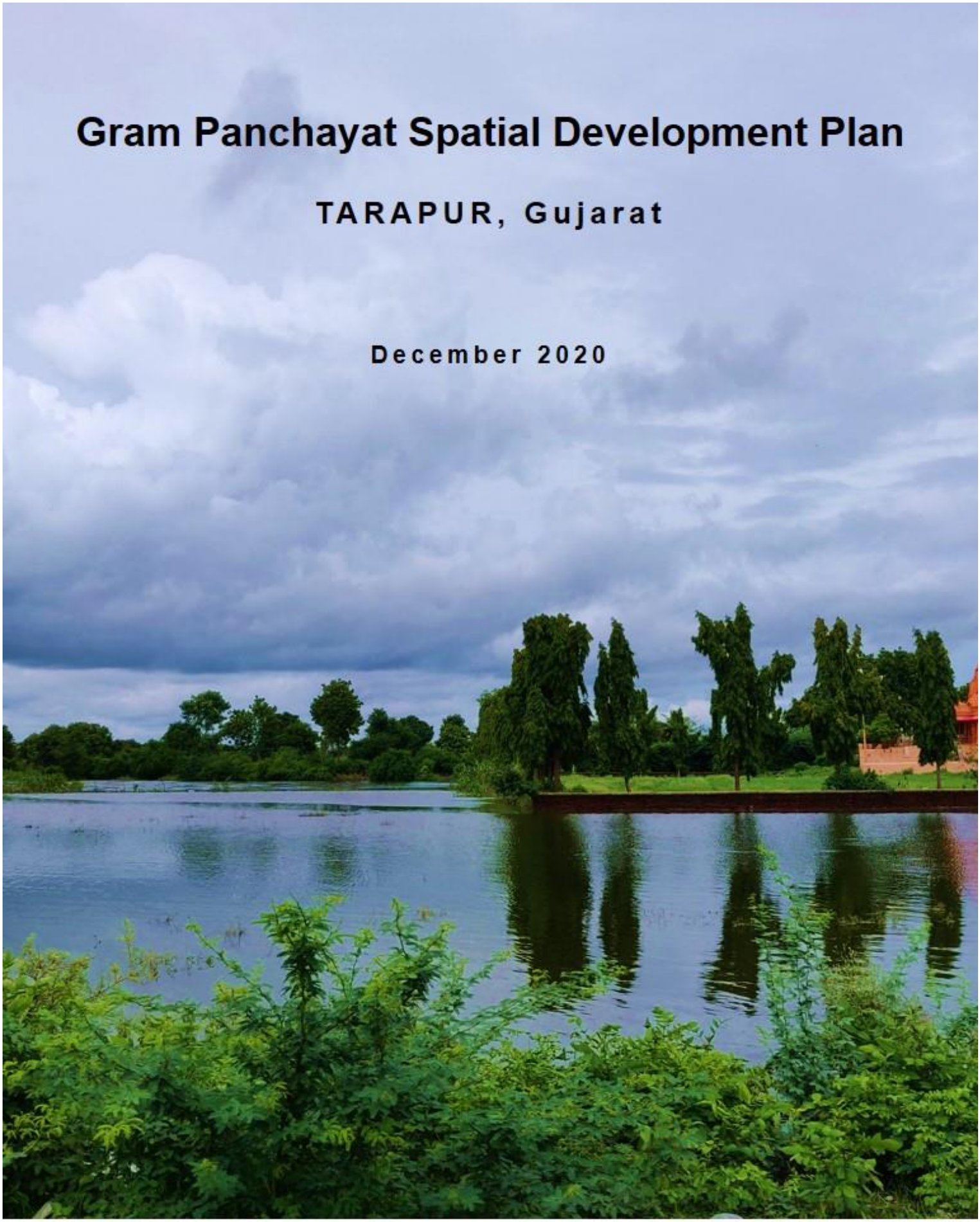
Gram Panchayat Spatial Development Plan

TARAPUR, Gujarat

December 2020



Panchayats, Rural Housing & Rural Development Departmnet
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Tarapur

GRAM PANCHAYAT SPATIAL DEVELOPMENT PLAN

FINAL REPORT

Panchayats, Rural Housing & Rural Development Departmnet
Government of Gujarat

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ACKNOWLEDGMENT

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List of Abbreviations

APMC	Agricultural Produce Market Committee
CHC	Community Health Center
CPHEEO	Central Public Health and Environmental Engineering Organisation
DDO	District Development Officer
DILR	District Inspector Land Record
ELU	Existing Land Use
ESR	Elevated storage reservoir
FGDs	Focus Group Discussions
GIS	Geographical Information System
GoG	Government of Gujarat
GP	Gram Panchayat
GPSDP	Gram Panchayat Spatial Development Plan
Ha	Hectare
HH	Household
HWY	Highway
ITI	Industrial training institute
Km	Kilometer
KVK	Krishi Vigyan Kendra
m	meter
MGVCL	Madhya Gujarat Vij Company Limited
MoHFW	Ministry of Health and Family Welfare
MoPR	Ministry of Panchayati Raj
MoRD	Ministry of Rural Development
mt.	meter
HH	Household
NH	National Highway
NIC	National Informatics Center
NRSC	National Remote Sensing Center
PHC	Primary Health Center
PLU	Proposed Land Use
PMAY	Pradhan Mantri Awas Yojana
Pph	Person per hectare
PSP	Public and Semi-Public
SBM	Swach Bharat Mission
SC	Schedule Cast
SEZ	Special Economic Zone
SH	State Highway
SIR	Special Investment Region
ST	Scheduled Tribe
STP	Sewage Treatment Plant
Sq.km	Square Kilometer

Sq.mt	Square Meter
TDO	Taluka Development Authority
URDPFI	Urban and Regional Development Plans Formulation and Implementation
WFPR	Workforce Participation Rate

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INTRODUCTION

CHAPTER 1: BACKGROUND

1.1. Background

Rapid urbanization, increased migration from rural to urban areas and declining rural poverty have been the central themes for economic development in India until now. However, the COVID-19 pandemic, the lockdown and the resultant reverse migration of lakhs of daily wage labourers, employed mainly in the informal sector, in 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 rural areas.

The Government of India has taken substantive measures to reach out to rural India by utilizing Jan Dhan Yojana which credited direct cash transfers to the bank accounts of poor women. Under the aegis of PM-KISAN scheme cash transfers have been credited to the accounts of farmers. In this regard, the role of Gram Panchayats, as the third tier of governance and the tier closest to the people, becomes significant for assisting the people. Further, empowering the Gram Panchayats, the Constitution Article 243G mandates the Panchayats to be endowed with such powers and authority to enable them for the preparation of plans for economic development and social justice within their respective areas.

Therefore, it's a natural corollary for the Panchayats to be capacitated to take over the larger canvas of local economic development in all spheres amongst their constituent villages, much like the spatial developmental planning undertaken by the Urban Local Bodies in the country. This potential for rapid economic development is particularly high in those Panchayats which are located on the National or State Highways. Up till now, the rural communities have not been able to fully exploit the vantage position offered to these villages in terms of a high volume of traffic flow (cars, trucks etc.) along these arterial highways and potential for commercial development of land along with the National Highways (NHs) and State Highways (SHs). Frequently, entrepreneurs from nearby urban areas have instead exploited the potential through the mushrooming growth of motels, hotels, restaurants and entertainment spots.

Hence, the Ministry of Panchayati Raj has proposed to prepare a Gram Panchayat Spatial Development Plan (GPSDP) for the 32 villages for the pilot implementation. The agenda of preparing the spatial plan is to focus on economic development and social justice within their respective areas. However, in their present set up the panchayat neither have the means nor the capacity to undertake such an effort. Therefore, the ministry has identified 16 institutions to extend their support for the preparation of the Spatial Development Plan for Gram Panchayat for future development.

GPSDP is an integrated plan that will incorporate the spatial layers corresponding to attributes like physical features, landholding, land ownership, land use in Abadi area, physical and social infrastructure, etc.; built environment parameters like housing typology, building height, building age, etc.; economic parameters like land-holding wise cropping pattern, etc. The plan will also incorporate non-spatial

attributes like socio-economic condition, skill level, and governance dimensions. The outcome will be in the form of a broad zoning system, a road and infrastructure plan and brief development guideline for rural settlements. Primary surveys for physical verification and assessment of socio-economic condition will be part of the study, along with focus group discussions with stakeholders and key informant surveys. Later the Panchayat members through Panchayat meetings will verify the spatial proposals formulated by the institutional team. This would make the GPSDP a participatory plan.

1.2. Need for the Gram Panchayat Spatial Development Plan

Unplanned development, whether in rural areas, or in peri-urban areas, or the vicinity of the national and state highways, is normally being inefficient in the use of resources; especially the land. Land being the limited resource has pressure from social, economic and environmental needs, including urbanization, industrialization, mining, transportation, rural development, protection of environmentally sensitive zones and resource areas etc. To prevent the unwarranted conversion of rich agricultural land to urban uses, it becomes essential to prescribe land use norms and activities permissible for the rural areas. Proper planning of land and its resources allows for rational and sustainable use of land catering to various needs, including social, economic, developmental and environmental needs. Proper land-use planning based on sound scientific, and technical procedures, and land utilization strategies, supported by participatory approaches empower people to make decisions on how to appropriately allocate and utilize land and its resources comprehensively and consistently catering to the present and future demands. There is a need for the scientific, aesthetic and orderly disposition of land resources, facilities and services to secure the physical, economic and social efficiency, health and well-being of communities.

To prevent unplanned development in the urban areas, spatial plans are prepared for cities and towns popularly known as Master Plans and Development Plans and notified under the respective State Town and Country Planning Acts. However, a similar initiative is not being taken so far for development in villages and their surrounding areas. There has been no serious attempt to prepare spatial plans for rural areas and considering the vast rural population of the country who have been deprived of the access to basic facilities. Similar planning initiative is crucial for rural areas as well; especially, now when during the COVID-19 pandemic, the lockdown and the resultant ‘reverse migration’ of lakhs of daily wage labourers-employed mainly in the informal sector. Similar to the urban areas, rural areas too should have a spatially integrated plan such as GPSDP that identifies land and infrastructure usage requirements for the villages, such as land allocation & usage, provisioning of infrastructure services, creating economically productive, for efficient, equitable, harmonious and sustainable growth of the villages.

GPSDP would be an overarching planning document and spatial layout which can be used for structuring land use and development within the jurisdiction of the Gram Panchayat (GP). It will outline a vision to guide the growth and development of a rural area over the next 20-30 years. The Geographical Information System (GIS) technology would be an internal component of the GPSDP.

1.2.1 Objective

The objective of the study majorly focuses on planning for development in the rural areas which needs to be an envisioning process requiring a sound professional assessment of the ground situation and provide options for sustainable development within the bounds of demographic, physical, socio-economic, and jurisdiction aspects. The specific objective of the plan is to:

- Outline a vision to guide the growth and development of a rural area over the next 20-30 years
- Preparation of a GPSDP ensuring the following
    - Managing growth and change
    - Providing for orderly and predictable development
    - Protecting environmental resources
    - Setting priorities for developing and maintaining infrastructure and public facilities
    - Strengthening local identity
    - Creating a framework for future policy decisions
    - Promoting open, democratic planning
    - Guiding landowners, developers and government authorities

1.2.2 Scope of work

The overall scope of work would include:

- Formulation of land use and land cover norms and standards specific to the rural areas
- Integrated development strategies with the nearest urban areas and plans including common development goals and a framework for their achievements
- Zoning and territorialisation
- Stronger cooperation between different levels of government administrations and agencies
- Unified efforts with industry and investors

CHAPTER 2: METHODOLOGY AND APPROACH

Preparation GPSDP is intended for the systematic development of the gram panchayats. Moreover, the plan is a tool to provide quality of life to the villagers through planned growth, provision of infrastructure and to spur overall economic growth of the area. This section outlines the overall approach and the adopted methodology for achieving the objectives of the project.

2.1. Approach

The overall approach for the preparation of GPSDP as explained below, this is followed by the adopted methodology along with the sequence of activities proposed to be taken up for achieving the objectives of the project.

Approach for the Preparation of GPSDP

1. Kick off Meeting
2. Reconnaissance Survey and Review of Existing Policies
3. Infrastructure Gap Identification
4. Future Growth Estimation
5. Consultation with Officials and Key Stakeholders
6. Project Phasing- Implementation Strategy

2.2. Methodology

2.2.1 Project Initiation

2.2.1.1 Village Selection Criteria

This task involves the identification of the Gram Panchayats for which the GPSDP will be undertaken. For the State of Gujarat, two GPs-namely Tarapur in Anand District and Nandasan in the Mehsana District, have been identified for the preparation of the Spatial Development Plan. The selection of GPs has been done in consultation with the Panchayat, Rural Housing & Rural Development Department of Gujarat, based on the following parameters:

1. As per the Census 2011, GP population should be more than 10,000
2. GP should be located adjoining to a National highway or State Highway
3. GP should not be part of any Urban Development Authority, Area Development Authority, and any other special development authority like SIR, SEZ etc.

4. GP should not be in the influential area (periphery of 2-3 villages) of any major Urban Development Authority (UDA) and Area Development Authority (ADA) or Special development authority
5. GP should be an important center in the region

This task included a critical review of the study area and its surrounding region. Once the village selection is done, the region will be reviewed considering the major roads, major natural features, current economic activities and administrative units. While identifying the study area, the following shall also be dealt with:

- A general overview of the study area
- Understanding important landmarks, features and recent development trends
- Study of previous/other planning initiatives for the study area
- Study of relevant policies, laws and legislative framework
- Documentation of relevant maps: administrative, transportation etc.

2.2.1.2 Understanding and Conceptualization of the Study Area

This stage is a very initial phase which involves the understanding and conceptualization of the project area (Tarapur GP) in consultation with the panchayat. The objective of this stage was to initiate the project by finalizing the work plan, methodology and the familiarization of the project with the project area.

This stage also included the reconnaissance survey of the project area by the study team. The object of this survey was to understand the spatial geography, important landmark development, prominent physical features and other features of the project area and surroundings. This also helped in identifying the various spatial growth trends, economic drivers, potential economy generating locations for the selected villages.

2.2.2 Data Collection and Analysis

2.2.2.1 Primary Data Collection

Task 1: Field Visit (Tarapur GP)

The field visits to the Gram Panchayat of Tarapur was undertaken for an overall background study through personal experiences. The objective of the visit was to interact with the officials and understand their vision for their GP in terms of socio-economic development for their village. The team had direct interaction with the GP's Taluka Development Officer (TDO), Sarpanch, Deputy Sarpanch, and Talati to get familiar with the basic profile of the Gram Panchayats, along with the distribution of the primary and secondary economic activities. The scope of potential development in the GPs and challenges faced by the villagers were also be discussed during the field visits.

Task 2: Household Survey

The purpose of the survey is to understand the characteristic of the gram panchayat, level of availability of the social and physical infrastructure to the villagers, and the present status of the supporting infrastructure for employment.

Roughly five per cent of the households are considered as a sample size for the survey; therefore, the sample size for the survey in the Tarapur GP is 300. The household survey was undertaken with the help of Sarpanch and Talati.

Task 3: Stakeholder Consultation

To identify the critical issues of the study area, consultations with stakeholder are very crucial for gathering relevant information as well as for understanding the issues faced by the villagers. Therefore, the project team has carried out focus group discussions in the project area. These discussions were conducted with residents, and with the key stakeholders like DDO, TDO, Sarpanch, and Talati to take stock of the status and availability of services in the area. Apart from this, a series of informal interviews were also conducted with the residents to access the existing infrastructure conditions and analyze gaps in basic amenity provisions. The discussed with the key stakeholders like TDO, Sarpanch, and Talati were conducted during the field visits of both the GPs.

2.2.2.2 Secondary Data Collection

Data from various online sources and authorities are collected to undertake the following tasks:

Task 1: Preparation of the Base Map

Predominantly a Base Map provides all the administrative and revenue boundaries with major linkages in terms of roads and rail lines. It refers to the accurate spatial database within a data system that depicts the fundamental map elements such as; topography, political divisions, cadastral divisions, roads, water bodies etc. It acts as a reference map for integrating other spatial information with a higher level of accuracy.

The map is prepared using the GIS platform. The Base Map demarcates the spatial spread of built-up land, settlements, vacant land, scrubland, vegetation cover, land under agriculture use, roads, rail line, forests, rivers and other water bodies based on aerial/ satellite imagery and relevant secondary data.

For the preparation of the Base Map for Tarapur GP, the satellite image is procured from NRSC, and village revenue maps are procured from the DILR.

Task 2: Preparation of Existing Land Use Map

This task involves the assessment of the existing situation of the study area in terms of the current distribution of land under each uses and identify the land cover classified as agriculture land, water bodies, wasteland, forest land, vacant areas, and built-up area. Preparation of existing land use was prepared by undertaking a combination of scientific and digital analysis of satellite images, primary field survey and data from relevant sources.

Existing land use map is very crucial to understand the spatial pattern of land uses, the amount of development of various uses and intensity of development. Also, various relevant observations and analysis can be mapped based on the land use map.

There are major four features identified and adopted in the land use preparation of the study area. These are- physical features, natural features, and cover and land use. These features are further subdivided into the number of layers and categories.

Existing Land Use map for Tarapur GP is prepared and compiled by overlaying information from the following source:

- Satellite image and its interpretation
- Existing land use plans as available with various authorities
- Google earth image for the spread of the urban built form

Task 3: Exiting Situation Analysis

Understanding the region holistically is very important to identify the thrust influencing the growth and existing situation of the study area. Hence a study of the features and significance of the area through a various lens becomes essential to develop the proposals for the future timeframe. Apart from these, the geographical profile is also studied at this stage through various secondary and primary data.

To understand the potentials and issues of the area, it is necessary to record and map the existing condition of the project area and then use them for the formulation of the proposals. Besides, various thematic maps are prepared for analysis of the existing situation and gap analysis for the various infrastructure is done at this stage for the preparation of the GPSDP.

This task has included the collection of all the secondary information from various departments and agencies for the project area. The information collected is covering aspects related to demographics, socio-economic, land use, infrastructure, industrial and economic activities, environmental and natural built heritage. The assessment of past planning initiatives, policies, schemes etc. in force, details of reserved sites are also collected. This stage has included the following analysis and assessments:

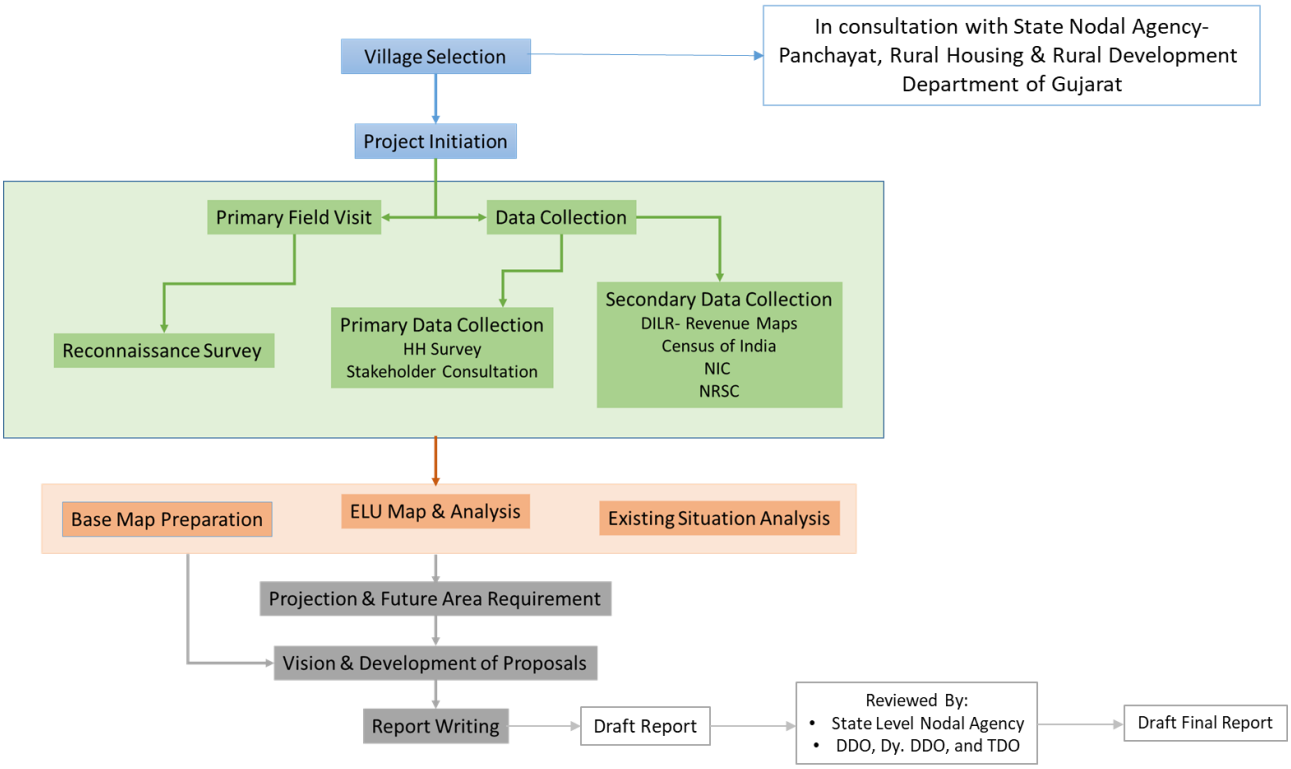
- **Demographic and Socio-Economic Analysis:** This includes the population growth trends, dependency ratio, workforce participation, occupational structure and expenditure & consumption pattern. Existing census information and village profiles are used to carry out the analysis. This section analyzes the demographic and socio-economic profiles at the levels of district, block and villages in order.
- **Identification of Existing Economic Drivers:** This section includes a detailed study of the key economic activities taking place in the project area. This would help in understanding the key economic generators and potential drivers for their future development in the region. It has also helped in identifying the agricultural area having high crop productivity, identify the significance of the manufacturing sector in terms of providing employment. This study was undertaken using the data collected from the panchayat office and Census of India.
- **Existing Infrastructure Assessment:** This includes a detailed assessment and mapping of the existing infrastructure situation in both the Gram Panchayat like- water supply network and coverage, water storage areas, sewage network and treatment system, educational and health care facilities, banks etc. the assessment was undertaken based on the data collected from the panchayat office and Census of India.
- **Open and Green Spaces and Natural Features:** This stage prepares the list of open and green spaces and natural resources in and near the GPs. This list is prepared based on the study of the satellite images, topographic maps and existing land use map. Slope profile and natural drainage pattern are studied to identify the issues like flood-prone areas and waterlogging spots in the region (if any).
- **Analysis of Housing Stocks:** Detail assessment of the distribution of the households w.r.t the income in the Gram Panchayats were undertaken for the preparation of GPSDP for Tarapur GP. This includes the study the number of households with the type of ownership, the character of the housing building in terms of kaccha and pucca houses, and level of availability of the physical infrastructure at the households' level. The study was done using the Census data, household surveys and panchayat data.
- **Analysis of Public Transportation:** The study includes an assessment of the existing transportation system available for the villagers to commute to their employment centers, along with the assessment of the inter-state travel infrastructure. Condition of the inter village road was done, along the study related to the availability of bus stops, provision of local bus services, local transport services within the panchayat region etc. will also be conducted.
- **Strengths and Weakness Analysis:** Based on all the study and assessment done for different components, the strengths and weaknesses of the study area were outlined before develop planning proposals.

2.2.3 Visioning and Development of Proposals

This task includes the vision and development objectives for the study area based on the existing situation analysis carried out in the last task. Also, future population, infrastructure demands and area

requirements for various activities and the provision of the infrastructure is calculated for the preparation of spatial development plan for Gram Panchayat. Development proposals for the Gram Panchayat are formulated based on the existing situation analysis, stakeholder consultations and future demand estimation.

Figure 1: Adopted Methodology Chart



CHAPTER 3: BASE MAP PREPARATION

Tarapur GP in Anand District is one of the two gram panchayats that are identified for the State of Gujarat, for the purpose of the preparation of the Spatial Development Plan. Tarapur GP is located at the junction of SH16, SH 83 and SH 8. It acts as the sub-district headquarter and administrative seat for the Taluka Tarapur. The GP acts as a major gateway between Saurashtra region and the southern regions of Gujarat due to which the GP has observed steady growth over the past few decades and has become one of the important upcoming centers in the Bhal region[1] of Gujarat with increasing growth in trade, industrial and logistical activities. This chapter explains the preparation of the Base Map for Tarapur GP.

3.1. Base Map Preparation for Tarapur GP

Preparing the base map for Tarapur GP started with procuring the cadastral map of the village from the Anand District Inspector Land Record (DILR), Government of Gujarat. Besides, images such as topography sheets, satellite images and such other relevant maps had been used to extract information about the basic features of the land. The purpose of preparing the base map is to delineate the existing administrative boundary and demarcate the natural and physical features of the GP. The Base Map demarcated the administrative boundary, and parcels based on the revenue maps and water bodies (based on the data received from NRSC). Canals and other water bodies are verified with the satellite imagery and relevant secondary data. Required satellite images were received from NRSC.

3.1.1 Data Source

Base Map of Tarapur GP was prepared using the data mentioned in the table below. The table also presents the features extracted and their uses in the Base Map preparation process.

Table 1: Data Source for Preparation of Base Map

Spatial Data	Source	Features
Cadastral Maps/ Revenue maps	DILR- Anand, Govt. of Gujarat	Village/survey boundaries, panchayat boundary, plot boundary along with survey numbers, water bodies. Spatial coordinates, major roads & railway line
Satellite Images	NRSC	For verification
Roads and water bodies	NRSC	Water bodies, canals, road network, railway line

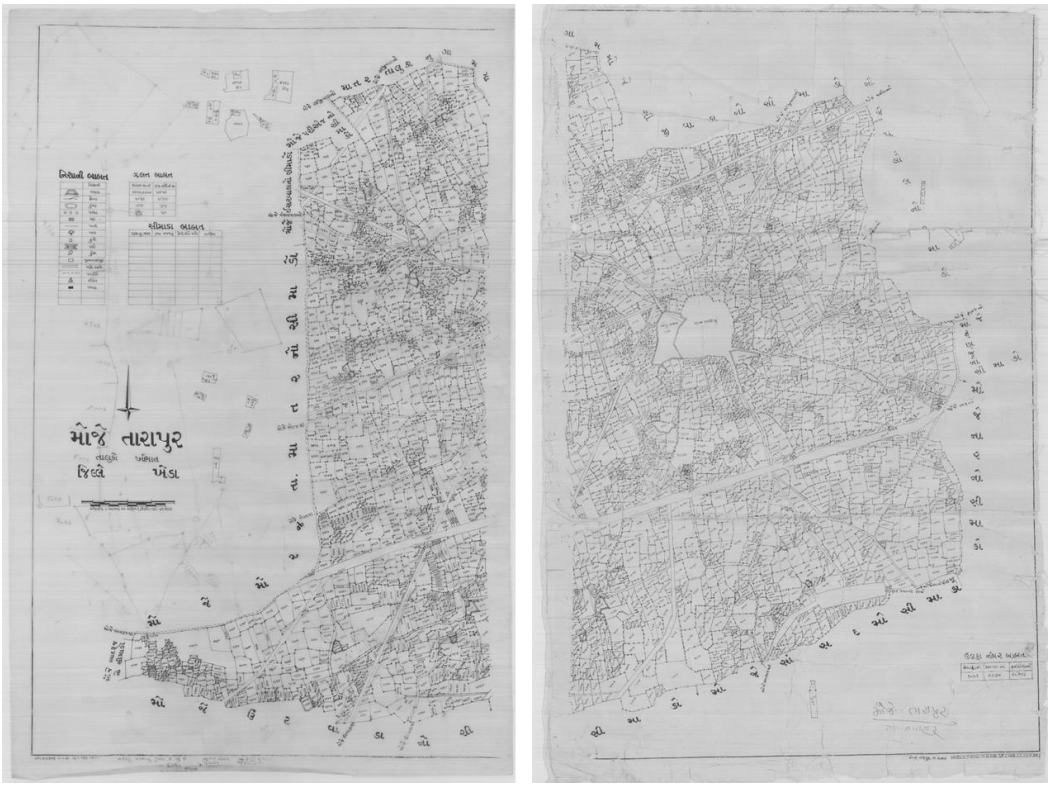
[1] Bhal Region: The Bhal region is situated on the deltas of the Sabarmati, Bhogawo, Bhada, Lilka and other rivers that flow east and southeast off the Kathiawar peninsula into the Gulf of Cambay.

3.1.2 Methodology

This section presents the methodology followed to prepare the Base Map for Tarapur GP

- Procurement of Revenue Maps or Cadastral Maps: The team had received scanned images of the hand-drafted revenue maps, in two parts; later both the images were joined for georeferencing.
- Georeferencing of Revenue Maps: All images were converted to Tiff for geo-referencing and GCPs were identified on Satellite image and revenue maps. These images were registered using these GCPs. As the received DILR maps are hand draft maps, while geo referencing minor error in alignment were identified.
- Digitization of Revenue Plots and Survey Nos.: All lines of plots, roads and rivers, canals and other water bodies were digitized after that and a unique no. was assigned to each polygon.
- Edge Matching: The GIS team cleaned up all edges of villages after matching to make the single boundary between adjacent villages and plots.
- Quality Check and Cleaning & Editing of Maps: All maps were thoroughly checked for the digitization of all features and appropriate no. of the plot. The team cleaned and edited all maps at the end to finalize.

Figure 2: Digital Tarapur Revenue Maps Images in Two Parts



Source: DILR Anand, Gujarat

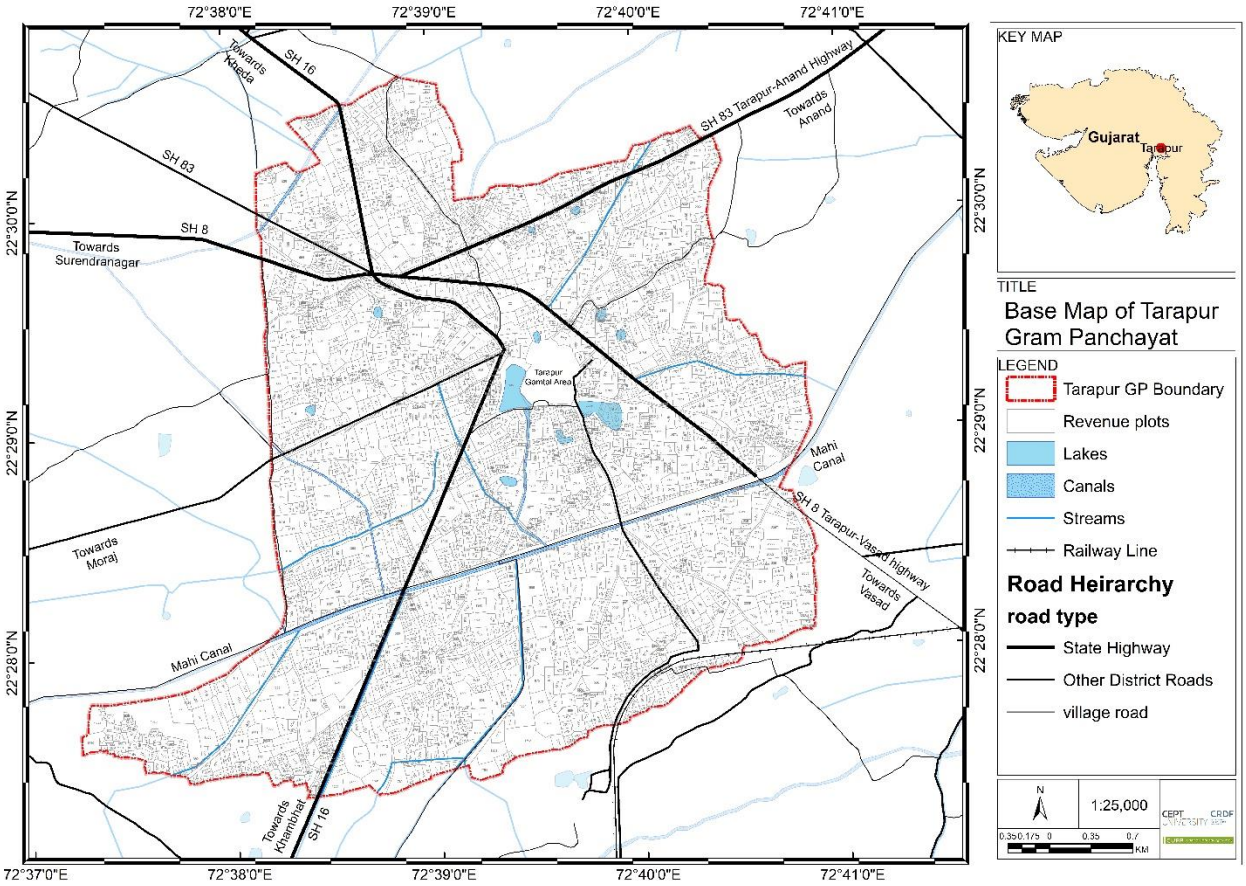
3.1.3 Final Base Map of Tarapur GP

As per the Base Map, the final Planning Area is 22.40 sq.km, including 0.42 sq.km of water bodies (Includes 0.26 sq.km of lakes, and 0.16 sq.km of Canals).

Table 2: Total Tarapur GP Area- As per the Base Map

Area as per Base Map (Area in sq.km)		
	Area(sq.km)	**Area in Percentage**
Total water bodies	0.42	1.87 %
Lakes	0.26	---
Canals	0.16	---
Total Land Area	21.98	98.13%
Total Tarapur GP Area	**22.40**	---
Source: As per Procured Revenue Maps from Anand DILR Office		

Map 1: Tarapur Base Map



Source: As per Procured Revenue Maps from Anand DILR Office

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EXISTING SITUATION ANALYSIS

CHAPTER 4: REGIONAL CONTEXT

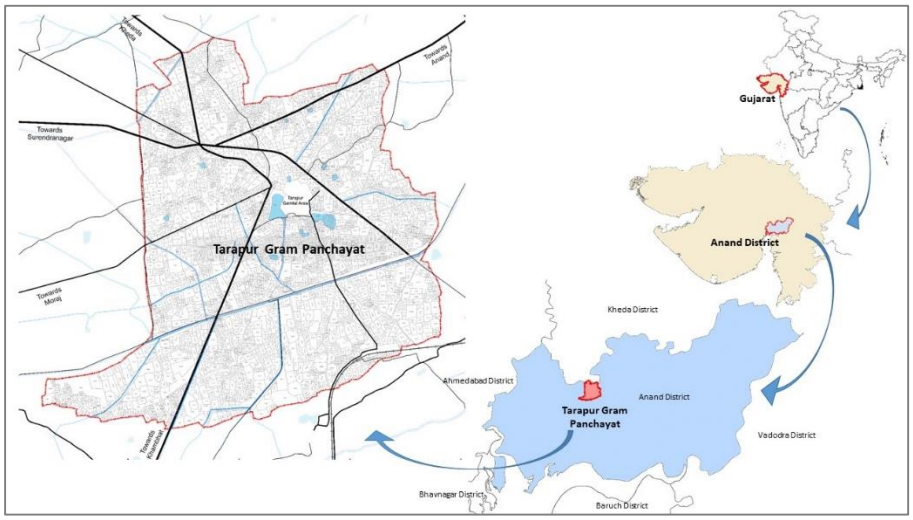
4.1. Introduction

Gram panchayat (GP) of Tarapur acts as the sub-district headquarters and administrative seat for the Taluka Tarapur. It falls within the administrative jurisdiction of Anand district. The GP acts as a major gateway between Saurashtra region and the southern regions of Gujarat due to which the GP has observed steady growth over the past few decades and has become one of the important upcoming centers in the Bhal region[1] of Gujarat with increasing growth in trade, industrial and logistical activities. Currently, the village does not directly fall under the authority of any Urban Development Authority (UDA), Area Development Authority (ADA) or any other special development authorities, which makes it integral for managing the growth in and around the Gram panchayat efficiently.

4.2. Introduction

Gram panchayat (GP) of Tarapur acts as the sub-district headquarters and administrative seat for the Taluka Tarapur. It falls within the administrative jurisdiction of Anand district. The GP acts as a major gateway between Saurashtra region and the southern regions of Gujarat due to which the GP has observed steady growth over the past few decades and has become one of the important upcoming centers in the Bhal region[1] of Gujarat with increasing growth in trade, industrial and logistical activities. Currently, the village does not directly fall under the authority of any Urban Development Authority (UDA), Area Development Authority (ADA) or any other special development authorities, which makes it integral for managing the growth in and around the Gram panchayat efficiently.

Map 2: Location Map of Tarapur GP



Tarapur GP is located 36 km towards west from the district headquarter Anand. The gram panchayat is surrounded by the rest of the Tarapur Taluka towards west, Khambhat Taluka in the south, Petlad Taluka in the east and on the north by the Matar and Sojitra Talukas. Petlad, Khambhat, Cambay, and Kheda are the nearby cities to the Tarapur GP. The neared statutory town is Sojitra which is around 15 km away towards. It is surrounded by Isarwada (4 km), Untwada (5 km), Palol (5 km), Adruj (5 km), and Runaj (5km) villages.

4.2.1 Evolution and Growth of Anand District

Anand district is located over the central part of the state and extends between 22.10^0 and 23.45^0 North attribute and 72.15^0 and 73.10^0 East longitudes. It is surrounded by Kheda district in the north, by Vadodara district in the east, by the Gulf of Khambhat and Bharuch district in south and Ahmadabad district in the west.

Anand district is newly created district of the Gujarat State. After bifurcation of the bilingual Greater Bombay State on 1st May 1960, the Kheda district became a part of newly created Gujarat State. The Government of Gujarat reconstituted former Kheda district by bifurcating it and created new Anand District with effect from 2nd October 1997. Further, for the administrative purposes, the Anand district is divided into 8 taluks namely Tarapur, Sojitra, Umreth, Anand, Petlad, Khambhat, Borsad and Anklav. All CD block boundaries are co-terminus with taluka boundaries. The total area of this district is 3,204 sq. km. i.e. it covers 1.63 % of the total geographical area of Gujarat. Total population is 653 per sq.km. It is 19th largest district in terms of the geographical area in the state.

Table 3: Change in the Administrative Division in Gujarat- 1990 to 2011

Sr.No.	Parameter	1990	2001	2011
1	Number of District	19	25	27
2	Number of Taluka	184	225	252
3	Number of Village	18,509	18,533	18,618
Note: At present, total districts in Gujarat is 33				
Source: Census of India				

Presently, the district comprises total of 8 talukas, 15 towns and 347 villages. Refer the table below for the taluka wise break up of towns and villages. Before the Anand district creation, Tarapur was part of the Khambhat taluka, with the creation of the new district, Tarapur was carved out of the Khambhat taluka, and so the Tarapur GP. At present, it is part of the Tarapur taluka in the Anand district.

Table 4: Taluka wise List of Towns and Villages

Sr.No.	Name of Taluka	No. of Towns	No. of Villages
1	Tarapur	0	42
2	Sojitra	1	24
3	Umreth	1	36
4	Anand	8	37
5	Petlad	1	56
6	Khambhat	1	57
7	Borsad	2	64
8	Anklav	1	31
Total		**15**	**347**
Source: District Handbook Anand; Census of India, 2011			

4.2.2 Influence of the Regional Development Growth

Anand district has been inscribed in golden letters in the history of modern India because of White Revolution and the largest co-operative sector development. With the presence of AMUL dairy, Anand city is known as the Milk Capital of India. This city hosts the Head Office of Gujarat Cooperative Milk Marketing Federation Ltd (GCMMF which is the parent organization for AMUL & co-operative operations to collect milk) and National Dairy Development Board (NDDB) of India. According to Industrial Commissionerate, GoG, with a turnover of INR 4,305 crore and milk collection capacity of 6.5 million kg/ day, AMUL becomes the largest dairy cooperative in India.

Apart from this, the district is emerging as a hub for Auto & Engineering, Chemical Plastic Industries and Food & Argo Industries. A recent surge in the growth of plastic industries in the district has added more jobs and increased opportunities for the masses. Due to the proximity to the other major industrial hubs of the state, such as Ahmedabad, Vadodara, Vapi has made the district a thriving region for investment. The influence of the proximity to these industrial hubs can be seen in rapid economic growth along the Anand-Vallabh Vidhaya Nagar and Karamsad road belt. Vitthal Udhyog Nagar-an industrial belt is located on the outskirts of the Anand city. ELECON, the Charotar Iron Factory, Warm Steam, Milcent and Atlanta Electrics are some of the famous industries are situated in this industrial belt. As per the Industrial Commissionerate, GoG, over 950 units of Small and Medium Enterprises (such as textiles, electronics, ceramics and food products) present in the district, which are the supporting pillars of the economy of the district, these industries provide direct and indirect employment to over 5,900 people in the district.

Agriculture is the main source of sustenance for the majority people of the district. According to the 2011 Census, 59.04% of the total working population of the district was engaged in agriculture, as against 49.61% in the State as a whole. Production and area under the horticultural use are continuously increasing in the last decade.

Animal husbandry sector is another very important sector for the district, it plays a vital role in the Gross State Domestic Product (GSDP) of the state, which is around 5%. In addition, the sector adds to produce nutritive food and generates a good supplementary income of the small farmers, marginal farmers and agricultural labourers. The sector has a scope of offering good employment if adopted on a large commercial basis.

4.2.3 Regional Connectivity

Anand district is very well connected with the other district and cities in Gujarat via road network and railway lines. National Highway (NH) 8 passes through the district connecting it to Vadodara and Kheda districts. The district is very well connected with the cities and industrial hubs in the state through the road network.

In total there are around 40 railway lines passes through Anand. The district is well connected with Godhra, Ahmedabad, Kheda, Khambhat, Vasad and Mumbai through a broad gauge rail line of 147 km. further, the Anand city lies between the Ahmedabad and Vadodara on the Western Railways. The city is a railway Junction and a broad gauge line from here runs to Godhra, covering Dakor- a major Hindu pilgrimage center.

Nearest airports are in Ahmedabad and Vadodara. Ahmedabad airport and Vadodara airports are easily accessible via NH 64; the Ahmedabad airport is also accessible via National Expressway 1. The district is also connected with the Dahej and Hazira ports through the well-established road network.

Map 3: Regional Connectivity Map

Source: Google Satellite Image

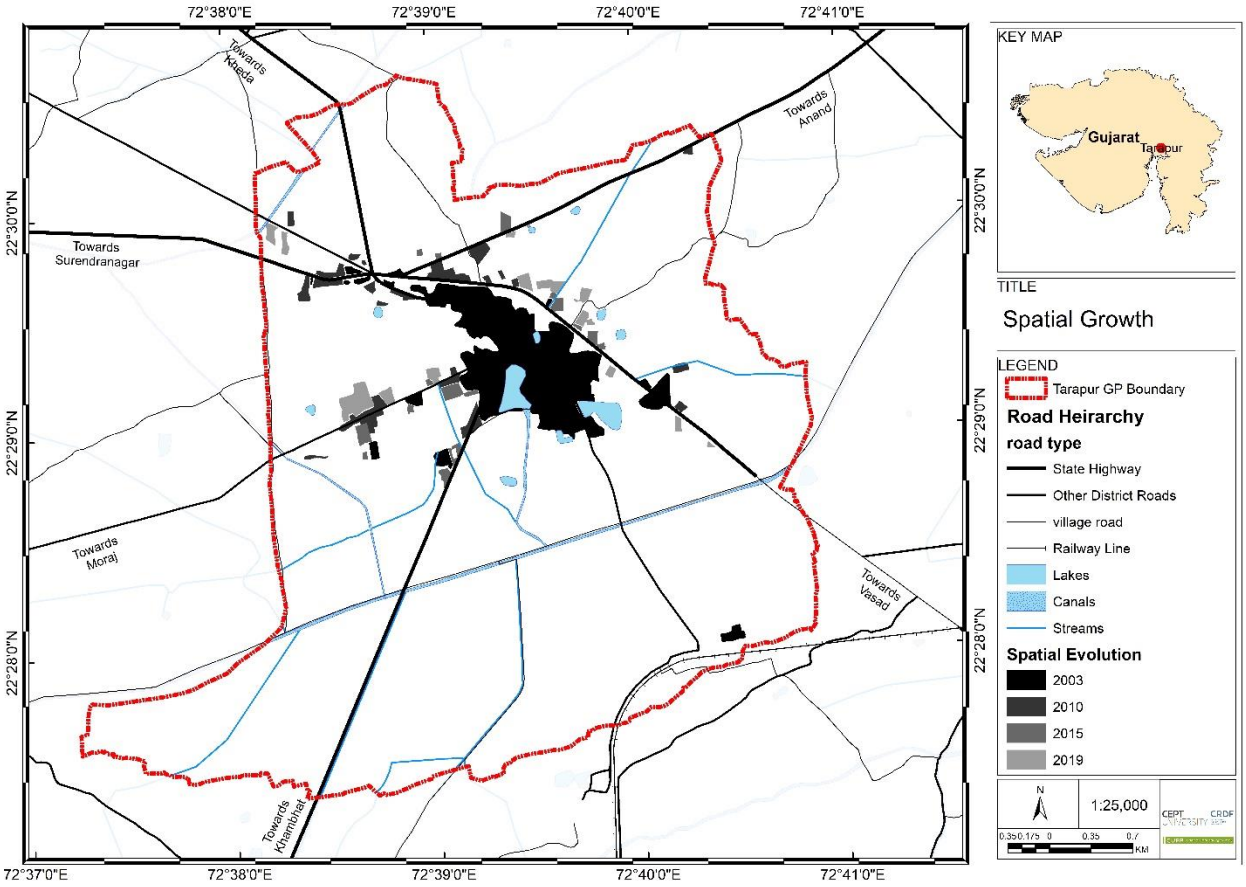
CHAPTER 5: PROFILE OF TARAPUR GRAM PANCHAYAT

5.1. Introduction

Gram panchayat (GP) of Tarapur acts as the sub-district headquarters and administrative seat for the Taluka Tarapur. It falls within the administrative jurisdiction of Anand district. Until 1991 census, Tarapur village was part of the Kheda district and Khambhat taluka. Since the formation of the Anand district, the GP is now part of the Anand district and Tarapur taluka. The GP is located on the junction of three major state highways- SH 8, SH 16 and SH 83. The total area covered under the GP jurisdiction boundary is 22.40 sq.km. The village is very well accessible from the SH8, SH 83 and SH 16.

5.1.1 Spatial Growth of Village

Map 4: Spatial Growth of Tarapur



Source: Google Satellite Time Series Data

Over the period, Tarapur village grew around the water bodies, especially between the junction of the three-state highways and the lake. Significant spatial growth in the village can be seen in this area.

However, during the recent decade, the village is spatially expanding along the district road most connecting the GP with Moraj. It is clear from the map that in recent years, scattered growth has occurred on the north of the SH 8.

5.1.2 Administrative Framework

The elected members and state government-appointed bureaucrats do rural administration. In Gujarat, rural development is managed according to the Panchayati Raj System. In the Panchayati Raj System, the administration is done in three tiers; Gram Panchayat (Village Panchayat), Taluka Panchayat, and Jilla Parishad (District Panchayat). At all the three levels, elected members and bureaucrats are working with clear roles, responsibilities and power. Tarapur village has its village panchayat. Tarapur village is the taluka headquarters as well.

In the year 1993 Government of India enacted a 73rd Constitutional Amendment regarding provisions of Panchayati Raj and in light of that constitutional amendment Government of Gujarat enacted amended Panchayati Raj Act from 15th April 1994. By this constitutional amendment, Panchayats are given constitutional status. Regular and timely election, the participation of women and backward classes, the formation of separate State Election Commission and rotation system in electing the heads of the various committees are other significant amendments in the act. The decentralized planning process and active participation of people is the soul of the Panchayati Raj Act. The powers for decentralized planning, implementation and development are delegated to the Panchayats.

The primary functions of the District/Taluka Panchayats are providing facilities for primary education, health, drinking water, electricity, constructions and maintenance of roads, bridges etc., maintenance of gauchars, organizing relief work at the time of scarcity and drought situation, sanitation and social welfare. Arrangements for housing facilities for below poverty line people and rural development schemes are implemented by panchayats.

State Level Setup

At the state level, there is the Panchayat, Rural Housing & Rural Development Department chaired by Minister and Additional Chief Secretary. District Development Officers (DDOs) of District Panchayats are monitored by a state-level entity called Office of Development Commissioner, headed by the Development Commissioner. The Commissioner is an immediate boss of all the DDOs of the District Panchayats.

District Panchayat

The district Panchayat is the apex of the three-tier structure of the Panchayati Raj system. The district Panchayat consists of representatives of the Panchayat Samiti; all the members of the state legislature and the parliament representing a part or whole of the district; all district level officers of the medical,

public health, public works, engineering, agriculture, veterinary, education and other development departments. A district panchayat constitutes the following committees

- Executive Committee for performing functions pertaining to finances, home guards and village defense and such other functions and duties of the panchayat as are not assigned to any other committee. The sub-committee formed from amongst its members from Executive Committee is not the competent authority to take any final decision on any matter.
- A Social Justice Committee for performing functions considered essential for securing social justice to the weaker section of the society including persons belonging to the Scheduled Castes and Schedule Tribe as may be prescribed.
- An education committee for performing the functions and duties pertaining to education and such other literary and cultural activities as the panchayat ay assign to it
- A public health committee for performing functions pertaining to public health, hospitals, health centers, sanitation, water supply, vaccination and family planning.
- A public works committee for performing functions pertaining to public works, communications, buildings, rural housing and relief against natural calamities.
- An appeal committee
- A committee for production, co-operation and irrigations
- A committee for woman and child development and youth activities.

The chairman of the District Panchayat is elected from amongst its members. The district development officer deputed by the state government becomes the development officer of the District Panchayat. The district Panchayat performs coordinating and supervisory functions. The district Panchayat also renders necessary advice to the state government with regards to the implementation of the various development schemes. It is also responsible for the maintenance of primary and secondary schools, hospitals, dispensaries, minor irrigation works etc. it also promotes local industries and art.

The administrative power of district panchayat comprises the duty of each district panchayat to make in the area within its jurisdiction and so far as the fund at its disposal will allow reasonable provisions. A district panchayat may with the sanction of the State Government incur expenditure on education or medical relief outside its jurisdiction if its finances permit.

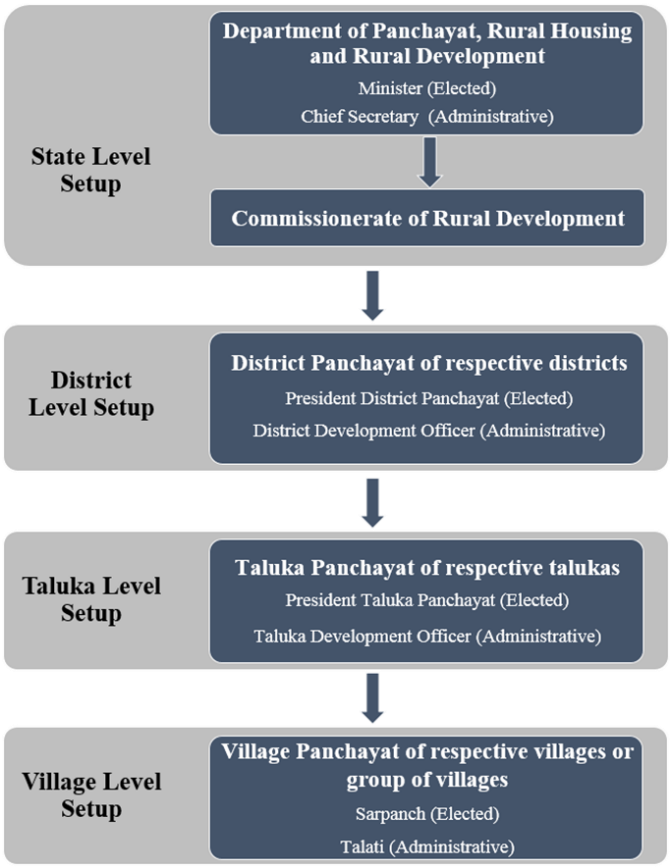
A district panchayat may also make provision for carving out in the area within the limits of its jurisdiction, any other work or measure which likely to promote

- The health, safety, comfort or convenience
- Social, economic or cultural well-being of the inhabitants of the area.

A district panchayat may, subject to rules, grant loan out of its fund to a panchayat subordinate for the purpose of this act. Considering the power of District panchayat, it is lawful to undertake work upon terms

and condition for construction, maintenance or repair of any work or the management of any institution on behalf of the Government.

Figure 3: Administrative Set-Up



Source: The Gujarat Panchayats Act, 1993

Taluka Panchayat

The Taluka Panchayat is the second tier of the Panchayati Raj. The Taluka Panchayat was envisaged as a single representative and vigorous democratic institution to take charge of all aspects of development in rural areas. A taluka panchayat constitutes an Executive Committee, for exercising powers and performing functions and duties of the taluka panchayat as the taluka panchayat may assign to it. The sub-committee formed from amongst its members from Executive Committee is not the competent authority to take any final decision on any matter.

The administrative power of taluka panchayat comprises the duty of each taluka panchayat to make in the area within its jurisdiction and so far as the fund at its disposal will allow reasonable provisions. A

taluka panchayat may with the sanction of the district panchayat incur expenditure on education or medical relief outside its jurisdiction if its finances permit.

A taluka panchayat may also make provision for carrying out in the taluka any other work measure, scheme or project which is likely to promote;

- The health, safety, comfort or convenience
- Social, economic or cultural well-being, and
- Education including secondary education of the inhabitants of the taluka or part thereof.

Village Panchayat

Village Panchayat is the lowest unit in the Panchayati Raj institution. Generally, for every village, there is a Gram Panchayat except some that have low population. For such villages, there is group Gram Panchayat between two or more villages. The Panchayat consists of representatives elected by the villagers.

A village panchayat may constitute an Executive Committee for performing of its function and duties as the panchayat may assign to it. A village panchayat constitute a committee called the social justice committee for performing function as are essential for securing social justice to the weaker sections of the society including persons belonging to the schedule castes and the scheduled tribes. The administrative power of panchayat comprises the duty of each panchayat to make in the area within its jurisdiction and so far as the fund at its disposal will allow reasonable provisions.

A panchayat also makes provisions for carrying out in the areas within the limits of its jurisdiction and any other work or measure which is likely to promote;

- The health. Safety, comfort or convenience
- Social, economic or cultural wellbeing, and
- Education including secondary education of the inhabitants of the areas.

The powers of panchayat to manage the institutions to execute work transferred to it by taluka district panchayat carried out by the necessary funds for such management or execution are placed at the disposal by the taluka panchayat or district panchayat**.** The president of elected representatives is known as Sarpanch. He/ she is responsible for the supervision and coordination of activities of the panchayat. He is the one who plays a major role in decision making and allows various departments to the appropriate elected members. Talati is the government-appointed employee to assist the Sarpanch in administration. He also keeps the Panchayat informed of various development programs and reports.

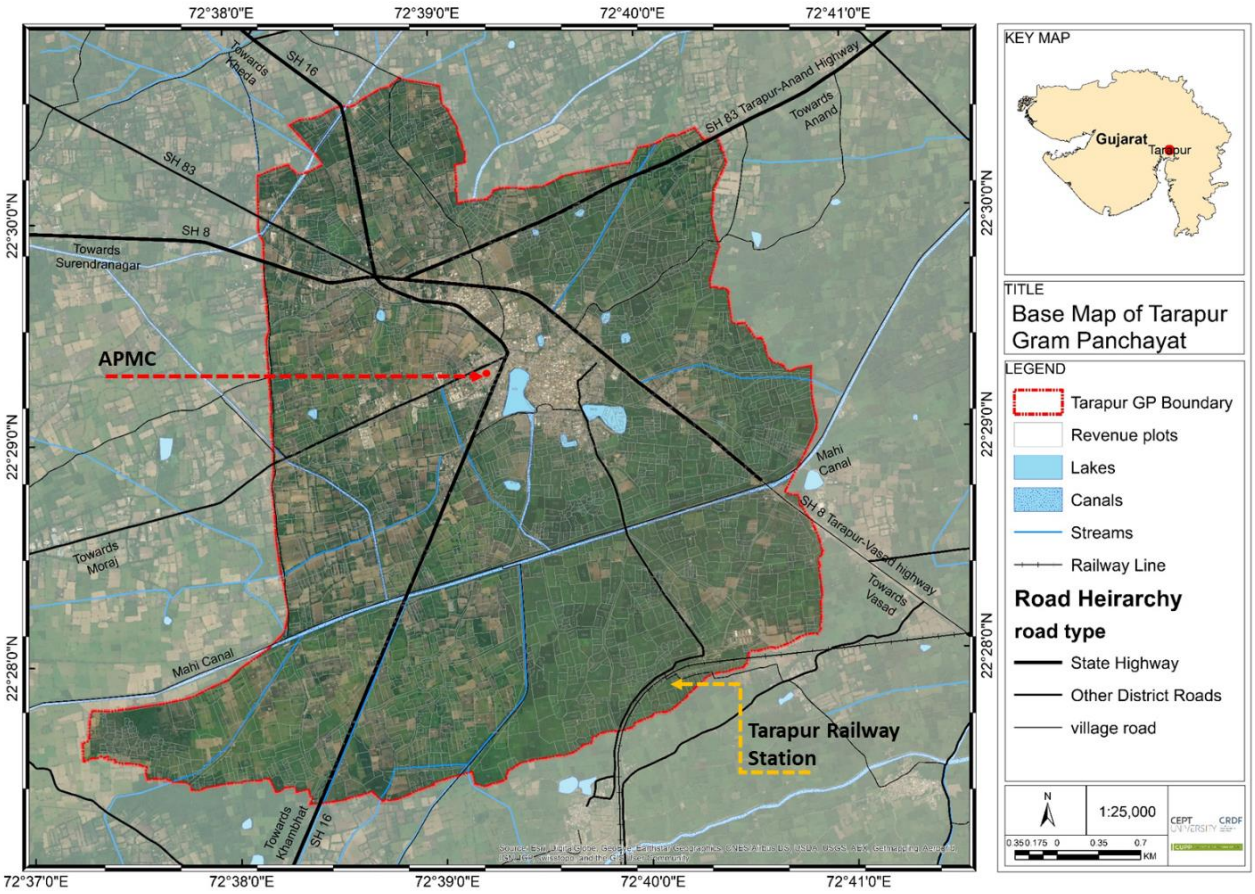
5.2. Connectivity and Accessibility

Road connectivity is one of the important components as it connects to major destinations. This section highlights the situation of road connectivity in the villages. The GP is located on the junction of three major state highways- SH 8, SH 16 and SH 83. The village is very well accessible from the SH8, SH 83 and SH 16. The village is connected with the rest of the district, state and surrounding village via state highways and district roads.

Villagers of Tarapur GP has access to the public and private bus service. The state public transport network connects the village with the district, with the surrounding towns and villages, and nearest railway station.

The village is very well connected through SH8, SH 83 and SH 16, which further branches into the village road network. The overall road network is sufficing the dependency of the village on the nearby centers for health, education and economic purposes.

Map 5: Tarapur GP-Connectivity Map



Source: As per Data Received from NRSC and Panchayat Office

CHAPTER 6: EXISTING LAND USE ANALYSIS

A reasonably accurate and updated existing land use map is an essential prerequisite for preparing a development plan for any area. Understanding and analysis of existing land use pattern are necessary for establishing development policies for future uses of lands. Appreciation of the existing land use pattern is necessary for the preparation of a development plan. In conventional practice is to depend on the available village cadastral maps and on the land use maps that are available from the responsible authorities. These maps are with the latest development but in hard copy. Also, there are chances to foreseen resolution errors. Because of this, it became necessary to obtain satellite images and correlate with other data sources.

6.1. Adopted Methodology

Existing land use map for Tarapur GP is prepared based on the land use data collected from the Revenue Department. 7/12 forms[2] details for each parcel were collected from the department website. Once the detail on each was completed, the base map was taken as a reference, and the procured details from the 7/12 documents were transferred into digital format (Note here that the existing land use survey is been done plot-wise). Land use map was updated and the details were verified with the satellite images and with the existing land use land cover map for the planning area, which were received from NRSC. Any contradictions and variation found from the satellite images and the map from the authority were reconfirmed and accurately recorded.

Data Source for ELU

- Satellite Images as received from NRSC
- Canals and other water bodies – Base Map (refer chapter- chapter 3)
- Existing land use information from 7/12 documents – Revenue Department

For ELU map, the planning area was divided into thirteen main land use categories. Following table explains the features incorporated under each land use category. Existing land use map presents the existing land uses at the parcel/ plot level.

[2] The 7/12 document/ form is an extract from the Land Register of any district in Gujarat, which gives complete information about a particular piece of land. It contains important details such as the survey number, area, date from which the current owner's name was registered, current land use etc.

Table 5: Land Use Categories for Existing Land Use Map

Sr no.	Existing Land Use Categories	
1	Abadi/ Gamtal Area	Original gamtal/ village area
2	Existing Settlement	Expansion of the original village area- General residential, mixed-use, etc.
3	Industrial	Industrial- Household industries and APMC
4	Agriculture	Agriculture-related activities
5	Canal	---
6	Crematorium	---
7	Dumping Site	---
8	Fallow Land	---
9	Lake	---
10	Pasture Land	---
11	Railway Station	---
12	Road	---
13	School	---

6.2. Existing Land Use Map and Area Statement

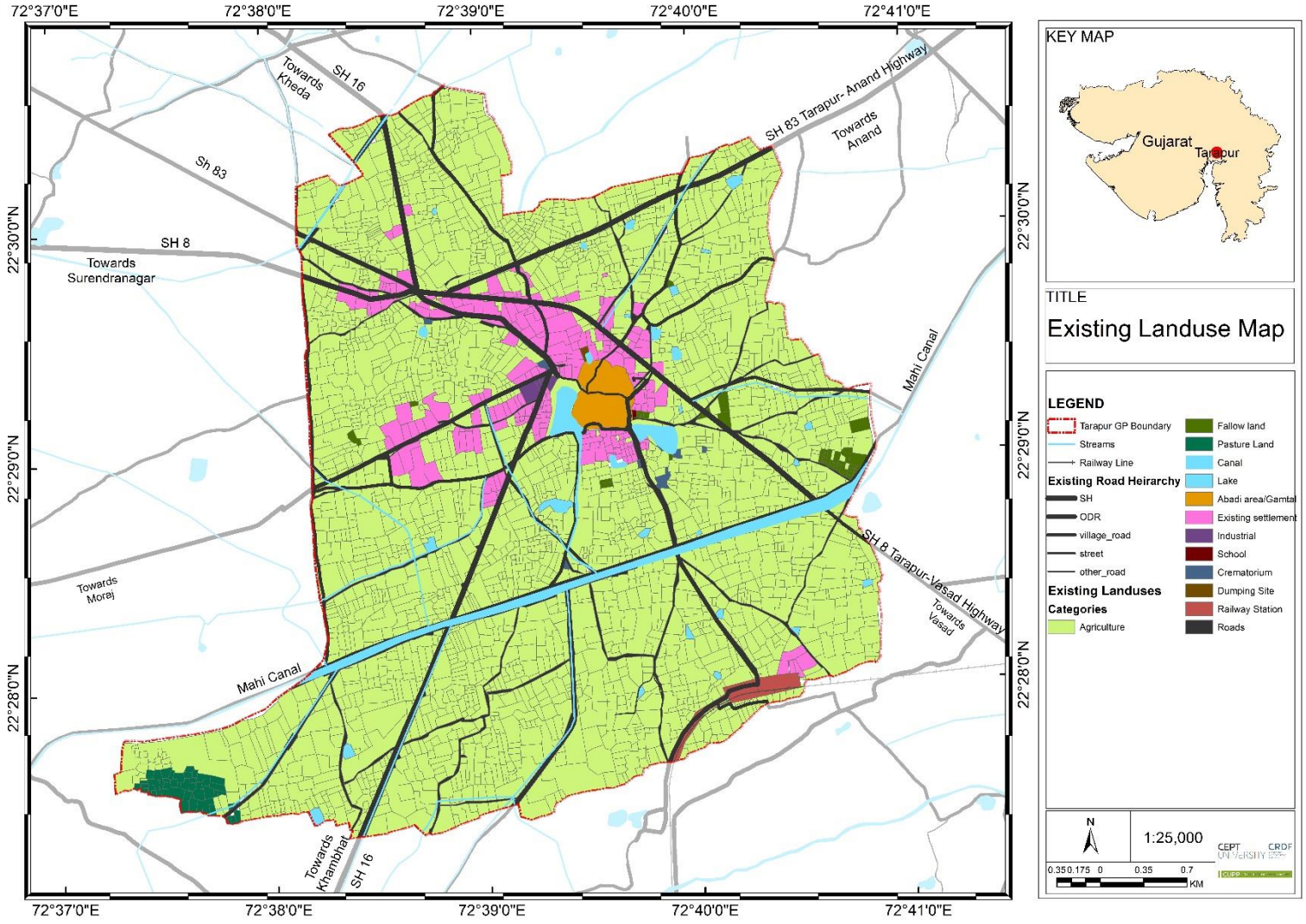
As per the Base Map, the planning area is spread over an area of 22.40 sq.km. The existing land uses in the planning area can be classified into thirteen categories presented in the following table.

Table 6: Existing Land Use Area Statement

Sr. No	Land Use Categories	Area (in sq.km)	Area in %
1	Abadi Area	0.22	0.98%
2	Existing Settlement	1.39	6.20%
3	Industrial	0.03	0.13%
4	Agriculture	18.31	81.74%
5	Canals	0.16	0.71%
6	Lake	0.26	1.16%
7	Fallow land	0.12	0.54%
8	Pasture land	0.18	0.80%
9	Railway Station	0.11	0.49%
10	Roads	1.58	7.05%
11	Dumping site	0.01	0.03%
12	Crematorium	0.03	0.13%
13	School	0.00	0.01%
Total		**22.40**	**100.00%**
Source: Revenue Records- 7/12 Documents, and Satellite Images by NRSC			

As per the existing land use map, the majority (81.74%) of the planning area is falling under the agricultural land use category. The second-largest category is also related to residential, which is the existing settlement area (excluding gamtal or abadi area), which covers around 6.2% of the total area of the GP. Abadi Area (Gamtal) area occupies around 0.98% of the total planning area. Around 1.87% of the GP is occupied with the water bodies, including canals and lakes and only 0.13 % area is covered under industrial land use categories.

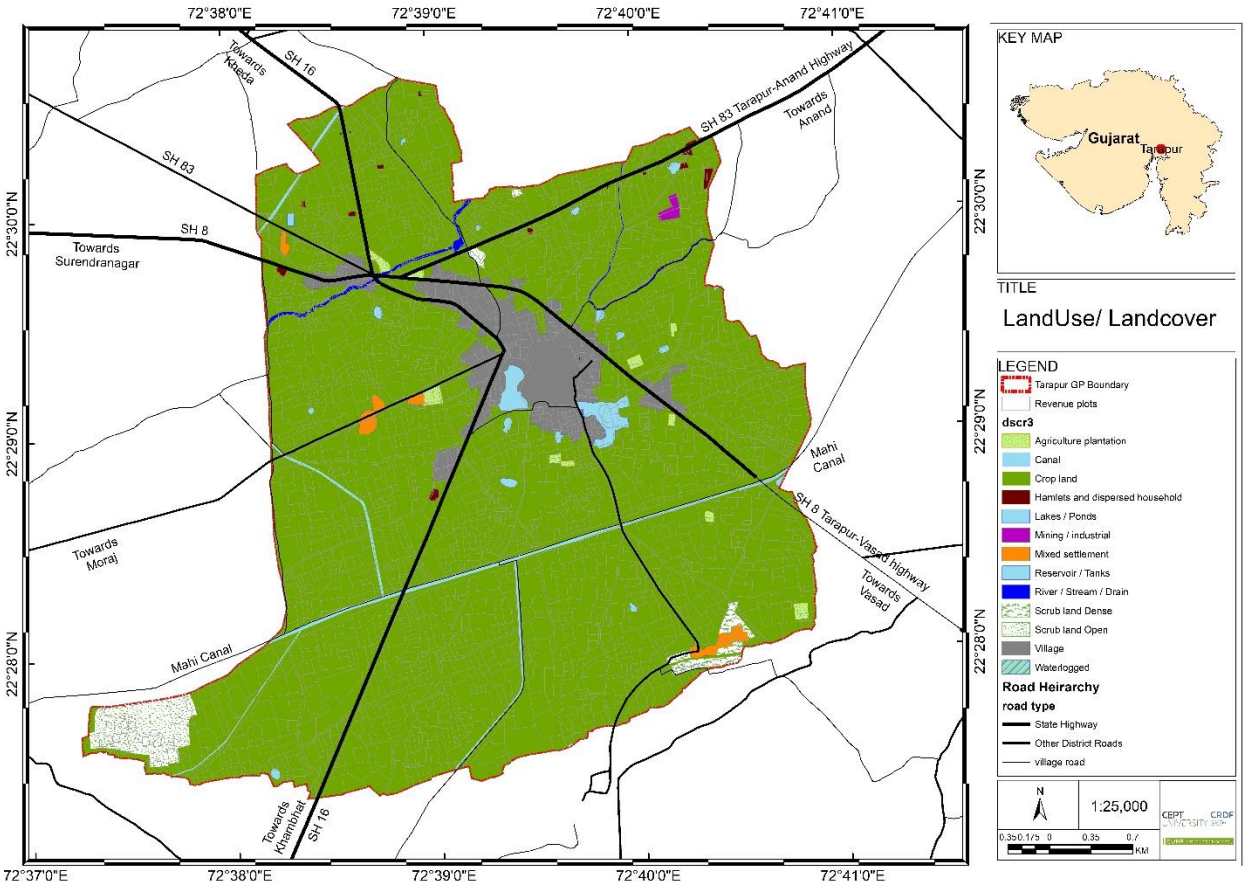
Map 6: Existing Land Use Map



6.2.1 Land Use Land Cover

This map is prepared based on the data received from NRSC of land use and land cover (Received on 29th July, 2020). As per this map, majority of the area is falling under crop land and the settlement area can be observed between both SH 8 and SH 16.

Map 7: Land Use Land Cover



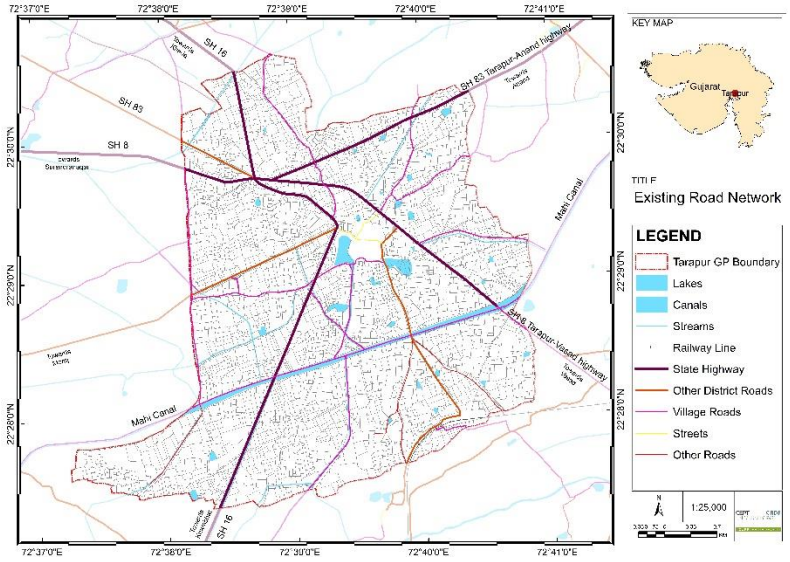
Source: As per Data Received from NRSC

6.3. Existing Road Network

Tarapur GP is located at the junction of three state highways- SH 83, SH 16 and SH 8. Through the network of highways, the GP is connected with Anand in the east (via SH 83), in the south with Khambhat via SH 16, with Surendranagar in NE via SH 8, in the north with Kheda via SH 16, and with Vasad via SH 8 and SH 83. Apart from the highway network, the GP also has the advantage of the road network made of the district and other village roads, via which the GP is very well connected with surrounding villages and

towns. The overall road network in Tarapur is developed in star and block pattern, where the roads are travelling from the village center to outwards connecting the village with the surrounding region.

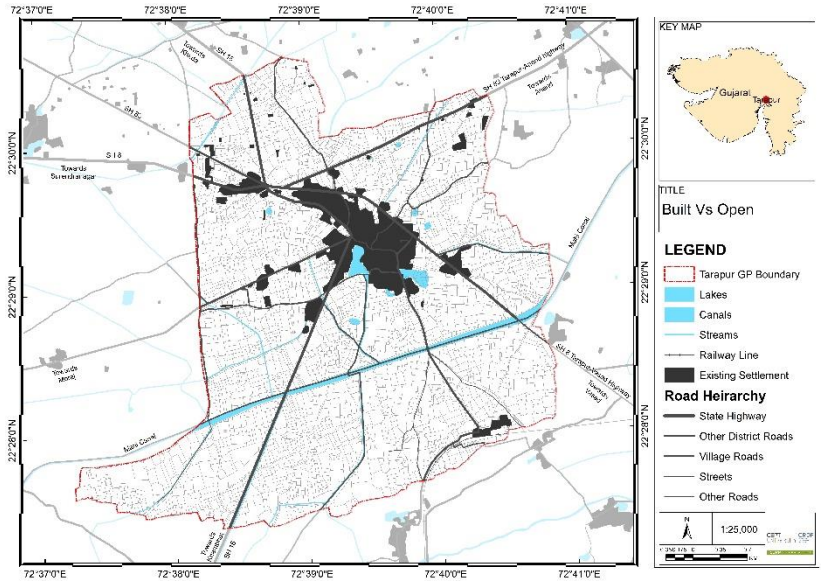
Map 8: Existing Road Network



Source: As per Data Received from NRSC

6.4. Settlement Pattern

Map 9: Built vs Open



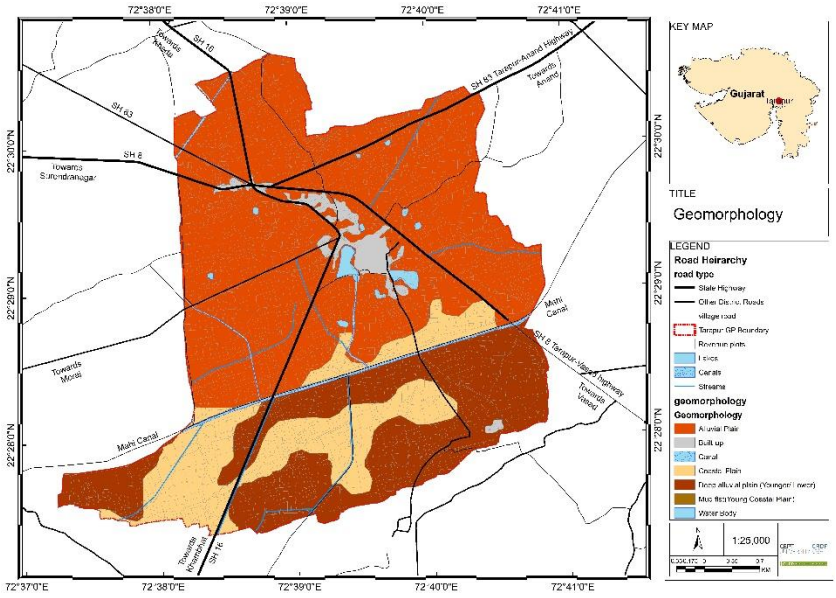
Source: As per Data Received from NRSC

It is clear from the above map, that the settlement (built development) is concentrated between the area situated between the junction of the four-state highways and the lake. The lakes are working as a growth boundary in the south. Though scattered development along the transport axis can be observed, no development beyond the south boundary of the lake has occurred. Majority of the growth can be observed in the triangle formed by highways and lakes.

6.5. Geomorphology

Map of geomorphology is prepared based on the received details from NRSC. It is very clear from the map that the village soil is fertile and good for agricultural activities. Majority soil of the village area falls under Alluvial Soil categories which consist of various proportions of sand, silt and clay. Such soil as a whole is very fertile. In fact, some part of the village falls under the deep alluvial plain category of soil.

Map 10: Geomorphology Map of Tarapur GP

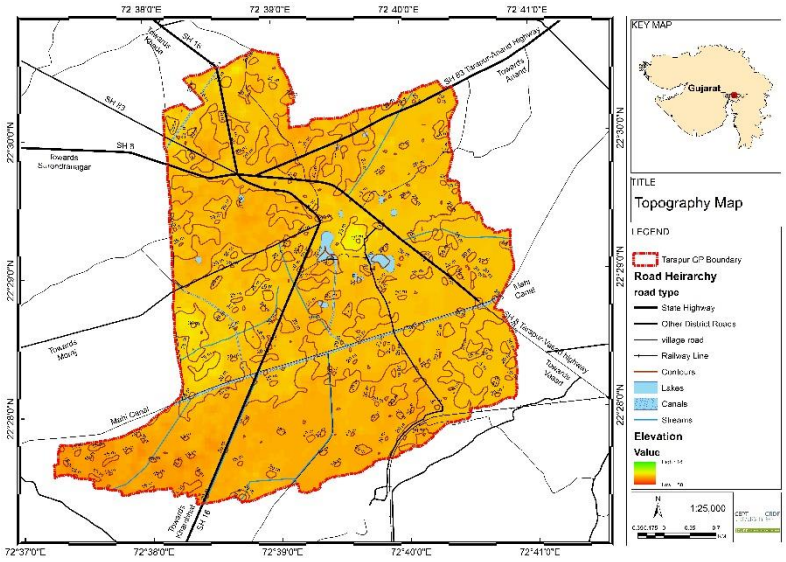


Source: As per Data Received from NRSC

6.6. Topography

Map of topography is prepared based on the received details from NRSC. It is very clear from the map that it is flat terrain in the GP, without much variation in the topology (mostly between 15 meters to 25 meters).

Map 11: Topography Map

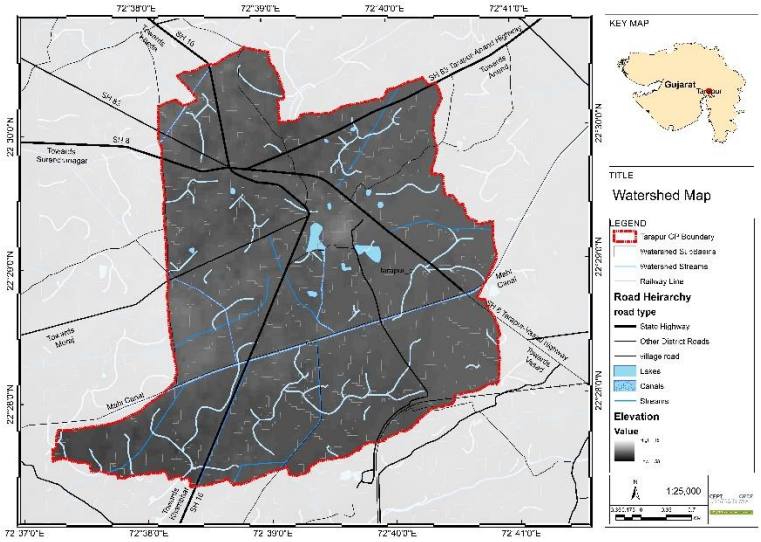


Source: As per Data Received from NRSC

6.7. Watershed

As suggested in the topography map, overall terrain is flat, the same can also be seen the watershed map. However, the area situated in the south of Mahi Canal is prominently falling under low lying area and there is a change of waterlogging in this area during monsoons.

Map 12: Watershed Map of Tarapur GP

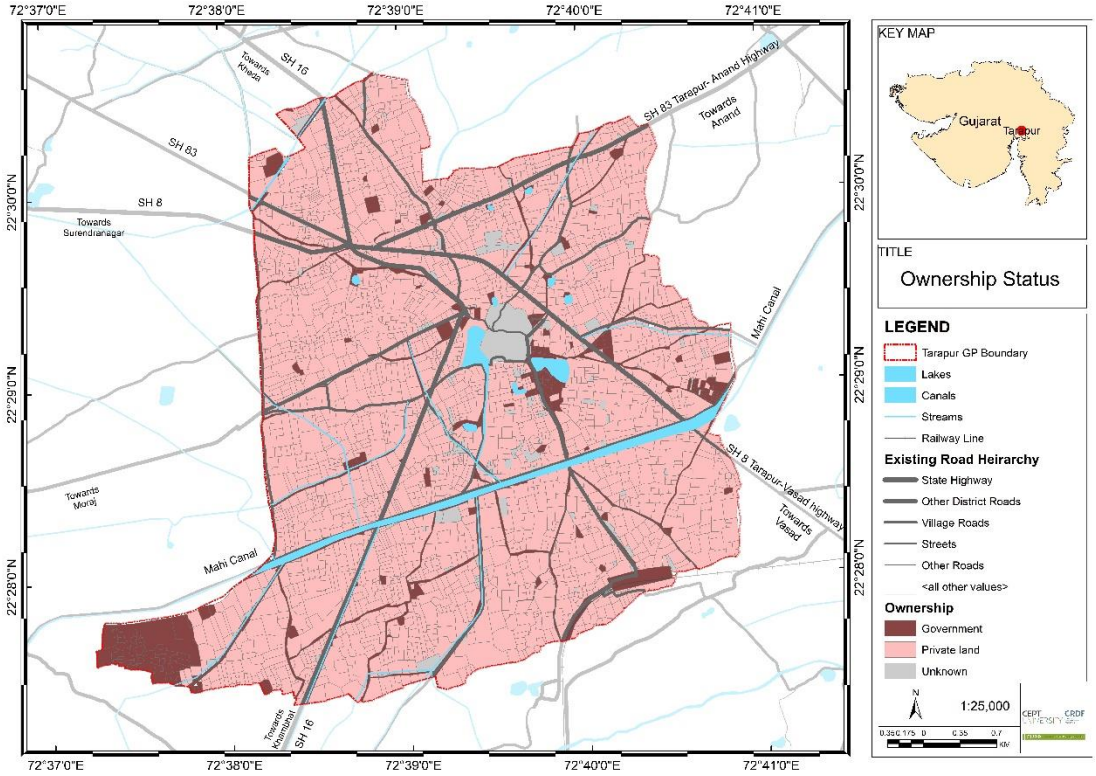


Source: As per Data Received from NRSC

6.8. Land Ownership

Approximately 2.17 sq.km, which is 12.40% of the total land, is under government owned land (including lakes, canals, and roads). Ownership of 1.29 sq.km of land is unknown, and approximately 18.94 sq.km (85%) of the land is under private ownership. The land ownership pattern is shown in the map below.

Map 13: Land Ownership Map



Source: As the Revenue Record

CHAPTER 7: ANALYSIS OF EXISTING SITUATION IN GRAM PANCHAYAT AREA

Census 2011 data, village profile 2020, HH survey and the primary survey data for Tarapur GP had been considered as the base for the analysis of the GP. Also, Census 1991 and 2001 data were used to calculate the decadal growth rate for Tarapur. Parameters like demography, socio-economic, social amenities and utilities were analyzed for the GP. Demographic Profile

7.1. Demographic Profile

Following parameters have been assessed under the demographic profile:

- Demography
  - Population Distribution (2011)
  - Decadal Growth Rate (1991-2001, and 2001-2011)
  - Scheduled Caste and Scheduled Tribe Population (2011)
  - Sex Ratio (2011)
  - Literacy Rate (2011)

7.1.1 Population Distribution

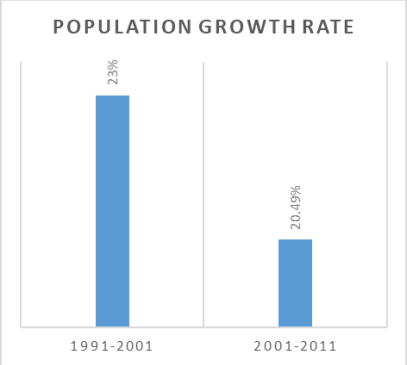
When it comes to the population, as per the Census 2011, Tarapur GP population is 17,994; while Tarapur Taluka rural population and the District rural population are 88.5 thousand and 14.5 lakhs, respectively. It means, that the GP holds 20.33% of the total rural population of the Tarapur Taluka. GP comprises total of 22.40 sq.km (2240 ha.) area and so the current population density in the GP is 8.03 pph (803 per sq.km).

Table 7: Population Distribution

Population Distribution				
Year	**Gujarat (Rural)**	**Anand (Rural)**	**Tarapur (Taluka Rural)**	**Tarapur GP**
2001	31,740,767	1,348,901	75,850	14,934
2011	34,694,609	1,457,758	88,522	17,994
Population Share				
Spatial Unit	**Total Population (2001)**	**Population share to the Upper Spatial Unit**	**Total Population (2011)**	**Population share to the Upper Spatial Unit**
Anand (Rural)	1,348,901	---	1,457,758	---
Tarapur (Taluka Rural)	75,850	5.62%	88,522	6.07%
Tarapur GP	14,934	19.69%	17,994	20.33%
Source: Census of India				

7.1.2 Population Growth Rate

Figure 4: Population Growth Rate- As per the Census of India, 2011



Overall, the population in the Tarapur GP is growing with the decreasing growth rate. Between the year 2001 and 2011, the total population in the GP grew by 20.49%, which is comparatively 2.51% less growth rate than the growth rate during the 1991-2001 decade.

7.1.3 Scheduled Caste and Scheduled Tribes Population

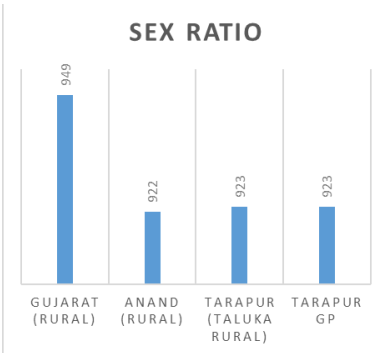
Out of the total population of the GP, only 5% (916) population is Schedule Caste. As per the Census 2011, the GP has a negligible percentage of Schedule Tribe population. Out of the total population, only 0.76% population belongs to the Scheduled Tribe.

Table 8: Share of Schedule Caste and Schedule Tribe Population-

Spatial Unit	Total Pop	SC Pop	SC Pop (in %)	ST Pop	ST Pop (in %
Anand (Rural)	1,457,758	74,755	5.13%	9,884	0.68%
Tarapur (Taluka Rural)	88,522	9584	10.83%	439	0.50%
Tarapur GP	17,994	916	5.09%	136	0.76%
Source: Census of India					

7.1.4 Sex Ratio

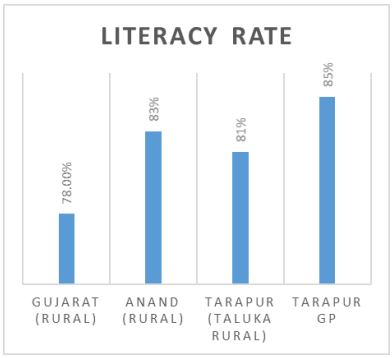
Figure 5: Sex Ratio- As per the Census of India, 2011



Sex ratio describes the number of females per 1000 of males. At present, the sex ratio in the GP is 923 females to that of 1,000 males, which is similar to the sex ratio in the district and taluka but comparatively less than that of in the state.

7.1.5 Literacy Rate

Figure 6: Literacy Rate- As per the Census of India, 2011



Development is a dynamic process and it requires an educated, skilled, and competent workforce. Literacy plays an important role in providing a skilled workforce as well as literate consumer demands more for a better lifestyle. Literacy rate refers to the number of literate population to the total.

As per the Census 2011, the literacy rate in the GP is 85%, which means out of the total population 17,994 people in Tarapur GP are literate. The literacy rate amongst, the state, district, taluka and at Tarapur GP levels, the GP has the highest number of literates.

7.1.6 Digital Literacy

As per the National Digital Literacy Mission, "Digital Literacy is the ability of individuals and communities to understand and use digital technologies for meaningful actions within life situations". The basic definition of digital literacy is which focuses on the understanding and the use of digital technology; the person who fulfils these criteria is considered as an e-literate.

Average desired level for digital connectivity is one e-literate person per household. Out of the total of 300 surveyed households, 14% of households have at least one e-literate person. Around more than 50% of the total population of the cluster is connected with digital literacy; this includes the use of phones and computers. This number is because of the recent shift in the pattern of usage of mobile phones especially smartphones with the internet. However, the majority (70%) smartphone users are using the technology to stay connected with the family and 58% of them are using the smartphone for work purposes as well. The data documented here have been acquired through primary survey and discussions with the panchayat authorities

7.2. Cultural Profile

The village has a mix caste population with around 50% population follow Hinduism while 40% are Muslims and 10% follow other religion. Majority of the population speaks Gujarati and Hindi languages. The village does not have any religious place that is of local, regional or state-level importance. There is no gathering space or public place anywhere in the village; people generally gather within the individual farmlands during functions and festivals.

Table 9: Cultural Profile

Details	Tarapur GP
Languages Spoken	Gujarati and Hindi
% of the population following Religion	50% Hindu, 40% Muslim and 10% other
Type of Castes	Bakshi, Bodana, Bharvad, Khumbhar, Gohil, Maheswari, Kadiyam Luhar, Panchal, Patel, Parmar, Raval, Sheikh, Shtri, Suthar, Solanki, Vaghela, Vankar, Vora, Vanand
Pilgrimage Centers	No
Tourist Centers	No
Monument Places of Heritage	No
Source: Primary Survey, Household Survey and FGDs	

7.3. Socio-Economic Profile

7.3.1 Workforce Participation Rate

Workforce participation rate (WFPR) refers to the percentage of the total number of workers to the total population. Total workers' population is the sum of the main workers and marginal workers. The WFPR for the district rural and taluka rural is around 43%. As per Census 2011, Tarapur GP has 5,839 of total workers, meaning almost 32% of the total population is the working population and so 68% of people are not active in any economic activities. The WFPR of the GP has decreased from 35.62% in 1991 to 32.45% by the 2011 census year. The decreasing trend in the participation rate indicates that the many working populations migrate outside the village for better livelihood opportunities.

Figure 7: Workforce Participation Rate- Census of India, 2011

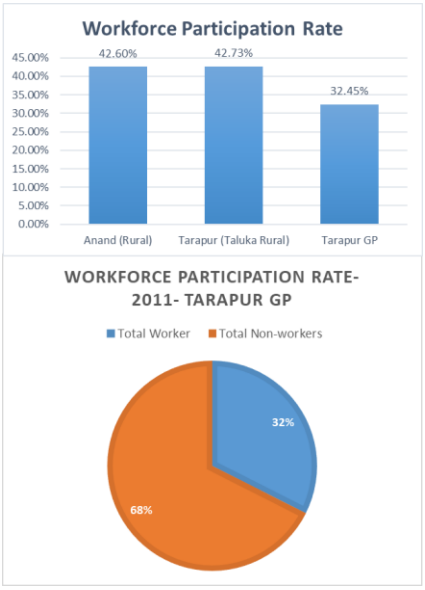


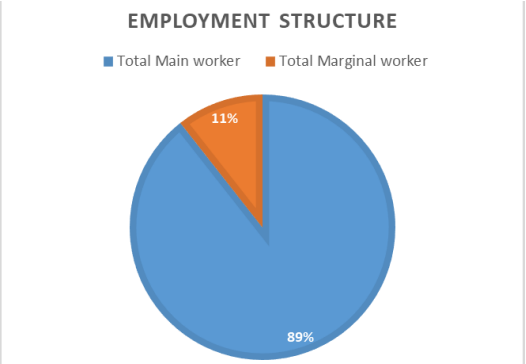
Table 10: Change in Workforce Participation Rate

	1991	2001	2011	1991 (In %)	2001 (In %)	2011 (In %)
Total Population	12,149	14,934	17,994	---	---	---
Total Worker	4,328	5,039	5,839	35.62%	33.74%	32.45%
Total Non-workers	7,821	9,895	12,155	64.38%	66.26%	67.55%
Source: Census of India						

7.3.2 Employment Structure

Employment structure refers to the reference period for determining a person as a worker or non-worker is one year preceding the date of enumeration. Based on the reference period work is divided into two categories- Main Workers and Marginal Workers. Main workers are who are employed for at least for six months, and the rest are marginal workers. Employment structure indicates a high percentage of main workers in the GP as compared to marginal workers. Around 89% of workers in Tarapur have employment for six or more months per year.

Figure 8: Employment Structure – As per the Census of India, 2011



7.3.3 Occupational Structure

Occupational structure refers to the aggregate distribution of occupations according to skill level and economic functions. It shaped by various factors like the structure of the economy (the relative weight, of different industries), technology, and administrative responsibility, labour market, etc. Primary and non-primary (Secondary + Tertiary sectors) are two main occupational structure classified by Census of India. As per the census 2011 data, Tarapur comprises 46% of primary workers, and only 54% of non-primary workers.

Table 11: Change in Occupational Structure in Tarapur GP

	2001	2011	2001	2011
Total Worker	5,039	5,839	33.74%	32.45%
Total Primary worker	2,270	2,680	45.05%	45.90%
Total Non-Primary	2,769	3,159	54.95%	54.10%

Source: Census of India

7.3.4 Economic Activities

Primary survey of the village reveals that the majority of workers are involved with the agriculture activities either as labourers or as cultivators. As per the Sarpanch, around 50% people are depending on agriculture as the main source of income, and remaining 50% workers are involved in various activities such as industrial labouring jobs, teaching, small business activities, government jobs, auto and shared van driving, etc.

Agriculture Activities

There is a double and triple cropping pattern adopted by the farmers, with the major crops sown in are Dangar, Paddy, Green Gram, Chana, Millet, and Wheat. Private bore wells and Mahi canal are two main sources for the irrigation. Power supply for agricultural activity is available in this village. Having the APMC, wholesale (weekly) market and cold storage within the panchayat jurisdiction are quite beneficial to the farmers. Tarapur APMC serves around 40 to 45 surrounding villages.

However, according to the Sarpanch and Talati, though the village highly depends on agricultural activities, there is a lack of knowledge amongst farmers and cultivators regarding new technology in farming. Moreover, there is no KVK (Krishi Vigyan Kentra) center in the village to guide farmers and demonstrates technology generation, technology assessment and refinement and dissemination in the field of agriculture and allied sectors. As of now, there is no warehouse in the village, however, it is clear from the FGDs, having APMC within the panchayat jurisdiction, farmers do not need warehouses to store the products, instead, they store within their storage built on their field for a couple of days and sell them in APMC within few days.

Other Economic Activities

As per the Sarpanch, around 9 to 10% of workers are industrial laboures and go to the Industrial establishment at Indranaj village at 10 km distance, on daily basis. Some people work as full-time casual laborers in APMC and wholesale (weekly) market. Around 20% of the working population is engaged with small businesses such as having a shop at APMC, small provision shop, tea stall, hotel, restaurants, etc. Around 10 to 15% of workers are daily commuting to nearby villages or Anand for livelihood and 5% of workers depend on daily wages involved in an auto or van driving, carpentry work, etc. However, the number of households involved in home-based economic activity is significantly low.

As per the panchayat, there is no skill development centers (Kaushlya Vardhan Kendra (KVK) or ITI) in the village for students and young work pool; such center is required in the village so the young work pool can be trained and absorbs in the surrounding industrial establishment/ various economic activities.

Figure 9: Tarapur APMC

Source: APMC Market Yard Tarapur; http://apmctarapur.com/

7.4. Social Infrastructure Assessment

Social infrastructure is the basic requirement of human life; therefore, availability and adequacy of infrastructure services have a larger role in the wealth and well-being of citizens; as well as in strengthening economic development in the region. Hence, provision of the social infrastructure is defined as basic services that any developing region requires to sustain its growth and development.

This section outlines the status of existing social infrastructure facilities and services in the Tarapur GP. Here presented analysis is done based on the Census 2011 and Village Profile date provided by the Tarapur Panchayat. Social infrastructure is the basic physical and organizational structures needed for the operation of a society, or the services and facilities necessary for an economy to function. For the provisions of amenities, URDPFI guidelines are considered as the basis for estimation of gaps and additional requirements.

7.4.1 Educational Facilities

Tarapur GP has four levels of educational facilities ranging from the junior kinder garden to the college level.

Pre-Primary School (Anganwadi):

Generally, pre-primary schools refer to the Anganwadi. As per URDPFI guidelines, one Anganwadi is required for every 2,500 of population. The total Anganwadi available within the panchayats are 19. As per the standards, at present only 7 aganwadies are required, which means the availability of Anganwadi in the GP is in surplus.

Primary + Middle School (Standards I to VIII):

Generally, Primary Middle School refers to the grade of education from 1st to 8th. As per URDPFI guidelines, one school is required for every 5,000 of population. The total schools available within the panchayats are 10 (7 Govt. + 2 English Privte+1 Madrasa). As per the standards, at present only 4 schools are required, which means in Tarapur GP schools are in surplus.

Secondary School (Standards IX to X):

Generally, the Secondary School refers to the grade of education from 9st to 10th. As per URDPFI guidelines, one school is required for every 7,500 of population. The total schools available within the panchayats are 2. As per the standards, at present only 2 schools are required.

Senior Secondary School (Standards I to VIII):

11th and 12th grades of education referred to senior secondary schools. As per URDPFI guidelines, one senior secondary school is required for every 15,000 of population. The total senior secondary school available within the village is 1. As per the standards, at present only 1 school are required.

Table 12: Status of the Educational Facilities in Tarapur GP

Type of School	Population 2011	Existing No. Facility	Required	Surplus/ Deficit
Pre-Primary School (Aanganwadi)	17,994	19	7	12
Primary Schools (primary + middle) I-VIII		10	4	6
Secondary Schools (IX to X)		2	2	0
Senior Secondary (XI-XII)		1	1	0
Colleges		0	0	0
Source: Census of India, Primary Survey, Village Profile, 2020 and URDPFI Guidelines				

College:

Generally, college refers to graduate-level education. As per URDPFI guidelines, one college served per unit for every 125,000. There are no colleges in the village. However, the Govt. ITA College is available in this village and nearest Govt. Arts and Science Degree College, Govt. Engineering College, Govt. MBA College and Govt. Polytechnic College is in Vallabh Vidyanagar (33km). Nearest Private Medical College is in Karamsad (29 km). Nearest Private Disabled School is in Anand (35 km).

Private Pre Primary, Govt Primary, Private Primary and Govt Secondary Schools are available in this Village. Govt. ITA College is available in this village.

7.4.2 Health Facilities

This section is focusing on existing health facilities available and need of the health facilities in the village According to the norms given by Indian Public Health Standards there should be one Primary Health Center for every 30,000 of population, followed by two sub centers and dispensaries. Based on these norms the demand and sufficiency of the health facilities are worked out. The health facilities in the villages are provided on various levels, e.g. Primary Health Sub-Centers, Primary Health Centers (PHC) and Community Health Centers (CHC).

Health Facilities Relevance to Villages

A Sub-Health Center (Sub-center) is the most peripheral and the first point of contact between the primary health care system and the community, while a Primary Health Center (PHC) is a referral Unit for 6 Sub Centers, equipped with 4-6 beds, manned with a Medical Officer In-charge and 14 subordinate paramedical staff members. Community Health Center (CHC) is a 30-bed hospital/referral unit for 4 PHCs with specialized services. As per the Indian Public Health Standards (by Ministry of Health and Family Welfare (MoHFW)), one sub-center is required for a population 5,000 people, one Primary Health Center (PHC) for 30,000 of population, one Community Health Center (CHC/Rural Hospital) for a population of one lakh, and one Maternity & Child Welfare Center is required per 15,000 of population.

The services at the Sub-Health Center is provided by an appointed Female Health Worker and Male Health Worker at each Sub-Center, whose responsibility is to provide vaccination and regular health check-ups to the village residents. The female health worker looks after the kids, pregnant women for delivery, family planning, and is responsible for vaccinations of the entire village. She is supposed to visit every household once a month. The male health worker looks primarily into diseases like, leprosy, malaria, TB, water borne diseases etc. A PHC is supposed to have a medical officer, who should be a doctor, a male and a female supervisor, a pharmacist, lab technician and an ambulance.

Figure 10: Hierarchy of Health Centers in Rural India

Source: MoHFW Guidelines

Table 13: Status of the Health Facility in Tarapur GP

Type of Facility	Population 2011	Existing No. Facility	Required	Surplus/ Deficit
Sub Health Center	17,994	1	4	-3
Primary Health Center (PHC)		1	1	0
Community Health Center (CHC)		1	0	1
Maternity & Child Welfare Center		1	1	0
Source: Census of India, Primary Survey, Village Profile, 2020 and MoHFW Guidelines				

Sub-Health Center:

As per the Indian Public Health Standards (by Ministry of Health and Family Welfare (MoHFW), one sub-center is required for a population 5,000 people, which means, with 17,994 of population total 4 Sub-Centers are required in the village. At present, there is only one sub health center in the village and 3 additional required. However, the Sub-center is being fulfilled by the presence of one Maternity and Child Welfare center in the village. With both the centers, the requirement of the sub-centers in Tarapur is been managed sufficiently.

Maternity and Child Welfare Center:

As per the standards, one such center is required for a population of 15,000 people, which means, with 17,994 of population total 1 center is required in the village. Currently, there is 1 such center located in the village.

Primary Health Center:

As per the Indian Public Health Standards (by Ministry of Health and Family Welfare (MoHFW)), one sub-center is required for a population 30,000 people, which means, with 17,994 of population total 1 PHC is required in the village. Currently, there is 1 PHC located in the village.

Community Sub-Center:

As per the Indian Public Health Standards (by Ministry of Health and Family Welfare (MoHFW)), one Community Center (CHC) is required for a population 1 lakh people, which means, with 17,994 of population, presence of the CHC within the panchayat jurisdiction is not required. Currently, there is 1 CHC located in the village.

Table 14: List of the Available Health Facilities in Tarapur GP

Sr. No.	Particulars	Status of Availability	If no facilities in the Village, then the nearest place of availability
1	Sub Health Center	Yes	1
2	Primary Health Center	Yes	1
3	Community Health Center	Yes	1
4	Maternity Home, Government, Private, Institutional	Yes	1
5	Government, Panchayat Hospital	Yes	1
6	Private, Institutional Hospital	Yes	1
7	Private Allopathy Clinic	Yes	1
8	Government/Private Ayurveda Clinic	No	Available at Dist. Anand - 35 km
9	Government/Private Homeopathic Clinic	No	Available at Dist. Anand - 35 km
10	Naturopathy Clinic	Yes	
11	Doctor of Medicine	Yes	1
12	Surgical doctor	Yes	1
13	Gynecologist	Yes	1
14	Pediatrician	Yes	1
15	Orthopedic	Yes	1
16	Ophthalmologist	Yes	1
17	Ear, Nose, Throat Doctor	Yes	1
18	Dermatologist	Yes	1
19	Orthopedic	Yes	1

Sr. No.	Particulars	Status of Availability	If no facilities in the Village, then the nearest place of availability
20	Total number of nurses in the village	Yes	1
21	Number of trained midwives	Yes	5
22	Asha worker in the village	Yes	17
23	Service of doctors for delivery under Chiranjeevi scheme	Yes	1
24	Ambulance facility in the village	Yes	2
25	108 Mobile van's station	Yes	2
26	Presence of Pharmacy/Medical Stores	Yes	5
27	Blood Bank facility	No	Available at Dist. Anand - 35 km
Source: Primary Survey and Village Profile 2020			

7.4.3 Social Cultural Facilities

As per URDPFI guidelines, one recreational center or a neighborhood park is required for every 15,000 of population, and for other socio-cultural facilities; facility center is required per every 100,000 of population. As per the Village Profile and the Sarpanch, the GP has one Public Park, community hall and open-air theatre, which is sufficient facilities as per the URDPFI guidelines.

7.4.4 Financing Facilities

Generally, banking facility refers to Co-operative Commercial, Agricultural Credit Societies, and other Credit Societies. Financial services have further divided into four categories such as Co-operative Commercial, Agricultural Credit Societies, and other credit societies included in the Banking Facility for Project Area. As per URDPFI guidelines, one bank is required per 15,000 of the population; which means, a total of 1 bank are required in the GP. However, at present, there is a total of 3 banks in the village. ATM facilities are available in this village. Also, Commercial Bank, Cooperative Bank, and Agricultural Credit Society are available in this village.

Table 15: Status of the Financial Facilities in Tarapur GP

Panchayat	Population	Banking facility		
		Existing facility	Required	Surplus/ Deficit
	2011	2011		
Tarapur	17,994	3	1	2
Source: Census of India, Primary Survey, Village Profile, 2020 and URDPFI Guidelines				

7.4.5 Communication Facilities

Post office and telecommunication are the various means of communication facilities available in the project area. Analysis of the communication facilities had been done using URDPFI guidelines. However,

with the extensive use of mobile services, in the current scenario availability of telecommunication became insignificant; hence, this aspect of socio-physical infrastructure is not included here.

7.4.6 LPG Facilities

As per the panchayat report, out of total 3,452 households, 2500 households (72.42 %) in the village have LPG facilities. Though the LPG gas cylinder center is not located in the GP, villagers get the home delivery from the agency located in Sojitra town through phone booking requests. Remaining household still uses kerosene and wood as cooking fuel; the majority of such households fall under BPL category.

Table 16: List of the Additional Facilities Available at Tarapur GP

Sr. No.	Particulars	Status of Availability
1	Post Office	Yes
2	TV Channels/ Dish Connectivity	Yes
3	Telephone Landline	Yes
4	Mobile connectivity	Yes
5	Is there more than 10 Mobile Holders	Yes
6	STD/PCO	Yes
7	Cyber Café	Yes
8	Private Courier Service	Yes
9	Provision of Police Station/Out Post	Yes
10	Crematorium	Yes
11	Public Library	Yes
12	Public Playground	Yes
13	Community Hall	Yes
14	Open Air Theatre	Yes
15	A place for social Ceremonies	Yes
16	Nationalise Bank	Yes
17	Co-operative or Gramin Bank	Yes
18	Land Development Bank	Yes
19	Private Commercial Bank	Yes
20	Agricultural Credit Society	Yes
21	Farm Produce Market Committee	Yes
22	Fertilizer, Seeds and Pesticide Store	Yes
23	Farm Tools Shop	Yes
24	Reasonable price shop	Yes
25	Petrol Pump/Diesel Pump	Yes
26	CNG/LPG Gas Pump	Yes
27	Cooking Gas Cylinder agency	No (Available at Sojitra Town- 10 km distance)
28	Cold storage	Yes
29	Weekly shop/Market	Yes

Sr. No.	Particulars	Status of Availability
30	ATM Service	Yes
31	PNG (Piped Natural Gas) service	Yes
32	Birth & Death registration office	Yes
33	Daily News Paper	Yes
34	Cinema Theater	Yes
35	Private Courier Facility	Yes
Source: Primary Survey and Village Directory, 2020		

7.5. Housing Profile[3]

This section of the report reviews the housing profile in the GP. Census 2011 housing data had used to analyze the profile.

7.5.1 Housing Stock

As per the Census 2011, Tarapur GP has 3,452 houses that accommodate the total 17,994 populations, which means the average HH size in the village is 5.21. Currently, 97.5% of houses in the village are either in good or in livable condition and only 2.5% of houses are in dilapidated condition. As per the HH survey, the majority of houses in the village are one-story building followed by ground plus one story.

Figure 11: Status of the Housing Condition in Tarapur GP- Census 2011

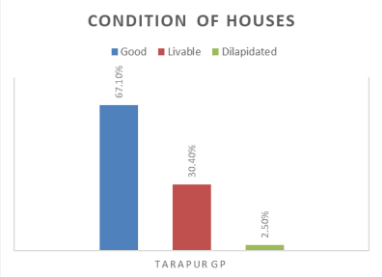


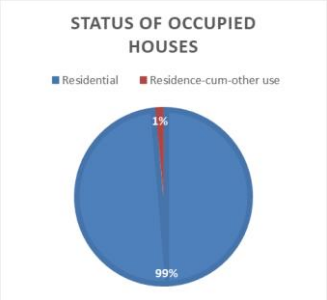
Table 17: Analysis of Housing Stock

Spatial Unit	Population	No. of HH	HH Size
Anand (District Rural)	1,457,758	297,658	4.90
Tarapur (Taluka Rural)	88,522	16,768	5.28
Tarapur GP	17,994	3,452	5.21
Source: Census of India, 2011			

[3] Housing Profile has been done based on the Census of India, 2011

7.5.2 Status of Occupied Houses

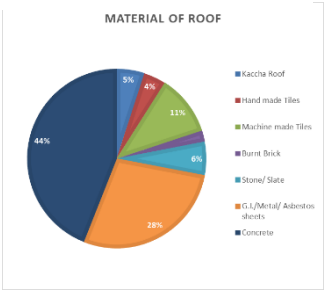
Figure 12: Status of the Occupied Houses- Census 2011



In 2011, out of a total number of occupied housing units in the GP, almost 99% of units are exclusively residential and only 1% is used for residence-cum-other uses. Out of total residential housing units, majority units are in good condition (66%) and livable (30%), while only 4% are in non-living condition.

7.5.3 Construction Material of Houses

Figure 13: Material of Roof- Census 2011

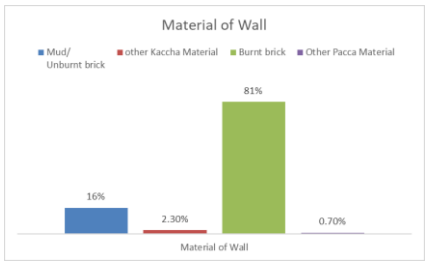


As per the Census 2011, 82% of houses in Tarapur are permanent houses, 14% are semi-permanent, and 5% of houses are temporary houses, mainly in the slums and unauthorized areas.

Material of Roof

Almost 95% of households in the project area have permanent roofs. 44% of households have roofs made of concrete Material. Only 5% of households have kaccha roofs made of a material like bamboos, wood, mud, plastic sheets, thatch grass, etc., especially in the slums and other low-income group areas.

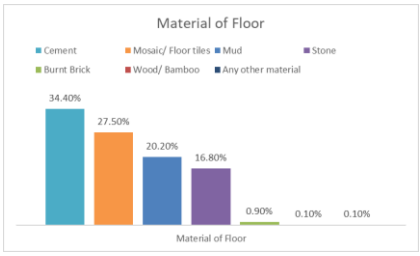
Figure 14: Material of Walls- Census of India



Material of Wall

Majority of houses (82%) in the GP are pucca houses with walls either made of burnt bricks (81%) or stoned packed with mortar or concrete (0.7%). At the same time, 18.3% of the total households in the village are kaccha houses, where the majority of the kaccha houses are made of mud or unburnt bricks (16%).

Figure 15- Material of Floor- Census of India

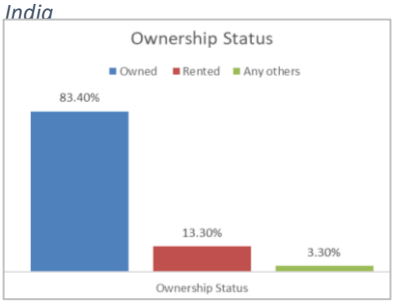


Material of Floor

In the village, cement is predominantly used material for flooring. Almost 35% of households in Tarapur GP have permanent flooring made of cement, followed by the mosaic tile flooring (28%). As per the Census of India, only 20% of houses are with flooring made of mud, especially in the slums and other un-authorized houses.

Ownership Status of Houses

Figure 16: Ownership Status- Census India



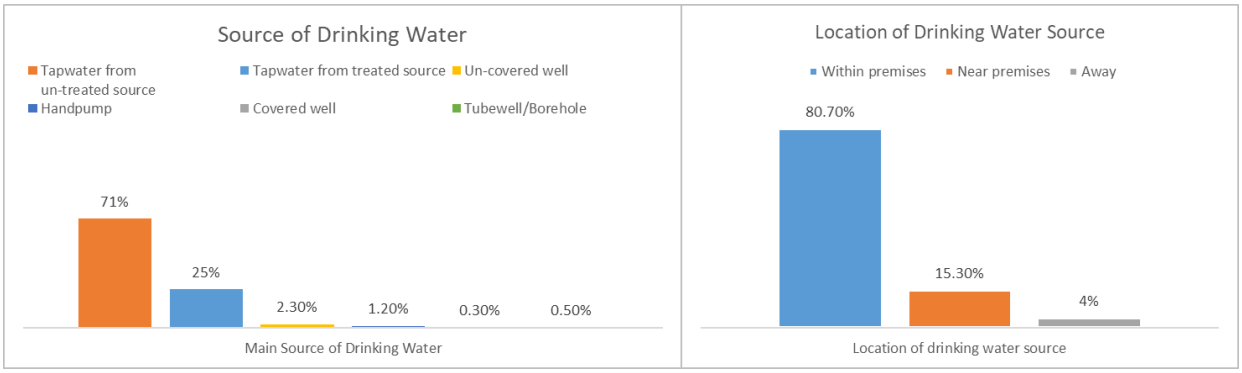
Out of the total number of households in Tarapur, 83.4% of households are owned, 13.3% are rented and only 3.3% is used for other accommodations.

7.5.4 Services

Source of Drinking Water

Majority of the households in the GP have a source of drinking water within their premises (81%) or nearby their premises (15%), such as water taps, wells, hand pumps, tube wells, or boreholes, and 4% households, who do not have sources within their premises or nearby their premises and have to go little far.

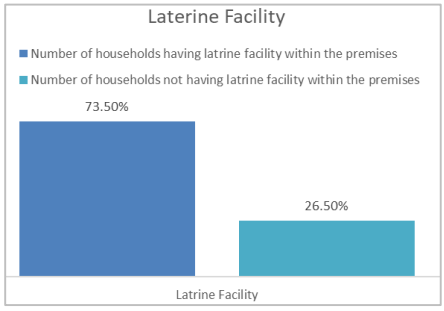
Figure 17: Source and Location of Drinking Water- As per the Census of India, 2011



In Tarapur, Panchayat is responsible for supplying water. Majority of the households receive water supply through water pipeline. Around 71% of houses use tap water from the un-treated source as a main source of the drinking water, and only 25% of households use tap water supplied from the treated source. Only 2.3% of households use water from uncovered wells.

Type of Latrine Facility

Figure 18: Type of Latrine Facility- As per the Census of India, 2011



Around 74% of households in the GP have latrine facility within the premises; which means, around 27% of households in the project area do not have the latrine facility within their premises; this gap is now covered up under Swacch Bhart Mission. At present, in Tarapur village, 100% of households have the toilet facility within in their premises. Septic tank (93%) is the most common type of treatment for in-premises latrine facility found in the project area.

Members from the 26.5% household who do not have the latrine facility within their premises do open defecation.

Type of Bathroom and Drainage Connectivity

Over 50% of households in the GP have bathing facilities within their premises. The majority of them have covered bathrooms. However, on the other hand, the GP is facing issues due to the lack of properly planned drainage system for wastewater discharge. As per the Census, around 37% of households are not connected with any kinds of drainage system (covered or open drainage). Only 23% household in the village is connected to the closed drainage system.

Table 18: Type of Bathroom and Drainage Facilities in Tarapur GP

Number of households having bathing facility within the premises			Wastewater outlet connected to		
Yes		No	Closed drainage	Open drainage	No drainage
Bathroom	Enclosure without roof				
68.4%	7.5%	24.1%	22.9%	39.7%	37.4%
Source: Census of India, 2011					

Table 19: List of Additional Services and Facilities Available at HH Level

Sr.no	Type of Services	Level of Availability	Source
Additional List of Services Available at HH Level			
1	Main Source of Light	98% HH- Electricity 2% HH- Kerosene (mainly in slum areas)	Census of India & Primary Survey
2	Cooking Fuel	72.4% HH-LPG Remaining Kerosene and Fire Wood	HH survey, Primary Survey & FGDs
List of Available Facilities at HH Level			
1	2 Wheeler	52% HH	HH Survey
2	Mobile and Telephone	66% HH	Census of India, 2011
		90% HH	HH Survey
3	Television	70% HH	HH Survey
4	Refrigerator	50% HH	HH Survey
Source: HH Survey, Primary Survey, FDGs and Census of India, 2011			

7.6. Inter Village Road and Connectivity

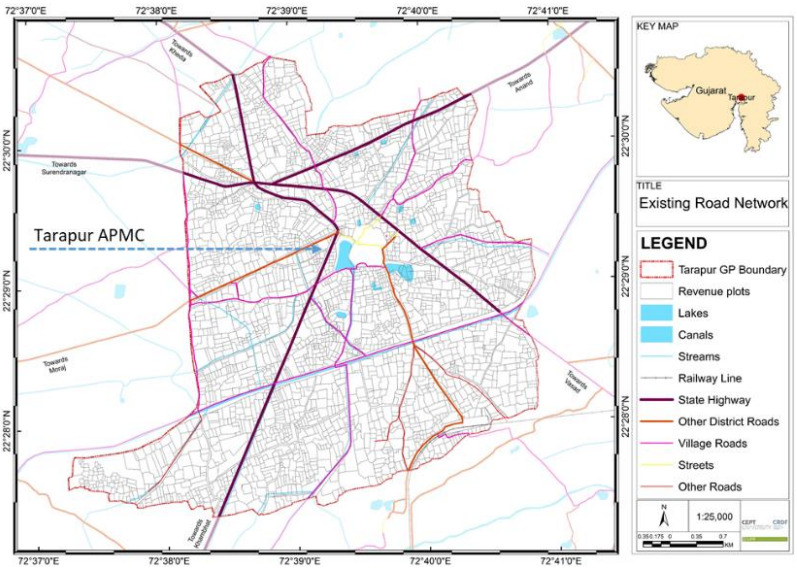
Road connectivity is one of the important components as it connects to major destinations. Tarapur GP located on the junction of three major state highways- SH 8, SH 16 and SH 83. The village is connected with the rest of the district, state and surrounding village via state highways and district roads. The access road connecting the village with these highways is an asphalt road with 2 lanes.

The village is very well connected through SH8, SH 83 and SH 16, which further branches into the village road network. The overall road network is sufficing the dependency of the village on the nearby centers for health, education and economic purposes.

The condition of the internal village road is good. Almost all the internal village roads are paved and pucca roads. The road network in the Gamtal area is also paved with blocks. In last five years, under various schemes (ATVT, MP and MLA Funds, Taluka Grants, 14th and 15th Finance Commission, 15 per cent Vivekadhin Yojana, etc.), a number of kaccha roads have been reconstructed and are now pucca.

Villagers of Tarapur GP has access to the public and private bus service. The state public transport network connects the village with the district, with the surrounding towns and villages, and nearest railway station. As per the primary survey, daily 47 bus trips are accessible by the villagers. However, recently, the bus depot that was located in the GP is shifted to Khambhat by the transport department. Also, well functional private shared van and shared auto services available along the highways. Tarapur APMC serves around 40 to 45 surround villages. During the day time, traffic chaos is noticed on the junction of Khed- Khambhat Road (highway- SH 16) and approach road to the APMC.

Map 14: Existing Road Network- Tarapur GP



Source: As per Data Received from NRSC

Streetlight:

Tarapur GP does not have streetlights along with the inter village road network, which is a basic requirement for increase safety and visibility during the night time. Recently, the panchayat has started arranging for the streetlight at identified locations, but so far only 10% streets are covered with the street lights; however, the process is slow due to the dependency of availability of fund for the same.

7.6.1.1 Issues with the Inter Village Roads and Connectivity

- During the pick hours, traffic chaos is noticed on the road approaching APMC.
- Lack of streetlights; only 10% of inter village roads have streetlights

7.7. Physical Infrastructure

This section evaluates the level of availability of utilities (physical infrastructure- water supply, sewage, power, etc.) based on the village profile 2020, FGDs, and the primary survey.

7.7.1 Water Supply System

Water is supplied in the village through the pipe network. The entire village is covered under the pipe network. There are total 7 bore wells and 2 government sump and ESR with total 6 lakh litre (3 lakh litre each) water storage capacity. Each bore well is connected with the pipe network via sumps/ ESRs. Currently, with these infrastructures, the panchayat can provide water 24 hrs. Also, sump with 3 lakh litre capacity has been proposed byHowever, the pipe network is nearly 30 to 35 years old and as a result, there is a problem of leakages, which requires frequent repairing. Up gradation of the water pipe network is required. Panchayat is responsible for the supplying of water. The supplied water quality is potable.

Table 20: Status of Water Supply System in Tarapur GP

Parameters	Values
No. of Borewells	7
Capacity of Sump	6 lakh litre (3 lakh litre + 3 lakh litre)
% of HH covered under pipe network	100%
Age of network	30 to 35 years
Water supply timing	24hrs
Water quality	Potable
Source: Primary Survey	

7.7.1.1 Issues with the Water Supply System

- Water supply pipe network is 30 to 35 years old, resulting in frequent leakage issues.

7.7.2 Sewerage and Drainage System

Currently, the open drainage system is available in the village. Wastewater from bathrooms and kitchen is directly connected with this open drainage network, and through the open drainage network, the untreated wastewater from the households mix with the rainwater and eventually discharged into the water bodies. Unfortunately, many farmers use the passing water through the main trunk of the open drainage network for irrigation purpose, which is not hygienic. Recently, under the Rurban Fund, laying of sewage network in the GP is done, however, the main truck is yet to be connected with the houses. Once the household sewage connection with the main trunk line will be established, using the rainwater from the open drainage line wouldn't be unhygienic. Presently, toilets are connected with the septic tanks;

almost all the households with toilets have septic tanks. However, they are not maintained well; they get clean on a required basis.

7.7.2.1 Issues with the Sewerage System

- Wastewater from kitchen and bathroom is being discharged into the open stormwater drainage network.
- Underground sewage network is not completed- household sewage connection to the main sewage network is not yet established.
- Soak pits are not maintained on regular basis, they only get clean when as and as required basis.

7.7.3 Solid Waste Management

Solid waste management is directly related to health and hygiene. It is also an indicator of the socio-cultural condition of the village and town. In Tarapur GP, panchayat is responsible for solid waste management. As per the panchayat, there is a system of the door-to-door collection in the village. Currently, in the village, door-to-door solid waste is being collected daily by the panchayat. There is also a system to collect garbage from the streets. However, without segregation, the collected waste is being transferred to the waste disposal site using 3 trollies and 3 tractors. For the waste disposal site, the panchayat uses the panchayat/ govt. wasteland, where the collected waste gets dumped without any treatment. Once the site is full with the waste, it will be covered with the black soil and then reuse it for other uses- For an example, existing Taluka Panchayat office building is built on such duping site. As per the panchayat, they need additional trolley and tractor to manage the solid waste with efficiently.

7.7.3.1 Issues with the Solid Waste Management System

- Collected solid waste is disposed of without segregation.
- Solid waste is directly dumped into an open field without any disposal treatment.

7.7.4 Electricity

MGVCL (Madhya Gujarat Vij Company Limited) is responsible for electricity supply to the village. The village has 24 hours of power supply. However, as there is no MGVCL service station in the village; in case of faults in the power line, the village experiences a power cut issue which lasts for 4 to 5 hrs. The village also gets power supply for agriculture activities, in a manner of weekly- day and night shifts.

Table 21: Electricity Supply- Tarapur GP

Particulars	Availability
Is the village electrified?	Yes
Number of electrical connections for residential purposes	5,106
Number of connections for industrial purpose	142
Number of agricultural connections	26
Does the village get three-phase electricity?	Yes
Does the village get 24 hours of electricity for residential purposes?	Yes
Is the streetlight electrified?	Yes
Does the village have solar streetlights?	Yes
Source: Village Profile, 2020	

7.7.4.1 Issues with the Electricity Supply

- No MGVCL service station located in the village; hence, during any faults in electric line, power cut last for more than 4 to 5 hrs

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PLANNING PROPOSALS

CHAPTER 8: VISION AND KEY CONSIDERATIONS FOR PLANNING PROPOSALS

The objective of preparing a Tarapur Gram Panchayat Spatial Development Plan is to integrate the planning of land and its resources allow for rational and sustainable use of land catering to various needs, including social, economic, developmental and environmental needs. For the integrated land use planning based on the holistic approach, it is necessary to appropriately allocation and utilize land and its resources comprehensively and consistently catering to the present and future demands. Hence, it is necessary to understand the strengths and emerging concerns of the planning area along with its future requirements. This chapter presents the key considerations for the planning area to achieve the goal of integrated land-use planning.

8.1. Strengths, Emerging Concerns and Opportunities

Knowing the strengths and weaknesses of the planning area gives a better understanding of the region. It identifies the areas where the most attention needed and helps in strategically plan and allocate the resources to fulfil the demand of the region. This section of the chapter highlights the strengths and weaknesses of the Tarapur GP based on the existing situation analysis presented in the previous chapters.

Strengths

- Strategic Location: - Tarapur GP is strategically located on the junction of SH16, SH 8and SH 83. It acts as a major gateway between Saurashtra region and the southern regions of Gujarat. It is just 35 km away from the district headquarter and the Milk Capital of India. Due to its strategic location and connectivity, the GP has observed steady growth over the past few decades and has become one of the important upcoming centers in the Bhal region[4] of Gujarat with increasing growth in trade, industrial and logistical activities. Having located on the junction of the three-state highways, the GP has the potential to grow as a commercial and mixed-use hub along the highways.
- A town like Characteristics: -Though the GP falls under the category of village, the GP has town like characteristics. It has social amenities like schools, health care centers (like PHC, CHC, private clinics), 24 hrs electricity, pipe water supply system, banks, post office, panchayat administrated door to door solid waste collection facility, and soon the village will have an underground sewage system. Many workers are working in surrounding villages but prefer living in Tarapur.

[4] Bhal Region: The Bhal region is situated on the deltas of the Sabarmati, Bhogawo, Bhada, Lilka and other rivers that flow east and southeast off the Kathiawar peninsula into the Gulf of Cambay.

- Tarapur APMC: - Tarapur APMC (Agricultural Produce Market Committee) was divided from the APMC Khambhat in 1999 post creation of the Anand District in 1997. APMC is establishing to regulate the market of different kinds of agricultural products and to cater the marketing needs of the farmers and providing them with a platform for selling agricultural produce in various markets and at competitive prices. Today, Tarapur APMC serves surrounding 40 to 45 villages.

Emerging Concerns and Weaknesses

- High Dependency on Agricultural Activity: - Though around 60%of the workforce is involved with agricultural activities there is a lack of knowledge amongst farmers regarding new technology in farming. Tarapur has alluvial soil, and it would be more beneficial for farmers if they make a little adjustment in existing cropping pattern; however, it is being ignored by farmers on account of lack of proper knowledge and poor yields (As per Anand District Census Handbook, sarpanch and Talati). Moreover, there is no KVK (Krishi Vigyan Kendra) center in the village to guide farmers and demonstrates technology generation, technology assessment and refinement and dissemination in the field of agriculture and allied sectors.
- Traffic Chaos: - Tarapur APMC is located at the junction Khed- Khambhat road (SH 16) and major district road. This APMC also market serves around 40 to 45 surround villages. As a result, heavy vehicular traffic, mainly four-wheelers (Trucks, tractors and cars) has been noticed on the roads connecting with the APMC, many times it becomes difficult to manage the traffic congestion.

Opportunities

- With strategically located on the junction of three state highways, being a gateway to one of the important upcoming centers in the Bhal region and having the establishment of APMC & weekly market (Mandi), Tarapur GP has a huge potential to have commercial development along the highways, where small restaurants, hotels, organized food courts, petrol pumps, lodge etc. can be established. These would help in reducing the high dependency on the primary sector.

8.2. Vision

Vision Statement

Tarapur GPSDP is a spatial plan to ensure integrated rural development. A vision for the plan is “to have a systematic development of the village to provide quality of life to the villagers through planned growth, provision of infrastructure and to spur overall economic growth of the area”.

8.3. Key Considerations for Planning Proposals

For the planning proposals, spatial growth pattern, various projections, area requirements to accommodate additional housing demand and economic activities, and availability of land for development are key considerations considered, which are explained below in this section.

8.3.1 Population Estimation

Projections are an extrapolation of historical data (population v/s time) into the future. Accuracy of population projection generally considered directly proportional to the size of the existing population/ employment and the historical rate of growth, and inversely proportional to the length of the time projection. This section comprises the estimation and projection of population for the planning area (Tarapur GP). Projection is done for horizon the year 2041, for which the Spatial Development Plan is being prepared for the planning area.

Data Source

Various data sources have been used for extracting population details for the planning area. The population distribution for the year 1991, 2001, and 2011 has been sourced from Census of India publications for the projections.

Adopted Methodology

Population projections for Tarapur GP were carried out using three mathematical projection methods. As they are mathematical methods and projections are based on the historical trend, the average of the three methods considered as a forecast population for 2041 for the further projections required for the development of planning proposals. Following three population forecasting methods:

- Arithmetic Method- This method is based upon the assumption that the decadal increase in population is constant.
- Geometric Increase Method- In this method, it is assumed that the percentage increase in population from decade to decade remains constant.
- Incremental Increase Method- The method refers to the difference between the absolute population increases during the two successive decades.

Incremental Increase method estimates the GP population for the horizon year the most and Arithmetic method calculates it the least, which is almost 3,923 less than the Incremental Increase method. As all three methods use historical data for the mathematical estimations, the average of the three methods is considered as the forecast population for the planning area; therefore, projected population for Tarapur GP by 2041 is 30,685.

Table 22: Population Estimation

Methods	Census 1991	Census 2001	Census 2011	Projected Pop for 2021	Projected Pop for 2031	Projected Pop for 2041
Arithmetic Method (AM)	12,149	14,934	17,994	20,917	23,839	26,762
Geometric Method (GM)	12,149	14,934	17,994	21,894	26,639	32,412
Incremental Increase Method (IIM)	12,149	14,934	17,994	22,447	28,429	32,882
Average of AM, GM and IIM**	---	---	---	**21,752**	**26,302**	**30,685**
Source: Census of India Note: ** Considered as the projected population for Tarapur GP.						

8.3.2 Employment Estimation

Employment generation is one of the major objectives of any development plan. While employment generation and balanced development will continue to be amongst the major objectives of the Development Plan for the planning area, the present context makes it necessary to have a more comprehensive strategy while determining the objectives given the expressed concerns. A comprehensive understanding of the future growth of the local economy is imperative for formulating an appropriate development strategy for the planning area. More specifically, such an understanding would help identify probable locations for employment centers and propose corresponding improvements to the transport network and other infrastructure services to meet future requirements.

Salient Features of Employment Projection

As per Census 2011, the workforce participation rate (WFPR) in the project area is 32.45%. While projecting employment for the planning area, it is assumed that the WFPR would be the same until the horizon year. Hence, considered WFPR for projecting employment in the project area is 33%.

As per the Census 2011, the ratio of primary, secondary, and tertiary sectors is 46%, 1%, and 53% respectively. Based on the past growth trend in the region, it is assumed that growth in the GP will continue at the same pace if not faster; hence, for projecting employment in the planning area considered ratio for the primary, secondary, and tertiary sectors are 46%, 1%, and 53% respectively. It is expected to have little over 10 thousand workers in the planning area by the year 2041. Moreover, it is assumed that 12% (1,215 workers) of the total workers will be commuting daily outside the GP for livelihood, which means total projected workers is 8,911 by the horizon year. Out of projected total 8,911 workers, 4,812 are foreseen to be employed in non-primary sectors.

Table 23: Employment Estimation

COMPONENTS	2011	2031	2041
Population	17,994	26,302	30,685
WFPR	32.45%	32.45%	33.00%
Total Workers	5,839	7,511 (8,535)**	8,911 (10,126)**
DISTRIBUTION OF WORKERS**			
Primary Sector (%)	45.90%	46%	46%
Secondary Sector (%)	1%	1%	1%
Tertiary Sector (%)	53%	53%	53%
Total Primary Workers	2,680	3,455	4,099
Total Secondary Workers	53	75	89
Total Tertiary Workers	3,106	3,981	4,723
Source: Census of India			
**Assuming 12% working outside Tarapur (Currently 10 to 15% working outside of Tarapur -Primary Survey) = 1,215 workers Note: Distribution of non-primary workers is as per the Census 2011 data for Tarapur GP= 1% HH Industries (secondary worker) and 53% other workers (tertiary works)			

Area Required for Economic Activities

It is assumed that 40% of secondary workers will work in the industrial sector, while the rest of 60% will be accommodated in commercial and mixed land uses. The total estimated secondary workers are 89, out of which around 36 workers are assumed to be working in the industrial area, and almost 53 workers will be working in the commercial and other economic activity areas. Also, assuming the required area per secondary worker in the industrial sector is 30 sq.mt/person; therefore, the total area required for industrial land use is 0.11 hectares. Further, it is assumed that the total required area per secondary jobs in commercial and mixed-use sectors is 15 sq.mt; hence, the total required commercial and other economic activity areas for secondary workers is 0.08 hectares.

Total foreseen tertiary workers in the project area are 4,723. It is believed all the tertiary jobs will be in commercial and economic zones. Besides, for tertiary workers, assumed total required area per person is 15 sq.mt; therefore, the total area requirement for tertiary workers is 7.08 hectares. Area required for commercial and economic activity area is calculated by taking into account of the total area of tertiary workers and 60% of secondary workers; hence, the total area estimated for commercial and economic activity is 7.16 ha (0.07 sq.km).

Table 24: Area Requirement for Economic Activities

Area Statement for Industrial Land Use		Population 2041	Area Unit
Projected Secondary Workers		89	---
Number of Secondary Workers in Industrial Sector		36	40%
Area Statement for Industrial Land Use			
Projected Secondary Workers	89		
Number of Secondary Workers in Industrial Sector	36		40%
Assuming about 30 sq.mt area per industrial jobs	1,069		sq.m
Area required for industrial jobs	0.00		sq.km
	0.11		ha
Note: Assumed 40% of the total secondary worked will be in Industrial sector remaining 60% will be working in commercial and mixed-use areas.			
Area Statement for Commercial And Mixed Land Use			
Number of Secondary Workers in Commercial and Mixed Land Use Sectors		53	60%
Assuming about 15 sq.mt area per Commercial/ Mixed use Jobs		801.98	sq.mt
Area Required for Commercial Jobs (Secondary Workers)		0.08	ha
Projected Tertiary Workers		4,723	---
Assuming about 15 sq.mt area per Tertiary Jobs		70,842	sq.mt
Area Required for Tertiary Jobs		7.08	ha
Total Area Required Commercial and Economic Activity		**7.16 (0.07)**	**Ha (sq.km)**

8.3.3 Housing Demand

Housing is one of the necessities of human sustenance deserves special attention in any kind of planning and policy level intervention. This section foresees the housing demand for the planning area. For this exercise, the following assumptions are adopted with the reference to the Census 2011 Housing Profile for Tarapur GP:

- Dilapidated houses account for 2.5% of total housing stock for the project area
- Household size 5.3

Table 25: Household Size

	1991	2001	2011	Ave. HH Size
Household Size	5.25	5.41	5.21	5.29 (5.3)
Source: Census of India				

Also, for 2041 projection 5.3 household size is considered, based on the historical data. The projected housing stokes for 2041 is 5,939 for the planning area. As per the census data, presently total housing

stoke in the GP is 3,538; which means additional residential area required to accommodate additional 2,396 houses by the horizon year.

Table 26: Housing Demand

	2011	2021	2031	2041
Population	17,994	21,752	26,302	30,685
Avg., Household Size	5.21	5.3	5.3	5.3
No. Houses Required	3,452	4,104	5,058	5,790
2.5% Dilapidated Houses	86	103	124	145
Total No. of Houses Required	**3,538**	**4,207**	**5,087**	**5,934**
Source: Census of India				

Residential Area Requirement based on Housing Demand

As per the housing projection, the GP would be required 2,396 (5,934-3,538=2,396) additional houses by 2041. Based on the ground situation, 64 sq.mt of area per unit is considered. Total estimated residential requirement is 19 ha by 2041, to accommodate additional 2,396 houses; out of which 12 ha area will be required by 2031 to accommodate the demand of additional houses.

Table 27: Residential Area Requirement based on the Housing Demand

Parameters	2031	2041
Additional No. of Houses Required	1,548	2,396
Area Per Housing Unit (sq.mt)*	64*	64*
Total Residential Area required (on sq.mt)	99,101	153,349
Assumed Additional 10 % Open Area Required**	9,910	15,335
Assumed Additional 15% circulation area (Roads)**	14,865	23,002
Net Area Requirement	123,877	191,686
Required Residential Area (sq.km)	0.12	0.19
Required Residential Area (ha)	**12**	**19**
Note: *As per the Sarpanch the size of the new housing is 64 sq.mt; which is cross-checked and confirmed with the satellite image. ** As per URDPFI Guidelines Source: Sarpanch Interview, and URDPFI Guidelines		

8.3.4 Environmental Consideration- Land Suitability Analysis

The topology and drainage system of the region presents a unique challenge towards attaining the perfect balance between resource conservation and utilization. The incorporation of effective environmental conservation and sustainability features will be an important aspect in the preparation of the Development Plan. Efficient measures towards conserving the natural surroundings should be adopted since the balance between natural and man-made surroundings significantly enhances the quality of life

of residents. Hence, no development buffer of 10 meters around the Full Tank Level of the water bodies is considered. Further, land suitability analysis was done to identify the non-developable and developable area.

8.3.4.1 Land Suitability Analysis

Conventional land-use development decisions are usually guided by single-dimensional criteria, most commonly short-term economic gain, not ecological, social, or even economic advantages over the long run. Suitability analysis is a process of determining the fitness of a specific land parcel to support a well-defined activity or land use. The basic premise of suitability analysis is that each aspect of the landscape has intrinsic characteristics that are in some degree either suitable or unsuitable for the activities being planned and that these relationships can be revealed through detailed evaluation and assessment. The primary objective of this suitability analysis is to identify eco-sensitive and developable zones.

Eco-sensitive zone or non-developable areas are strictly not to be disturbed and no other use is allowed in these areas except those permitted under the relevant legislation. There are bound to be exception such as settlements by tribes and other indigenous people living within protected zones.

Non-Development Area:

Following areas are considered as the non-developable area

- Water Bodies- River, lakes, canals and other water bodies
- In the case of the village- Pastureland (Gauchar land)
- Green Buffer- no development buffer of 10 meters around the Full Tank Level of the water bodies is considered as the non-developable area

Table 28: Total Non-Developable Land in Tarapur

Parameter	Area(sq.km)
Total Water Bodies	0.42
Water Body Buffer Area (10 mts)	0.31
Pasture Land (Gauchar Land)	0.19
Total Non-Developable Area	**0.92**

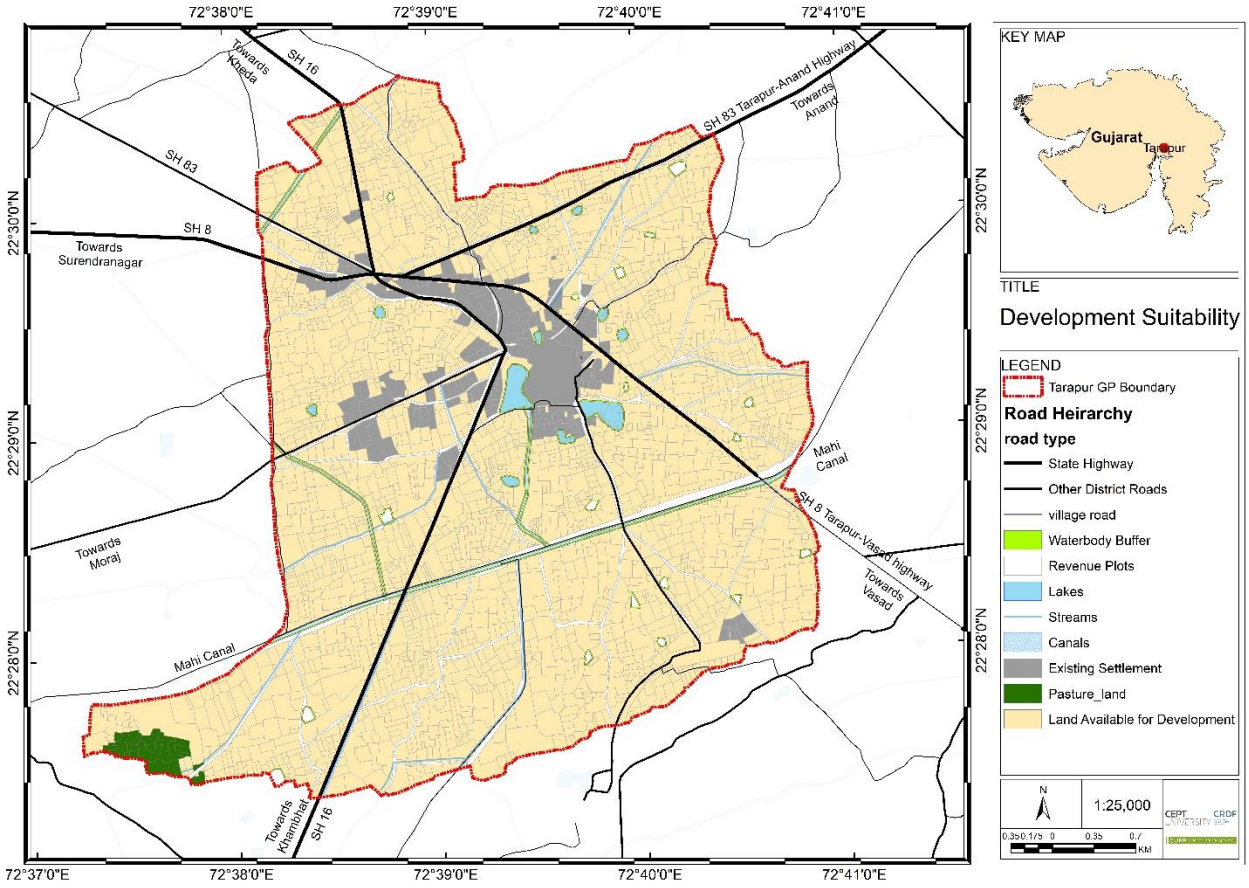
8.3.5 Land Available for Development

Out of a total of 22.40 sq.km of the planning area, 0.92 sq.km of land is non-developable and around 21.48 sq.km of the land is developable land. Further, a total of 1.61 sq.km of the land is already developed land (settlement); hence, around 98% (19.88 sq.km) of the total village is available for future development.

Table 29: Total Land Available for Development

Parameter	Area(sq.km)
Total Water Bodies	0.42
Water Body Buffer Area (10 mts)	0.31
Pasture Land (Gauchar Land)	0.19
Total Non-Developable Area	**0.92**
Total Tarapur GP Area	22.40
Total Land Suitable for Developable	**21.48**
Existing Settlement	1.61
Total Available Land for Development	**19.88**

Map 15: Land Available for Development – as per the Land Suitability Analysis



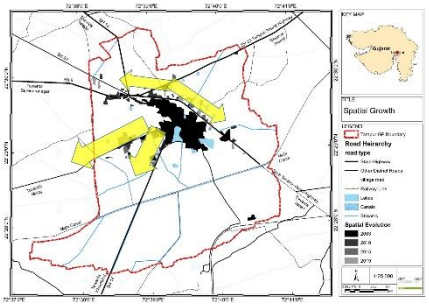
8.3.6 Spatial Growth Trend and Land Potential Analysis

In addition to land suitability analysis, the land potential analysis is required to determine the potential use of a suitable area within the region. In addition to the environmental constraints, landform and land cover also define the level of suitability for a pocket of land having the potential for development. Along

with the land potential analysis, analyzing the spatial growth pattern in the region is equally important, as it highlights the pockets with the current demand for development; and by concentrative growth in the area with demand would help in channelizing the growth in a planned manner and avoid scattered and unplanned growth in the region. Also, avoid haphazard conversion of agricultural land to non-agricultural land.

8.3.6.1 Spatial Growth Trend

Map 16: Spatial Growth Trend in Tarapur



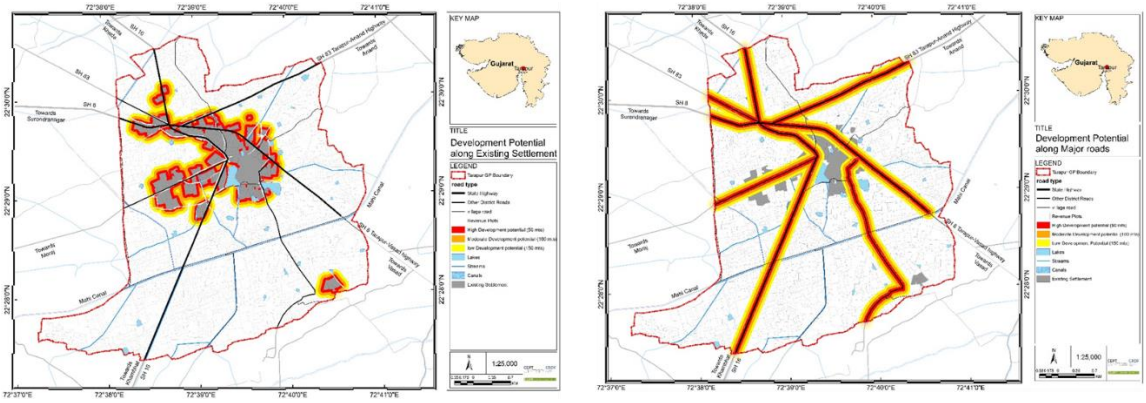
Village spatial growth pattern is one of the key criteria considered while developing the planning proposals. It is clear from the map that, over the period, Tarapur village grew around the water bodies and along the transport axis; especially in the area located between the junction of the three-state highways and the lakes (refer map-15). Significant spatial growth of the village can be seen in this area. However, during the recent decade, the village is spatially expanding along the district road connecting the GP with Moraj in the west. In addition, the village also continues to grow along with the SH 8; however, with less pace and intensity as compared to the growing intensity along the district road connecting Moraj in the west. It is also noticed that the lake is working as a south growth boundary for spatial growth and no spatial development on the south of the lakes is observed.

8.3.6.2 Land Potential Analysis

For the land potential analysis, two criteria- existing settlement and transport axis (SH and District roads) are considered.

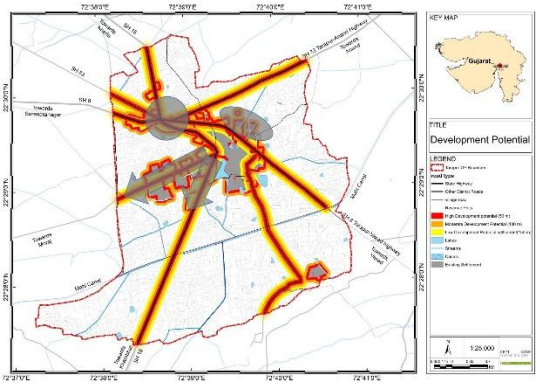
1. Existing Settlement: - Major existing settlement is clustered in the center of the village or along the major roads, such as SH and district road. According to the existing land use survey and field survey, assumed high and moderate potential buffer around the existing settlement is 50 meter and 100 meters, respectively.
2. Transport Axis: - Numbers of major transportation routes pass through the planning area. For the analysis, state highways and district road going towards Moraj (based on the spatial growth pattern) were considered; where it is assumed that 50 meters on both sides of the roads have a high potential for development, while from 51 to 100 meters on both the sides have comparatively moderate development potential, and 150 meters and beyond that the development potential is low.

Map 17: Land Potential Analysis



8.3.6.3 Composite Spatial Growth Patten and Land Potential Analysis

Map 18: Composite Spatial Growth Pattern and Land Potential Analysis



Based on the different parameter of land potentiality, a composite Land Potential Map was prepared to determine land with the most potential for development. This map was then overlaid with the spatial growth pattern map to identify the pockets with demand for development. It is clear, that the most suitable and potential area for development is along the district road that connects Tarapur with Moraj in the west. In recent years, significant growth is observed along this transport axis. Further, development in areas along the state highways and at the junction of three highways is also observed; however, with less pace as compared to the growing intensity along the district road connecting Moraj in the west. Similarly, commercial and economic development at the junction of the highways is also observed.

8.3.7 Provision of Socio-Physical Amenities

URDPFI guidelines will be the baseline for foreseeing the socio-physical amenities requirement for the horizon year 2041.

8.4. Concept Plan Development

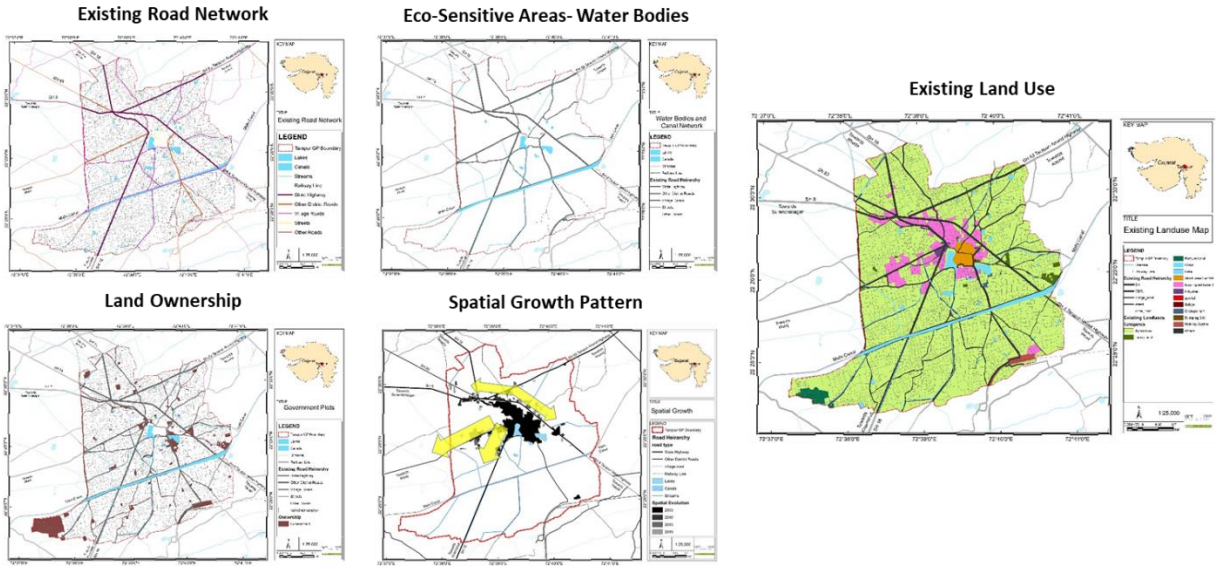
8.4.1 Criteria for the Concept Development Plan

Purpose of the exercise was to examine the possibility for the development that can help in achieving sustainable development for the planning area. The concept is created based on the present spatial growth pattern. Focus on developing a logical and efficient road network that integrated with the

environmental features and possible land uses has given high weightage while developing the concept. Existing Land Use, existing road network, existing settlement pattern, terrain topology, spatial growth pattern, locations of the eco-sensitive areas and existing land use have taken into consideration while developing proposed land-use zoning for the GP.

Tarapur is strategically located at the junction of three state highways- SH 8, 89 and 16. Through these highways, the village is very well connected with the rest of the district and the state. There has been visible growth is observed along these highways. However, recently, new development is occurring along the district road connecting the village with Moraj in the west. Tarapur APMC is located at the junction of SH 16 and district road that connects the village with Moraj. Hence, along with the spatial growth pattern & existing land use, the present road network is also taken into consideration while developing the proposed land use zoning for Tarapur. Also, as mentioned above, conserving water bodies was also a key consideration taken into account while developing the concept plan for Tarapur. Further, the location of government parcels was also taken into account to formulate proposals related to amenities and utilities.

Figure 19: Criteria taken into Consideration for the Concept Plan



8.4.2 Criteria for the Proposed Road Network

Road network should be designed to have a proper road circulation throughout the region, with road hierarchy to provide free movement. It is feasible to proposed road network based on the existing one, which will serve efficiently by reducing the discrepancies in the existing road network; hence, the existing road network has considered as the base while developing the proposed road network. Further, road

hierarchy[5] recommended by Ministry of Rural Development based on the right of way of roads is also considered while developing the road network.

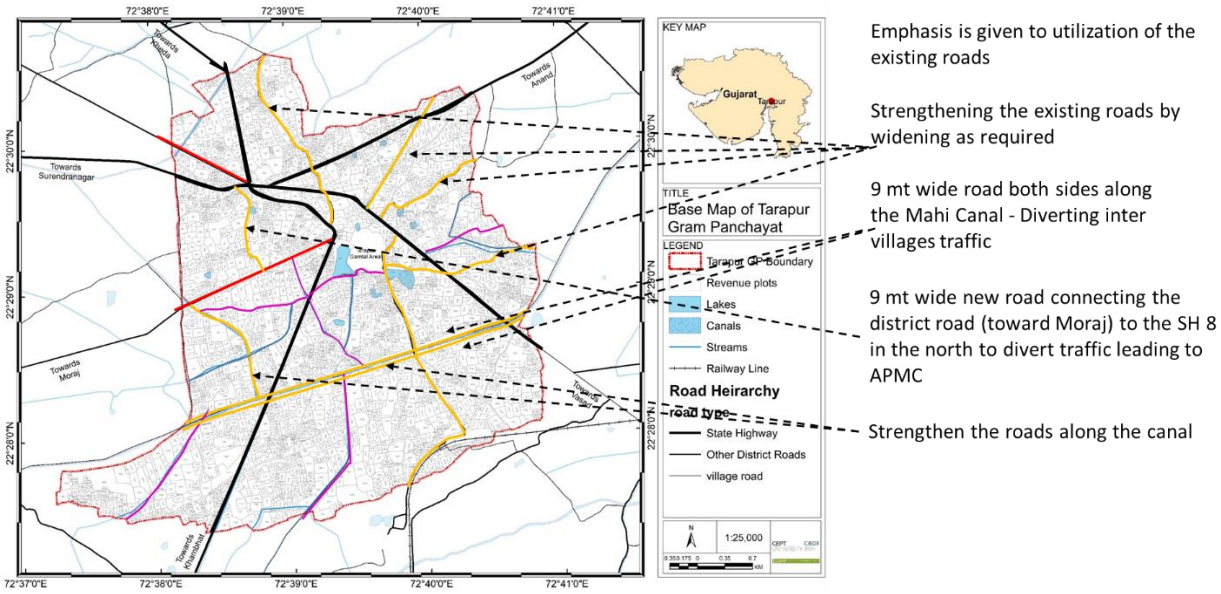
- Emphasis was given to utilize existing road axis as far as possible with the purpose of strengthening the existing road axis and the overall existing road network as much as possible with new roads proposed only where it is absolutely necessary.
- Where ever it was possible for village roads, no development green buffer around the water bodies, especially along the canals were utilized for village road axis so the unwanted development in the green buffer can be managed. 9 mt wide road along both sides of the Mahi canals is proposed within the 10-meter-wide no-development green buffer to diver inter villages traffic passing east-west.
- A new road requirement connecting the district road (toward Moraj) to the SH 8 in the north to divert traffic leading to APMC; this would release pressure on the junction of SH 16 and the district road approaching APMC. 9-meter wide road is proposed to divert the APMC traffic.
- Road hierarchies were used as per standard right of way of road recommended under "Framing Guidelines for Model Land Use, Development Control, & Service Level Benchmark with appropriate Enforcement Mechanisms for Rural Clusters" prepared by Ministry of Rural Development.

Table 30: Recommended Road Hierarchy

S. No.	Road Description	Road Widths	Functions and Remarks
1.	Internal Village Road	3 m – 4.5 m	Village lanes meant for internal movement within a village.
2.	Village Road	Above 4.5 m –up to 6.0 m	These roads facilitate inter-village connections.
3.	Collector Street	Above 6.0 m up to 9.0m	Roads meant to take major traffic to the village. Village roads with a drain on both sides to facilitate drainage system in a village
4	Other Village Road/ District Roads	Above 9.0 m up to 12.0 m	Roads meant for connecting a village to nearby areas, connecting villages of villages with each other to the nearest road of a higher category. They also connect to major village activity nodes such as market place, lake, social amenities, etc.
5	Other District Roads	12.0 m above	Roads serving rural areas and providing them with outlets to market centers, taluka headquarters, block headquarters or major district roads, and serves to connect villages with a population of 1,000 and above or a a cluster of villages.
Source: Framing Guidelines for Model Land Uses, Development Controls, and Service Level Benchmarks with Appropriate Enforcement Mechanisms for Rurban Clusters, prepared for MoRD by SPA Delhi			

[5] Framing Guidelines for Model Land Use, Development Control, & Service Level Benchmark with Appropriate Enforcement Mechanisms for Rural Clusters, prepared for Ministry of Rural Development by School of Planning and Architecture, Delhi

Figure 20: Criteria taken into Consideration for Developing Proposed Road Network



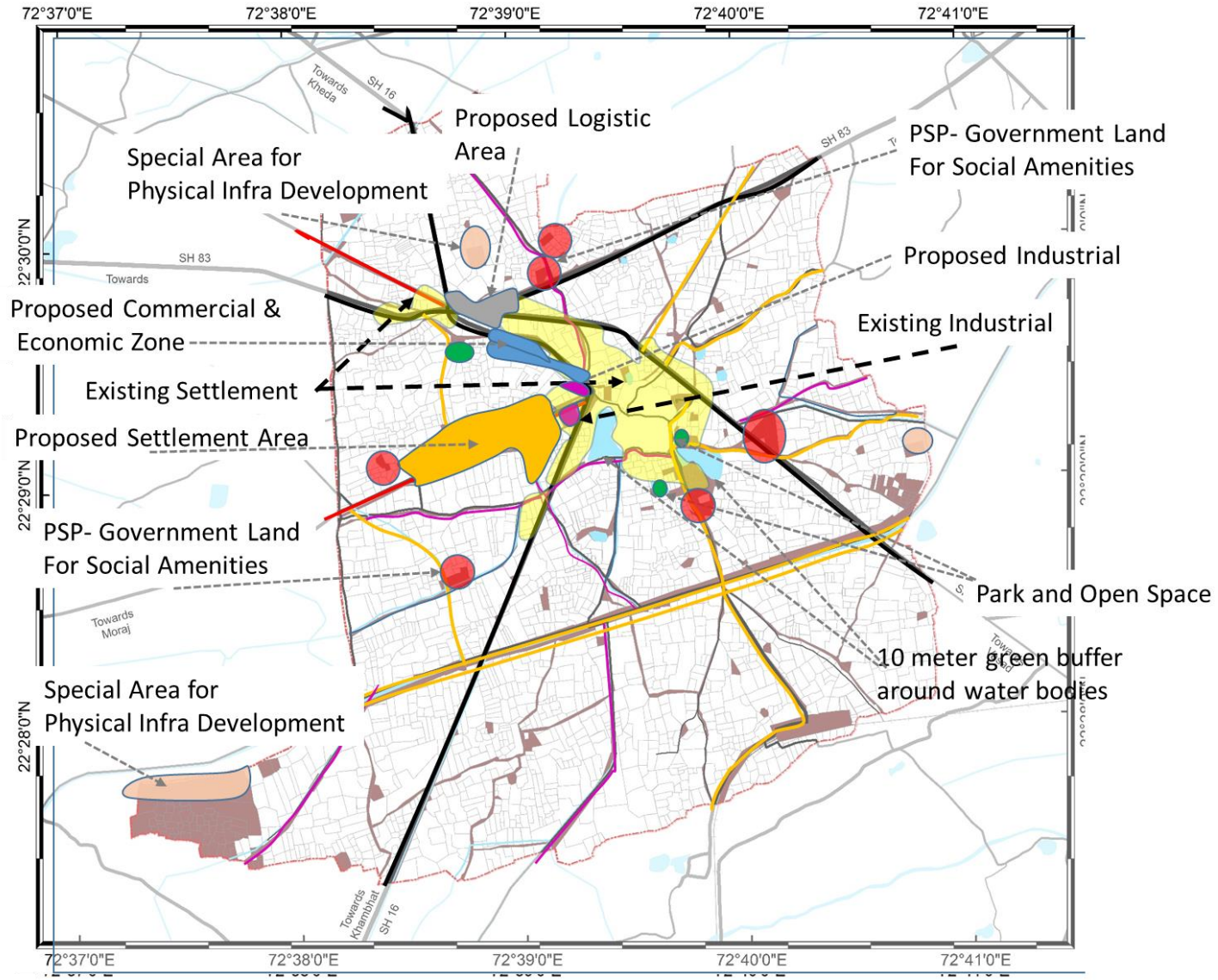
8.4.3 Criteria for the Proposed Land Use Zoning

Based on the existing land use pattern, and existing situation following criteria were considered while developing land-use proposals for the GP:

- Existing Land Use and Settlement Pattern were considered while preparing the development plan. It is clear from the spatial growth pattern that recent residential development is occurring along the district road going towards Moraj in the west; hence, pocket along the road is considered for the expansion of the settlement.
- Pocket is identified for the future industrial development close to the existing industrial area, as the required infrastructure is already developed in the area which can be utilized in future for similar activities as well.
- The area along the state highways fall under high potential development possibility. There is a high potential for commercial and mixed-use activities where any kind of economic activities (formal and informal) can be established; hence, a pocket of commercial and economic activities is considered in this area.
- Junction of the three-state highway is feasible to have logistic activities where transport-related activities can be established; activities such as bus stands, organized parking are for para-transit such as auto, shared van, etc.
- No-development buffer (Green Buffer) of 10 meters has kept surrounding the water bodies to conserve and protect the sensitivity of such features.
- The proposed Land Use Plan aims to conserve agriculture and grazing/ pasture lands as far as possible.

- Pockets of government land is identified as a special area which can be reserved to develop large scale public infrastructure, such as wastewater treatment plant, solid waste compost treatment plant, etc.
- Also, for development of social amenities, government land identified under Public semi-public zone.

Map 19: Concept Map



CHAPTER 9: PROPOSAL FOR GRAM PANCHAYAT SPATIAL DEVELOPMENT PLAN

This section of the report presents the development proposals for Tarapur GP, which are formulated based on the key consideration mentioned in section 8.3 and concept development criteria (section 8.4).

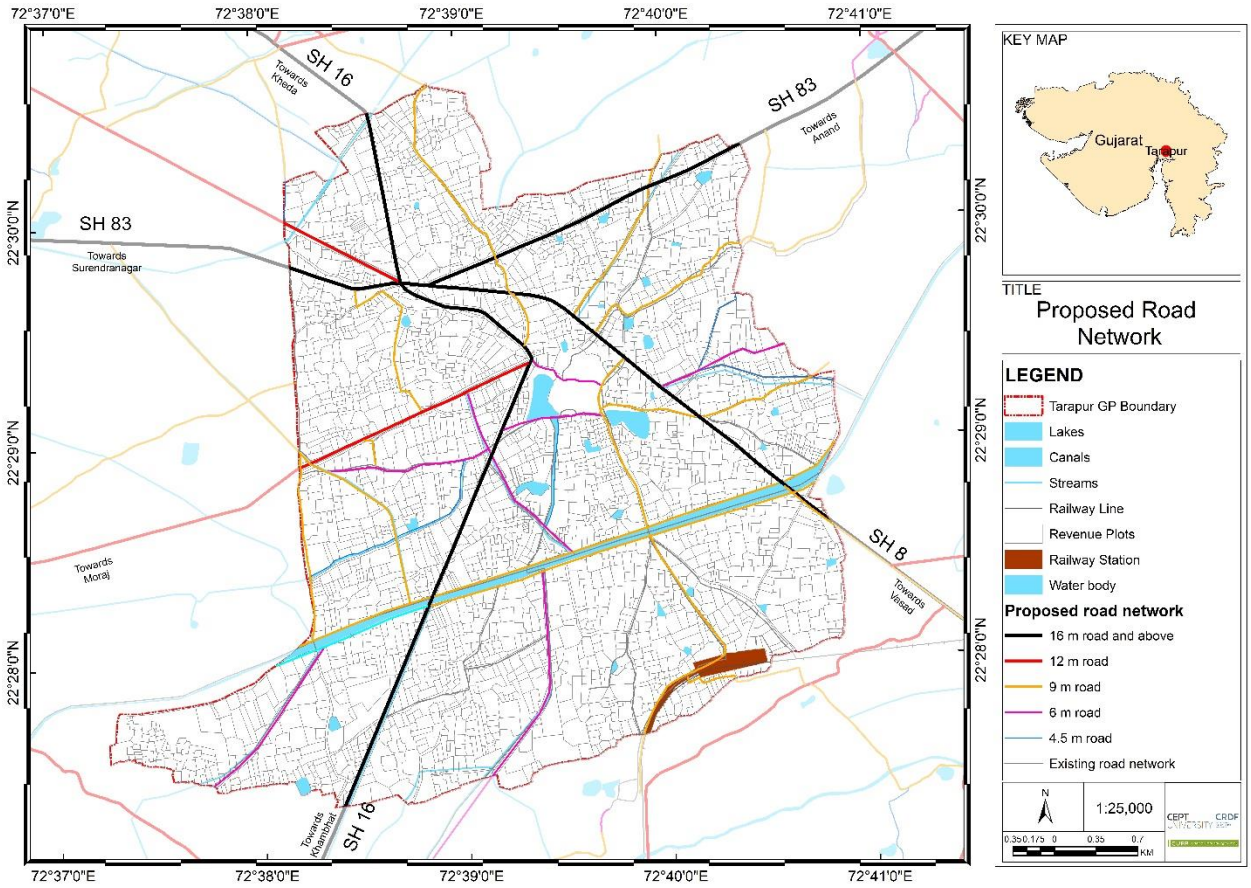
9.1. Proposed Road Network

Proposed road network for the GP is developed based on the criteria mentioned in section 8.4.2. The proposed road network is designed to have a proper road circulation through the planning area. Road hierarchy is proposed to provide free movement within the GP. Roads are earmarked as Transport Zone in the Proposed Land Use Zoning Map.

Proposed Hierarchy of Road

- Road 16 meter and above: - state highways passing through the gram panchayat fall under this hierarchy of roads. These roads carry through and through traffic, connecting the region with district and other parts of the state.
- 12-meter-wide roads: - Other district roads passing through the gram panchayat fall under this hierarchy of roads. These roads connect Tarapur with district headquarters and other surrounding towns and villages. These roads shall be designed with open or close stormwater channels to carry rain runoff water.
- 9-meter-wide roads: - these roads are meant to take major traffic to the village. The width of this road is 9 mt. This road connects the village with the highways and district roads and works as an access road to the village as well. These roads are designed to have a drain on both sides to facilitate the drainage system in the village.
- 6-meter-wide roads: -these roads are village road connecting 12-meter-wide and 9-meter-wide roads. These roads are designed to have a drain on both sides to facilitate the drainage system in the village. They also connect to major village activity nodes such as market place, lake, social amenities, etc.
- 4.5-meter-wide roads: - These roads facilitate inter-village connections. They are 4.5 meters wide.
- 3-meter-wide roads: - These roads are meant to be for the internal movement within the village. Width of these roads is 3 meter; mainly existing internal village roads. This is the lowest hierarchy in the proposed road network.

Map 20: Proposed Road Network



9.2. Proposed Land Use Zoning Distribution

The table below presents the proposed land use zoning distribution in Tarapur GP. The proposed land use zoning map allocates around 3.12% land for Proposed Settlement zone, around 0.58% land for commercial & economic zone, and for the existing settlement zone 8.03% of the total land. In addition, the proposed land use map assigns 80.39% of the land for agricultural development, 0.31% for industrial activities, 0.80% for public and Semi Public, and 0.45% land as logistic activities.

Table 31: Area Statement of Proposed Land Use Zoning

Sr. No	Proposed Land Use Zoning Categories	Area (sq.km)	Area (%)
1	Abadi Area (Gamtal Area)	0.22	0.98%
2	Existing Settlement Zone	1.80	8.03%
3	Proposed Settlement Zone	0.7	3.12%
4	Commercial and Economic Zone	0.13	0.58%
5	Industrial	0.07	0.31%
6	Logistic	0.1	0.45%
7	Public Semi-Public	0.18	0.80%
8	Park and Open Area	0.02	0.09%
9	Transport Zone	1.26	5.62%
10	Agriculture	18.01	80.39%
11	Pasture Land (Gauchar Land)	0.18	0.80%
12	Water Body	0.42	1.87%
13	Eco-Sensitive Area	3.88	17.32%
14	Special Area Zone	0.35	1.56%
	Total	22.40	100.00%

Refer the Proposed Land Use Zoning Map below for earmarked area for each zone. Note- Here presented proposed land use zoning map is prepared plot wise.

Map 21: Proposed Land Use Zoning Map

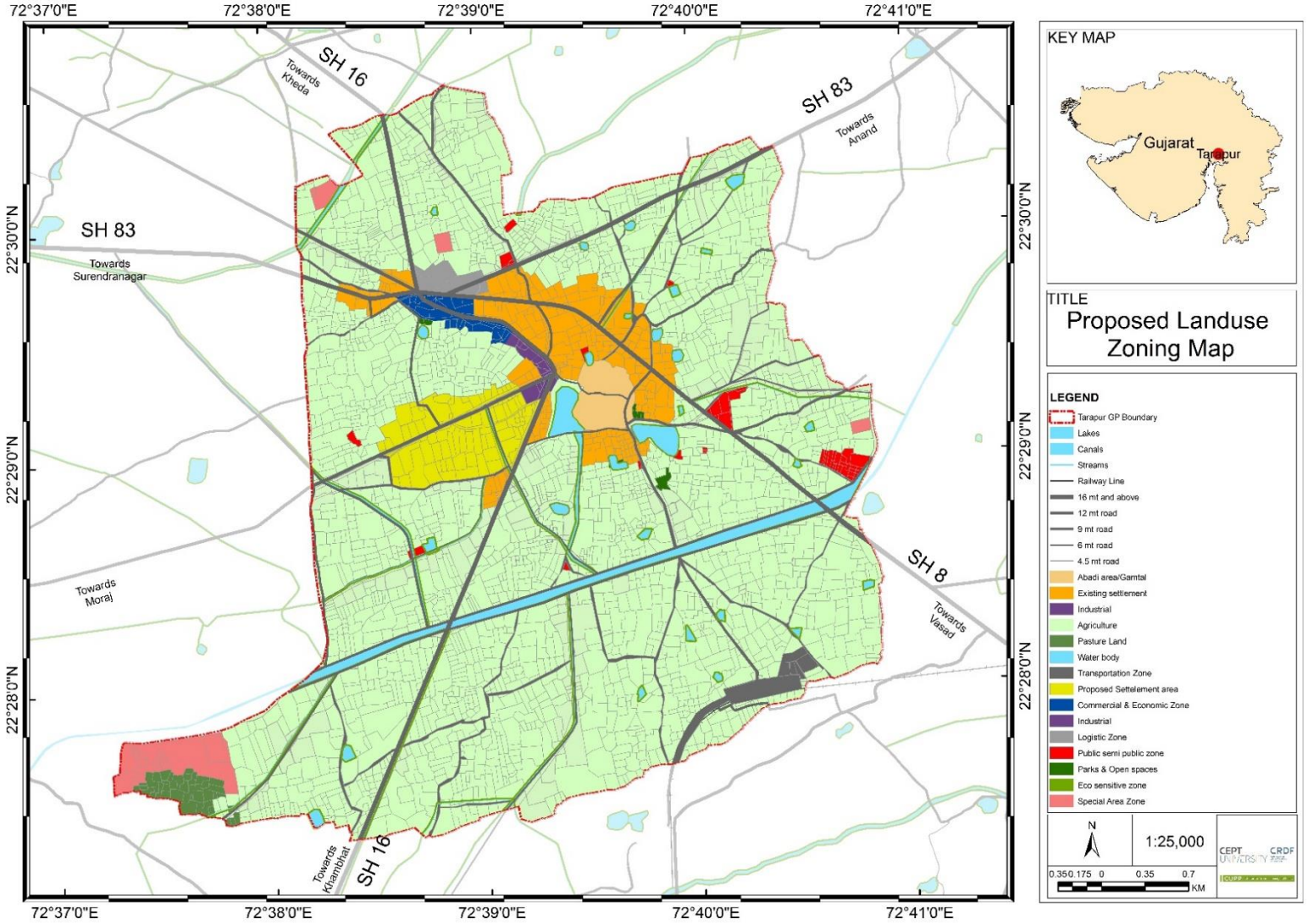


Table 32: Proposed land Use Zoning and Recommended Allowed Uses

No	Proposed Land Use Zoning	Description	Allowed Uses
1	Abadi Area (Gamtal Area)	The existing village area is known as Abadi or Gamtal area	• All existing uses, as per current development regulations
2	Existing Settlement Zone	Existing settlement area, outside Abadi area	• All existing uses, as per current development regulations • Convenient shopping
3	Proposed Settlement Zone	Proposed expansion area to accommodate future housing demand	• Residential activities • Incidental commercial activities for day-to-day needs of shopping use • A comprehensive range of community facilities, including schools, medical facilities, neighbourhood retail, and open space are permitted
4	Commercial and Economic Zone	The proposed area to accommodate additional economic activities	• All existing uses • Informal commercial activities- daily market, informal shopping, weekly market, • Formal commercial activities- Retail shopping, market complex, godowns, storage units, grain and vegetable mandi, slaughters house, etc. • Hotels, restaurants, provision store, carpentry workshop, private health and educational facilities workshops or working space related to economic activities, etc. • A comprehensive range of community facilities, including schools, medical facilities, neighbourhood retail, and recreational space are permitted
5	Industrial	Area to accommodate household industries	• Existing industries • Household industries • Warehouse, cold storage, etc.
6	Logistic	To accommodate transport-related activities	• Bus stand, truck terminal, parking stand for para-transit vehicles (auto stand, van stand, private transport picking up and drop –off, public parking space, etc.
7	Public and Semi-Public Zone (PSP)	Government land for social and physical infrastructure	• Educational centers- Anganwadis, schools • Skill development training institute, skill development center,

			• Health Facilities- sub-health center, dispensaries, primary health center, maternity center, community health center, hospital, private clinic, veterinary clinic and hospital • Community space- community hall, Dharamshala, social welfare center, religious buildings, neighbourhood center, • bank and ATM, RO plant, cooperative and credit society, police post and station, cremation ground, burial ground, temple, mosque, church, and other religious institutions, • government and semi-government offices, common village land, and government land • Water bore well, ESR, Sump
8	Park and Open Space (OP)	Area with recreational activities, government land identified for the public recreational activities	• Public park, garden, public open space, playground, sports field
9	Transport	All roads, railway line, railway station	• Roads -NH, SH, District roads, and other roads, Existing rail line and railway station • Railway line, railway station
10	Agriculture Zone	Agricultural land, cultivable land	• All existing uses, tree plantation
11	Pasture Land (Gauchar Land)	Existing pasture land	• Grazing land and tree plantation
12	Water Body	Existing all water bodies- Lakes, canal, stream	• No development allowed, except
13	Eco-Sensitive	Green Buffer is created to protect the water bodies by providing a no-development buffer around them. The 10-meter wide buffer around the Full Tank Level of the water bodies is proposed as a Green Buffer	• No development/ no construction activities are permitted • Tree plantation is allowed
14	Special Area Zone	Government land is reserved for the development of public level large scale infrastructure	• Public level large scale infrastructure, such as water treatment plant, landfill (SWM site), ESR, Sump, etc.

Note:

- Here recommended allowed uses in each zone are indicative and can be modified/applied as per the suitability and decisions are taken by a local implementing authority.
- Note here that all the existing nonconforming uses are allowed in all the proposed zones until the redevelopment of such land parcels. However, whenever the parcel is subject to alteration, improvement, reconstruction, and redevelopment, the nonconforming uses will be terminated and the parcel will be subject to the respective proposed zoning requirements. Nonconforming uses mean the existing uses of a parcel which is not allowed as per the proposed land-use zoning for that specific parcel.

9.2.1 Proposed Land Use Zoning Proposals

This section of the report presents the proposed land-use zoning for Tarapur GP. Note here that all the existing nonconforming uses are allowed in all the proposed zones until the redevelopment of such land parcels.

9.2.1.1 Abadi Area (Gamtal Area)

Existing Abadi area is earmarked as Abadi Area. Total 0.22 sq.km of the area is covered under this zone. Allowed uses in this zone is as per the current development structure.

9.2.1.2 Existing Settlement Zone

The existing settlement as per the ELU map is earmarked as Existing Settlement Zone in the proposed land-use zoning map. As per the current structure, all the existing activities are permitted in the zone. The zone comprises a total of 1.80 sq.km of area, which is 8.03 % of the total area of the GP.

9.2.1.3 Proposed Settlement Zone (PS)

This zone is primarily proposed is to accommodate the future residential activity. This zone is a predominantly residential area, where major commercial and industrial activities are not allowed; however, it permits incidental commercial activities for day-to-day needs of shopping uses. In addition, a comprehensive range of community facilities, including schools, medical facilities, neighborhood retail, and open space are permitted. Total 0.7 sq.km of the area is earmarked for Proposed Settlement Zone in the proposed land use plan.

9.2.1.4 Commercial and Economic Zone (C&E)

Total 0.13 sq.km of the area is earmarked as Commercial and Economic Zone. Purpose of this zone is to accommodate economic activities in the designated area rather than let them established haphazardly. The proposed area for this zone is demarcated along with the SH 16, specifically the area located between SH 16 and SH8. Economic activity supporting infrastructure is already established in this area and utilizing the same is feasible rather than developing new areas; hence, this location is proposed for the C&E zone. Informal commercial activities (daily market, informal shopping, weekly market), formal commercial activities such as retail shopping, market complex, godowns, storage units, grain and vegetable mandi, slaughters house, etc., hotels, restaurants, provision store, carpentry workshop, private health and educational facilities workshops or working space related to economic activities, etc., and a comprehensive range of community facilities, including schools, medical facilities, neighborhood retail, and recreational space are permitted in this zone.

9.2.1.5 Industrial

Total 0.07 sq.km of the area is earmarked as Industrial Zone to accommodate industrial activities. The proposed area for this zone is demarcated along with the SH 16 close to the existing industrial area. Existing industrial activities, household industries, godowns, storage units, warehouses and cold storage units shall be permitted in this zone; hazardous, large and medium scales industries shall not be permitted in this zone.

9.2.1.6 Logistic

Total 0.1 sq.km of the area is earmarked as Logistic Zone. Purpose of this zone is to accommodate transport-related activities such as bus stand, area for pick-up and drop-off passengers, designated parking area for autos and private van (private shared transport service), etc. The proposed area for this zone is demarcated at the junction of SH 8 and SH 83.

9.2.1.7 Public and Semi-Public (PSP)

Total 0.18 sq.km of the area is earmarked as a Public and Semi-Public Zone in the proposed land use zoning map. Health, educational, cultural (community space), government buildings, recreational amenities and other small scale public amenity facilities are permitted in this zone. Government land is demarcated as this zone (except the road, railway, and special area zone) in the PLU map. Note that government land located in Abadi Area and Existing Settlement Zone are not demarcated as PSP zone; only government land that is situated outside Abadi Area and Existing Settlement area is considered for this zone.

9.2.1.8 Park and Open Space Zone (OP)

Proposed land-use zoning plan proposes public open spaces as Park & Open Space Zone. Total 0.02 sq.km area is earmarked for this zone. This zone allows various types of recreational activities, parks, playgrounds, public gardens, sports field, and exhibition grounds.

9.2.1.9 Agriculture Zone

Total 18.01 sq.km of area is demarcated as Agriculture Zone. The zone allows activities that are related to agricultural activities and no other activities are permitted in this zone.

9.2.1.10 Pasture Land

Proposed Land Use Zoning has retained the pasture land, as far as possible. Total 0.18 sq.km of existing Gauchar land is earmarked as Pasture Land in the proposed Land Use Zoning map, where grazing and related activities are allowed.

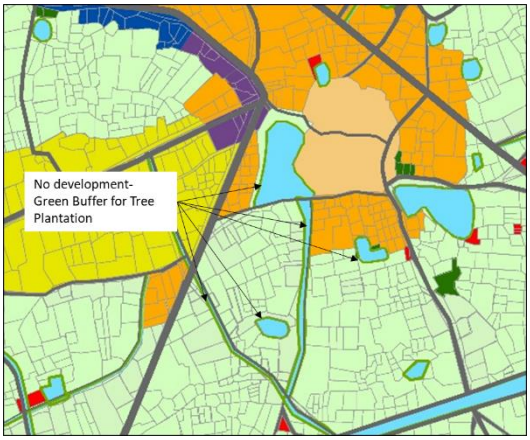
9.2.1.11 Water Body

Water Bodies Zone indicates all notified water bodies, i.e. lakes, streams, and canals, as indicated in the Revenue Department. Notified lakes, streams and canals data are procured from the DILR maps and NRSC; which have been considered in the PLU map. The boundary of the water bodies relates to the full tank level as indicated in relevant maps, 0.42 sq.km of land is covered with water bodies in the Village. No development – Green buffer is given surrounding the water bodies. No development activity is allowed in this zone and government rules and regulation to be followed in this zone.

9.2.1.12 Eco-Sensitive Zone

Green Buffer is created to protect the water bodies by providing a no-development buffer around them. Buffer width of 10 meters around the Full Tank Level of the water bodies is proposed as a Green Buffer; which is earmarked as Eco-Sensitive Zone in the proposed land-use zoning map. Total 3.88 sq.km of Green Buffer is earmarked in the proposed land-use zoning map. Note here that there are certain roads and the main rail line is passing over the green buffer, in such situations, the respective areas are considered as roads or railway area and not as a green buffer area. This area shall be used only for tree plantation activities and no development/ construction activities are permitted in this zone.

Figure 21: Eco-Sensitive Zone for Tree Plantation



9.2.1.13 Special Area Zone

The proposed land-use zoning map reserves land for the provision for larger-scale public infrastructure. Area for the same is earmarked as Special Area Zone in the proposed land-use zoning map. Government owend land is identified and reserved for the development of large scale amenities. For the quality of life if villagers and hygiene purpose, this zone is demarcated at distance from the settlement areas. Total 0.35 sq.km of land is reserved for this zone.

9.2.1.14 Transport Zone

Total 1.26 sq.km of the area is demarcated as Transport Zone. Road and railway area are earmarked as the Transport Zone in the proposed land-use zoning map.

9.2.1.15 Nonconforming Uses

A nonconforming use is an existing use of any parcel; which is no longer allowed or permitted under the current zoning regulations. Such existing uses (building/land) will continue as nonconforming use until such building/land apply for redevelopment. Whenever the parcel is subject to alteration, improvement, reconstruction, and redevelopment, the nonconforming use of the parcel will be terminated and the parcel will be subject to the respective proposed zoning requirements. Nonconforming uses mean the existing uses of a parcel which is not allowed as per the proposed land use zoning for that specific parcel.

9.3. Housing

Housing is one of the necessities of human sustenance, and so deserves special attention in any kind of planning and policy level intervention. This section foresees the housing demand for Tarapur GP. For this exercise, the following assumptions are adopted with the reference to the Census 2011 Housing Profile for Tarapur GP:

- Dilapidated houses account for 2.5% of total housing stock for the project area
- Household size 5.3

Table 33: Household Size

	1991	2001	2011	Ave. HH Size
Household Size	5.25	5.41	5.21	5.29 (5.3)
Source: Census of India				

Also, for 2041 projection 5.3 household size is considered, based on the historical data. The projected housing stokes for 2041 is 5,939 for the planning area. As per the census data, presently total housing stoke in the GP is 3,538; which means additional residential area required to accommodate additional 2,396 houses by the horizon year. Required additional housing demand will be accommodated in the Proposed Settlement Zone.

Table 34: Housing Demand

	2011	2021	2031	2041
Population	17,994	21,752	26,302	30,685
Avg. Household Size	5.21	5.3	5.3	5.3
No. Houses Required	3,452	4,104	5,058	5,790
2.5% Dilapidated Houses	86	103	124	145
Total No. of Houses Required	**3,538**	**4,207**	**5,087**	**5,934**

Residential Area Requirement based on Housing Demand

As per the housing projection, the GP would be required 2,396 (5,934-3,538=2,396) additional houses by 2041. Based on the ground situation, 64 sq.mt of area per unit is considered. Total estimated residential requirement is 19 ha by 2041, to accommodate additional 2,396 houses; out of which 12 ha area will be required by 2031 to accommodate the demand of additional houses. On the other hand, the proposed land use zoning map has earmarked 0.7 sq.km of the area as the Proposed Settlement Zone to accommodate the future demand.

Table 35: Residential Area Requirement based on the Housing Demand

Parameters	2031	2041
Additional No. of Houses Required	1,548	2,396
Area Per Housing Unit (sq.mt)*	64*	64*
Total Residential Area required (on sq.mt)	99,101	153,349
Assumed Additional 10 % Open Area Required**	9,910	15,335
Assumed Additional 15% circulation area (Roads)**	14,865	23,002
Net Area Requirement	123,877	191,686
Required Residential Area (sq.km)	0.12	0.19
Required Residential Area (ha)	**12**	**19**

Note:
*As per the Sarpanch the size of the new housing is 64 sq.mt; which is cross-checked and confirmed with the satellite image.
** As per URDPFI Guidelines
Source: Sarpanch Interview, and URDPFI Guidelines

Proposals and Recommendations:

Following proposals and recommendations are based on the housing situation analysis (Refer section 7.5), which should be fulfilled under various government schemes:

- Though the majority of households receive tap water (treated or un-treated sources), 2.3% HH still use un-covered well water; water pipeline connected should be established coving this remaining HH.
- Kachha and semi-permanent houses should be upgraded under the PMYA scheme.
- Around 24% of households in the GP do not have bathing facilities within their premises. This gap should be covered under schemes like SBM and MENREGA

9.4. Inter Village Road and Connectivity

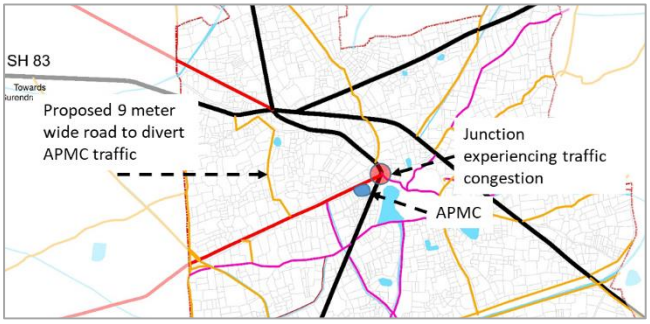
The access road connecting the village with the highways is an asphalt road with 2 lanes. The overall road network is sufficing the dependency of the village on the nearby centers for health, education and

economic purposes. The road condition of the internal village road is good. Almost all the internal village roads are paved and pucca roads. Tarapur APMC serves around 40 to 45 surround villages. During the day time, traffic chaos is noticed on the junction of Kheda- Khambhat Road (highway- SH 16) and approach road to the APMC. At present, only 10% of inter-village roads have streetlights which are installed by the panchayat.

Proposals and Recommendations:

- At present, only 10% of inter-village streets have streetlights. It is recommended that all the village roads should have street light, which is a basic requirement for increase safety and visibility during the night time.
- Tarapur APMC serves around 40 to 45 surround villages. During the day time, traffic chaos is noticed on the junction of Khed- Khambhat Road (highway- SH 16) and the district road approaching APMC. To divert the heavy traffic from the local traffic, a new 9-meter-wide road is proposed connecting the district road with SH-83; this will reduce the traffic at the junction of SH 16 and the district road approaching APMC.

Figure 22: Proposed 9 Meter wide Road to Divert APMC Traffic



9.5. Economic Activities

According to the Sarpanch and Talati, thought the village highly depends on agricultural activities, there is a lack of knowledge amongst farmers and cultivates regarding new technology in farming. Moreover, there is no KVK (Krishi Vigyan Kendra) center in the village to guide farmers and demonstrates technology generation, technology assessment and refinement and dissemination in the field of agriculture and allied sectors. Also, there are no skill development centers (Kaushlya Vardhan Kendra (KVK) or ITI) in the village for students and young work pool; such center is required in the village so the young work pool can be trained and absorbs in the surrounding industrial establishment/ various economic activities.

Proposals and Recommendations:

- Provision of Skill Development Center: - It is recommended the skill development centers like Kaushlya Vardhan Kendra (KVK), ITI should be established in the village. Courses such as sewing, tailoring, electrician, digital literacy, auto repair, wireman, computer operator and programme assistant, welder, etc. shall be proposed at the centers to train younger work pool as well as the present work pool. Also, KVK (Krishi Vigyan Kendra) center in the village to guide farmers and

demonstrates technology generation, technology assessment and refinement and dissemination in the field of agriculture and allied sectors. As per the standard, 1 such center per 5,000 of population is required, which means to cater to the foreseen population around 6 skill development centers is required in the village. Such a center should be established along the road with a minimum of 6 meters wide. Training center can be established in the PSP and proposed Commercial and Economic Activity zones.

9.6. Physical Infrastructure

9.6.1 Water Demand and Estimation for Wastewater Generation

This section foresees the water demand and recommendations to meet the gap in the facility for the planning area. Water demand and wastewater generation have been estimated for the GP. It is assumed that there will be continuous improvement in living standards of the population residing in the village after 2011 and so there will be an increase in water demand. For this exercise, the following assumptions are adopted with the reference to the CHPEEO guidelines:

- Per capita water supply level for the project area is 70 Lpcd
- Additional 15% of water demand for Unaccounted for Water (UFW) has been considered
- As water demand for the institutional and floating population is not available; addition 10% water demand has been considered.
- Firefighting water demand for the project area has been calculated in kiloliter per day based on the formula of population/100
- 80% of water supply is considered for wastewater generation

Estimated Water Demand

Based on the above-mentioned assumptions, the estimated water demand for the planning area is 2.56 MLD and 2.99 MLD by 2031 and 2041, respectively. Looking at the estimated water demand for the coming years there is a need to augment existing water supply sources. At present, the main source of water is 7 bore wells and the total water storage capacity is 0.6 MLD and addition 0.3 is proposed (for the estimation exercise 0.9 MLD total storage capacity is been considered). With these existing infrastructure, the panchayat supplies water for 24 hr; however, to do so it has to run electric motes for total 8 hrs a day (4 hrs in the morning and 4 hours in the evening).

Table 36: Water Demand Estimation

GP Name	Population			Recommended Water Supply Level (CPHEEO)	Total Water Supply Req. (in MLD)	Existing Capacity MLD (6 lakh + 3 lakh proposed)	Additional Water Supply Req.	Total Wastewater Generation (in MLT)
	2011	2031	2041		2031/2041		2031/2041	2031/2041
Tarapur GP	17,944	26,302	30,685	70 lpcd	2.56/2.99	0.90	1.66/2.09	2.05/2.39
Source: CPHEEO Guidelines, and Primary Survey								

Proposal and Recommendation

- At present, there is only 2,916 water connection, which means to cover the present gap in the water connection and to meet the future demand addition 2,879 water connection will be required to be established. For which expansion of the piped water network will be also required to be done.
- Considering by 2041, the GP water demand will increase, to meet the future demand, of 2.99 MLD by the horizon year, additional 2.09 MLD water supply capacity will be required to be augmented.
- Upgradation of the existing pipe network is necessary, as they are30 to 35 years old which results in frequent leakage problems.

Estimated Wastewater Generation (Sewage System)

The total water requirement for the project area is 2.99 MLD (by the year 2041). As per CHPEEO Guideline, 80% of total water demand is considered as the sewerage flow; therefore, around 2.39 MLD water is expected to go in sewerage lines.

At present, the village has an open drainage system and wastewater from bathrooms and kitchen is directly connected with this open drainage network, and through which network the untreated wastewater via the main trunk discharges into the ocean. Toilets are connected with the soak pits- Not maintained well- get clean on a required basis.

Proposal and Recommendation

- Under the Rurban Fund, laying of sewage network is the GP is done, however, the main truck is yet to be connected with the houses. It is recommended that the priority shall be given to complete the incomplete work of sewage network, and HH sewage connection with the sewage network should be established.
- As time passes, the area is expected to develop and along with it, high water demand and larger wastewater discharge shall be expected; hence, the sewage treatment plant is required so the wastewater will not be discharged in the natural drains, which will help in reducing the water pollution in general. A centralized conventional treatment plant, which consists of a combination

of physical, chemical, and biological processes and operations to remove solids, organic matter and, sometimes, nutrients from wastewater. Sewerage Treatment Plant (STP) sites should be identified depending on considerations such as the quantum of environmentally suitable land, and availability of government land, capital and O&M cost of different options. Such infrastructure activities can be accommodated in the proposed special area zone as demarcated on the proposed land use zoning map. Further, such activity shall be allowed only on the road with a width of 6 meters or wider.

9.6.2 Solid Waste Management

Waste generation encompasses activities in which materials are identified as no longer being of value and are either thrown away or gathered together for disposal. The management of this waste refers to a systematic process that comprises of waste segregation and storage at the source, primary collection, secondary storage, transportation, secondary segregation, resource recovery, processing, treatment, and final disposal of solid waste.

Based on the CPHEEO standards, the following assumption was considered while estimating the volume of the solid waste and required area for the landfill site for the proposed urban population for the horizon year 2041:

- It is assumed, that solid waste will be collected by the panchayat regularly
- Characteristic of the collected solid waste in the region will be inconsistent with the characteristics mentioned in the CPHEEO manual.
- Per Capita Solid Waste Generation-200 Grams per Capita per Day
- Composition of Collected Waste (Density in characteristics)- 0.55 tons per cubic meter
- Biodegradable Waste-75%, Inert Waste- 25%
- Active Period of the Landfill Site- 20 years
- Due to daily cover and components
- Increase in Volume of Liner- 10%, and in Cover- 12.5% (Due to daily cover and components)
- Decrease in Volume- 10% (Due to settlement & decomposition of waste)
- Landfill site is above the ground
    - Maximum Height of the Site- 25 meter
- Addition Landfill Area Required for Supporting Infrastructure- 15%
- Growth Rate of Waste Generation- 20% (Population Growth Rate of the GP)

Table 37: Estimation for Solid Waste Generation

	Units	
Projection for Solid Waste Generation		
Projected Population (2031)	---	30,685
Total Generated Waste per Day	Grams per Day	200
Total Generated Waste per Year	Tons per Year	2,240.01
Waste Disposal to the Landfill (25% of the total waste goes to the site)	cubic meters	560.00
Area Requirement for the Landfill Site		
Waste Generated in 20th Year	Tones per Year (TPY)	21,469.15
Total Waste	TPY	220,291.47
Total Volume in 20 Years	cubic meters	293,721.97
Volume of Daily Cover)	cubic meters	29,372.20
Volume for Components	cubic meters	73,430.49
Volume by Settlement	cubic meters	-29,372.20
1st estimate cu.mt	cubic meters	367,152.46
Total Required Landfill Area (sq.km)	---	0.02
Source: CPHEEO Guidelines		

Total estimated generated solid waste volume for the planning area is 2,240 tons per year, out of which only 560 cubic meters will be disposed to the dumping site identified by the panchayat for filling up the ground or to a landfill site; total required area to dispose of the estimated volume is 0.02 sq.km by 2041.

Once the site is full with the waste, it will be covered with the black soil and then reuse it for other uses- For an example, existing Taluka Panchayat office building is built on such duping site. The panchayat has planned to convert the present dumping site into the road.

Proposal and Recommendation

Currently, in Tarapur GP, door-to-door solid waste is being collected daily by the panchayat. There is also a system to collect garbage from the streets. However, without segregation, the collected waste is being transferred to the waste disposal site using 3 trollies and 3 tractors. For the waste disposal site, the panchayat uses the panchayat/ govt. wasteland, where the collected waste gets dumped without any treatment. Once the site is full with the waste, it will be covered with the black soil and then reuse it for other uses- For an example, existing Taluka Panchayat office building is built on such duping site. As per the panchayat, they need additional trolley and tractor to manage the solid waste with efficiently.

- Segregation of organic waste and other waste must be done at the source. Here presented approach of waste segregation should be encouraged by the panchayat. However, since this transformation may take time and if the waste is not segregated at the source than it shall be segregated at transfer station by the panchayat.

- Required additional trolley and tractor to manage the solid waste with efficiently.
- GPSDP recommends having a Treatment plant/ Compost plant to manage solid waste in the village effectively. Such infrastructure activities can be accommodated in the proposed special area zone as demarcated on the proposed land use zoning map. Further, such activity shall be allowed only on the road with a width of 6 meters or wider.
- Awareness regarding solid waste management and the importance of segregation at the source (at household) should be spread by the panchayat.

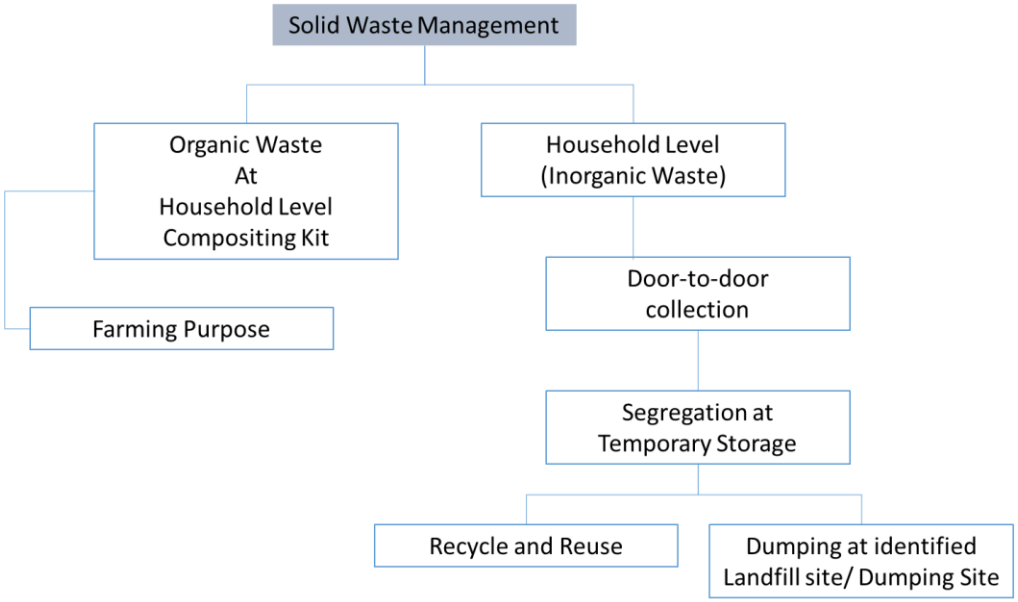
Treatment Plant or Compost Plant

At present all the solid waste collected in Tarapur is dumped at a designated site in the village. There is no treatment done of the collected waste at present; hence, the solid waste plant is recommended. Present, location for the garbage plant can be the site utilized for the dumping of solid waste. Capacity of proposed plant is 6 tons per day. Different metallurgy material is segregated with separators and it is converted into manure or refuse-derived fuel or it can also be baled. This solid waste material can be used to produce manure, RDF and electricity by different methods of conveying, screening, and destoning. Thus in a way it can also serve the purpose of generating revenue to make it sustainable in long run. After segregating the waste, the waste is then transferred to the wasteland for fill up the ground (as per the present practice); this way there is not landfill site required for the GP.

- **Provision of Composting Kits at Household Level: -** There will be different systems for organic waste and inorganic waste in solid waste management. For organic waste, there will be the provision of composting kit at the individual household level. Hence, organic waste will be used for farming purpose. Inorganic waste will be collected through door to door collection and segregated at temporary storage at the village level. Later segregation, recyclable waste will be reuse while non-recyclable waste will be dumped to the wasteland for fill up the ground (as per the present practice). Total projected houses for the village is 5,934, out of which present household stock is 3,538; hence, over 5,000 composting kits required by 2041; out of which currently, over 3,000 composite kits are required.
- **Guidelines for Locations of the Landfill Sites: -** Ideally, landfill site should be located in the area, which is at the distance from the residential development where people do not come directly in contact with the site. In addition, landfill sites should not be located close to the river, lake, parks, forest, wetlands, etc. The site should have with the area for both waste filling and supporting facilities. The waste filling area can proceed in phases with only a part of the area under active operation. The site should be facilities with access roads, equipment shelters, weighing scales, office space, location of waste inspection & transfer station, temporary waste storage and/or disposal sites for special wastes, areas to be used for waste processing, demarcation of the landfill areas, and demarcation of the areas for stockpiling cover material & liner material, drainage facilities, location of landfill gas management facilities, location of leachate treatment facilities, and location of monitoring wells. Biogas plants for bio-degradable waste can also be considered

in association with the landfill site as future expansion. However, a detail project report is required to be prepared for the feasibility, design and the selection of the landfill site/s for the project area.

Figure 23: Recommended Solid Waste Management System



9.6.3 Storm Water System

Tarapur GP has an open drainage system, which is connected with the main stormwater drainage line. Open stormwater drainage network collects rainwater and discharges into the main stormwater drainage line which discharges stormwater into the ocean near Khambhat. However; in absence of the well-developed sewage network in the village, the untreated wastewater from bathrooms and kitchen is directly connected with this open drainage network. Unfortunately, many farmers use the rainwater through the main trunk of the open drainage network for irrigation purpose, which is not hygienic.

Proposal and Recommendation

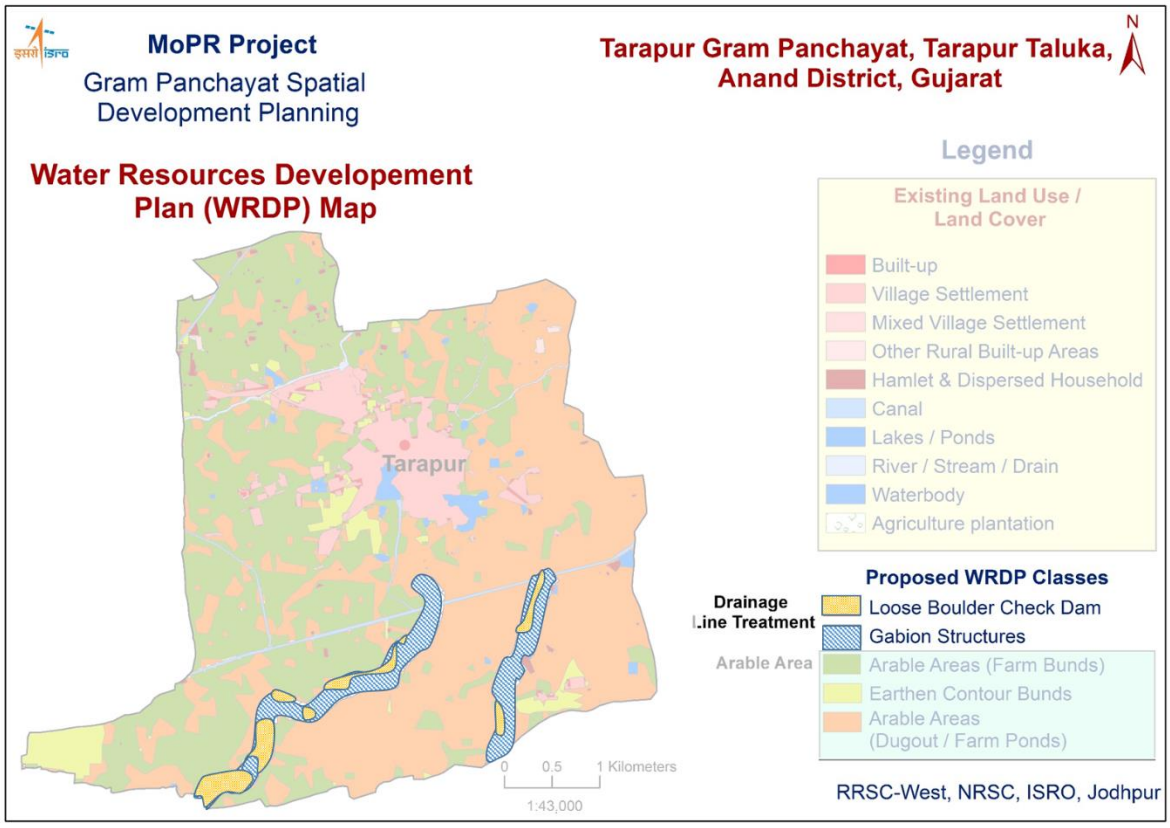
Following are the recommendation for the strengthening the natural drainage system in the GP

- At present, the village has an open drainage network; however, HH sewage network is connected with the network, which needs to be separated immediately by establishing the HH sewage connection with the main sewage line.
- New roads should be planned in accordance with the slope, which will allow the natural drains to strengthen. Major storm water drainage should be converged towards the water bodies/ canals

and should be parallel to the major transportation network. Roads should be proposed to be a carrier for the stormwater and can channelize the water towards the river.

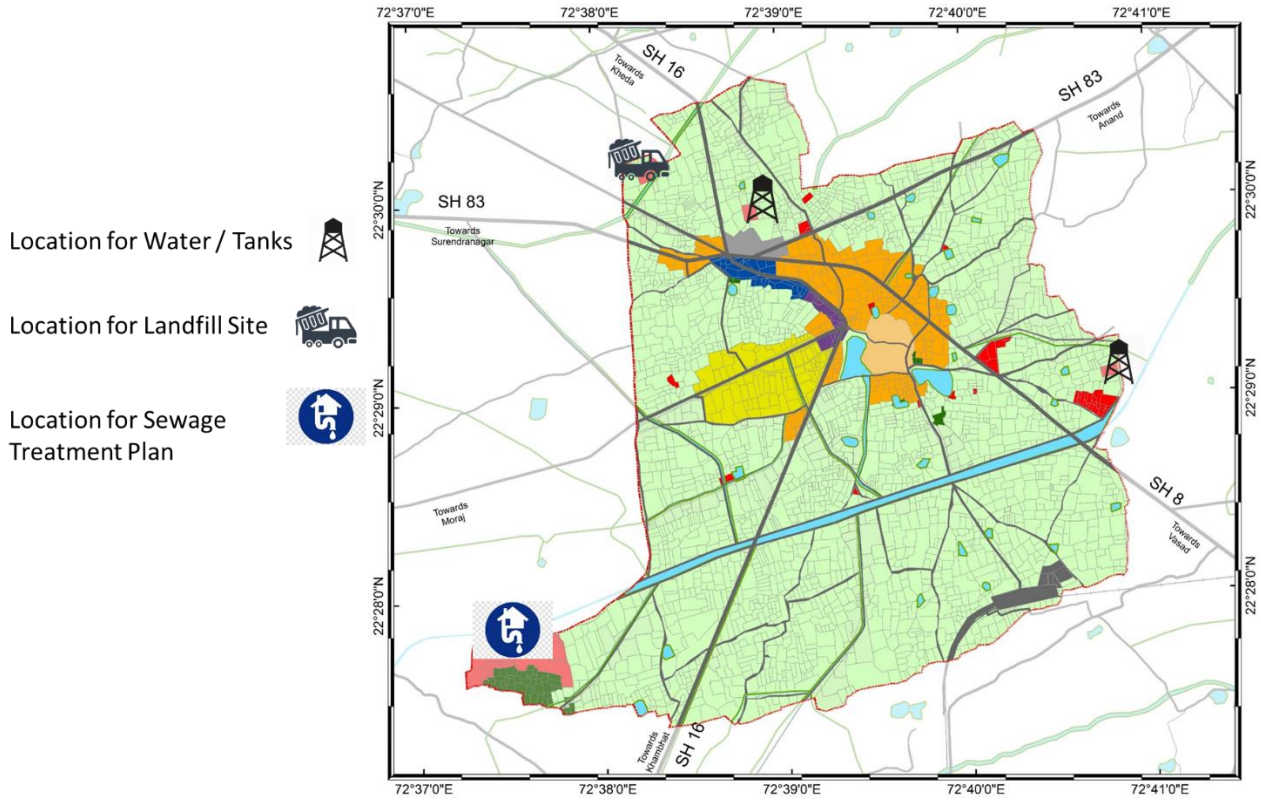
- At present, 0.42 sq.km of area is covered under water body in Tarapur GP. Water bodies depicted are inventory of water storage structures and can be augmented with de-silting and other renovation. As per the water resources development plan prepared by NRSC, the drainage line is not discernible but concentrated runoff will route through 1st order drainage derived from DEM. Hence, for the purpose of controlling the hydraulics in the channel flow the loose bolder check dams are suggested confining to 100-meter buffer of streams by NRSC. Along with the check dams, Gabion Structures are also recommended. Refer figure 24 for the recommended locations for check dams and gabion structures. It is also recommended that, in farm ponds are with in farm and in black cotton and fine textured soils dugout pond or large diameter dug-well can be used for storing the run-off. Also, the GPSDP recommends that the earthen contour bunds should be explored as water harvesting technology for establishment of trees.

Figure 24: Recommended Locations for Check Dams and Gabion Structure



Source: Provided by NRSC

Figure 25: Recommended Tentative Locations for Physical Infrastructure



9.7. Social Infrastructure Facilities

This section focuses on gaps in the social infrastructure facilities in the proposed Influence Area for the horizon year 2041. URDPFI guidelines are considered as the base while estimating gaps and the additional facility requirement for the foreseen population.

The first step is to estimate the demand for the social infrastructure facilities at the project area level, followed by the distribution of facilities at the project area level. The demand assessment had been done based on the Census 2011 data.

9.7.1 Educational Facilities

This section focuses on the adequacy of educational facilities (pre-primary, primary, secondary, senior secondary schools and colleges) for the GP, based on the URDPFI guidelines w.r.t the projected population in the village.

Table 38: Educational Facility Estimation

Type of School	Population 2011	Existing No. Facility	Required	Surplus/ Deficit	Population 2041	Required	Additional
Pre-Primary School (Aanganwadi)	17,994	19	7	12	30,685	6	-13
Primary Schools (primary + middle) I-VIII		10	4	6		6	-4
Secondary Schools (IX to X)		2	2	0		2	0
Senior Secondary (XI-XII)		1	1	0		2	1
Colleges		0	0	0		0	0
Source: Census of India, Village Profile 2020, and URDPFI Guidelines							

- **Pre-Primary School:**

Generally, pre-primary schools refer to Anganwadi. As per URDPFI guidelines, one pre-primary school is required for every 2,500 of population. The total pre-primary schools available within the village are 19. As per Census 2011, the pre-primary school scenario in the planning area is in surplus. Further, by 2041, a total number of required pre-primary schools is 6, which means no additional new schools will be required in Tarapur GP.

- **Primary School (Primary + Middle School):**

Generally, primary plus middle schools refer to the grade of education starts from standards 1st to 8th. As per URDPFI guidelines, one primary School is required for every 5,000 of population. The total primary schools available within the planning area are 10. As per Census 2011, the primary school scenario in the village is in surplus. Further, by 2041, a total number of required primary schools is 6, which means no additional new schools will be required in Tarapur GP.

- **Secondary School:**

Secondary schools refer to the grade of education from 9th to 10th. As per URDPFI guidelines, one secondary school is required for every 7,500 of population. There are total of 2 secondary schools located in the village. Further, by 2041, a total number of required secondary schools will be 2 which means no additional new schools will be required in Tarapur GP.

- **Senior Secondary School:**

11th and 12th grades of education referred to senior secondary schools. As per URDPFI guidelines, one senior secondary school is required for every 15,000 of population. The total senior secondary schools available within the planning area is 1. At present, having one school in the village is sufficient; however, by 2041, 2 senior secondary schools will be required in Tarapur GP; hence, additional one new school is required. If the additional school is a government school, then it can be developed in the proposed PSP

zone/ on the government land or if it is a private school then it can be developed in the proposed new settlement zone area.

- **College:**

Generally, college refers to graduate-level education. As per URDPFI guidelines, one college served per unit for every 125,000. At present, Govt. ITA College is available in this village and nearest Govt. Arts and Science Degree College, Govt. Engineering College, Govt. MBA College and Govt. Polytechnic College is in Vallabh Vidyanagar (33km). Nearest Private Medical College is in Karamsad (29 km). Nearest Private Disabled School is in Anand (36 km). As per the URDPFI guidelines, no new collage needs to be established in the village.

9.7.2 Health Facilities

Adequacy of the health facility is assessed for the village to understand the differential requirement for the projected population by the year 2041. As per the Indian Public Health Standards (by Ministry of Health and Family Welfare (MoHFW), one sub-center is required for a population 5,000 people, one Primary Health Center (PHC) for 30,000 of population, one Community Health Center (CHC/Rural Hospital) for a population of one lakh, and one Maternity & Child Welfare Center is required per 15,000 of population.

Table 39: HealthCare Facility Estimation

Type of Facility	Population 2011	Existing No. Facility	Required	Surplus / Deficit	Population 2041	Required	Additional
Sub-Center	17,994	1	4	-3	30,685	6	5
Primary Health Center		1	1	0		1	0
Community Health Center		1	0	1		0	---
Maternity & Child Welfare Center		1	1	0		2	1
Source: Census of India, and Indian Public Health Standards by Ministry of Health and Family Welfare (MoHFW) Guidelines							

- **Sub-Health Center:**

As per the Indian Public Health Standards (by Ministry of Health and Family Welfare (MoHFW)), one sub-center is required for a population of 5,000 people. At present, there is only one sub-center in the village and 3 additional required. By 2041, additional 5 sub-health centers will be needed in the village to serve the foreseen population.

- **Maternity and Child Welfare Center:**

As per the standards, one such center is required for a population of 15,000 people, which means, which means, with the foreseen population of 30,685 total 2 such centers are required in the village. Currently, there is 1 center in the village, and one additional will be required by 2041.

- **Primary Health Center:**

As per the Indian Public Health Standards (by Ministry of Health and Family Welfare (MoHFW)), one sub-center is required for a population 30,000 people, which means, with the foreseen population of 30,685 total 1 PHC is required in the village. Currently, there is 1 PHC located in the village, which will be sufficient to serve the foreseen population, and no addition center is required.

- **Community Sub-Center:**

As per the Indian Public Health Standards (by Ministry of Health and Family Welfare (MoHFW)), one Community Center (CHC) is required for a population 1 lakh people, which means, with the foreseen population of 30,685, presence of the CHC within the panchayat jurisdiction is not required. Currently, there is 1 CHC located in the village.

Overall, the village has surplus health care facilities to serve the present population. Tarapur has one CHC, as per the URDPFI guideline one CHC is required for a population 1 lakh people; which means the village does not require to have CHC in the GP area. Considering the fact that the village does not require any CHC by the standards and yet there is one CHC is in Tarapur; hence, it is assumed that instead of adding 5 sub-health center, having established one new center will be sufficient to the server the projected population. Hence, it is proposed to develop one new sub-health center and one new maternity and child welfare center in the village, which shall be established on the government land- in the proposed PSP zone.

9.7.3 Social and Cultural Facilities

As per URDPFI guidelines, one recreational center or a neighbourhood park is required for every 15,000 of population, and for other socio-cultural facilities; facility center is required per every 100,000 of population. As per the Village Profile and the Sarpanch, the GP has one Public Park, community hall and open-air theatre, which is sufficient facilities to serve the present population. However, one additional recreational center (such as a public park, community hall, etc.) will be required by 2041 to serve the projected population. A community hall can be developed by private developers and so there is no need for the panchayat to develop; however, it is proposed that one new public park/ public recreational facility should be developed in the village, which can be developed in proposed part and open space zone.

Table 40: Social and Cultural Facility Estimation

Type of Facility	Population 2011	Existing No. Facility	Required	Surplus/ Deficit	Population 2041	Required	Additional
Recreational Center	17,994	1	1	0	30,685	2	1
Socio-Cultural Facilities other than Recreational Center		0	0	0		0	0
Source: Census of India, Village Profile 2020, and URDPFI Guidelines							

9.7.4 Communication Facility

Post office and telecommunication are the various means of communication facilities available in the village. Adequacy of the communication facility is assessed of the planning area to understand the differential requirement for the projected population by the year 2041. Analysis of the communication facilities had been done using URDPFI guidelines and Census 2011 data. However, with the extensive use of mobile services, in the current scenario availability of telecommunication became insignificant; hence, this aspect of socio-physical infrastructure is not included here.

Post Office

As per the URDPFI Guidelines, one post office is required per 15,000 of population. As per the Census 2011, a total number of post offices recorded within the project area is 1. By the year 2041, total 2 post offices will be required in the project area; hence, additional 1 new post offices will be required to meet the demand.

Table 41: Estimation for Communication Facilities

Type of Facility	Population 2011	Existing No. Facility	Required	Surplus/ Deficit	Population 2031	Required	Additional
Post Office	17,994	1	1	0	30,685	2	1
Source: Census of India, Village Profile 2020, and URDPFI Guidelines							

9.7.5 Financial Services

Generally, banking facility refers to Co-operative Commercial, Agricultural Credit Societies, and other Credit Societies. Financial services have further divided into four categories such as Co-operative Commercial, Agricultural Credit Societies, and other credit societies included in the Banking Facility for the planning area. As per URDPFI guidelines, one bank is required per 15,000 of the population; which means, only 1 bank is required in the village. By the year 2041, total 2 banking facility will be required in

the Tarapur; however, at present the total 3 facilities available in the village, no additional bank establishment required to meet the demand.

Table 42: Estimation for Banking Facility in Tarapur GP

Type of Facility	Population 2011	Existing No. Facility	Required	Surplus/ Deficit	Population 2031	Required	Additional
Banks	17,994	3	1	0	30,685	2	0
Source: Census of India, Village Profile 2020, and URDPFI Guidelines							

9.7.6 Cooking Fuel- LPG Facility

As per the panchayat report, out of total 3,452 households, 2500 households (72.42 %) in the village have LPG facilities. Though the LPG gas cylinder center is not located in the GP, villages get the home delivery from the agency located in Sojitra town through phone booking requests. Remaining household still uses either kerosene or wood as cooking fuel. Slum dwellers are the one who uses kerosene as cooking fuel; while remaining other people (not having LPG connection) prefer to use wood by choice.

- Social awareness regarding benefits of LPG as a cooking fuel is required to spread.
- Establish LPG connection to the remaining 27% of households

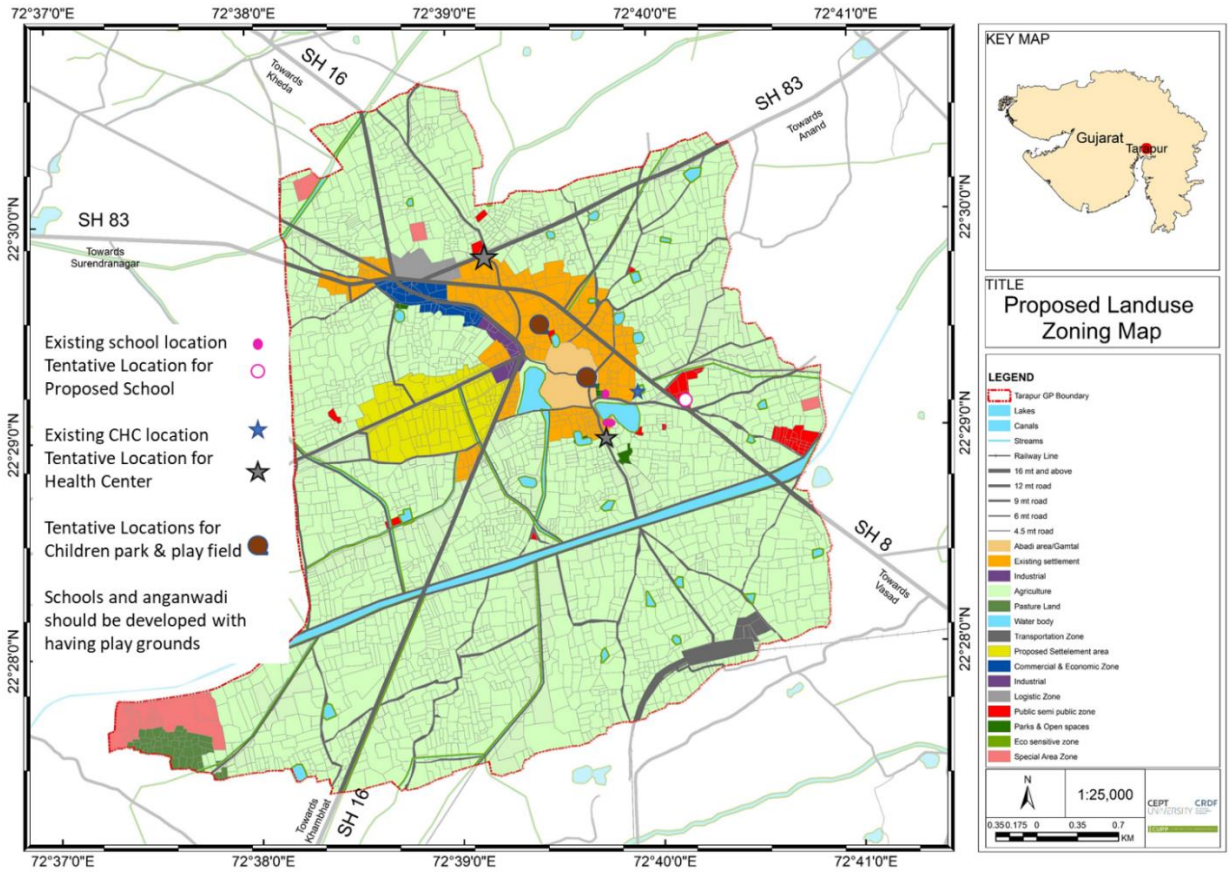
Proposals and Recommendations for Social Infrastructure

- One new senior school is required to meet future demand. If the additional school is a government school, then it can be developed in the proposed PSP zone/ on the government land or if it is a private school then it can be developed in the proposed new settlement and commercial and economic zones. In any case, new school location should be in proximity to the settlement areas. Further, minimum road width required for a new school establishment is 6 meter. It is recommended that all aganwadies and school should have children playground as part of the school.
- Overall, the village has surplus health care facilities to serve the present population. Tarapur has one CHC, as per the URDPFI guideline one CHC is required for a population 1 lakh people; which means the village does not require to have CHC in the GP area. Because the village does not require any CHC by the standards and yet there is one CHC is in Tarapur; hence, it is assumed that instead of adding 5 sub health center, having established one new center will be sufficient to server the projected population. Hence, it is proposed to develop one new sub health center and one new maternity and child welfare center in the village. Any new government health center can be developed in the proposed PSP zone/ on the government land; while private hospitals, dispensaries, maternity health center developed in the proposed new settlement and commercial and economic zones. In any case, location for any new health center should be in proximity to the

settlement areas. Further, minimum road width required for a sub-health establishment is 6 meter and for a hospital development is 9 meters.

- One recreational center, such as Public Park, children play ground and park, community hall, etc. will be required to develop by 2041 to serve the projected population. Public Park, children play ground and garden can be developed in the proposed park and open space zone; while small community hall can be developed in the proposed new settlement and commercial and economic zones as well.
- Additional 1 new post offices will be required to meet the demand.
- Establish LPG connection to the remaining 27% of households

Figure 26: Recommended Tentative Locations for Social Amenities



9.8. Recommendation for Implementation Strategy

Identified proposals by the GPSDP Tarapur shall be implemented through various central and state level schemes. The table below identifies schemes under which the proposals can be implemented.

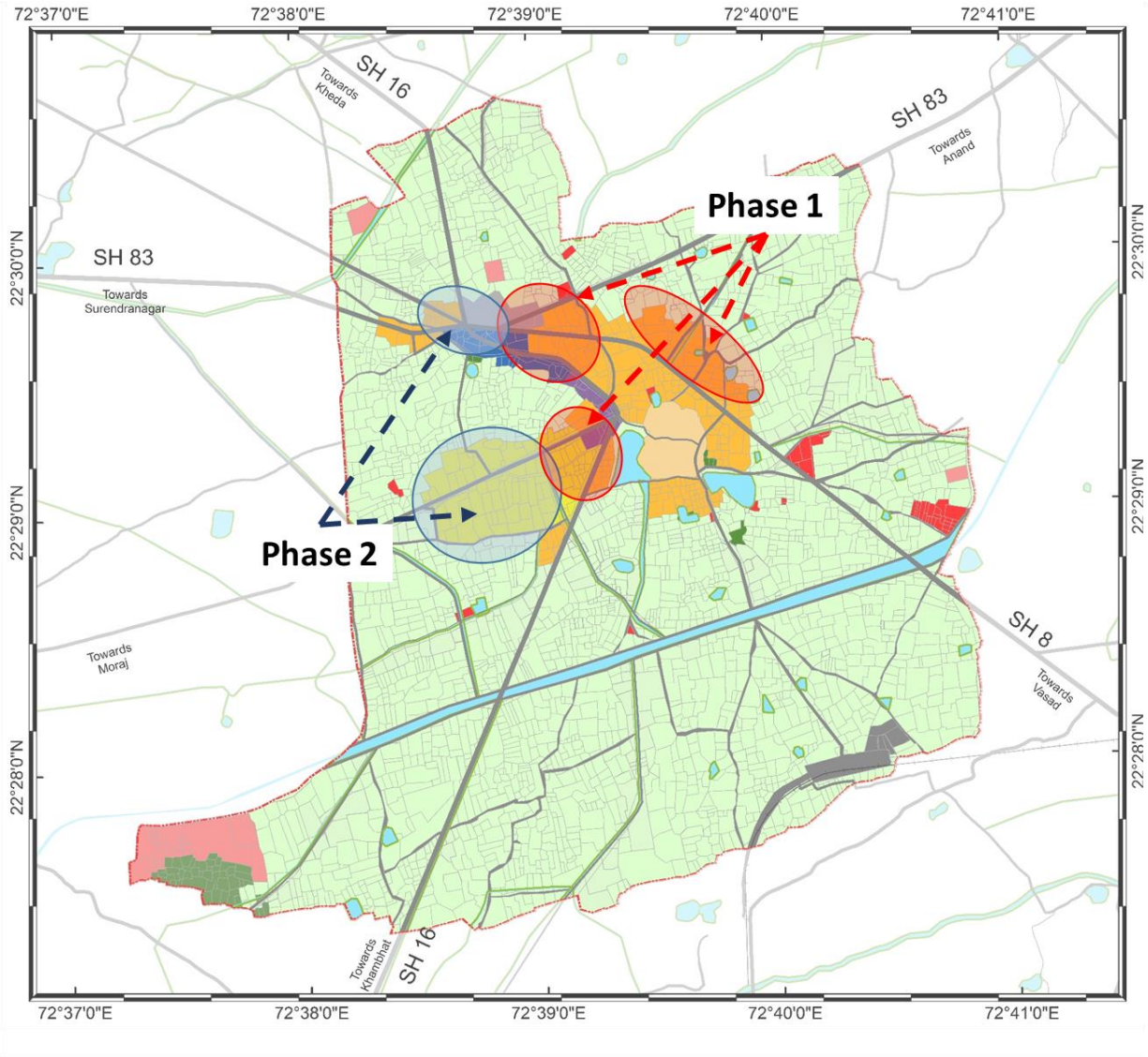
Table 43: Recommendation for Implementation Strategy- Through Central and State Schemes

Category	Project	Scheme Name
Housing	Upgradation of Kaccha Houses	PMYA
Village Road	New road construction and bridge across the canal connecting two roads	District Fund, MLA Fund, Pradhan Mantri Gram Sadak Yojana
	Provision of Streetlight	Jyoti Gram Yojana
Training linked to economic activities	Skill Development Center	DDU-GKY, National Backward Classes Finance & Development Corporation, GCSRA, Mason Training- PMAY
Water Supply	Establishment of water pipeline supply to remaining HHs/ Expansion of water supply pipe network	National Rural Drinking Water Programme (NRDWP), Quality Monitoring and Surveillance (WQMS), GWSSB, WASMO, MGNREGA
	Upgradation of the existing pipe network	
	Additional Water Storage Capacity	
Sewage Network/ Sanitation	Establishing HH sewage line connection with the sewage network, to the main sewage network trunk	Swachh Bharat Mission/ MNREGA
	A centralized conventional sewage treatment plant	
Solid Waste Management	Provision of Composting kit at Projected HH for 2041 (5,934 HH)	Swachha Gram Swastha Gram
	Provision of Treatment Plant/ Compost Plan	SBM Gramin
	Provision of additional Transportation Infrastructure	SBM Gramin
Education	One additional Senior Secondary School required by 2041	Sarva Siksha Abhiyan
Health	One new Sub-Health Center	National Rural Health Mission (NRHM)
	One Maternity and Child Welfare center	National Rural Health Mission (NRHM)
Communication Facility	Additional Post Office required	
LPG Connection	Provision of LPG Connections to the remaining 27% HHs	Pradhan Mantri Ujjwala Yojana

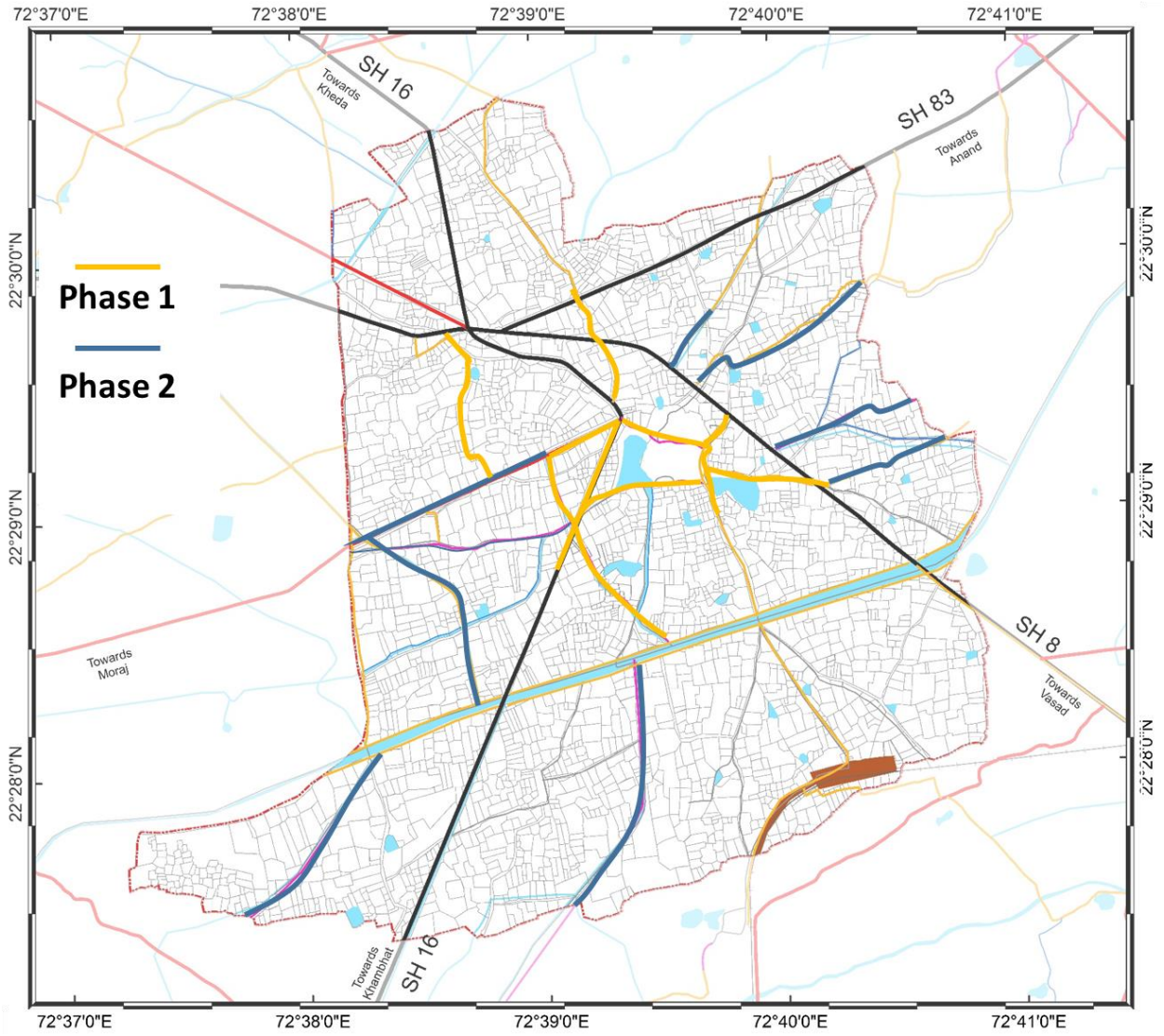
9.9. Implementation Phasing

Spatial development plan for Tarapur GP recommends development in phasing. The plan recommends the development of open areas and upgrading of road network in phasing as shown in the maps below.

Map 22: Recommended Implementation Phasing for Developable Land



Map 23: Recommended Implementation Phasing for Proposed Road Network



9.10. Recommendations for the Development Control Regulation[6]

Development control regulations give shape and form to the built environment. So far no such provisions exist specifically for rural areas. This section of the report presents recommendations for the development control regulations in Tarapur GP. Here presented recommendations are adopted from the Framing Guidelines for Model Land Uses, Development Controls, and Service Level Benchmarks with

[6] Here presented recommendations are adopted from the Framing Guidelines for Model Land Uses, Development Controls, and Service Level Benchmarks with Appropriate Enforcement Mechanisms for Rurban Clusters developed by School of Planning and Architecture Delhi (SPA Delhi) for Ministry of Rural Development.

Appropriate Enforcement Mechanisms for Rurban Clusters developed by School of Planning and Architecture Delhi (SPA Delhi) for Ministry of Rural Development.

Key Definitions for a Spatial Development Plan

Following are the suggested key definitions for the Gram Panchayat Spatial Development Plan:

- Development: With all its variations and cognate expressions, development means the carrying out of any building, engineering, mining, or other operations in, on, over and under land or the making of any material changes in any building or land or the case of use of any building or land and includes layout and sub-division of any land.
- Agriculture: Agriculture includes horticulture, farming, growing crops, fruits, etc., breeding and keeping of livestock, use of land for any purpose, which is ancillary to cultivation or any other agriculture purposes.
- Amenity: It includes roads, streets, open spaces, parks, playgrounds, recreational grounds, water and electric supply, street lighting, sewerage, drainage, public works and other agriculture purposes.
- District: A district constituted from time to time under the Land Revenue Code or any other relevant state act in force in a state.
- District Development Officer: Such an officer as a state government may appoint to be the district development officer for this act or officer of a similar rank.
- District Panchayat: A district panchayat (zilla panchayat) as per the relevant state panchayati raj act.
- Land: This includes benefits to arise out of the land, and things attached to the earth or permanently fastened to anything attached to the earth.
- Village Panchayat/ Gram Panchayat: A village panchayat, taluka or block panchayat, or district panchayat as constituted under a state panchayati raj act.
- Regulations: Regulations made by a block Samiti would include development regulations and any other regulations made as a part of a cluster development plan.
- Revenue Village: Revenue village is a small administrative unit with defined borders. One revenue village may contain many hamlets.
- Sarpanch: An elected head of a village panchayat may be called a Sarpanch.
- Taluka: Taluka means a taluka as constituted from time to time under a relevant state act.
- Taluka Panchayat: Taluka panchayat means a panchayat constituted from time to time under a Panchayati Raj Act.
- Tax: Tax, or rate imposed under an act of a state government, which does not include a fee.

Recommendation for Guidelines for Reserving Land for Public Purposes

Here, recommended guidelines for reserving land for public purposes are derived from the national level guidelines such as URDPFI, and CPHEEO. These guidelines suggest to reserve available public land or government land for development of public amenities. However, these guidelines are based on population and are suggestive in nature, and hence open to modifications.

Table 44: Space Requirements for Reservation of Land for Amenities at Village Level

Sr.No	Amenities at Village Level	Population Range	Area Requirement	Minimum Road Width Requirement
1	Skill Development Center	1,000 - 5,000	300 - 500 sq.m	Minimum 6 m
2	Agriculture Services and Processing Center	1,000 - 5,000	300 - 500 sq.m	Minimum 6 m
3	Warehouses for Cold and Dry Storage	1,000 – 5,000	300 - 500 sq.m	Minimum 6 m
4	Primary School	One for 2,500	800 sq.m	Minimum 6 m
5	Secondary School	One for 5,000	4000 sq.m	Minimum 6 m
	Senior Secondary	One per 15,000	Area per school is 1.80 ha; Maximum ground coverage 50 per cent	Minimum 9 m
6	Health Sub – Center	3,000-5,000	800 – 1,200 sq.m	Minimum 6 m
	Primary Health Center	One per 30,000	0.20 - 0.30 ha	Minimum 9 m
7	LPG Distribution Center	2,500	100 sq.m	Minimum 6 m
8	Common Service Center	1,000	100 sq.m	Minimum 6 m

Note: The space norms provided are indicative and can be applied as per the suitability and decisions taken by a local plan preparing agency.
Source: Framing Guidelines for Model Land Uses, Development Controls, and Service Level Benchmarks with Appropriate Enforcement Mechanisms for Rurban Clusters developed by School of Planning and Architecture Delhi (SPA Delhi) for Ministry of Rural Development.

Recommendation for Building Development Guidelines

Building development guidelines provide guidelines related to buildings in a rural settlement area and settlement extension area or buffer area. These guidelines are based on road widths so as to avoid congestion and to ensure sufficient spaces for provision of infrastructure.

Table 45: Recommendation for Building Development Guidelines

Road Width in meter	Minimum Plot Size (sq. m)	Uses Permissible	Front Setback in m	Side Setback in m	Rear Setback in m	Maximum Permissible Building Height and Maximum Ground
Less than 9 m	<100	Residential, Commercial, others	A = 1.5	A = 1.0	A = 1.0	MPBH = 7 m GC = 60 %
			AE = 1.5	AE = 1.0	AE = 1.0	Others = 75 %
09 to 12	100	Residential, Commercial, others	A = 1.5	A = 1.0	A = 1.5	MPBH = 10 GC = 60 %
			AE = 3	AE = 1.0	AE = 1.5	Others = 75 %
12 to 18	100	Residential, Commercial, others	A = 1.5	A = 1.0 AE = 2.25	A = 1.5	MPBH = 15 GC = 50 %
			AE = 3		AE = 3.0	Others = 60 %
18 to 24	100	Residential, Commercial, others	A = 3	A = 1.5 AE = 2.25	A = 2.25	MPBH = 15 GC = 50 %
			AE = 3		AE = 3.0	Others = 60 %

Note:

- A= Abadi & Existing Settlement Area
- AE= Abadi Extension areas, such as Proposed Settlement Zone, Commercial & Economic Zone, Industrial Zone, and Logistic Zone
- Animal crossing in the form of an underpass to be provided if village animals will have to cross a road with a right of way of 18 meters or more.
- MPBH = Maximum permissible building height; GC = Ground Coverage for Commercial Use; GI = Ground Coverage for Industrial Use; O = Ground Coverage for Other Uses

Source: Framing Guidelines for Model Land Uses, Development Controls, and Service Level Benchmarks with Appropriate Enforcement Mechanisms for Rurban Clusters developed by School of Planning and Architecture Delhi (SPA Delhi) for Ministry of Rural Development.

Recommendation for Parking Norms

Parking of vehicles is likely to become a critical issue in a village well as more people and households would own more private vehicles per person with rising economic development. Thus another important aspect of planning for as well.

Table 46: Recommendation for Parking Norms

Land Use Category	Parking Norms
Residential	1 ECS for 100 sq m of built space
Commercial	2 ECS for 100 sq m of built space
Public Semi-Public	2 ECS for 100 sq m of built space
Mandi and Godowns	2 ECS for 100 sq m of the plot area
Industry	2 ECS for 100 sq m of built space
Note: ECS= Equivalent Car Space Source: Framing Guidelines for Model Land Uses, Development Controls, and Service Level Benchmarks with Appropriate Enforcement Mechanisms for Rurban Clusters developed by School of Planning and Architecture Delhi (SPA Delhi) for Ministry of Rural Development.	

CHAPTER 10: WAY FORWARD

Preparation of Tarapur GPSDP is a part of an initiative started by MoPR as a pilot project for integrated spatial and economic development in the rural areas of India. For this pilot project, total 32 gram panchayats and 16 institutes were identified for preparation of the Gram Panchayat Spatial Development Plan. CEPT University is being one of these institutes involved in preparing the GPSDP for two gram panchayats, namely, Nandasan Gram Panchayat, District Mehsana and Tarapur Gram Panchayat, District Anand. Prepared GPSDP for Tarapur GP is a document with a set of proposals for land uses in the gram panchayat to have a systematic development in the village, to provide quality of life to the villagers through planned growth and to spur overall economic growth of the area. The plan also covers proposals and recommendations for social & civic amenities and infrastructure development.

A development plan is usually a broad vision for the project area that includes a broad brush policy, projects, and recommendations for the various topic, such as land use zoning, housing, social and civic amenities, utilities, infrastructure, etc.; which are further needed to be detailed out and should be implemented systematically. Currently, the ministry is in process of formulating an implementation strategies for the systematic implementation of the plan. This section of the GPSDP for Tarapur GP recommends the following consideration that should be taken up into account while formulating an implementing mechanism of the GPSDP:

- Public Participation and Transparency:

  Normally public participation has a positive impact on the quality of governance, where transparency is considered as the first step of the public participation process as it means that all the stakeholder/ public have access to all the necessary information to contribute to decision making. Therefore, it is recommended that the prepared Gram Panchayat Spatial Development Plan should be kept in a public domain so villagers can review the plan; however, a period should be specified by the implementation authority for such review. In addition, public participation can be done through gram sabhas. Further, a methodology or mechanism for collecting and reviewing comments and suggestions from the villager should be recognized.

  Statutory provisions, similar to GTPUD Act, for enabling the action of keeping the plan open in the public domain for public inspection is required for keeping the plan in the public domain for receiving objection and suggestions. In case of GTPUDA the local authority is responsible to prepare, publish and receiving objections and suggestions on the development plans. Similar statutory, institutional and implementation mechanism is required to be formulated for the systematic implementation of the spatial development plan for the rural area.

- Self-Revenue Generating Model:

  Empowerment of panchayats lies in the ability of a self- revenue generating institution to finance their expenditure. Therefore, a self-revenue generating model through panchayat for the implementation of the GPSDP should be explored so that the panchayat does not only need to depend on state government devolutions and fund for the development in the village. This would lead to the timely development of the required infrastructure and amenities. Through the panchayat's internal generation of resources, such as water supply charges, housing tax, developing commercial spaces on government land and leasing out for the various economic activities, development through a public-private partnership, etc. can help the panchayat become self-sufficiency and independent with the reduced dependency on the availability of funds via central and state government. Moreover, along with the development of infrastructure and amenities, the self-revenue generating model should also include the aspect of maintenance of the developed infrastructure and amenities in a long run.

- Implementation Mechanism through Land Pooling Model (Town Planning Scheme):

  Town Planning Scheme is an implantation tool developed based on the land pooling mechanism for the development of public facilities. The GPSDP recommends that the similar to the section 40 of the GTPUD Act (Gujarat Town Planning and Urban Development Act), a statutory mechanism enabling the implementation of the Gram Panchayat Spatial Development Plan through land pooling mechanism (Town Planning Scheme) should be explored. This would help in reducing dependency on the availability of government land for the required development of amenities and infrastructure and avoid land acquisition for the same. Moreover, the land pooling mechanism is public participation oriented implementation mechanism; hence, implementation of the GPSDP through Town Planning Scheme would also bring transparency in the implementation process.

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ANNEXURE

CHAPTER 11: ANNEXURE

Annexure 1: Household Survey Form- in Gujarati (Regional) Language

હાઉસહોલ્ડ સર્વે No.														
પ્રતિસાદ આપનારનું નામ:							નિવાસનો સમયગાળો:				સ્થાન:			
ધર્મ:		જાતિ:					માલિકી: ભાડે:				બીપીએલ કાર્ડ: રેશન કાર્ડ:			
મૂળભૂત માહિતી														
સભ્ય	ઉંમર	સેક્સ	વૈવાહિક સ્થિતિ	લાયકાત	શિક્ષણ સુવિધાનું સ્થાન	વ્યવસાય	જોબનું સ્થાન	વાહન માલિકીનું					સ્થળાંતર સ્થાન	ડિજિટલ સાક્ષરતા
								2 ડબલ્યુ	3 ડબ્લ્યુ	4 ડબ્લ્યુ	ચક્ર	કંઈ નહીં		
વ્યવસાયમાં પરિવર્તન જો કોઇ હોય તો: ક્યારે અને કારણ:														
મોબાઇલ વપરાશ / નેટવર્ક														
સભ્ય	કનેક્ટિવિટી		ઇન્ટરનેટનો ઉપયોગ		વાઇફાઇ / બ્રોબંદ		ઉપયોગનો હેતુ							
	સારું	ગરીબ	હા	ના	હા	ના	ફેમિલી કનેક્ટ	કામ	અભ્યાસ	ઓનલાઇન ખરીદી	ઇમરજન્સી ઉપયોગ			

અવધિ											
જો કૃષિ / બાગાયતી				**જો કુશળ / અશિષ્ટ લેબર / મત્સ્યઉદ્યોગ / صنعت**				**જો વ્યવસાય**			
સામેલ સભ્યોની સંખ્યા:					1	2	3		1	2	
વિસ્તાર	**માટીનો પ્રકાર**			**પ્રકાર**				**પ્રકાર**			
પાકનો પ્રકાર				**સ્થાન**				**સ્થાન**			
આવર્તન				**મુસાફરીની રીત**				**મુસાફરીની રીત**			
સિંચાઈનો સ્ત્રોત				**યાત્રા અંતર**				**યાત્રા અંતર**			
જો હા, યોજના / ખાનગી				**સીમાંત / પૂર્ણ વર્ષ**				**સીમાંત / પૂર્ણ વર્ષ**			
બીજ ઉપલબ્ધતા (ક્યાંથી)				**વેતન**				**વાર્ષિક આવક**			
શું પાકની પદ્ધતિમાં કોઈ ફેરફાર છે?				**ગુણવત્તા અને સપોર્ટ સ્થિતિનું વર્ણન અને સમસ્યાઓ જો કોઈ હોય તો**							
સ્ટોર સ્થાન				**રોજગાર સુવિધા**				**આર્થિક સુરક્ષા / ભવિષ્ય નિધિ, પેન્શન વગેરે.**			
તમે ક્યાં વેચો છો				**સ્વચ્છતા સુવિધા**				**કામ શિફ્ટ ટાઇમગ**			
પે પે				**હીથકેર સપોર્ટ**				**કોઈપણ અન્ય ટિપ્પણી**			
જો સેવા જોબ											

વધુ અભ્યાસ અથવા કૌશલ્ય વિકાસ માટે અવકાશ		**યાત્રા અંતરની ટિપ્પણી અથવા ફેરફાર માટે ટિપ્પણીઓ**		
અવકાશ અને સુવિધા અપગ્રેડ કરવાની		**સમય અને મુશ્કેલીઓ પર ટિપ્પણી શિફ્ટ કરો જો કોઈ હોય તો**		
શું તમે કોઈપણ સપોર્ટ સુવિધાને પ્રાધાન્ય આપો છો?		**કોઈપણ અન્ય ટિપ્પણી**		

જમીન હોલ્ડિંગ					
ઠાસરા નં.				**વિસ્તાર:**	**જમીન હોલ્ડિંગનો સમયગાળો:**
ખેતીલાયક:				**ગળી જવું/** fallow land:	
વધારાની જમીન ધારક/ Additional land holding:				**વિસ્તાર:**	**હેતુ:**

હાઉસિંગ (બિલ્ટ અપ ડિટેલ)				
સ્ટ્રક્ચરનો પ્રકાર	**કચ્છ**	**પાકું**	**સેમી પાકું**	
સામગ્રી (છત)	ઘાસ / ખાંયો / વાંસ	કાદવ	અનબર્ન્ટ ઇંટો	મોર્ટાર સાથે સ્ટોન
સામગ્રી (વોલ)	ઘાસ / ખાંયો / વાંસ	કાદવ	અનબર્ન્ટ ઇંટો	મોર્ટાર સાથે સ્ટોન
બિલ્ડિંગ .ંચાઇ	જી	જી + 1	જી + 2	જી + 3
યોજના (**(Yes/ No)**)				
રચનાની ઉંમર	10 વર્ષથી ઓછા	10-20 વર્ષ	20-50 વર્ષ	50 થી વધુ વર્ષો
શરત	સારું	જીવંત	જર્જરિત	

સેવાઓ					
સેવાઓ				**સુવિધાઓ**	**મોસમી વિક્ષેપો**

	પ્રાપ્યતા સિસ્ટમ અનુસરી	આવર્તન અને જથ્થો	યાત્રા અંતર		ઉનાળો	વરસાદી
પાણી પુરવઠા અને સંગ્રહ (જોડવાની તસવીર)				કૂવો / હેન્ડ પંપ / બોરવેલ / ખાનગી ટેપ / સાર્વજનિક ટેપ		
સોલિડ વેસ્ટ સંગ્રહ (જોડવાની તસવીર)				ડમ્પિંગ / કમ્પોસ્ટ / કલેક્શન કાર્ટ ખોલો		
વીજળી				હાઉસ હોલ્ડ / સિંચાઈ		
પરિવહન				બસ / ટેમ્પો / ટ્રેક્ટર / બુલockક કાર્ટ / 2 વ્હીલર / 4 વ્હીલર / સાયકલ		
ટેલિફોન						
રાંધણ છંધણ (જોડવાની તસવીર)				એલપીજી / કેરોસીન / ફાયર વુડ / બાયોગેસ / ડબર કેક		
શ્રેષ્ઠ પ્રયાસો (જોડવાની તસવીર)				વરસાદનાં પાણીની ખેતી / ખાતર / રસોડું ગાર્ડન / સૌર ઉપકરણો		

ટોઇલેટ્સ									
અવલેબિલિટિ yes / No)	જો હા, વપરાશ હેઠળ (yes / No)	જાહેર	ખાનગી	સમુદાય	ખુલ્લામાં શૌચ	યોજના હેઠળ / પોતાના બાંધકામ	જો યોજના હેઠળ; પ્રાપ્ત રકમ:	પાણી જોડાણની ઉપલબ્ધતા (yes / No)	છબી જોડવાની છે

માસિક ખર્ચ						
માપદંડ	ખોરાક	આરોગ્ય	શિક્ષણ / તાલીમ	પરિવહન	ભાડુ	નવરાશ
રેન્કિંગ						

એકમ રકમનો માસિક ખર્ચ:	**જો વ્યાજ ચૂકવવું હોય તો કેટલું:**	**વ્યાજનો સમયગાળો:**

આરોગ્ય														
સભ્ય	**આરોગ્ય કાર્ડ / વીમો**	**આદતો**				**પ્રાથમિક આરોગ્ય સંભાળનું સ્થાન**	**ક્રિટિકલ કેરનું સ્થાન**	**મુસાફરીની રીત**	**યાત્રા અંતર**	**એક મહિનામાં હોસ્પિટલની મુલાકાતની સંખ્યા**		**1 વખતની મુલાકાત માટે ફી ચૂકવવામાં આવી છે**	**છેલ્લા 2 વર્ષથી આરોગ્યના પ્રશ્નો**	**મૃત્યુનું કારણ જો કોઈ હોય તો**
		અલ્કોહોલ	**ધૂમ્રપાન**	**તમાકુ**	**અન્ય**									

રસીકરણ જો કોઈ હોય તો: હા નહીં

વિવિધ સરકારી આરોગ્ય યોજનાઓ વિશે જાગૃતિ: હા / ના

એસેટ્સ

પશુધન	નંબર	સમસ્યા / રોગ	વાણિજ્યિક (Yes/ No)		અન્ય સંપત્તિ	હા નાં
ગાય / 'ભેંસ					ટેલિવિઝન	
બળદ					સ્માર્ટફોન	
બકરીઓ					રેફ્રિજરેટર	
ચિકન					સૌર ઉપકરણો	
ઘોડાઓ					સ્ટોવનો પ્રકાર	
ગધેડા					કમ્પ્યુટર / લેપટોપ	
અન્ય						

વિલાજ ઈન્ફ્રાસ્ટ્રક્ચરના સુધારણા માટે સૂચનો

સામાજિક સુવિધાઓ	શિક્ષણ સુવિધાઓ	હેલ્થકેર સુવિધાઓ	વ્યાપાર સુવિધાઓ	રોજગાર સુવિધાઓ

Annexure 2: Household Survey Form- In English

HOUSEHOLD SURVEY			
Name of Respondent:		**Time Period of Residence:**	**Location:**
Religion:	**Caste:**	**Ownership: Rent:**	**BPL Card: Ration Card:**

BASIC INFORMATION

Member	**Age**	**Sex**	**Marital Status**	**Qualification**	**Location of Education Facility**	**Occupation**	**Location of Job**	**Vehicle Owned**					**Place of Migration**	**Digital Literacy**
								2W	**3W**	**4W**	**Cycle**	**None**		

Change in Occupation if any:
Since When and Reason:

MOBILE USAGE/NETWORK											
Member	Connectivity		Use of Internet		WIFI/Broaband		Purpose of Use				
	Good	Poor	Yes	No	Yes	No	Family Connect	Work	Study	Online Shopping	Emergency Use

OCCUPATION											
IF AGRICULTURE/ Horticulture				IF SKILLED/UNSKILLED LABOUR/ FISHING/ INDUSTRY				IF BUSINESS			
No. of members involved:					1	2	3		1	2	
Area	Soil Type			Type				Type			
Crop Type				Location				Location			
Frequency				Mode of Travel				Mode of Travel			
Source of Irrigation				Travel Distance				Travel Distance			
if yes, scheme/private				Marginal/ Full Year				Marginal/Full Year			
Seeds Availability (From where)				Wages				Annual Income			
is there any change in cropping pattern				Quality and Support status description and problems if any							
Store Location				employment facility				economic security/ provident fund, pension etc.			
Where do you sell				hygiene facility				Shifts timimg of work			
Produce p.a.				heathcare support				any other remarks			
IF SERVICE JOB											
scope for further study				Travel Distance remarks or							

or skill development		comments for change		
scope and facility to upgrade		Shifts remarks on timing and difficulties if any		
would you prefer any support facility		any other remarks		

LAND HOLDING					
Khasra No.				Area:	Time Period of Land Holding:
Cultivatable:				Fallow:	
Additional Land Holding:				Area:	Purpose:

HOUSING (Built up Detail)				
Type of Structure	Kachcha	Pucca	Semi Pucca	
Material (Roof)	Grass/thatch /bamboo	Mud	Unburnt Bricks	Stone with Mortar
Material (Wall)	Grass/thatch /bamboo	Mud	Unburnt Bricks	Stone with Mortar
Building Height	G	G+1	G+2	G+3
Scheme (Y/N)				
Age of structure	Less than 10 Years	10-20 Years	20-50 Years	More than 50 Years
Condition	Good	Livable	Dilapidated	

SERVICES					
Services				Facilities	Seasonal Interruptions

	Availability system followed	Frequency and quantity	Travel Distance		Summer	Rainy
Water Supply & Storage (Image to be attached)				Well / Hand pump / Bore well / Private Tap / Public Tap		
Solid waste collection (Image to be attached)				Open Dumping / Compost / Collection Cart		
Electricity				House Hold / Irrigation		
Transportation				Bus / Tempo / Tractor / Bullock Cart / 2 wheeler / 4 wheeler/ Cycle		
Telephone						
Cooking Fuel (Image to be attached)				LPG/ Kerosene/Fire wood/Biogas/Dung Cake		
Best Practises (Image to be attached)				Rain water Harvesting/Composting/Kitchen Garden/ Solar Appliances		

TOILETS									
Availabilty (Y/N)	If Yes, Under Use (Y/N)	Public	Private	Community	Open defecation	Under Scheme/ Ow	If under scheme; Amount received:	Availability of water Connection (Y/N)	Image to be attached

						n Construction			

MONTHLY EXPENDITURE						
Criteria	Food	Health	Education/ Training	Transportation	Rent	Leisure
Ranking						

Lump-sum Monthly Expenditure:	**If paying Interest then how much:**	**Time period of Interest:**

HEALTH															
		Habits													
Member	**Health Card / Insurance**	**Alcohol**	**Smoking**	**Tobacco**	**Others**	**Location of Primary Health Care**	**Location of Critical Care**	**Mode of travel**	**Travel Distance**	**No. of visit to Hospital in a month**		**Fees paid for 1 time visit**	**Health Issues for past 2 years**	**Cause of Death If any**

Vaccination if any: Yes No

Awareness about the various Government health schemes: Yes/No

ASSETS

Livestock	Number	Problem/Disease	Commercial (Y/N)
Cow/'Buffalo			
Ox			
Goats			
Chickens			
Horses			
Donkeys			
Others			

Other Assets	Yes/No
Television	
Smartphone	
Refridgerator	
Solar Appliances	
Stove Type	
Computer/Laptop	

SUGGESTIONS FOR IMPROVEMENT OF VILLAGE INFRASTRUCTURE

Social Facilities	Education Facilities	HealthCare Facilities	Business Facilities	Employment Facilities

Annexure 3: Sarpanch Questionnaire- in English

1. Background Information about Sarpanch

	Name		Age:
	Caste		
	Education		
	Contact No		

2. Cultural Information about village (Source: Sarpanch/Talati)

	Languages spoken	Gujarati	Hindi	English	Other
	Religion and (Population %)	Hindu	Muslim	Christian	Others
	Types of Caste				
	Types of Tribes				
	Pilgrimage Centers in Village				
	Tourist centers				
	Monuments and heritage				

3. Educational Profile of village (Source: Schools of villages)

4. Skill Development (Source: Sarpanch/Talati)

	% of population with higher secondary education	
	% of population with secondary education	
	% of population with Primary education	

	Enrolment and Dropout rate M/F			
	% of population with knowledge of digital gadgets (e-literacy)	Smart Phones		Computer
	Campaigns for Digital literacy			
	No of beneficiaries % (M/F)	Total	Male Total No Percentage	Female Total No Percentage
	Types of skills with villagers			
	Schemes undertaken for skill development			
	No of beneficiaries % (M/F)	Total	Male Total No Percentage	Female Total No Percentage
	Identified needs for skill development			
	Agencies involved in skill development/training			

5. Demographic data (Talati/Sarpanch)

	% Population disabled				
	% Population of single woman				
	Age profile (age bracket with the largest % of population)				
	Age profile of the village	0-14	14-35	35-60	>60

6. Basic Infrastructure Information of the villag (Sarpanch/Talati/ Water supply dept.)

Water				
Water supply system	Piped	Public Tap	Public Hand Pumps	
Water supply source	Lake	Ground Water	Canal	Tankers
Water supply agency	Panchayat	State Govt. Agency	Other	
Depth of water table	Winter	Summer	Monsoon	
Timing for water supply	Once in a day (Hours)	Twice in a day(hours)		
Water supply treatment plant	Type	capacity		
ESR and Ground storage capacity	No of ESR:	No of sump:		
	Total Storage Capacity:	Total Storage Capacity:		
Age of infrastructure				
Number of	Hand Pumps	Stand Posts		
HH Covered by each hand pump and stand post				
% of HH with individual WS connection				
Per capita availability of water				
Metering system	yes	no	Coverage(%HH)	
Quality of water				
Water supply systems of historical/religious significance				

Sanitation and Drainage					
Drainage system in the village	Open Drainage	Closed drainage	Piped drainage network	No drainage	
Agency providing Drainage					
Toilet coverage in the village (%) Caste wise	Total (%)				
Condition of individual toilets					
Percentage open defecation					
Number of public toilets in the village					
Condition of public toilets	good	average	bad		
Public toilets connected to	A) Open drain	B) Soak Pit	C) Septic tank	D) Sewerage	
If not connected to sewage, Alternative Grey water Disposal	A) Side Drain (Closed)	B) Side Drain (Open)	C) Discharge to open plots / roads	D) Discharge to Water bodies	
Sewerage system coverage (%)					
Sewerage treatment plant	Type	Condition			
Alternate system (if any)					
Recycling system (if any)					
Storm water drains					
% of streets covered with drains					

Type of drains (covered /uncovered)				
Storm water disposal facilities				
Solid waste				
Solid waste collection?	Door to door	Secondary	Dumping	No collection
Collection frequency				
Segregation methods used				
Agency for solid waste collection				
Service charge for Door to door collection (Rs.)				
Existing facilities for treatment				
Existing facilities for disposal				
Any non-conventional/nonconventional method for organic composting				
Waste disposal facilities for hazardous/industrial waste				

Do you reuse the solid waste elsewhere?	Yes		Where:				No		
Electricity									
Electricity coverage of village									
Availability of three phase electricity	Yes				No				
No of connections	Residential connections		Agricultural connections				Industrial Connections		
Power cut Duration Issues (hours/day)									
Non-conventional source of electricity									
Potential of renewable energy usage	Wind		Solar				Mini Hydel		
Cooking fuel/ LPG availability (Sarpanch, LPG agencies)									
What is the **cooking energy** used?	A. LPG Gas cylinder		B. Pipe system		C. kero sene		D. Fire wood		E. others
No of HH with LPG connections									
No of LPG godowns									
Social Infrastructure (Sarpanch, Schools, Hospitals) **{All School data to be written individually on left page for each school}**									
No. of **Educational** institutions in village (If not available then distance of it from the village)	A. Primary School		B. Secondary School		C. Higher secondary school		D. Govt. College		E. ITI center
	Govt	Pvt	Govt	Pvt	Govt	Pvt	Govt	Pvt	F. Aangan wadi

School specifications	No of standards	Total no of classes	No of teachers	No of male students	No of female students	
	Separate toilets	Drinking water	Bench availability	Play ground	Compute r Lab	Mid-day meal
School for physically challenged person						
Healthcare facilities in village and no.	A. Primary health center	B. Samuhik Arogya Kendra	C. Govt. Hospital No. Of beds :	D. Mobile health unit	E. Veterinary hospital	
	F. Lady health visitor?	G. Pathological services		H. Doctor availability in village		
If not in village than Distance from village						
Infrastructure facilities at health care centers	No of beds:	Operation theatre	Maternity service	Ambulance		
	X-ray, Citi scan machines					
Diseases in last one year						
Road Network						
Coverage of village streets						
Length of roads in % (length in km)	Kutcha	Semi-Pucca	pucca			
Connectivity with major roads	MDR	State Highway	National Highway			

Width of village streets(motorable/non-motorable)		motorable		Non-motorable
Capacity of existing roads				
Pedestrian pathways available				
Transportation (ST depot, Sarpanch)				
Public transport at HH level	Chhakada	Rickshaw	Tempo	Others
Public transport	Direct connectivity to taluka HQ		Direct connectivity to District HQ	
	Frequency per day		Frequency per day	
Destination with highest frequency of	Bus		Chhakada	
Public transport connectivity at Cluster level	Bus Terminals	Railway stations	Local Trains connectivity	
Improvement proposal				
Village street lights				
Street Light availability(per km)	Yes		No	
Type of street lights	LED		Sodium vapour	
Nonconventional methods for Street lighting				
No of street lights to be replaced				
Irrigation (Talati/Sarpanch)				
Source of Irrigation	Well/Tube well	Canal	Khet talavadi	Rain water

Area under irrigation (in hectares)				
Fuel used for irrigation	Electricity	Diesel	Kerosene	Non-conventional
Area under drip irrigation				
Environment Information (General public)				
Drinking water quality	Good	Satisfactory	Bad	
Usage of renewable energy in village	Solar	Biogas	Wind	Other
Major Polluters	Vehicle	Industries	Sewage	Solid waste

7. Economic profile of the village (Talati/Sarpanch)

Presence of occupations in the village	Agriculture	Industrial	Home based industry	Others
Occupation that villagers are involved in				
Home based or traditional industries				
MSME cluster details	No:	Types:		
Employment Generated by				
Average distance to work place				

8. Agricultural Services and Processing (Talati/Sarpanch)

Type of crops	
Crop Yield and area	

Any Existing agricultural service center						
Yes	No					
Issues and need for up gradation						
Agro processing Industries		Type	Size	Scale		
Yes	No					
Presence of adequate storage & warehousing facilities						
Presence of cold storage facilities						
Presence of mandis/wholesale agri produce markets (No and distance between these mandis)						
Issues related to optimum yield						
Identified requirement of additional support infrastructure to						

improve agri-productivity.					

9. Digital Aminities (Talati/Sarpach)

ICT enabled front end Common Service Center		Issues :
yes	no	
Connectivity under NOFN/Broad Band connectivity		
Coverage of the above 2 services		
Coverage under E-Kranti		
% of households with digital connectivity		
% of households with at-least one e literate person		

10. Institutional infrastructure (Talati/Sarpanch)

Banks			
Sahkari Mandali			
Post office			
ATM			
Cooperative dairy			
Panchayat Building			
Anganwadi			
Gram Hat			
Distance of APMC market			
Ware houses & cold storages			
Public Distribution System			

Petrol Pump	
Religious institutions in village	

11. Programmes, schemes and sanctioned amount for the same in 5 years

Scheme	Year of starting	No of beneficiaries	Funding	
			Received	Used

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