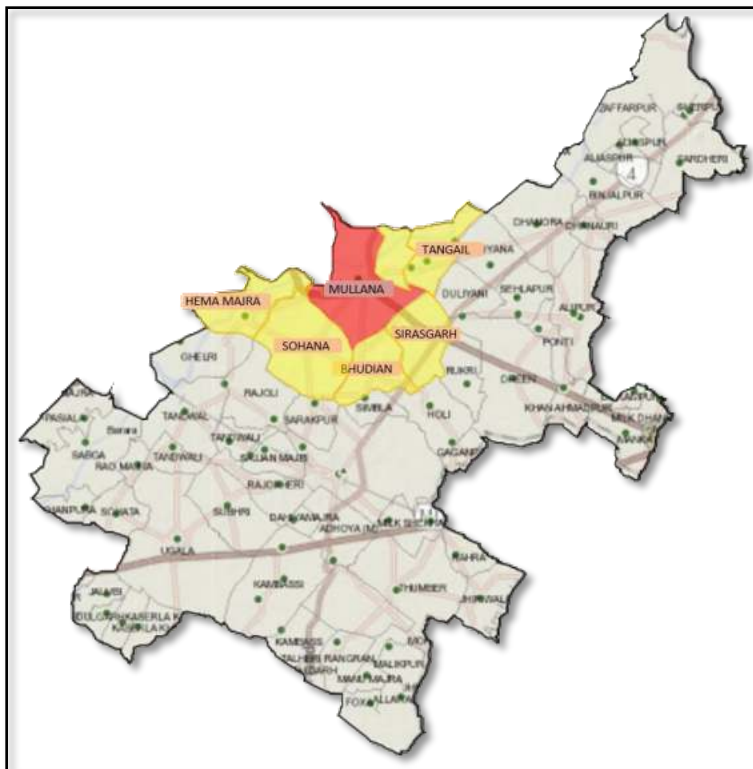


Spatial Development Plan for **MULLANA GRAM PANCHAYAT** Ambala District Haryana



Prepared by -
Chandigarh College of Architecture
Sector 12, Chandigarh

for
Ministry of Panchayati Raj
Government of India

Acknowledgement

We acknowledge the help and assistance of the following persons without which this project would remain incomplete:-

1. Ms. Gurmeet Kaur, CTP, Haryana
2. Mr. Ravi Singh Bajwa
3. Dr. Poonam Parkash
4. Ar. Umadhar Kamti & his team
5. Mr. Parmod Kumar, Sarpanch, Pathreri
6. Mr Naresh Chauhan, Sarpanch, Mullana
7. Principal & Staff of Govt Senior Secondary School, Pathreri
8. BDPO, Shahzadpur
9. BDPO, Barara
10. Pattwari, Shahzadpur
11. Pattwari, Barara
12. Mr. Jasmohinder Singh Brar
13. Chachaji of Pathreri
14. Master Kuldeep Singh
15. Residents of Pathreri & Mullana

CONTENTS

| | |
|---|-----------|
| List of Figures..... | iii |
| List of Tables..... | vi |
| List of Abbreviations..... | vii |
| PROJECT TECHNICAL Team..... | viii |
| 1. Introduction | 1 |
| 1.1 About the Project..... | 1 |
| 1.2 Need for Spatial Plan for Gram Panchayats..... | 3 |
| 1.3 Objectives of Development Plan for Mullana..... | 3 |
| 1.4 Vision Statement..... | 4 |
| 1.5 Methodology..... | 4 |
| 2. About MULLANA Gram Panchayat | 6 |
| 2.1 Location and regional connectivity..... | 7 |
| 2.1.1 Categorisation of Mullana..... | 11 |
| 2.2 History and Evolution of the Village..... | 12 |
| 2.2.1 History..... | 13 |
| 2.2.2 Evolution..... | 15 |
| 2.3 Socio Demographic Characteristics..... | 18 |
| 2.3.1 Population..... | 19 |
| 2.3.2 Density..... | 21 |
| 2.3.3 Schedule Caste Population..... | 22 |
| 2.3.4 Literacy..... | 22 |
| 3. Economic Base | 23 |
| 3.1.1 Workforce Participation..... | 24 |
| 3.1.2 Major findings for demography, literacy and employment..... | 26 |
| 3.1.3 Area under cultivation..... | 27 |
| 3.1.4 Mandis and Markets..... | 27 |
| 3.1.5 Livestock –..... | 27 |
| 4. Natural Resources | 30 |
| 4.1 Land Cover..... | 30 |
| 4.2 Soil Fertility..... | 32 |
| 4.3 Water Resources..... | 33 |
| 4.4 Rainfall and Surface Runoff..... | 33 |
| 4.4.1 Surface Runoff..... | 34 |
| 4.4.2 Surface Water Resources..... | 36 |
| 4.4.3 Groundwater Resources and Potential..... | 39 |
| 4.4.4 Pollution potential assessment of Markanda river..... | 41 |
| 4.4.5 Flood Problem..... | 41 |
| 4.4.6 Flood Plain..... | 42 |
| 4.5 Major Findings..... | 43 |
| 5. Infrastructure | 45 |

| | | |
|-----------|--|-----------|
| 5.1 | Road Network within Mullana | 45 |
| 5.2 | Telecommunication | 46 |
| 5.3 | Electricity | 46 |
| 5.4 | Water Supply | 46 |
| 5.4.1 | Water Supply System in Abadi Area | 48 |
| 5.5 | Sanitation | 50 |
| 5.5.1 | Coverage of Toilets | 50 |
| 5.5.2 | Coverage of Sewerage Network | 50 |
| 5.6 | Solid waste management | 53 |
| 5.7 | Major Findings | 55 |
| 6. | HOUSING | 56 |
| 6.1 | MAJOR FINDINGS | 61 |
| 7. | Proposals | 62 |
| 7.1 | Proposed Land use Zoning Plan for Mullana | 62 |
| 7.1.1 | Suitability and Parameters for Proposed Land Use Zoning | 64 |
| 7.1.2 | Regulations and Bye Laws | 69 |
| 7.1.3 | Minimum Standards for the Light and Ventilation of Buildings | 72 |
| 7.1.4 | Parking Norms..... | 73 |
| 7.2 | Water Resource Management | 75 |
| 7.2.1 | Rainwater Harvesting..... | 75 |
| 7.2.2 | Interlinking and revival of existing water structures | 76 |
| 7.2.3 | Water Supply | 76 |
| 7.2.4 | Water Demand | 76 |
| 7.3 | Sanitation..... | 77 |
| 7.4 | Solid Waste Management | 79 |
| 7.5 | Modifications Along Existing Streets..... | 79 |
| 7.6 | Literacy and Employment | 82 |
| 7.7 | Industrial zone | 82 |
| 7.8 | RECREATIONAL ZONE..... | 82 |
| 7.9 | HERITAGE CONSERVATION | 82 |
| | References | 87 |
| | APPENDIX I | 1 |
| | APPENDIX II | 9 |

LIST OF FIGURES

| | |
|---|----|
| Figure 1-Reserach Methodology for Preparation of Development Plan for Mullana GP | 5 |
| Figure 2: Location of Ambala district (left) Mullana GP in the state of Haryana (right)..... | 6 |
| Figure 3: GP's surrounding Mullana (left) Cadastral Map of Mullana GP showing the settlement (right) | 6 |
| Figure 4: Airport Connectivity Map for Mullana | 7 |
| Figure 5: Regional Connectivity Map of Mullana Through Road and Rail Network..... | 8 |
| Figure 6: Major Towns near Mullana Through Roads | 9 |
| Figure 7: Road connectivity with nearby villages | 11 |
| Figure 8 Settlement Hierarchy on the basis of population - Barara Tehsil - 2011 | 12 |
| Figure 9 Mullana GP Settlement 1960 | 15 |
| Figure 10 Mullana GP Settlement 2009 | 16 |
| Figure 11 Mullana GP Settlement 2020 | 17 |
| Figure 12 Comparison to Surrounding Gram Panchayats in Shahzadpur Block | 18 |
| Figure 13: Percentage increase in the Decadal growth of total population from 1991-2011 for Haryana, Ambala and Mullana | 19 |
| Figure 14 Total population comparison with other G.P's | 20 |
| Figure 15 Percentage of male and female population for the year 2001 and 2011 | 20 |
| Figure 16 Change in density of Haryana, Ambala and Mullana for the year 2001 & 2011 | 21 |
| Figure 17 Comparison of density of Mullana with other surrounding GP's | 21 |
| Figure 18 Percentage of Schedule Caste population in Haryana, Ambala and Mullana from 1991-2011. | 22 |
| Figure 19 Literacy rate in Haryana, Ambala and Mullana in 2011 | 23 |
| Figure 20 Literacy rate in Haryana, Ambala and Mullana in 2001 | 23 |
| Figure 21 Percentage of working population of Haryana, Ambala and Mullana for the year 2001 and 2011 | 24 |
| Figure 22 Percentage of male and female working population of Haryana, Ambala and Mullana for the year 2001 and 2011 | 25 |
| Figure 23 Percentage of main and marginal workers in Haryana, Ambala and Mullana for the year 2001 and 2011 | 25 |
| Figure 24 Comparison of types of workers for the year 2001 and 2011. | 26 |
| Figure 25 Livestock Ownership within the Abadi | 28 |
| Figure 26: Location for various Employment Avenues with respect to Mullana | 29 |
| Figure 27 : Land Use and Land Cover Pattern of Mullana | 31 |
| Figure 28 : Landuse Map within the Village settlements | 32 |
| Figure 29: Soil Type within the GP Boundary and Surrounding Area | 33 |
| Figure 30: Yearly rainfall (in mm) trends for Ambala from 2000 to 2019..... | 34 |
| Figure 31: Location of Recharge Pit as per the Surveys for Rainwater Harvesting | 35 |
| Figure 32 : Photograph showing surface drains and street with paver blocks | 36 |
| Figure 33 : Map of River Begna & River Markanda with respect to Mullana..... | 37 |
| Figure 34 : Confluence of Markand and Begna River | 37 |
| Figure 35 : Photograph of the Village Pond | 38 |
| Figure 36 : Marshy area in the north eastern edge of the village | 38 |
| Figure 37: Categorisation of Assessment Units for Ground Water Availability | 39 |
| Figure 38: Suitability for Artificial Recharge Structures | 40 |
| Figure 39 Hydrogeomorphic map of the Markanda river basin | 42 |

| | |
|---|----|
| Figure 40 : False Colour Composite (FCC) image of IRS 1D LISS III image of upper part of the Markanda basin..... | 43 |
| Figure 41 Road Network within Mullana village | 45 |
| Figure 42 Photograph showing surface drains and street with paver blocks (Source: Physical Survey, Nov 2020) | 45 |
| Figure 43 Household Survey - Electricity | 46 |
| Figure 44 Old Dried Well (Source: Physical Survey, Nov 2020)..... | 47 |
| Figure 45 Tubewell connected with underground water tank (Source: Physical Survey, Nov 2020) | 47 |
| Figure 46 Well in functional condition within Abadi Area (Source: Physical Survey, Nov 2020)..... | 47 |
| Figure 47 Tubewells, water bodies and old wells | 48 |
| Figure 48 Overhead water in Mullana (Source: Physical Survey, Nov 2020) | 48 |
| Figure 48 Household Survey - Water supply | 49 |
| Figure 49 Overhead water tank near Sub Tehsil Office Mullana (Source: Physical Survey, Nov 2020) | 49 |
| Figure 51 Household Survey - Type of Toilet..... | 50 |
| Figure 52 Sewage pipes opening in street drains (Source: Physical Survey, Nov 2020)..... | 51 |
| Figure 53 Sewerage pipes opening in street drains (Source: Physical Survey, Nov 2020)..... | 51 |
| Figure 54 Overflow outlet of village pond in the corner (Source: Physical Survey, Nov 2020)..... | 52 |
| Figure 55 Overflow outlet drain of pond used for sewerage outlet (Source: Physical Survey, Nov 2020) | 52 |
| Figure 56 Sewerage drainage in village | 53 |
| Figure 57 Household Survey - Solid Waste Collection..... | 54 |
| Figure 58 Site nearby Hanuman Temple where solid waste is being dumped (Source: Physical Survey, Nov 2020) | 54 |
| Figure 59 Figure 60 Site nearby Adharsh Anganwadi where solid waste is being dumped (Source: Physical Survey, Nov 2020) | 55 |
| Figure 60 Site along old Highway where solid waste is being dumped (Source: Physical Survey, Nov 2020) | 55 |
| Figure 61 Household Survey - House ownership | 56 |
| Figure 62 : Household Survey - Building Age | 57 |
| Figure 63 : Household Survey - Building Condition | 57 |
| Figure : 64 Household Survey - Building Height..... | 58 |
| Figure : 65 Single storey building (Source: Physical Survey, Nov 2020) | 58 |
| Figure : 66 Double storey Building (Source: Physical Survey, Nov 2020) | 59 |
| Figure 67 Double storey buildings in market street (Source: Physical Survey, Nov 2020)..... | 59 |
| Figure 68 : Household Survey - House Type based on Building Material (Source: Physical Survey, Nov 2020) | 60 |
| Figure 69 : Double storey Pucca Building (Source: Physical Survey, Nov 2020) | 60 |
| Figure 70 : Single storey building - Semi Pucca (Source: Physical Survey, Nov 2020) | 61 |
| Figure 71 : Semi Pucca Building (Source: Physical Survey, Nov 2020) | 61 |
| Figure 72 Proposed Land Use Zoning Map - 2051 | 65 |
| Figure 73 Land use distribution for the proposed development plan – 2051 | 66 |
| Figure 74 Proposed infrastructure sites..... | 68 |

| | |
|--|----|
| Figure 75 : Covering open drains with concrete grate covers | 78 |
| Figure 76 : Proposed changes for encroachments on streets | 80 |
| Figure 77 : Projection of balcony | 81 |
| Figure 78 Solar street lights | 81 |
| Figure 79: Oldest Haweli, Owner: Mr. Krishna Pundir nearby Patwar khana | 83 |
| Figure 80 : Oldest Haweli, Owner: Mr. Krishna Pundir nearby Patwar khana | 83 |
| Figure 81 : Oldest Haweli, Owner: Mr. Krishna Pundir nearby Patwar khana | 84 |
| Figure 82: Oldest Haweli, Owner: Mr. Krishna Pundir nearby Patwar khana | 84 |
| Figure 83: Heritage Street (Labour Chowk) | 85 |
| Figure 84 Heritage Street nearby Hanuman Mandir..... | 85 |
| Figure 85 : Old ageStructure, (Labour Chowk) | 86 |
| Figure 86 : Shop (Market Street) | 86 |

LIST OF TABLES

| | |
|---|----|
| Table 1 Decadal growth of total population from 1991-2011. | 19 |
| Table 2-Total number of Schedule Caste population in Haryana, Ambala and Mullana from 1991-2011. | 22 |
| Table 3- Literate population in Haryana, Ambala and Mullana from 1991-2011. | 22 |
| Table 4 Population trends for Mullana in 1991, 2001, 2011 and 2019 | 62 |
| Table 5 Calculation of CAGR using 2001 and 2011 Population | 62 |
| Table 6 Population Projection using 2001 and 2011 by CAGR Method..... | 63 |
| Table 7 Calculation of CAGR using 2011 and 2019 Population | 63 |
| Table 8 Population Projection using CAGR from 2011 and 2019 Population..... | 63 |
| Table 9 Norms for Educational/health/public utility Facilities | 66 |
| Table 10 Norms for socio cultural facilities | 67 |
| Table 11 Additional Infrastructure required as per projected population of 2051 | 67 |
| Table 12: Permissibility of Various Land uses within Major Land Use Zones..... | 69 |
| Table 13: Road Widths and Permissible Land Uses for proposed roads..... | 70 |
| Table 14: Permissible Building Heights on Different ROW | 71 |
| Table 15 Parameters for residential buildings..... | 71 |
| Table 16 Parameters of Commercial Building..... | 72 |
| Table 17 Institutional and Community Spaces norms | 72 |
| Table 18 Industrial Norms | 72 |
| Table 19 Minimum Standards for the light and Ventilation of Buildings | 73 |
| Table 20 Parking Norms applicable for different Land Uses..... | 73 |
| Table 21 Building Controls for Building Activities along Highways | 74 |
| Table 22 Plot Size, Ground Coverage, FAR, height for schools..... | 74 |
| Table 23 Minimum Widths for New Village Roads..... | 75 |
| Table 24: Proposed Water Demand as per population projection for 2051 | 77 |

LIST OF ABBREVIATIONS

| | |
|--------|--|
| GP | Gram Panchayat |
| ISRO | India Space Research Organization |
| NWRP | National Water Resources Plan |
| TOI | Times of India |
| RADPFI | Rural Areas Development Plan Formulation and Implementation Guidelines |
| ROW | Right of Way |
| ECS | Equivalent Car Space |
| EVS | Equivalent Vehicular Space |

PROJECT TECHNICAL TEAM

Faculty

Dr Sangeeta Bagga Mehta, Principal

Mr Sujay Sengupta, Associate Professor

Ms Disha Singh, Assistant Professor

Ms Saumya Sharma, Assistant Professor

Ms Shilpa Sood, Assistant Professor

Mr Vijay Kumar, Assistant Professor

Post Graduate Scholars

Mr Vijay Karan Singh, Research Fellow

Ms Nikhita Kinger, Research Fellow

Post Graduate Students

Mr Ujjayant Bhattacharyya

Mr Himani Agarwal

Mr Apoorva Gupta

Mr Rishabh Kundra

Secretarial Assistance

Mr Devvarat, Stenotypist

Mr Jatin Nautiyal, Clerk

1. INTRODUCTION

It is a well-established norm that while urban centers, towns and cities have progressed, the rural areas in India continue to suffer the ill effect of little or low development. Despite significant achievements in many sectors, the rural poor continue to struggle with unemployment, poor infrastructure, illiteracy, inequality, low per capita income, and consequent low standards of living. According to Census 2011, the number of migrants within the country stands at about 450 million. Of these, 78 million moved from rural to urban areas, particularly to the Metro areas and the industrial centres, which are regarded as the engines of economic growth and livelihood.

Thus, the initiative taken by the Government of India with regard to rural spatial planning as arising out of the foregoing discussion that whereas the urban areas in the country already have a system in place in terms of important plans for the large cities and towns, there is no such perspective spatial planning process in place for rural areas.

It is undisputed that the inter-dependency of villages with cities, industrial towns and urban centres calls for spatial development planning for villages with respect to services and infrastructure with the aim to restrict the migration to towns and important cities and also reinforce the development of rural, peri-urban areas. Especially so for the villages located in the vicinity of national and state highways so that the optimum use of resources can be conducted, and adverse social and environmental impacts/ hazards can be mitigated.

However, due to the COVID-19 pandemic, followed by the nationwide lockdown and the resultant 'reverse migration' of lakhs of daily wage labourers, employed mainly in the informal sector, over the past few weeks now pose a huge socio-economic problem and challenge to authorities. It will be a tough task to provide gainful employment to these people in the rural areas. In response to this and the initiatives taken by some of the gram Panchayats at their own level, the Ministry of Panchayati Raj, Govt. of India, has launched a pilot project of Spatial Development planning of gram Panchayats across select Indian states and partnering with academia and professionals in the field of Spatial Planning.

1.1 ABOUT THE PROJECT

The initiative for developing Gram Panchayat Spatial Development Plan on pilot basis for 16 states across the country comprising two Gram Panchayats (GPs) per state in collaboration with the reputed academic institutions has been proposed by the Ministry of Panchayati Raj, Government of India. The selection of Gram Panchayats will be through a consultative process with the respective institutes and State department of Panchayati Raj.

The criteria for the selection of Gram Panchayats are –

- Gram Panchayat should be with a population not less than 5 thousand but should ideally be of size 10 thousand.
- It should be located on a national highway or a prominent state highway. The choice of such GPs is to ensure that the low hanging fruit that such GPs can immediately cash upon due to their unique geographical locations.

- It should have enough area for future development.
- It should not be located very close to another city because then land will not be available for further planning.

Further, Article 243G of the Constitution mandates for the Panchayats to be endowed with such powers and authority to empower them for the preparation of plans for economic development and social justice within their respective areas. However, in their present setup, the Panchayats neither have the means nor the capacity to undertake such an effort. Therefore, to begin with, if the Panchayats are to do any meaningful planning for economic development within their geographical jurisdiction, it is important for them to envision and correlate economic development with land use classification, both present and for the future.

The planning process for such development of these rural areas needs to be an envisioning process requiring a sound professional assessment of the ground situation and providing options for sustainable development within the bounds of demographic, physical, socio-economic, jurisdictional, and financial aspects.

Based on the above, 16 states covering 32 Gram Panchayats have been chosen for preparation of master plans in a time bound manner through a consultative process and keeping in view the objectives of the Concept Note issued by the Ministry of Panchayati Raj. Two VC meetings have been held wherein participation and consultation with all the stake holders have been conducted. The ongoing status ODF (Open Defecation Free) work has been reviewed to the satisfaction of the MoPR.

The Spatial Planning Development plan for Gram Panchayats has been prepared with the support of National Informatics Centre (NIC) and National Remote Sensing Centre (NRSC) as technology partners of the Ministry. They have provided the technical information along with the Spatial data to the institutions for this initiative.

As the Gram Panchayats are economic transformers in the rural areas of the country, they have been actively involved in the projects. The Panchayats have also served as important stake holders during the conduct of household survey development of the oral histories of the Gram Panchayats and physical verification of data received from the technology partners. The Gram Manচিতra and Bhoovan platforms have provided leverage for this initiative. Further, since the ground situation varies from state to state and also from Panchayat to Panchayat, the focus of this exercise has been to deal with the Gram Panchayat on case-to-case basis and thereby formulate a roadmap to equip the rural areas to meet the challenges for the next century. Further, since some of the Government programmes are underway in rural areas therefore, the present Gram Panchayat planning would keep in mind the programmes already under implementation or in planning stage so that the policy level changes when required to be met would be taken up in consultation with the states at appropriate instances of time.

The Spatial Planning activity aims to stimulate the decentralized models of development considering local sensitivity of the people, their expectations, aspirations and indigenous resources - both human and natural and thereby striving various building Atmanirbhar Bharat in the true sense.

Thereafter, the Chandigarh College of Architecture with its dedicated team of faculty and post graduate students has been working on the project with the support of the Haryana State Panchayati Department along with the Nodal Officer assigned to this project by the State Government. The identified Gram Panchayats are Pathreri and Mullana in the district of Ambala.

The Spatial Development plans for the village, the selected Gram Panchayats would address challenges of location indigenous resources, social, economic, environmental needs as well as prevent unwarned conversion of rich agricultural land to urban use. The methodology includes Geospatial and App based survey, household data collection, sampling, and analysis. It also includes cross referencing through historical research, oral histories to ascertain environmental concerns such as Eco sensitive zones, brick kilns, and quarries for building material, etc. so that loss of alluvial and arable land may not disturb the in-situ attributes of the soil, and water table. The emerging master plan document would outlay a vision to guide growth and development of the rural areas for the next 20 to 30 years by utilizing the latest geographical information system (GIS) technology. The proper integrity of sector planning, into the master plan of the GPs for management of growth and providing for orderly and protective development, productive information resources, development and maintenance of infrastructure strengthening the local identity of the gram Panchayat and its people.

1.2 NEED FOR SPATIAL PLAN FOR GRAM PANCHAYATS

Since land is limited resource and has pressure to cater the social, economic, and environmental needs for urbanization, rural development, transportation etc. It becomes essential to regulate all the activities like industrialization, mining and haphazard expansion of urban areas. This not only increase pressure on rich agricultural land but also damage the environmentally sensitive areas and natural resources as well. The proper integrity of sector planning, into the master plan of the GPs for management of growth and providing for orderly and protective development, productive information resources, development and maintenance of infrastructure strengthening the local identity of the gram Panchayat and its people. The masterplan will provide framework for following:

- Managing growth and change around the Gram Panchayat
- Resource allocation for orderly and predictable development
- Protecting environmental resources
- Planning for infrastructure and public facilities in planned manner
- Creating framework for future decisions

1.3 OBJECTIVES OF DEVELOPMENT PLAN FOR MULLANA

The Development Plan would focus to improve the quality of life of the people while planning for prospective years for the Village Mullana. The broad objectives for the Master Plan would be:

- Optimal allocation of land for different uses.
- Resource allocation based on a tripartite approach to develop future infrastructure which would cater to Educational, Industrial and Recreational needs of the catchment without exploiting the natural resources .

- Fair and efficient distribution of facilities and infrastructure catering to all social segments
- Inclusive and participatory planning while taking in consideration of aspirations of the village people without creating nuisance and environmental hazards.

1.4 VISION STATEMENT

Mullana GP comprises mainly agricultural land scattered clusters of settlement. The farmland is mainly fertile and produces a decent yield of multiple crops. Over time, due to its strategic location along a major transit network, it has developed into an institutional hub and as an agro retail hub. Carrying forward these trends of economic activity would engage the local population and restrict migration. Further, the prevalence of a historic core in Mullana offers the potential to develop a heritage zone along with recreational infrastructure, abutting the banks of the Markanda river.

1.5 METHODOLOGY

The development plan has been prepared going through multiple processes in effort to understand the village profile and characteristics well. The broad research methodology is given below:



Initially the reconnaissance surveys of the village were conducted to strategise the overall methodology and local setting. Based on reconnaissance surveys, the sampling for household surveys were distributed not spatially but considering the housing typology and caste parameters. The key person interviews were conducted the Sarpanch and other prominent persons based on their age and work. Physical surveys to locate various prominent physical features, Public institutions and land parcels were also conducted.

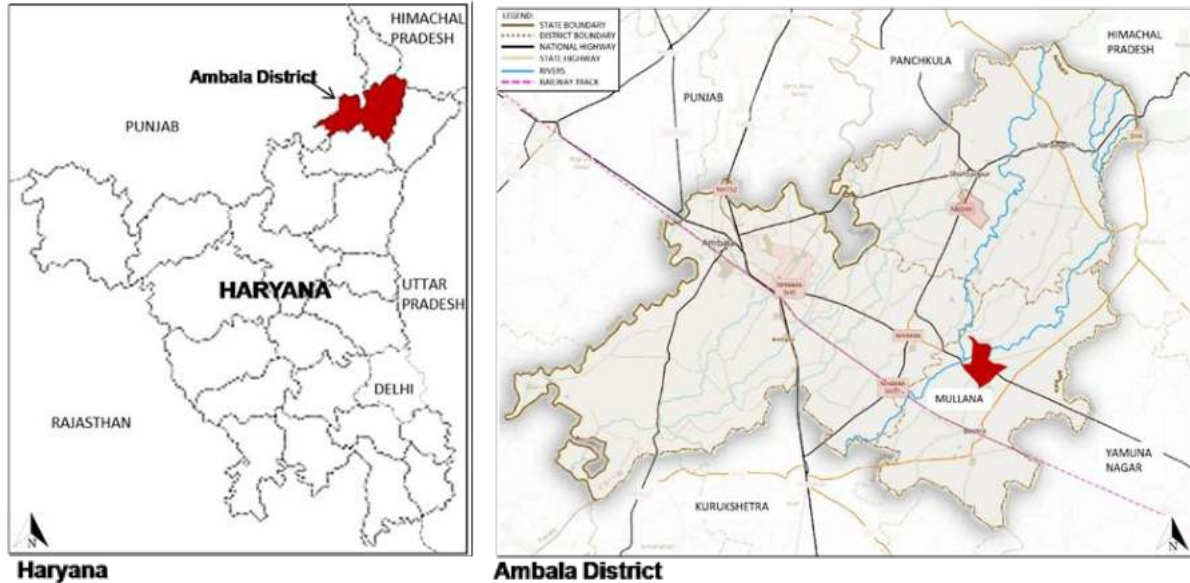
Figure 1-Reserach Methodology for Preparation of Development Plan for Mullana GP

| S.No. | Description |
|-------|--|
| 1 | Compiling and generating relevant data from the documents, imagery and maps provided by the Central and State Government |
| 2 | Physical Survey by college team |
| 3 | Household Surveys, Focus Group Discussions and Key person interviews by volunteers from the village |
| 4 | Telephonic interviews and video conferencing with the officials from various government departments, elected representatives of the panchayat, village elders, residents and people visiting on a daily or occasional basis. |
| 5 | Future projections and Analysis |
| 6 | Compiling the aspirations of people, and relating with growth trends and analysis |
| 7 | Proposals |

2. ABOUT MULLANA GRAM PANCHAYAT

The Gram Panchayat of Mullana (Pin code 133203) is located in Block Barara, District Ambala in the state of Haryana. Its Parliament Constituency is Ambala and Assembly Constituency is Mullana City.

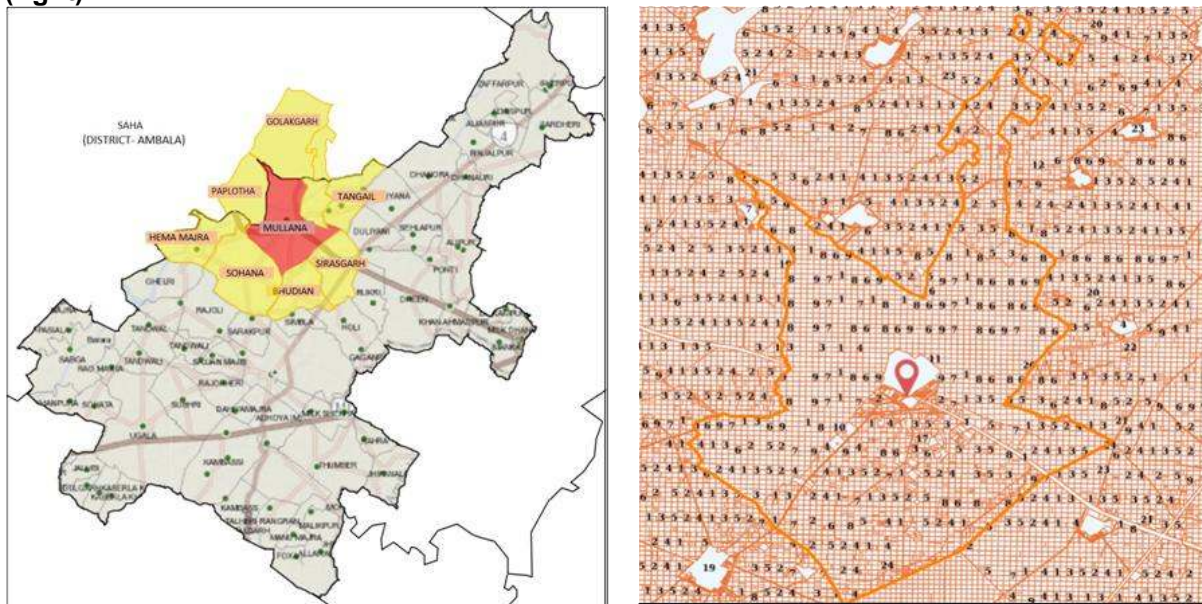
Figure 2: Location of Ambala district (left) Mullana GP in the state of Haryana (right)



Source: d-maps.com (left), mapsofindia.com (right)

According to the 2011 Census the Gram Panchayat covers an area of 1290 hectares and comprises of the settlement of Mullana village and its surrounding agricultural land. The Gram Panchayat of Mullana is flanked by the gram panchayats of Tangail, Sirasgarh, Bhudian, Sohana and Hema Majra.

Figure 3: GP's surrounding Mullana (left) Cadastral Map of Mullana GP showing the settlement (right)



Source: Grammanchitra-NIC Bhuvan-ISRO

The village has traditionally been and continues to be an agrarian village as most of its residents dependent on agriculture as a primary source of income. The 2011

Census categorises the settlement of Mullana as a village although it has historically been a site of importance. As per the 2011 Census, the village has a population of 9363 people..

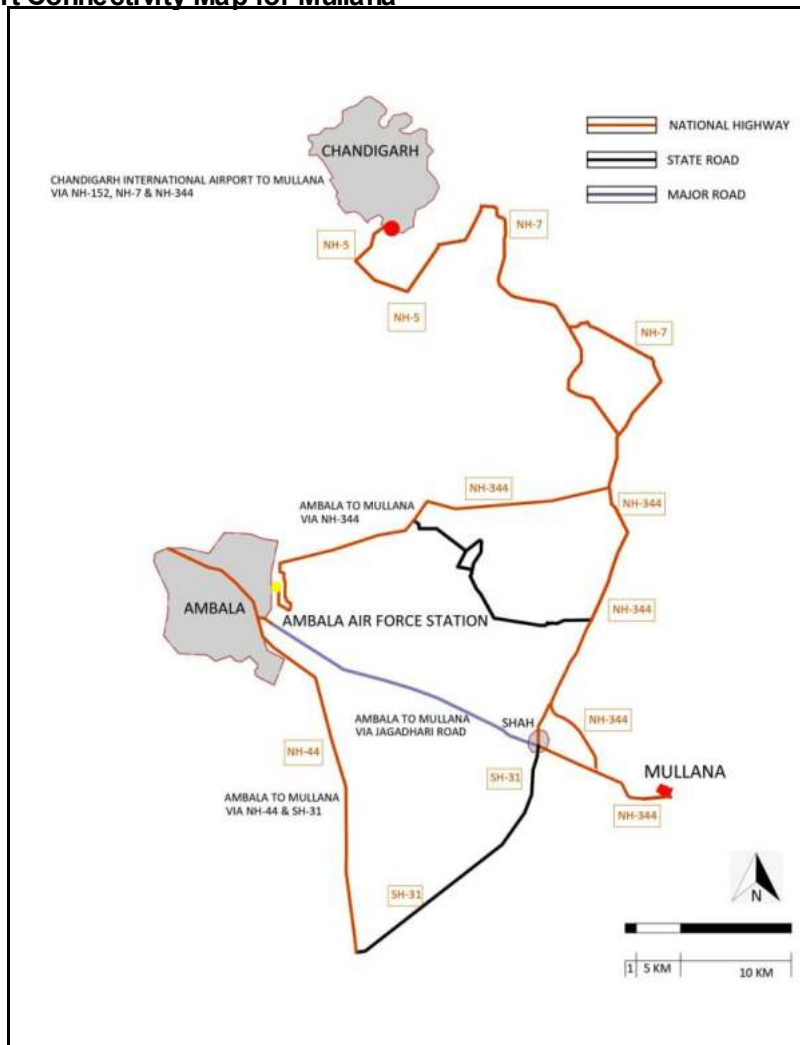
The settlement in the GP is on one side of the National Highway 344, which is a direct connection between Ambala and Jagadhri.

2.1 LOCATION AND REGIONAL CONNECTIVITY

The GPS coordinates for Mullana are 30.2753° N Latitude, 77.0476° E Longitude.

It is connected to major cities of Ambala, Panchkula, Saha and Jagadhari.

Figure 4: Airport Connectivity Map for Mullana



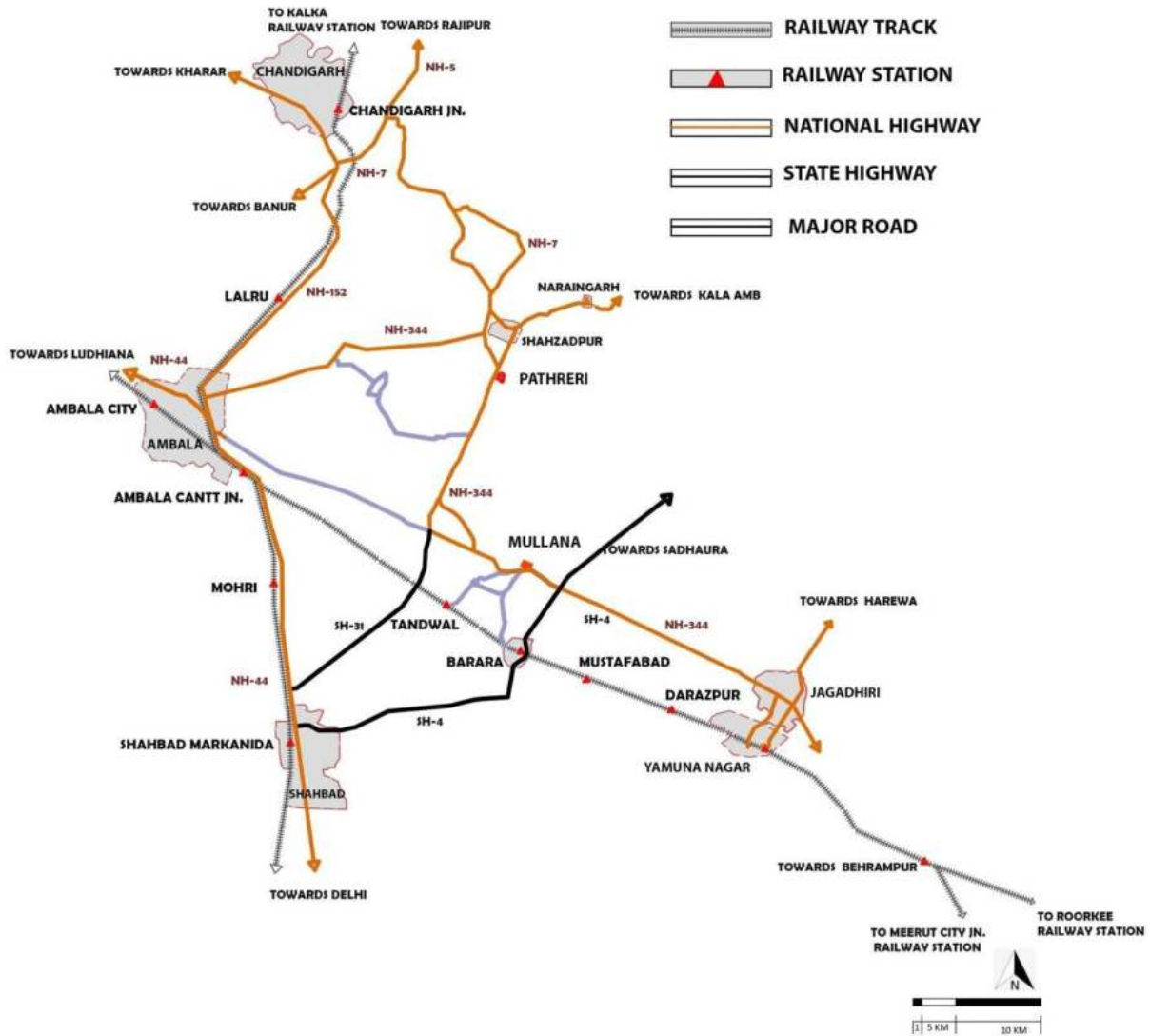
Source: NRSC, Google Earth

Airport: The nearest Airport is located at Chandigarh, at a distance of 61.7 km from Mullana. The airport located in Ambala Cant. is located in the Air Force Station and is not for civil use.

Railway Connectivity: The nearest main railway station are located in Ambala Cantonment and then in Ambala City. The other stations marked on the map are minor stops for trains with the exception of the one in Yamuna Nagar. The nearest

local station is Tandwal and Barara which is on the railway line connecting Ambala and Meerut/Shahjahanpur as shown in Figure 5.

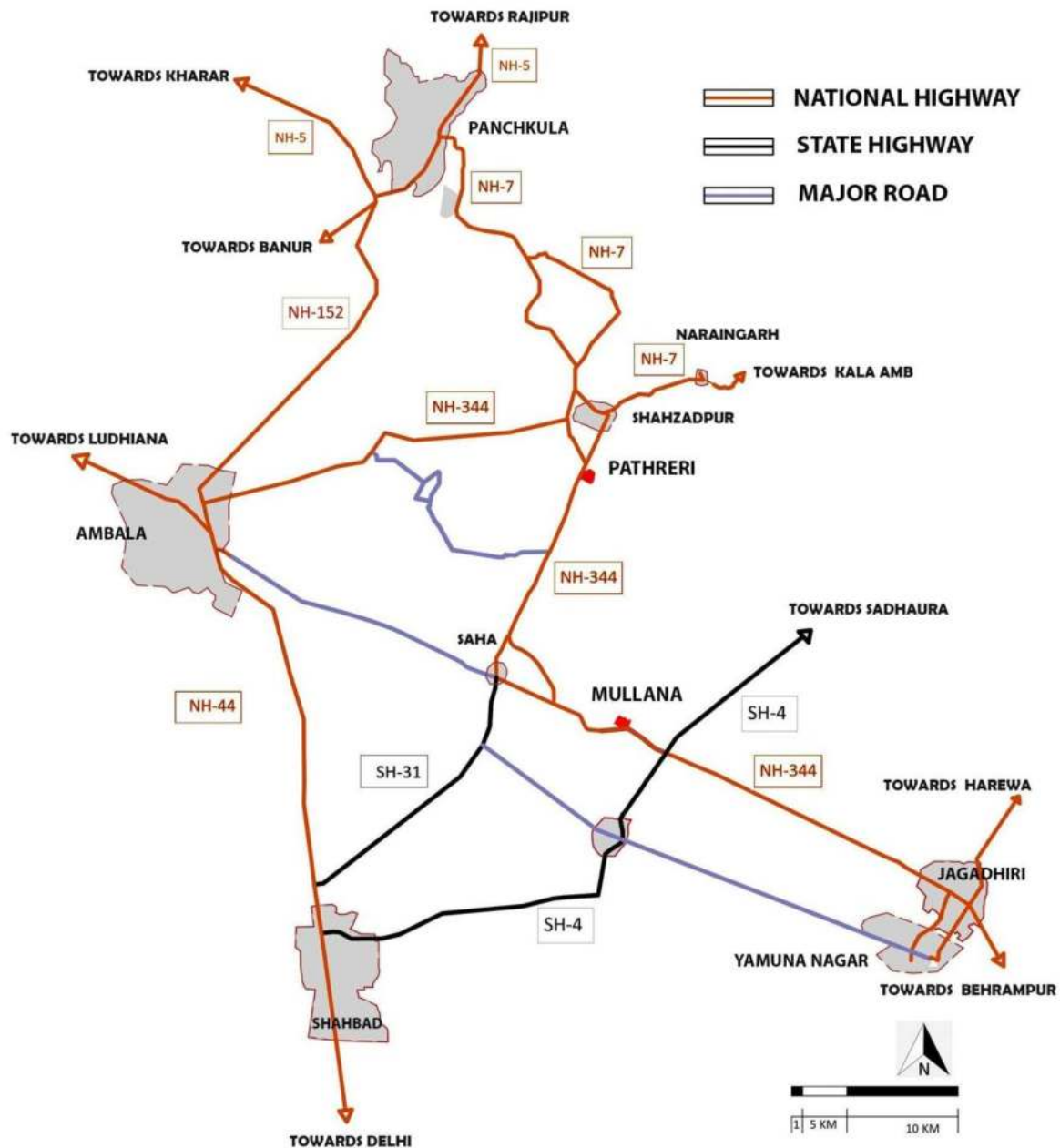
Figure 5: Regional Connectivity Map of Mullana Through Road and Rail Network



Source: NRSC, Google Earth

Road Connectivity: Figure 5 also shows the regional connectivity of Mullana with important towns and cities in its vicinity. The National Highway 344 runs through the GP and connects Mullana to Saha on one side and Jagadhri on the other. Further on NH 344, in close proximity to the GP are Ambala, Pathreri, Barara, Shahbad, Yamuna Nagar and Jagadhri. NH 344 merges with SH-31 at Saha which leads to Shahbad and Delhi. The GP is connected to Ambala Via NH-334 and Chandigarh and Panchkula via Shahzadpur following NH 7.

Figure 6: Major Towns near Mullana Through Roads



Source: NRSC, Google Earth

The National Highway 344 runs through the GP and connects Mullana to Saha on one side and Jagadhri on the other. Further on NH 344, in close proximity to the GP are Ambala, Pathreri, Barara, Shahbad, Yamuna Nagar and Jagadhri. NH 344 merges with SH-31 at Saha which leads to Shahbad and Delhi. The GP is connected to Ambala Via NH-334 and Chandigarh and Panchkula via Shahzadpur following NH 7.

Figure 6 shows the location of Mullana with respect to major nearby towns and their connectivity through road network.

The distance of major nearby towns is mentioned below:

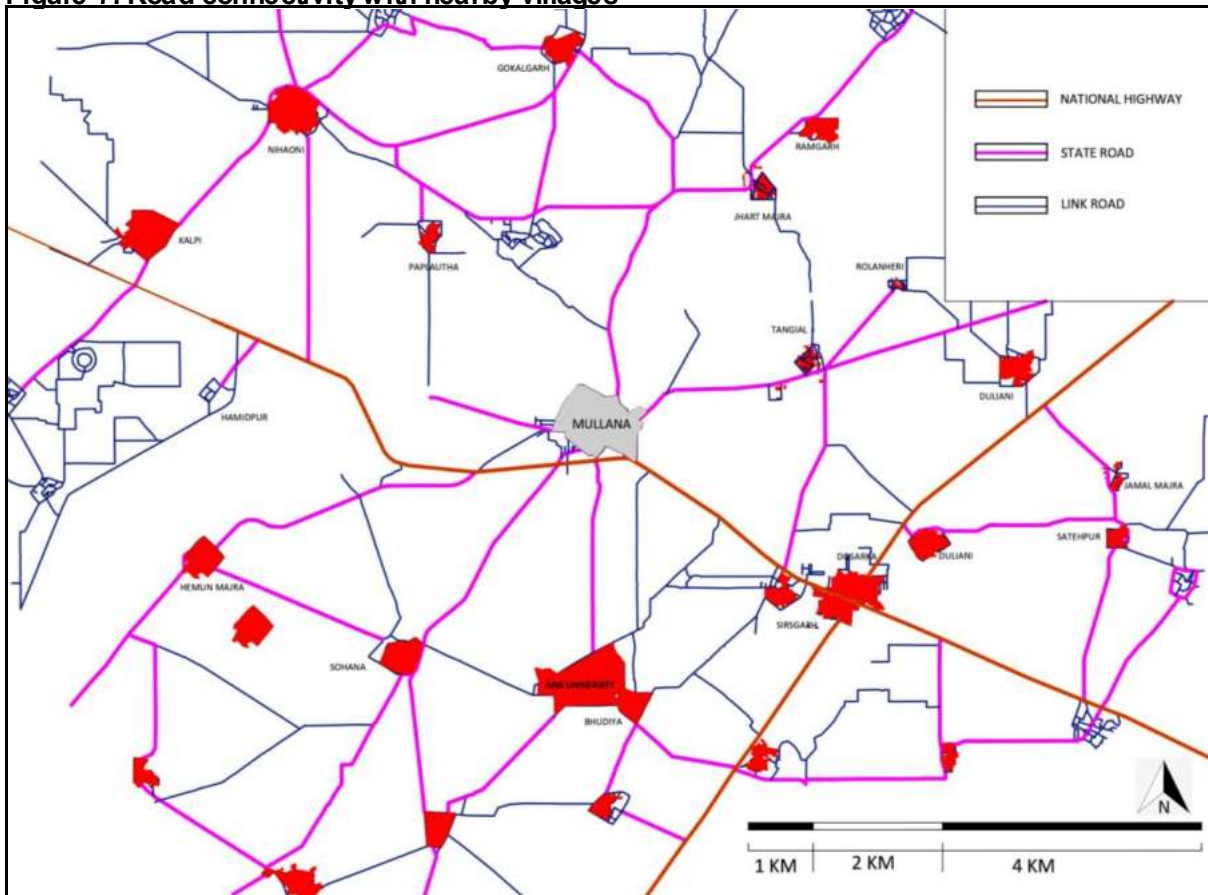
- Saha – 9.5 Km
- Barara – 9.9 Km
- Pathreri -23.5 km
- Jagadhri – 27.3 km
- Yamuna Nagar – 30.2 Km
- Shahbad –30.4 km
- Ambala – 44 km
- Chandigarh – 74.1 km

The GP has a bus stop in the village located on NH 344 but the nearest bus stand are Ambala (44 km) and Jagadhri (27.3 km).

Figure 7 shows the connectivity of Mullana with other villages and Gram Panchayats in its immediate vicinity. It is observed that Mullana village is the largest village in the proximity

The GP has a bus stop in the village located on NH 344 but the nearest bus stand are Ambala (44 km) and Jagadhri (27.3 km).

Figure 7: Road connectivity with nearby villages

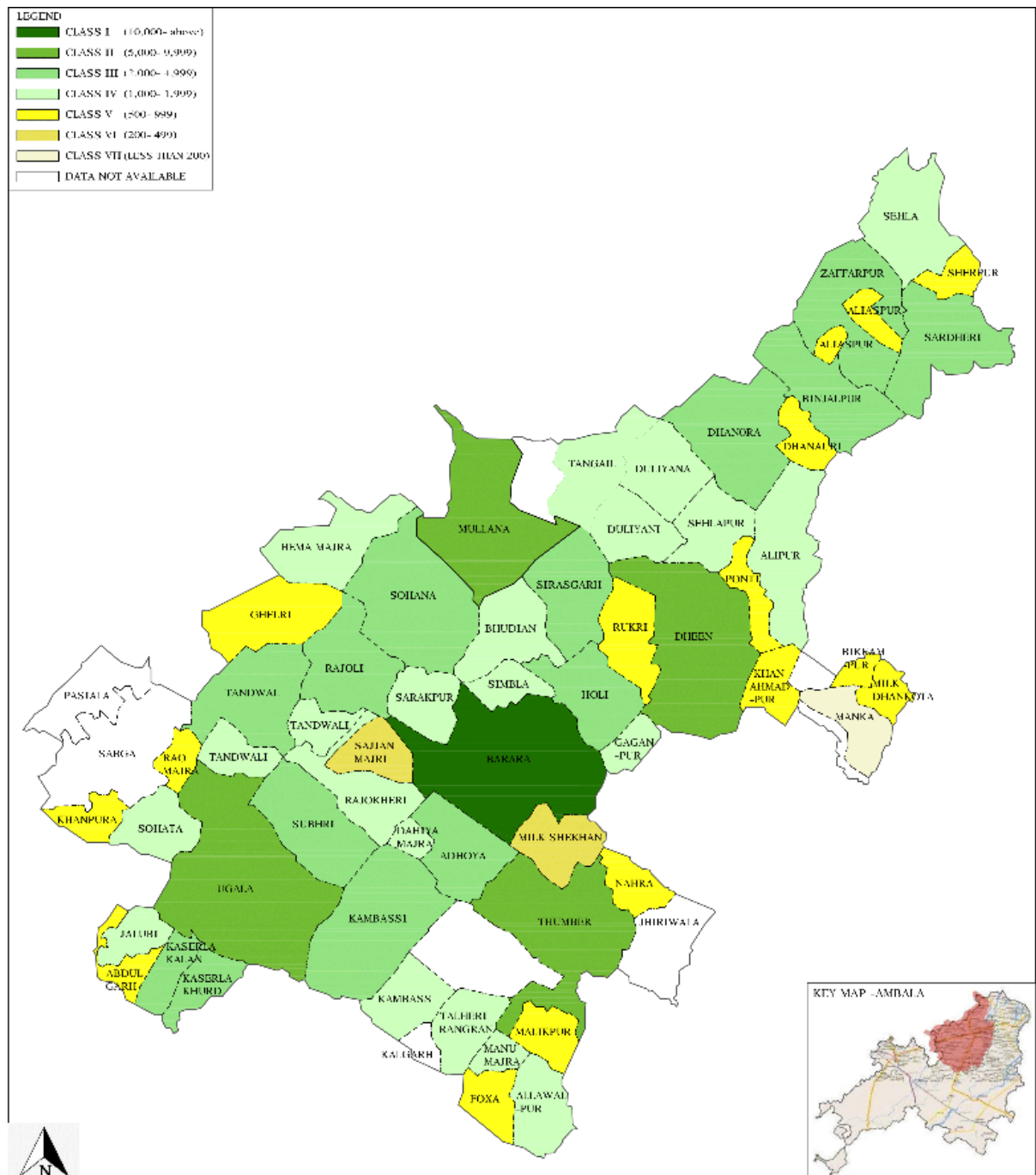


Source: NRSC, Google Earth

2.1.1 Categorisation of Mullana

On the basis of location the Mullana Village is located on the National Highway 344. It is connected in the North to Shazadpur and Naraingarh and in south towards Saha and Ambala. The village is well connected through the roads to the major corridors as well.

Figure 8 Settlement Hierarchy on the basis of population - Barara Tehsil - 2011



Source: Census of India, 2011

In the Barara Tehsil only the settlement of Barara belongs to class I as it has a population of above 10,000. Mullana is categorized under Class II, which refers to GP's with population between 5000-9999. There are only three other GP's which are categorized under Class II – Ugala, Dheen and Thumber.

2.2 HISTORY AND EVOLUTION OF THE VILLAGE

There is not much history available about the village in the reliable secondary sources except in few as mentioned in the following part. So to understand the origin and evolution of the village, key-person interviews were conducted with the elder residents of the village who have been staying in the village since decades. The

details as mentioned by the village elders were also cross validated from some officials and administrative people.

2.2.1 History

As per oral history Mullana has been recognized as a kasba since its establishment. It is said to have been under the control of Rajputs, Mughals, Sikhs and Britishers at different points in history. It is said to have been established in 1436 A.D. by Rajputs and was probably called Milansar. Later, when it came under the control of the Mughals it is said that the name was changed to Mughalana which over time morphed to the present name Mullana. But since this district became the most prominent route for every invader aiming to conquer Delhi, the Mughals could not retain a strong hold over this area and in 1763 Ambala district area fell into the hands of the Cis-Sutlej Sikhs. The British records state that each separate family, and each group of feudatories strong enough to stand alone, built itself something like a fort as a center from which it could govern the whole neighbourhood. According to the local narrative, independent Sikh chiefs gained control over Mullana in 1803 A.D and built an outpost called Singho Ka Quila.

The Ambala Gazetteer 1892 states that no attention was paid to the country by the British Government and it is believed that the profoundest ignorance prevailed both as to the constitution, the rights and the political strength of the supposed rulers till 1809. In 1809, when Maharaja Ranjit Singh stated invading these areas, a treaty was signed with him by the British under which he surrendered his new acquisitions south of the Sutlej, and bound himself to abstain from further encroachments on the left bank. For the next 36 years the area remained peacefully under independent Sikh chiefs as solo owners of their possessions free of money tribute to the British; while only requiring them in return on their side to furnish supplies for the army, and to assist the British by arms against enemies from any quarter as occasion might hereafter arise. In 1846-47 a fresh step had to be taken owing to passive The obstruction or open hostility on the part of the chiefs, when called on to assist the Government with supplies and men during its campaign against the Trans Sutlej Sikhs in 1845. Mullana thus came under the governance of the British Empire in 1847.

The district of Ambala was formally constituted in 1847, from territories which had lapsed to Government or been confiscated for misbehaviour during the period 1809-1846, under which there were 5 tehsils were divided. In 1862 the division of tehsils was revised namely: Ambala, Jagadhari, Ropar, Kharar, Pipli and Naraingarh. These tehsils were further divided into parganahs and Mullana and Ambala were constituted as the two parganahs of Ambala Tehsil. Mullana became a major business settlement under the Britishers and a Girls' Boarding School, a Post Office, a Hospital and a Police Station were developed during this period.

Mullana is further divided into three pattis namely- Mullana, Chanarthal and Bhageru. Initially each patti was self governed and had their own separate Panchayats but now all the pattis constitute one Gram Panchayat. According to oral history, during 1947 partition, migration took place mostly out of Patti Chanarthal with local Muslims leaving for Pakistan. The population of cross border migrants were rehabilitated here. The Mohallas of the main Abadi area are observed to have developed based on caste divisions.

The most important landmark of Mullana is the Balasundri Mata Mandir. It is one of the oldest and the most revered temple. A nine day long Navratri mela, that attracts huge crowds from the surrounding villages, is a major festival celebrated in the mela ground near this temple. Presently, the village has 36 temples, 2 Gurudwaras and a Mosque.

Mullana got proper electricity supply in 1964 and water facility (tube-well) was introduced in 1967. Before that people used personal wells and Markanda river helped meet the water demands of the villagers. The local narrative mentions the existence of a canal connected to Markanda river but presently this infrastructure is nonexistent.

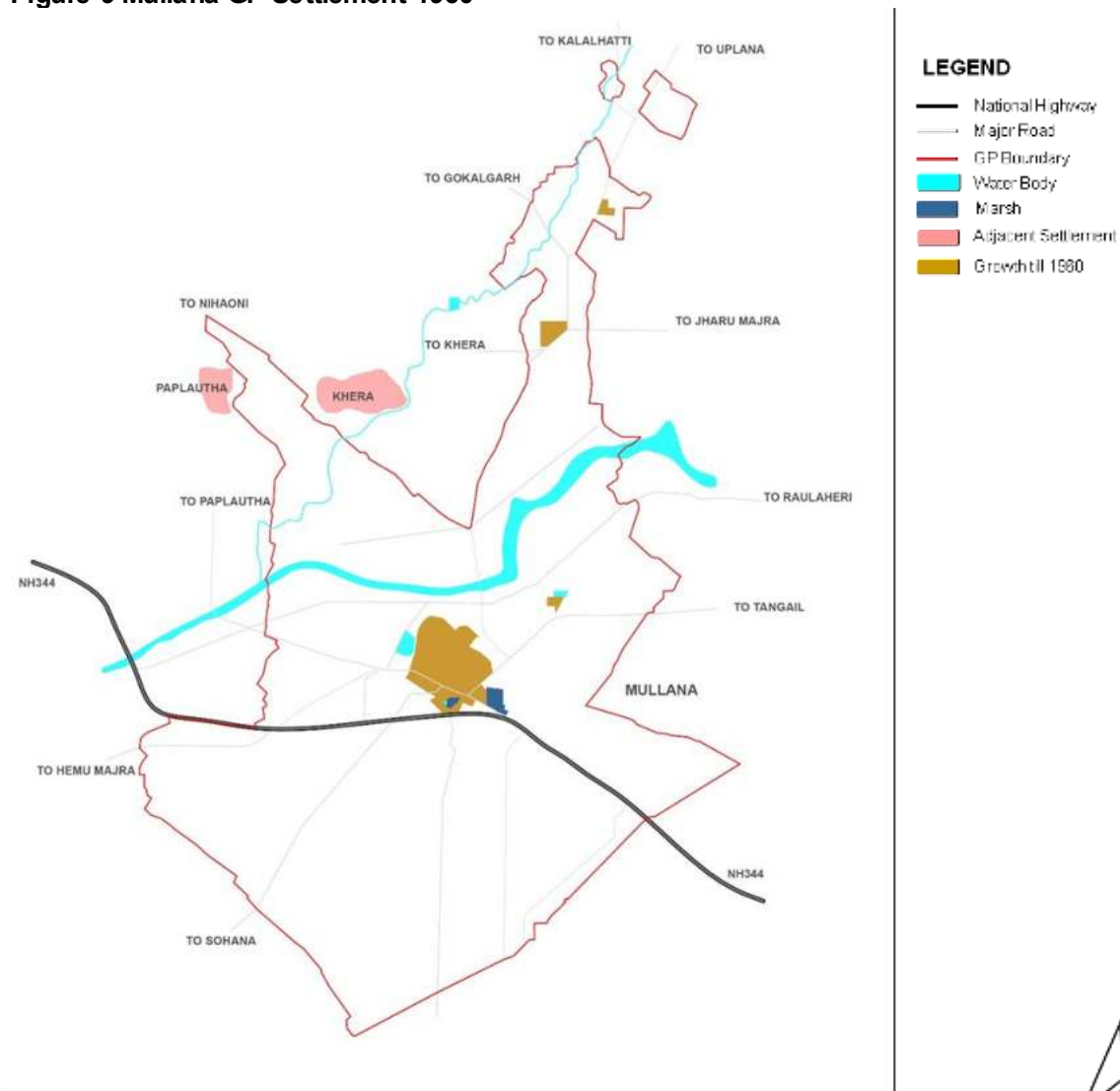
The Maharishi Markandeshwar University was established in 1993 near Mullana, which has made a drastic impact over the demographics of the village. The university has increased employment opportunities for the locals and has given the village many economic and educational benefits.

Currently the village has a major farmer population and local economy is majorly based on agriculture, small businesses and institutions/ student orientated facilities. Sugarcane, sunflower, wheat and maize are the major agricultural produce of the village, with much of the agricultural land owned and plowed by people residing in Mullana itself.

2.2.2 Evolution

As per the key person interview conducted with (name of person and details or name of the document), it was established that the village of Mullana was the main settlement cluster in 1960. Figure 9 Mullana GP Settlement 1960, shows that the trajectory of NH 344 in 1960 was relatively the same as the current scenario with the exception of the flyover. There was one main water body on the western edge of the settlement. Marshy areas were present on the south eastern edge of the settlement and next to the Bala Sundari Mandir.

Figure 9 Mullana GP Settlement 1960



Source: Google Earth and Key Person Interviews for 1960 area

Figure 10 Mullana GP Settlement 2009, shows that by 2009 the village had extended beyond the Lal Dora. A major percentage of the expansion appears to have taken place along the NH 344. Several poultry farms also cropped up at a distance from the village. It is mostly because of the. Figure 10 Mullana GP Settlement 2009, shows that the core settlement expanded in clusters along the arterial roads leading to the surrounding villages. Some clusters also developed along the road leading to the Maharishi Markandeshwar University. The marshy areas on the south eastern edge of the village appeared to have shrunk or completely disappeared, as the settlement grew. A marsh appears to have developed towards the north eastern edge of the settlement. A large chunk of the newer settlement areas comprised of Mandi's, both government and private.

Figure 10 Mullana GP Settlement 2009

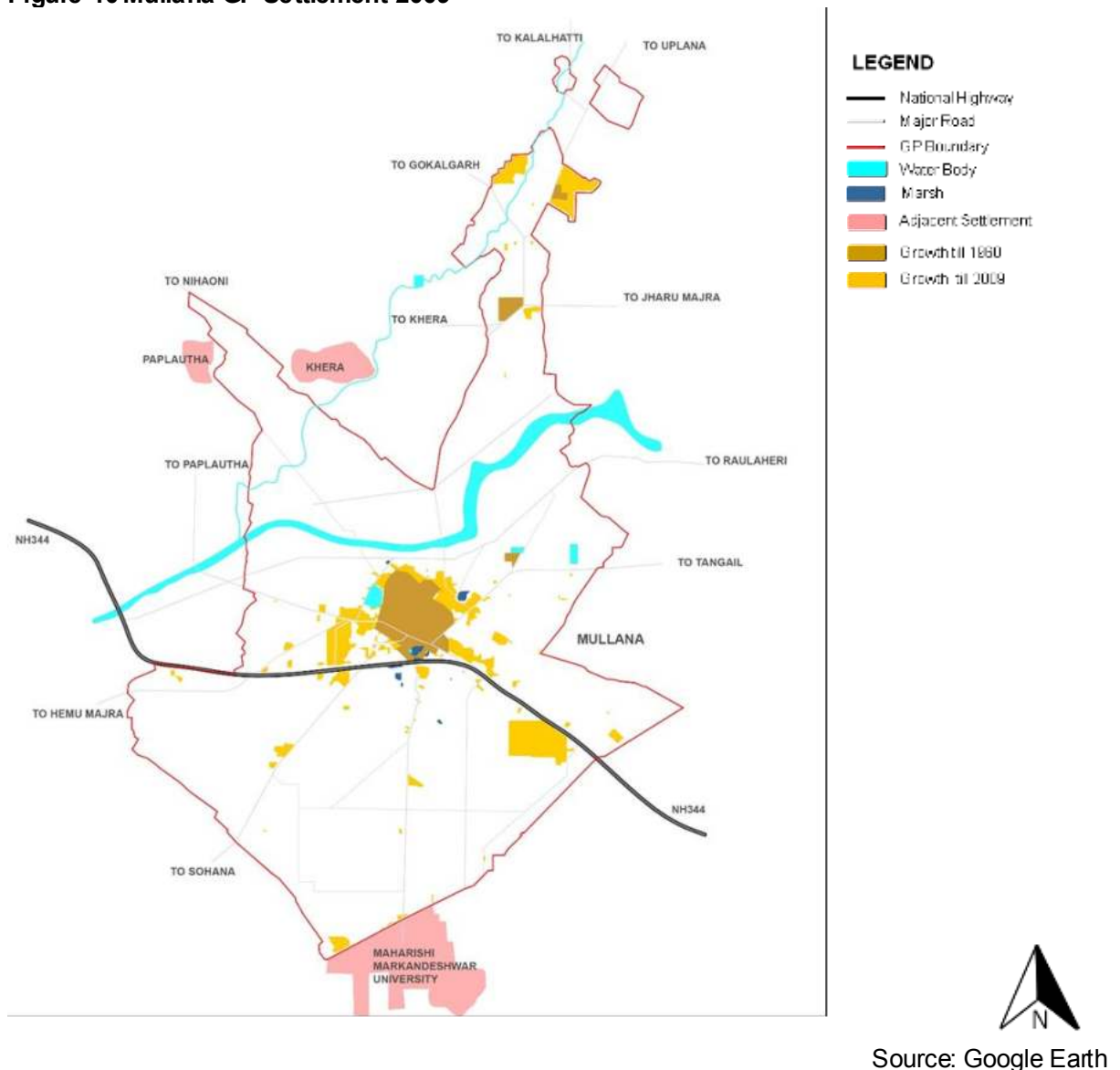
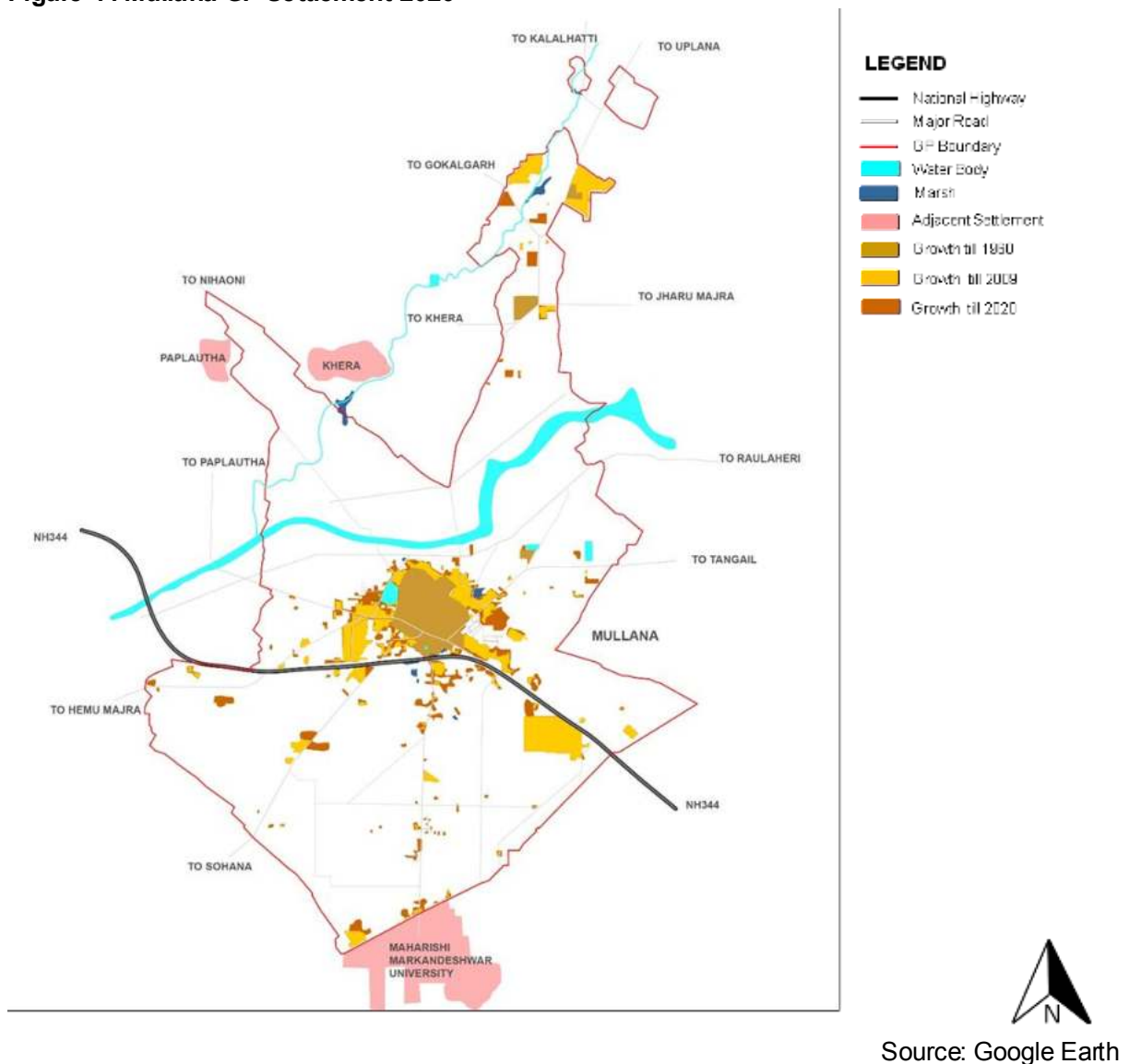


Figure 11 Mullana GP Settlement 2020, shows that by 2020 the clusters which had developed by 2009 have further grown. In particular the road leading to Maharishi Markandeshwar University shows a dramatic growth. The core settlement area also shows growth along the edges especially around the water body.

There is also development on the other side of the NH 344. The marshy area on the south eastern edge has almost disappeared. However, smaller marshy areas have developed around the new settlement clusters.

Figure 11 Mullana GP Settlement 2020

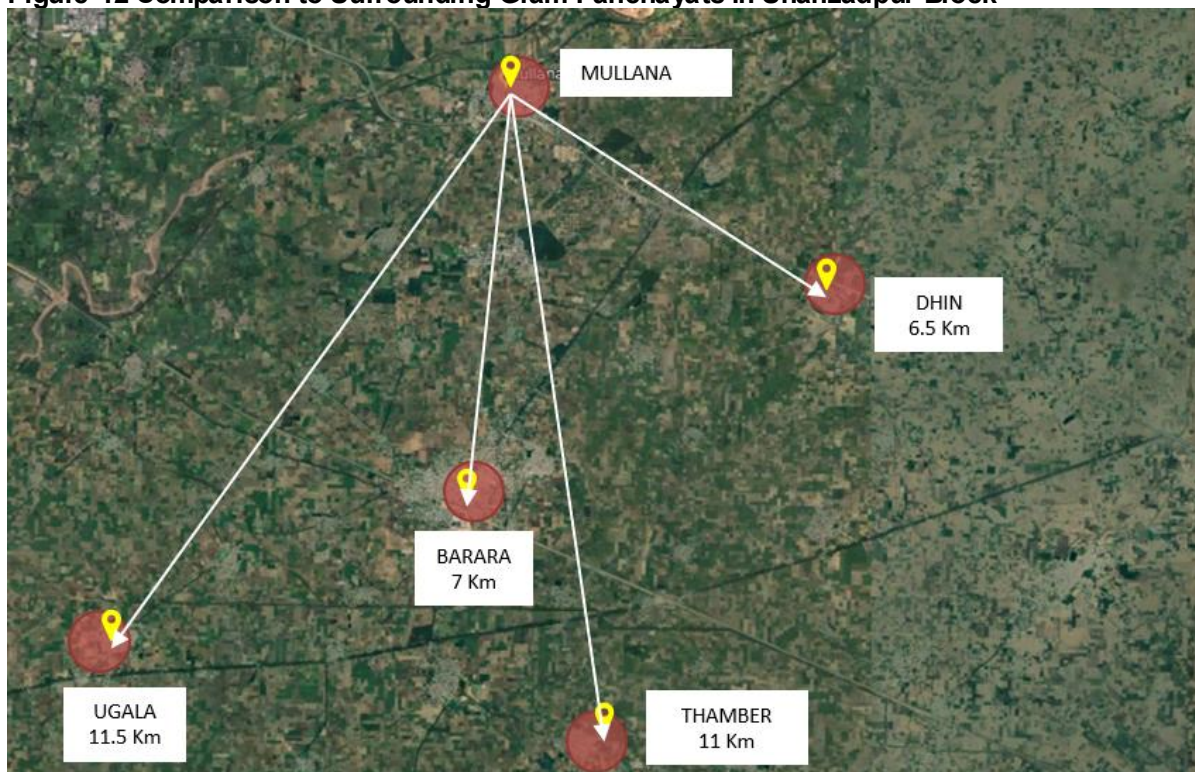


2.3 SOCIO DEMOGRAPHIC CHARACTERISTICS

The socio demographic characteristics are helpful to assess the quality of life, which will further help to prioritise the planning interventions and proposals. To understand and compare the various socio demographic parameters of Mullana there have been two type of comparisons done for the assessment. One, the comparison has been done with state and district statistics where they are relevant. Second, the comparison was made with other major GP's of Barara block where state and district statistics were not at relevant scale. There are total of 67 GP's which fall under the Barara Block (refer Annexure II). Out of these 67 GP's, the 5 GP's with highest populations, were considered. So, GP's with a population of 5000 and above have been mentioned below namely:

1. Mullana
2. Barara
3. Thamber
4. Ugala
5. Dhin

Figure 12 Comparison to Surrounding Gram Panchayats in Shahzadpur Block



Source: Google Earth Image (2020)

2.3.1 Population

The population of Mullana is shown in Table 1 for the years 1991, 2001, 2011 as per Census India of respective years.

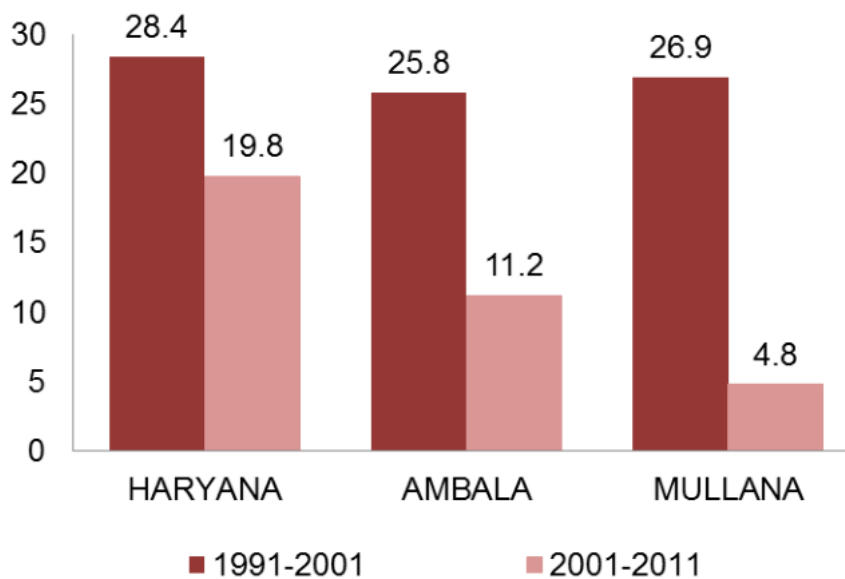
Table 1 Decadal growth of total population from 1991-2011.

| YEAR | HARYANA | AMBALA | MULLANA |
|------|-------------|-----------|---------|
| 2011 | 2,53,51,462 | 11,28,350 | 9363 |
| 2001 | 21,144,564 | 10,14,411 | 8927 |
| 1991 | 16,463,648 | 8,06,482 | 7036 |

Source: Census of India, 1991,2011 & 2001

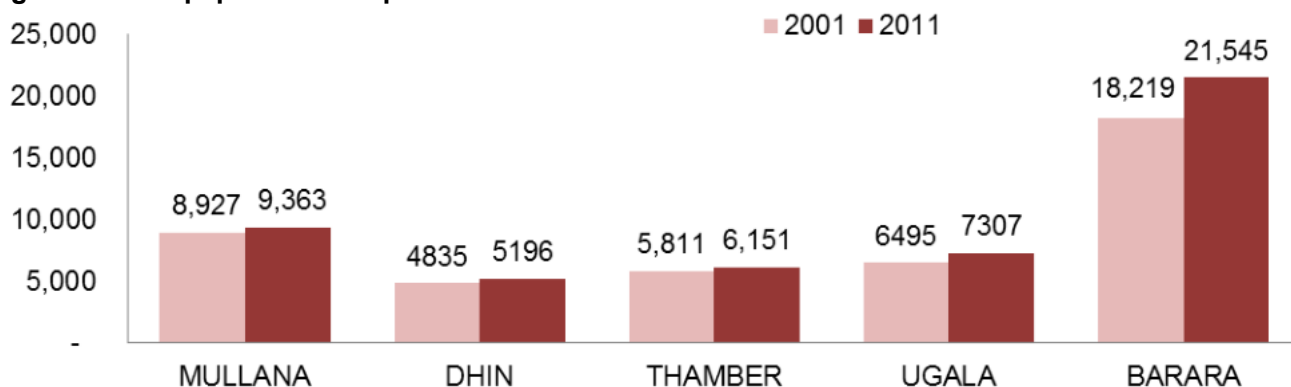
The population of Mullana has increased by 4.8% in the decade 2001-2011, as compared to 26.9% increase in previous decade of 1991-2001 (Figure 13). The Figure 13 shows that in the decade 1991-2001 the decadal population growth rate for District Ambala was lower (25.8%) than that of Mullana (26.9%). But for the next decade (2001-2011) the growth rate for Mullana is 4.8% but the overall growth in the whole district was 11.2%.

Figure 13: Percentage increase in the Decadal growth of total population from 1991-2011 for Haryana, Ambala and Mullana



Source: Census of India 1991, 2001 & 2011

Figure 14 Total population comparison with other G.P's

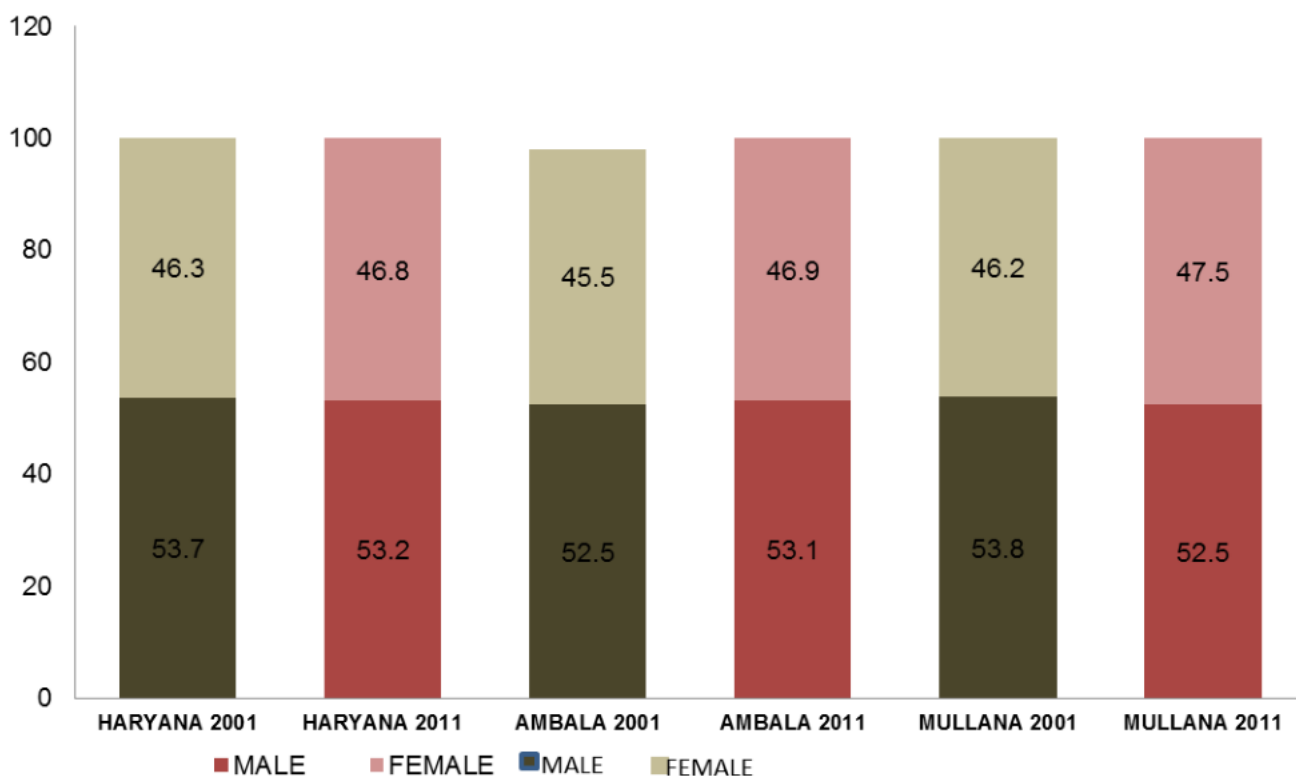


Source: Census of India, 2001 & 2011

The above chart represents a decadal analysis of the surrounding GP's (with a similar population of above 5000) from the year 2001 to 2011.

Decadal change in the male & female population: The Figure 15 shows the comparison of percentage of female population to male population in 2001 and 2011 across Mullana GP, Ambala District, and Haryana State. It is observed that the female population percentage is higher in case of Mullana as compared to the state and the district female population percentage.

Figure 15 Percentage of male and female population for the year 2001 and 2011

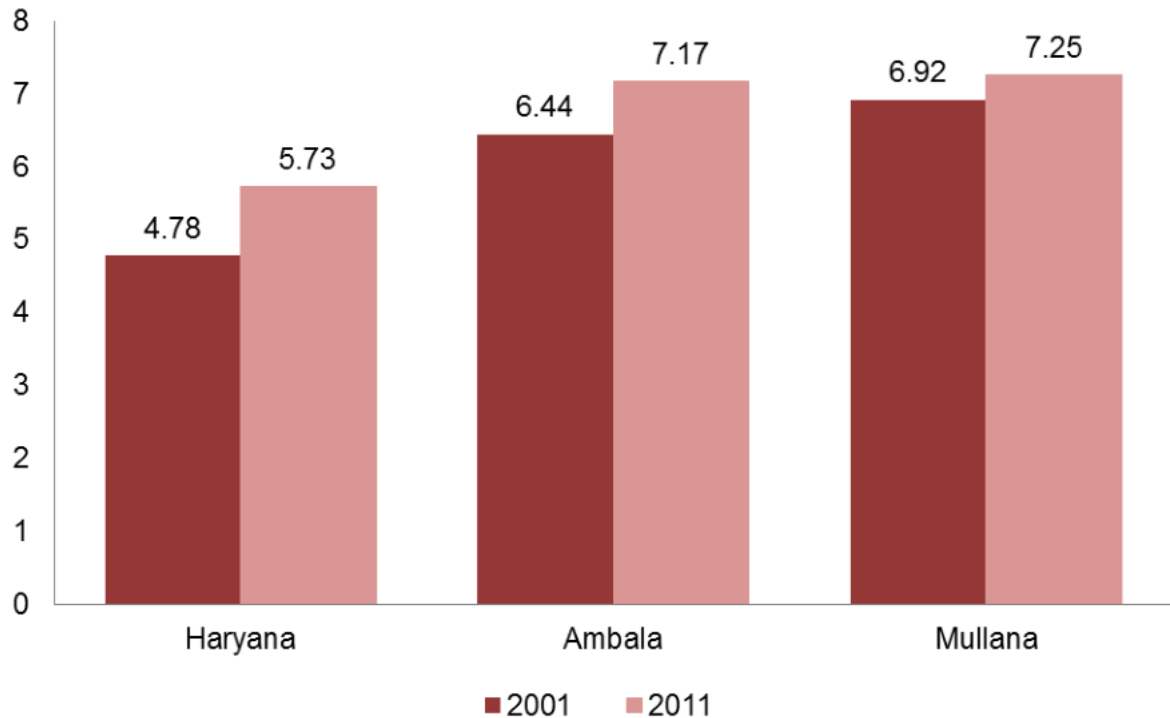


Source: Census of India 2001 & 2011

2.3.2 Density

The density of Mullana is 7.25 pph in 2011, it will be misleading to compare the density of a village to density of state or district because of the variation in the scale of area and administrative levels.

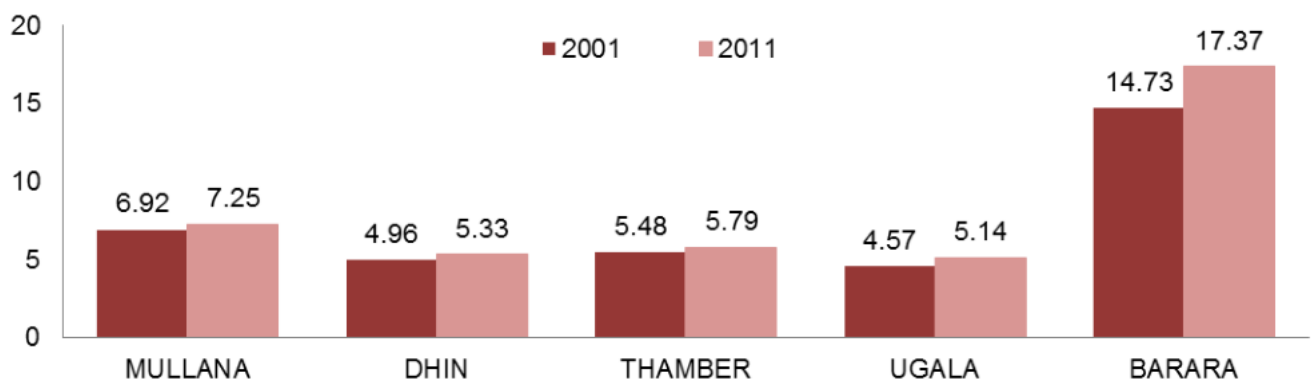
Figure 16 Change in density of Haryana, Ambala and Mullana for the year 2001 & 2011



Source: Census of India, 2001 & 2011

The Figure 17 shows the change in densities across the selected GP's. The density of other villages is lesser than Mullana except for Barara. The density of Barara is more than 2 times of the Mullana.

Figure 17 Comparison of density of Mullana with other surrounding GP's



Source: Census of India, 2001 & 2011

2.3.3 Schedule Caste Population

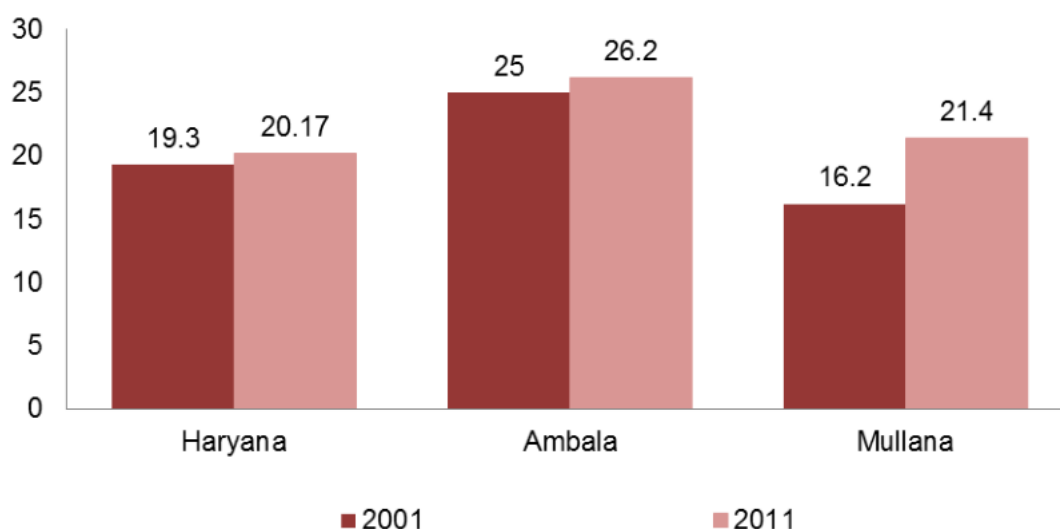
The Table 2 shows the total scheduled caste population in Haryana, Ambala district, and Mullana village in year 2001 and 2011. The schedule caste population percentage with total population has considerably increased in case of Mullana from 2001 to 2011 as compared to Haryana and Ambala (Figure 18). Schedule caste population for 2011 is almost 21.2 percentage of the total population in case of Mullana. The increase in case of Mullana is 5.2% whereas the increase for the state and district is almost 0.9% and 1.2% respectively. Though the total schedule caste population percentage is lesser for Mullana is lesser than the district.

Table 2-Total number of Schedule Caste population in Haryana, Ambala and Mullana from 1991-2011.

| YEAR | HARYANA | AMBALA | MULLANA |
|------|-----------|----------|---------|
| 2011 | 51,13,615 | 2,96,246 | 2,010 |
| 2001 | 40,91,110 | 2,54,477 | 1,452 |

Source: Census of India, 2001 & 2011

Figure 18 Percentage of Schedule Caste population in Haryana, Ambala and Mullana from 1991-2011.



Source: Census of India, 2001 & 2011

2.3.4 Literacy

The literate population is mentioned for the state, district, and village in Table 3. The Figure 19 and Figure 20 shows the percentage of literate of total population, male population, and female population respectively for 2001 and 2011. The female literacy is lowest in case of Mullana as compared to state and district.

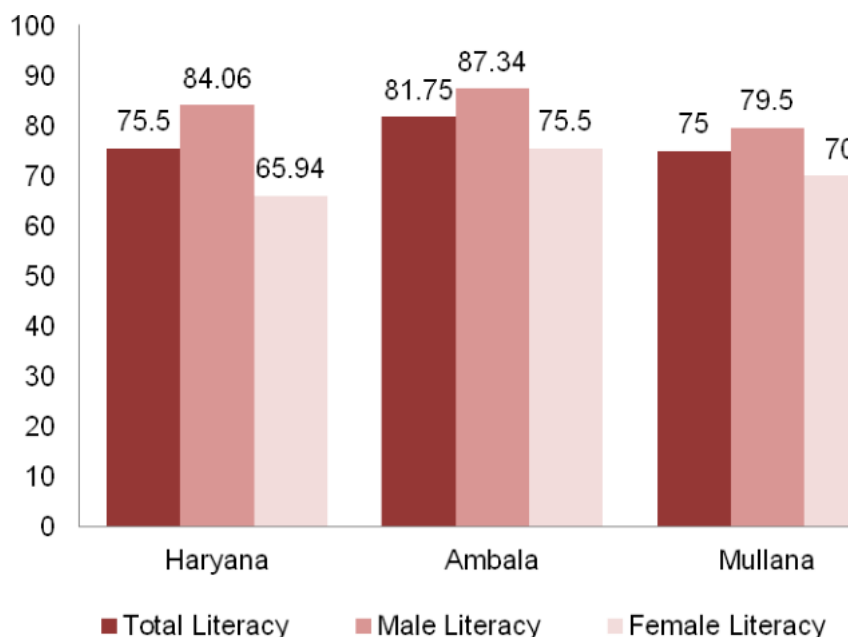
Table 3- Literate population in Haryana, Ambala and Mullana from 1991-2011.

| YEAR | HARYANA | AMBALA | MULLANA |
|------|----------|--------|---------|
| 2011 | 16598988 | 818025 | 7021 |
| 2001 | 12093677 | 662789 | 5961 |

Source: Census of India, 2001 & 2011

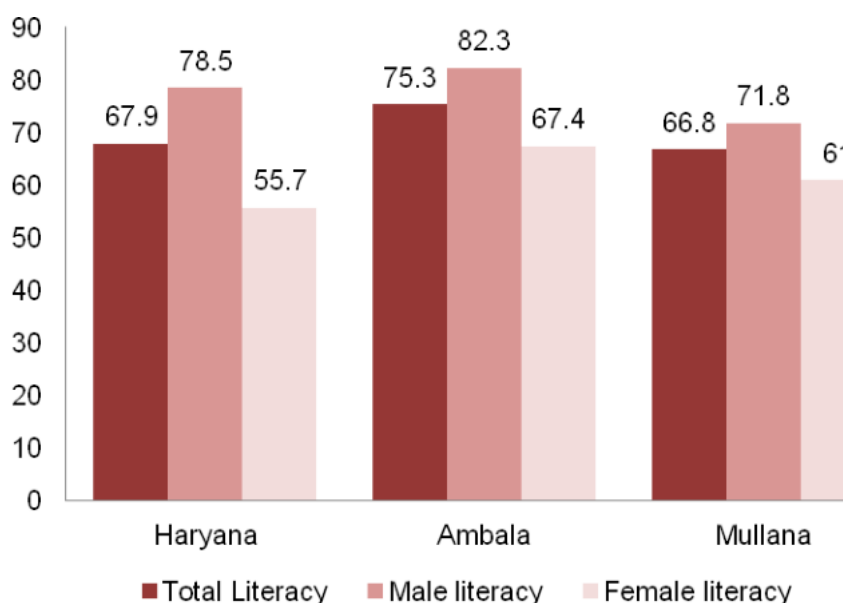
The female literacy has improved from 61% in 2001 to 70% in 2011 in case of Mullana. The percentage of literate population is higher (both male and female) in Mullana as compared to the district and state (comparing Figure 19 and Figure 20).

Figure 19 Literacy rate in Haryana, Ambala and Mullana in 2011



Source: Census of India, 2011

Figure 20 Literacy rate in Haryana, Ambala and Mullana in 2001



Source: Census of India, 2001

3. ECONOMIC BASE

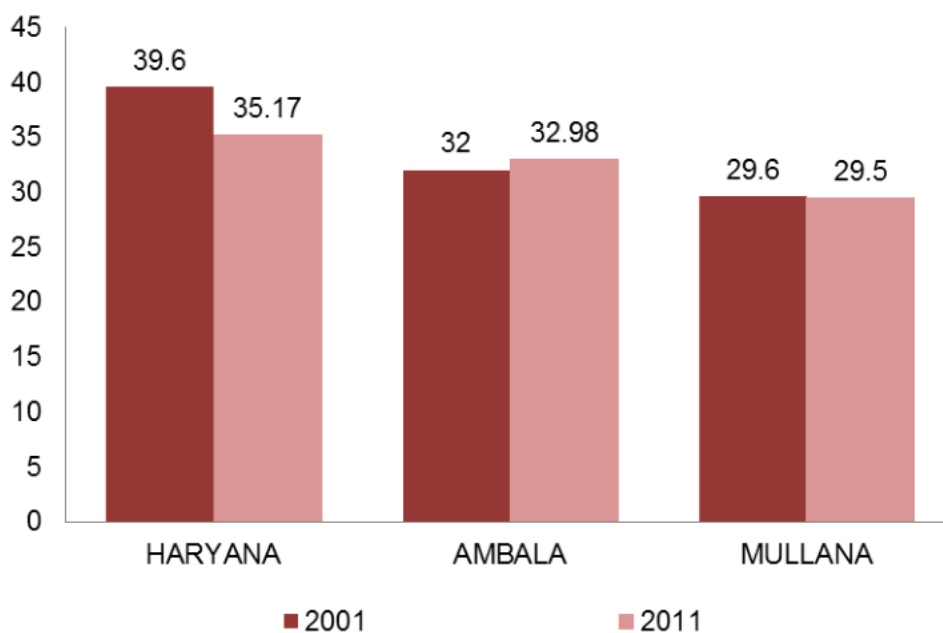
The economy base of the village is largely agrarian but there are secondary and tertiary sectors which have developed in the past years. A lot of institutions have also created more jobs and opportunities directly and indirectly. The village also has dependency on other activities within or outside the village. The National highway

has provided good connectivity and better opportunities to the village people to work in secondary and tertiary sectors outside the village as well. This section discusses the details of economic activities within the village and outside the village on which the village depends.

3.1.1 Workforce Participation

The Figure 21 shows the percentage of the workforce participation from the total population for the State, district or GP and change during the decade (2001-2011). The total workforce participation is lower in case Mullana village than state and district. There is no considerable change in workforce participation in case of Mullana from 2001 to 2011 rather it has decreased by 0.1 %.

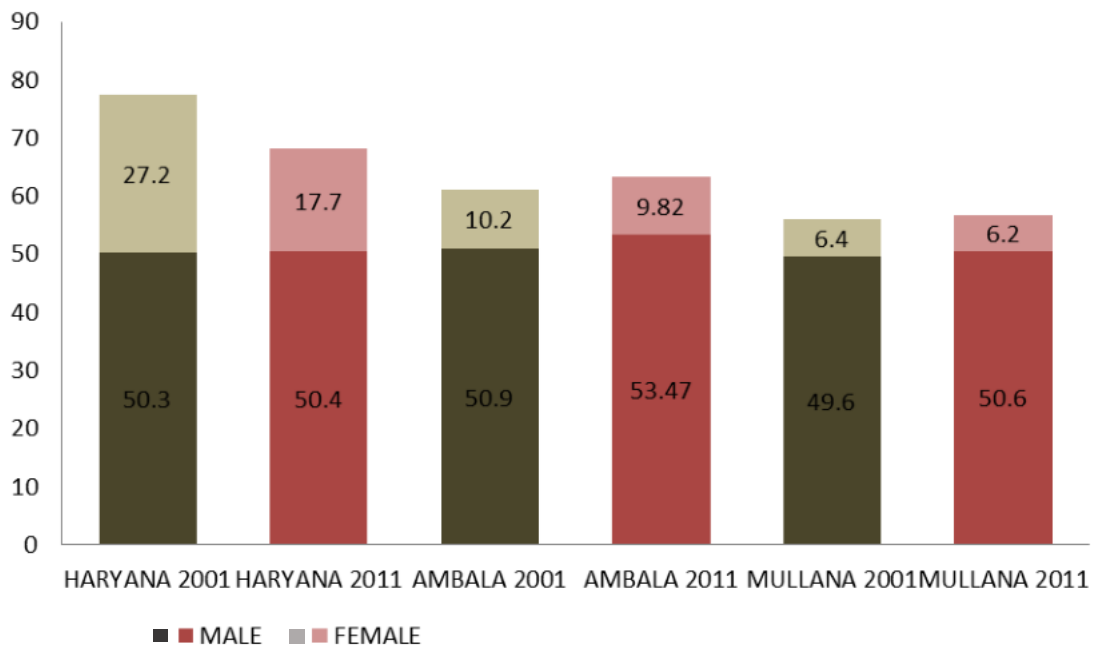
Figure 21 Percentage of working population of Haryana, Ambala and Mullana for the year 2001 and 2011



Source: Census of India, 2011&2001

Figure 22 shows that across all three-state, district and Mullana, there is decline in the percentage of women working out of the total women population. This percentage is very lower (6.2%) than the state (17.7%), and district level (9.82%) participation by women in the year 2011.

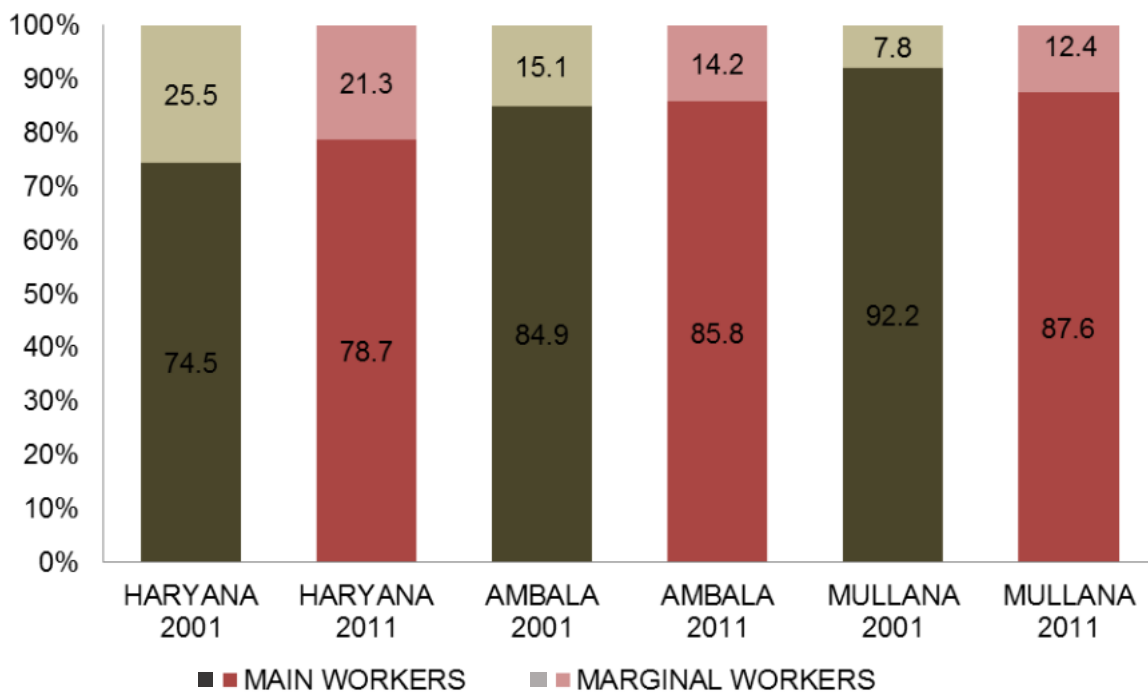
Figure 22 Percentage of male and female working population of Haryana, Ambala and Mullana for the year 2001 and 2011



Source: Census of India, 2011&2001

As per the analysis done 12.4% of the working population is marginal workers in the village Mullana. The Figure 23 shows the comparison between the state, district and Mullana. The percentage of the marginal worker has increased from 7.8% in 2001 to 12.4 % in 2011.

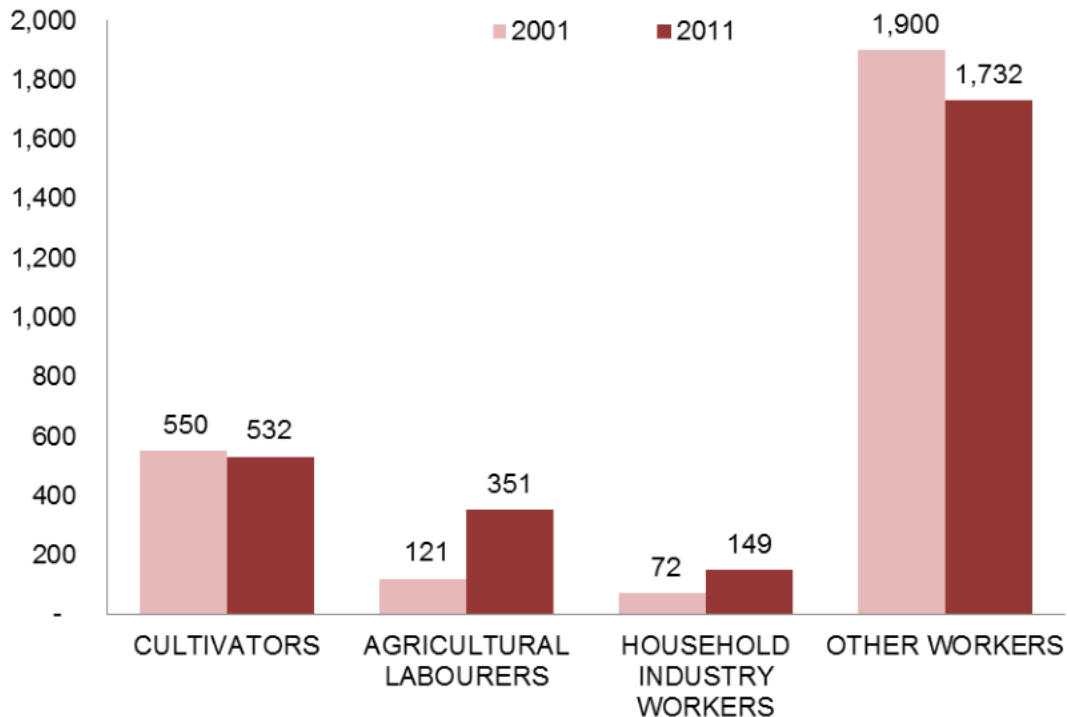
Figure 23 Percentage of main and marginal workers in Haryana, Ambala and Mullana for the year 2001 and 2011



Source: Census of India, 2011&2001

There is remarkably interesting finding in case of working population in Mullana. The total working population in 2011 has decreased as compared to total working population 2001, but the marginal worker percentage has increased. The number of cultivators has decreased in 2011 (Figure 24), whereas agricultural labourers and household industry workers has increased to more than double from 2001 to 2011. This might be because many individuals might have sold their land or it has been acquired for developing Mandi, or to setup institutions. Whereas the number of other workers has also decreased during the same period.

Figure 24 Comparison of types of workers for the year 2001 and 2011.



Source: Census of India, 2011&2001

3.1.2 Major findings for demography, literacy and employment

- As per the Census data the literacy rate has improved by 6.4% between 2001 and 2011. However, there has been a corresponding increase of 4.9 % in population growth during the same period.
- The data from the household survey, done for this project in 2020 shows a similar literacy rate (76%) amongst the sample size.
- As per the Census 2001 and 2011 statistics, the literacy level has improved compared to the rate of increase in population, but we do not find considerable employment amongst the literate youth, as most of the working population are engaged in agriculture, which is also reflected in the household survey.
- Some residents even commute to the surrounding areas to work in private organisations, shops, and offices as well as in government institutions.
- Cultivators and Agricultural labourers – The census data show a 1% decrease in number of cultivators and a 9% increase in the number of agricultural labourers between 2001 and 2011.

- The trend shows that cultivators have sold their land holdings and moved from the village and small land holder have sold their land holdings and are working as agricultural labourers.
- Apart from the agricultural income, the village has a lot of potential because of the presence of Maharishi Markandeswar University and other private institutions nearby or within the village.
- The availability of mandi is also a major factor and potential for growth of the village.

3.1.3 Area under cultivation

Majority of the population residing in Mullana is dependent on major source agriculture as a source of income. The 2011 Census cites the total net sown area in the village as 901 Ha out of which 897 Ha is irrigated land area.

. Agriculture has been the major employment provider in case of Mullana.

Crops: The crops grown in the Ambala district can be divided into two main categories viz, kharif and rabi locally known as sawani and sadhi. The former is the summer season harvest and the latter the winter harvest. As per the Household Survey and key person interviews, the agricultural land in the GP is used to cultivate wheat and paddy. Additionally, sugarcane, sunflower, mustard and bajra are also grown.

The Antyodaya report 2019 mentions the presence of seed centres and fertilizer shop in the village. This establishes that the village has good accessibility to the necessary products required in cultivation.

3.1.4 Mandis and Markets

The nearest 'Anaj Mandi' is within the Mullana village itself on national highway (NH-344). The proximity to the location of mandi's helps the farmers to have crops for which they can easily take their produce to mandi's. As per the key person interviews, there are sugar and oil seed factories in the vicinity to which the harvest from sugarcane, mustard and sunflower crops is transported directly.

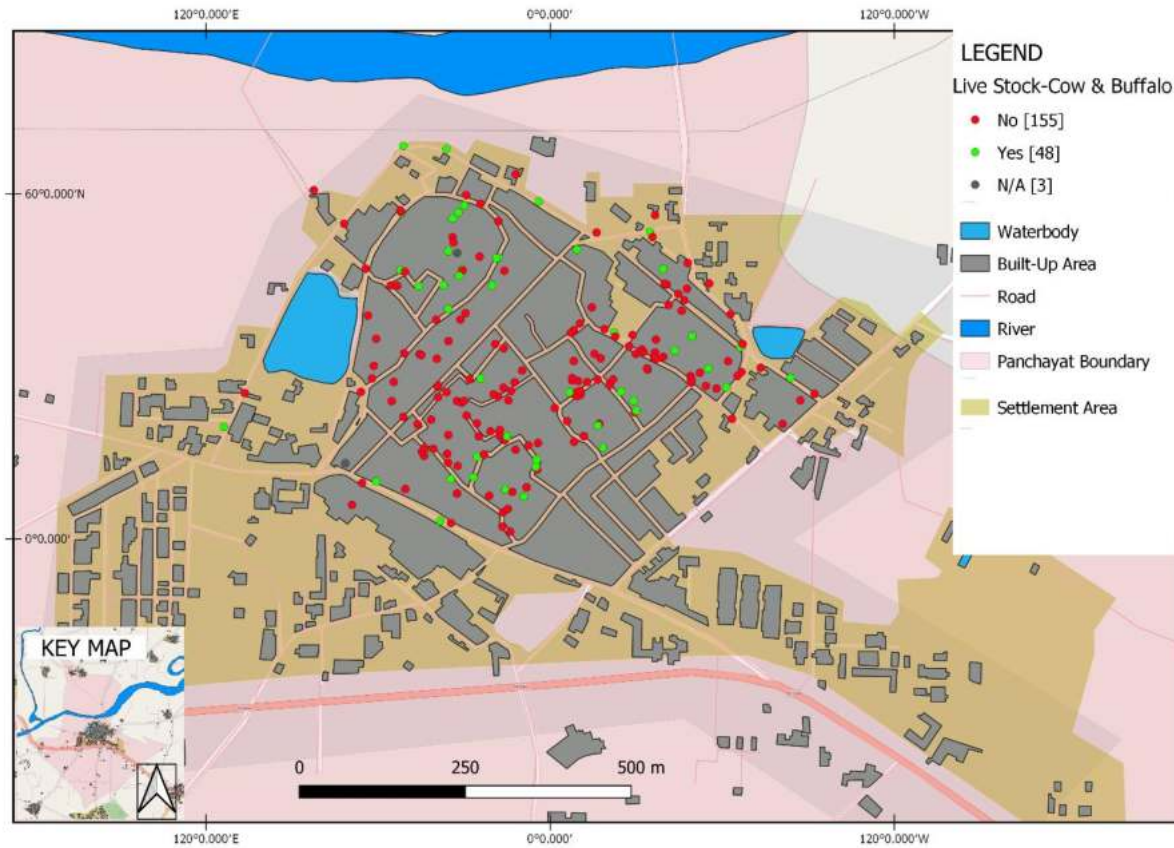
3.1.5 Livestock –

Livestock is also major economic activity generally in the villages. In case of Mullana below mentioned dependencies were established through the physical surveys and key person interviews.

Poultry Farming: The GP has several small poultry farms which are located on the NH 344 connecting. Most of the poultry farms has emerged during last 5-6 years' timeline only.

Dairy Farming: As per the household survey, a few families own cattle. However, through the surveys and observations, no commercial dairy farms were found in the village. The cattle owned by the village people seems to be only for own consumption itself.

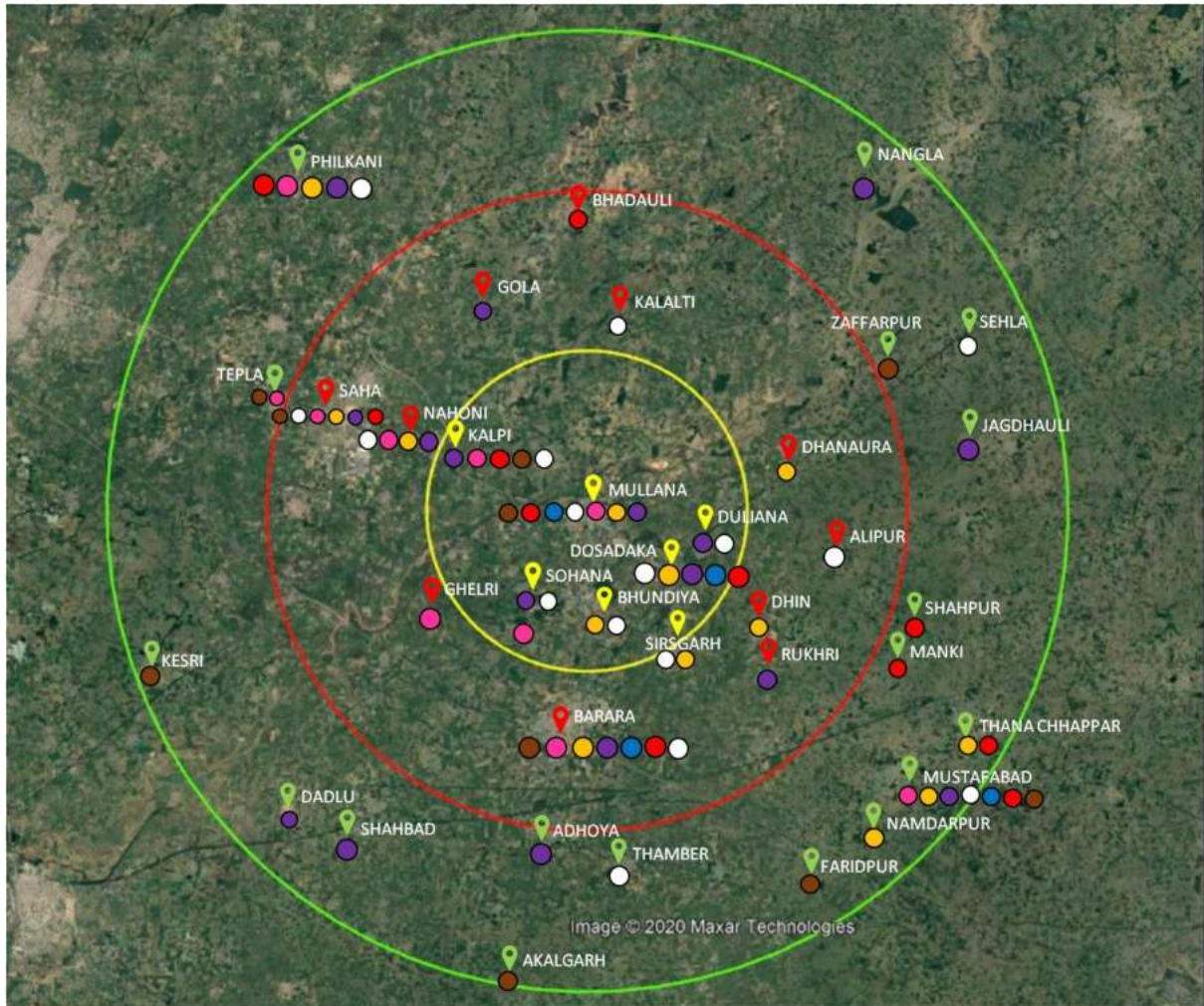
Figure 25 Livestock Ownership within the Abadi



Source: Primary Survey (November, 2020)

Other Employment avenues: Residents of the village commute daily to Jagadhri, Ambala and Panchkula for employment in shops, government, and private offices as shown in Figure 26.

Figure 26: Location for various Employment Avenues with respect to Mullana



- HEALTH
- MARKETS
- FACTORIES & INDUSTRIES
- EDUCATION INSTITUTES
- GOVT. PUBLIC INFRASTRUCTURE & SERVICES
- SOCIAL
- RELIGIOUS

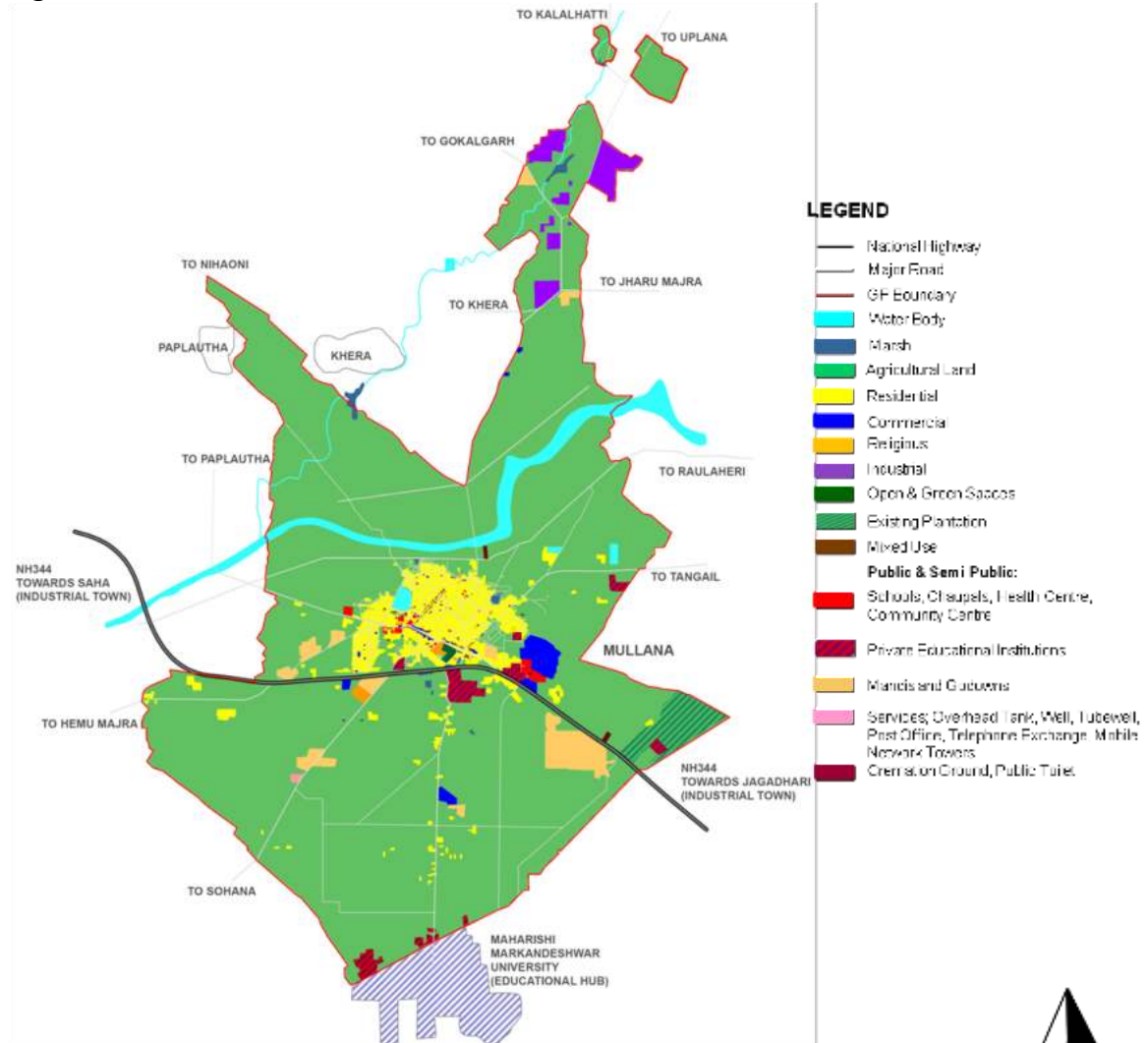
4. NATURAL RESOURCES

The natural resources include different types of physical features like rivers, streams, forests, agricultural land etc. Any form of land can be seen as resource for having potential of doing multiple activities on it. It is important to discuss the type of resources in the village and strategise the use on those features or around the features in a manner that ensures the environmental sustainability and no negative externalities like pollution, degradation of the resources, contaminating and harming the ecosystem etc. This chapter discusses the natural resources available in the village and later considering a suitable proposals for the same by preserving the important environmental parameters.

4.1 LAND COVER

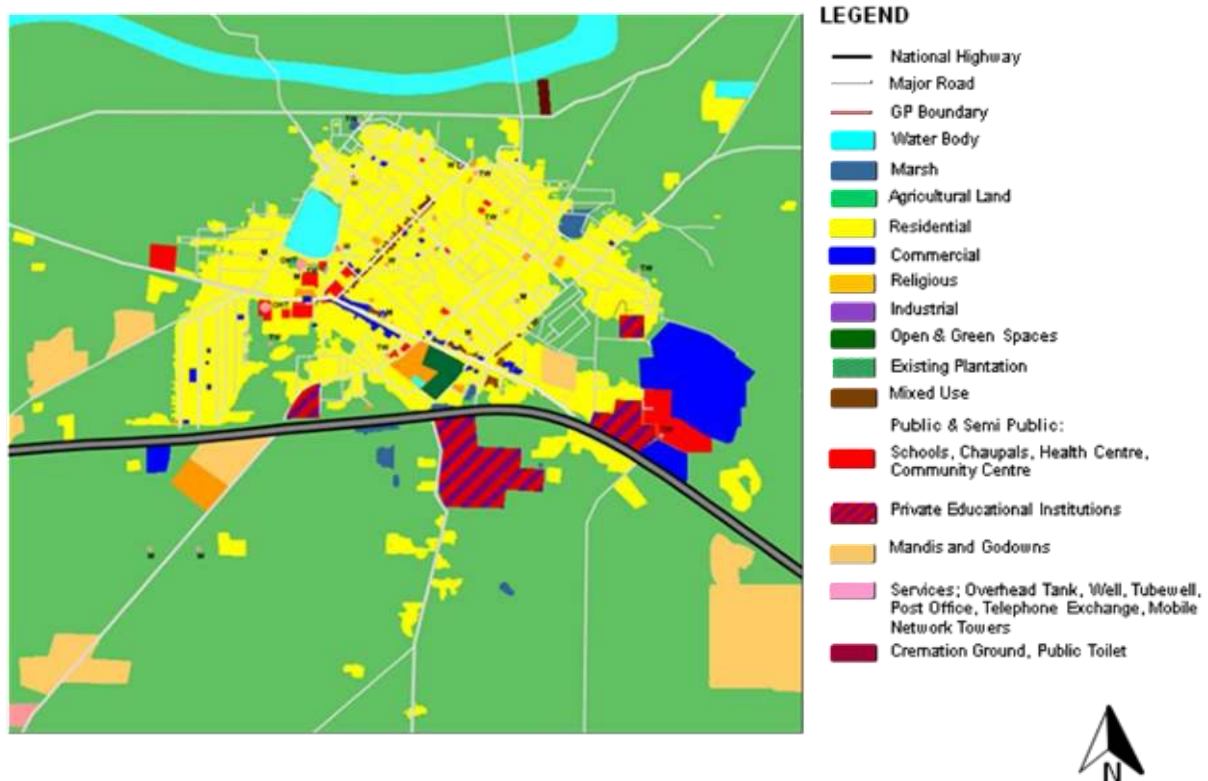
The land use pattern in the GP, as per Figure 27 : Land Use and Land Cover Pattern of Mullana, shows that a major portion of the area is under agricultuale land followed by residential construction. This land use pattern shows the major area is in line with the predominant agrarian economy. The number of mandis and godowns further reinforce this. The largest Mandi, which is along the NH 344, is government owned and the remaining are privately owned. The Industrial areas comprise primarily of brick kilns.

Figure 27 : Land Use and Land Cover Pattern of Mullana



Source: Google Earth

Additionally there are a number of private educational institutions, the largest of which is Maharishi Markandeshwar University.

Figure 28 : Landuse Map within the Village settlements

Source: Google Earth:

Within the village the commercial areas are concentrated along two major roads. The commercial areas include markets, shops and a resort. There are few scattered convenience shops opening on the internal lanes, but within the residential plots itself. The public and semi-public buildings are majorly concentrated at two locations in the village. There are several religious structures scattered through the village.

A large water body, covering about 3.82 acres, is located on the north western edge of the village with some marshy areas on the north eastern edge. The largest and most important temple in Mullana is the Bala Sundari Mandir which is located parallel to the NH 344. It has a large mela ground in its immediate vicinity. The village does not have any other designated large green spaces. There is a Hotel Management Institute, run by MMU, along NH 344. The institute includes a hotel, a banquet hall and educational facilities for the students.

4.2 SOIL FERTILITY

The GP predominantly has coarse or fine loamy soil according to the soil health cart issued by the ministry of agriculture and farmers welfare govt. of India. The soil is alkaline i.e. has a PH level of above 7. The overall soil fertility is adequate except for some plots where the addition of gypsum is recommended. As per the soil report cards (Welfare, 2019) - wheat, rice, bajra, sunflower, maize and mustard are the crops predominantly grown in this GP, which are suited to the nutrients present in the soil. These documents also recommend the planting of "Dhaincha", a green manuring crop, which can be planted, allowed to grow for 35-40 days and then ploughed into the fields to add to the soil nutrients.

Figure 29: Soil Type within the GP Boundary and Surrounding Area

4.3 WATER RESOURCES

Water resources refers to the sources of water that the population depends on for domestic, agriculture, industrial and miscellaneous uses. They are usually divided into two categories : Surface Water and Ground Water.

Surface water sources refer to the water available on the surface of the earth which includes rivers, rivulets, ponds etc.

Ground water refers to water available below the surface of the earth in the aquifers and above the bed rock. (Asian Development Research Institute)

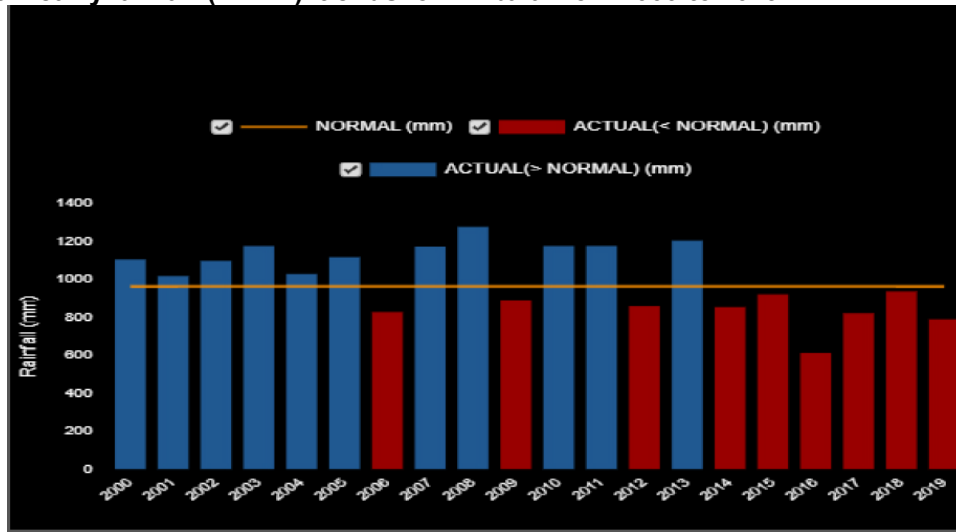
The recharge of aquifers in India predominantly depends on the annual precipitation, particularly during the monsoon, and the surface water sources depend on the melting of the snow in the Himalayas.

The state of Haryana has three main rivers flowing through its territory, the largest being Yamuna while the remaining two, Ghaggar and Markanda, are seasonal rivers. (India- WRIS) Most of the state depends on ground water as the river network serve a small percentage of the territory.

4.4 RAINFALL AND SURFACE RUNOFF

The average annual rainfall data in the last 20 years, for the Ambala (District) is shown in Figure 30. The Normal rainfall is almost 980 mm but in the past 6 years the average annual rainfall has decreased with lowest of 600 mm in 2016. Excess rainfall was recorded in three years, 2007,2008, 2010,2011 and 2013, with highest of 1200 mm in 2008. During the interviews conducted it was referred that in 2013 there was incident of flood to some nearby villages, but Mullana was safe during that. For the agrarian economy it is particularly important to have sufficient and timely rainfall for better yield or to develop alternatives for the irrigation.

Figure 30: Yearly rainfall (in mm) trends for Ambala from 2000 to 2019



Source: India WRIS

4.4.1 Surface Runoff

The surface runoff is the excess water on the surface which does not get percolated in the ground. The surface run-off depends on lot of factors like slope of surface, soil types, coarse/texture of the surface etc. The excess water flows on the surface and adds into the streams or rivers. It has big potential to recharge the ground water or for direct use (for various purposes). Over the years the surface run-off has increased because of the change in landcover from agricultural to paved surfaces, thus increasing the surface runoff and leading to lesser ground water recharge and more chances of sudden floods. In case of village Mullana the build area has increased to over the years and similar problems are obvious. Even through the Household Surveys (HH Surveys) it was confirmed that the ground water has declined in the past years to the extent that all the village wells have dried up. For the development plan of Mullana, the surface run-off has been considered as one of the resources with objective to utilize and get benefit from it.

Some entries on the Grammanchitra website suggest that work has been carried out under MGNREGA to install recharge pits as marked on map (Figure 31).

Figure 31: Location of Recharge Pit as per the Surveys for Rainwater Harvesting

Source: Google map

Water Harvesting Potential: The built-up area of the Abadi in 2020 is approximately 1,29,00,000 sq m. As per data on WRIS India, the highest amount of rainfall was recorded in one day in June 2008 was 20mm (0.020m). Since the village settlements have semi-paved roads and houses with semi-paved surfaces the surface run-off coefficient was assumed as 0.60. The maximum amount of water that can be received in one day was calculated to be 1,54,800 cubic meters which is equivalent to 15,48,00,000 liters. Quantify the annual run-off (using average rainfall) total run-off throughout the years.

Similarly, if we assume the average annual rainfall of 800mm (.8 m) and similar settlement area, the quantity of surface runoff that can be harvested come out to be 61,92,000 cubic meters which is equivalent to 6,19,20,00,000 liters annually.

Figure 32 : Photograph showing surface drains and street with paver blocks

Source: Primary Survey (November 2020)

4.4.2 Surface Water Resources

Rivers – The closest surface water source for the GP of Mullana is the Markanda River, which is at a distance of 0.5 km from one edge of GP boundary. Markanda rises in the Shiwaliks near Nahan. In the first twenty miles of its course in the plains, it is joined by Sadarani and Begna torrents. During the rainy season the floods come down the Markanda with extraordinary suddenness and violence, spreading silt and sand over vast areas. Begna is a seasonal rivulet which originates in the Shivalik range and flows through Haryana. According to news articles from August 2019 (TOI, 2020), an increase in the water levels of the Begna led to flooding of villages, Brahman Majra, Hamidpur and Gola-Goli villages due to lack of an embankment or adequate drainage pipes. There also accounts of flooding of the Begna during the monsoon season from previous years. However, the village of Mullana is not at risk of flooding as it is located beyond the flood prone area of the river. The nearest flood affected village is Hema Majra village which is at a distance of 6.5 km from Mullana.

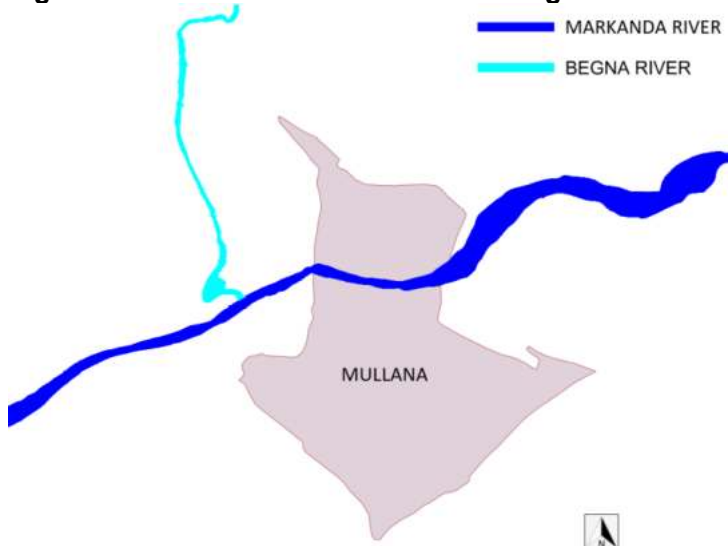
As per the primary surveys and key-person interviews conducted, there is no irrigation system developed within the village using surface water specially from the rivers or canals. Traditionally the wells and pond was being used and other major dependency was on the seasonal rains only.

Figure 33 : Map of River Begna & River Markanda with respect to Mullana



Source: Google map

Figure 34 : Confluence of Markand and Begna River



Source: Google map

Village Ponds and other water bodies - Village Ponds - A large water body, covering about 3.82 acres, is located on the north western edge of the village. It is essentially a pond replenished by rainwater. Although this water body holds religious and cultural significance for the village but it has been contaminated by sewerage discharge from the residential areas. There is another marshy plot on the North eastern edge of the village. Images from Google Earth timeline show that these marshy areas were earlier use to be retention ponds which decreased in size over the years.

Figure 35 : Photograph of the Village Pond



Source: Primary Surveys (November 2020)

Figure 36 : Marshy area in the north eastern edge of the village



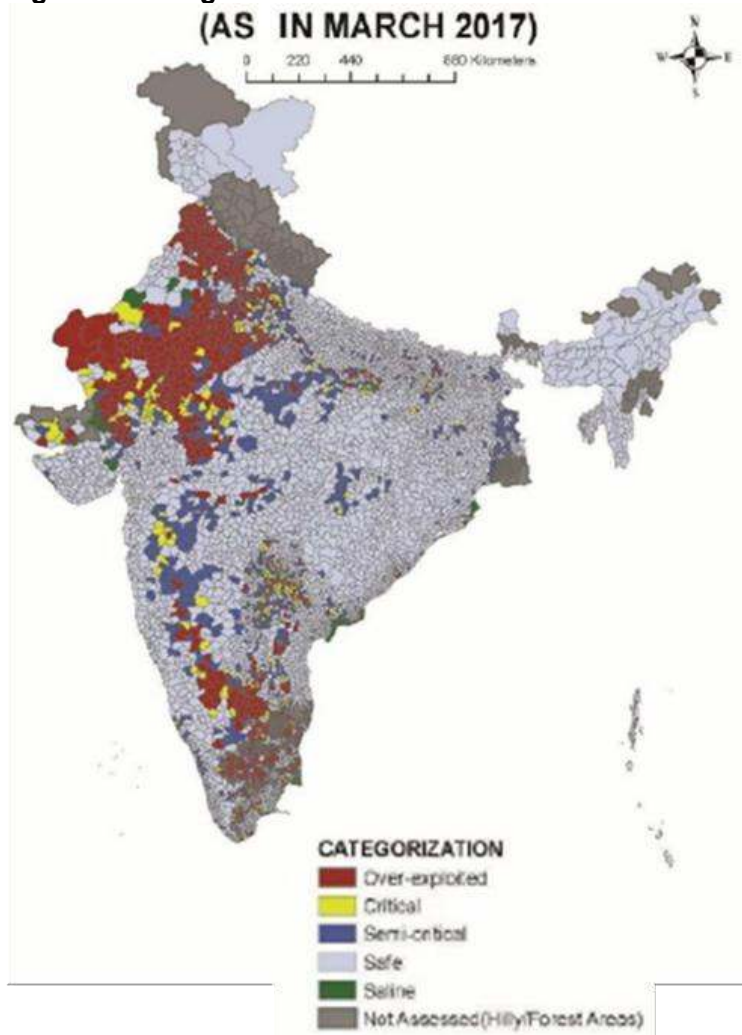
Source: Google map

4.4.3 Groundwater Resources and Potential

As per the National Compilation on Dynamic Ground Water Resources of India, 2017 (between the period of 2013 to 2017) Block Barara and Nearby blocks have been categorized as 'Over Exploited'. The designation of 'Over Exploited' is assigned to areas where the stage of ground water extraction more than 100% of the annually replenishable ground water recharge.

As per the above report, although areas in parts of Haryana have abundant replenishable resources there have been indiscriminate withdrawals of ground water leading to over-exploitation. The primary source of irrigation and water supply in the GP of Mullana is ground water, accessed through tube wells.

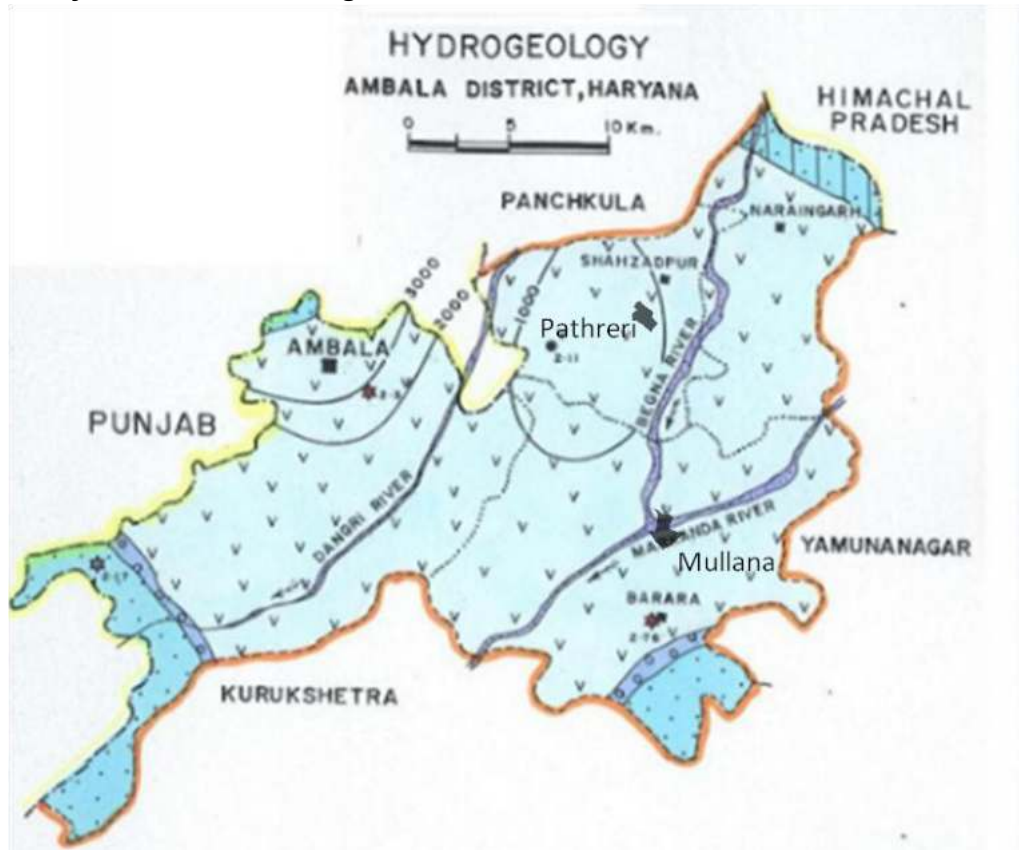
Figure 37: Categorisation of Assessment Units for Ground Water Availability



Source: CGWB 2017

Through the above map (Figure 37), it can be observed that the states of Haryana and Punjab predominantly lies in the over-exploited zones. This means the ground water recharge is lesser than the usage of ground water for different purposes. This establishes the reasons for the decline in the ground water-table and as a strong reason for dried wells in the village.

Figure 38: Suitability for Artificial Recharge Structures



INDEX

| | WELLS FEASIBLE | RIGS SUITABLE | DEPTH OF WELL (m) | DISCHARGE (lpm) | SUITABLE ARTIFICIAL RECHARGE STRUCTURES |
|--|--------------------------------------|-------------------------|--|-----------------|---|
| SOFT ROCK AQUIFER | TUBE WELLS | REVERSE / DIRECT ROTARY | 50 - 440 | 480 - 3200 | RECHARGE TRENCH WITH INJECTION WELL |
| SOFT ROCK AQUIFER | TUBE WELLS | REVERSE / DIRECT ROTARY | 20 - 100 | 360 - 480 | RECHARGE TRENCH AND RECHARGE SHAFT |
| SOFT ROCK AQUIFER | TUBE WELLS | REVERSE / DIRECT ROTARY | 20 - 60 | 240 - 360 | RECHARGE TRENCH AND RECHARGE SHAFT |
| ELECTRICAL CONDUCTIVITY (MICROMHOS / CM AT 25°C) | ★ IRON > PERMISSIBLE LIMIT (1.0 ppm) | | ● FLUORIDE > PERMISSIBLE LIMIT (1.5 ppm) | | |
| 1000 | | | | | |

Source:CGWB

4.4.4 Pollution potential assessment of Markanda river

Markanda River originates at Baraban in the hills of Katasan in district Sirmour of Himachal Pradesh. It flows from south-east to south-west direction and it passes on to the Ambala district, Haryana at Kala-amb. Areas of Bajora, Kala-amb the lands of Shambhuwala, Rukhri, fields of Bir Bikrambag and the Khadar Bag are irrigated by its water. Markanda River, during its flow through lower hills of Sirmour district in Himachal Pradesh receives domestic and industrial effluents from different villages around Kala-amb industrial town situated on its bank. The Kala-amb region in district Sirmour has about 350 industrial units and most of the units are situated around Markanda River. The major industries in these areas include pharmaceutical, chemicals, ghee industry, food industry, ferroalloy, paper & pulp etc. These industries, although developed with proper planning, but are discharging their effluents in the nearby natural drains and are being ultimately collected in Markanda river. Increasing industrialization and urbanization in these areas are resulting in the degradation of natural resources. The disposal of effluents generated by the industries into river, can pose a great threat to life.

4.4.5 Flood Problem

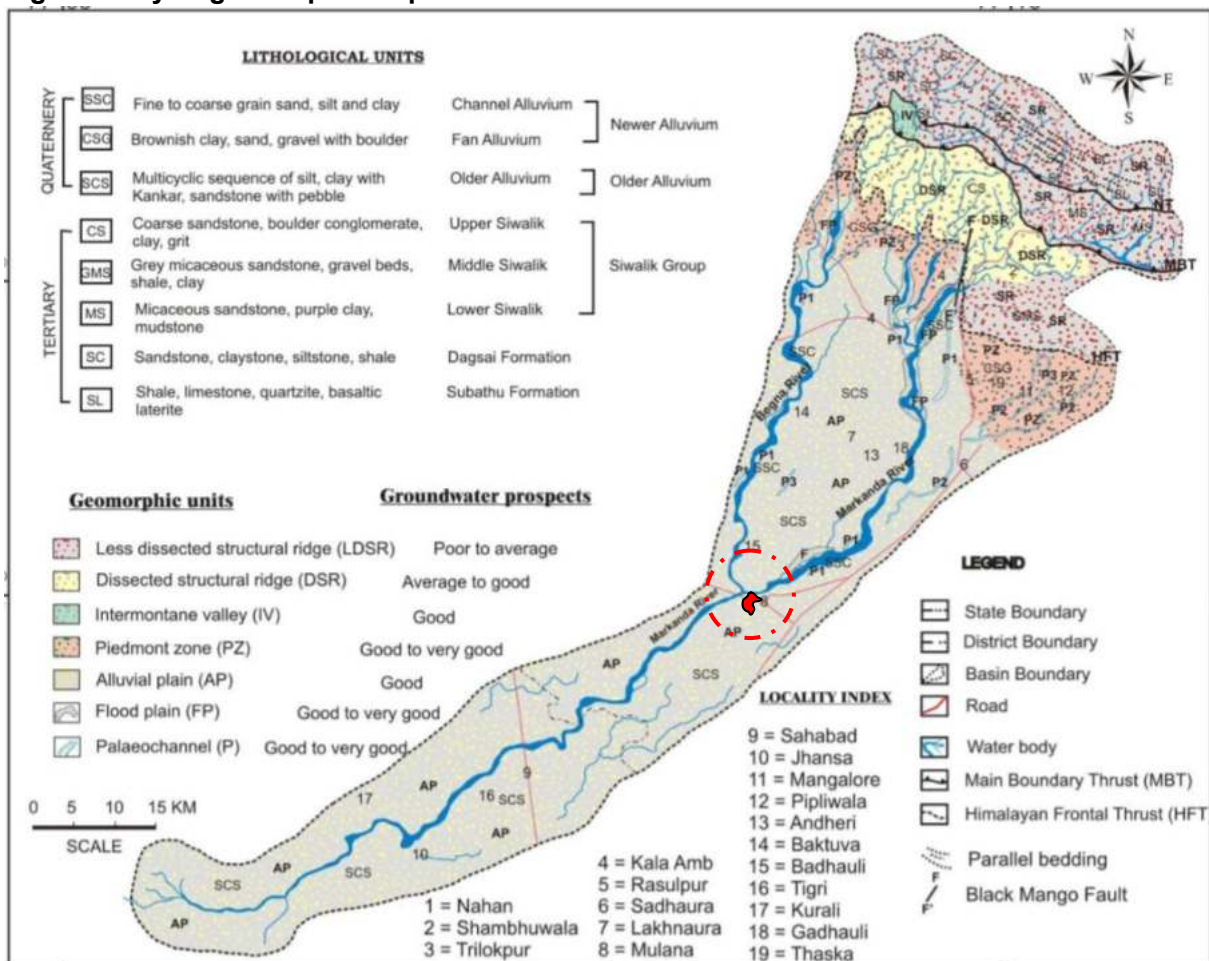
Over the years the river has turned seasonal but during monsoons, it swells up into a raging torrent, which is notorious for its devastating power power brings floods to villages and towns. The surplus water is carried on to the Sanisa Lake where the Markanda joins the Saraswati. There is a flood control structure built on river at Jalbehra in Kurukshetra district. Every year the river floods during monsoon. On August 2013 the infuriated Markanda breached several embankments in Ambala districts flooding many villages. The flood water damaged crops of hundreds of farmers. Similarly, on July, 23, 2016 this year high alert was sounded in Ambala after heavy rains flooded Tangri and Markanda rivers. According to news articles from August 2020 (HT, 2020), Several villages of Kurukshetra and acres of standing crops have submerged due to overflowing of Markanda river. the heavy rainfall led to the overflowing of river, whose water has entered Jharoli Khurd, Ajrana Kalan, Ajrana Khurd, Jhansa, Thaska Miraji, Khanjarpur, Bibipur, Kalsana, Kathwa, Tangor and Rohti villages of Shahbad block.

As per the primary surveys and key-person interviews conducted, Mullana is not at risk of flooding as Awadi Area is located beyond the flood prone area of the river.

4.4.6 Flood Plain

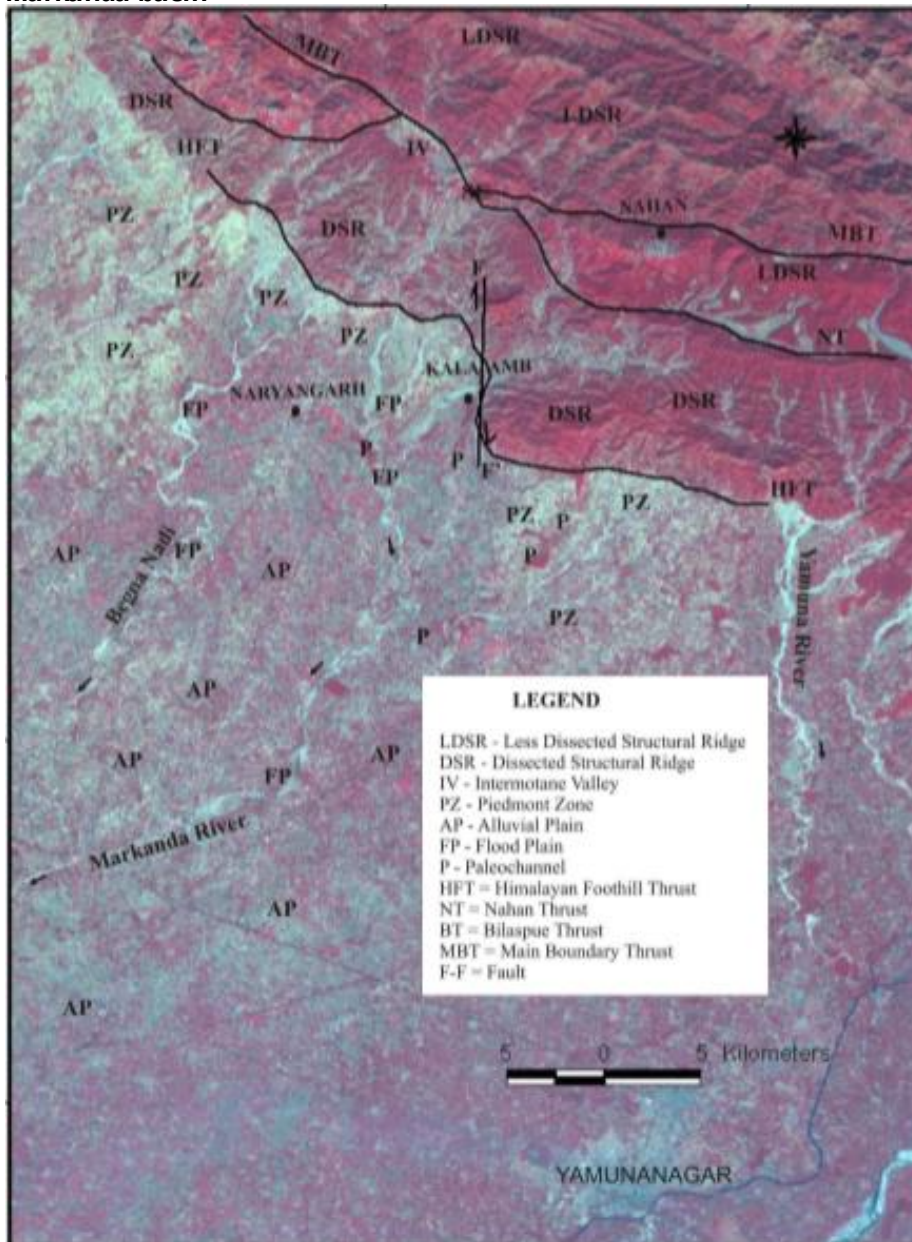
Flood plain is limited to the vicinity of the main river courses of the Markanda and its tributary, the Begna River. As the Markanda River being ephemeral stream, the flood plains are narrow and limited only to their courses. In FCC, they are displayed by dark greenish colour (location FP, Figure 40 in the moisture contained areas, while those areas covered with vegetations is marked by pinkish red colour. Freshly deposited and reworked dry sands are marked by white colour. Abandoned channels are present in flood plain. These abandoned channels formed good aquifers as they are hydraulically connected to the main river. The discharge rates in these areas around Mullana area (locations 8 as marked on map, Figure 39).

Figure 39 Hydrogeomorphic map of the Markanda river basin



Source: Journal Geological Society of India

Figure 40 : False Colour Composite (FCC) image of IRS 1D LISS III image of upper part of the Markanda basin



Source: Journal Geological Society of India

4.5 MAJOR FINDINGS

The settlement clusters are growing along the highway and the roads leading to the surrounding villages. As per the projected population growth a zoning plan would need to be put in place to allow for a well-rounded growth of the village including required infrastructure, facilities, and amenities.

As per the soil report cards (Welfare, 2019) - wheat, rice, bajra, sunflower, maize and mustard are the crops predominantly grown in this GP, which are suited to the nutrients present in the soil.

As per the primary surveys and key-person interviews conducted, Mullana is not at risk of flooding as Awadi Area is located beyond the flood prone area of the river.

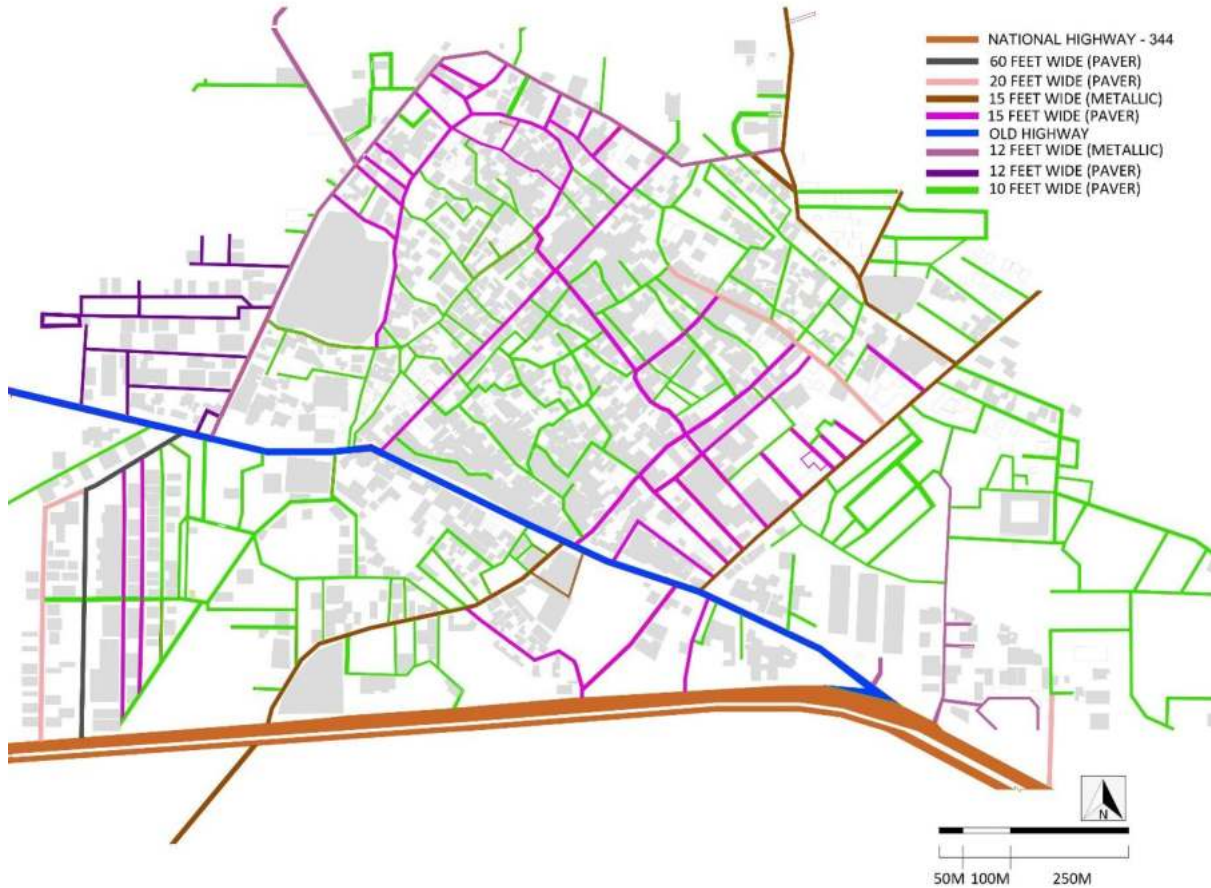
Ambala district only has the Markanda river as a surface water source, however this water cannot be channeled to Mullana, as it is contaminated by industrial effluents before it reaches the GP. A trend of decrease in the annual precipitation has been observed and this would result in a reduction of recharge of the aquifers, and thereby a steady decline in the water table level. Furthermore, the status of 'Over Exploited' w.r.to. ground water extraction is alarming. All these factors, along with the fact that the GP is only dependent on ground water sources for water supply both domestic and agricultural, indicates a future shortage of water if adequate measures are not implemented. Therefore, recharging the water table becomes essential particularly in the Abadi area.

5. INFRASTRUCTURE

This chapter includes the details of existing road network within the village, physical infrastructure, social infrastructure within the village.

5.1 ROAD NETWORK WITHIN MULLANA

Figure 41 Road Network within Mullana village



Source: Google Earth

Figure 41 shows the road network within the village. The road width varies from 10 feet to 60 feet. Almost all the roads are 'pucca' and are either metalled or are laid with concrete pavers.

Figure 42 Photograph showing surface drains and street with paver blocks (Source: Physical Survey, Nov 2020)



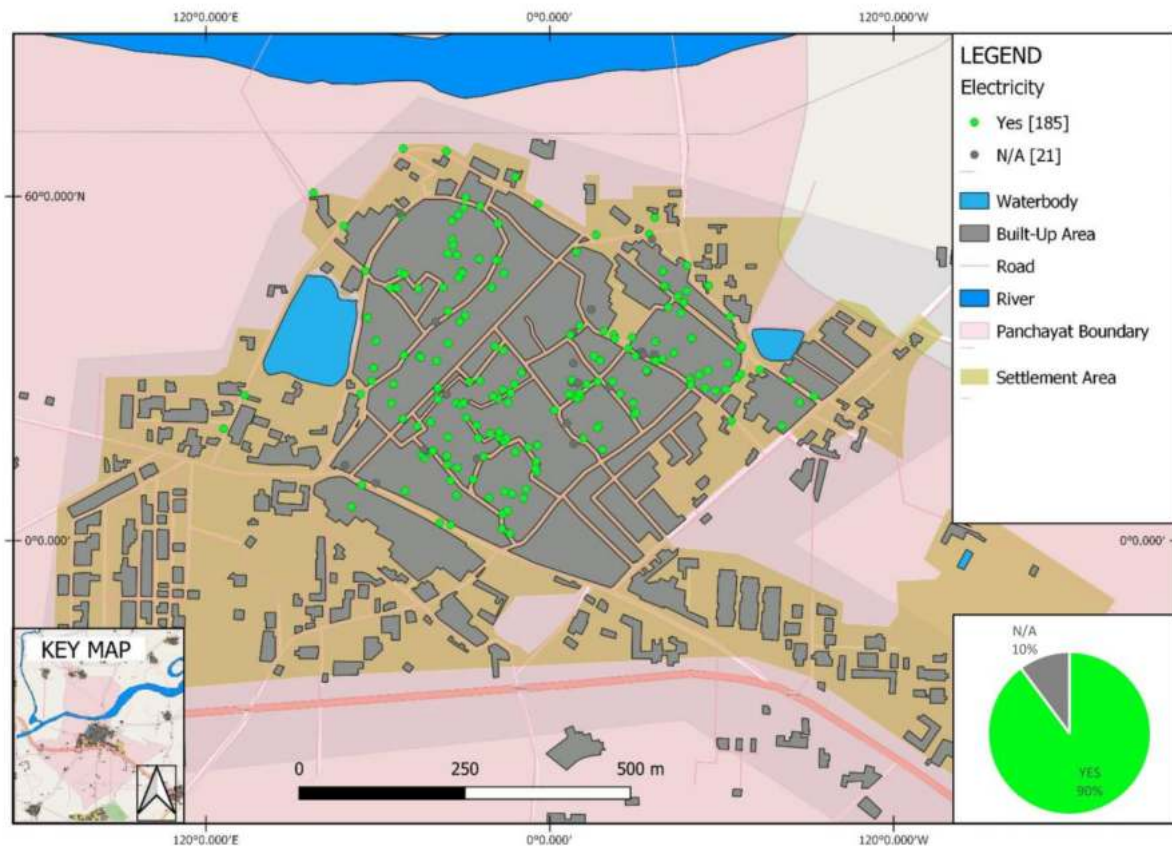
5.2 TELECOMMUNICATION

There is a BSNL telephone exchange within the village. The mobile networks are quite strong as per the household surveys, and the village has good digital awareness with almost each household having mobile phones with at least one member.

5.3 ELECTRICITY

As per the household survey and key person interviews, the village appears to have almost 100% electrification.

Figure 43 Household Survey - Electricity



Source: NRSC (Primary Survey)

5.4 WATER SUPPLY

The 'Abadi' area is serviced by 08 tubewells. One of the tubewell is connected to underground tanks. Of the three overhead tanks in the village two are not functional.

The water is supplied to the households directly from these tubewells. As per the key person interview held with the village Sarpanch, Sh. Naresh Kumar, there is no shortage of water supply in village. As per the requirement about 08 tubewells were installed. The village also has 06 old shallow wells, 05 of them have dried up and are not in use anymore whereas 01 is still in functional condition. Figure 47 Tubewells, water bodies and old wells. Figure 47 indicates the location of 08 tubewells & 06 wells.

Figure 44 Old Dried Well (Source: Physical Survey, Nov 2020)



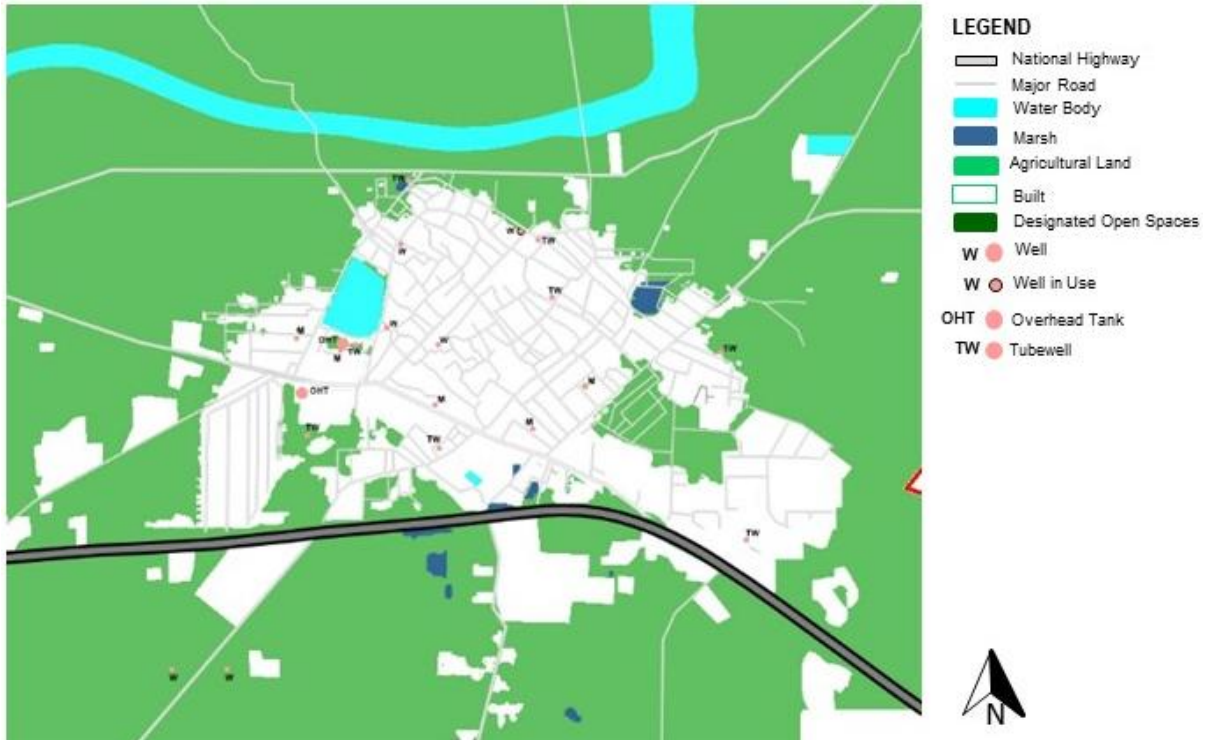
Figure 45 Tubewell connected with underground water tank (Source: Physical Survey, Nov 2020)



Figure 46 Well in functional condition within Abadi Area (Source: Physical Survey, Nov 2020)



Figure 47 Tubewells, water bodies and old wells



Source: Google Earth

5.4.1 Water Supply System in Abadi Area

The villagers have access to the tubewell water via private taps.

Private taps refer to households which have a dedicated supply line coming inside the house. As per household survey, 67% of population have private taps and 29% are using well. Most of these households store the water in overhead tanks.

Figure 48 Overhead water in Mullana (Source: Physical Survey, Nov 2020)



Figure 49 Household Survey - Water supply

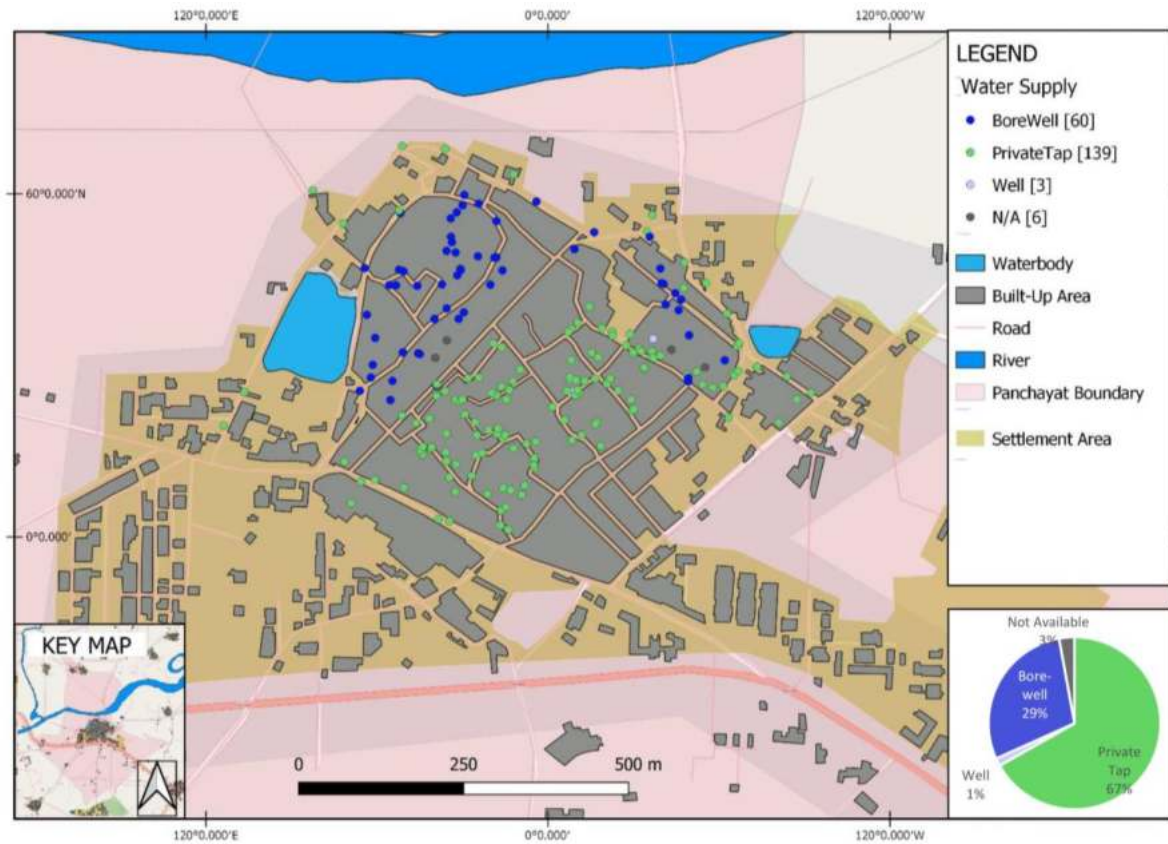


Figure 50 Overhead water tank near Sub Tehsil Office Mullana (Source: Physical Survey, Nov 2020)



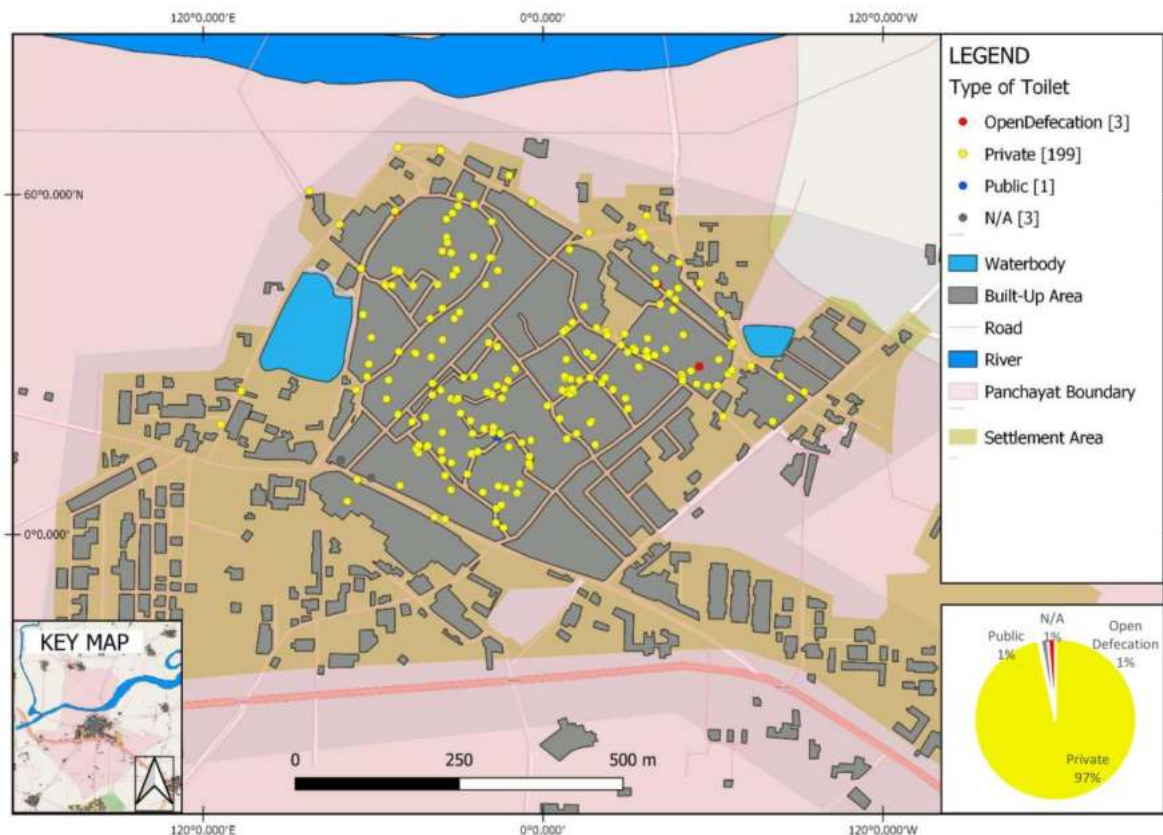
5.5 SANITATION

The sanitation section includes the availability of toilets to each household and the disposal of sludge and wastewater. The village primarily has surface drains which carry the wastewater from the household to the local pond. The water in pond undergoes a natural bleaching and treatment over time due to various chemical processes in the water through microbacteria's and various organisms inside water. However, linking to the previous section, where 44% of the households have access to groundwater through private borewells, also changes the user behaviour leading to more use of water. The increased use of water has also led to increased wastewater discharged into the pond because of which it stays saturated throughout the year. This implies that there is a need to augment the wastewater facility in the village.

5.5.1 Coverage of Toilets

As per the household survey, 97% of the sample size have private toilets, 1% have access to public toilets and 1% are reliant on open defecation.

Figure 51 Household Survey - Type of Toilet



Source: NRSC (Primary Survey)

5.5.2 Coverage of Sewerage Network

As per the household survey and the physical site survey, Mullana does not have a system for handling of sewerage or solid waste. There is a proposed STP for the village near 33kV Sub-Station on Mullana-Sohana road.

The current sewerage disposal comprises of an unregulated system of open street drains. Pipes extend out from the outer walls of houses and empty into the open street drains. This leads to bad odor in the streets. Surface runoff also drains into the open street drains. In case of heavy rainfall this leads to the severe water flooding on the streets.

Figure 52 Sewerage pipes opening in street drains (Source: Physical Survey, Nov 2020)



Figure 53 Sewerage pipes opening in street drains (Source: Physical Survey, Nov 2020)



The open street drains feed into open areas/ fields in different directions to the village. These areas have turned into marshy zones. This has resulted in odour as well as contamination of soil and ground water. These marshy zones further drain the overflow to Markanda river through 'nalas'.

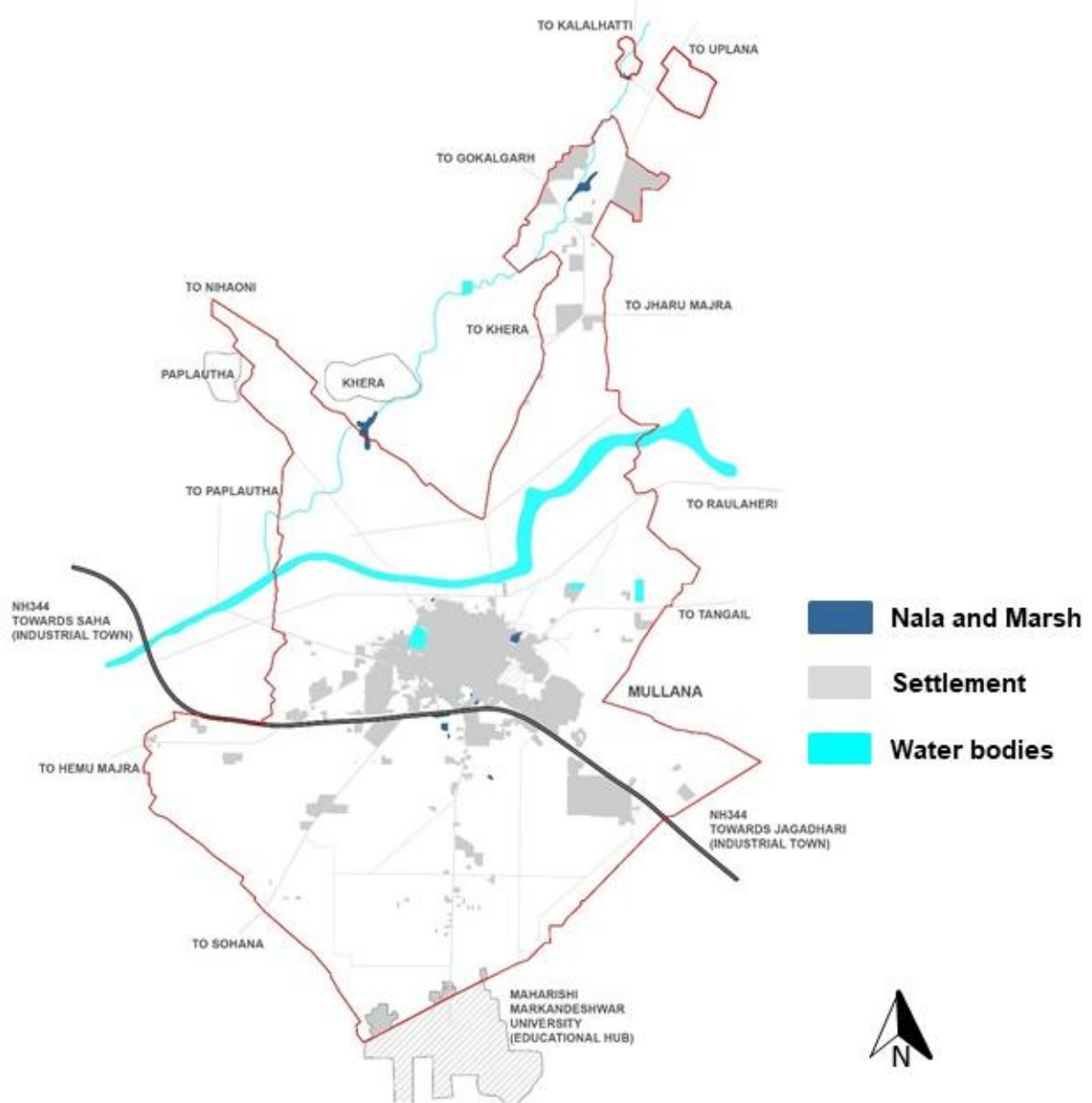
Figure 54 Overflow outlet of village pond in the corner (Source: Physical Survey, Nov 2020)



Figure 55 Overflow outlet drain of pond used for sewerage outlet (Source: Physical Survey, Nov 2020)



Figure 56 Sewerage drainage in village

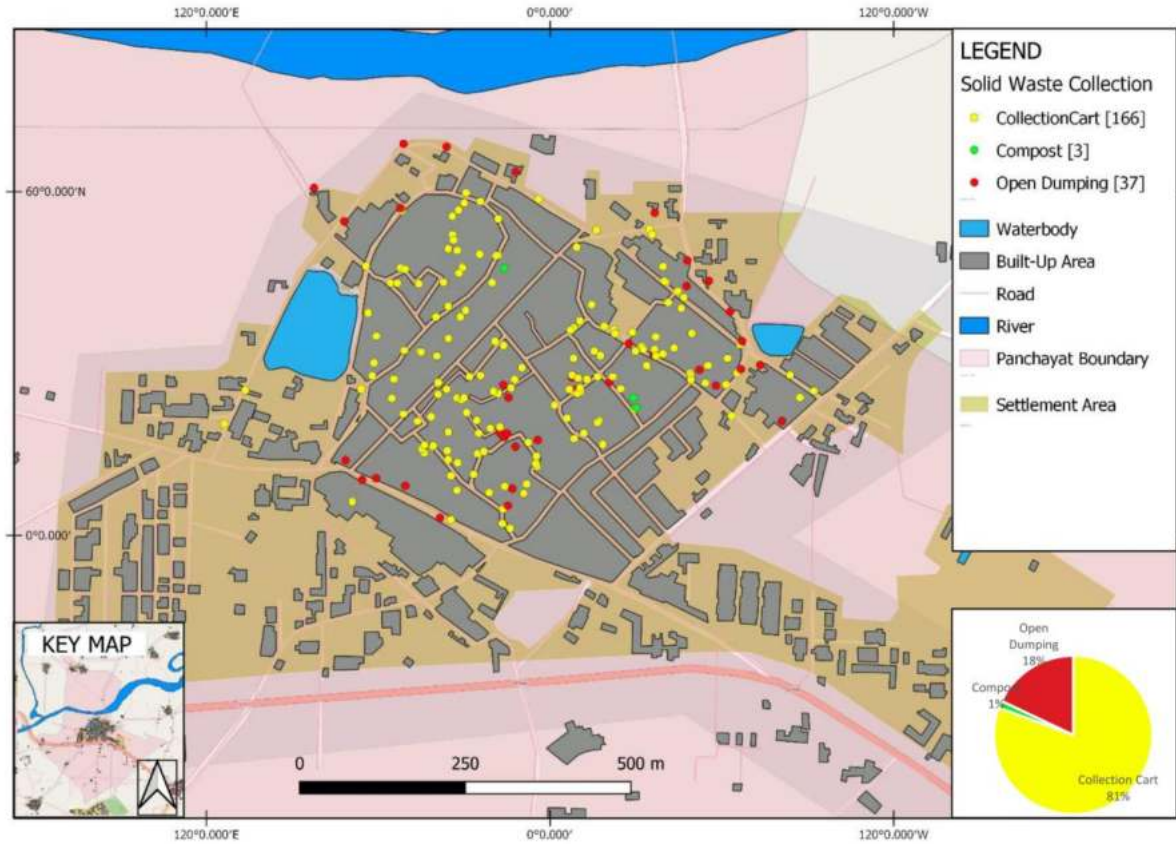


Source: Google Earth

5.6 SOLID WASTE MANAGEMENT

Solid waste management system in the village is unregulated to a large extent. Most of the solid waste is dumped on the edges of the village. As per the household survey, major portion of the village is serviced by a collection cart whereas residents of the other areas rely on open dumping. A few households are composting the solid waste.

Figure 57 Household Survey - Solid Waste Collection



Source: NRSC (Primary Survey)

The physical site survey showed that most of untreated solid waste was dumped on the edges of the village, although some entries in the household survey have denoted that they are practicing composting.

Figure 58 Site nearby Hanuman Temple where solid waste is being dumped (Source: Physical Survey, Nov 2020)



Figure 59 Figure 60 Site nearby Adharsh Anganwadi where solid waste is being dumped (Source: Physical Survey, Nov 2020)



Figure 60 Site along old Highway where solid waste is being dumped (Source: Physical Survey, Nov 2020)



5.7 MAJOR FINDINGS

There is no proposal which encompasses the entire village with regard to tackling the issue of rainwater drainage or harvesting.

A major problem that has been recorded in the village is the issue of sewage treatment and rainwater disposal.

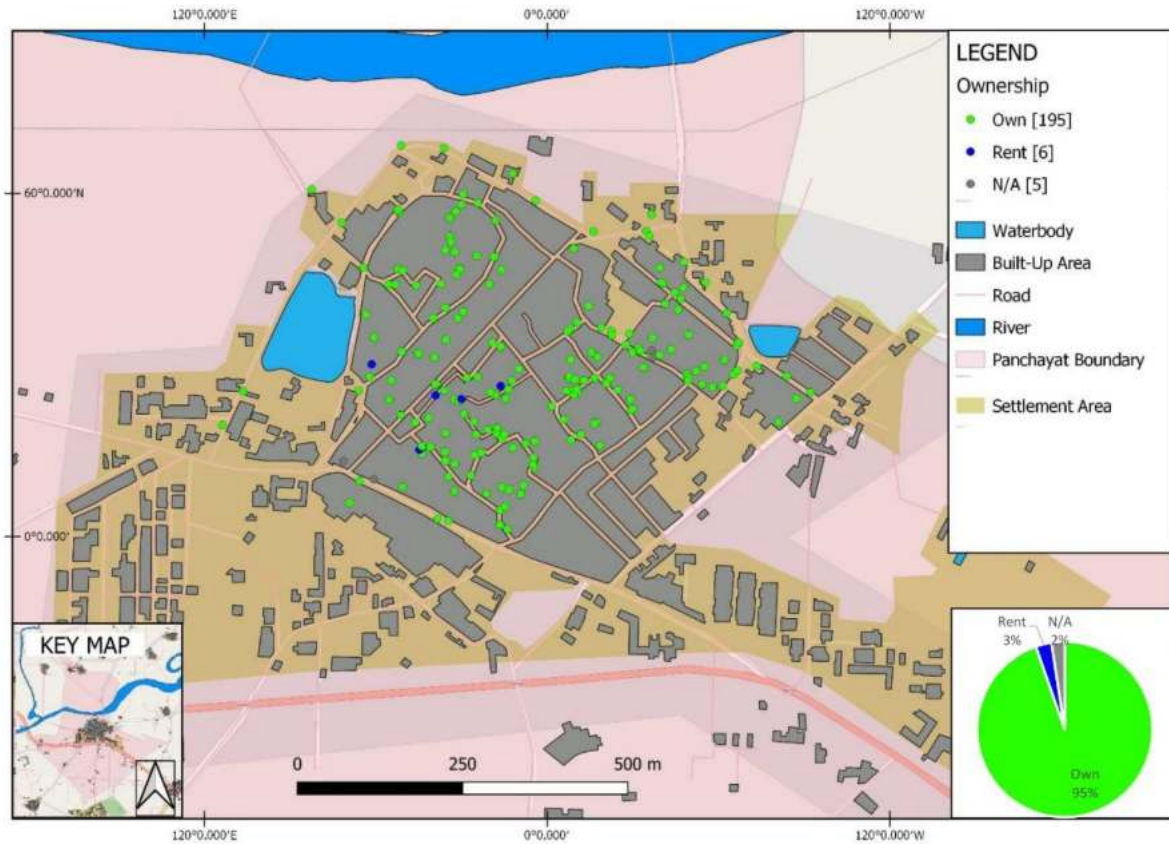
During the monsoon, certain areas of the village get water logged.

For this, the concerned departments dealing with sanitation of the village need to be brought in to propose a suitable system to solve this issue. For future expansion, underground sewer lines need to be laid and surface runoff needs to be channelled into recharge pits for rainwater harvesting.

6. HOUSING

Ownership - As per the household survey and key person interviews the housing situation in the village is adequate. The houses are mostly owned by the families residing in them Figure 61.

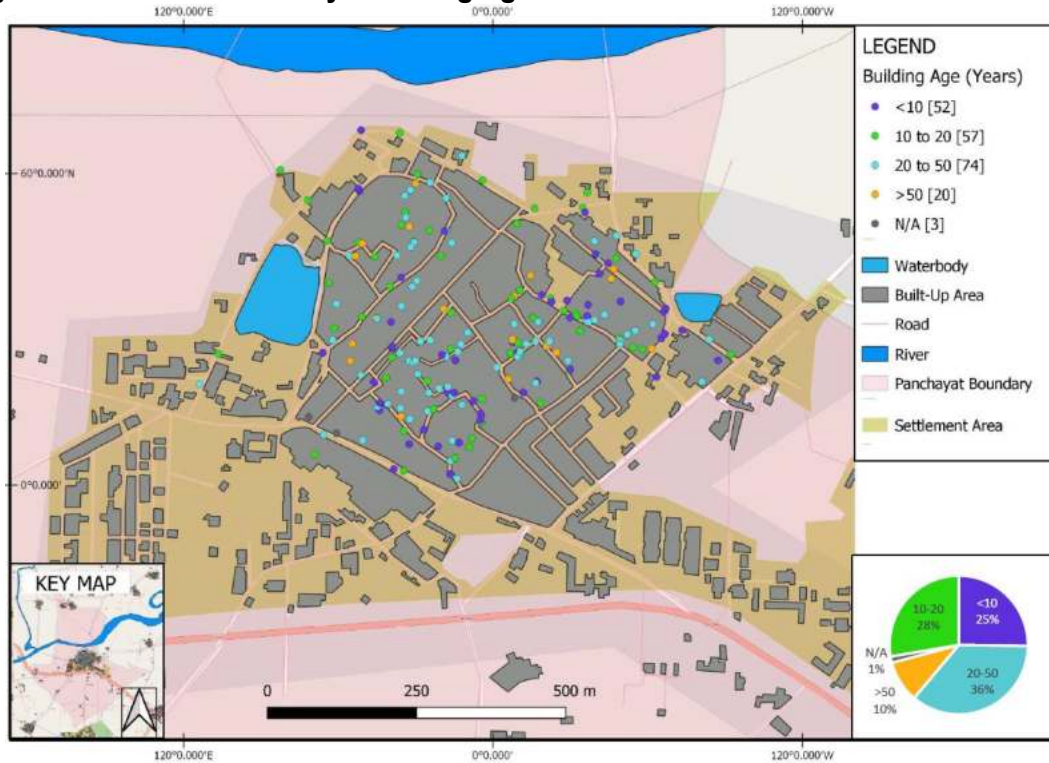
Figure 61 Household Survey - House ownership



Source: NRSC (Primary Survey)

Building Age - As per the household survey, one third of the buildings are recently constructed (36% of household survey respondents). About 10% are more than 50 years old Figure 62.

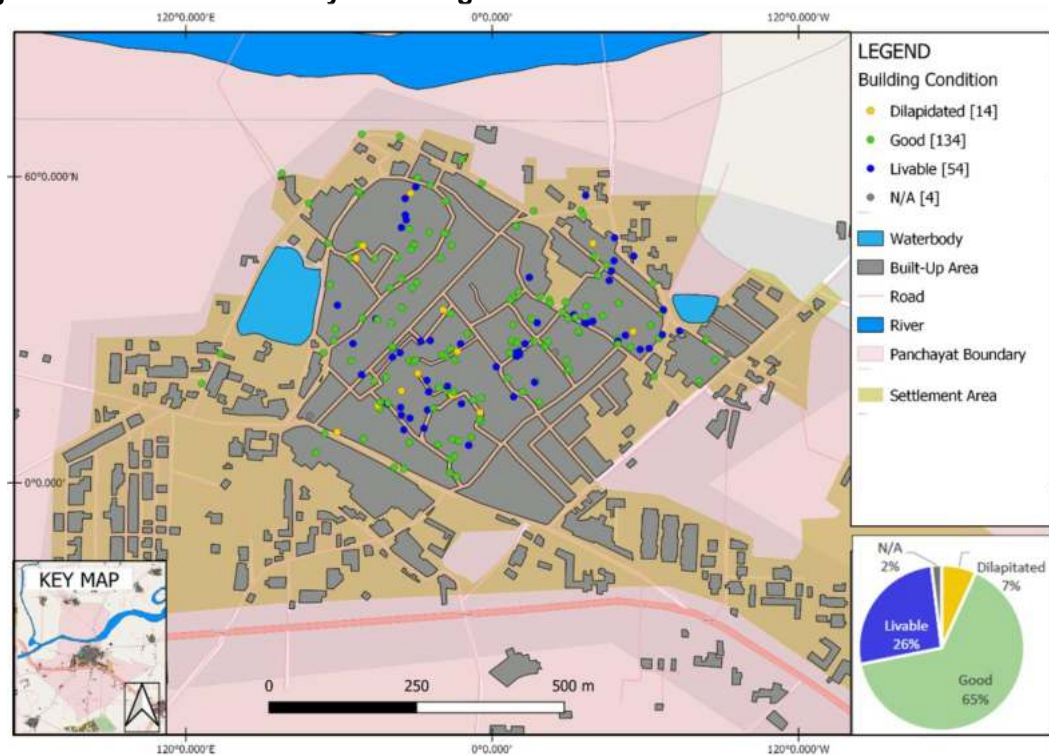
Figure 62 : Household Survey - Building Age



Source: NRSC (Primary Survey)

Building Condition- As per the household survey most of the houses are in good or livable condition Figure 63.

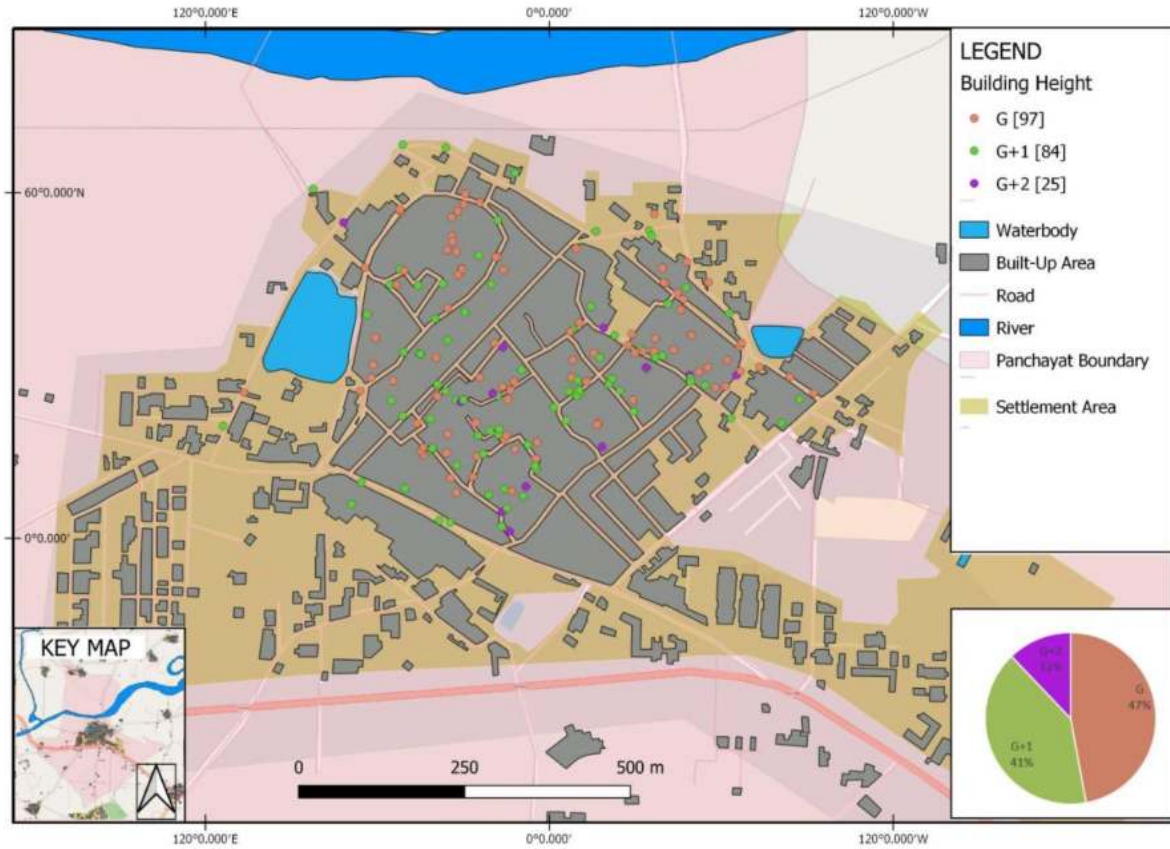
Figure 63 : Household Survey - Building Condition



Source: NRSC (Primary Survey)

Building Height - As per the household survey, most of the buildings in the village are single and double storey, with very few buildings have 3 storey **Error! Not a valid bookmark self-reference..**

Figure : 64 Household Survey - Building Height



Source: NRSC (Primary Survey)

Figure : 65 Single storey building (Source: Physical Survey, Nov 2020)



Figure : 66 Double storey Building (Source: Physical Survey, Nov 2020)



Figure 67 Double storey buildings in market street (Source: Physical Survey, Nov 2020)



Building Material - As per the household survey, it was recorded that 11% of the houses are 'kachcha' with bamboo/thatch/grass roof, 10% of the houses are 'semi-pucca' with brick/tin roof laid on a framework and 78% houses are 'pucca' with concrete roofs Figure 68.

Figure 68 : Household Survey - House Type based on Building Material (Source: Physical Survey, Nov 2020)

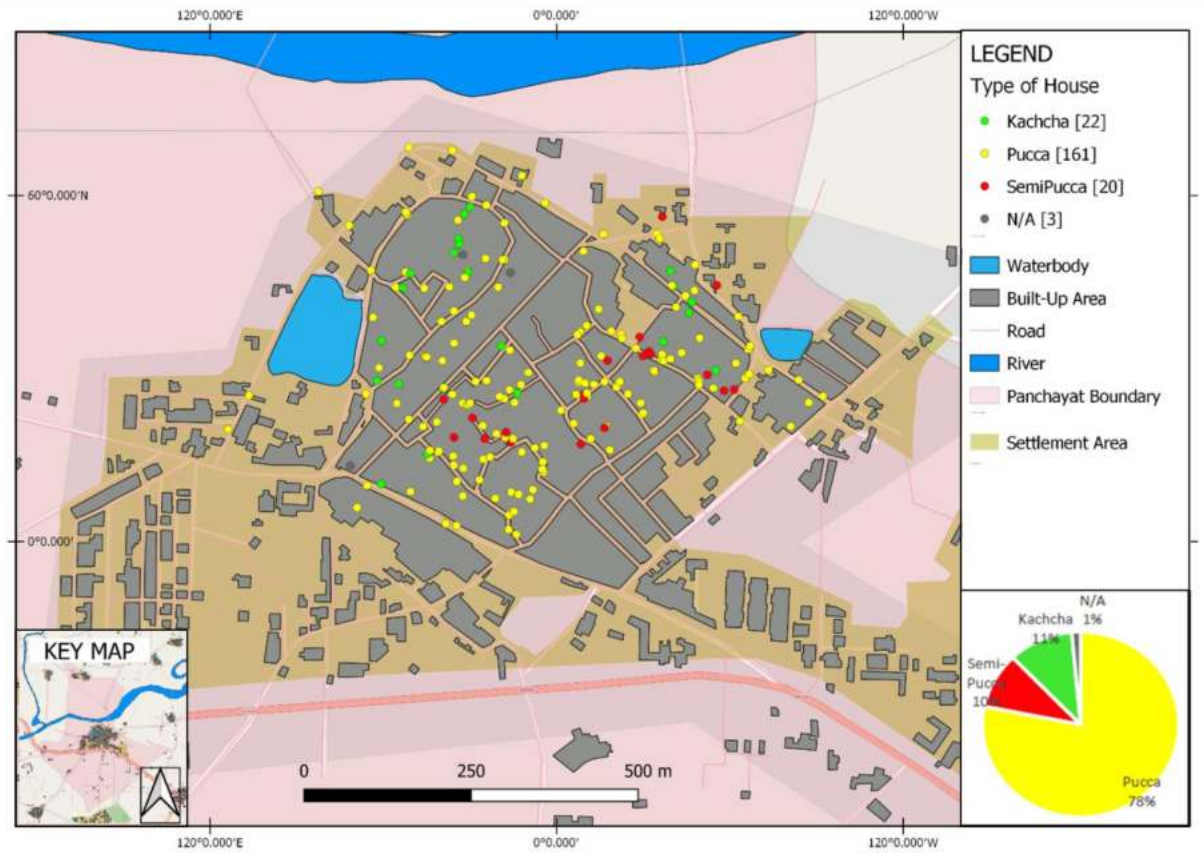


Figure 69 : Double storey Pucca Building (Source: Physical Survey, Nov 2020)



Figure 70 : Single storey building - Semi Pucca (Source: Physical Survey, Nov 2020)



Figure 71 : Semi Pucca Building (Source: Physical Survey, Nov 2020)



6.1 MAJOR FINDINGS

This material palette allows an economical, safe and strong structure to be built.

Only 7% of the sample survey structures are dilapidated.

7. PROPOSALS

The proposals for the Development Plan of Mullana were framed: a) considering shortcomings and supply gaps for major infrastructure facilities in the village. b) Considering the future needs of growing population and aspirations of the village residents. c) to bring in better infrastructure, digital connectivity, and opportunities in the village to reduce the outmigration from the village. Mullana has developed as an educational hub with a number of private educational institutes of higher level. Maharishi Markandeshwar University (MMU) is located just outside the GP boundary of the Southern side. The road connecting the settlement with MMU has experienced some development activities in small clusters. Keeping this trend active the proposed development strategies for the GP has been designed. The sector-wise proposals are discussed in the coming section.

7.1 PROPOSED LAND USE ZONING PLAN FOR MULLANA

Before delineating the land use zoning for the village, the population projection was done. Population trends from 1991, 2001, 2011 census data were analysed to develop a relevant method for the population projection. The population for these years is mentioned in Table 4. Surprisingly, the population increase in Mullana during 1991-2001 was 26.9%, but the population increase during 2001-2011 was 4.9%.

Table 4 Population trends for Mullana in 1991, 2001, 2011 and 2019

| Year | 1991 (Census) | 2001 (Census) | 2011 (Census) | 2019 (Antyodaya 2019) |
|--|------------------|------------------|------------------|--------------------------|
| Population | 7036 | 8927 | 9363 | 10547 |
| Decadal Population increase (in percent) | - | 26.9 | 4.9 | 12.6 |

Sources: Compiled by author from sources as mentioned in table

The detailed methodology for the population projection for Development Plan 2051 of Mullana is also explained. To start with the population projection was done till 2051 using population figures from Census year 2001 and 2011. The CAGR of 0.48% (Table 5) was calculated and used to do the population projections till 2051.

Table 5 Calculation of CAGR using 2001 and 2011 Population

| Year | 2001 (Census 2001) | 2011 (Census 2011) | CAGR (in percent) | 2019 (Antyodaya Report 2019) |
|------------|--------------------------|--------------------------|----------------------|------------------------------------|
| Population | 8927 | 9363 | 0.48 | 10547 |

Source: Compiled by author from sources as mentioned in table

The projected numbers for different years is mentioned in the Table 6. The population projection done using 2001 and 2011 population was cross-checked with the 2019 population (as per Antyodaya 2019). The Projected population for 2019 was almost 8% lower than the actual population of 2019. Also the projected population for the year 2041 is more similar to the actual population of 2019,

indicating the conflicts in the projections. if we consider the population growth during 1991-2001, 2001-2011, and 2011-2019, the 2001-2011 population growth looks little on pessimistic side and the growth during 1991-2001 looks too optimistic considering 26.9% decadal growth. Also the Antyodaya numbers cannot be as reliable as Census so it was thought to formulate some different method.

Table 6 Population Projection using 2001 and 2011 by CAGR Method

| Year | 2019 (Antyodaya 2019) | Projected Population | | | | |
|---|--------------------------|----------------------|------|-------|-------|-------|
| | | 2019 | 2021 | 2031 | 2041 | 2051 |
| Population Projection Using 2001-2011) | 10547 | 9727 | 9820 | 10300 | 10803 | 11331 |

Source: Antyodaya 2019 and Population projection using Census 2001 and 2011

It was thought that depending upon single decadal growth can be misleading, so the need for some calibration in the population projection was felt necessary. The population from Census 2011 and population from Antyodaya 2019 was considered to calculate another CAGR and another projection up to 2051 (Table 7). The CAGR for population growth during 2011-2019 is 1.5% which is almost 3 times the previous CAGR calculated for 2001-2011.

Table 7 Calculation of CAGR using 2011 and 2019 Population

| Year | 2011 (Census 2011) | 2019 (Antyodaya 2019) | CAGR (in percent) |
|------------|-----------------------|--------------------------|----------------------|
| Population | 9363 | 10547 | 1.5 |

Source: Census 2011 and Antyodaya 2019

The projected population for different years using 2011 and 2019 population is shown in Table 8. Both the projections were averaged and considered as more reliable figures. The projected population for the year 2051 is 14157 (shown in Table 8).

Table 8 Population Projection using CAGR from 2011 and 2019 Population

| Year | 2019 (Antyodaya 2019) | Population Projection | | | |
|--|--------------------------|-----------------------|--------------|--------------|--------------|
| | | 2021 | 2031 | 2041 | 2051 |
| Population Projection (Using 2011-2019) | 10547 | 10866 | 12610 | 14633 | 16982 |
| Population Projection Using 2001-2011) | 9727 (Projection) | 9820 | 10300 | 10803 | 11331 |
| Population Considered (after averaging) | - | 10343 | 11455 | 12718 | 14157 |

Source: Census 2011 and Antyodaya 2019

The purpose of the population projection is to find out the total infrastructure load and plan for the village by speculating different possible growth scenarios. So for

Mullana the CAGR was calculated for period during 2001-2011 and 2011-2019 and the average of both the was taken as more reliable numbers. The final population considered (as in Table 8) is on slightly higher side with respect to the CAGR method (as discussed in Table 6) will help to have adequate infrastructure and facilities to accommodate higher population as well. If the actual population during coming years varies from the population considered as mentioned in the Table 8, then the planning provisions can be made later as well.

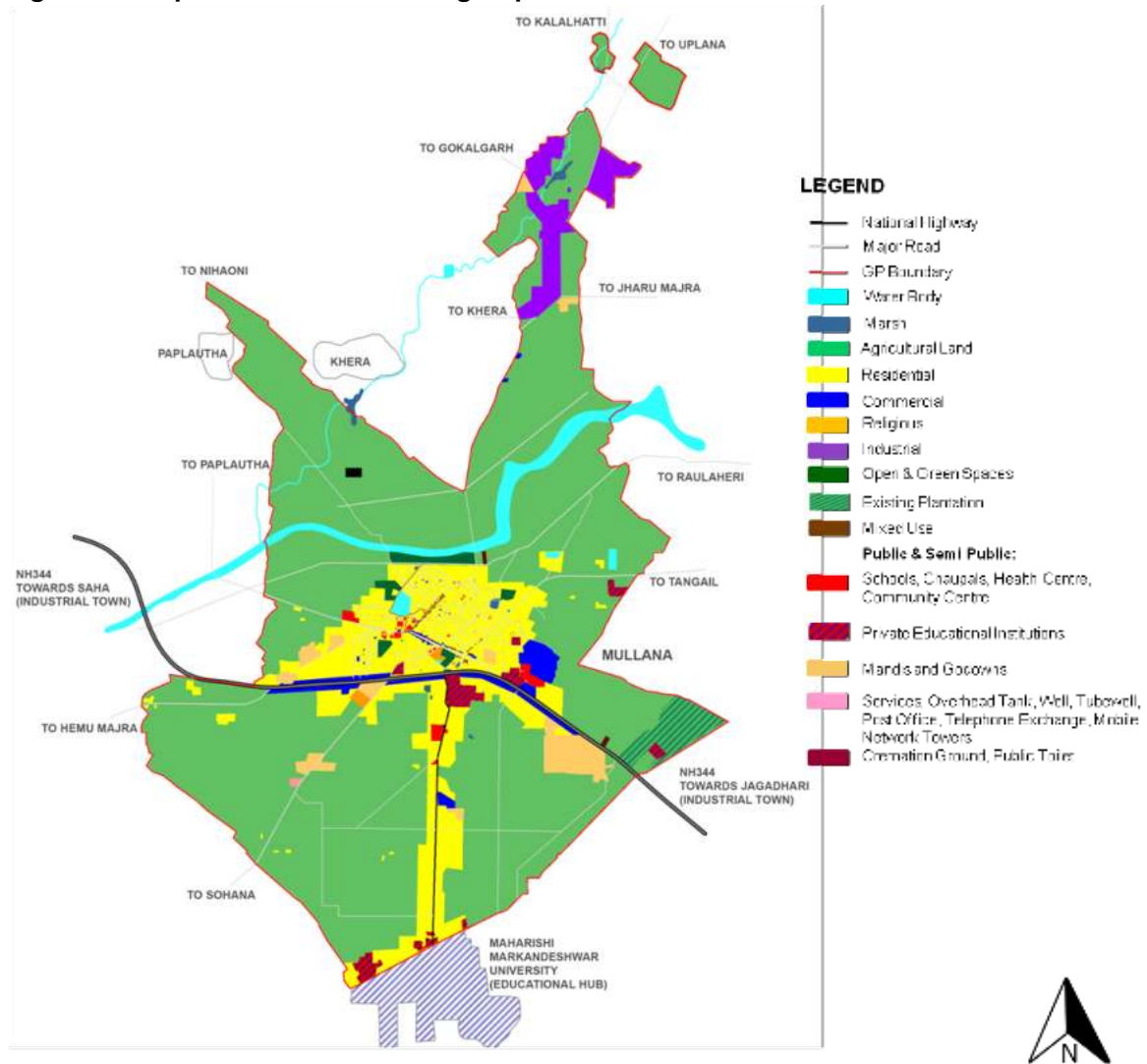
The population of Mullana till 2051 is speculated to grow to **14157**. For the present village Abadi area of 128 hectares and population (as per 2019 population), the gross density is 82 pph. For the speculated population of 14157, and total area after expansion (243 hectares) as per the development plan, the gross density of village will be 59 pph. It is important to take a note that Mullana have many educational institutions with huge open areas and also there are huge areas under the Mandi and logistics spaces. Also because of the presence of the river

7.1.1 Suitability and Parameters for Proposed Land Use Zoning

For reaching to the proposed land use zoning, the first consideration was to preserve eco-sensitive area and natural features. The Markanda river on the Northern side is a prominent natural feature within the village apart from the smaller waterbodies and green patches. The river also has some land adjoining to it which is more prone to flooding during heavy rainfalls. The planning process has been to preserve this river edge and also developing green areas along the river. The neighborhood level park has been proposed along the river side. The detailed proposals will be discussed in the coming section. Buffer of green spaces was strategized around all other sensitive natural features wherever possible. Later consideration was availability of government land for various facilities and provision for future and present population needs. The revenue plots were considered to delineate the outer boundary for expansion of the newer development area within the village.

The proposed land use Map for 2051 for the GP of Mullana has been devised keeping in mind the projected population for 2051, the consequent increase in various land uses over time, and the trends of growth of the Abadi area. The proposed land use zoning is different from the conventional planning approach by allowing different other type of activities within the major land use zones. The same will be discussed in later sections in detail. The reason for allowing such kind of mix is to retain the character of the village where various activities co-exists together. The Figure 72 shows the broad land use zoning for the Proposed Development Plan 2051 for Mullana village and Gram Panchayat.

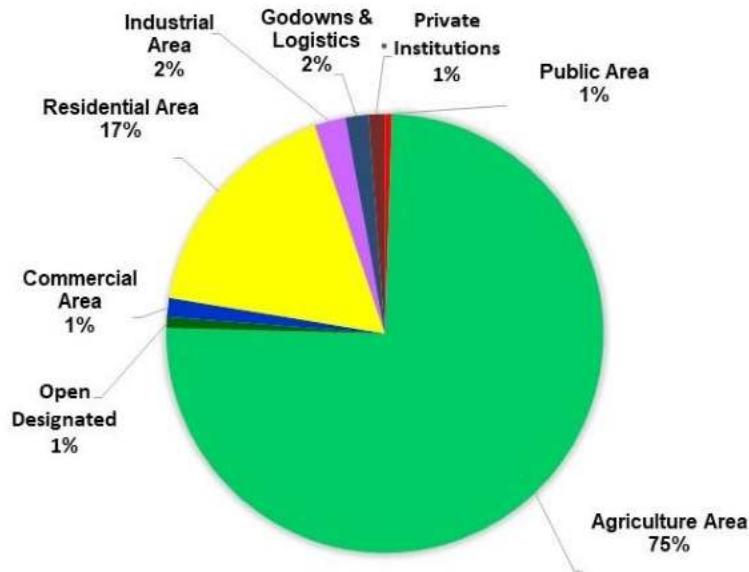
Figure 72 Proposed Land Use Zoning Map - 2051



Source: Compiled by the Author

As per the GP evolution maps shown in Figure 9, Figure 10 and Figure 11, the Markanda river is acting as physical edge for the expansion of the village on the northern side. Also, to restrict the development within the flood prone area the land parcel along the river on north side of the peripheral road of the village is dedicated under recreational area and neighbourhood park. The edge of the land should be kept in the natural material and vegetation to enhance water percolation of water and also to maintain the quality of the runoff to the river. Additionally, it has been proposed to strengthen the existing commercial and institutional areas (discussed in previous section) within the GP as per Figure 72. Consequently the distribution of Land Use percentage will be as per Figure 73.

Figure 73 Land use distribution for the proposed development plan – 2051



Source: Compiled by the Author

The educational/health/public facilities required for speculated population in 2051 were calculated using the standards from the RADPFI guidelines as shown in Table 9.

Table 9 Norms for Educational/health/public utility 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 1 km |
| Dispensary/ Health Centre | 1 for 5000 | .05 ha | Within 500 metres |
| Community Hall | 1 for 5000 | .05 ha | Within 1 km |
| Aanganwadi | 1 for 5000 | .05 ha | Within 500 metres |

Source: As referred from RADPFI guidelines

The norms for socio cultural facilities required is discussed in Table 10. Considering these norms and speculated population the facilities required to cater future population were calculated.

Table 10 Norms for socio cultural facilities

| Category | Population Served per unit | Land Area Requirement (minimum) |
|---|---|---------------------------------|
| Cremation Ground | One per Gram Panchayat or 5000 Population | 400 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. |

Source: As referred from RADPFI guidelines

Table 11 gives the status of the current infrastructure and what augmentation of said infrastructure would be required in 2051 as per norms discussed.

Table 11 Additional Infrastructure required as per projected population of 2051

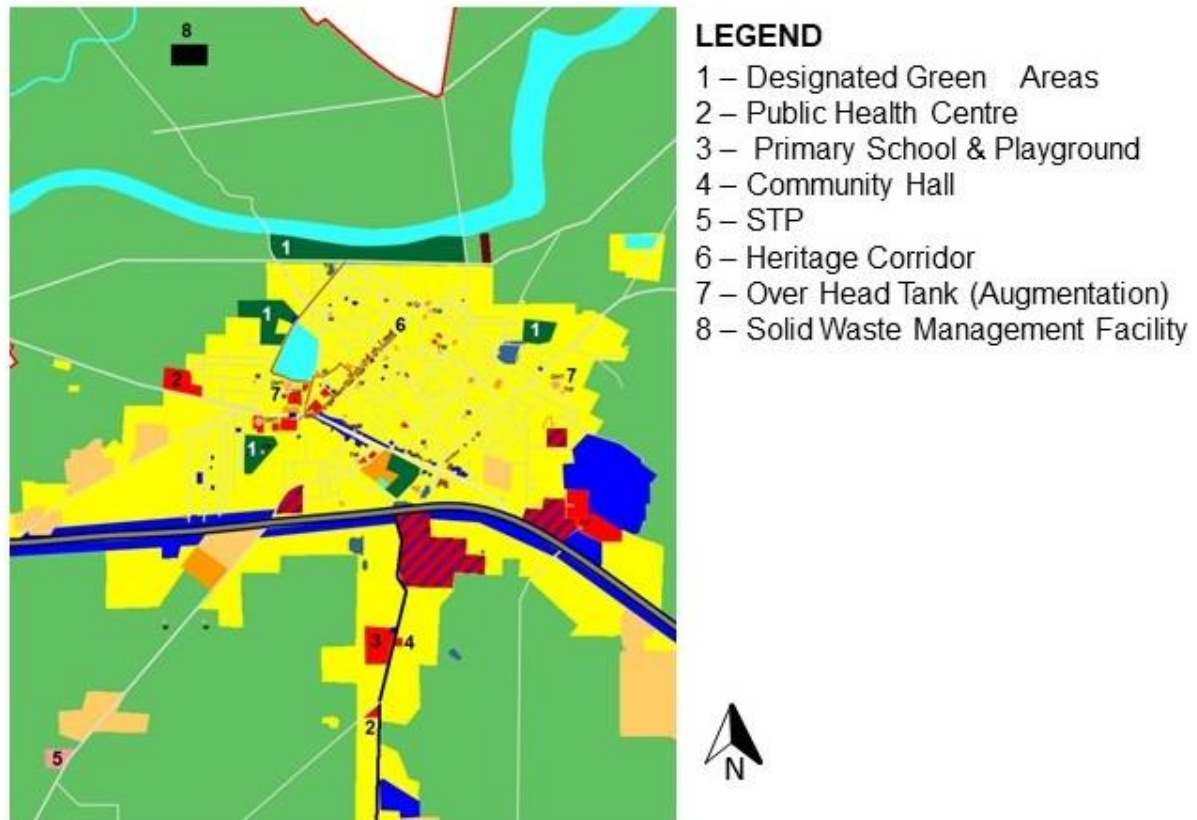
| Use | Required Infrastructure for 2051 (as per RADPFI) | Existing Infrastructure | Proposed Infrastructure in 2051 | Min. Area of each (in hectares) |
|---|--|--------------------------|---------------------------------|---------------------------------|
| Primary School | 3 | 2 Government + 1 Private | 1 | 0.05 |
| High School with Primary School | 1 | 1 Government | 0 | - |
| Dispensary/ Health Centre | 3 | 1 | 2 | 0.05 |
| Community Hall | 2 | 1 | 1 | 0.05 |
| Aanganwadi | 2 | 1 | 0 | - |
| Cremation Ground | 3 | 4 | 0 | - |
| Neighbourhood Park | 1 | 0 | 1 | 1.0 |
| Open Spaces/Parks | 2 | 0 | 2 | 0.5 |
| Playground /Ground for Fairs and Festivals | 3 | 2 | 1 | 1.0 |

Author: Compiled by the Author

The infrastructure facilities are placed strategically to locate them at positions where they are more accessible to larger area of population within shorter walking distances. Even the facilities were distributed on the southern side of the highway as well so that the future growth on that side also has better facilities nearby. Also, the various facilities were clustered together wherever possible, for example the Dispensary, Convenience shopping and Schools are clustered on the road leading to Maharishi Markandeshwar University (MMU). It is envisioned to have various facilities within the common boundary walls to facilitate the more accessibility and more efficient utilisation of the land resources. As part of the proposed expansion for

2051, the additional infrastructure has been added in the development plan and their locations are demarcated as per the proposed infrastructure facilities are shown in Figure 74.

Figure 74 Proposed infrastructure sites



Source: Compiled by the Author

The villages traditionally have mix land use activities in general, which was confirmed for case of Mullana through the field surveys to the village. The effort to retain the current character of the village is essential as there are different land use activities permissible within the major land use zones. So considering the local requirements and context of Mullana village, proposed regulations were formulated differently for different activities which are discussed in upcoming section. The permissibility of various land uses is discussed in Table 12: Permissibility of Various Land uses within Major Land Use Zones.

Table 12: Permissibility of Various Land uses within Major Land Use Zones

| S. No. | Land Use Zoning | Permissible Land uses/Activities | Remarks |
|--------|------------------------|--|---------|
| 1 | Residential | <ul style="list-style-type: none"> • Residential • Commercial (only convenience shops) • Cattles for Domestic use only • Small Religious where already existing • Household industries | |
| 2 | Commercial | <ul style="list-style-type: none"> • Residential • Commercial • Palaces, Marriage halls • Storage, Godowns as per road widths • Hospitality • Household industries • Health | |
| 3 | Agricultural | <ul style="list-style-type: none"> • Agriculture • Religious • Farmhouses • Livestock • Poultry • Recreation • Health | |
| 4 | Industrial | <ul style="list-style-type: none"> • Agriculture • Recreation • Farmhouses • Livestock • Poultry • Any other Agro-based industry with organic byproduct only and no effluents | |
| 5 | Public and Semi Public | <ul style="list-style-type: none"> • As specified | |

7.1.2 Regulations and Bye Laws

The village character was observed to be organic and mix of various activities along with other activities. In the proposed land use regulations, this character was preserved by allowing co-existence of certain activities together. But at the same time, it was important to restrict certain activities in the zones where they can be nuisance to the other lower hierarchy functions or activities. For framing the overall building regulations, RADPFI guidelines and tables mentioned in it were followed. In addition to the Table 12 **Error! Reference source not found.**, the activities within the plots or land parcels shall also be governed by the Right of Way (ROW) of the roads providing access to the respective plots/land parcels. The activities with non-compatible uses will be filtered through this.

Since the land use zoning as mentioned in , allows various activities within one zoning, it becomes important to regulate some activities which can create nuisance as well. In order to keep a check of certain activities which can be non-compatible to the major land use activity because of right of way (ROW), the attempt have been made to eliminate such activities. The Table 13 discusses the permissible land use activities on different road widths as per their space consumption, spread pr footfall on the roads. The following will be applicable in the GP boundary, however the Panchayat has the power to withdraw certain activities which may not adhering to the standards for creating pollutions or degrading the natural features/ecosystem. The old commercial area within the village Abadi area is preserved and demarcated as commercial development only.

Table 13: Road Widths and Permissible Land Uses for proposed roads

| S. No. | ROW | Building Uses Permissible |
|---|-------------------------------|---|
| 1 | Less than 15 feet | <ul style="list-style-type: none"> Residential |
| 2 | 15 feet and less than 24 feet | <ul style="list-style-type: none"> Residential Convenience Shopping Health Agricultural |
| 3 | 24 feet and less than 30 feet | <ul style="list-style-type: none"> Residential Convenience Shopping Health Local Commercial Religious Agricultural Household industry |
| 4 | 30 feet and less than 40 feet | <ul style="list-style-type: none"> Residential Commercial Religious Institutional Educational Agricultural Industrial as per Table 18 Industrial Norms |
| 5 | 40 feet and less than 60 feet | <ul style="list-style-type: none"> Residential Commercial Religious Institutional Agricultural Industrial (Non-Polluting) |
| 6 | 60 feet above | <ul style="list-style-type: none"> Hotels, Malls Godowns and Logistics All uses except not permissible in Table 13 |
| The polluting industries or industries with emissions and effluents are not permitted in the village except for the industries sanctioned by the state. | | |

Source: Compiled by the Author after analytical analysis

The building heights are regulated as mentioned in Table 14 to ensure there is sufficient light and ventilation on the streets and to the openings of the buildings which are towards the streets. However, the height of the buildings within the Abadi area is restricted to 24 feet maximum in order to maintain the built form characters of the buildings.

Table 14: Permissible Building Heights on Different ROW

| S. No. | ROW | Building Height (meters) | Permissible |
|--------|-------------------------------|--------------------------|-------------|
| 1 | Less than 12 feet | Maximum 24 feet | |
| 2 | From 12 feet up to 15 feet | Maximum 27 feet | |
| 3 | 15 feet and less than 40 feet | Up to 36 feet | |
| 6 | 40 feet and above | Up to 48 feet | |

Table 15 discusses the other parameters applicable for the residential development within the Abadi area and outside the Abadi area as well.

Table 15 Parameters for residential buildings

| S. No. | Plot Area in sq. yards | Maximum Ground Coverage (in percent) | FAR | Setbacks | | | Minimum Open space in percent |
|--------|------------------------|--------------------------------------|-----|----------|------|------|-------------------------------|
| | | | | Front | Side | Back | |
| 1 | Below 50 | 90 | 1.8 | - | - | - | 10 |
| 2 | 51-100 | 80 | 1.8 | - | - | - | 20 |
| 3 | 101-200 | 75 | 1.5 | - | - | - | 25 |
| 4 | 201-300 | 65 | 1.2 | - | - | - | 35 |
| 5 | 301-500 | 60 | 1.2 | 10* | - | 5* | 40 |
| 6 | Above 501 | 50 | 1.0 | 15* | - | 10* | 50 |
| 7 | **Farmhouse | 15 | .3 | 50 | - | 20 | 85 |

**Includes farms houses within the agricultural zoning

* Only applicable for new construction outside the Abadi areas.

The setbacks are not being enforced for the smaller plot sizes as it has been observed during the course of the study that the rural character of the village is reflective of the lifestyle of the people and therefore it needs to be preserved. The traditional structures within the village have rooms with windows towards the streets, and central courtyard after a wide passage from entrance. This kind of built form is also favourable as per the climatic conditions in the area. This self-shading streets with projections on streets and open courts, & verandahs within the plot area help to keep building cooler and well ventilated during the hot climate.

Table 16 Parameters of Commercial Building

| S. No. | Use | Ground Coverage in percent | FAR | Maximum Height (in feet) | Front Setbacks (in feet) |
|--------|--------------------------------|----------------------------|-----|--------------------------|--------------------------|
| 1 | **Convenience Shops | 75 | 1 | 24 | 6 |
| 2 | **Local Shopping Centre | 50 | 1 | 24 | 10 |
| 3 | Gram Panchayat Shopping Centre | 40 | 1.2 | 30 | 15 |

*Minimum size of plot is 25 sq. yards.

** in case of commercial areas within the Abadi area the regulations can be exempted after ensuring minimum light and ventilation.

For all institutional buildings and community spaces within the GP boundary should abide by the regulations as discussed in Table 17.

Table 17 Institutional and Community Spaces norms

| S. No. | Plot Size (in sq yards) | Ground Coverage in percent | FAR | Maximum Height (in feet) | Setbacks (in feet) | | |
|--------|-------------------------|----------------------------|-----|--------------------------|--------------------|------|------|
| | | | | | Front | Side | Back |
| 1 | 500-1000 | 40 | 1.2 | 21 | 15 | 10 | 10 |
| 2 | 1001-2000 | 30 | 1.0 | 30 | 15 | 10 | 15 |
| 3 | 2001-4000 | 30 | 0.9 | 30 | 20 | 10 | 15 |
| 4 | Above 4001 | 25 | 0.9 | 40 | 30 | 10 | 20 |

For any kind of industrial development within the village area the ground coverage, setbacks and other parameters should be followed as mentioned in Table 18.

Table 18 Industrial Norms

| S. No. | Plot Size (in sq yards) | Ground Coverage in percent | FAR | Maximum Height (in feet) | Setbacks (in feet) | | |
|--------|-------------------------|----------------------------|-----|--------------------------|--------------------|------|------|
| | | | | | Front | Side | Back |
| 1 | 100-200 | 75 | 1.5 | 24 | 10 | - | - |
| 2 | 201-500 | 65 | 1.2 | 24 | 10 | - | 10 |
| 3 | 501-1000 | 55 | 1.2 | 24 | 15 | - | 10 |
| 4 | 1001-2000 | 50 | 1.0 | 24 | 20 | 10 | 10 |
| 5 | 2001-4000 | 40 | 0.8 | 24 | 24 | 10 | 15 |
| 6 | Above 4001 | 30 | 0.6 | 24 | 30 | 10 | 15 |

7.1.3 Minimum Standards for the Light and Ventilation of Buildings

Since the approach followed for the Development Plan was to retain and follow the village character by not following the setbacks (in case of residential use), but it is still important to fulfill the minimum light and ventilation requirement in the buildings. Though the light and ventilations will be taken care through the setbacks (in case of uses other than residential) and open areas provided in Table 15, but there must be some minimum standards to make it sure that there is no compromise in health and

sanitation conditions. The Table 19 provides the minimum dimensions for the Open to Sky(OTS) areas within the buildings regulated by the building heights.

- All the habitable rooms must have openings of minimum 20% of the floor area towards the OTS.
- In case of ventilation for toilets, the minimum dimensions for the ventilation shaft should be 3 feet in case not artificial ventilation is provided.
- For the below table, the depth of the habitable room borrowing light and ventilation from the Open to Sky (OTS), must not be more than the 10 feet or 3 times) of the minimum dimensions as provided (whichever is higher).

Table 19 Minimum Standards for the light and Ventilation of Buildings

| S. No. | Building Height (Feet) | Minimum side (Feet) |
|--------|------------------------|---------------------|
| 1 | Up to 12 | 3 |
| 2 | 12-24 | 4 |
| 3 | 24-30 | 6 |
| 4 | Above 30 | 10 |

*In case buildings not conforming to the above regulations, there must be provisions for artificial ventilation and air conditioning.

7.1.4 Parking Norms

Given below are the norms for parking for different building typologies.

Table 20 Parking Norms applicable for different Land Uses

| S. No. | Use | No. of EVS*/ECS* |
|--------|---|--|
| 1 | *Residential | <ul style="list-style-type: none"> • 1 EVS for 100-200 sq. yard plots • 1 ECS and 1 EVS for 201-500 plots more than 201 sq. yards • 2 ECS and 1 EVS for plots more than 500 sq. yards |
| 2 | Multi-Family Residential | 1 ECS for 100 sq. yard of the built-up area and 1.25 for every additional 100 sq. yards of built-up area |
| 3 | Motel | 1 ECS per guest room provided |
| 4 | Wholesale Mandi, Godown and Cold Storage | 2 ECS per 550 cu. Yard storage. 2 ECS per 100 sq. yards built-up area |
| 5 | Offices, Conference Hall, Banquet Hall, Marriage Palace | 2 ECS per 100 sq. yards built-up area |
| 6 | Educational | 1 ECS per 100 sq. yards built-up area |
| 7 | Industrial | 1 EVS and .5 ECS for 100 sq. yards built-up area |

- * In case of plots inside narrow lanes, some alternative provisions must be made by the owners for the required parking as per the rules.
- *This is the minimum required parking space for the above mentioned uses, for any increased vehicle ownership, the owner must have to arrange for alternative parking provisions within the same plot or some other plot.
- *The plot with no front offsets (as per regulations), must follow the parking norms and must give parking under the covered porch or in the courtyard after providing passage.
- ECS stands for Equivalent Car Space, which is 23 sq. meters, if provided in open.
- EVS stands for Equivalent Vehicle Space, which is inclusive of Light Commercial Vehicles and tractors with trailers and non-motorised vehicles like bullock carts.

Table 21 Building Controls for Building Activities along Highways

| Type of Building Activity | National Highway or State Highway (Front Setback in feet) | Major District Roads | Village Roads (All subcategories) |
|--|---|----------------------|-----------------------------------|
| Theatres, Industrial Units etc., Major Commercial Establishments | 26 | 16 | 10 |
| Residential | 16 | 10 | 10 |
| Institutional | 27 | 16 | 10 |

Table 22 Plot Size, Ground Coverage, FAR, height for schools

| S. No. | Use | Minimum Plot Size (in sq. meters) | Ground Coverage (In percent) | FAR | Height | Setbacks (in feet) | | |
|--------|---------------------------|-----------------------------------|------------------------------|-----|--------|--------------------|------|------|
| | | | | | | Front | Side | Back |
| 1 | Nursery School/ Anganwadi | 500 | 33 | 1.0 | 35 | 15 | 10 | 10 |
| 2 | Primary School | 4000 | 30 | 1.0 | 35 | 20 | 10 | 20 |
| 3 | Senior Secondary School | 4000 | 30 | 1.0 | 45 | 30 | 15 | 20 |
| 4 | Nursing Home | 250 | 60 | 0.8 | 24 | 10 | - | 10 |
| 5 | Dispensary | 250 | 33 | 0.8 | 35 | 15 | - | 10 |
| 6 | Diagnostic Centre | 500 | 30 | 1.0 | 35 | 20 | 10 | 15 |

The internal village roads cannot be widened because it is going to demolish structures and spoil the front fabric and character of old buildings. The walkability can be improved by providing small walkable connections wherever possible within the Abadi area. For the new roads to be laid on proposed area, the minimum widths should be provided as per Table 23.

Table 23 Minimum Widths for New Village Roads

| Village Road Type | Road Description | Minimum Road Width (In feet) | Functions/Remarks |
|-------------------|---------------------|------------------------------|--|
| R1 | Link Roads | 20 | Inter village, ODR, highway connectors |
| R2 | Major Through Roads | 24 | Main Village roads with drain on both sides to facilitate drainage system of the village |
| R3 | Minor Through Roads | 15 | Other village roads |
| R4 | Minor Through Lanes | 12 | Village Lanes |

7.2 WATER RESOURCE MANAGEMENT

As Ambala district only has the Markanda river as a flowing surface water source, it primarily depends on ground water to cater to the water requirements for domestic and agricultural purposes. Apart from the surface water, there is a lot of dependency on the seasonal rainfall during the Monsoons and western disturbances for the irrigation. But there has been a decrease in the annual precipitation as per Figure 30: Yearly rainfall (in mm) trends for Ambala from 2000 to 2019. This also would have added to the reduction in ground water recharge, apart from the increased development, and thereby a steady decline in the water table level of the aquifers is evident.

The future growth is also going to increase the water demand for various uses and at the same time, reduce the area of land available for ground water recharge. Therefore, the rainwater harvesting provisions must be made while discussing the expansion and development of the village Mullana. The water resource development is done by interlinking various sector proposal like rainwater harvesting systems and reuse of rainwater for non-portable uses.

A detailed ground water and soil testing should be carried out to determine the water conservation measures that may be implemented in agriculture and the provisions for improving ground water quality.

The comprehensive proposals are discussed below:

7.2.1 Rainwater Harvesting

In 2051, as per the proposed land use zoning plan, the estimated area of the Abadi is expected to measure 29,44,200 sqm. Since this newer development area have adequate proposed open spaces & green spaces and harvesting systems as well, for that reason we can assume the surface run-off coefficient as 0.5 instead of 0.6 as done in earlier calculations. As per WRIS India's rainfall data, we can assume average annual rainfall as 800 mm (.8 m).

The estimated surface run-off will be 23,55,360 cubic meters which is equivalent to 2,35,53,60,000 litres for the whole year. This is rough estimate even if considering

the water losses this will be huge amount of water which can be used for alternative uses for example gardening, flushing, etc.

For the alternative use of this water, laying down the infrastructure of dual line system of water-supply will not be feasible at village level, so it's recommended to have the dual system of supply at public buildings and common toilets only. There should be series of retention ponds interlinked with each other. Each of the Public and Semi-Public building must have retention ponds and harvesting tanks to store water at cluster level. From these buildings the water can be used for toilets and gardening of the open spaces under public use.

Using Harvested Water for Construction: No construction shall be allowed from the ground water from personal bore-well or portable water supply tap. The harvested water should be treated for primary (if required then secondary treatment) to make it fit for construction and same should be supplied to the construction sites within the Gram Panchayat area.

7.2.2 Interlinking and revival of existing water structures

The rainwater harvesting provisions need to be provided at existing and proposed open & green spaces, and public & semi-public buildings.

Rainwater harvesting provisions need to include the old dried public wells. As per Figure 47, the old wells that are located on incidental points should be used as rainwater recharge sites.

Reclaiming (removing debris and encroachments) around the existing water bodies needs to be done to allow them to function as catchment areas.

The open marshy areas should be redeveloped with a basin of required depth which will function as a water body. The grey water from the drains may be drained into these water bodies, and suitable plants should be planted to remove odour and further oxidize and purify the water. Two such systems are the Duckweed Pond system and the Root Zone Treatment System. The surrounding areas would then have the feasibility of being developed as usable open green spaces as per Figure 74.

7.2.3 Water Supply

As per the speculated future expansion considering the past growth trends and restricting special areas for development, In 2051, the estimated area of the Abadi is expected to measure 29,44,200 sqm. As per data on WRIS India, the highest amount of rainfall was recorded in June 2008. Taking 20mm (0.020m) as the maximum rainfall in one day and considering 0.60 as the runoff coefficient for the semi paved surfaces, the maximum surface runoff in one day is calculated to be 35,330 cu.m.

7.2.4 Water Demand

As per the RADPFI guidelines 70-100 lpcd is the recommended water usage. Below are the calculations of projected water demand in accordance with projected increase in population.

Table 24: Proposed Water Demand as per population projection for 2051

| Year | Projected Population | RADPFI (lpcd) | Required capacity | UFW (15%) | Total required capacity (MLPD) |
|------|----------------------|---------------|-------------------|-----------|--------------------------------|
| 2021 | 10343 | 100 | 1034300 | 155145 | 1.189445 |
| 2031 | 11455 | 100 | 1145500 | 171825 | 1.317325 |
| 2041 | 12718 | 100 | 1271800 | 190770 | 1.462570 |
| 2051 | 14157 | 100 | 1415700 | 212355 | 1.628055 |

Unaccounted-for Water (UFW) is the difference between the quantity of water supplied to a city's network and the metered quantity of water used by the customers. UFW has two components: (a) physical losses due to leakage from pipes, and (b) administrative losses due to illegal connections and under registration of water meters. The above figures exclude UFW, which should be limited to 15% for new proposed systems. (Ministry of Urban Development, 2015)

Proposed systems whether single pipe or dual pipe and areas where public taps to be installed

The existing potable water infrastructure should be augmented at the three designated locations of the overhead tanks which are presently non-functional shown in Figure 74 Proposed infrastructure sites.

7.3 SANITATION

Sewerage System - As per UDPFI guidelines, 80% of water supply may be expected to reach the sewers. The table below gives the quantity of sewerage discharge as per the projected increase in water demand with time.

| Year | Population | Total required water supply capacity (MLPD) | Sewerage Discharge (MLPD) |
|------|------------|---|---------------------------|
| 2021 | 10343 | 1.189445 | 0.951556 |
| 2031 | 11455 | 1.317325 | 1.053860 |
| 2041 | 12718 | 1.462570 | 1.170056 |
| 2051 | 14157 | 1.628055 | 1.302444 |

It is recommended to augment the present system in a manner which keeps the sewerage system decentralized. To treat the black water waste, it is recommended that wherever possible, each household should have a septic tank. In those areas where this is not possible, the black water should be channelized to the already proposed sewage treatment plant (STP) located outside the Abadi area as shown in Figure 74. The residential cluster in the Northern part of the Abadi which is separated by green open space should have a separate waste water disposal system to carry the black water to the proposed STP.

The sludge from the septic tanks would need to be pumped out periodically.

The grey water runoff from the septic tank can be channeled into the street drains, which would also carry water from the kitchen and other areas of the house. These drains would also ferry the surface runoff. The grey water can then be channeled into the water bodies within the proposed designated green spaces.

This will allow the current network of drains within the village to be used.

However, the following steps would need to be implemented for the open drains:

- All open drains need to be covered with concrete grate covers, with provision for inspection hatches at regular intervals, as shown in Figure 75.
- The household pipes which discharge into the open drains, need to do so below road level, so that no effluents are discharged in the open. Existing pipes which do not fulfill this requirement need to be turned downwards and extended to the required level.
- In the zones where new construction shall take place in the future, sewage discharge and surface water discharge must be carried by two separate pipelines. The treatment of the two shall also be done separately, with the sewage discharge ferried to the sewerage treatment plants and the later to the rainwater recharge pits.

Figure 75 : Covering open drains with concrete grate covers



7.4 SOLID WASTE MANAGEMENT

A uniform system needs to be devised through the village. Segregation at source and system for collection of solid waste needs to be implemented.

Segregation need to be done according to the following categories:

- Organic waste – that can be converted into manure
- Domestic Biohazardous waste
- Reusable waste
- Recyclable Waste such as:
 - paper, cardboard - recycled into handmade paper, stationery products
 - recyclable plastic bags
 - metal, glass, bottles etc – which can be collected by scrap dealers
 - Dry Waste – incineration, pulverizing etc.

| Year | Projected Population | Solid waste generation (in Kg/day) |
|------|----------------------|------------------------------------|
| 2021 | 10343 | 1551.45 |
| 2031 | 11455 | 1718.20 |
| 2041 | 12718 | 1907.70 |
| 2051 | 14157 | 2123.55 |

As per the household survey, very few residents are practicing composting. This may be encouraged and the households which are unable to do so should be part of the existing cart collection system. This cart collection system needs to be expanded throughout the Abadi area and also towards the proposed expansion. The organic waste, thus collected, could be fed into a bio gas plant to generate cooking fuel for the residence of this gram panchayat and the surrounding clusters. The site for Solid Waste Management Facility is demarcated in Figure 74 and the bio gas plant could also be located here.

Domestic Bio medical/hazardous waste needs to be segregated at the household level and collected separately. The concerned health department needs to then be contacted to dispatch the same to the nearest incineration facility.

The inert waste segregated from the waste collected should be transported to the nearby scientific disposal site at block or district level.

7.5 MODIFICATIONS ALONG EXISTING STREETS

It was observed during the physical survey that the road width within the village have decreased due to encroachments (like steps, balcony, building walls etc.) and

absence of any byelaws.

The following points may be taken care of to create a liveable environment within the residential clusters:

- As per the building fabric of the village the houses should not be higher than 3 floors, unless there is a special requirement. Maximum height may be relaxed on wider roads as per Table 14: Permissible Building Heights on Different ROW
- Encroachments in the form of steps or ramps, rising from the street, need to be restricted within 4.5 inches from the outer edge of the drains as shown in Figure 76.
- No balcony should be projected 21 inches beyond the plot line as shown in Figure 77.

Solar Street lights should be installed in all the lanes of the village as shown in

- Figure 78.

Figure 76 : Proposed changes for encroachments on streets



Figure 77 : Projection of balcony



Figure 78 Solar street lights



7.6 LITERACY AND EMPLOYMENT

As per the major findings of the physical survey it was analysed that the literacy level of Mullana is comparable with the block Barara and district Ambala. The educational facility is adequate within the village and higher education facility is available within and surrounding the GP but additional primary education facility needs to be brought in for the projected population of 2051. Accordingly the site for school and playground have been proposed as per Figure 74.

- The anganwadis should promote to develop household and facilitate the products to be sold in the markets.
- The efforts should be made to make digital presence for the different products made by the household industries within the village.
- Other benefits should be taken from the existing government schemes for education.
- The projects to be framed from the village development plan will be carried through convergence of various centre and state government's existing schemes. Pradhan Mantri Sadak Yojna, Swachh Bharat Abhyan or other schemes should give priority to the village people.

The way forward might not necessarily be through conventional higher education but rather through skill development.

7.7 INDUSTRIAL ZONE

There is some industrial activity happening along the road connecting the village to Gokal garh and Uplana. The activity primarily comprises of brick kilns. The industrial zone which has been demarcated in the 2051 proposal for the GP, is along these roads.

Additionally, the industries which may be set up would be agro based. The development of the industrial zone would take place as per Table 18 Industrial Norms.

7.8 RECREATIONAL ZONE

Mullana GP is having a number of open spaces out of which some will be converted into designated green spaces with discharge pits within. A proposed playground has also been indicated in Figure 74. The river Markanda flows through the central part of the GP which has open spaces abutting the Northern boundary of the GP. This space can be developed as a green recreational zones for the residents of this place. Suitable measures may be taken by the concerned department to clean the water which flows through the river and thereby make this proposed recreational zone usable.

7.9 HERITAGE CONSERVATION

There are a number of old structures within the Abadi area of Mullana which are of heritage value. The buildings have different elements and materials used which dates back to different time periods.

It is proposed to preserve these structures and reuse them wherever possible. This will increase the cultural and heritage importance of the streets along which these are located and of Mullana as a whole. A tourist circuit is being proposed in the historic core of the settlement which will be augmented by recreational infrastructure along the banks of Markanda river.

Figure 79: Oldest Haweli, Owner: Mr. Krishna Pundir nearby Patwar khana



Source: Primary Survey (Nov 2020)

Figure 80 : Oldest Haweli, Owner: Mr. Krishna Pundir nearby Patwar khana



Source: Primary Survey (Nov 2020)

Figure 81 : Oldest Haweli, Owner: Mr. Krishna Pundir nearby Patwar khana



Source: Primary Survey (Nov 2020)

Figure 82: Oldest Haweli, Owner: Mr. Krishna Pundir nearby Patwar khana



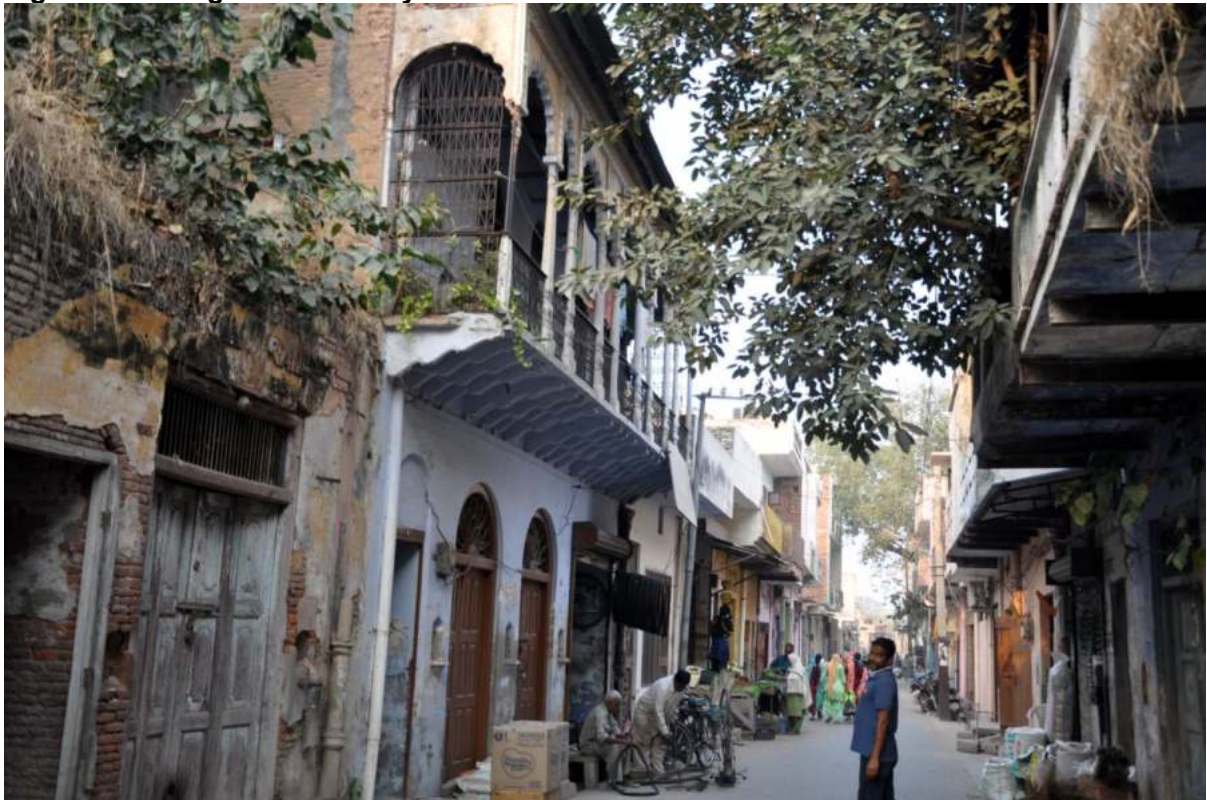
Source: Primary Survey (Nov 2020)

Figure 83: Heritage Street (Labour Chowk)



Source: Primary Survey (Nov 2020)

Figure 84 Heritage Street nearby Hanuman Mandir



Source: Primary Survey (Nov 2020)

Figure 85 : Old ageStructure, (Labour Chowk)



Source: Primary Survey (Nov 2020)

Figure 86 : Shop (Market Street)



Source: Primary Survey (Nov 2020)

REFERENCES

Google

Primary Survey 2018

Earth, G. (2018, November 20).

Google. (2018, November 22).

Primary Survey. (2018).

APPENDIX I

INDUSTRY

As per 'Brief Industrial Profile of Ambala District' (Ministry of MSME), conducted by Ministry of MSME, Govt. of India, in Ambala district sand mineral is available however, as per the Order of Hon'ble Punjab & Haryana High Courts, mining in Haryana particularly in Ambala district is banned from 2010 to till date.

Listed below are the names of industrial areas designated by the Haryana Government:

| S. No. | Name of Industrial Area | Land acquired (In hectare) | Land developed (In hectare) | No of Plots | No of allotted Plots | No. of Units in Production |
|--------------|--|---------------------------------|--------------------------------|-------------|----------------------|----------------------------|
| 1 | HSIIDC, Ambala Cantt. | 50.421 Acres | 50.421 Acres | 130 | 130 | 128 |
| 2 | Industrial Growth Centre, Saha Phase I | 410.26 Acre | 410.26 Acre | 554 | 554 | 460 |
| 3 | Industrial Growth Centre, Saha Ph 2 | 250 Acre (Under Development) | -- | -- | -- | -- |
| Total | | | 460.68 Acres | 684 | 684 | 588 |

DETAILS OF EXISTING MICRO & SMALL ENTERPRISES AND ARTISAN UNITS IN THE DISTRICT (Source: DIC Ambala)

| TYPE OF INDUSTRY | NUMBER OF UNITS | INVESTMENT (Lakh Rs.) | EMPLOYMENT (Nos.) |
|---|-----------------|-----------------------|-------------------|
| Agro based | 518 | 7770 | 3200 |
| Soda water | 05 | 80 | 29 |
| Cotton textile | 130 | 65 | 265 |
| Woolen, silk & artificial Thread based clothes. | 6 | 683 | 23 |
| Jute & jute based | Nil | Nil | -- |
| Ready-made garments & embroidery | 15 | 150 | 102 |
| Wood/wooden based furniture | 496 | 5000 | 3465 |

| | | | |
|--|-----|-------|------|
| Paper & Paper products | 103 | 1442 | 837 |
| Leather based | 240 | 1500 | 2160 |
| Chemical/Chemical based | 95 | 1950 | 970 |
| Rubber, Plastic & petro based | 106 | 1802 | 897 |
| Mineral based | Nil | -- | -- |
| Metal based (Steel Fab.) | 964 | 11580 | 7746 |
| Engineering units | 650 | 13200 | 5213 |
| Electrical machinery and transport equipment | 150 | 2805 | 998 |
| Repairing & servicing | 43 | 480 | 258 |
| Others | Nil | -- | -- |

Medium Scale Enterprises

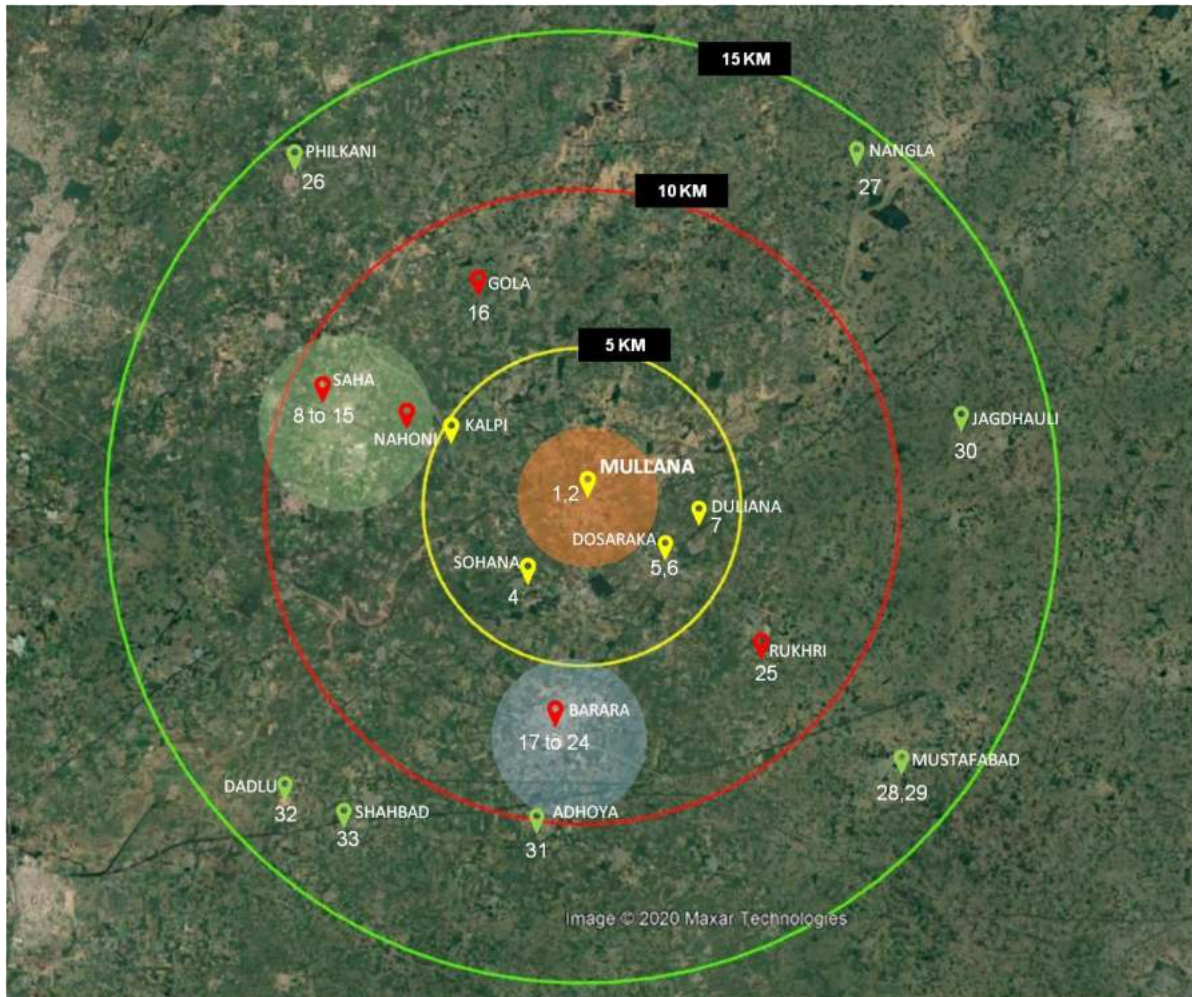
List of the units in Ambala & Near by Area

- a. M/s. Laboratory Instruments Ltd., Plot No. 10, HSIIDC Ambala Cantt.
- b. M/s. Maha Kali Agro Industries, Vill Mohra, Ambala District

Large Scale Industries / Public Sector undertakings

List of the units in Ambala & Near By Area

1. M/s. Naraingarh Sugar Mills, Vill Banodhi PO Shahzadpur (Ambala)
2. M/s. Partap Extractions (P) Ltd., Vill Nasirpur, Hisar Road, Ambala City
3. M/s. Swastika Agro Oils (P) Ltd., 7th KM Stone, Hisar Road, Vill Balana, Ambala City
4. M/s. Swastik Feed (P) Ltd., Vill Balana, Ambala City
5. M/s. Western Hatcheries Ltd., Vill Patwi PO Jatwar, Naraingarh, Ambala



Source: Google Earth

5 kms radius

1. Jindal Agro Industries, Mullana
2. M/S Phaggu Ram & Sons, Mullana
3. Gautam Group Industries, Kalpi
4. Sonu Namsot Led Technology, Sohana
5. Rana Agro Industries, Dosarka
6. Hind Fertilizers & Chemical Industries, Dosarka
7. Shanti Enterprises, Duliana

10 kms radius

8. Arco - Arihant Industries, Saha
9. Premium Packaging Industries, Saha
10. Kirpa Agro Industries, Saha
11. Garg poultry farms, Saha
12. National Industries, Saha
13. Ambala Industrial Fabricators & Engineers, Saha
14. Gulati Industries Tools, Saha
15. Rado Color Industries, Saha
16. Shree Krishna Industries, Gola

17. Dinesh Boring Company, Barara
18. Partap Poultry Farm, Barara
19. Rupa Packaging Industries, Saha
20. Mahadev Aluminium House & Works, Barara
21. Bajrang Rice & Gen. mills, Barara
22. All Tech Grading Solution, Barara
23. Radhika Engineers, Barara
24. Radhika Engineers, Barara
25. Sabharwal Poultry Farm, Rukhri

15 kms radius

26. Narindra Scientific Industries, Pilkhani
27. SCL Industries, Nangla
28. Vishwakarma Flour Mill & Raj Feed Industry, Mustafabad
29. Laxmi Rice Industry, Mustafabad
30. Rana Poultry Farm , Jagdhauli
31. Hedon poultry farm, Adhoya
32. Poultry Farm, Dadlu
33. Dadwal Weigh Industries, Shahbad
34. Shree Nanak Agriculture Industries, Pilkhani

| SR. NO. | NAME & ADDRESS OF THE INDUSTRIAL UNIT | DISTRICT | LARGE/ MEDIUM | MANUFACTURING ITEM | YEAR OF ESTABLISHMENT | INVESTMENT | EMPLOYMENT |
|---------|---|----------|---------------|-----------------------------------|-----------------------|------------|------------|
| 297 | M/S SWASTIK FEEDS LTD, VILLAGE BALANA, | AMBALA | L&M | VEGETABLE OILS | 1990-91 | 112.48 | 55 |
| 383 | M/S KRISHAN KANHIYA MILK FOOD(P) LTD., VILL SAHA, AMBALA | AMBALA | L&M | SKIMMED MILK BUTTER, FRESH CHEESE | 1992-93 | 265.00 | - |
| 448 | M/S PARTAP FURANE PVT.LTD, VILLAGE, MOHRA DUKHERI ROAD, AMBALA CANTT. | AMBALA | L&M | REFINED VEGETABLE OIL | 1993-94 | 1272.00 | 250 |
| 449 | M/S WESTERN HATCHERIES LTD, VILL.PATVI, P.O. JATWAR, THE NARAINGAR | AMBALA | L&M | POWER FEED SUPPLEMENT FOR POULTRY | 1993-94 | 681.34 | 139 |

| | | | | | | | |
|------|---|--------|--------|--|-----------|---------|-----|
| | H, AMBALA | | | | | | |
| 531 | M/S LABOTRON INSTRUMENTS LTD., TRIBUNE COLONY, AMBALA | AMBALA | L&M | RESEARCH MICROSCOPE/L APRO-SCOPE, LIFE SAVING MICROSCOPE | 1994-95 | 256.58 | 100 |
| 532 | M/S N.K. JAIN INSTRUMENTS(P) LTD., 15, HSIDC INDUSTRIAL ESTATE, AMBALA | AMBALA | L&M | RESEARCH MICROSCOPE/L APRO-SCOPE, LIFE SAVING MICROSCOPE | 1994-95 | 160.00 | 50 |
| 533 | M/S PARTAP EXTRACTION PVT.LTD., VILL. NASIRPUR, HISSAR ROAD, AMBALA CITY | AMBALA | L&M | VEGETABLE OIL & DE-OILED CAKES | 1994-95 | 428.00 | 26 |
| 534 | M/S SUBHARI PAPERS PVT. LTD., JAGADHRI ROAD, VILL. KANSAPUR, AMBALA | AMBALA | L&M | PAPER | 1994-95 | 633.00 | 102 |
| 535 | M/S SWASTIK AGROILS PVT. LTD., 7 K.M. STONE, HISSAR ROAD, V. & P.O. BALANA, AMBALA. | AMBALA | L&M | REFINED SOYABIN, SUN FLOWER ETC | 1994-95 | 2200.00 | 100 |
| 742 | M/S NARAINGAR H SUGAR MILLS, V. BANONDI, P.O. SHAHZADPUR, TEH. NARAINGAR H, AMBALA. | AMBALA | L&M | WHITE CRYSTAL SUGAR | 1996-97 | 490.10 | 35 |
| 1215 | M/S LABOTRON INSTRUMENTS LTD.-II, 10, INDUSTRIAL AREA, AMBALA CANTT. | AMBALA | MEDIUM | MICROSCOPE | 2006-2007 | 1206.00 | 19 |
| 1255 | M/S MOUNT SHIVALIK BREWERIES LTD., INDUSTRIAL GROWTH CENTRE, | AMBALA | LARGE | BREWERIS | 2007-2008 | 570.00 | 52 |

| | | | | | | | |
|------|--|--------|------------|-------------------|-----------|---------|-----|
| | SAHA. | | | | | | |
| 1394 | M/S KANDHARI BEWERAGE (P) LTD., GROWTH CENTRE, SAHA. | AMBALA | LARGE | COKE | 2009-2010 | 920.00 | 70 |
| 1395 | M/S MAHAKALI AGRO INDIA PVT. LTD., MOHRA DUKHERI ROAD, AMBALA CANTT. | AMBALA | LARGE | Vegetable ghee | | | |
| 1395 | M/S MAHAKALI AGRO INDIA PVT. LTD., MOHRA DUKHERI ROAD, AMBALA CANTT. | AMBALA | LARGE | VEGETABLE GHEE | 2009-2010 | 891.00 | 140 |
| 1396 | M/S N.V. DISTELERIES VILL. BHADOLI, DISTRICT AMBALA | AMBALA | MEDIU M | ENGLISH WINE | 2009-2010 | 1027.00 | 354 |

| | | | | | | | |
|------|--|--------|--------|--|----------|-----|----|
| 1716 | M/S CRYSTAL PHARMACEUTIC ALS 365 MODEL TOWN, AMBALA CITY-134003 | AMBALA | MEDIUM | MFG OF ALLOPATHIC PHARMACEUTIC AL PREPARATIONS | NOV 2015 | 542 | 96 |
|------|--|--------|--------|--|----------|-----|----|

| | | | | | | | |
|-------|--|--------|--------|---|----------|-----|-----|
| 17/17 | M/S PARJAI INDUSTRIES INDIA.PVT LTD VILL. KHERAGANNI, V&PO FATEHGARH, RAIPURRANI ROAD, TEHSIL NARANGARH ROAD, DISTT AMBALA-134201 | AMBALA | MEDIUM | MFG OF INSECTICIDES, RODENTICIDES, FUNGICIDES, HERBICIDES | DEC 2015 | 552 | 120 |
|-------|--|--------|--------|---|----------|-----|-----|

DISTRICTWISE LIST OF INDUSTRIES ASSOCIATIONS IN HARYANA

| AMBALA | | | |
|--------|---|---------------------------------|------------|
| S.No | Name of Association & Address | President/General Secretary | Contact No |
| 1 | AISMA, M/s Rescholar Equipments, Plot No 85 Industrial Estate, Ambala Cantt. | Sh Rakesh Gupta President | 9812037983 |
| 2 | Rice Sheller Association, M/s Jay Vee Rice Mills, Hisar Road, Ambala City | Sh. Sat Pal Gupta, President | 9215728920 |
| 3 | Electrical Association, M/s Suprya Electrical, Near Old Jain School, Timber Market, Ambala city | Sh, Ajay Aggarwal, | 9215215117 |
| 4 | SAMA, M/s Swastika Electrical Timber Market, Ambala cantt | Sh G C Aggarwal | |
| 5 | Industrial Estate Association, 108-IE, Ambala cantt | Sh. D.C. Gupta, | 9315837853 |
| 6 | Indl. Association Saha, M/s Sampooran Packers, 327-28, IGC Saha, A/cantt | Sh Rajbeer Choudhry | 9812000043 |
| 7 | Saha Food Park Industrial Association, 198 food park saha, A/cantt | Sh Rajeev Sharma | 9215221169 |
| 8 | Scientific Apparatus | Sh Mahesh Singal | 9215730200 |

| | | | |
|----|---|---|--------------------------|
| | Manufacturers & Exporters, Laby Instruments Industries 62, 1st Floor, IE, A/cantt | | 9416028983 9896301760 |
| 9 | Mixi Association, M/s Electromax Home Appliances, Plot No 16, New Vita Enclave, Opp. Vita Plant, Near Baldev Nagar, A/City | Sh Ashwani Goel | 9812037765 |
| 10 | Master Printers Association, Ambala, #25, 1st Level, Krishna Murti Market, Nigar Cinema Street, A/Cantt-133001 | Sh Balwinder Singh President Sh Sarabjot Singh General Secretary | 9215555339 9416085598 |
| 11 | Ambala Small Scale Industries Welfare Association, M/s Nu-Tech Dairy Engineers P Ltd, Naraingarh Road, Vill. Mandhour, A/City | Sh Viplove Singla President | 9416027666 |

APPENDIX II

GP's in Ambala District

| S.No. | District | Block | GP Name | URL of Gram Panchayat |
|-------|----------|------------|-------------------|---|
| 1 | AMB AL A | AMB AL A-I | ADHO MAJRA | http://gpadhomajra.harpanchayats.gov.in |
| 2 | AMB AL A | AMB AL A-I | AHEMA | http://gpahema.harpanchayats.gov.in |
| 3 | AMB AL A | AMB AL A-I | AMIPUR | http://gpamipur-ambala1.harpanchayats.gov.in |
| 4 | AMB AL A | AMB AL A-I | AN ANDPUR JALBERA | http://gpandpurjalbera.harpanchayats.gov.in |
| 5 | AMB AL A | AMB AL A-I | B AB AHERI | http://gpbabaheri.harpanchayats.gov.in |
| 6 | AMB AL A | AMB AL A-I | B AKN AUR | http://gpbaknaur.harpanchayats.gov.in |
| 7 | AMB AL A | AMB AL A-I | B AL ANA | http://gpbalana-ambala1.harpanchayats.gov.in |
| 8 | AMB AL A | AMB AL A-I | B AL APUR | http://gpbalapur.harpanchayats.gov.in |
| 9 | AMB AL A | AMB AL A-I | B AR A | http://gpbara-ambala1.harpanchayats.gov.in |
| 10 | AMB AL A | AMB AL A-I | B AROULA | http://gpbaroula.harpanchayats.gov.in |
| 11 | AMB AL A | AMB AL A-I | B AROULI | http://gpbarouli-ambala1.harpanchayats.gov.in |
| 12 | AMB AL A | AMB AL A-I | B ATROHAN | http://gpbatrohan.harpanchayats.gov.in |
| 13 | AMB AL A | AMB AL A-I | BEDSAN | http://gpbedsan.harpanchayats.gov.in |
| 14 | AMB AL A | AMB AL A-I | BEGO MAJRA | http://gpbegomajra.harpanchayats.gov.in |
| 15 | AMB AL A | AMB AL A-I | BEHBALPUR | http://gpbehbaldpur-ambala1.harpanchayats.gov.in |
| 16 | AMB AL A | AMB AL A-I | BHANOKHERI | http://gpbhanokheri.harpanchayats.gov.in |
| 17 | AMB AL A | AMB AL A-I | BHANPUR NAKATPUR | http://gpbhanpurnakatpur.harpanchayats.gov.in |
| 18 | AMB AL A | AMB AL A-I | BHARI | http://gpbhari.harpanchayats.gov.in |
| 19 | AMB AL A | AMB AL A-I | BHUNNI | http://gpbhunni.harpanchayats.gov.in |
| 20 | AMB AL A | AMB AL A-I | BHURANGPUR | http://gpbhurangpur.harpanchayats.gov.in |
| 21 | AMB AL A | AMB AL A-I | BHURE MAJRA | http://gpbhuremajra.harpanchayats.gov.in |
| 22 | AMB AL A | AMB AL A-I | BISHANGARH | http://gpbishangarh-ambala1.harpanchayats.gov.in |
| 23 | AMB AL A | AMB AL A-I | CHHAPRA | http://gpchhapra-ambala1.harpanchayats.gov.in |
| 24 | AMB AL A | AMB AL A-I | CHHOTABAROUA | http://gpchhotabaroula.harpanchayats.gov.in |
| 25 | AMB AL A | AMB AL A-I | D ANGERIAN | http://gpdangerian.harpanchayats.gov.in |
| 26 | AMB AL A | AMB AL A-I | D ANIPUR | http://gpdanipur.harpanchayats.gov.in |
| 27 | AMB AL A | AMB AL A-I | DELU MAJRA | http://gpdelumajra.harpanchayats.gov.in |
| 28 | AMB AL A | AMB AL A-I | DHANOURA | http://gpdhanoura.harpanchayats.gov.in |
| 29 | AMB AL A | AMB AL A-I | DHANOURI | http://gpdhanouri-ambala1.harpanchayats.gov.in |
| 30 | AMB AL A | AMB AL A-I | DHURALA | http://gpdhurala-ambala1.harpanchayats.gov.in |
| 31 | AMB AL A | AMB AL A-I | DHURKARA | http://gpdhurkara.harpanchayats.gov.in |
| 32 | AMB AL A | AMB AL A-I | DUKHERI | http://gpdukheri.harpanchayats.gov.in |
| 33 | AMB AL A | AMB AL A-I | DURANA | http://gpdurana-ambala1.harpanchayats.gov.in |
| 34 | AMB AL A | AMB AL A-I | FAR OULI | http://gpfarouli.harpanchayats.gov.in |
| 35 | AMB AL A | AMB AL A-I | FAZAILPUR | http://gpfazailpur.harpanchayats.gov.in |
| 36 | AMB AL A | AMB AL A-I | GORSIAN | http://gpgorsian.harpanchayats.gov.in |
| 37 | AMB AL A | AMB AL A-I | HUMAYUNPUR | http://gphumayunpur-ambala1.harpanchayats.gov.in |
| 38 | AMB AL A | AMB AL A-I | ISMALPUR | http://gpismailpur-ambala1.harpanchayats.gov.in |
| 39 | AMB AL A | AMB AL A-I | JAGOLI | http://gpjagoli.harpanchayats.gov.in |
| 40 | AMB AL A | AMB AL A-I | JAITPURA | http://gpjaitpura.harpanchayats.gov.in |
| 41 | AMB AL A | AMB AL A-I | JALALPUR | http://gpjalalpur-ambala1.harpanchayats.gov.in |
| 42 | AMB AL A | AMB AL A-I | JANDHERI | http://gpjandheri.harpanchayats.gov.in |
| 43 | AMB AL A | AMB AL A-I | JANSUA | http://gpjansua.harpanchayats.gov.in |
| 44 | AMB AL A | AMB AL A-I | JANSUI | http://gpjansui.harpanchayats.gov.in |
| 45 | AMB AL A | AMB AL A-I | JODHPUR | http://gpjodhpur-ambala1.harpanchayats.gov.in |
| 46 | AMB AL A | AMB AL A-I | KALAWAR | http://gpkalawar-ambala1.harpanchayats.gov.in |
| 47 | AMB AL A | AMB AL A-I | KALERAN | http://gpkaleran.harpanchayats.gov.in |
| 48 | AMB AL A | AMB AL A-I | KANGWAL | http://gpkangwal.harpanchayats.gov.in |
| 49 | AMB AL A | AMB AL A-I | KATHGARH | http://gpkathgarh-ambala1.harpanchayats.gov.in |
| 50 | AMB AL A | AMB AL A-I | KHAIRA | http://gpkhaira-ambala1.harpanchayats.gov.in |
| 51 | AMB AL A | AMB AL A-I | KHANNAMAJRA | http://gpkhannamajra.harpanchayats.gov.in |
| 52 | AMB AL A | AMB AL A-I | KHASPUR | http://gpkhaspur-ambala1.harpanchayats.gov.in |
| 53 | AMB AL A | AMB AL A-I | KHURCHANPUR | http://gpkhurchanpur.harpanchayats.gov.in |
| 54 | AMB AL A | AMB AL A-I | KONKPUR | http://gpkonkpur.harpanchayats.gov.in |

| | | | | |
|-----|----------|-------------|------------------|---|
| 55 | AMB AL A | AMB AL A-I | KOT KACHWA KALAN | http://gpkotkachwakalan.harpanchayats.gov.in |
| 56 | AMB AL A | AMB AL A-I | KOT KACHWA KHURD | http://gpkotkachwakhurd.harpanchayats.gov.in |
| 57 | AMB AL A | AMB AL A-I | KURBANPUR | http://gpkurbanpur.harpanchayats.gov.in |
| 58 | AMB AL A | AMB AL A-I | LADANA | http://gpladana.harpanchayats.gov.in |
| 59 | AMB AL A | AMB AL A-I | LAKHNOUR SAHIB | http://gplakhnoursahib.harpanchayats.gov.in |
| 60 | AMB AL A | AMB AL A-I | LALANA | http://gplalana.harpanchayats.gov.in |
| 61 | AMB AL A | AMB AL A-I | LAUTAN | http://gplautan.harpanchayats.gov.in |
| 62 | AMB AL A | AMB AL A-I | MAJRI | http://gpmajri-ambala1.harpanchayats.gov.in |
| 63 | AMB AL A | AMB AL A-I | MALLOUR | http://gpmallour.harpanchayats.gov.in |
| 64 | AMB AL A | AMB AL A-I | MALWA | http://gpmalwa.harpanchayats.gov.in |
| 65 | AMB AL A | AMB AL A-I | MARDO SAHIB | http://gpmardosahib.harpanchayats.gov.in |
| 66 | AMB AL A | AMB AL A-I | MAS TPUR | http://gpmastpur.harpanchayats.gov.in |
| 67 | AMB AL A | AMB AL A-I | MATHARI JATTAN | http://gpmatharijattan.harpanchayats.gov.in |
| 68 | AMB AL A | AMB AL A-I | MATHERI SHEKHAN | http://gpmatherishekhan.harpanchayats.gov.in |
| 69 | AMB AL A | AMB AL A-I | MEHLAN | http://gpmehlan.harpanchayats.gov.in |
| 70 | AMB AL A | AMB AL A-I | METLAN | http://gpmetlan.harpanchayats.gov.in |
| 71 | AMB AL A | AMB AL A-I | MIRJAPUR | http://gpmirjapur-ambala1.harpanchayats.gov.in |
| 72 | AMB AL A | AMB AL A-I | MIYAN MAJRA | http://gpmiyanmajra.harpanchayats.gov.in |
| 73 | AMB AL A | AMB AL A-I | MOHRA | http://gpmohra.harpanchayats.gov.in |
| 74 | AMB AL A | AMB AL A-I | MOHRI | http://gpmohri-ambala1.harpanchayats.gov.in |
| 75 | AMB AL A | AMB AL A-I | MOKHA MAJRA | http://gpmokhamajra.harpanchayats.gov.in |
| 76 | AMB AL A | AMB AL A-I | MUJAFARA | http://gpmujafara.harpanchayats.gov.in |
| 77 | AMB AL A | AMB AL A-I | NADIYALI | http://gpnadiyali.harpanchayats.gov.in |
| 78 | AMB AL A | AMB AL A-I | NAGGAL | http://gpnaggal-ambala1.harpanchayats.gov.in |
| 79 | AMB AL A | AMB AL A-I | NANEOLA | http://gpnaneola.harpanchayats.gov.in |
| 80 | AMB AL A | AMB AL A-I | NIHARSA | http://gpniharsa.harpanchayats.gov.in |
| 81 | AMB AL A | AMB AL A-I | NIHARSI | http://gpniharsi.harpanchayats.gov.in |
| 82 | AMB AL A | AMB AL A-I | NURPUR | http://gpnurpur.harpanchayats.gov.in |
| 83 | AMB AL A | AMB AL A-I | OJALAN | http://gpojalan.harpanchayats.gov.in |
| 84 | AMB AL A | AMB AL A-I | PANJOLA | http://gppanjola.harpanchayats.gov.in |
| 85 | AMB AL A | AMB AL A-I | RAWALON | http://gprawalon.harpanchayats.gov.in |
| 86 | AMB AL A | AMB AL A-I | ROSHANPUR | http://gproshanpur.harpanchayats.gov.in |
| 87 | AMB AL A | AMB AL A-I | RUPO MAJRA | http://gprupomajra.harpanchayats.gov.in |
| 88 | AMB AL A | AMB AL A-I | SAHIBPURA | http://gpsahibpura-ambala1.harpanchayats.gov.in |
| 89 | AMB AL A | AMB AL A-I | SAKRAHON | http://gpsakrahon.harpanchayats.gov.in |
| 90 | AMB AL A | AMB AL A-I | SARANGPUR | http://gpsarangpur-ambala1.harpanchayats.gov.in |
| 91 | AMB AL A | AMB AL A-I | SEGTA | http://gpsegta.harpanchayats.gov.in |
| 92 | AMB AL A | AMB AL A-I | SEGTI | http://gpsegti.harpanchayats.gov.in |
| 93 | AMB AL A | AMB AL A-I | SHEKHUPUR | http://gpshekhupur.harpanchayats.gov.in |
| 94 | AMB AL A | AMB AL A-I | SOUNTA | http://gpsounta.harpanchayats.gov.in |
| 95 | AMB AL A | AMB AL A-I | SOUNTI | http://gpsounti.harpanchayats.gov.in |
| 96 | AMB AL A | AMB AL A-I | SULLAR | http://gpsullar.harpanchayats.gov.in |
| 97 | AMB AL A | AMB AL A-I | TAR | http://gptar.harpanchayats.gov.in |
| 98 | AMB AL A | AMB AL A-I | TEJAN | http://gptejan.harpanchayats.gov.in |
| 99 | AMB AL A | AMB AL A-I | THARWA | http://gptharwa-ambala1.harpanchayats.gov.in |
| 100 | AMB AL A | AMB AL A-I | UDAPUR | http://gpudaipur.harpanchayats.gov.in |
| 101 | AMB AL A | AMB AL A-I | UGARA | http://gpugara.harpanchayats.gov.in |
| 102 | AMB AL A | AMB AL A-II | BARNALA | http://gpbarnala.harpanchayats.gov.in |
| 103 | AMB AL A | AMB AL A-II | BHILPURA | http://gpbhilpura-ambala2.harpanchayats.gov.in |
| 104 | AMB AL A | AMB AL A-II | BRAHMAN MAJRA | http://gpbrahmanmajra-ambala2.harpanchayats.gov.in |
| 105 | AMB AL A | AMB AL A-II | DADIYANA | http://gpdadiyana.harpanchayats.gov.in |
| 106 | AMB AL A | AMB AL A-II | DANGDHERI | http://gpdangdheri.harpanchayats.gov.in |
| 107 | AMB AL A | AMB AL A-II | DEVI NAGAR | http://gpdevinagar.harpanchayats.gov.in |
| 108 | AMB AL A | AMB AL A-II | DHANKAUR | http://gpdhankaur.harpanchayats.gov.in |
| 109 | AMB AL A | AMB AL A-II | GARNALA | http://gpgarnala.harpanchayats.gov.in |
| 110 | AMB AL A | AMB AL A-II | GHEL KALAN | http://gpghelkalan.harpanchayats.gov.in |
| 111 | AMB AL A | AMB AL A-II | GHEL KHURD | http://gpghelkhurd.harpanchayats.gov.in |
| 112 | AMB AL A | AMB AL A-II | JANETPUR | http://gpjanetpur.harpanchayats.gov.in |
| 113 | AMB AL A | AMB AL A-II | KALU MAJRA | http://gpkalumajra.harpanchayats.gov.in |

| | | | | |
|-----|----------|-------------|-----------------|---|
| 114 | AMB AL A | AMB AL A-II | K AUL AN | http://gpkaulan.harpanchayats.gov.in |
| 115 | AMB AL A | AMB AL A-II | KHATOULI | http://gpkhatouli.harpanchayats.gov.in |
| 116 | AMB AL A | AMB AL A-II | KHUDDAKALAN | http://gpkhuddakalan.harpanchayats.gov.in |
| 117 | AMB AL A | AMB AL A-II | LIHARSA | http://gpliharsa.harpanchayats.gov.in |
| 118 | AMB AL A | AMB AL A-II | LOHGARH | http://gplohgarh-ambala2.harpanchayats.gov.in |
| 119 | AMB AL A | AMB AL A-II | MAN AKPUR | http://gpmanakpur-ambala2.harpanchayats.gov.in |
| 120 | AMB AL A | AMB AL A-II | MAN GL AI | http://gpmanglai.harpanchayats.gov.in |
| 121 | AMB AL A | AMB AL A-II | MUNN ARHERI | http://gpmunnarheri.harpanchayats.gov.in |
| 122 | AMB AL A | AMB AL A-II | PANJOKHRA | http://gppanjokhra-ambala2.harpanchayats.gov.in |
| 123 | AMB AL A | AMB AL A-II | RATTANHERI | http://gprattanheri.harpanchayats.gov.in |
| 124 | AMB AL A | AMB AL A-II | ROL AN | http://gprolan.harpanchayats.gov.in |
| 125 | AMB AL A | AMB AL A-II | SAHIBPURA | http://gpsahibpura-ambala2.harpanchayats.gov.in |
| 126 | AMB AL A | AMB AL A-II | SAP ERA | http://gpsapera.harpanchayats.gov.in |
| 127 | AMB AL A | AMB AL A-II | TUNDLI | http://gptundli.harpanchayats.gov.in |
| 128 | AMB AL A | B AR AR A | ABDUL GARH | http://gpabdulgarh.harpanchayats.gov.in |
| 129 | AMB AL A | B AR AR A | ADHOI | http://gpadhoi.harpanchayats.gov.in |
| 130 | AMB AL A | B AR AR A | ADHOYA HINDWAN | http://gpadhoyahindwan.harpanchayats.gov.in |
| 131 | AMB AL A | B AR AR A | ADHOYA (M) | http://gpadhoyam.harpanchayats.gov.in |
| 132 | AMB AL A | B AR AR A | AK AL GARH | http://gpakalgarh-barara.harpanchayats.gov.in |
| 133 | AMB AL A | B AR AR A | ALI ASPUR | http://gpaliaspur.harpanchayats.gov.in |
| 134 | AMB AL A | B AR AR A | ALIPUR | http://gpalipur-barara.harpanchayats.gov.in |
| 135 | AMB AL A | B AR AR A | ALL AW AL PUR | http://gpallawalpur.harpanchayats.gov.in |
| 136 | AMB AL A | B AR AR A | B AR AR A | http://gpbarara.harpanchayats.gov.in |
| 137 | AMB AL A | B AR AR A | BHUDIAN | http://gpbhudian.harpanchayats.gov.in |
| 138 | AMB AL A | B AR AR A | BIKKAMPUR | http://gpbikkampur.harpanchayats.gov.in |
| 139 | AMB AL A | B AR AR A | BINJALPUR | http://gpbijnjalpur.harpanchayats.gov.in |
| 140 | AMB AL A | B AR AR A | D ADUPUR | http://gpdadupur-barara.harpanchayats.gov.in |
| 141 | AMB AL A | B AR AR A | DAHIYAMAJRA | http://gpdahiyamajra.harpanchayats.gov.in |
| 142 | AMB AL A | B AR AR A | DERA SALIMPUR | http://gpderasalimpur.harpanchayats.gov.in |
| 143 | AMB AL A | B AR AR A | DHAN AURI | http://gpdhanauri.harpanchayats.gov.in |
| 144 | AMB AL A | B AR AR A | DHANORA | http://gpdhanora.harpanchayats.gov.in |
| 145 | AMB AL A | B AR AR A | DHEEN | http://gpdheen.harpanchayats.gov.in |
| 146 | AMB AL A | B AR AR A | DULIYANA | http://gpduliyana.harpanchayats.gov.in |
| 147 | AMB AL A | B AR AR A | DULIYANI | http://gpduliyani.harpanchayats.gov.in |
| 148 | AMB AL A | B AR AR A | FOXA | http://gpfoxa.harpanchayats.gov.in |
| 149 | AMB AL A | B AR AR A | GAGANPUR | http://gpgaganpur.harpanchayats.gov.in |
| 150 | AMB AL A | B AR AR A | GHELRI | http://gpghelri.harpanchayats.gov.in |
| 151 | AMB AL A | B AR AR A | HEMA MAJRA | http://gphemamajra.harpanchayats.gov.in |
| 152 | AMB AL A | B AR AR A | HOLI | http://gpholi.harpanchayats.gov.in |
| 153 | AMB AL A | B AR AR A | JAH AN GIR PUR | http://gpjahangirpur-barara.harpanchayats.gov.in |
| 154 | AMB AL A | B AR AR A | JALUBI | http://gpjalubi.harpanchayats.gov.in |
| 155 | AMB AL A | B AR AR A | K AMB ASS | http://gpkambass.harpanchayats.gov.in |
| 156 | AMB AL A | B AR AR A | K AMB ASSI | http://gpkambassi.harpanchayats.gov.in |
| 157 | AMB AL A | B AR AR A | K ANSAPUR | http://gpkansapur.harpanchayats.gov.in |
| 158 | AMB AL A | B AR AR A | KASER LA KAL AN | http://gpkaserlakalan.harpanchayats.gov.in |
| 159 | AMB AL A | B AR AR A | KHAN AHMADPUR | http://gpkhanahmadpur.harpanchayats.gov.in |
| 160 | AMB AL A | B AR AR A | KHANPURA | http://gpkhanpura.harpanchayats.gov.in |
| 161 | AMB AL A | B AR AR A | MALIKPUR | http://gpmalikpur-barara.harpanchayats.gov.in |
| 162 | AMB AL A | B AR AR A | MANKA | http://gpmanka.harpanchayats.gov.in |
| 163 | AMB AL A | B AR AR A | MANKI | http://gpmanki.harpanchayats.gov.in |
| 164 | AMB AL A | B AR AR A | MANU MAJRA | http://gpmanumajra.harpanchayats.gov.in |
| 165 | AMB AL A | B AR AR A | MAU JGARH | http://gpmaujgarh-barara.harpanchayats.gov.in |
| 166 | AMB AL A | B AR AR A | MILK DHANKOTA | http://gpmilkdhankota.harpanchayats.gov.in |
| 167 | AMB AL A | B AR AR A | MILK SHEKHAN | http://gpmilkshekhan.harpanchayats.gov.in |
| 168 | AMB AL A | B AR AR A | MULL ANA | http://gpmullana.harpanchayats.gov.in |
| 169 | AMB AL A | B AR AR A | NAHRA | http://gpnahra.harpanchayats.gov.in |
| 170 | AMB AL A | B AR AR A | PONTI | http://gponti.harpanchayats.gov.in |

| | | | | |
|-----|----------|---------------|-------------------|---|
| 171 | AMB AL A | B AR AR A | RAJOKHERI | http://gpajakheri.harpanchayats.gov.in |
| 172 | AMB AL A | B AR AR A | RAJOLI | http://gpajoli.harpanchayats.gov.in |
| 173 | AMB AL A | B AR AR A | RAO MAJRA | http://gpao:majra.harpanchayats.gov.in |
| 174 | AMB AL A | B AR AR A | RUKRI | http://gprukri.harpanchayats.gov.in |
| 175 | AMB AL A | B AR AR A | SAJJAN MAJRI | http://gpsajjanmajri.harpanchayats.gov.in |
| 176 | AMB AL A | B AR AR A | SAR AK PUR | http://gpsarakpur-barara.harpanchayats.gov.in |
| 177 | AMB AL A | B AR AR A | SARDHERI | http://gpsardheri.harpanchayats.gov.in |
| 178 | AMB AL A | B AR AR A | SEHLA | http://gpsehla.harpanchayats.gov.in |
| 179 | AMB AL A | B AR AR A | SEHLAPUR | http://gpsehlapur.harpanchayats.gov.in |
| 180 | AMB AL A | B AR AR A | SHERPUR | http://gpsherpur-barara.harpanchayats.gov.in |
| 181 | AMB AL A | B AR AR A | SIMBLA | http://gpsimbla.harpanchayats.gov.in |
| 182 | AMB AL A | B AR AR A | SIRASGARH | http://gpsirasgarh.harpanchayats.gov.in |
| 183 | AMB AL A | B AR AR A | SIWAN MAJRA | http://gpsiwanimajra.harpanchayats.gov.in |
| 184 | AMB AL A | B AR AR A | SOH ANA | http://gpsohana-barara.harpanchayats.gov.in |
| 185 | AMB AL A | B AR AR A | SOHATA | http://gpsohata.harpanchayats.gov.in |
| 186 | AMB AL A | B AR AR A | SUBHRI | http://gpsubhri-barara.harpanchayats.gov.in |
| 187 | AMB AL A | B AR AR A | SULAKHNI | http://gpsulakhni-barara.harpanchayats.gov.in |
| 188 | AMB AL A | B AR AR A | TALHERI R ANGR AN | http://gptalherirangran.harpanchayats.gov.in |
| 189 | AMB AL A | B AR AR A | TANDWAL | http://gptandwal-barara.harpanchayats.gov.in |
| 190 | AMB AL A | B AR AR A | TANDWALI | http://gptandwali.harpanchayats.gov.in |
| 191 | AMB AL A | B AR AR A | TANGAIL | http://gptangail.harpanchayats.gov.in |
| 192 | AMB AL A | B AR AR A | THUMBER | http://gpthumbur.harpanchayats.gov.in |
| 193 | AMB AL A | B AR AR A | UGALA | http://gpugala.harpanchayats.gov.in |
| 194 | AMB AL A | B AR AR A | ZAFFAR PUR | http://gpzaffarpur.harpanchayats.gov.in |
| 195 | AMB AL A | N AR AING ARH | AJAMPUR | http://gpajampur.harpanchayats.gov.in |
| 196 | AMB AL A | N AR AING ARH | AKB ARPUR | http://gpakbarpur-naraingarh.harpanchayats.gov.in |
| 197 | AMB AL A | N AR AING ARH | AMBLI | http://gpambli-naraingarh.harpanchayats.gov.in |
| 198 | AMB AL A | N AR AING ARH | ANDHERI | http://gpandheri.harpanchayats.gov.in |
| 199 | AMB AL A | N AR AING ARH | BADHAULI | http://gpbadhali.harpanchayats.gov.in |
| 200 | AMB AL A | N AR AING ARH | BAKARPUR | http://gpbakarpur-naraingarh.harpanchayats.gov.in |
| 201 | AMB AL A | N AR AING ARH | BAKHTUA | http://gpbakhtua.harpanchayats.gov.in |
| 202 | AMB AL A | N AR AING ARH | BALLOPUR | http://gpballopur.harpanchayats.gov.in |
| 203 | AMB AL A | N AR AING ARH | BALTI | http://gpbalti.harpanchayats.gov.in |
| 204 | AMB AL A | N AR AING ARH | BARAGAON | http://gpbaragaon-naraingarh.harpanchayats.gov.in |
| 205 | AMB AL A | N AR AING ARH | BARI RASOUR | http://gpbarirasour.harpanchayats.gov.in |
| 206 | AMB AL A | N AR AING ARH | BAROULI | http://gpbarouli-naraingarh.harpanchayats.gov.in |
| 207 | AMB AL A | N AR AING ARH | BARSU MAJRA | http://gpbarsumajra.harpanchayats.gov.in |
| 208 | AMB AL A | N AR AING ARH | BATORA | http://gpbatora.harpanchayats.gov.in |
| 209 | AMB AL A | N AR AING ARH | BERKHERI | http://gpberkheri.harpanchayats.gov.in |
| 210 | AMB AL A | N AR AING ARH | BHARERI KALAN | http://gpbharerikalan.harpanchayats.gov.in |
| 211 | AMB AL A | N AR AING ARH | BHARERI KHURD | http://gpbharerikhurd.harpanchayats.gov.in |
| 212 | AMB AL A | N AR AING ARH | BHUKHARI | http://gpbhukhari-naraingarh.harpanchayats.gov.in |
| 213 | AMB AL A | N AR AING ARH | BRAHAMAN MAJRA | http://gpbrahamanmajra.harpanchayats.gov.in |
| 214 | AMB AL A | N AR AING ARH | BUDHAKHERA | http://gpbudhakhera-naraingarh.harpanchayats.gov.in |
| 215 | AMB AL A | N AR AING ARH | CHANDSOLI | http://gpchandsoli.harpanchayats.gov.in |
| 216 | AMB AL A | N AR AING ARH | CHECHI MAJRA | http://gpchechimajra.harpanchayats.gov.in |
| 217 | AMB AL A | N AR AING ARH | CHHAJAL MAJRA | http://gpchhajalmajra.harpanchayats.gov.in |
| 218 | AMB AL A | N AR AING ARH | CHHOTI KOHRI | http://gpchhotikohri.harpanchayats.gov.in |
| 219 | AMB AL A | N AR AING ARH | CHOTTI BASSI | http://gpchottibassi.harpanchayats.gov.in |
| 220 | AMB AL A | N AR AING ARH | DANOURA | http://gpdanoura.harpanchayats.gov.in |
| 221 | AMB AL A | N AR AING ARH | DEHAR | http://gpdehar.harpanchayats.gov.in |
| 222 | AMB AL A | N AR AING ARH | DERA | http://gpdera.harpanchayats.gov.in |
| 223 | AMB AL A | N AR AING ARH | DUDHALI | http://gpdudhali.harpanchayats.gov.in |
| 224 | AMB AL A | N AR AING ARH | FATEHPUR-126 | http://gpfatehpur126.harpanchayats.gov.in |
| 225 | AMB AL A | N AR AING ARH | FATEHPUR-80 | http://gpfatehpur80.harpanchayats.gov.in |
| 226 | AMB AL A | N AR AING ARH | FIROZPUR | http://gpfirozpur |

| | | | | |
|-----|----------|---------------------|-------------------------------|---|
| | | | | naraingarh.harpanchayats.gov.in |
| 227 | AMB AL A | N A R A I N G A R H | FIROZPUR KATH | http://gpfirozpurkath.harpanchayats.gov.in |
| 228 | AMB AL A | N A R A I N G A R H | GADHOULI | http://gpgadhoul.harpanchayats.gov.in |
| 229 | AMB AL A | N A R A I N G A R H | G A N A U L I | http://gpganauli-naraingarh.harpanchayats.gov.in |
| 230 | AMB AL A | N A R A I N G A R H | H A M I D P U R | http://gphamidpur-naraingarh.harpanchayats.gov.in |
| 231 | AMB AL A | N A R A I N G A R H | H A R B O N | http://gpharbon.harpanchayats.gov.in |
| 232 | AMB AL A | N A R A I N G A R H | H A S A N P U R | http://gphasanpur-naraingarh.harpanchayats.gov.in |
| 233 | AMB AL A | N A R A I N G A R H | H U S S A I N I | http://gphussaini.harpanchayats.gov.in |
| 234 | AMB AL A | N A R A I N G A R H | J A N G U M A J R A | http://gpjangumajra-naraingarh.harpanchayats.gov.in |
| 235 | AMB AL A | N A R A I N G A R H | J E O L I | http://gpjeoli.harpanchayats.gov.in |
| 236 | AMB AL A | N A R A I N G A R H | J H I R I W A L A | http://gpjhiriwala.harpanchayats.gov.in |
| 237 | AMB AL A | N A R A I N G A R H | K A L A A M B (M) | http://gpkalaambm.harpanchayats.gov.in |
| 238 | AMB AL A | N A R A I N G A R H | K A L Y A N A | http://gpkalyana-naraingarh.harpanchayats.gov.in |
| 239 | AMB AL A | N A R A I N G A R H | K A N J A L A | http://gpkanjala.harpanchayats.gov.in |
| 240 | AMB AL A | N A R A I N G A R H | K A T H E M A J R A | http://gpkathemajra.harpanchayats.gov.in |
| 241 | AMB AL A | N A R A I N G A R H | K H A N P U R L A B A N A | http://gpkhanpurlabana.harpanchayats.gov.in |
| 242 | AMB AL A | N A R A I N G A R H | K H A N P U R R A J P U T A N | http://gpkhanpurrajputan-naraingarh.harpanchayats.gov.in |
| 243 | AMB AL A | N A R A I N G A R H | K H E R K I J A T T A N | http://gpkherkijattan.harpanchayats.gov.in |
| 244 | AMB AL A | N A R A I N G A R H | K O H R A B H U R A | http://gpkohrabhura.harpanchayats.gov.in |
| 245 | AMB AL A | N A R A I N G A R H | K U L L A R P U R | http://gpkullarpur.harpanchayats.gov.in |
| 246 | AMB AL A | N A R A I N G A R H | K U R A L I | http://gpkurali-naraingarh.harpanchayats.gov.in |
| 247 | AMB AL A | N A R A I N G A R H | L A H A | http://gplaha.harpanchayats.gov.in |
| 248 | AMB AL A | N A R A I N G A R H | L A K H N O U R A | http://gplakhnoura.harpanchayats.gov.in |
| 249 | AMB AL A | N A R A I N G A R H | L A L P U R | http://gplalpur-naraingarh.harpanchayats.gov.in |
| 250 | AMB AL A | N A R A I N G A R H | L O T T O N | http://gplotton.harpanchayats.gov.in |
| 251 | AMB AL A | N A R A I N G A R H | M A H U W A K H E R I | http://gpmahuwakheri-naraingarh.harpanchayats.gov.in |
| 252 | AMB AL A | N A R A I N G A R H | M I L K | http://gpmilk.harpanchayats.gov.in |
| 253 | AMB AL A | N A R A I N G A R H | M I R J A P U R K A T H | http://gpmirjapurkath.harpanchayats.gov.in |
| 254 | AMB AL A | N A R A I N G A R H | M I R P U R | http://gpmirpur-naraingarh.harpanchayats.gov.in |
| 255 | AMB AL A | N A R A I N G A R H | M I Y A N P U R | http://gpmiyanpur.harpanchayats.gov.in |
| 256 | AMB AL A | N A R A I N G A R H | M U G A L M A J R A | http://gpmugalmajra-naraingarh.harpanchayats.gov.in |
| 257 | AMB AL A | N A R A I N G A R H | M U N N A M A J R A | http://gpmunnamajra.harpanchayats.gov.in |
| 258 | AMB AL A | N A R A I N G A R H | N A B I P U R | http://gpnabipur-naraingarh.harpanchayats.gov.in |
| 259 | AMB AL A | N A R A I N G A R H | N A G A W A N | http://gpnagawan.harpanchayats.gov.in |
| 260 | AMB AL A | N A R A I N G A R H | N A G L A R A J P U T A N | http://gpnaglarajputan.harpanchayats.gov.in |
| 261 | AMB AL A | N A R A I N G A R H | N A G O U L I | http://gpnagouli.harpanchayats.gov.in |
| 262 | AMB AL A | N A R A I N G A R H | N A K H R O U L I | http://gpnakhrouli.harpanchayats.gov.in |
| 263 | AMB AL A | N A R A I N G A R H | N A N D U W A L I | http://gpnanduwali.harpanchayats.gov.in |
| 264 | AMB AL A | N A R A I N G A R H | N A N H E R A | http://gpnanhera-naraingarh.harpanchayats.gov.in |
| 265 | AMB AL A | N A R A I N G A R H | O K H A L | http://gpokhal.harpanchayats.gov.in |
| 266 | AMB AL A | N A R A I N G A R H | P A N J L A S A | http://gppanjlasa.harpanchayats.gov.in |
| 267 | AMB AL A | N A R A I N G A R H | P U L L E W A L A | http://gppullewala.harpanchayats.gov.in |
| 268 | AMB AL A | N A R A I N G A R H | R A J J U M A J R A | http://gprajjumajra.harpanchayats.gov.in |
| 269 | AMB AL A | N A R A I N G A R H | R A M P U R | http://gprampur-naraingarh.harpanchayats.gov.in |
| 270 | AMB AL A | N A R A I N G A R H | S A N M A J R A | http://gpsainmajra.harpanchayats.gov.in |
| 271 | AMB AL A | N A R A I N G A R H | S A K A R P U R A | http://gpsakarpura.harpanchayats.gov.in |
| 272 | AMB AL A | N A R A I N G A R H | S A M B H A L W A | http://gpsambhalwa.harpanchayats.gov.in |
| 273 | AMB AL A | N A R A I N G A R H | S A N G R A N I | http://gpsangrani.harpanchayats.gov.in |
| 274 | AMB AL A | N A R A I N G A R H | S H A H P U R | http://gpshahpur-naraingarh.harpanchayats.gov.in |
| 275 | AMB AL A | N A R A I N G A R H | S H A H P U R N U R D | http://gpshahpurnurd.harpanchayats.gov.in |
| 276 | AMB AL A | N A R A I N G A R H | T A P R I A N R U L D U K I | http://gptaprianruduki.harpanchayats.gov.in |
| 277 | AMB AL A | N A R A I N G A R H | T O K A | http://gptoka.harpanchayats.gov.in |
| 278 | AMB AL A | N A R A I N G A R H | U J J A L M A J R I | http://gpujjalmajri.harpanchayats.gov.in |

| | | | | |
|-----|----------|------|-----------------|---|
| 279 | AMB AL A | SAHA | AKB ARPUR | http://gpakbarpur-saha.harpanchayats.gov.in |
| 280 | AMB AL A | SAHA | ALL APUR | http://gpallapur.harpanchayats.gov.in |
| 281 | AMB AL A | SAHA | BAJIDPUR | http://gpbajidpur-saha.harpanchayats.gov.in |
| 282 | AMB AL A | SAHA | BIHTA | http://gpbihata-saha.harpanchayats.gov.in |
| 283 | AMB AL A | SAHA | CHHANNI | http://gpchhanni.harpanchayats.gov.in |
| 284 | AMB AL A | SAHA | CHHAPRA | http://gpchhapra-saha.harpanchayats.gov.in |
| 285 | AMB AL A | SAHA | CHUDIALA | http://gpchudiala.harpanchayats.gov.in |
| 286 | AMB AL A | SAHA | CHUDIALI | http://gpchudiali.harpanchayats.gov.in |
| 287 | AMB AL A | SAHA | DHAKOLA | http://gpdhakola.harpanchayats.gov.in |
| 288 | AMB AL A | SAHA | DHURALA | http://gpdhurala-saha.harpanchayats.gov.in |
| 289 | AMB AL A | SAHA | DINARPUR | http://gpdinarpur.harpanchayats.gov.in |
| 290 | AMB AL A | SAHA | DUBLI | http://gpdubli.harpanchayats.gov.in |
| 291 | AMB AL A | SAHA | FULELMAJRA | http://gpfulelmajra.harpanchayats.gov.in |
| 292 | AMB AL A | SAHA | GAGANHERI | http://gpgaganheri.harpanchayats.gov.in |
| 293 | AMB AL A | SAHA | GHASITPUR | http://gpghasitpur.harpanchayats.gov.in |
| 294 | AMB AL A | SAHA | GOKALGARH | http://gpgokalgarh-saha.harpanchayats.gov.in |
| 295 | AMB AL A | SAHA | GOLA | http://gpgola.harpanchayats.gov.in |
| 296 | AMB AL A | SAHA | HALDRI | http://gphaldri.harpanchayats.gov.in |
| 297 | AMB AL A | SAHA | HAMIDPUR | http://gphamidpur-saha.harpanchayats.gov.in |
| 298 | AMB AL A | SAHA | HARDA | http://gpharda.harpanchayats.gov.in |
| 299 | AMB AL A | SAHA | HARYOLI | http://gpharyoli-saha.harpanchayats.gov.in |
| 300 | AMB AL A | SAHA | JAWAHARGARH | http://gpjawahargarh.harpanchayats.gov.in |
| 301 | AMB AL A | SAHA | JHARUMAJRA | http://gpjharumajra.harpanchayats.gov.in |
| 302 | AMB AL A | SAHA | KAKAR KUNDA | http://gpkakarunda.harpanchayats.gov.in |
| 303 | AMB AL A | SAHA | KALPI | http://gpkalpi.harpanchayats.gov.in |
| 304 | AMB AL A | SAHA | KESHOPUR | http://gpkeshopur-saha.harpanchayats.gov.in |
| 305 | AMB AL A | SAHA | KESRI | http://gpkesri.harpanchayats.gov.in |
| 306 | AMB AL A | SAHA | KHANPUR | http://gpkhanpur-saha.harpanchayats.gov.in |
| 307 | AMB AL A | SAHA | KHARU KHERA | http://gpkharukhera.harpanchayats.gov.in |
| 308 | AMB AL A | SAHA | KHERA | http://gpkhera-saha.harpanchayats.gov.in |
| 309 | AMB AL A | SAHA | LANDA | http://gplanda.harpanchayats.gov.in |
| 310 | AMB AL A | SAHA | LANGER | http://gplanger.harpanchayats.gov.in |
| 311 | AMB AL A | SAHA | MALIKPUR | http://gpmalikpur-saha.harpanchayats.gov.in |
| 312 | AMB AL A | SAHA | MEHMOODPUR | http://gpmehmoodpur-saha.harpanchayats.gov.in |
| 313 | AMB AL A | SAHA | MEHTABGARH | http://gpmehrabgarh.harpanchayats.gov.in |
| 314 | AMB AL A | SAHA | MITHAPUR | http://gpmithapur.harpanchayats.gov.in |
| 315 | AMB AL A | SAHA | NAGLAJATTAN | http://gpnaglajattan.harpanchayats.gov.in |
| 316 | AMB AL A | SAHA | NAHONI | http://gpnahoni.harpanchayats.gov.in |
| 317 | AMB AL A | SAHA | NARANGARH MAJRA | http://gpnaraingarhmajra.harpanchayats.gov.in |
| 318 | AMB AL A | SAHA | NURD | http://gpnurd.harpanchayats.gov.in |
| 319 | AMB AL A | SAHA | PANJAIL | http://gppanjail.harpanchayats.gov.in |
| 320 | AMB AL A | SAHA | PAPLOTHA | http://gppaplotha.harpanchayats.gov.in |
| 321 | AMB AL A | SAHA | PASIALA | http://gppasiala.harpanchayats.gov.in |
| 322 | AMB AL A | SAHA | PILKHANI | http://gppilkhani.harpanchayats.gov.in |
| 323 | AMB AL A | SAHA | RAMGARH | http://gpramgarh-saha.harpanchayats.gov.in |
| 324 | AMB AL A | SAHA | RAMPUR | http://gprampur-saha.harpanchayats.gov.in |
| 325 | AMB AL A | SAHA | SABANPUR | http://gpsabanpur.harpanchayats.gov.in |
| 326 | AMB AL A | SAHA | SABGA | http://gpsabga.harpanchayats.gov.in |
| 327 | AMB AL A | SAHA | SAHA | http://gpsaha.harpanchayats.gov.in |
| 328 | AMB AL A | SAHA | SAMBHALKHA | http://gpsambhalkha.harpanchayats.gov.in |
| 329 | AMB AL A | SAHA | SAMLEHRI | http://gpsamlehri-saha.harpanchayats.gov.in |
| 330 | AMB AL A | SAHA | SHERGARH | http://gpshergarh-saha.harpanchayats.gov.in |
| 331 | AMB AL A | SAHA | TALHERI GUJRAN | http://gptalherigujran.harpanchayats.gov.in |
| 332 | AMB AL A | SAHA | TAMNOLI | http://gptamnoli.harpanchayats.gov.in |
| 333 | AMB AL A | SAHA | TAPRIAN | http://gptaprian-saha.harpanchayats.gov.in |
| 334 | AMB AL A | SAHA | TEPLA | http://gptepla.harpanchayats.gov.in |
| 335 | AMB AL A | SAHA | THAKURPURA | http://gpthakurpura.harpanchayats.gov.in |
| 336 | AMB AL A | SAHA | THARWA | http://gptharwa-saha.harpanchayats.gov.in |

| | | | | |
|-----|----------|--------------|----------------------|---|
| 337 | AMB AL A | SAHA | TOB A | http://gptoba.harpanchayats.gov.in |
| 338 | AMB AL A | SAHA | UPL ANA | http://gpuplana-saha.harpanchayats.gov.in |
| 339 | AMB AL A | SH AHZ ADPUR | B ANOUNDI | http://gpbanoundi.harpanchayats.gov.in |
| 340 | AMB AL A | SH AHZ ADPUR | B APOLI | http://gpbapoli-shahzadpur.harpanchayats.gov.in |
| 341 | AMB AL A | SH AHZ ADPUR | B AR AGARH | http://gpbaragarh.harpanchayats.gov.in |
| 342 | AMB AL A | SH AHZ ADPUR | B ARI BASSI | http://gpbaribassi.harpanchayats.gov.in |
| 343 | AMB AL A | SH AHZ ADPUR | B ARIKOHRI | http://gpbarikohri.harpanchayats.gov.in |
| 344 | AMB AL A | SH AHZ ADPUR | BEHLOLI | http://gpbeholi.harpanchayats.gov.in |
| 345 | AMB AL A | SH AHZ ADPUR | BERPURA | http://gpberpura.harpanchayats.gov.in |
| 346 | AMB AL A | SH AHZ ADPUR | BHARAPURA | http://gpbharapura.harpanchayats.gov.in |
| 347 | AMB AL A | SH AHZ ADPUR | BHAROG | http://gpbharog.harpanchayats.gov.in |
| 348 | AMB AL A | SH AHZ ADPUR | BHERON | http://gpbheron.harpanchayats.gov.in |
| 349 | AMB AL A | SH AHZ ADPUR | BIBIPUR | http://gpbibipur-shahzadpur.harpanchayats.gov.in |
| 350 | AMB AL A | SH AHZ ADPUR | BICH PARI | http://gpbichpari-shahzadpur.harpanchayats.gov.in |
| 351 | AMB AL A | SH AHZ ADPUR | BILASPUR | http://gpbilaspur-shahzadpur.harpanchayats.gov.in |
| 352 | AMB AL A | SH AHZ ADPUR | BURAJSHAHID | http://gpburajshahid.harpanchayats.gov.in |
| 353 | AMB AL A | SH AHZ ADPUR | CHETAN | http://gpchetan.harpanchayats.gov.in |
| 354 | AMB AL A | SH AHZ ADPUR | CHHAJU MAJRA | http://gpchhajumajra.harpanchayats.gov.in |
| 355 | AMB AL A | SH AHZ ADPUR | DEHARI | http://gpdehari.harpanchayats.gov.in |
| 356 | AMB AL A | SH AHZ ADPUR | DHAMOLI BICHLI | http://gpdhamolibichli.harpanchayats.gov.in |
| 357 | AMB AL A | SH AHZ ADPUR | DHAMOLI MAJRI | http://gpdhamolimajri.harpanchayats.gov.in |
| 358 | AMB AL A | SH AHZ ADPUR | DHAMOLI UPPARLI | http://gpdhamoliupparli.harpanchayats.gov.in |
| 359 | AMB AL A | SH AHZ ADPUR | DHANANA | http://gpdhanana-shahzadpur.harpanchayats.gov.in |
| 360 | AMB AL A | SH AHZ ADPUR | FATEH GARH | http://gpfatehgarh-shahzadpur.harpanchayats.gov.in |
| 361 | AMB AL A | SH AHZ ADPUR | GANEHSPUR | http://gpganehspur.harpanchayats.gov.in |
| 362 | AMB AL A | SH AHZ ADPUR | GAZIPUR | http://gpgazipur.harpanchayats.gov.in |
| 363 | AMB AL A | SH AHZ ADPUR | GHAROLI | http://gpggharoli.harpanchayats.gov.in |
| 364 | AMB AL A | SH AHZ ADPUR | GOBINDPUR | http://gpgobindpur-shahzadpur.harpanchayats.gov.in |
| 365 | AMB AL A | SH AHZ ADPUR | HANDI KHERA | http://gphandikhera.harpanchayats.gov.in |
| 366 | AMB AL A | SH AHZ ADPUR | JANGU MAJRA | http://gpjangumajra-shahzadpur.harpanchayats.gov.in |
| 367 | AMB AL A | SH AHZ ADPUR | JATWAR | http://gpjatwar.harpanchayats.gov.in |
| 368 | AMB AL A | SH AHZ ADPUR | KAKKAR MAJRA | http://gpkakkarmajra.harpanchayats.gov.in |
| 369 | AMB AL A | SH AHZ ADPUR | KALAL MAJRA | http://gpkalalmajra-shahzadpur.harpanchayats.gov.in |
| 370 | AMB AL A | SH AHZ ADPUR | KALAL MAJRI | http://gpkalalmajri.harpanchayats.gov.in |
| 371 | AMB AL A | SH AHZ ADPUR | KARASAN | http://gpkarasan.harpanchayats.gov.in |
| 372 | AMB AL A | SH AHZ ADPUR | KHANPUR BRAHMNANA | http://gpkhanpurbrahmna.harpanchayats.gov.in |
| 373 | AMB AL A | SH AHZ ADPUR | KHEDABODA | http://gpkhedaboda.harpanchayats.gov.in |
| 374 | AMB AL A | SH AHZ ADPUR | KHEDAGANNI | http://gpkhedaganni.harpanchayats.gov.in |
| 375 | AMB AL A | SH AHZ ADPUR | KHERKI MANAKPUR | http://gpkherkimanakpur.harpanchayats.gov.in |
| 376 | AMB AL A | SH AHZ ADPUR | KHURD | http://gpkhurd.harpanchayats.gov.in |
| 377 | AMB AL A | SH AHZ ADPUR | KORWAKALAN | http://gpkorwakalan.harpanchayats.gov.in |
| 378 | AMB AL A | SH AHZ ADPUR | KORWAKHURD | http://gpkorwakhurd.harpanchayats.gov.in |
| 379 | AMB AL A | SH AHZ ADPUR | MAGGARPURA | http://gpmaggarpura.harpanchayats.gov.in |
| 380 | AMB AL A | SH AHZ ADPUR | MAJRA | http://gpmajra-shahzadpur.harpanchayats.gov.in |
| 381 | AMB AL A | SH AHZ ADPUR | MANGLOR | http://gpmanglor.harpanchayats.gov.in |
| 382 | AMB AL A | SH AHZ ADPUR | MUKANDPUR | http://gpmukandpur-shahzadpur.harpanchayats.gov.in |
| 383 | AMB AL A | SH AHZ ADPUR | NAGGALAJATTAN | http://gpnaggalajattan.harpanchayats.gov.in |
| 384 | AMB AL A | SH AHZ ADPUR | NASRAULI | http://gpnasrauli.harpanchayats.gov.in |
| 385 | AMB AL A | SH AHZ ADPUR | NEKNAWAN | http://gpneknawan.harpanchayats.gov.in |
| 386 | AMB AL A | SH AHZ ADPUR | PANJETON | http://gppanjeton-shahzadpur.harpanchayats.gov.in |
| 387 | AMB AL A | SH AHZ ADPUR | PATHREHRI | http://gppathrehri.harpanchayats.gov.in |
| 388 | AMB AL A | SH AHZ ADPUR | PATVI | http://gppatvi.harpanchayats.gov.in |
| 389 | AMB AL A | SH AHZ ADPUR | PRAIL | http://gpprail.harpanchayats.gov.in |

| | | | | |
|-----|----------|--------------|--------------|---|
| 390 | AMB AL A | SH AHZ ADPUR | RACHERI | http://gpracheri.harpanchayats.gov.in |
| 391 | AMB AL A | SH AHZ ADPUR | RAIWALI | http://gpriwali.harpanchayats.gov.in |
| 392 | AMB AL A | SH AHZ ADPUR | RAJOLI | http://gprouli.harpanchayats.gov.in |
| 393 | AMB AL A | SH AHZ ADPUR | RAJPURA | http://gprouli.harpanchayats.gov.in |
| 394 | AMB AL A | SH AHZ ADPUR | RASIDPUR | http://gprasadpur.harpanchayats.gov.in |
| 395 | AMB AL A | SH AHZ ADPUR | RATOR | http://gprator.harpanchayats.gov.in |
| 396 | AMB AL A | SH AHZ ADPUR | SADIKPUR | http://gpsadikpur-shahzadpur.harpanchayats.gov.in |
| 397 | AMB AL A | SH AHZ ADPUR | SALOLA | http://gpsalola.harpanchayats.gov.in |
| 398 | AMB AL A | SH AHZ ADPUR | SANTOKHI | http://gpsantokhi.harpanchayats.gov.in |
| 399 | AMB AL A | SH AHZ ADPUR | SH AHZ ADPUR | http://gpsantokhi.harpanchayats.gov.in |
| 400 | AMB AL A | SH AHZ ADPUR | SHAMRU | http://gpshamru.harpanchayats.gov.in |
| 401 | AMB AL A | SH AHZ ADPUR | SHERPUR | http://gpsherpur-shahzadpur.harpanchayats.gov.in |
| 402 | AMB AL A | SH AHZ ADPUR | SONTLI | http://gpsontli.harpanchayats.gov.in |
| 403 | AMB AL A | SH AHZ ADPUR | TANDWAL | http://gptandwal-shahzadpur.harpanchayats.gov.in |
| 404 | AMB AL A | SH AHZ ADPUR | TASDOLI | http://gptasdoli.harpanchayats.gov.in |
| 405 | AMB AL A | SH AHZ ADPUR | WASALPUR | http://gpwasalpur.harpanchayats.gov.in |
| 406 | BHIWANI | BADHRA | ARYANAGAR | http://gparyanagar-badhra.harpanchayats.gov.in |
| 407 | BHIWANI | BADHRA | BADHRA | http://gpbadhra.harpanchayats.gov.in |
| 408 | BHIWANI | BADHRA | BADRAI | http://gpbadrai.harpanchayats.gov.in |
| 409 | BHIWANI | BADHRA | BERLA | http://gpberla.harpanchayats.gov.in |
| 410 | BHIWANI | BADHRA | BHANDWA | http://gpbhandwa.harpanchayats.gov.in |
| 411 | BHIWANI | BADHRA | BILAWAL | http://gpbilawal.harpanchayats.gov.in |