**). There are no infrastructure present for Pre-primary school, Engineering colleges, Management institute, Polytechnic Vocational training, Non-formal training centre and Special school for disabled. To avail higher education facilities, people have to go to nearby towns or cities like Sironj and Vidisha. This is found as one of the factors for increase in the number of dropout girl child after matriculation due to safety concerns as

highlighted by female participants in the stakeholder discussions. There is also backwardness in education which is found to be linked to poverty as they cannot afford private schools.

Table 24 Education Services in Murwas.

Pre - Primary School	Govt Pre - Primary School (Nursery/LKG/UKG) (Numbers)	0	0
	Private Pre - Primary School (Nursery/LKG/UKG) (Numbers)	0	
	Nearest Facility Status	Private	
	Nearest Village/Town Name	Sironj	
	The distance range of nearest place where facility is available	> 10 kms	
Primary School	Govt Primary School (Numbers)	2	3
	Private Primary School (Numbers)	1	
Middle School	Govt Middle School (Numbers)	1	1
Secondary School	Govt Secondary School (Numbers)	1	1
Senior Secondary School	Govt Senior Secondary School (Numbers)	1	1
Degree School	Govt Arts and Science Degree College (Numbers)	0	0
	Private Arts and Science Degree College (Numbers)	0	
	Nearest Facility Status	Govt	
	Nearest Village/Town Name	Lateri	
	The distance range of nearest place where facility is available	5-10 Kms	
Engineering Colleges	Govt. Engg. Colleges (Numbers)	0	0
	Private Engg. Colleges (Numbers)	0	
	Nearest Facility Status	Govt	
	Nearest Village/Town Name	Vidisha	
	The distance range of nearest place where facility is available	> 10 kms	
Management Institute	Govt Management Institutes (Numbers)	0	0
	Private Management Institutes (Numbers)	0	
	Nearest Facility Status	Govt	
	Nearest Village/Town Name	Bhopal	
	The distance range of nearest place where facility is available	> 10 kms	
Polytechnic (Pt)	Govt Polytechnic (Numbers)	0	0
	Private Polytechnic (Numbers)	0	
	Nearest Facility Status	Govt	

	Nearest Village/Town Name	Vidisha	
	The distance range of nearest place where facility is available	> 10 kms	
Vocational Training School/ITI	Govt Vocational Training School/ITI (Numbers)	0	0
	Private Vocational Training School/ITI (Numbers)	0	
	Nearest Facility Status	Govt	
	Nearest Village/Town Name	Sironj	
	The distance range of nearest place where facility is available	> 10 kms	
Non-Formal Training Centre	Govt Non-Formal Training Centre (Numbers)	0	0
	Private Non-Formal Training Centre (Numbers)	0	
	Nearest Facility Status	Govt	
	Nearest Village/Town Name	Vidisha	
	The distance range of nearest place where facility is available	> 10 kms	
Special School for Disabled	Govt School for Disabled (Numbers)	0	0
	Private School for Disabled (Numbers)	0	
	Nearest Facility Status	Govt	
	Nearest Village/Town Name	Bhopal	
	The distance range of nearest place where facility is available	> 10 kms	
Others	Govt Others (Numbers)	0	0
	Private Others (Numbers)	0	
	Nearest Facility Status	Govt	
	Nearest Village/Town Name	Vidisha	
	The distance range of nearest place where facility is available	> 10 kms	

(Source: DCHB)

5.6.2.2 Health Services

There is only one primary health sub-centre in the village (**Table 25**). Other health centres like community and primary health centres are located 5-10kms away from the village. Major problem is faced by pregnant women as Maternity and Child welfare centre is located more than 10kms away. This was also evident during interaction with various female groups. The lack of medical facility was the main concern highlighted by the majority of residents including women.

Table 25 Available Health facilities.

Community Health Centre	The distance range of nearest place where facility is available	5-10 Kms
Primary Health Centre	The distance range of nearest place where facility is available	5-10 Kms
Primary Health Sub Centre	Primary Health Sub Centre (Numbers)	1
	Primary Health Sub-Centre: Doctors Total Strength (Numbers)	2
	Primary Health Sub- Centre Doctors In Position (Numbers)	2
	Primary Health Sub Centre Para Medical Staff Total Strength (Numbers)	2
	Primary Health Sub Centre Para Medical Staff In Position (Numbers)	2
Maternity and Child Welfare Centre	The distance range of nearest place where facility is available	> 10 kms
TB Clinic	The distance range of nearest place where facility is available	5-10 Kms
Hospital Allopathic	The distance range of nearest place where facility is available	5-10 Kms
Hospital Alternative Medicine	The distance range of nearest place where facility is available	5-10 Kms
Dispensary	The distance range of nearest place where facility is available	5-10 Kms
Veterinary Hospital	The distance range of nearest place where facility is available	5-10 Kms
Mobile Health Clinic	The distance range of nearest place where facility is available	5-10 Kms
Family Welfare Centre	The distance range of nearest place where facility is available	5-10 Kms
Non-Government Medical facilities	Non-Government Medical Facilities Medical Practitioner with no Degree (Numbers)	2
	Non-Government Medical Facilities Traditional Practitioner and Faith Healer (Numbers)	0
	Non-Government Medical facilities Medicine Shop (Numbers)	0
	Non-Government Medical facilities Others (Numbers)	0

(Source: DCHB, 2011)

5.6.2.3 Physical Infrastructure

5.6.2.3.1 Regional Linkages

Murwas Gram panchayat is only linked with Sironj town (approximately 19 kms.) towards east and Lateri town (10 kms.) towards west via State highway. It has poor connectivity with neighboring villages (**Table 26**).

5.6.2.3.2 Road network within the Gram Panchayats

Gram Panchayat is covered with 65% of *Kuccha*³ roads and 35% of Pucca roads. The settlement present towards South of highway only have pucca roads while roads in North of highway and outside settlements are all *Kuccha* (**Table 26**). An example of Village road present in gram panchayat's settlement is shown in **Figure 46** and its spatial network is shown in **Figure 47**.

Table 26 Connectivity in Murwas.

Roads	National Highway (Status)	NA
	The distance range of nearest place where facility is available	> 10 Kms
	State Highway (Status)	Available
	Major District Road (Status)	Available
	Other District Road (Status)	Available
	Black Topped (pucca) Road (Status)	Available
	Gravel (Kuccha) Roads (Status)	Available
	Water Bounded Macadam (Status)	NA
	The distance range of nearest place where facility is available	< 5 Kms
	All Weather Road (Status)	Available
	Navigable Waterways (River/Canal) (Status)	NA

(Source: DCHB, 2011)

³ Mud and gravel road



Figure 46 Village Road within *Abadi* area.

(Source: Author)

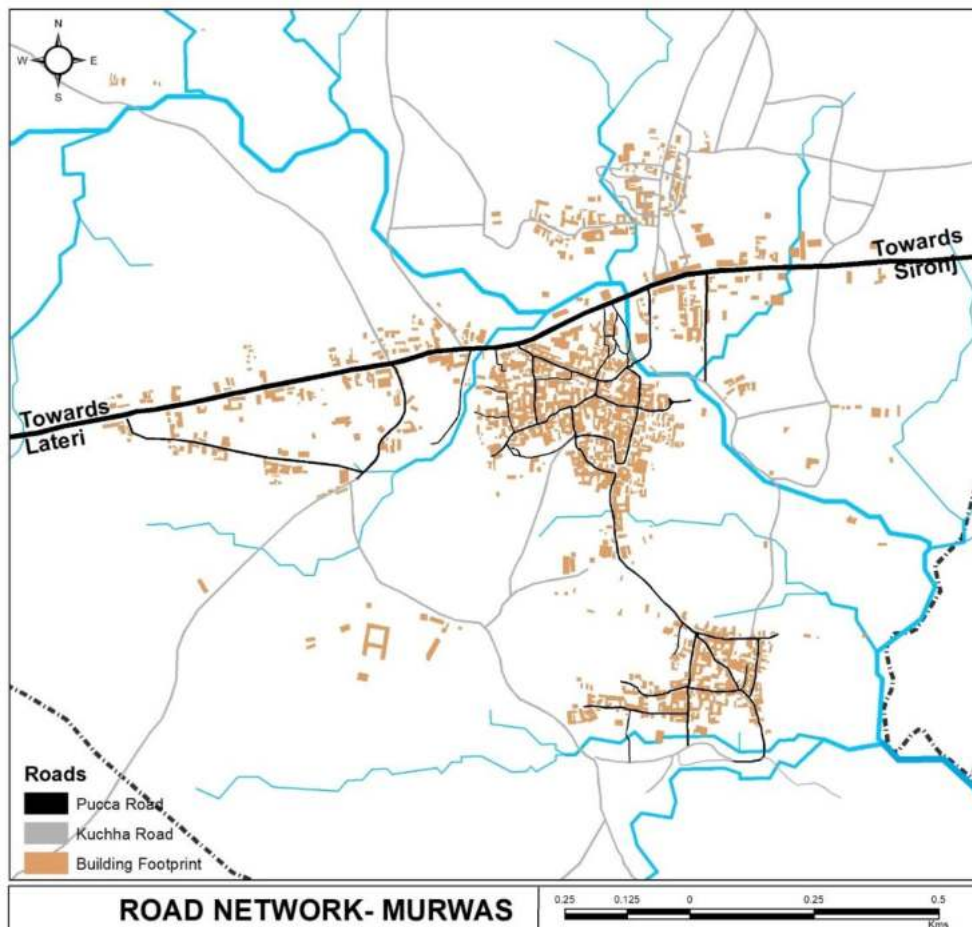


Figure 47 Road Network within settlements.

(Source: Drone Survey, 2020)

5.6.2.3.3 Travel Behavior from and to GP

There is no public bus transport available within the Murwas but within 5-10 kms. Although private bus facility is available but due to its high cost, few people use this facility. All the other transport facilities like Railway station, Auto rickshaw, taxi, Vans, etc. are located more than 10 kms.

5.6.2.3.4 Transport network and vehicle ownership in GP

The village is linearly connected with nearby two towns present in East and West direction through state highway. The poor transport network has resulted in lack of infrastructure facilities and more dependency on adjoining towns (**Table 27**). Only 29% of people own two-wheelers while 61% people are found to be dependent on bus facility indicating travelling to long distances (**Figure 48**)

Table 27 Mode of transport as per census 2011

Mode of transport	The distance range of nearest Public Bus Service	5-10 Kms
	Private Bus Service (Status)	Available
	The distance range of nearest Railway Station	> 10 Kms
	The distance range of nearest place Auto/Modified Autos is available	> 10 Kms
	The distance range of nearest place where Taxi is available	> 10 Kms
	The distance range of nearest place where Vans facility is available	5-10 Kms
	Tractors (Status)	Available
	The distance range of nearest place where facility is available	< 5 Kms
	Cycle-pulled Rickshaws (manual driven) (Status)	Available
	The distance range of nearest place where f Cycle-pulled Rickshaws (machine driven) is available	5-10 Kms
	Carts Driven by Animals (Status)	Available
	The distance range of nearest place where Sea/River/Ferry Service is available	> 10 Kms
	Footpath (Status)	Available

. (Source: DCHB, 2020)

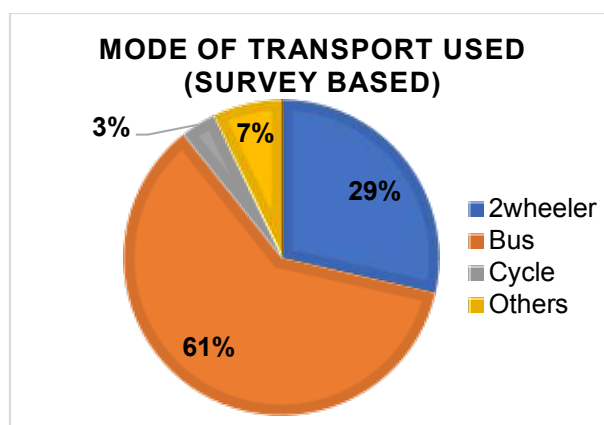


Figure 48 Mode of transport used as per sample survey.

(Source: Household survey, 2020)

5.6.2.4 Environmental Services

5.6.2.4.1 Water Resources and Water Supply

Village has wells and handpump as the only available sources of water (Table 28). As per census 2011, 90% of village population was dependent on groundwater source i.e., hand pump with limited access to water as only 27% of population had water source within premises (**Figure 49**). But there has been a shift from hand pump to public water supply system within a decade as evident from household survey (**Figure 50**). However, they still have limited access to water as only 21% of household survey samples have water facility within their premise.

Table 28 Available Water Resources.

Tap Water			NA
Well	Covered Well	Covered Well (Status)	NA
	Uncovered Well	Uncovered Well (Status)	Available
		Uncovered Well Functioning All Round the Year	Available
		Uncovered Well Functioning in Summer months (April-September)	Available
Hand Pump		Hand Pump (Status)	Available
		Hand Pump Functioning all- Round the Year	Available
		Hand Pump Functioning in Summer months (April-September)	Available
Tube Wells/ Bore Wells		Tube Wells/ Bore Wells (Status)	NA
Springs		Springs (Status)	NA
River/Canals		Springs (Status)	NA
Tanks/Pond/Lake		Tanks/Pond/Lake (Status)	Available

(Source: DCHB, 2011)

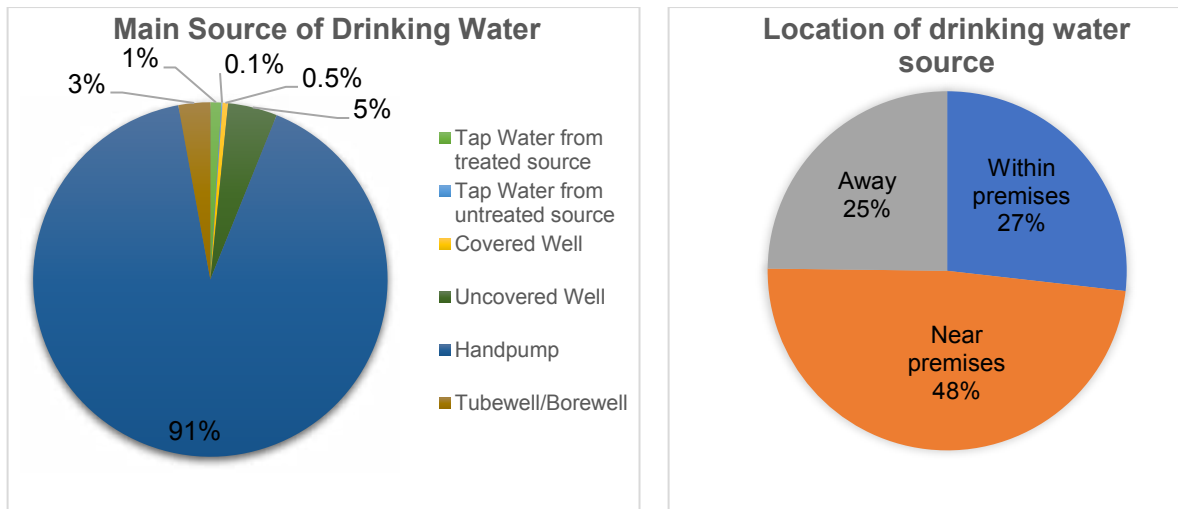


Figure 49 Sources of drinking Water.

(Source: Census of India, 2011)

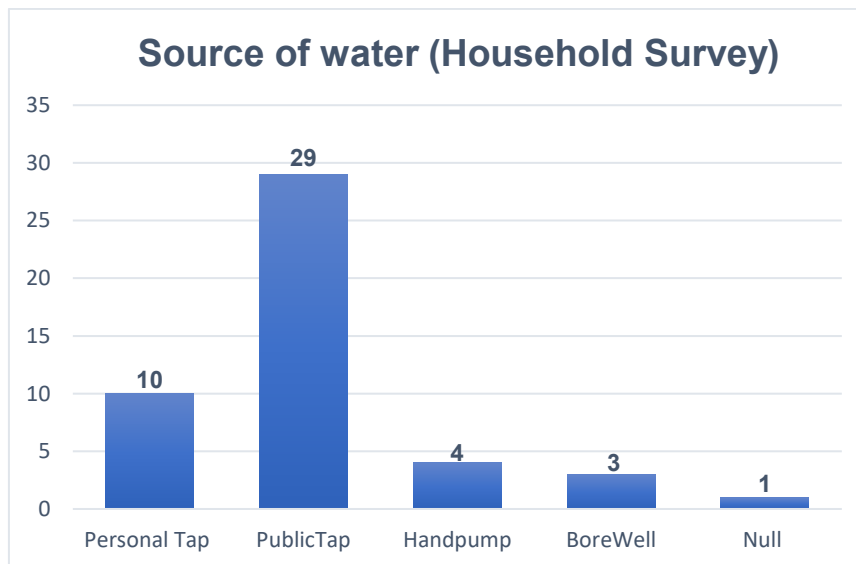


Figure 50 Survey based sources of water.

(source: Household survey, 2020)

5.6.2.4.2 Solid Waste Management

Currently, all the waste is dumped into different dumping sites located within settlements (**Table 29**). Such dumping sites pose threat to health as well as soil contamination. From household survey, it was found that because of government initiatives for sanitation, there has been reduction in open defecation. In 2011, 80% of population used to defecate in open while during survey, 50% samples are found to have toilet facility (**Figure 51**). There is also an opportunity for sewer network as 15% had septic tank connection in 2011 (**Figure 52**) and currently all the toilets have soak pits which can be connected to sewers.

Table 29 Available Sanitation facilities.

Sanitation	Is the Area Covered under Total Sanitation Campaign (TSC)? (Status)	NA
	Community Toilet Complex (including Bath) for General Public (Status)	NA
	Community Toilet Complex (excluding Bath) for General Public (Status)	NA
	Rural Production Centres or Sanitary hardware outlet availability near the village (Status)	NA
	Rural Production mart or Sanitary hardware outlet availability near the village (Status)	NA
Disposal	Community waste disposal system after house-to-house collection (Status)	NA
	Community Bio-gas or recycle of waste for production use (Status)	NA
	No System (Garbage on road/street) (Status)	Available

(Source: DCHB, 2011)

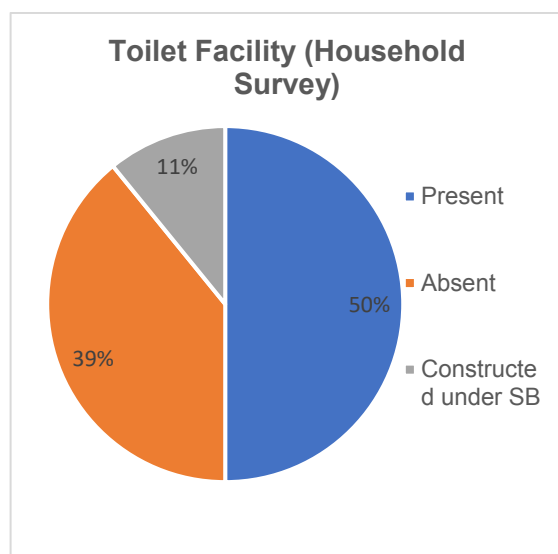


Figure 51 Survey based toilet Facility.

(Source: Household survey, 2020)

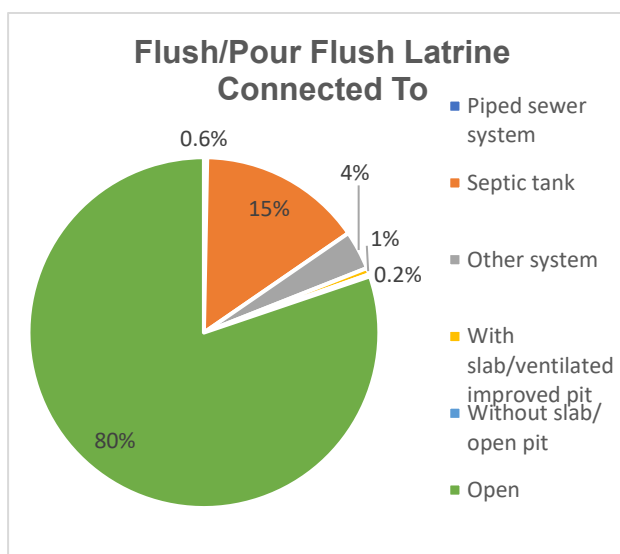


Figure 52 Type of Sewage disposal used.

(source: DCHB, 2011)

5.6.2.4.3 Liquid Waste Management

The village lacks liquid waste management system. But there is a potential for liquid waste management system as the treated water can be put to agriculture use.

5.6.2.4.4 Drainage

The status of available drainage system is shown in **Table 30** as per census 2011. There are 47% of open kuccha drains (**Figure 53**) present in the village, rest 53% of households have no

drainage coverage. This results in water logging every year during heavy rains as noted during household survey.

Table 30 Type of drainage system.

Drainage	Closed Drainage (Status)	NA
	Open Drainage (Status)	Available
	Open Pucca Drainage Covered with Tiles Slabs (Status)	NA
	Open Pucca Drainage Uncovered (Status)	NA
	Open Kuccha Drainage (Status)	Available
	Whether Drain water is discharged directly into water bodies or to sewer plant (For Water Bodies/Sewer Plants)	NA

(Source: DCHB, 2011)

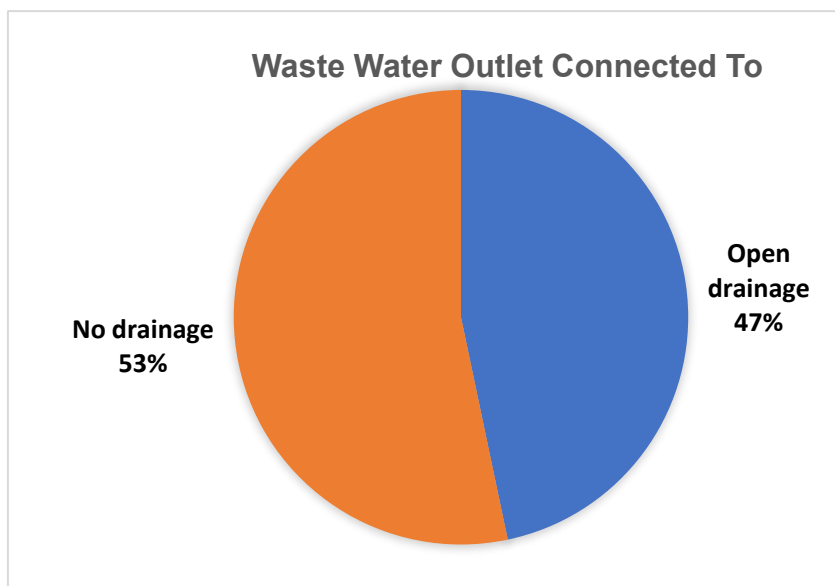


Figure 53 Drainage system.

Figure 54 & Figure 55 shows street section with existing open drain system within the village.

(Source: DCHB, 2011)



Figure 54 Presence of Open drain on both sides of road within *Abadi* area.

(Source: Author)

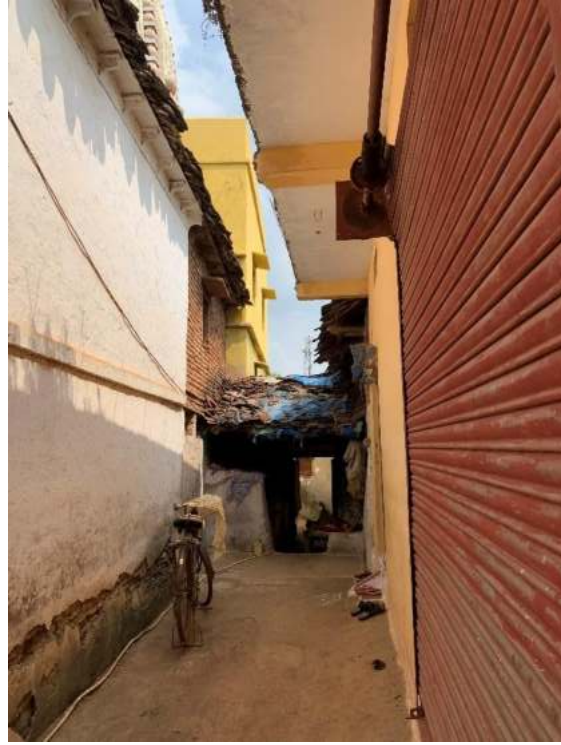


Figure 55 Open drain on one side.

(Source: Author)

5.7 Peoples' Perception

Based on the interaction with stakeholders and household survey, the findings from their perception can be summarized into-

5.7.1 Infrastructure

5.7.1.1 Transportation

- Many people said that transportation infrastructure must be improved as well as access to medical services as well as construction of a new hospital in the village.
- They are travelling to other villages/urban centres for medical facilities and therefore transportation becomes a major factor in accessing the mentioned services.

5.7.1.2 Housing

- From housing data, it can be stated that there is a need to improve both the housing structure as well as the housing condition in the village.

5.7.1.3 Social Infrastructure

- There is no provision for solid waste collection or management within the village.
- Medical facilities to cater to the needs of women is needed.

5.7.2 Economy

- It is evident that most people have lived in this village for generations and prefer to work within the village. There is out migration because of lack of the livelihood opportunities.
- They are also spending highest on food, then education, followed by medical and transportation.
- Males are engaged in agricultural and construction labourers while females are primarily homemakers. Few people are engaged in business as well as the service sector.

5.7.3 Education

- Most of them are either illiterate or have not completed high school. The people engaged in the service sector have received some formal education in their life.
- Girl children have an equal opportunity to get formal education. However, they are not able to pursue higher education because of safety concerns in commuting daily to nearby towns for availing the facility.

5.7.4 Social & Cultural Harmony

- People have sense of shared responsibility and do not get affected even during major riots in other parts of the country.

5.8 Inferences from Stakeholders' Discussion

Stakeholder discussion is conducted keeping in mind representation of various social groups and people of all age groups including both males and females. It includes big farmers, small farmers, Panchayat officials, women, children, elderly residents, and bank officials. Each group was asked separate set of questions pertaining to their interest areas. Vision for the future development was discussed with each group separately as well as in a group to involve appraisal on their expectations for the future. They were also asked for their level of involvement for achieving these developmental goals. This technique helped in formulation of vision for the spatial development plan of gram panchayat.

The comprehensive interaction with stakeholders helped to identify concerns, potential and opportunities available in the village for its spatial development which are listed in **Table 31**

Table 31 Identified Concerns, Potential and Opportunities from Stakeholders' discussions.

CONCERNS	POTENTIAL	OPPORTUNITIES
No accessibility to farmland during rainy season	Better agricultural produce by provision of through and through road for accessibility to farms as well as nearby areas	Communal Harmony
Lack of Health facilities specially for women	Training/ Vocational center to develop skill set of youth	Safe place to live (No thefts and robbery)
Garbage collection (scattered here and there).	Warehouse	Branding of Murwas for wheat
Backwardness in education and is linked to poverty. Girls are deprived of higher education because of safety concerns in travelling to far off places. Housing for the poor	Recreational facilities such as play area and park	Scope for horticulture
Depleting groundwater (The level has gone down from 40' to 100')	Waste recycling and use in Agriculture	Food processing and dairy farming
Degradation as well as encroachment on forest land		
Lack of green spaces within the <i>Abadi</i> area		

(Source: Qualitative survey)

6 Spatial Development of Murwas Gram Panchayat

6.1 Vision

The vision for spatial development plan of Murwas Gram Panchayat is to provide ***Sustainable Livelihood for People through Technology, Education, Economy, and Infrastructure with Social Harmony.***

6.1.1 Short term Vision- By 2030

The short-term goal for Murwas Gram Panchayat Spatial Development Plan is to provide connectivity to neighboring villages, Affordable Low-cost Housing with less waste produce and more Recycle and Re-Use by 2030, Self-sustaining Healthcare infrastructure, use of renewable energy source, Education for all, to make Natural features and Green spaces an opportunity to harvest Rainwater and to achieve Zero waste with people's participation.

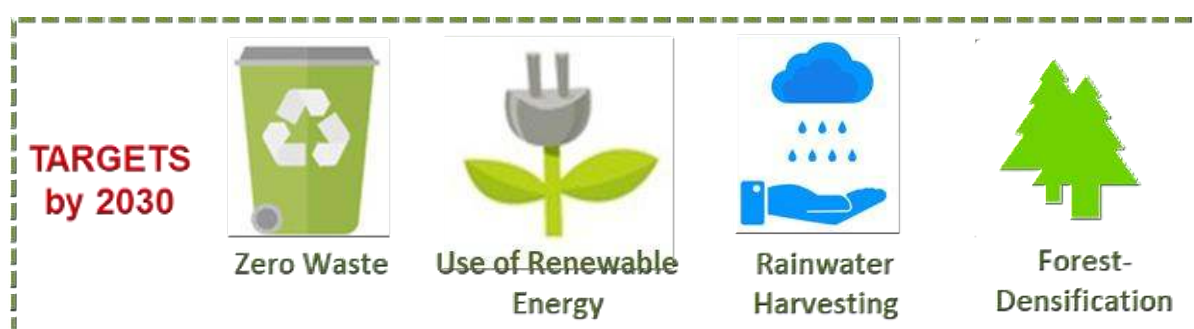


Figure 56 Targets to achieve by 2030.

(Source: Author)

6.1.2 Future Vision – Beyond 10 Years

Murwas is expected to have high level technology induction due to skill development that is emerging in the area. This will empower the Murwas village to move into a Town status.

Murwas will become a Town beyond 10years and expected to

6.2 Projection & Future Spatial Development

6.2.1 Population

The Murwas village population is projected till 2050 using Induced Population Projection method. The existing population has already reached beyond the upper limit of rural area definition and has potential of becoming a census town. It shows the growth of population reaching to 14000 by 2050 (**Figure 57**) hence, transformation to more urban characteristic.

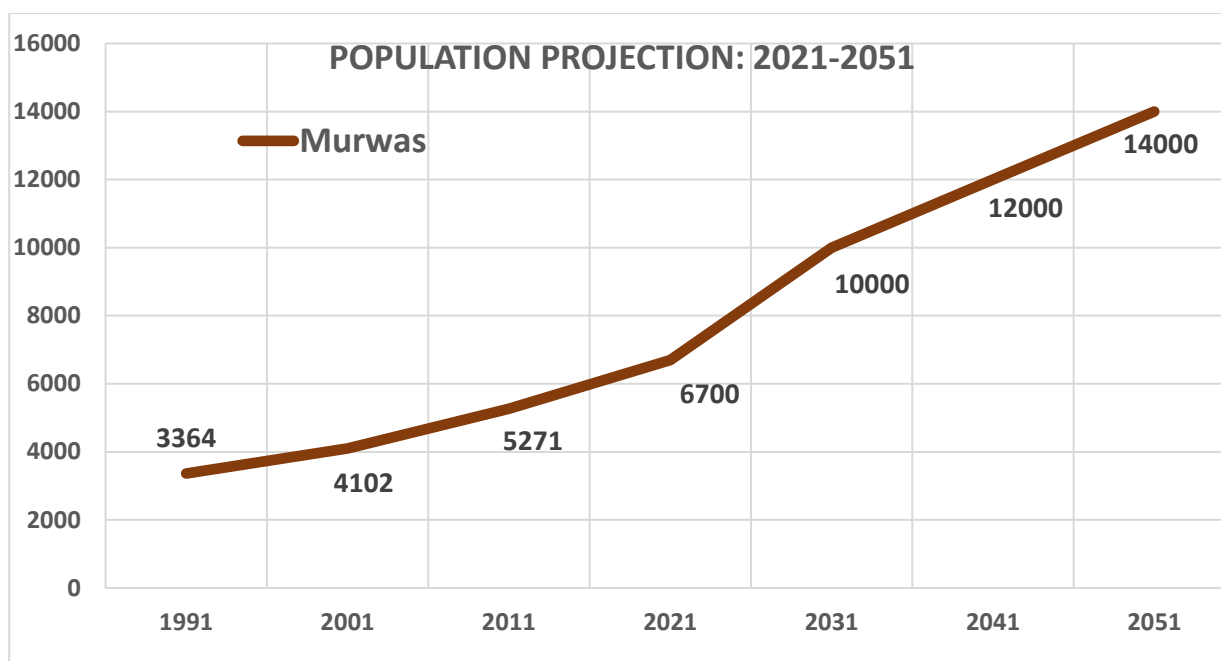


Figure 57 Population Projection till 2050.

(Source: Author)

6.2.2 Land Capability and where to locate?

The land capability of Murwas for its anticipated spatial growth is identified using Land suitability assessment. The selection of suitable land is based upon the process of understanding existing quality and factors of land, which determine the activities of land. The characteristics of a land depends upon the relationship of various factors, like location of available sites, extent of the land, road accessibility, ownership etc., and physiography of the site like slope.

The appropriate base data required for suitability analysis was gathered from satellite data, thematic maps, field data (household data and stakeholders discussions) and topographic data. The weighted overlay technique, a weighting and scoring method, has been used and applied to the various aspects of suitability. Suitable sites are identified by overlaying all the layers which influence suitability assessment.

Following parameters have been considered for the suitability analysis.

- i. **Existing land use:** Land use land cover with six-fold classification of Agriculture, Rural Built-up, waste land, water bodies, Fallow Land and Hamlet's (**Figure 58**). This map has been extracted from Bhuvan portal. **Table 32** highlights the weightage assigned to each of the land use as per their significance for assessing land suitability.

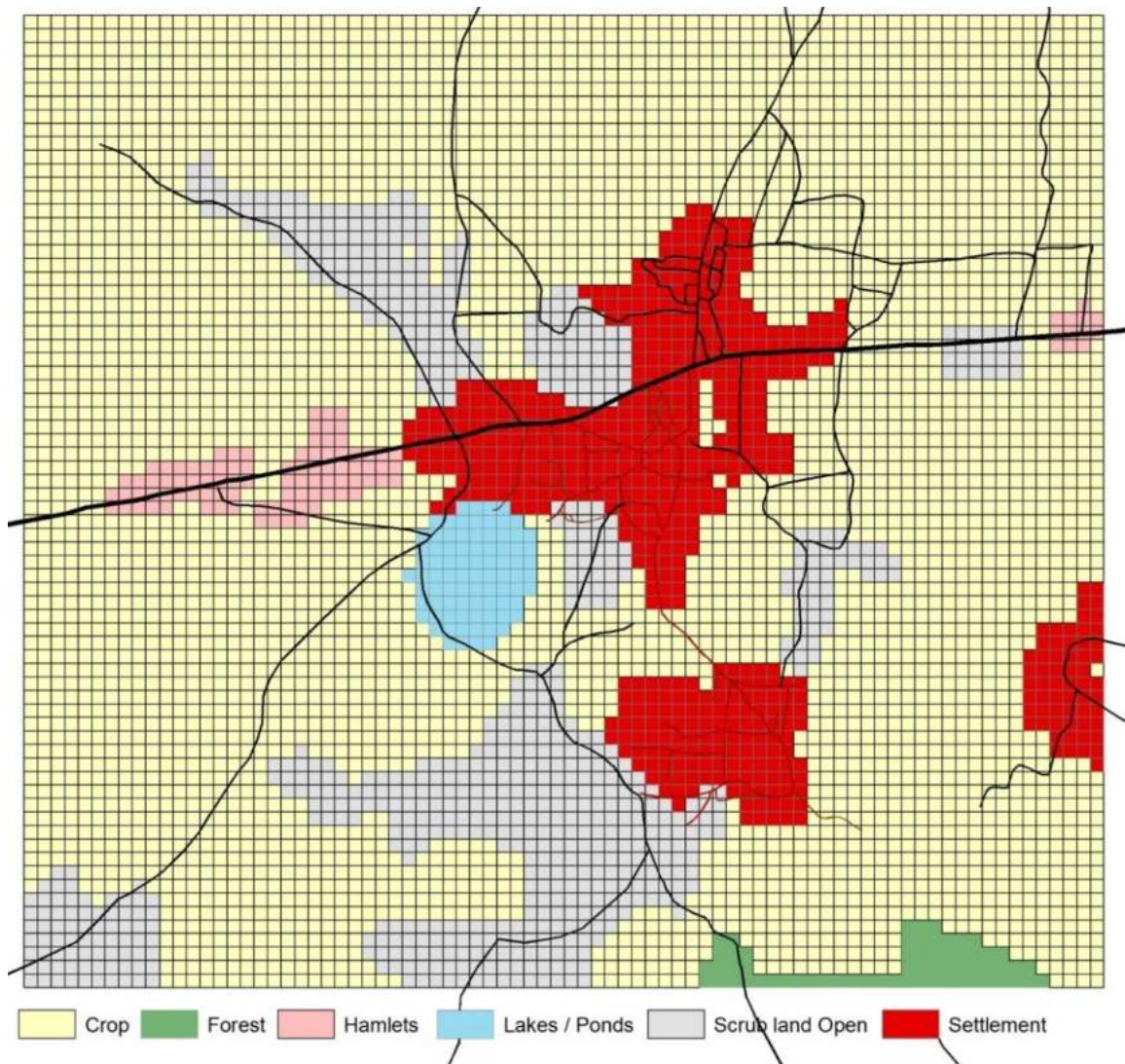


Figure 58 Pixel-based Land Use for Land Suitability Assessment.

(Data source: BUVAN portal)

Table 32 Weightage given to each Land use for the Land Suitability Assessment.

Layer	Influence %	Field	Scale	Suitability	Area (in Acres)
LULC	16	scrub land	9	High	167
		crop	1	Very Low	929
		Forest	0	Restricted	62
		Settlement	1	Low	130
		Lakes/Ponds	0	Restricted	18.45
		Hamlets	1	Low	22.46

- ii. **Land ownership:** Government and private land has been spatially mapped (**Figure 58**) using Land records web site MP Bhulekh and validated by Field data. The weightage assigned is given in **Table 33**.

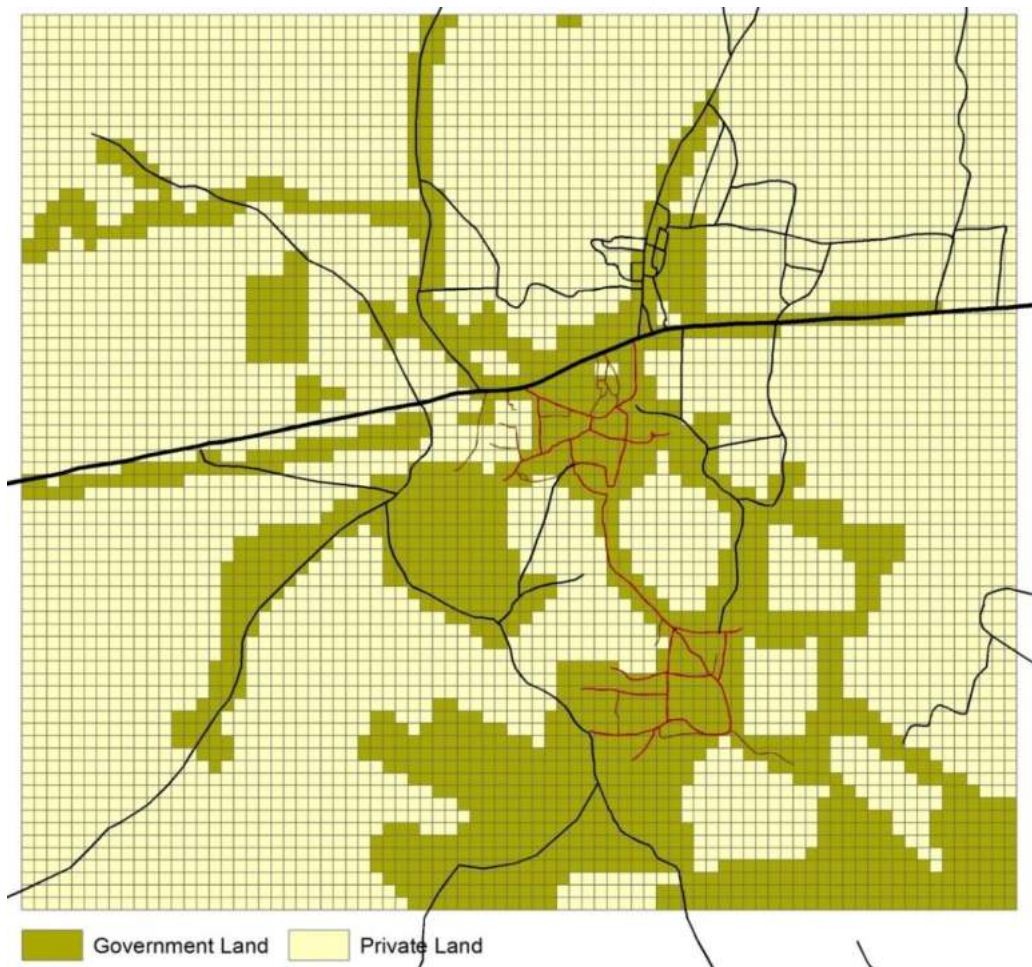


Figure 59 Pixel-based Land Ownership for analysis.

Table 33 Weightage given to each type of Land ownership for the Land Suitability Assessment.

Layer	% Influence	Field	Scale value	Suitability	Area (in Acres)
Landowner ship	16	Private	0	Restricted	922.71
		Government	9	High	358.27

- iii. **Natural Buffers:** All the Natural Features which includes Forest, water Bodies and Natural Streams are considered with buffer of 30m (**Figure 60**) for Highest order streams

(riparian restricted and management guidelines). Weightages are assigned as given in the **Table 34**.

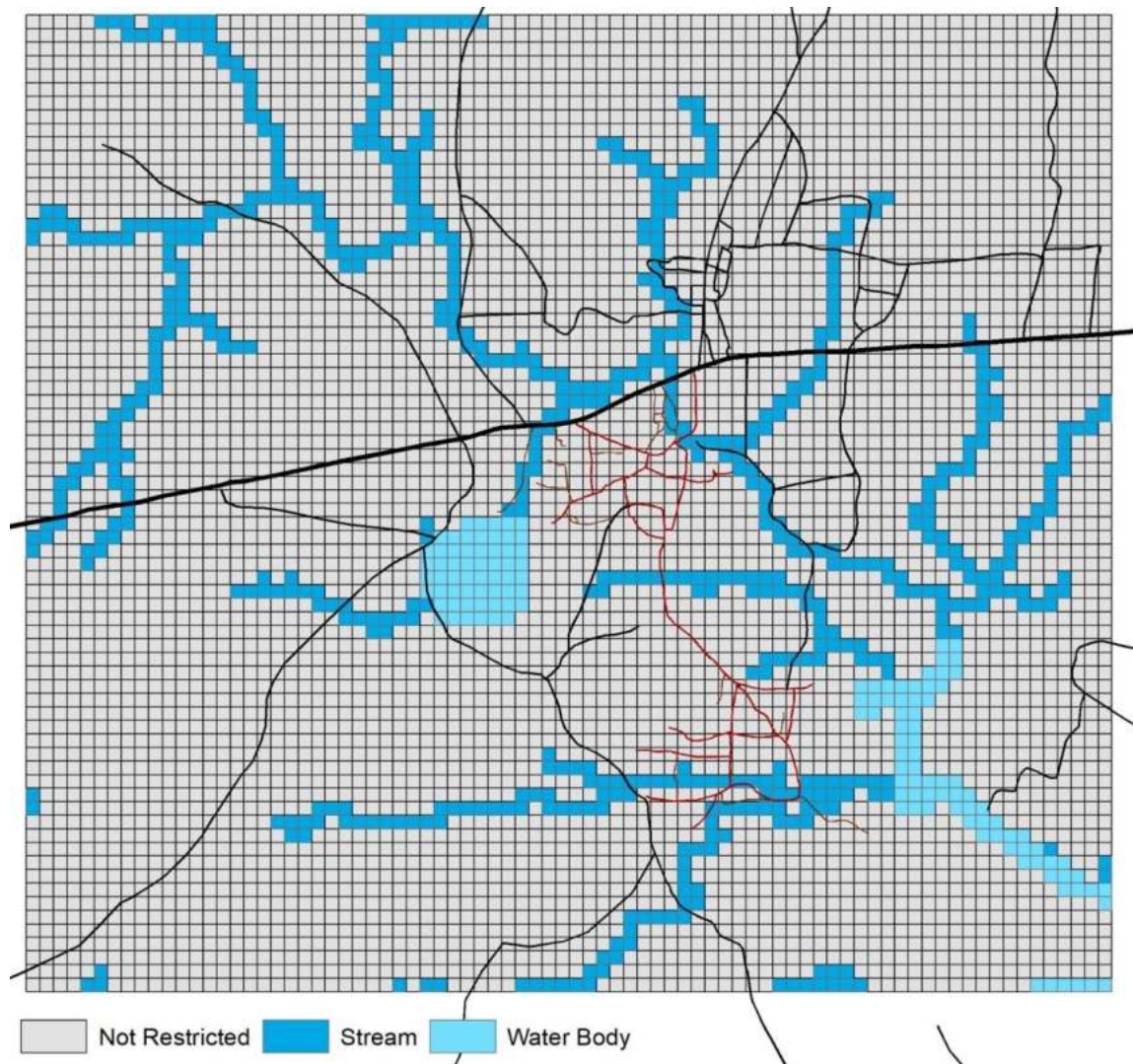


Figure 60 Pixel-based Natural Buffers for GIS based analysis.

Table 34 Weightage for Natural feature layer for Land Suitability Assessment.

Layer	% Influence	Field	Scale	Suitability	Area
Natural Features	16	Stream	0	Restricted	136.55
		water Body	0	Restricted	29.8
		Other Area	9	High	1114.64

- iv. **Road Accessibility:** To identify the accessibility towards the proposed Land use, road type is classified into two types pucca which is considered as Highly accessible and

kacha as low accessible as shown in **Figure 61**. Weightages assigned for land suitability is given in **Table 35**.

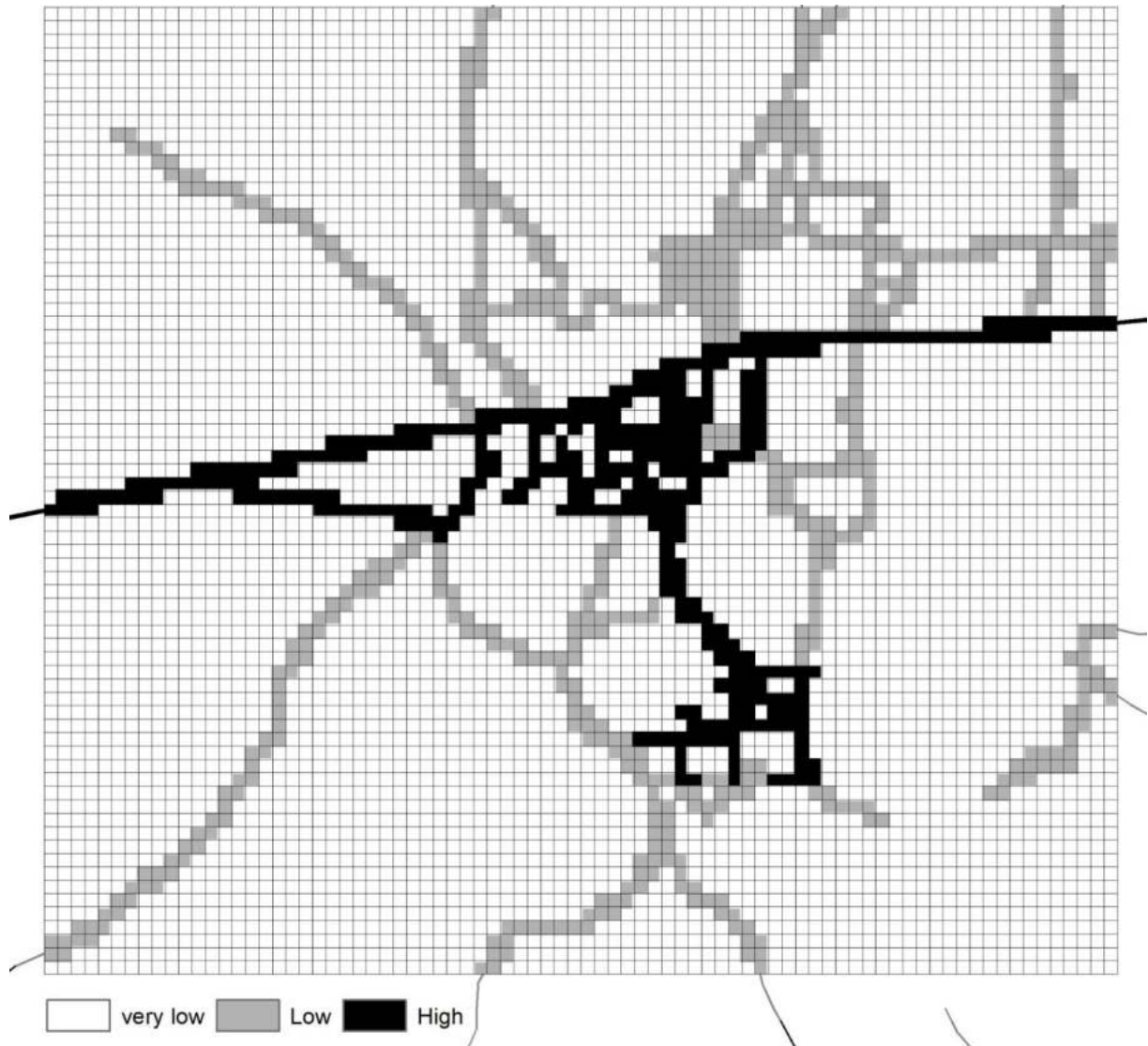


Figure 61 Pixel based map of Road Accessibility for Analysis.

Table 35 Weightage for Road Accessibility layer for Land Suitability Assessment.

Layer	% Influence	Field	Scale	Suitability	Area
Road	16	More Accessibility	9	High	75
		Less Accessibility	5		138
		Very Less Accessibility	0	Restricted	1067.27

- v. **Slope:** Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER-DEM) is used to generate Elevation model and classified into five categories (**Figure 62**), where moderate slope lands are considered as suitable lands (**Table 36**).

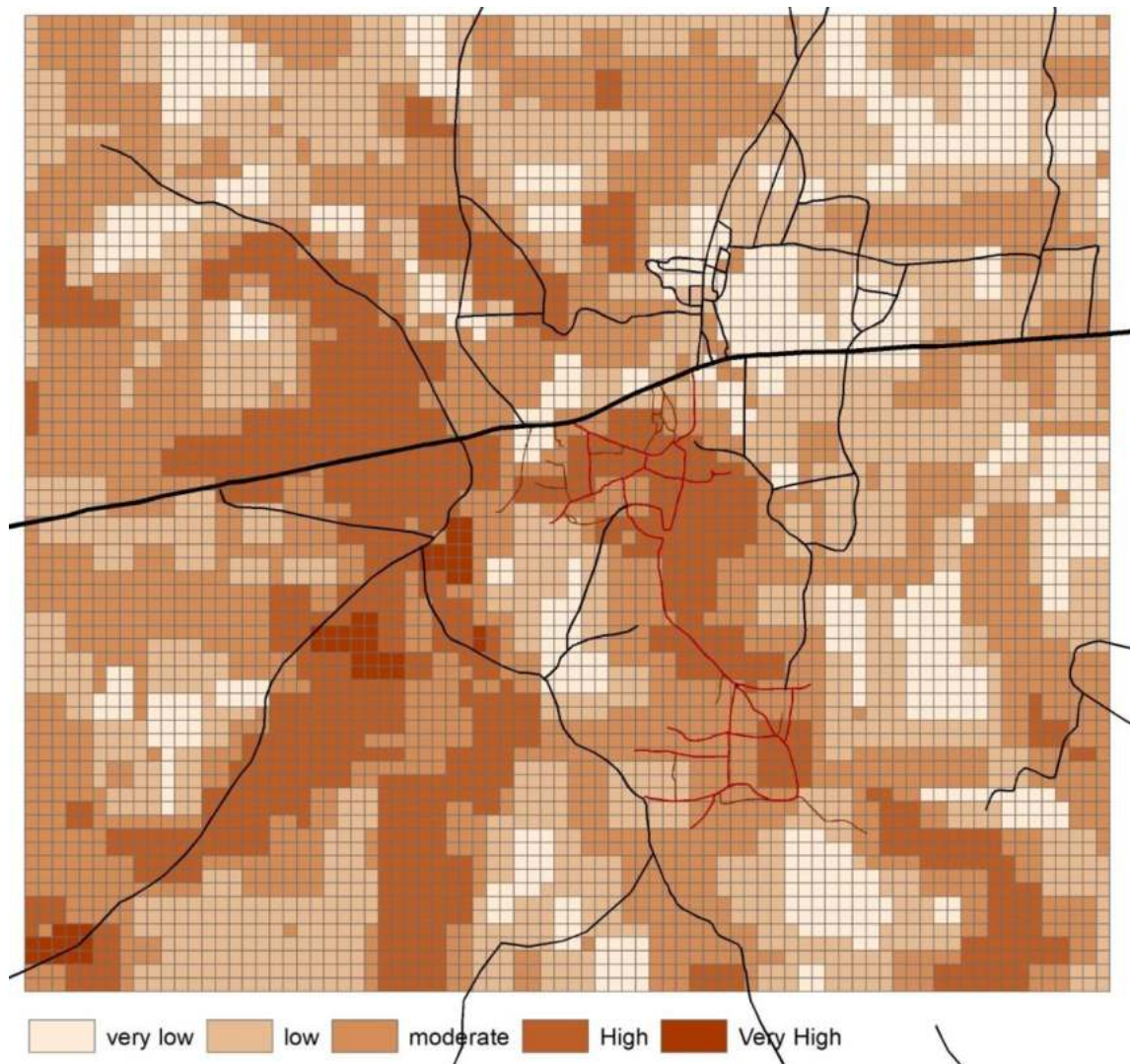


Figure 62 Pixel based Slope for Land Suitability Assessment.

Table 36 Weightage for Slope layer for Land Suitability Assessment.

Layer	% Influence	Field	Scale value	Suitability	Area (in Acres)
Slope	16	Very Low	0	Restricted	168
		Low	5	Very Low	415
		Moderate	9	High	459
		High	3		226
		Very High	1	Very Low	10.89

- vi. **Growth direction:** Spatial growth extent is projected based on Shannon’s entropy method (**Figure 63**). In this method based on the past trends of growth pattern and other factors are considered to project the growth. **Table 37** highlights the weightages assigned for computing land suitability.

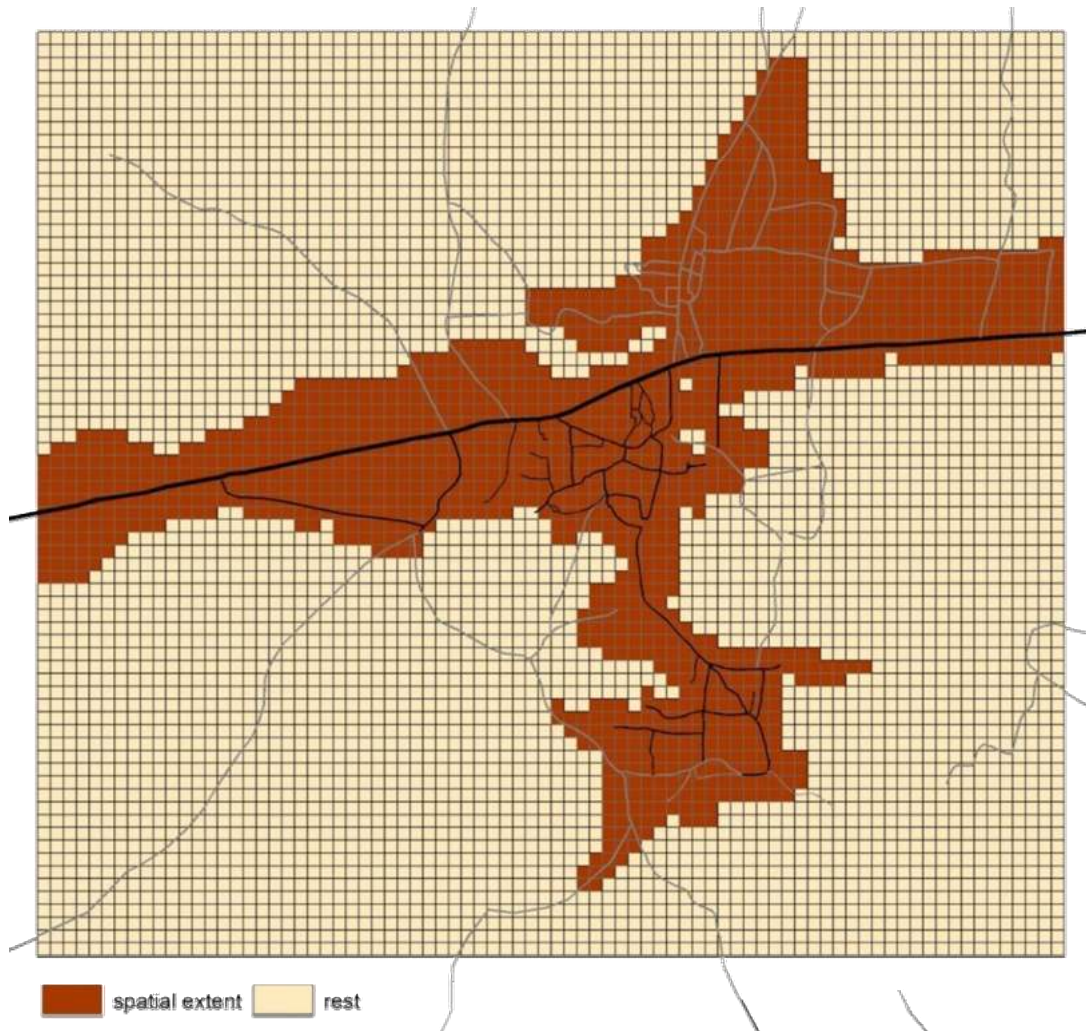


Figure 63 Pixel based spatial growth extent for Land Suitability Assessment.

Table 37 Weightage for Spatial extent layer for Land Suitability Assessment.

Layer	% Influence	Field	Scale value	Suitability	Area (in Acres)
spatial Extent	16	Projected	9	High	429
		Other Area	0	Restricted	851

6.2.3 Land use Projections

A total of 41.34 acres of land is found to be suitable for future spatial growth (**Figure 64**) based on Land suitability assessment. The maximum projected land of 21 acres lies towards South while 6 acres of land is found to be suitable towards North-East i.e., Sironj side. North West side also has suitable land of 7 acres for spatial development.

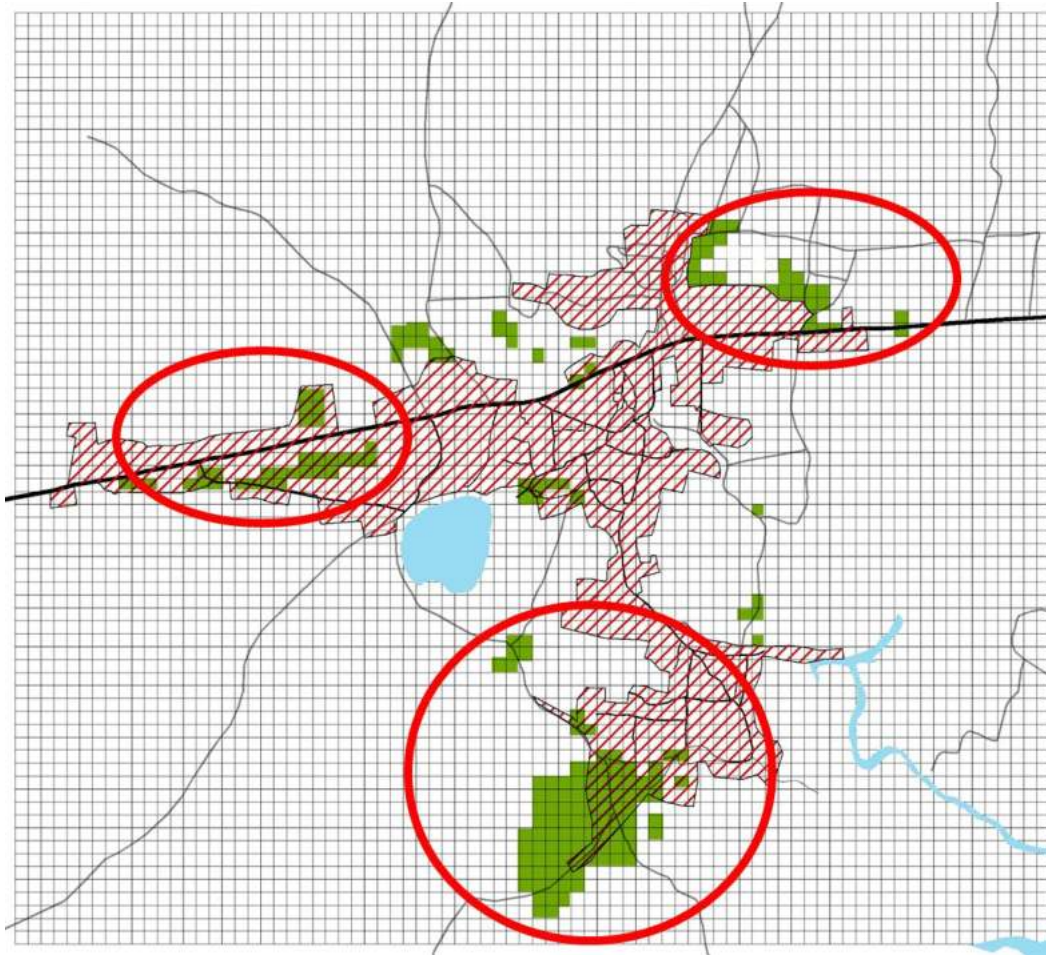


Figure 64 Suitable Land as per Land Suitability Assessment.

(Source: Author)

6.2.4 Housing

The housing requirement is calculated based on projected population. There is a need of 2150 households to accommodate the population of 14000 by 2050 (**Figure 65**). The total housing requirement till 2050 is 18.2 ha (45 acres) as calculated based on 75 sq.m. per household area from RADPFI guidelines.

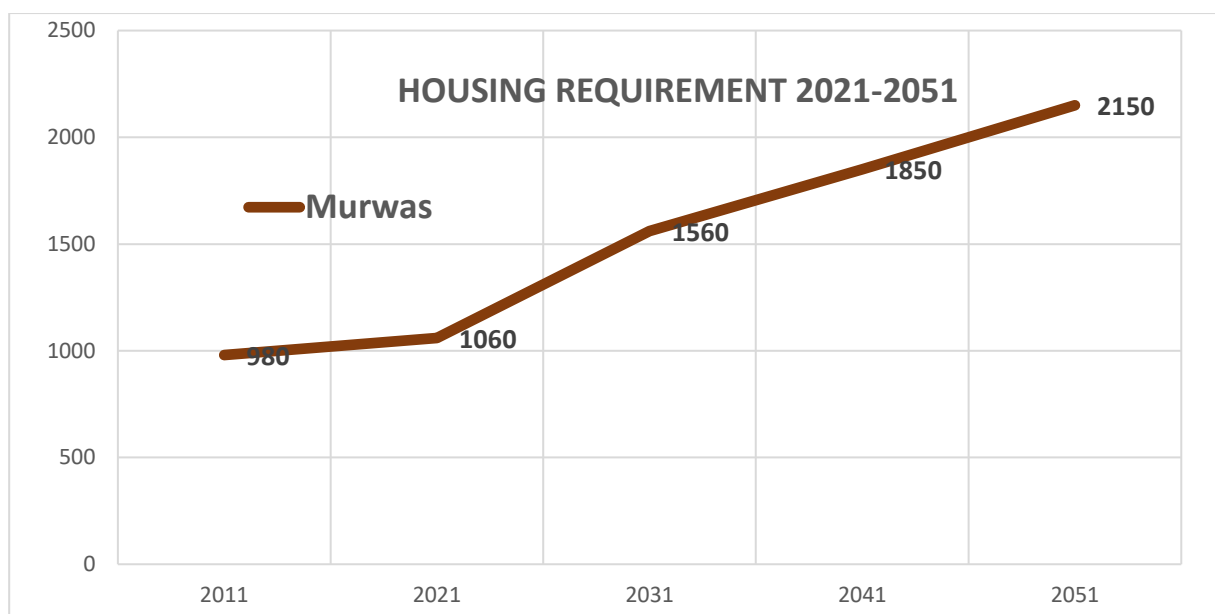


Figure 65 Projected Housing Requirement till 2051. (Source: Author)

6.2.5 Infrastructure

The requirement of infrastructure for anticipated population growth is calculated based on RADPFI guidelines (**Table 38**). Few other infrastructures like Warehouse, Road connectivity to other villages and infrastructure for Solid Liquid Waste Management (SLWM) is proposed using visioning technique. It is based on household survey and stakeholders' discussion.

Table 38 Infrastructure requirement till 2050 based on projected population

Infrastructure Facility	2011 Status	RADPFI standards	Per Unit area requirement	Gap (as per current population)	2021	2031	2041
EDUCATION							
Pre-primary School	Not Avail.	-		-	-	-	-
Aanganwari	Available	1/5000 persons	1500 sq.m.	1	2	2	3
MEDICAL							
Pr. Health Sub Centre	1	1/5000 persons	-	1	2	2	3
OTHERS							
Community hall	Not Avail.	1/5000 persons	-	2	2	2	3
Playground	Not Available	1/5000 persons	10000	1	2	2	3

(Source: Author)

6.2.5.1 Technological Interventions

The technologies required to prepare GPSDP are selected based on village character, availability of land, type & quantity of waste generated both from households and agriculture and the feasibility/applicability of technology in Murwas Gram Panchayat. Different associated guidelines (**Table 39**) have been referred for allocation of suitable land and area-requirement. All these are proposed phase-wise; spatial allocation of which is represented in **Figure 66**, **Figure 67** and **Figure 68**. The vision till 2030 have been presented in two phases as detailed out as in Annexure 3 and also presented here in **Figure 69**.

Table 39 Proposed Technological Interventions.

S.No.	Proposed Technologies	Area	Source
1.	Duckweed & Fish pond Wastewater Treatment	2-6 ha	RADPFI
2.	Vermi-composting site	0.24 ha	SBM-G
3.	Warehouse	2,250 sq.m. to 5000 sq.m.	Warehouse Manual, 2007
4.	Wheat Straw Ash Plant	-	
5.	Small Bore Sewers Network	-	RADPFI, MoDWS
6.	Miyawaki Method for densification of Forest	-	-
7.	Solar Farm	To be decided by the Gram Panchayat within the available land	
8	Dairy Farm and Processing Unit	Based on co-operative basis	Private funding

(Source: Author)

The proposals have been integrated with existing GPDP of Murwas gram panchayat and with related government schemes. The phase-wise elaboration of each proposal can be referred from **Figure 69**. Phasing shows the proposed road connectivity with adjoining villages along with spatial allocation of health and education infrastructure. The detailed phase-wise implementation of Solid Liquid Waste Management (SLWM) is spatially represented in **Figure 67**. The existing drains are proposed to be converted into economical small-bore sewers, the network of which terminates to waste water treatment site i.e., into Duckweed & Fishpond system. This system shall also include surface run off water. The treated water can either be used in agriculture or stored in Talayya (a reservoir tank) present in South East of panchayat. This technology serves dual purpose-treatment of water by duckweeds and income generation

through fish farming, a livelihood opportunity identified during stakeholders' discussion. Moreover, existing dumping sites are proposed to be converted into green spaces and a new composting site for Bio-culture technology is provided towards West of gram panchayat. The Agro-waste specifically Wheat straw is proposed to be utilized in construction industry i.e., conversion into Wheat straw ash as a replacement of cement, which requires Wheat Straw Ash Plant within the village providing livelihood opportunities.

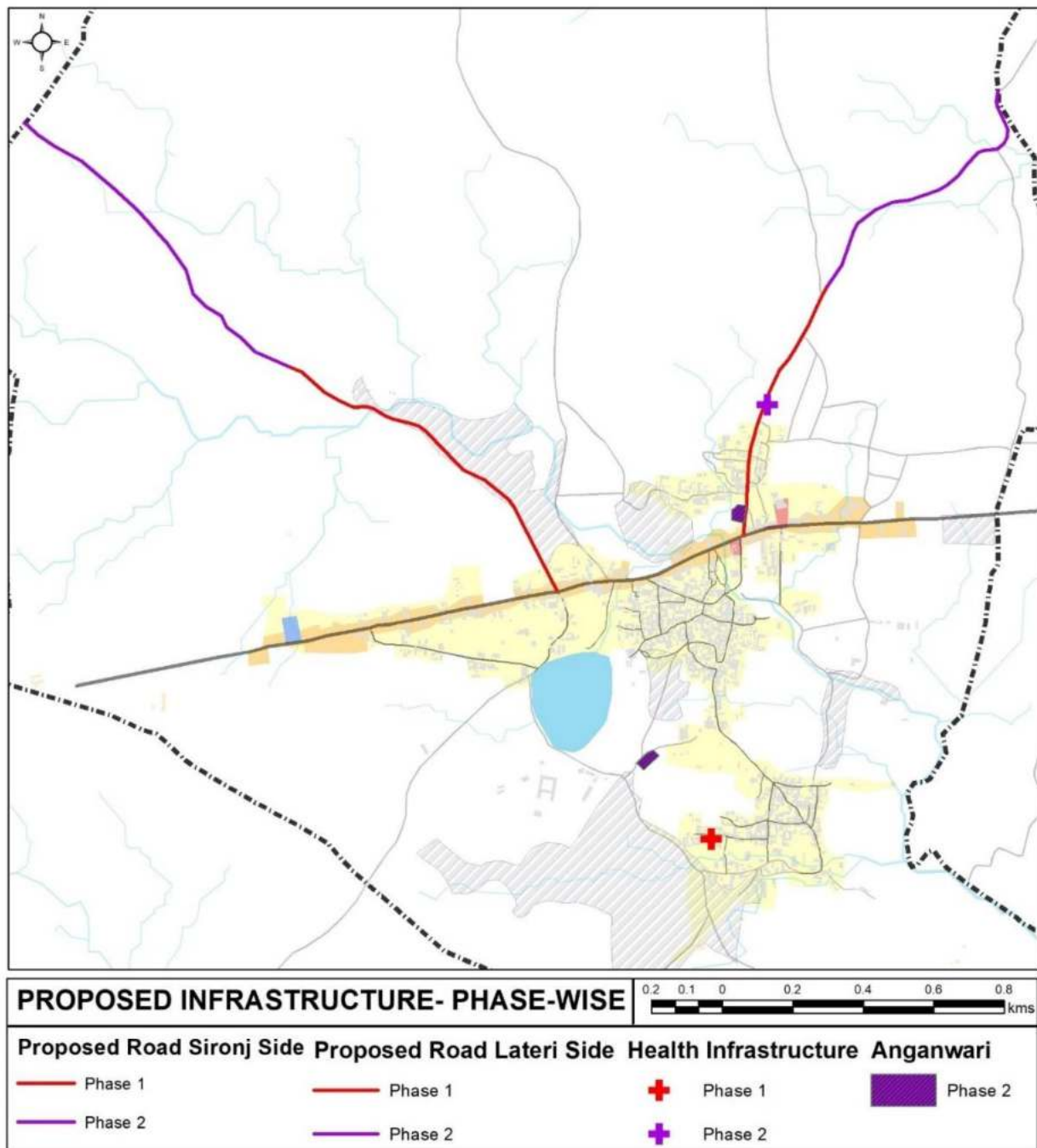


Figure 66 Proposal map for Phase-wise implementation of Infrastructure.

(Source: Author)

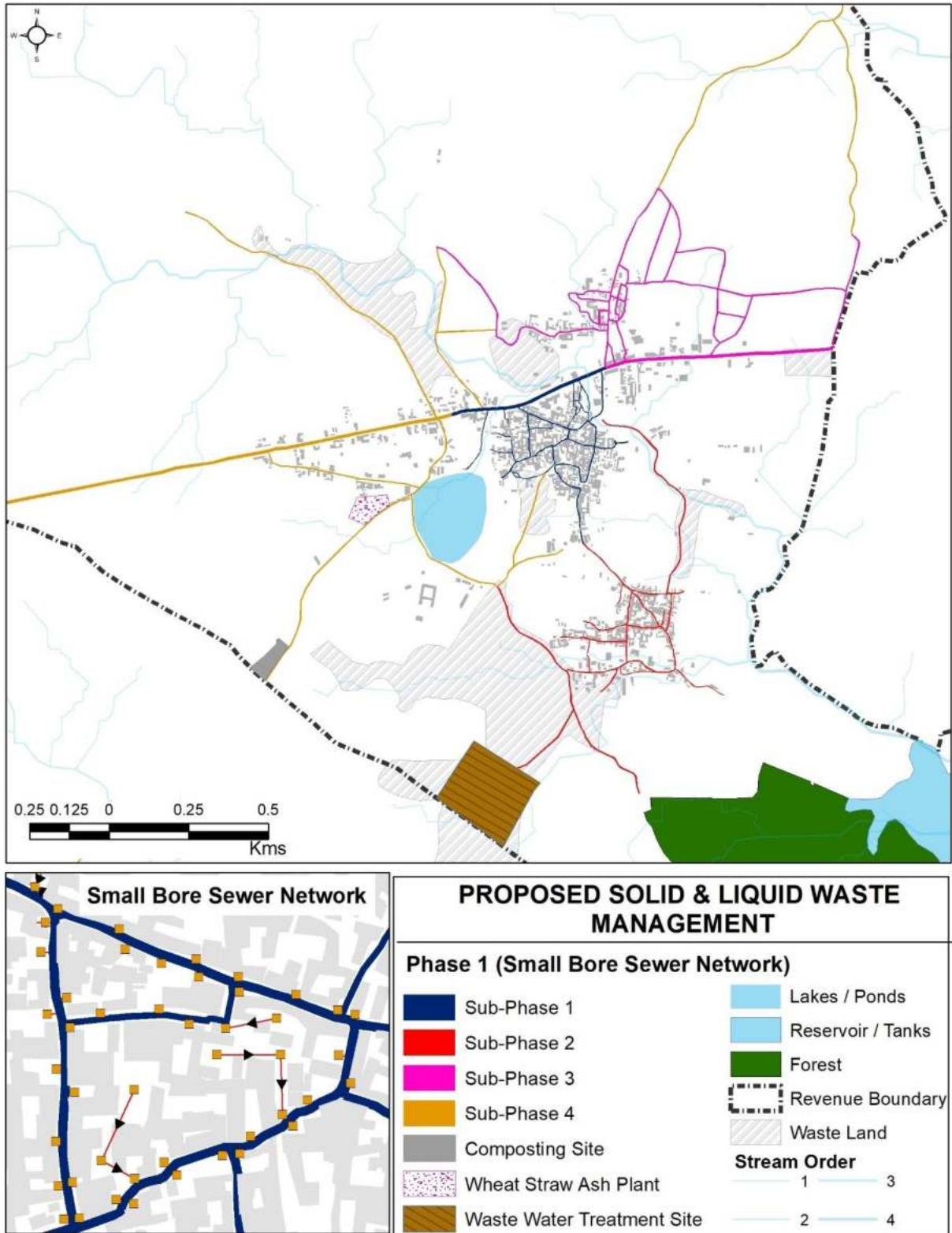


Figure 67 Proposal map for phase-wise Solid Liquid Waste Management.

(Source: Author)

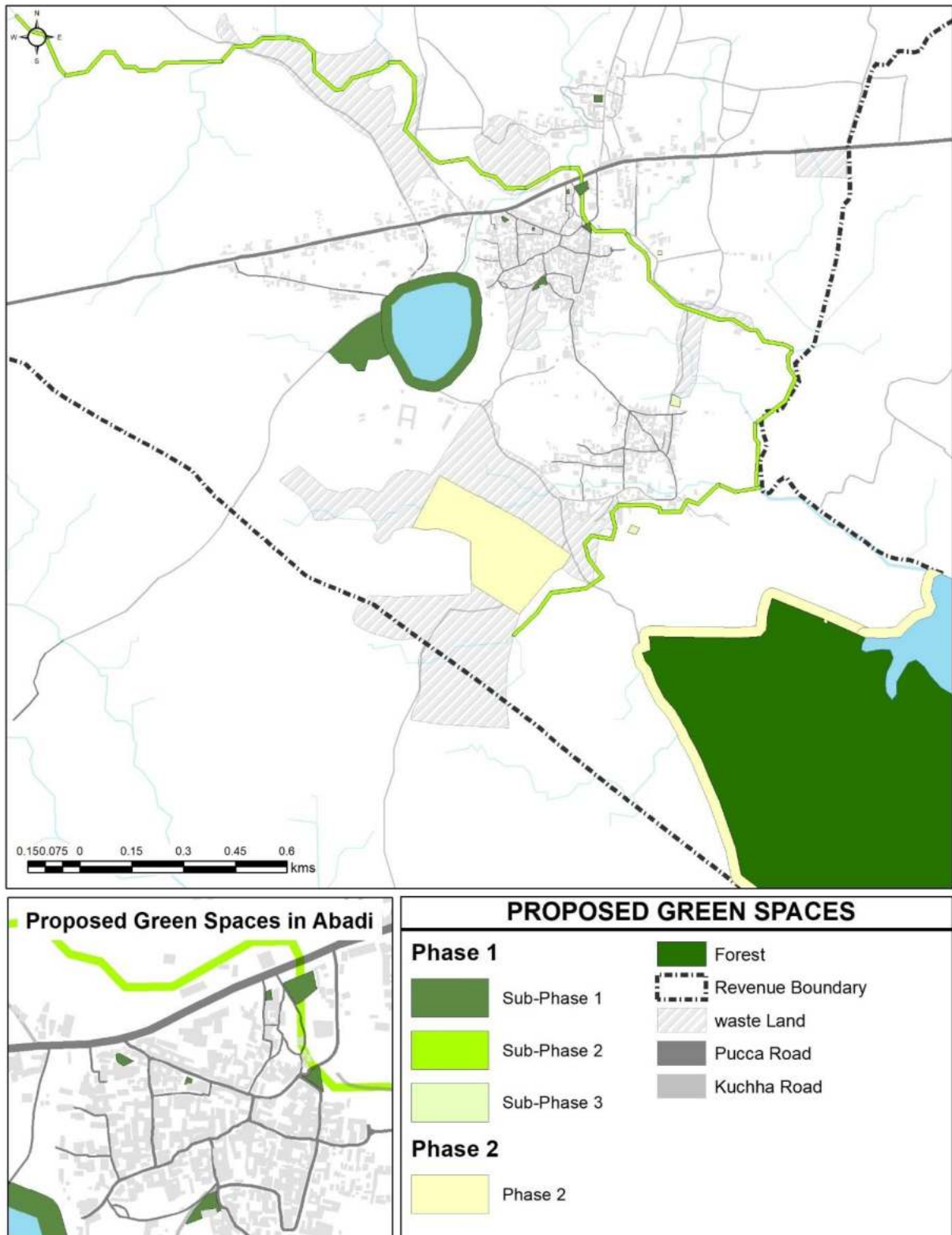


Figure 68 Proposal map for phase-wise implementation of Green spaces.

(Source: Author)

GRAM PANCHAYAT SPATIAL DEVELOPMENT PLAN- MURWAS GRAM PANCHAYAT, 2020

FOCUS AREA	ACTIVITY TYPE	PHASE 1 (2021-2025)					PHASE 2 (2026-2030)				SOURCE OF FUND	RELATED GOVERNMENT SCHEMES		
		2021	2022	2023	2024	2025	2026	2027	2028	2029			2030	
Infrastructure	Roads	Construction of 750m proposed concrete roads towards North East (i.e. Sironi) side using wheat husk ash	Construction of 1km proposed concrete roads towards North West i.e. Lateri side using wheat husk ash				Construction of remaining 1km proposed concrete roads towards Lateri side using wheat husk ash					Finance commission PMGSY MGNREGA Swachh Bharat Mission-Gramin Neel Kranti Mission MGNREGA	Pradhan Mantri Gram Sadak Yojana (PMGSY) MGNREGA	
	Toilets	Toilet facility to all HHs without toilet										Finance Commission Swachh Bharat Kosh, MGNREGA	Swachh Bharat Mission-Gramin Neel Kranti Mission MGNREGA	
Solid & Liquid Waste Management	Wheat Straw Ash Plant	Construction of Plant												
	Composting Site	Provisioning of physical facilities for segregation of waste at source (3 bins- Green, Blue and Red), IEC activities and Segregation at source at each Households	Construction of site towards South West											
	Small Bore/Sewer Network	Conversion of existing drains to small bore sewers and laying of new small bore sewer network wherever required along with interceptor tanks in zone 1 (see map)	With similar process as in zone 1, Coverage of zone 2 (see map)	With similar process as in zone 1, Coverage of zone 3 (see map)	With similar process as in zone 1, Coverage of zone 4 (see map)		Network becomes Operational					Finance Commission Swachh Bharat Kosh, MGNREGA	Swachh Bharat Mission-Gramin Neel Kranti Mission MGNREGA	
Health Infrastructure	Waste water treatment site				Construction of three ponds - Anaerobic, facultative and duckweed & fish pond on the prescribed location									
	Duck Weed													
Recreational Space	Primary Health-Sub Centre	Training on Health & Hygiene among people of all age groups	Construction of Self-sustaining solar powered 1 No. Primary Health centre towards South West with involvement of locals using recyclable material				Construction of self-sustaining solar powered 1 No. Primary Health centre with involvement of locals using recyclable material					Finance Commission and related Schemes	National Rural Health Mission (NRHM) Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) Multi-Sectoral Development Programme (MSDP)	
	Playground, Green Spaces/Parks, Green Buffers	Formation of recreational green spaces in Zone 1 and Green belt along pond	Sub-phase wise formation of Green belt along natural drains (see map)	Conversion of existing dumping sites to green areas and formation of Green Belt along Lalawa			Green buffer along forest					MGNREGA	National Service Scheme for tree plantation MGNREGA	
Institutional Infrastructure	Density of Forest	Plantation of trees in 50 ha of land starting from settlement side using Miyawaki method	Plantation of trees in another 50 ha of land using same method											
	Warehouse	Construction of self-sustaining Solar powered Warehouse near Pond	Provision of Self-sustaining Solar Powered Dairy farming											
Education	Dairy Farm													
	Anganwadi, Higher Secondary School	Initiation of After school education programs to educate local people inclusive of digital learning, behavioral waste management, creative activities and Upgradation of Middle school present in South West.					Construction of required 2 Nos Anganwadis towards South and North West with involvement of locals using recyclable materials.						Related schemes	Rashtriya Madhyamik Shiksha Abhiyan (RMSA) Sarva Shiksha Abhiyan (SSA) Rashtriya Uchchaitar Shiksha Abhiyan Integrated Child Development Services (ICDS)
Housing		Construction of 40% of required HHs towards NE (i.e. Sironi) side and 30% of required HHs towards North West providing livelihood to locals each with the provision of Bio-gas plant and Rain water Harvesting					Construction of 30% of required HHs towards South-West providing livelihood to locals each with the provision of Bio-gas plant and Rain water Harvesting						Related schemes	Indira Awaas Yojana Mukhya Mantri Gramin Awaas Yojana and Mukhya Mantri Antyodaya Awaas Yojana Multi-Sectoral Development Programme (MSDP) for minority community Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY)

Figure 69 Scheme for proposed spatial development of Murwas Gram panchayat in line with existing GPDP.

(Source: Author)

6.2.6 Employment Opportunities

The proposed development plan entails livelihood opportunities in each identified sector. All the construction activities encourage locals to participate and provide employment opportunities like Warehouse, dairy farming, *Aanganwari*, etc.

6.2.7 Proposed Land Use Zones for Spatial Development of Murwas

With the help of technology, people participation and stakeholder’s discussion, the land use zones for anticipated spatial development of Murwas Gram Panchayat are allocated and shown in **Figure 70**.

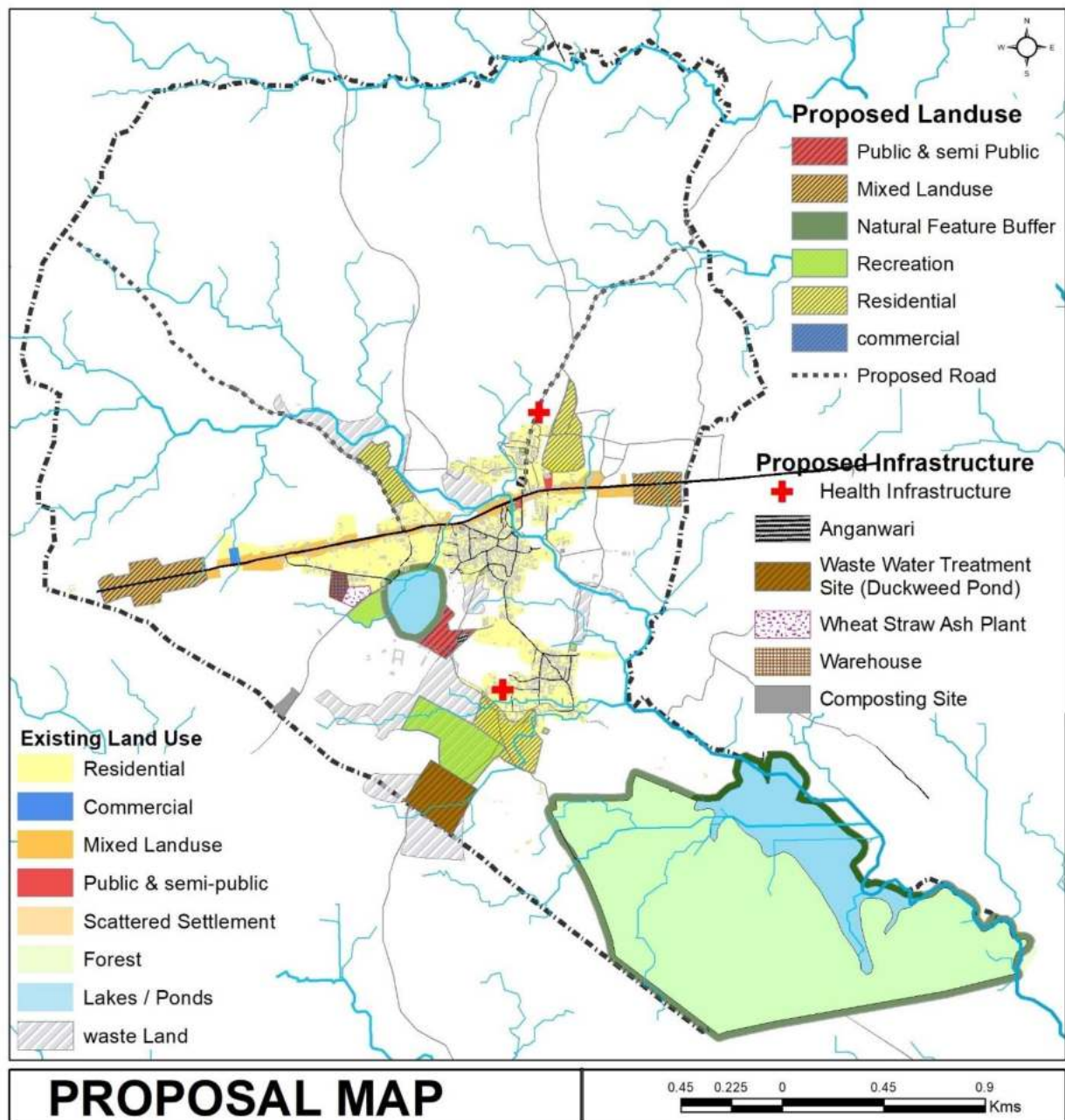


Figure 70 Proposed Spatial Development Plan

7 Institutional Support and Governance

7.1 District Town and Country Planning – Interface

The town and Country Planning at district level mainly focus on planning of urban areas with its region. There is no mentioning of Country in the Town and Country Planning Act as well as Block Level at district level in its functioning. However, Madhya Pradesh has included Janpad Panchayat at block level under Panchayati Raj institution. It is the regulating body acting as an intermediary between gram panchayats at lower level and Zila panchayat at district level. Hence, there is a need for intermediary governing body for integration of village level planning with district level planning. However, the Block level institution (Janpad) has not been empowered to have Spatial Planning at Block or Village level. Necessary Amendment needs to be incorporated.

7.2 Rural Land Use Changes – 73rd CAA AND AMENDMENT/RULES

Since rural areas are not identified for land use planning under T & CP Act, there is a continuous conversion of agricultural or fertile land into built spaces in rural areas. Though, 73rd CAA and 74th CAA recognized decentralized governance and constituted District Planning Committee for integration of Urban and Rural level development plans but it still lacks spatial planning of rural areas. To reiterate the earlier aspect, it is necessary to Amend the 73rd and 74th CAA to include the Spatial Planning at - Village level (Amendment in the 11th Schedule of 73rd Amendment) and District and Block level to Amend the 74th CAA – especially 12th Schedule to incorporate spatial planning of peri-urban areas, and Census Towns in India.

7.3 Spatial and Sectoral Convergence: District and Below

The decentralized governance empowers development from grassroots level to District level. There should spatial or sectoral planning at each level for an integrated development. Though, plans are prepared based on sectors at each level but lack spatial plans at grassroots level. There should be convergence of spatial planning with sectoral planning to reduce the disparities. Spatial plans can be prepared in the form of land use plans, infrastructure plan, spatial distribution of demographics and economies, etc. both for urban and rural areas. They can be integrated at district level for the preparation of District Development plan. These plans can be integrated with 29 sectors identified in Eleventh schedule for preparation of Gram Panchayat Development plan.

7.4 Capacity Building: People's Community Power- GP

As discussed earlier, village participatory plans have a significant role to play for the effective implementation of development plans. This can be achieved with building capacity at all levels. The training strategy should be adopted for building capacities of all stakeholders, institutions,

etc., simultaneously to reduce the time. This capacity building is not just for Murwas alone, but in the state of Madhya Pradesh, a capacity development for the inhouse officials at all levels needs to be inducted on regular basis. This will ensure use of Digital platform and linking it to convergence of various sectors and their functioning.

7.5 Monitoring of the Spatial Development Plan: GP/Ward Level

The most important aspect for the implementation of Gram Panchayat Spatial Development plan is its monitoring every year. This will ensure the rural areas development on the same pace with urban areas without any lag. Especially for the areas like Murwas, which are on adjoining the District level Roads or state level roads, and which are exposed to quick development, it is important to have continuous monitoring of the spatial development to capture the land value for the benefit of the GP. This monitoring can be used to NISC or NIC on regular basis using the remote sensing imageries.

7.6 Linking/Integration of Schemes and Spatial Planning

For the effective implementation of GPSDP, all the schemes falling in same sector needs to be identified first and integrated with spatial planning. The similar strategy is adopted in the spatial development plan of both gram panchayats as shown in Figure 70 for integration of schemes with the sectoral development activities. In addition to the sectors/schemes mentioned below (Figure 71) Skill Development is to be integrated. This can be integrated to Agriculture, Dairying, SMEs and Housing Construction.

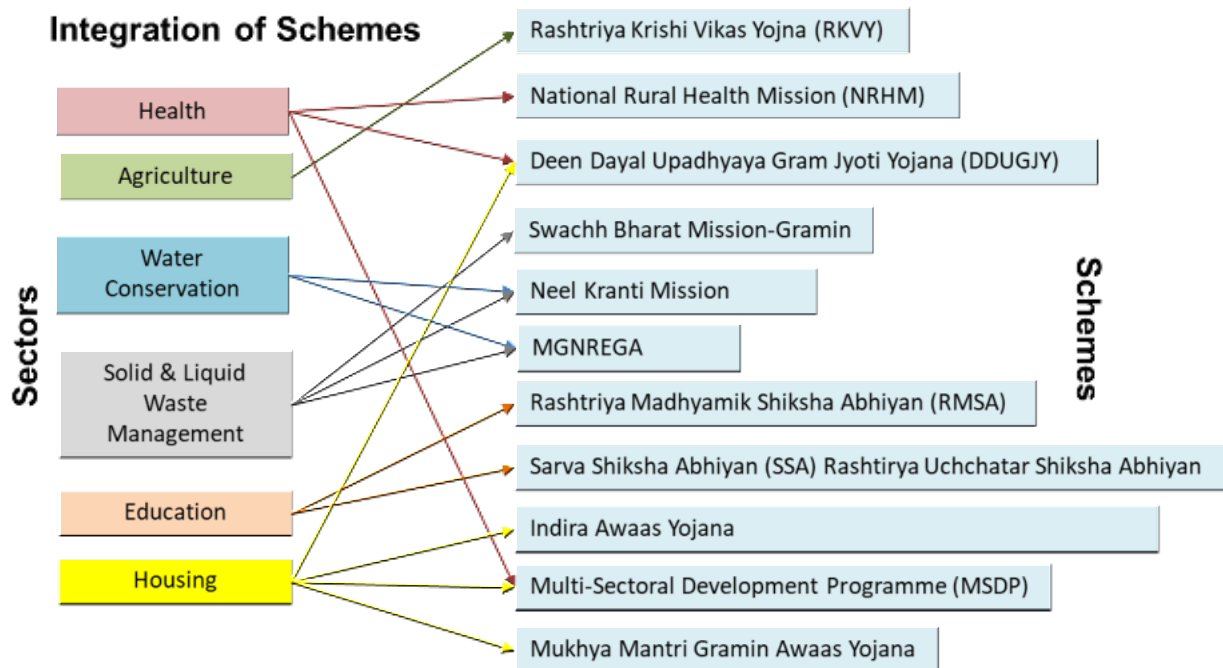


Figure 71 Integration of Schemes and Spatial Planning

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Annexure 1

No	Recycling/ Treatment Technique	Applicability	Land Requirement (per MLD in Hectares)	Capital Cost (per MLD in INR)	O&M cost Million/ year/MLD
1	Activated Sludge Process	The most widely used option for treatment of domestic wastewater for medium to large towns where land is scarce.	0.15-0.25	2-4	0.3-0.5
2	Stabilisation Pond Systems (SPS)	<ul style="list-style-type: none"> • In warm conditions • Easy land availability • Where power supply is expensive, low or unreliable. • Where social preference is for aquaculture 	0.8-2.3	1.5-4.5	0.06-0.1
3.	Duckweed Pond System	<ul style="list-style-type: none"> • Low strength domestic wastewater after sedimentation of influent • Biological Oxygen Demand (BOD)<80mg/L 	2-6	1.5-4.5	0.18
4.	Root Zone Treatment System	<ul style="list-style-type: none"> • Suitable for treatment of small quantities of waste water (250 gm BOD per day) • Maximum 50 kf BOD per day. 			low
5.	Anaerobic Decentralise d wastewater treatment system (DEWATS)	<ul style="list-style-type: none"> • Modified septic tank system • Takes total waste water , both grey and black. • Effluent has much less BOD, suitable for reuse in agriculture and horticulture., • Can be designed to handle waste water flow of 1- 1000 m³ per day. 			
6.	Soakage pit	<ul style="list-style-type: none"> • Simplest method of construction and use for grey water. • Household level, low volume handling • Suitable for sandy or sandy clay soil, for clay and black soil size of the pit would need to be larger. 			

7.	Up flow anaerobic Sludge Blanket Process (UASB)	The suitability of this technology may be doubtful as a standalone secondary treatment option may be needed.	0.2-0.3	2.5-3.6	0.08-0.17
8.	Facultative Aerate Lagoon (FAL)	<ul style="list-style-type: none"> • Standalone system • As a pre-treatment unit for WSP. • As an upgradation option for overloaded WSPs. 	0.27-0.4	2.2-2.9	0.15-0.2
9.	Biological Filtration and Oxygenated Reactor (BIOFOR) technology	<ul style="list-style-type: none"> • Adaptability to flow and load variations • Deep reactors enabling low land requirements • Very limited odour production • High energy/power requirement (220-335 kwh/ML treated). 	0.04	6.5-8.1	0.86
10.	High Rate Activated Sludge Biofor-F Technology	<ul style="list-style-type: none"> • Compact layout • Higher aeration efficiency • Compliance with strict discharge standards • Absence of odour and aerosol in the working area. 	0.08	5.2	0.18
11.	Trickling Filters	<ul style="list-style-type: none"> • Standalone system if operated at slow rates • As a high-rate roughing filter. <p><i>For high BOD waste water</i></p> <ul style="list-style-type: none"> • In combination with ASP. 	0.25-0.65		
12.	Fluidized Aerated Bed (FAB)	<ul style="list-style-type: none"> • Small to medium flows in congested locations • Sensitive locations • Decentralized approach • Relieving existing overloaded STPs. 	0.06	3-5	0.6-0.75
13.	Submerged Aeration Fixed film (SAFF) Technology	<ul style="list-style-type: none"> • Small to medium flows in congested locations • Sensitive locations • Decentralized approach • Relieving existing overloaded trickling filters 	0.05	7	1.14
14.	Cyclic Activated Sludge	<ul style="list-style-type: none"> • Small to medium flows in congested locations • Sensitive locations • Decentralized approach 	0.1-0.15		

	Process (CASP)	• Relieving existing overloaded trickling filters			
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(Source: Compendium of Sewage Treatment Technologies, National River Conservation Directorate, MOEF, 2009 ; Technical options for Solid and Liquid Waste Management in Rural Areas, Ministry of Drinking water and Sanitation., 2013)

Annexure 2

Guttman Scalogram Analysis for Lateri Tehsil: Year 2011

Villages in Lateri Tehsil- Year: 2011			
Village Name	Guttman Score	Total Population	Order of Service
Anandpur	16	4225	Second
Jhukar Jogi	13	3455	Second
Unarsi Kalan	13	2507	Second
Khamkheda	11	403	Second
Mahoti	11	1342	Second
Mundra Ratansi	11	899	Second
Murwas	11	5271	Second
Murariya	9	3296	Third
Rusalli Sahu	9	2374	Third
Sunkher	9	1473	Third
Bairagarh	8	1241	Third
Danwas	8	1279	Third
Jawati	8	2452	Third
Kala Dev	8	1729	Third
Khachhi Kheda	8	1346	Third
Sahar Kheda	8	1641	Third
Semari Ahir	8	1050	Third
Bajna	7	954	Third
Okhli Kheda	7	1612	Third
Titarbarri	7	1187	Third
Mukta Kheda Aminpur	6	90	Third

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Ahmadnagar (Motipur)	6	1104	Third
Aligarh	6	56	Third
Amahi	6	581	Third
Balrampur	6	1640	Third
Bandarsena	6	758	Third
Chamar Umariya	6	710	Third
Chandbad	6	980	Third
Esarwas	6	1262	Third
Kolua Pathar	6	1503	Third
Mahmoodganj	6	307	Third
Mohammadpur Urf.Malania	6	2469	Third
Mundla	6	881	Third
Munimpur	6	534	Third
Muskara	6	1587	Third
Newali	6	1188	Third
Pathera Chandu	6	755	Third
Ratangarh	6	284	Third
Aligarh Kotra	5	1015	Fourth
Alinagar	5	680	Fourth
Amkheda	5	444	Fourth
Badagaon	5	499	Fourth
Bamori	5	501	Fourth
Banarsi	5	544	Fourth
Barkheda Dev	5	555	Fourth
Barkheda Dhannu	5	800	Fourth
Barkheda Ghosi	5	807	Fourth
Chhirari	5	1121	Fourth
Dabakan	5	650	Fourth
Damkheda	5	515	Fourth
Daurala	5	928	Fourth
Dondkheda	5	387	Fourth

Esagarh	5	718	Fourth
Jamoniya Kalan	5	560	Fourth
Jarsena	5	606	Fourth
Jheetri	5	204	Fourth
Jhukar Umariya	5	248	Fourth
Khiriya Kheda	5	354	Fourth
Mohanpur Khurd	5	468	Fourth
Mukata Kherdi	5	444	Fourth
Narayanpur Kalan	5	865	Fourth
Narsinghpur	5	318	Fourth
Nayanagar	5	433	Fourth
Nenwas Kalan	5	1380	Fourth
Nisobarri	5	1110	Fourth
Raghogarh	5	398	Fourth
Raipura	5	1677	Fourth
Rusalli Udran	5	637	Fourth
Rusiya	5	1489	Fourth
Satpada	5	737	Fourth
Sawan Khedi	5	562	Fourth
Semara Meghnath	5	1181	Fourth
Shergarh	5	324	Fourth
Tajpura	5	599	Fourth
Tiloni	5	1574	Fourth
Tonkara	5	1715	Fourth
Ulakhedi	5	478	Fourth
Agara Pathar	4	579	Fourth
Aliganj	4	283	Fourth
Amarai	4	573	Fourth
Ameenpur	4	105	Fourth
Amirgang	4	583	Fourth
Arino Abad	4	478	Fourth

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Bahedabbarri	4	196	Fourth
Bamankhedi	4	575	Fourth
Bandipur	4	953	Fourth
Beeju Khedi	4	798	Fourth
Bhatoli	4	445	Fourth
Bheelakhedi Kalan	4	367	Fourth
Bhugai Kalan	4	165	Fourth
Champa Khedi	4	245	Fourth
Chopna Nobad	4	364	Fourth
Daulatpura	4	454	Fourth
Deharipama	4	418	Fourth
Dharga	4	806	Fourth
Dumrawani	4	408	Fourth
Golakheda	4	733	Fourth
Haidarpur	4	457	Fourth
Ibrahimganj	4	339	Fourth
Islamnagar	4	872	Fourth
Jajamkhedi	4	383	Fourth
Jalpur	4	134	Fourth
Khairkhedi Kalan	4	661	Fourth
Khalilpur	4	240	Fourth
Kherkhedi Nauabad	4	432	Fourth
Kolapura	4	571	Fourth
Kolua Nauabad	4	534	Fourth
Kundan Khedi	4	180	Fourth
Lalatora	4	668	Fourth
Lalchiya	4	599	Fourth
Lodhakhedi	4	377	Fourth
Madawata	4	811	Fourth
Mahaban	4	882	Fourth
Mamkhedi	4	452	Fourth

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Mandkho	4	157	Fourth
Masoodi	4	1214	Fourth
Meena Umariya	4	395	Fourth
Mohammadgarh	4	269	Fourth
Mubarakpur	4	425	Fourth
Narayan Kheda	4	303	Fourth
Nenwas Khurd	4	424	Fourth
Parwariya	4	885	Fourth
Raghunathpur	4	108	Fourth
Rengna	4	296	Fourth
Sagada	4	472	Fourth
Saidnagar	4	71	Fourth
Semari Baseer	4	149	Fourth
Shahpur	4	411	Fourth
Sirajnagar	4	442	Fourth
Sojana	4	975	Fourth
Sudawata	4	305	Fourth
Tonka	4	326	Fourth
Vapcha	4	970	Fourth
Ahamadpur Kalan	3	211	Fifth
Bahadurpur Lalchiya	3	207	Fifth
Bahadurpur Sunkher	3	316	Fifth
Basilgarh	3	192	Fifth
Bhilakhedi Khurd	3	347	Fifth
Budha Kheda Gawroo	3	34	Fifth
Budhakheda Mangal Khan	3	185	Fifth
Chainpura	3	497	Fifth
Chamra Kundal	3	321	Fifth
Chanderi	3	866	Fifth
Chopada	3	207	Fifth
Dhirgarh	3	947	Fifth

Dond Khedi	3	422	Fifth
Fatehgarh	3	430	Fifth
Faujpur	3	171	Fifth
Gaon Sindh	3	160	Fifth
Gopalpur	3	729	Fifth
Hafijpur Khona	3	173	Fifth
Haripur	3	344	Fifth
Hinotiya	3	346	Fifth
Husainpur	3	233	Fifth
Jagatpur	3	367	Fifth
Jhujala Kheda	3	132	Fifth
Kakaraj	3	642	Fifth
Khurmabad	3	62	Fifth
Kilan Khedi	3	215	Fifth
Kokangarh	3	152	Fifth
Kolu Khedi	3	152	Fifth
Madankhedi	3	167	Fifth
Mohabbatpur	3	1205	Fifth
Mundra Sagar	3	638	Fifth
Nagori	3	352	Fifth
Poriya	3	325	Fifth
Ramtek Kotra	3	75	Fifth
Salra	3	304	Fifth
Sharifpur	3	236	Fifth
Thana Viran	3	215	Fifth
Chandpur	2	238	Fifth
Firojganj	2	93	Fifth
Jamoniya Khurd	2	419	Fifth
Kareelpur	2	151	Fifth
Kherkhedi Khurd	2	74	Fifth
Rampur Nouabad	2	156	Fifth

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Semari Sikandrabad	2	27	Fifth
Sojani Kheda	2	310	Fifth
Tinsiya	2	275	Fifth
Veerpur Kalan	2	1092	Fifth
Champatpur	1	104	Sixth
Chandarpur	1	62	Sixth
Jorawar Khedi	1	21	Sixth
Belaradi	0	0	Sixth
Bhugai Khurd	0	0	Sixth
Chak Nahar Khedi	0	0	Sixth
Gola Kheda Khurd	0	0	Sixth
Goshnagar	0	0	Sixth
Husaingarh	0	0	Sixth
Lakhamipur	0	0	Sixth
Majhera Viran	0	0	Sixth
Semara Bhoot	0	0	Sixth
Vastu Viran	0	0	Sixth
Vikrampur(Barkhedi)	0	0	Sixth

Annexure 3

FOCUS AREA	ACTIVITY TYPE	PHASE 1 (2021-2025)					PHASE 2 (2026-2030)					SOURCE OF FUND	RELATED GOVERNMENT SCHEMES
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
Infrastructure	Roads	Construction of 750m proposed concrete roads towards North East i.e. Sironj side using wheat husk ash		Construction of 1km proposed concrete roads towards North West i.e Lateri side using wheat husk ash			Construction of remaining 850m road in concrete prepared using wheat husk ash		Construction of remaining 1km proposed concrete roads towards Lateri side using wheat husk ash			<ul style="list-style-type: none"> Finance commission PMGSY MGNREGA 	<ul style="list-style-type: none"> Pradhan Mantri Gram Sadak Yojana (PMGSY) MGNREGA
Sanitation	Toilets	Toilet facility to all HHS without toilet										<ul style="list-style-type: none"> Finance Commission Swachh Bharat Kosh, MGNREGA 	<ul style="list-style-type: none"> Swachh Bharat Mission-Gramin Neel Kranti Mission MGNREGA
Solid & Liquid Waste Management	Wheat Straw Ash Plant	Construction of Plant										<ul style="list-style-type: none"> Finance Commission Swachh Bharat Kosh, MGNREGA 	<ul style="list-style-type: none"> Swachh Bharat Mission-Gramin Neel Kranti Mission MGNREGA
	Composting Site	Provisioning of physical facilities for segregation of waste at source (3 bins-Green, Blue and Red), IEC activities and Segregation at source at each Households		Construction of composting site towards South West									
	Small Bore/Sewer Network	Conversion of existing drains to small bore sewers and laying of new small bore sewer network wherever required along with interceptor tanks in zone 1 (see map)		With similar process as in zone 1, Coverage of zone 2 (see map)	With similar process as in zone 1, Coverage of zone 3 (see map)	With similar process as in zone 1, Coverage of zone 4 (see map)		Network becomes Operational					
	Waste water treatment site (Duck Weed				Construction of three ponds - Anaerobic, facultative and duckweed & fish pond on the prescribed location		Treatment system becomes Operational						
Health Infrastructure	Primary Health-Sub Centre	Training on Health & Hygiene among people of all age groups		Construction of Self-sustaining solar powered 1 No. Primary Health centre towards South West with involvement of locals using recyclable material			Construction of Self-sustaining solar powered 1 No. Primary Health centre towards North East with involvement of locals using recyclable material					Finance Commission and related Schemes	<ul style="list-style-type: none"> National Rural Health Mission (NRHM) Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) Multi-Sectoral Development Programme (MSDP)
Recreational Space	Playground, Green Spaces/Parks, Green Buffers	Formation of recreational green spaces in Zone 1 and Green belt along pond		Sub-phase wise formation of Green belt along natural drains (see map)		Conversion of existing dumping sites to green areas and formation of Green Belt along talavva		Green buffer along forest			MGNREGA	<ul style="list-style-type: none"> National Service Scheme for tree plantation MGNREGA 	
	Density of Forest	Plantation of trees in 50 ha of land starting from settlement side using Miyawaki method		Plantation of trees in another 50 ha of land using same method		Plantation of trees in remaining land using same method					Related scheme	<ul style="list-style-type: none"> Intensification of Forest Management 	
Institutional Infrastructure	Warehouse	Construction of self-sustaining Solar powered Warehouse near Pond										Related schemes	<ul style="list-style-type: none"> Rashtriya Krishi Vikas Yojna (RKVY) National Programme for Dairy Development Dairy Entrepreneurship Development Scheme Private Entrepreneurs Guarantee (PEG) Scheme Decentralised Procurement of Foodgrains Scheme Food, Storage & Warehousing
	Dairy Farm		Provision of Self-sustaining Solar Powered Dairy farming										
Education	Anganwadi, Higher Secondary School	Initiation of After school education programs to educate local people inclusive of digital learning, behavioral, waste management, creative activities and Upgradation of Middle school present in South West.					Construction of required 2 Nos Anganwadis towards South and North West with involvement of locals using recyclable materials.					Related schemes	<ul style="list-style-type: none"> Rashtriya Madhyamik Shiksha Abhiyan (RMSA) Sarva Shiksha Abhiyan (SSA) Rashtriya Uchcharat Shiksha Abhiyan Integrated Child Development Services (ICDS) Multi-Sectoral Development Programme (MSDP)
Housing		Construction of 40% of required HHS towards NE i.e. Sironj side and 30% of required HHS towards North West providing livelihood to locals each with the provision of Bio-gas plant and Rain water Harvesting					Construction of 30% of required HHS towards South-West providing livelihood to locals each with the provision of Bio-gas plant and Rain water Harvesting					Related schemes	<ul style="list-style-type: none"> Indira Awaas Yojana Mukhya Mantri Gamin Awaas Yojana and Mukhya Mantri Antyodaya Awaas Yojana Multi-Sectoral Development Programme (MSDP) for minority community Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY)



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