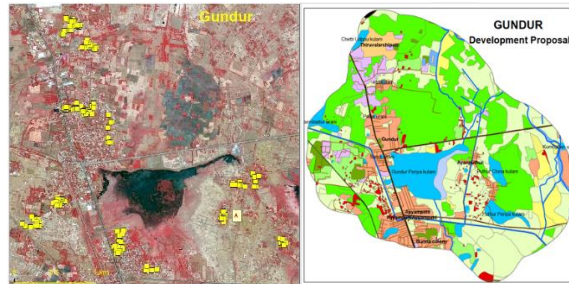




सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF PANCHAYATI RAJ

**SPATIAL PLANNING IN GRAM
PANCHAYATS**



GUNDUR GRAM PANCHAYAT

(Tiruverumbur taluk, Tiruchirapalli district, Tamil Nadu)



DEPARTMENT OF ARCHITECTURE
NATIONAL INSTITUTE OF TECHNOLOGY
TIRUCHIRAPPALLI

*(in collaboration with Regional Remote Sensing Centre - South,
NRSC/ISRO, Govt. of India, Bengaluru)*

JANUARY 2021

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ACKNOWLEDGEMENTS

National Institute of Technology Tiruchirappalli, Department of Architecture would like to thank the Ministry of Panchayati Raj for offering us an opportunity to work on the project SPATIAL PLANNING IN RURAL AREAS for two-gram panchayats in Tamil Nadu. NIT Tiruchirappalli is grateful to Mr. Sunil Kumar IAS, Secretary, Mr. Kushwant Singh Sethi IAS, Joint Secretary and other officials in the Ministry for offering us the opportunity and also for the encouragement and guidance for successful completion of the project.

We would like to thank the officials and scientists of NRSC and NIC officials for their inputs and support. We express our sincere and special thanks to the officials and scientists RRSC-South, Bangalore, NRSC for their continuous help and guidance throughout the project.

NIT Tiruchirappalli would also like to thank officials of Directorate of Rural Development & Panchayat Raj Department, Government of Tamil Nadu for their support to complete this project. We would like to thank the elected president of the Gram Panchayat for the excellent cooperation and help extended for completion of this project. We would like to thank the Village Administrative Officer (VAO), and office secretary in gram panchayat office for providing all required information and records. Special thanks to people of the gram panchayat who helped us in carrying the household surveys and field studies.

We would like to thank the Director, Dean (R&C) for providing us necessary support for the completion of this project. Special thanks to our technical people Mrs. Aananthi Mohankumar, Mr. Jose Desouza Aanand and Mr. M. Pandiarajan for their full support and help. We would like to thank everyone who contributed either directly or indirectly for the completion of this project.

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List of Abbreviations

DEM	Digital Elevation Model
DOP	Date of Pass
FCC	False Colour Composite
NCC	Natural Color Composite
GIS	Geographic Information System
GP	Gram Panchayat
GPS	Global Positioning System
GPSDP	Gram Panchayat Spatial Development Plan
ICT	Information and Communication Technology
IRS	Indian Remote Sensing
LULC	Land Use Land Cover
RS	Remote Sensing

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

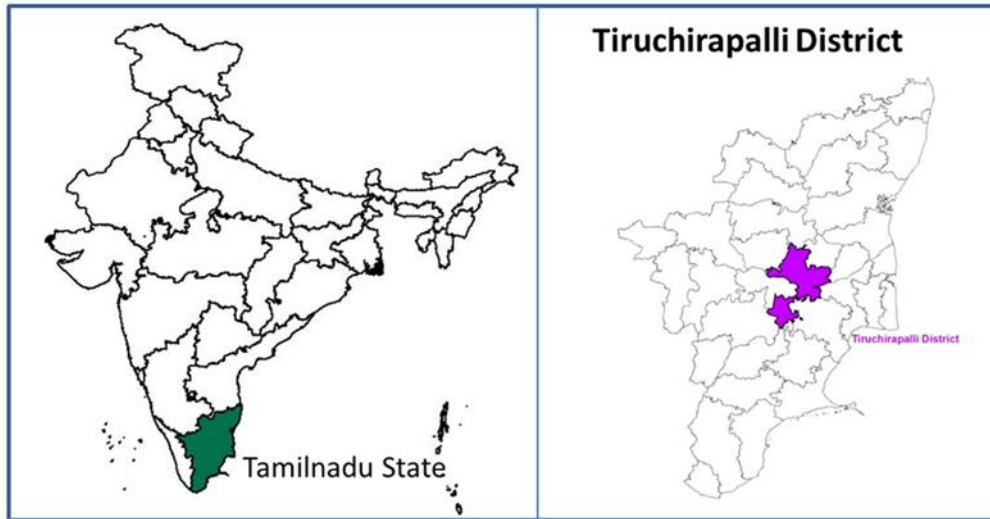
Remarkable economic growth, with significant achievements in the areas of agriculture, health, rural development, poverty alleviation, education and science & technology, has been experienced in India during last few decades. Still the rural poor face unemployment, poor infrastructure, low literacy level, inequality, low per capita income and consequent low standards of living. Most of the developments are taking place in urban areas and rate of development is high in metros and large cities. These developmental activities taking place in urban areas extend to peri-urban areas as haphazard development mainly in villages adjoining the urban areas located on NH and major highways and. These haphazard, unregulated developments also lead to environment and other issues in the rural areas.

The rural areas have vast land area, the natural resource that is indispensable for development activities. For any nation, effective utilization of natural resources and their management are extremely essential. Hence, there is a need to catalyze the planning process at grassroots level. Land is a limited resource and has pressure from social, economic and environmental needs, including urbanization, industrialization, mining, transportation, rural development, protection of environmentally sensitive zones and resource areas. Unplanned development in rural, peri-urban areas and that in the vicinity of national and state highways also has adverse social, environmental and health hazards. Spatial planning in rural areas is of paramount importance in order to have well-designed rural communities, as well as scientific and orderly disposition of land resource. This would in turn foster economic development and contribute to the ease of living along with improvement in the quality of life.

The professional assessment of the ground situation and proposals for the future sustainable development within the bounds of demographic, physical, socio-economic, jurisdictional and financial aspects for the gram panchayat – GUNDUR, located in Tiruverumbur taluk and Tiruchirappalli district is presented in this report.

1.2 TIRUCHIRAPPALLI DISTRICT

Tiruchirappalli District in Tamil Nadu is located on the banks of the Kaveri River in Tamil Nadu, India. The main town in Tiruchirappalli District and the headquarters is the city of Tiruchirappalli. As per 2011 census data, the district had a population of 2,722,290 with 1,013 females for every 1,000 males.



Source: Regional Remote Sensing Centre - South, NRSC/ISRO, Govt. of India, Bengaluru



Source: Tiruchirappalli District Census Handbook 2011

Figure 1.1 Tiruchirappalli District

The extent of the district is 4,404 square kilometres and bounded in the north by Salem district, in the northwest by Namakkal district, in the northeast by Perambalur district and Ariyalur District, in the east by Thanjavur District, in the southeast by Pudukkottai District, in the south

by Madurai District and Sivagangai District, in the southwest by Dindigul district and, in the west by Karur district. The Kaveri river flows through the length of the district and is the principal source of irrigation and drinking water.

According to 2011 census, Tiruchirappalli district had a population of 2,722,290 with a sex-ratio of 1,013 females for every 1,000 males. The Scheduled Castes and Scheduled Tribes accounted for 17.14% and 0.67% of the total population respectively. The average literacy of the district was 74.9%, compared to the national average of 72.99%. Tiruchirappalli district had a total of 698,404 households. There were 1,213,979 workers in total, comprising 161,657 cultivators, 319,720 main agricultural labourers, 25,174 in house hold industries, 575,778 other workers, 131,650 marginal workers, 9,012 marginal cultivators, 59,062 marginal agricultural labourers, 5,212 marginal workers in household industries and 58,364 other marginal workers in Tiruchirappalli District according to 2011 census (District Census Handbook 2011).

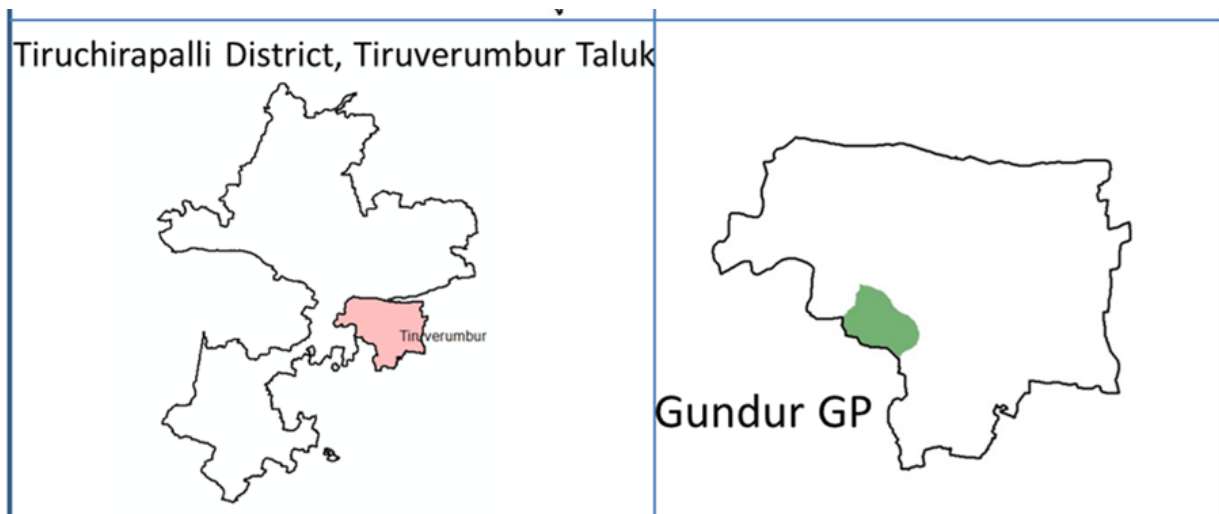
Tiruchirappalli is a place of historic, cultural and economic importance. The district has a rich and diverse cultural heritage. The prominent historical monuments in Tiruchirappalli include the Rock fort, the Ranganathaswamy temple at Srirangam, the Erumbeeswarar Temple at Tiruverumbur, the Jambukeswarar temple at Thiruvanaikaval and Our Lady of Lourdes Church. Several temples having religious importance and having heritage values are located within the district and also in nearby districts. The district has several tourist attractions also. The tourist places include railway museum, Mukkombu, Kallanai, Pachamalai, Puliyancholai falls, butterfly park, etc. The district is also known for its exquisite handicrafts, castings and South Indian musical instruments.

The economy of the district is mainly farming and also metal based and other industries. The agriculture practice is sustained by a network of irrigation sources and improved methods of cultivation. The vast tracts of the land in this district are irrigated by the major rivers are Kaveri, Kollidam and their tributaries. The major crops are rice, sugarcane, banana/plantain, coconut, cotton, betel, corn, groundnut, etc. With the commissioning of Bharat Heavy Electricals Limited in the 1960s, the district endured extensive economic development in the industrial development. Major industries in Tiruchirappalli include Bharat Heavy Electricals Limited (BHEL), High Energy Projectile Factory (HEPF), Golden Rock Railway Workshop, Ordinance Factory Tiruchirappalli, Light and heavy metal-based industries, Food Processing, Sugar Mills,

Cigar Making, Hosiery and garments, IT/BPO, manufacturing of Synthetic Stones for Jewellery, etc.

Tiruchirappalli district is also well-known educational centre in Tamil Nadu. The major educational institutions are National Institute of Technology Tiruchirappalli, Tamil Nadu National Law School, Indian Institute of Management, Bharathidasan University, Anna University Tiruchirappalli, Indian Institute of Information Technology Tiruchirappalli, Government Medical College, National Research centre for banana, and Agricultural College & Research Institute. The district has a private medical college and several business schools, engineering, arts and science, polytechnic colleges. The district has several reputed schools including two Kendriya vidyalayas.

Tiruchirappalli district has 04 revenue divisions, namely Tiruchirappalli, Srirangam, Lalgudi and Musiri. The district has 11 taluks namely Tiruchirappalli west, Tiruchirappalli east, Lalgudi, Manapparai, Musiri, Thuraiyur, Mannachanallur, Srirangam, Thottiyam, Tiruverumbur, and Marungapuri. The number of revenue villages in each of the taluks is 13, 11, 93, 51, 61, 67, 46, 59, 30, 31 and 45 respectively. The gram panchayat Gundur is located within Tiruverumbur taluk.

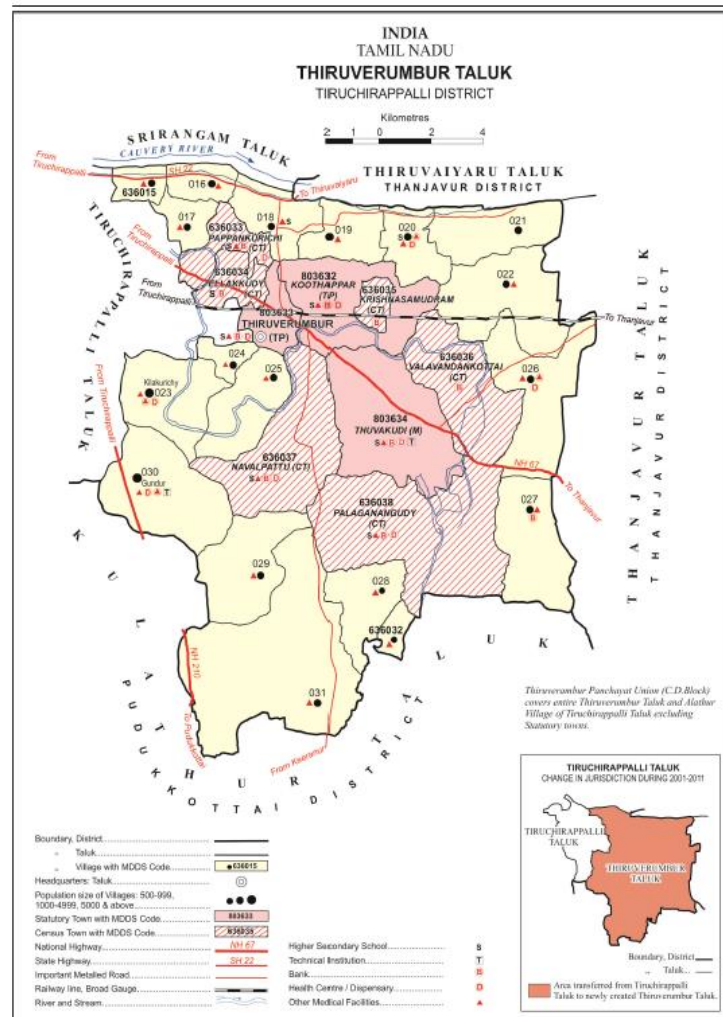


Source: Regional Remote Sensing Centre - South, NRSC/ISRO, Govt. of India, Bengaluru

Figure 1.2 Tiruverumbur Taluk and Gundur GP

1.3 TIRUVERUMBUR TALUK

The headquarters of the Tiruverumbur taluk is the town of Tiruverumbur. This taluk has 18 inhabited villages. As per 2011 census, the population of Tiruverumbur taluk is 225,517 with 114753 males and 110764 females. Out of the total population, 75% people lives in Urban areas while 25% lives in the Rural areas. There were 965 women for every 1000 men. The sex ratio of urban areas in Tiruverumbur Taluk is 953 while that of rural areas is 1,005. The overall literacy rate of taluk is 89.16%. The male literacy rate is 93.89 % and the female literacy rate is 84.27% in Tiruverumbur Taluk. The literacy rate of rural areas of this taluk is 84.65 90.6 78.79%. The male literacy rate is 90.60 % and the female literacy rate is 78.79% in rural areas of Tiruverumbur Taluk. The population of Children of age 0-6 years in Tiruverumbur Taluka is 21460 which is 9.5% of the total population (District Census Handbook 2011).



Source: Tiruchirappalli District Census Handbook 2011

Figure 1.3 Tiruverumbur Taluk

1.4 GUNDUR GRAM PANCHAYAT

Gundur is a large village located in Tiruverumbur Taluk of Tiruchirappalli district, Tamil Nadu. As per 2011 census, there were 2504 households in this GP. The Gundur GP has population of 10386 of which 5186 are males while 5200 are females as per Population Census 2011.

As per constitution of India and Panchyati Raaj Act, Gundur village is administrated by Sarpanch (Head of Village) Mrs. Lakshmi Thirumurugan, who is elected representative of village. Gundur comprises of 5 hamlets namely Gundur, Thiruvallarchipatti, Ayyampatti, G. Burma Colony and Ayanputhur. All the hamlets are well connected with pucca roads. The map showing the revenue boundaries of constituent villages is shown in Figure 1.4.

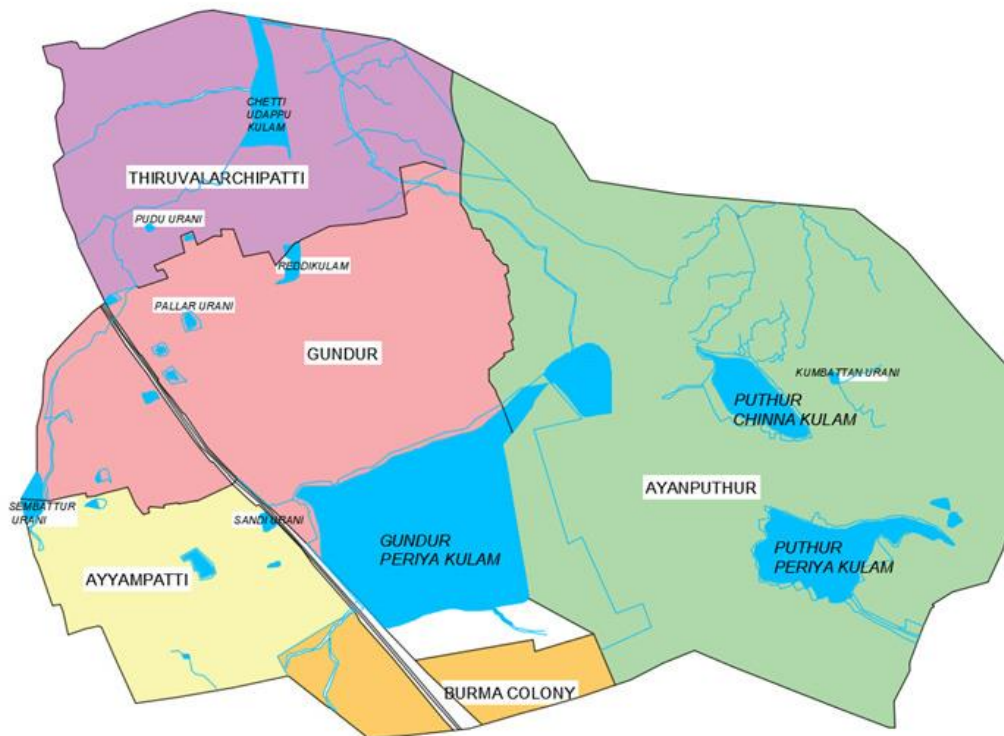


Figure 1.4 Hamlets & Lakes – Gundur GP

1.5 OBJECTIVES

The basic objectives include

1. To understand the demographic profile and their socio-economic characteristics;
2. To ascertain the current status of physical infrastructure, services & facilities, open space & recreation and geographical & natural resources;

3. To assess the present gaps and future needs of this GP in terms of economy, physical infrastructure, services & facilities, and open space & recreational facilities
4. To propose effective utilisation and management of natural resource of the GP.
5. To propose integrated development strategies for the GP.

As the information on natural resources of a region is crucial to any planning process, the present study was taken up with the following objectives (*Regional Remote Sensing Centre - South, NRSC/ISRO, Govt. of India, Bengaluru*):

1. Inventory and spatial analysis of natural resources that include thematic layers viz., infrastructure layers, LU/LC, slope, drainage network & water bodies, contours, soil etc.
2. Generation of Land and Water resource development plans

1.6 METHODOLOGY

1.6.1 INVENTORY OF NATURAL RESOURCES USING GEOSPATIAL TECHNOLOGIES

(Regional Remote Sensing Centre - South, NRSC/ISRO, Govt. of India, Bengaluru)

Developmental planning is a complex process of decision making based on the information about the status of resources, socio-economic conditions and institutional constraints. Reliability of the databases, both the spatial and non-spatial, is therefore crucial to the success of the developmental planning. Hence, it is necessary to understand various elements of Gram Panchayat and their interrelationship for ecological planning.

The conventional techniques employed to provide spatial information on natural resources are highly tedious, time consuming and more often subjective; whereas satellite remote sensing with synoptic and regular coverage has the requisite potential to provide this information in a timely and more objective manner. Remote sensing (RS), Geographic Information System (GIS) and Global Positioning System (GPS) constituting the emerging field of geospatial technology offer great promise for generating spatial information on natural resources at national and subsequent disaggregated levels. With advancements in space technology, availability of high resolution data and advanced processing techniques, the remote sensing technique has become a powerful tool for mapping and monitoring of natural resources. These

techniques have immense potential for providing spatial information on natural resources resource mapping and monitoring at regular intervals.

GIS is a powerful tool for integrating natural resources for development of spatial decision support systems. Thus, geospatial technology along with Information and Communication technology (ICT) has become a very useful technique and powerful tool for providing spatial information including development of land use information systems, towards decision making. Further, the system is also highly useful for updating and monitoring the dynamics of land use changes through the monitoring capabilities of the multi-temporal remote sensing data. Remote Sensing in conjunction with Geographical Information System (GIS) and other IT tools is also emerging as flexible, efficient, speedy, cost-effective and reliable technology for obtaining information on natural resources analysis and modeling. It is an integral part of data management in large number of applications. Spatial information - images and maps, forms the foundation and basis for the most planning and implementation of developmental activities; infrastructure development; disaster management support; environmental monitoring; natural resources management and many other national activities.

Over the last two decades remote sensing and GIS have been widely used for the preparation of different types of thematic layers and integrating them for different applications that include land and water resources planning, agricultural applications, water resource management, disaster management, forestry applications, watershed management and urban applications etc.

1.6.2 DATA COLLECTION

The required data for spatial planning of gram panchayat was obtained through

1. Field studies: The field studies were carried out mainly to update the land use map, marking the location various facilities and also to understand the present problems faced by the people of this GP.
2. Household surveys: Household surveys were carried out in 5% of the households using the mobile app developed by NRSC. The household survey was carried out in 208 households covering all hamlets, different socio-economic groups of population and different typologies of houses (Figure 1.5).
3. Discussions/ feedback from various stakeholders: The information regarding the facilities available, shortcomings and expectations were collected through informal discussions and feedbacks from different sections of people.

4. Gram panchayat office: The details regarding population, housing, infrastructure, facilities, welfare projects being carried out and budget of GP were obtained from the gram panchayat office.
5. Revenue Department – Village Administrative Officer & other revenue records of state government: Survey number wise land records, extent of land area occupied by various uses, etc., were collected.
6. Information/ Data/ Maps published by NIC & NRSC
7. Census data: The demographic details were obtained from Tiruchirappalli District Census Handbooks – 1961, 1981, 1991, 2001 and 2011.
8. Information/ Data/ Maps published by NIC & NRSC
9. Census data

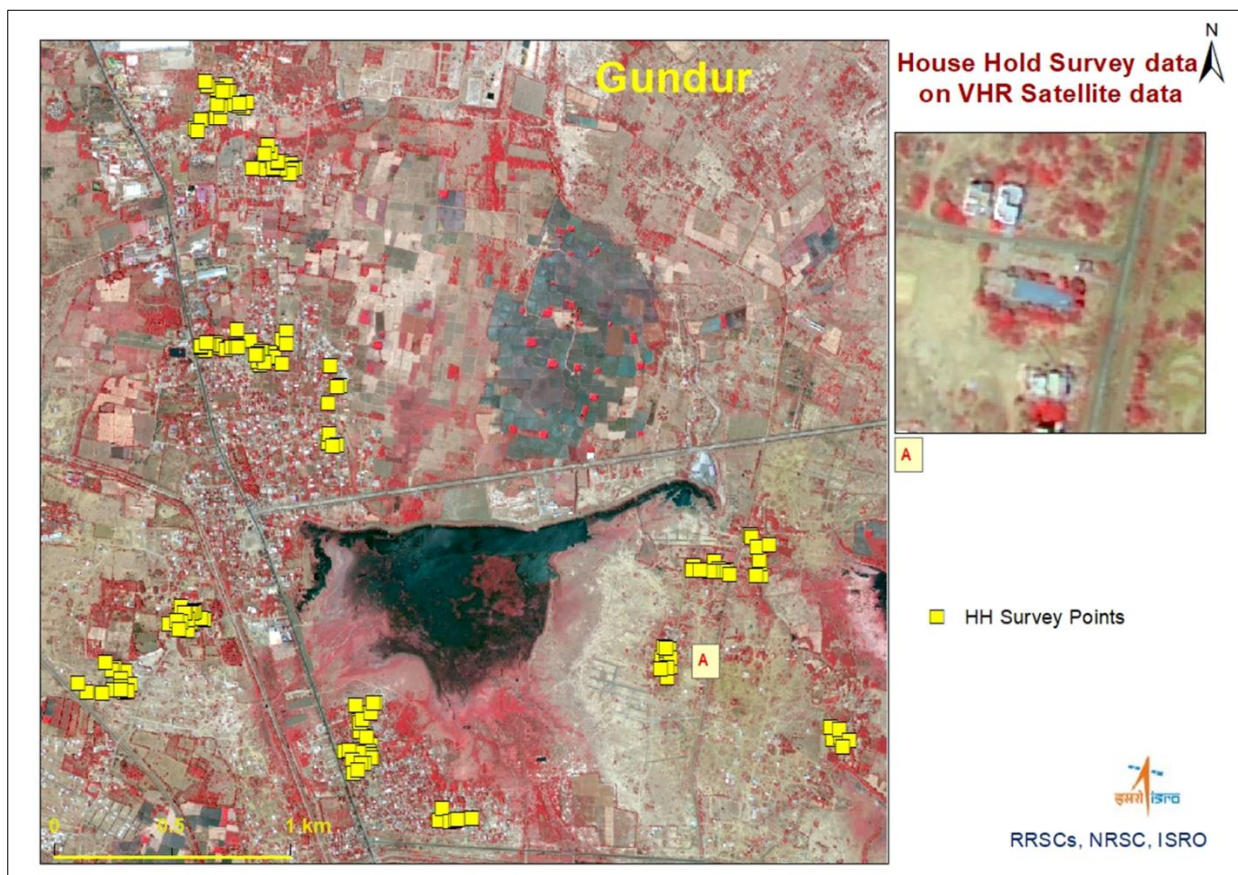


Figure 1.5 Household Survey Points

CHAPTER 2

PHYSICAL FEATURES AND LANDUSE LAND COVER DETAILS OF GRAM PANCHAYAT

2.1 INTRODUCTION

Gundur GP is extending on either side of NH336 connecting Tiruchirappalli and Pudukkottai on the southern direction Tiruchirappalli city, adjacent to Tiruchirappalli International Airport. Gundur GP extends from 10°44'29.60"N to 10°46'52.68"N latitude and 78°34'40.95"E to 78°37'0.23"E longitude. The geographical area of this GP is 1359.24.5 hectares. This GP is connected to Tiruchirappalli by NH 336. It is situated 20km away from sub-district headquarter Tiruverumbur and 10km away from district headquarter Tiruchirappalli.

2.2 PHYSICAL EXTENT

The geographical area of this GP is 1359.24.5 hectares. 837.37.5 hectares is under dry land category that include crop land and fallow. The overall extent of wet lands is 168.96.0 hectares, of which 152.07 hectares is crop land and 16.89 hectares is fallow land. 5.94.5 hectares of land is under fallow category (with taxation & non-taxation) and the extent of govt. land (poramboke) is 346.96.5 hectares (Table 2.1 & Figure 2.1). There are 3 large lakes – Gundur Periyakulam, Pudhur Periya kulam, Pudhur Chinna kulam, and several small ponds in Gundur GP (Fig 1.4) Mayanur Barrage canal is also used for irrigation of agricultural lands.

Table 2.1 Land Details – Gundur GP

Classification	Area		%	Crop Land	Fallow
	Hectare	Ares			
Total Dry Lands	837	37.5	61.6	103.30	734.07.5
Total Wet Lands	168	96.0	12.4	152.07	16.89
Fallow & Other Uses	05	94.5	0.5		
Govt. Land (Poramboke)	346	96.5	25.5		
Total	1359	24.5	100	255.37	

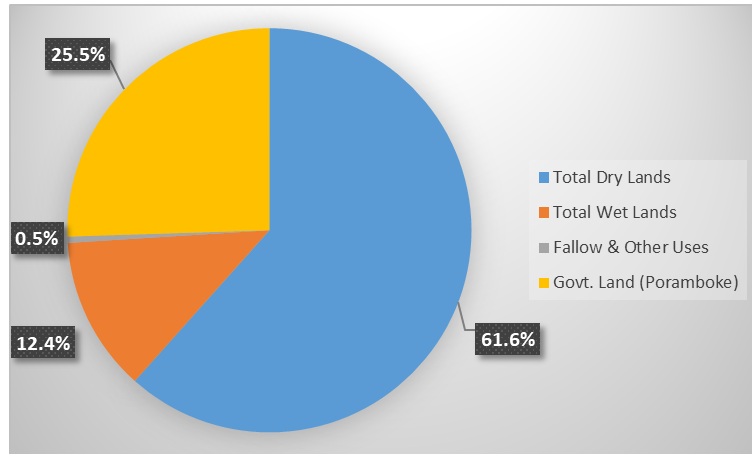


Figure 2.1 Land Details – Gundur GP



Figure 2.2a Gundur Periyakulam



Figure 2.2b Puthur Periyakulam



Figure 2.2c Puthur Chinnakulam



Figure 2.2d Mayanur Barrage canal



Figure 2.2e Kattukarai Urani



Figure 2.2f Urani in Thiruvallarchipatti



Figure 2.2g Pallar urani



Figure 2.2h Chetti udappu kulam



Figure 2.2i Railway track on west end

2.3 LAND USE/ LAND COVER DETAILS

The major land area is under non- agricultural use in this GP. The non-agricultural uses such as housing and other areas of hamlets, institutional areas, industrial areas, scrub and fallow lands occupy significant percentage of land area. As per Tiruchirappalli district census handbook 2011, 828.4 hectares of land area was under non-agricultural uses. The barren and uncultivable land area is 38.1 hectares. 5.7 hectares under fallow lands other than current fallows, and culturable waste land area was 60.1 hectares. The net sown area was 426.9

hectares, of which 426.3 was irrigated land area and 0.6 hectares un-irrigated land area (Tiruchirappalli District Census Handbook, 2011).



Figure 2.3 Scrubland vegetation

2.4 INVENTORY OF NATURAL RESOURCES USING HIGH RESOLUTION SATELLITE DATA

(Regional Remote Sensing Centre - South, NRSC/ISRO, Govt. of India, Bengaluru)

Potential tools such as remote sensing and GIS techniques are utilized for generation of various thematic resource maps in conjunction with collateral data. Data integration and generation of development plans are carried out in Geographic Information System environment.

2.4.1. INFORMATION SOURCES FOR DEVELOPMENTAL PLANNING

Satellite data IRS -1D LISS III data, Cartosat and IRS P6 LISS IV data and other collateral data form major source for preparation of various thematic maps as spatial database. The data acquired from the multi-spectral sensors LISS IV (5.6 m resolution) and CARTOSAT (2.5 m resolution) of the Indian Remote Sensing Satellite (IRS) series are extensively used for generating spatial databases. Very high-resolution satellite data (Cartosat 2S & Komsat 3A), is analyzed at finer resolutions to update the spatial layers needed for generating the value-added Land resource and water resource development plans. The data needed for this study is studied in detail and the collected primary maps have been grouped into hydro-geomorphological, topographical, land use/land cover, hydrology and socio-economic parameters (Table 2.2). Subsequently, these primary maps are used to produce utilitarian types of maps to serve planning decisions. They are derived, in some cases, by direct translation of single thematic map and in others by combination of two or more thematic maps or chosen parameters of the different themes (Table 2.3). Natural resources data representing environmental status of the study area that were generated under various national level projects at 1:50000 scale was

considered for the present study and are presented below. The database was standardized for integrated analysis under GIS environment.

Table 2.2: Information sources for development planning

Data/map	Source	Spatial/Non-spatial	Scale
Digital Elevation Model	Cartosat Stereo data	Spatial	10 m
Contour	CARTODEM	Spatial	5m
Geological map	Rajiv Gandhi National Drinking Water Mission	Spatial	1:50K
Geomorphological map		Spatial	1:50K
Structures/Lineaments		Spatial	1:50K
Soil Texture	NRIS	Spatial	1:50K
Land use/cover	Very high-resolution data	Spatial	1:4K
Drainage map and Surface water bodies	High resolution satellite data	Spatial	1:4K
Meteorological data	IMD	Spatial	25 km grid
Settlement		Spatial	1:4K
Infrastructure	High resolution satellite data	Spatial	1:4K
Village boundaries		Spatial	1:50K

Table 2.3: Derived spatial databases required for planning

Derived map	Theme map	Remarks
Contour/Slope	Topographical map/IRS PAN stereo data	Derived from DEM
Groundwater potential	Geology, Geomorphology, borewell, Lithology and yield data	Integration of thematic maps and point database
Water Resource Development Plan	Slope, soil map, land use, drainage order, lineament, Runoff Potential	Multi Criteria analysis
Land Resource Development Plan	Slope, soil map, land use, Ground Water Potential, Geomorphology	Multi Criteria analysis

2.5 SATELLITE DATA USED

(Regional Remote Sensing Centre - South, NRSC/ISRO, Govt. of India, Bengaluru)

High resolution (2.5m), very high resolution (0.7m) satellite datasets and Digital Elevation Model (DEM) were used for preparation of spatial thematic layers for Gundur GP.

2.5.1 HIGH RESOLUTION SATELLITE DATA (HRS DATA)

Merged product of Cartosat-1 PAN and IRS LISS-IV Mx datasets acquired during 2015-16, in Natural Colour Composite i.e. NCC mode of 2.5m spatial resolution was used for GPSDP planning (Figure 2.4). The latest Resourcesat LISSIV of 2019 (5m) covering the GP is given in Figure 2.5

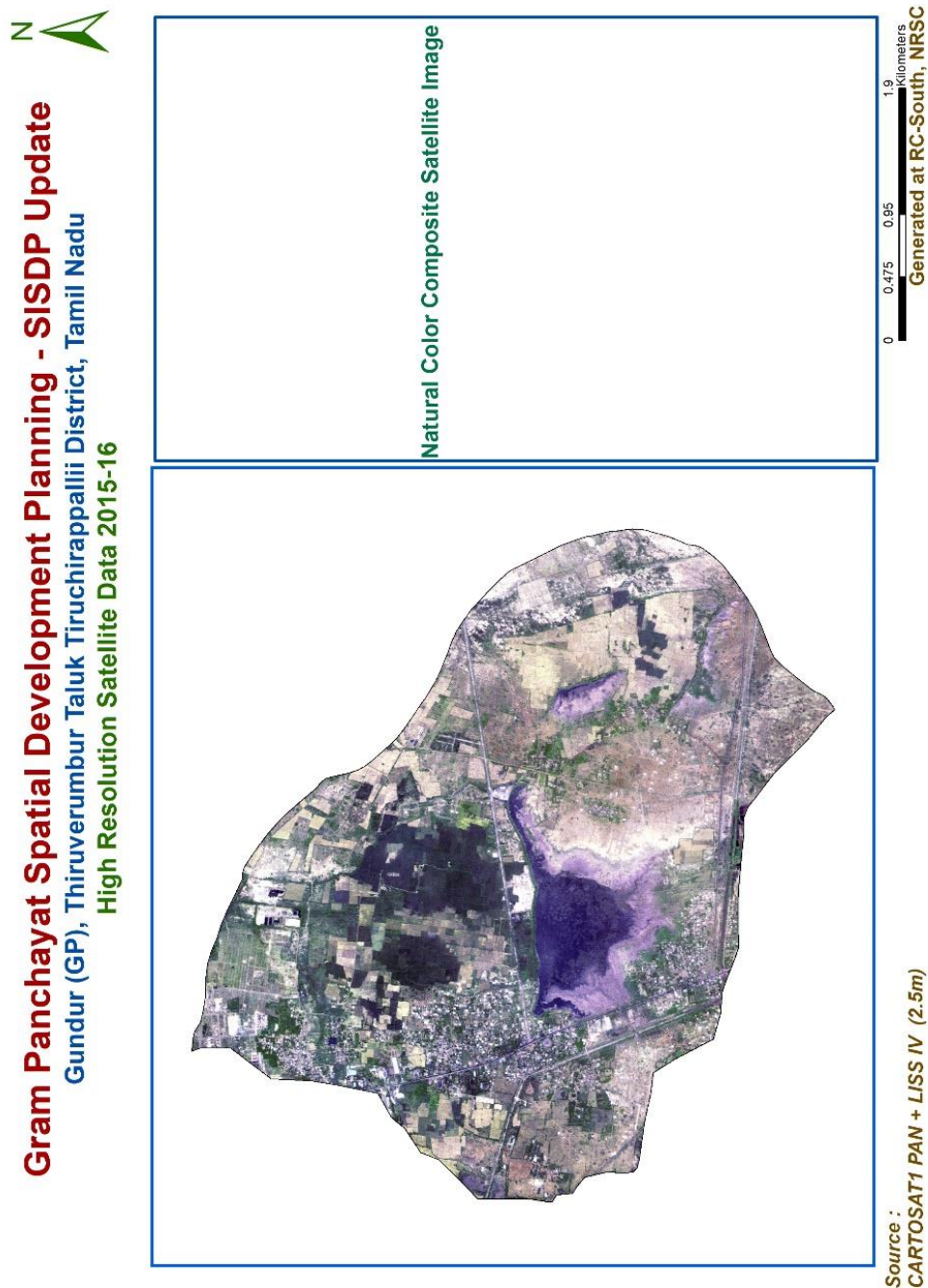


Figure 2.4: CARTOSAT1 PAN + LISS IV data (NCC) of Gundur GP



Gram Panchayat Spatial Development Planning - SISDP Update

Gundur (GP), Thiruverumbur Taluk Tiruchirappallii District, Tamil Nadu

SATELLITE IMAGE 2019

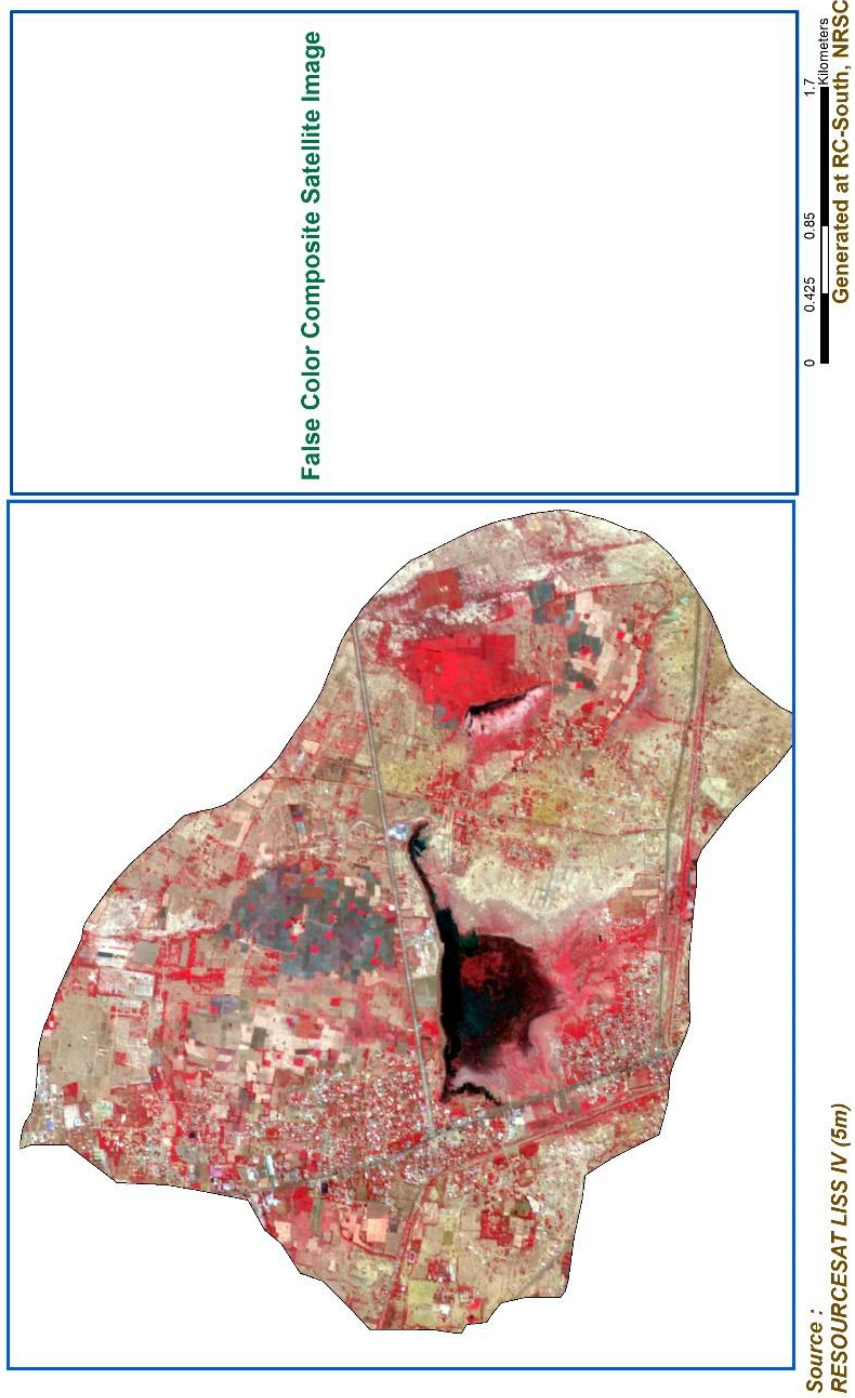


Figure 2.5: Resourcesat LISSIV of 2019 of Gundur GP

2.5.2 VERY HIGH-RESOLUTION SATELLITE DATA (VHRS DATA)

Resource mapping at 1:4,000 scale was carried out using VHRS data at sub-meter resolution

acquired using KOMPSAT-3 sensor (optical high-resolution Korean observation mission of Korea Aerospace Research Institute). KOMPSAT-3A provides panchromatic resolution of 0.55m and multispectral resolution of 2.2 m and has an infrared sensor at 5.5m resolution. The merged product is generated with spatial resolution of 0.7m in False Colour Composite FCC mode (Figure 2.6).

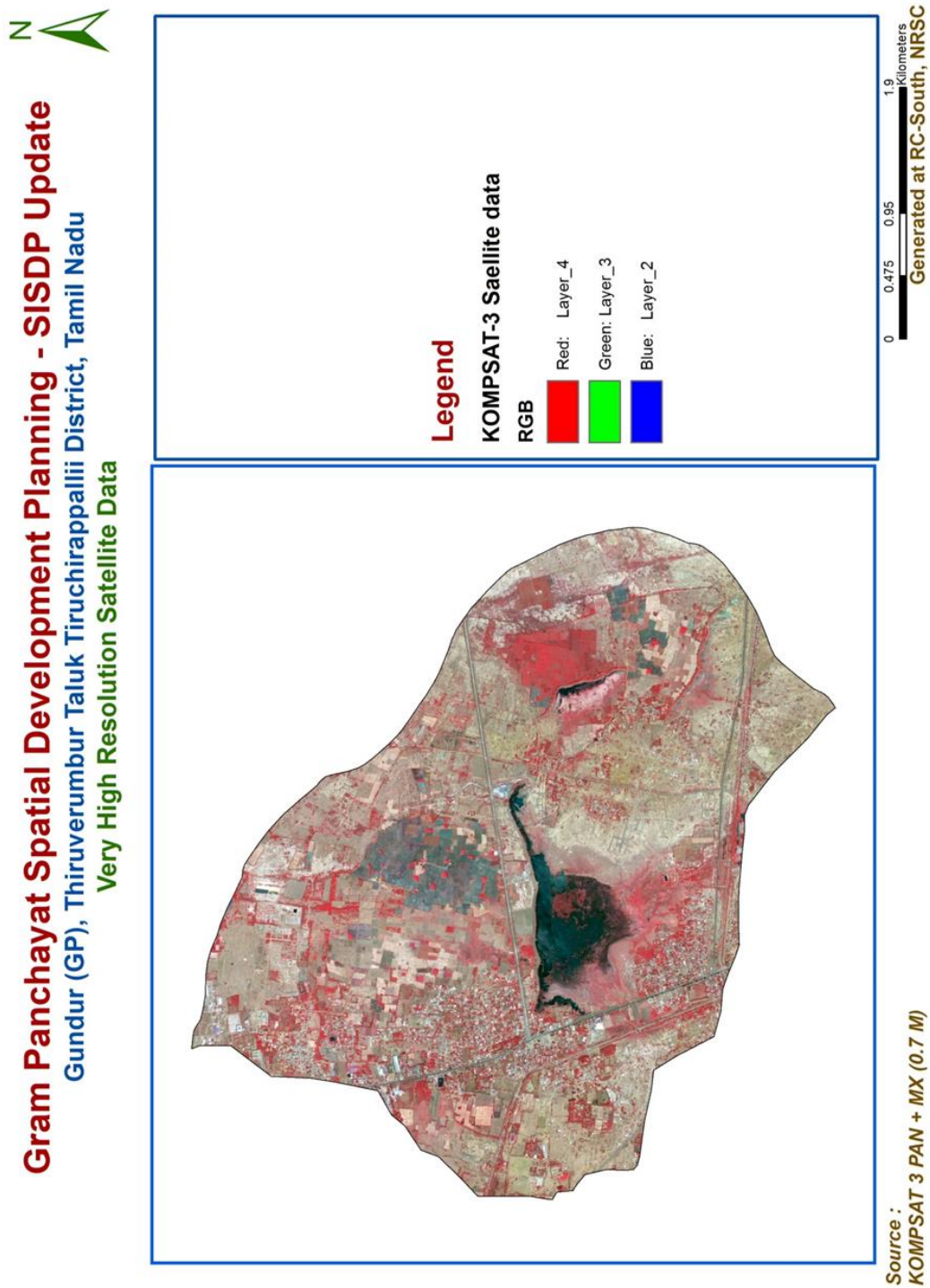


Figure 2.6: Very High Resolution Satellite data of GUNDUR GP

2.6 SPATIAL LAYERS

(Regional Remote Sensing Centre - South, NRSC/ISRO, Govt. of India, Bengaluru)

Spatial layers representing the synoptic view of GP were generated at 1:4,000 and 1:10,000 scales.

2.6.1 SETTLEMENT AND TRANSPORTATION LAYER

For Gundur GP, Settlement and Transportation Layer was generated using VHRS data at sub-meter resolution at 1:4,000 scale (Figure 2.7). Growth of settlement in a particular direction can be analyzed using satellite data more explicitly. Details of type-wise road length are given in Table 2.4 and Rail length in Table 2.5.

Table 2.4: Estimates of type-wise road length for Gundur GP

S. No.	ROAD / RAIL CATEGORY	ROAD / RAIL LENGTH (KM)
1	National Highway	4.47
2	Other Road	2.28
3	Village Road	54.91
	TOTAL	61.66

Table 2.5: Estimates of type-wise rail length for Gundur GP

S. No.	RAIL CATEGORY	RAIL LENGTH (KM)
1	Rail	2.69
	TOTAL	2.69



Gram Panchayat Spatial Development Planning - SISDP Update
Gundur (GP), Thiruverumbur Taluk Tiruchirappalli District, Tamil Nadu
Settlement and Transportation Network Map 2019

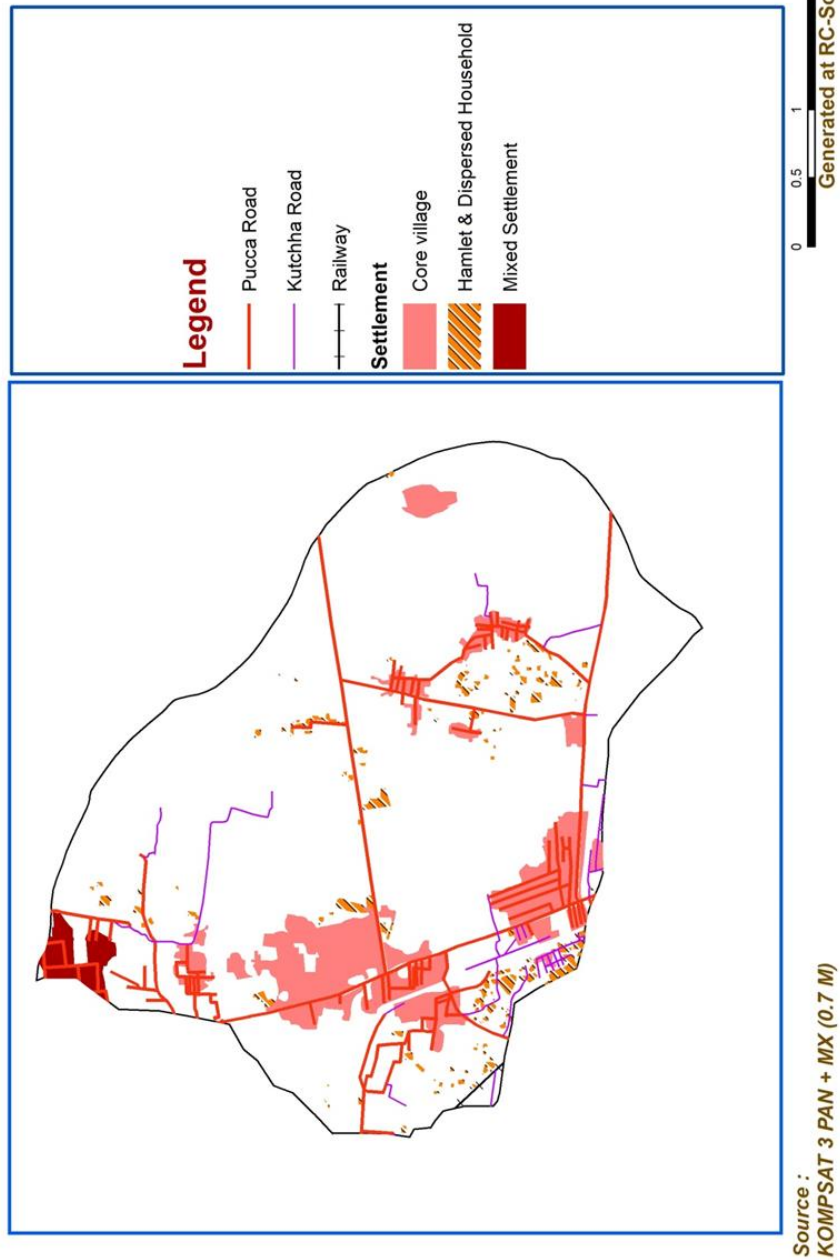


Figure 2.7: Settlement and Transportation Network of Gundur GP

2.6.2 LAND USE LAND COVER MAP (1:4,000 SCALE)

Very high resolution, sub-meter satellite imagery from KOMPSAT-3 sensor (DOP: 01 March 2018) of 0.7m spatial resolution was utilized for preparation of detailed Land Use / Land Cover (LULC) map of Gundur GP. 0.7m merged satellite data was formed by data fusion of panchromatic image (0.7m) and multispectral image (2.8m) in FCC mode, both from

KOMPSAT-3. Onscreen visual interpretation technique was adopted in GIS environment for delineating boundaries of various classes using ArcMap 10.5 software. The merged satellite image was zoomed up to 1:1,500 scale to delineate the feature boundaries. The final LULC map was prepared at 1:4,000 scale (Figure 2.8). Area estimates of various LULC classes in Gundur GP are summarized in Table 2.6. Overall, the GP area was divided into 5 main categories, namely, cropland / agricultural plantations, settlement, wasteland, water and other land use land cover classes. These categories were further subdivided into theme wise classes as indicated in Table 2.6 and the map legends.

Table 2.6: Area estimates of various LULC classes in Gundur GP (1:4k map)

S.No.	CLASS CATEGORY / NAME	AREA (Ha)
A.	CROPLAND/AGRICULTURAL PLANTATIONS	
1	Crop Land	455.86
2	Agriculture Plantation / Orchards	9.30
<i>Sub-total</i>		465.16
B.	SETTLEMENTS	
3	Hamlet & Dispersed Household	23.50
4	Industrial Area / Institution	18.43
5	Core Village	180.05
6	Openland	13.84
7	Layout	128.03
<i>Sub-total</i>		363.85
C.	WASTELAND	
8	Sparse scrub land	302.27
9	Dense scrub land	137.79
<i>Sub-total</i>		440.06
D.	WATER	
10	River (RI)	4.44
11	Tanks	133.87
12	Canal	7.26
<i>Sub-total</i>		145.57
E.	OTHERS	
13	Transport Network	24.71
<i>Sub-total</i>		24.71
TOTAL		1439.36

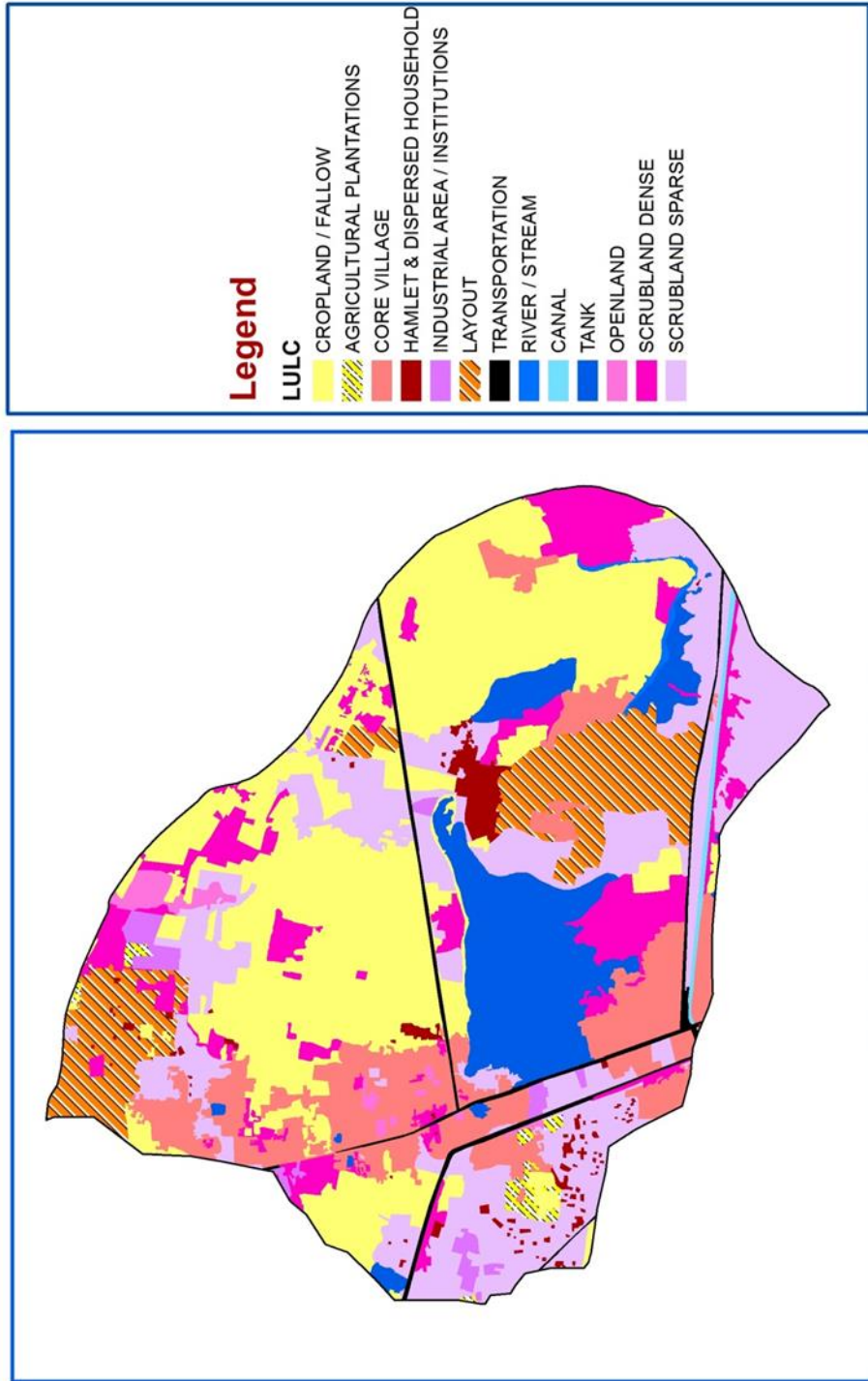
Majority of the area under Gundur GP is under cropland (455.86 Ha), followed by agricultural plantations (9.30 Ha). These two classes cover about one-thirds of the entire GP area (32.3%). The settlement / built-up area in the GP covered about 363.85 Ha, which was further delineated as village settlement (180.05 Ha), hamlet & dispersed household (23.5 Ha, open land & layouts 141.84 Ha. Wastelands occupied 440.06 Ha area nearly one third of the GP area, comprising of sparse scrub land (302.27 Ha) and Dense scrub land (137.79 Ha). Water bodies covered an area of 145.57 Ha (4.44 Ha by river, tanks by 133.87 Ha and canal by 7.26 ha). Other LULC classes covered the remaining area of 24.71 Ha.

2.6.3 LAND USE LAND COVER MAP (1: 50,000 SCALE)

IRS LISS-III multispectral satellite data of spatial resolution 24 m acquired during 2015-16 was used to prepare Land Use Land Cover Map at 1:50,000 scale (Figure 2.9). At a broad level, classes were categorized into Cropped in more than 2 seasons, cropped in 2 seasons, agricultural plantations, rural built-up and waste lands (scrub lands – dense & sparse).



Gram Panchayat Spatial Development Planning - SISDP Update
Gundur (GP), Thiruverumbur Taluk Tiruchirappalli District, Tamil Nadu
Land use/Land cover 2019



0 0.475 0.95 1.9 Kilometers
Generated at RC-South, NRSC

Source :
KOMPSAT 3 PAN + MX (0.7 M)

Figure 2.8: LULC map of Gundur GP at 1:4k scale



Gram Panchayat Spatial Development Planning - SISDP Update

Gundur (GP), Thiruverumbur Taluk Tiruchirappalli District, Tamil Nadu
Land Use/ Land Cover Map (50 K)

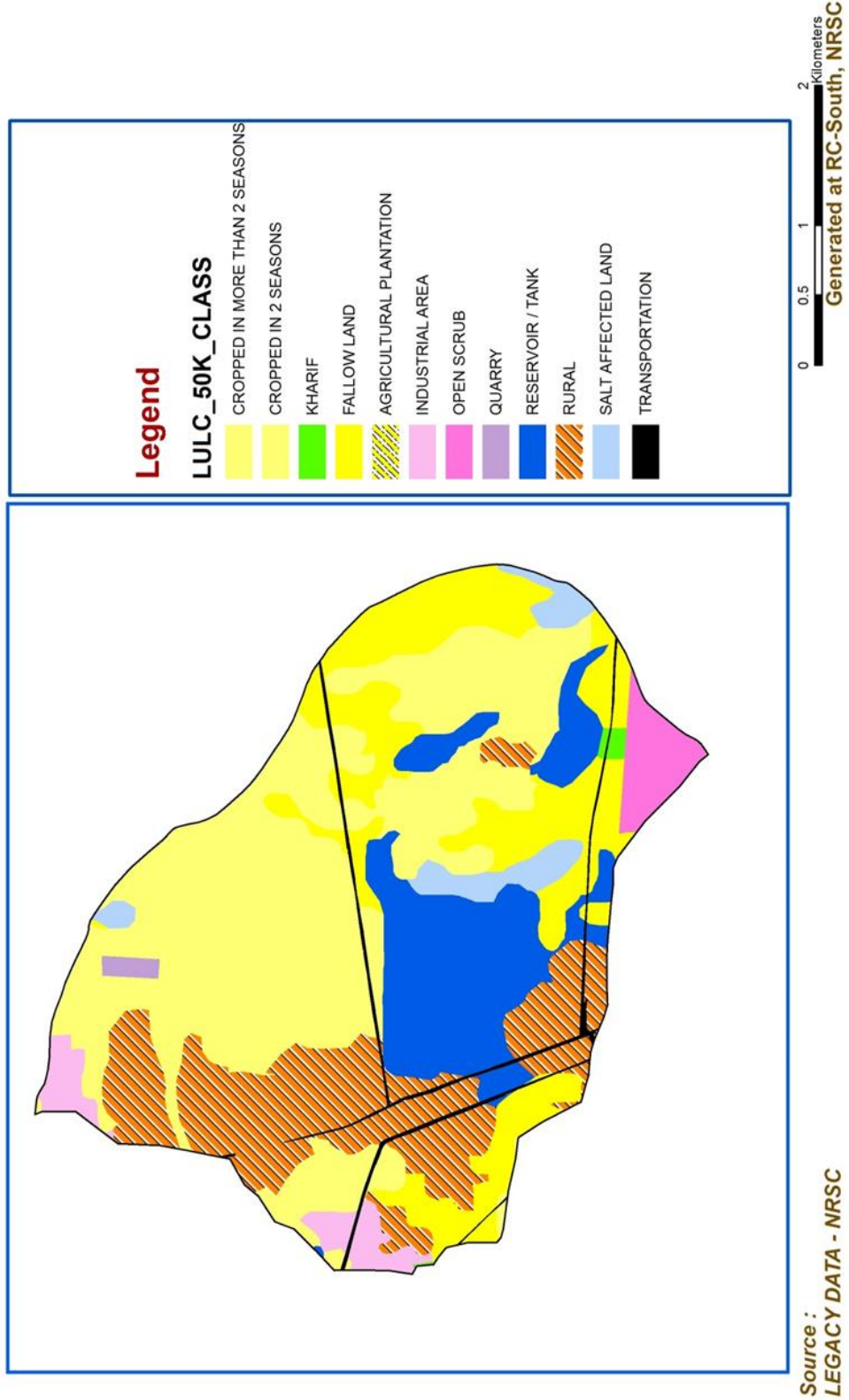


Figure 2.9: LULC map of Gundur GP at 1: 50,000 scale

2.6.4. DRAINAGE NETWORK & SURFACE WATER BODIES

Rivers/streams are natural course of water flowing on the land surface along a definite channel and its spatial distribution in the GP is shown as Figure 2.10. The estimates of drain length are given in Table 2.7. Three major tanks are present in the GP.

Table 2.7: Estimates of drain length for Gundur GP

S.No.	DRAIN CATEGORY	DRAIN LENGTH (KM)
1	River /Stream	4.0
2	Canal	19.27
	TOTAL	23.27

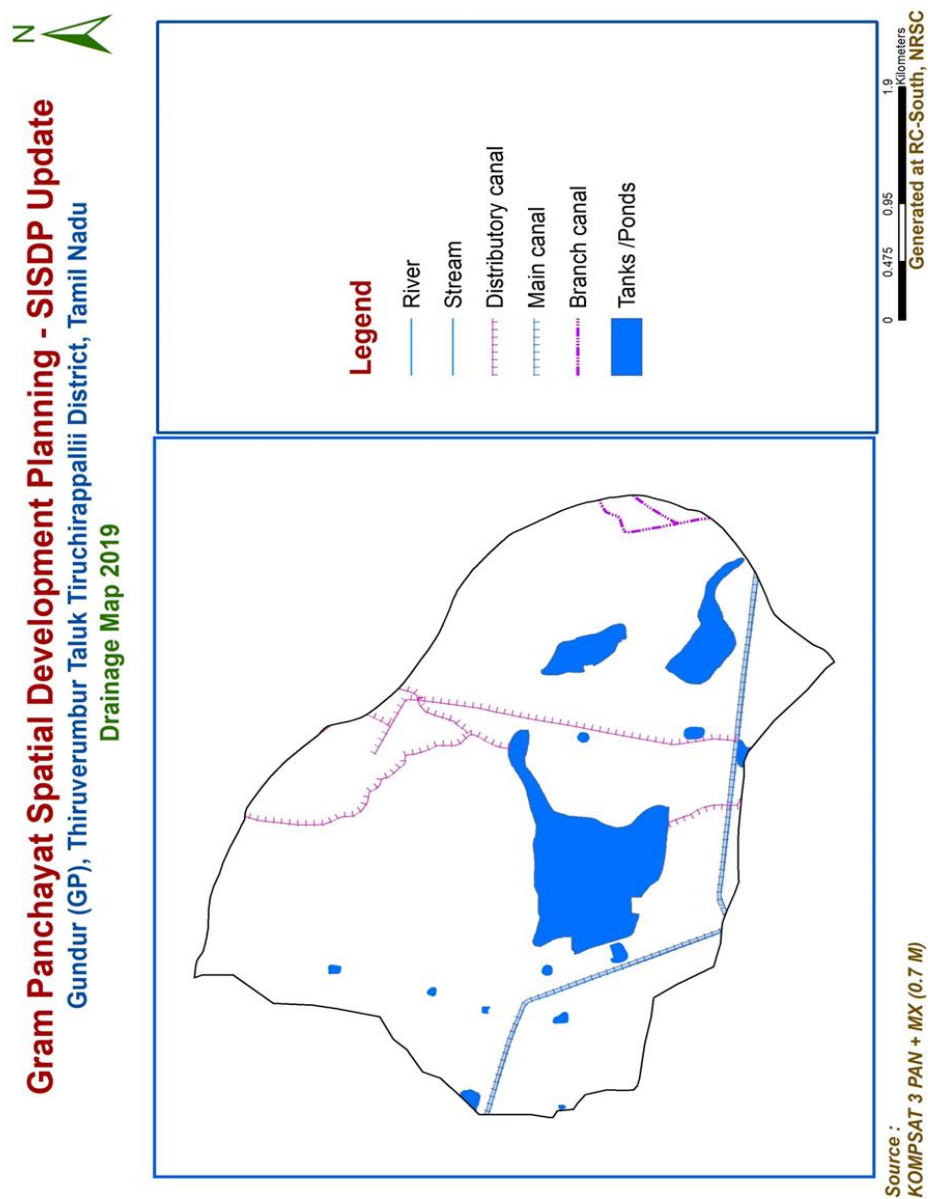


Figure 2.10: Drainage map of Gundur GP at 1: 4,000 scale

2.6.5 SLOPE MAP

CartoDEM was used for generation of the slope layer and it plays an important role in developing the Water Resource Development Plan (Figure 2.11).

2.6.6 GEOMORPHOLOGY MAP

Hydro-geomorphological maps depict major geomorphic units, landforms and provide an understanding of the processes relating to groundwater occurrence as well as groundwater prospects. Based on the morphological expressions in the satellite data, geomorphological map prepared at 1:50000 scale is presented in Figure 2.12.

2.6.7 SOIL TEXTURE MAP

Spatial distribution of soil texture in Gundur GP is shown in Figure 2.13. Major soil textures found in this GP are clay, clay loam, sandy clay loam, sandy loam and gravelly sand.



Gram Panchayat Spatial Development Planning - SISDP Update

Gundur (GP), Thiruverumbur Taluk Tiruchirappalli District, Tamil Nadu

Slope Map

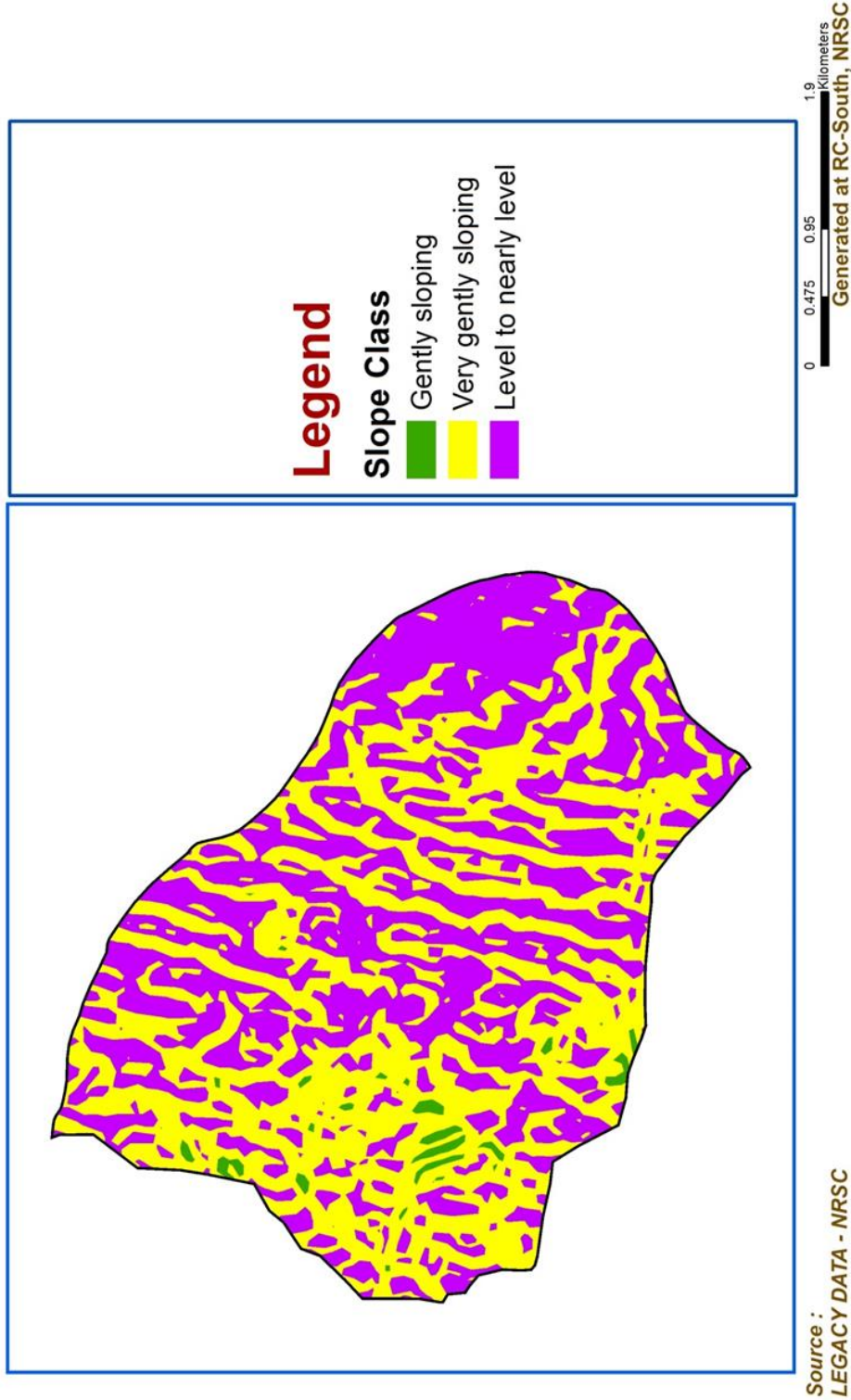


Figure 2.11: Slope map of Gundur GP



Gram Panchayat Spatial Development Planning - SISDP Update
Gundur (GP), Thiruverumbur Taluk Tiruchirappalli District, Tamil Nadu
Geomorphology Map

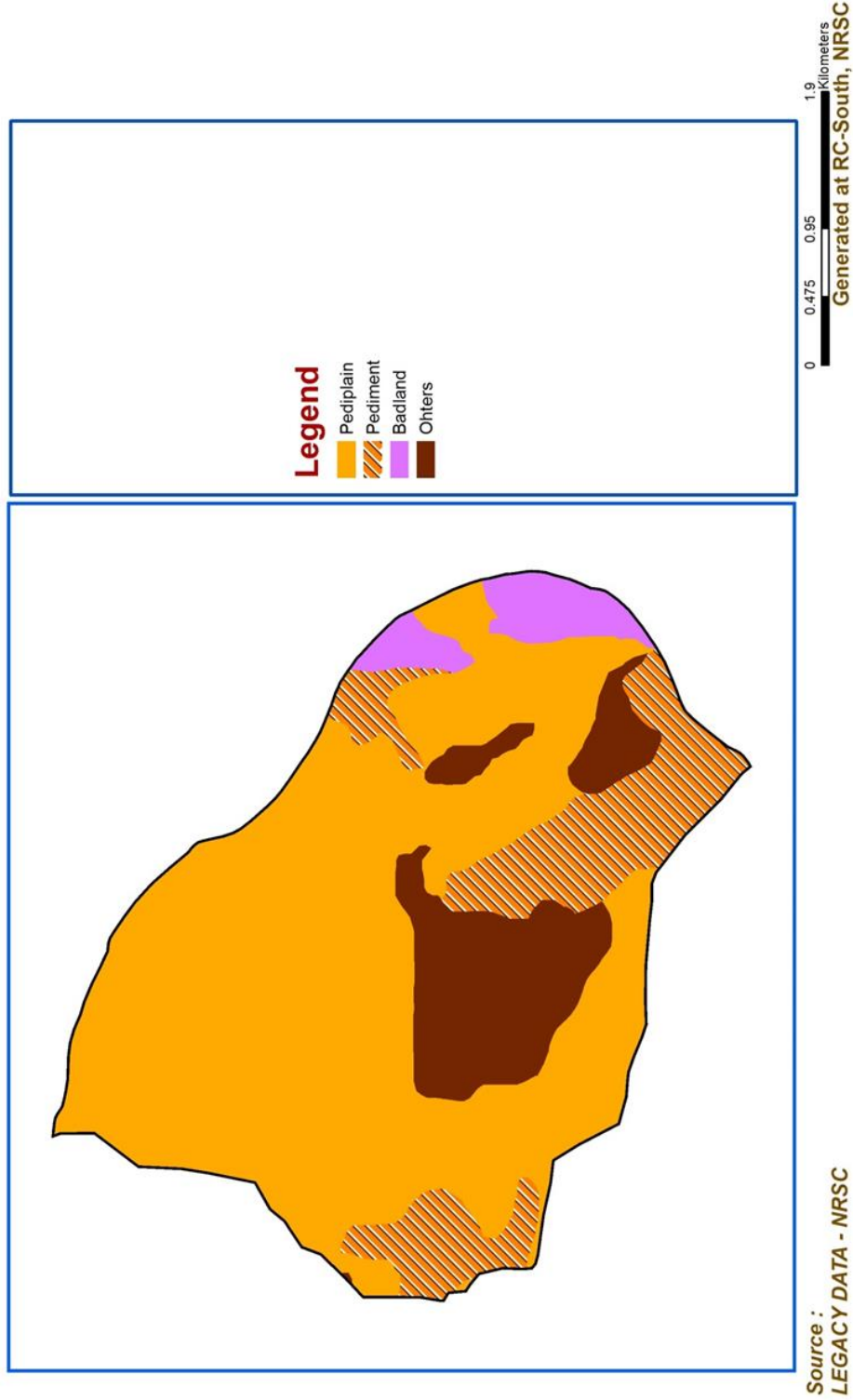


Figure 2.12: Geomorphological map of Gundur GP



Gram Panchayat Spatial Development Planning - SISDP Update

Gundur (GP), Thiruverumbur Taluk Tiruchirappalli District, Tamil Nadu

Soil Texture map

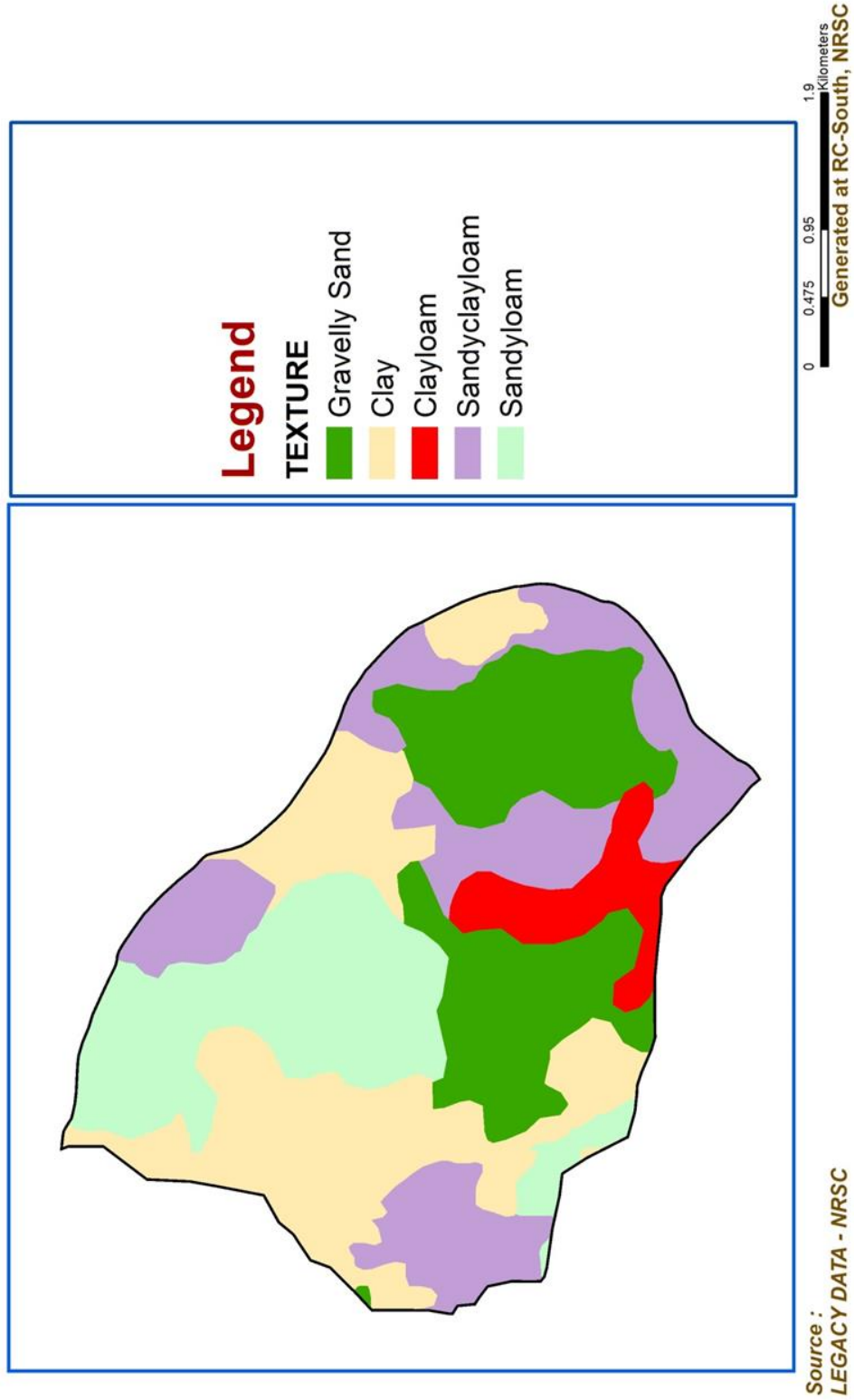


Figure 2.13: Soil Texture map of Gundur GP

2.7 DERIVED SPATIAL LAYERS

2.7.1. AGRICULTURE MAP

Agricultural areas under Gram Panchayat were delineated from LULC layer at 1:4000 scale and depicted in Figure 2.14. Basically, these are the areas which includes cropped areas, fallows and agricultural plantations.

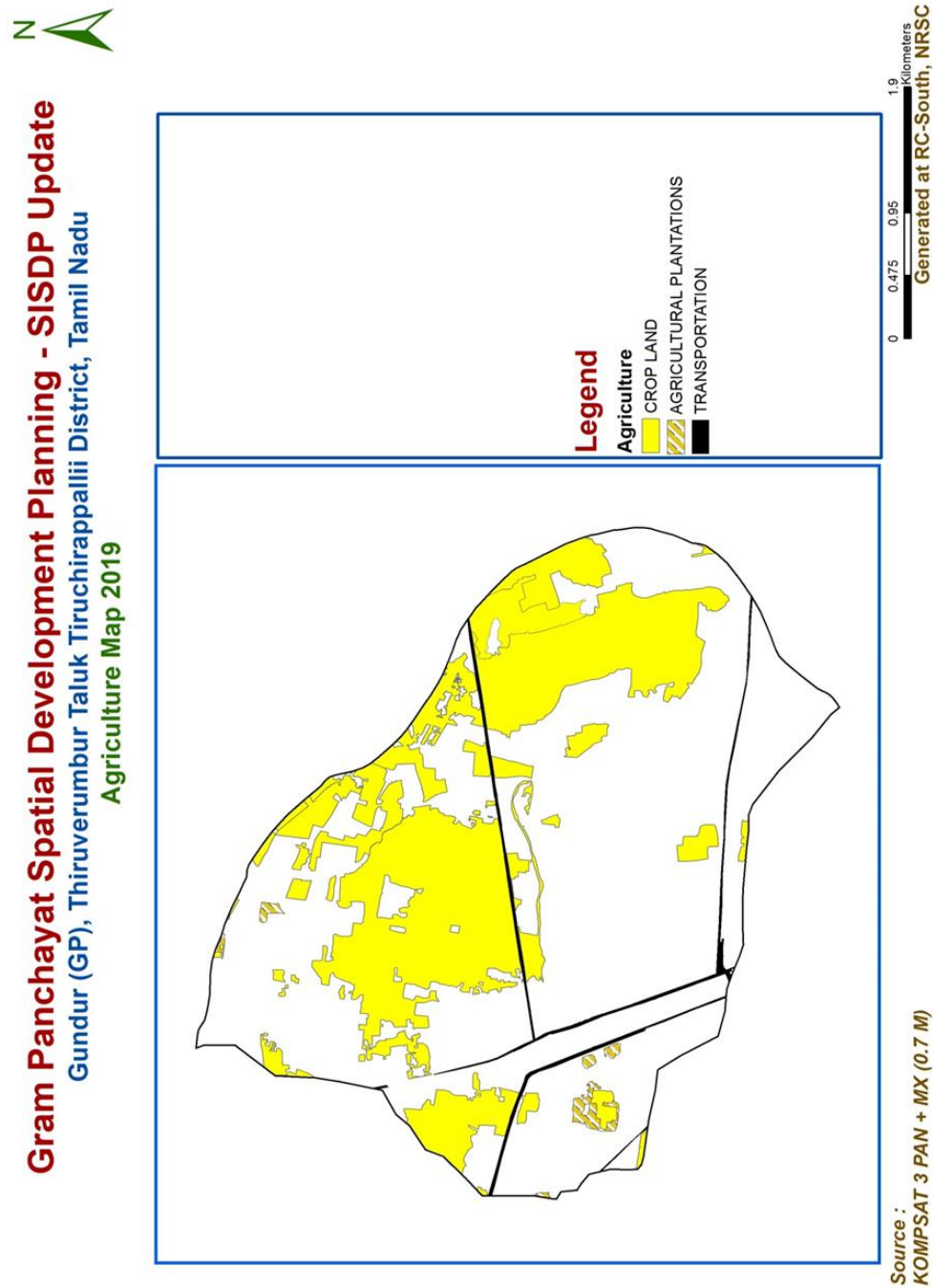


Figure 2.14: Agriculture map of Gundur GP

2.7.2 GROUND WATER QUALITY WELL LOCATION MAP

Ground water quality well locations are depicted in Figure 2.15 and the ground water quality is given in Table 2.8. The ground water quality details are from archived data collected during 2005-2006 and it is only indicative.

Table 2.8 Ground water quality parameters of Wells

FID	id	Shape *	pH	TDS	HARDNESS	FLUORIDE	CHLORIDE	IRON	NITRATE	SULPHATE	ARSENIC	ALKALINITY	GWQ	
0	1	Point	8	557	298	0.3	80	0.3	28	22	0	288	Potable	T
1	2	Point	8.2	721	236	0.6	184	0.6	36	18	0	252	Potable	T
2	3	Point	8	390	160	0.5	70	0.4	20	15	0	180	Potable	T
3	4	Point	8	463	260	0.3	80	0.4	23	0	0	204	Potable	T
4	5	Point	8.2	655	268	0.5	136	0	12	23	0	280	Potable	T
5	6	Point	8.3	2740	288	0.8	850	0	17	17	0	272	Non Potable	T
6	7	Point	7.4	11047	376	0.3	4266	0	17	310	0	312	Non Potable	T
7	8	Point	7.3	820	448	0.2	390	0	42	127	0	324	Potable	T
8	9	Point	8.2	578	208	0.3	50	0	0	3	0	380	Potable	T
9	10	Point	8	900	210	0.3	133	0	5	19	0	440	Potable	T
10	11	Point	7.2	1220	448	0.1	404	0	9	42	0	310	Potable	T



Gram Panchayat Spatial Development Planning - SISDP Update
Gundur (GP), Thiruverumbur Taluk Tiruchirappalli District, Tamil Nadu
Wells Location - Ground Water Quality

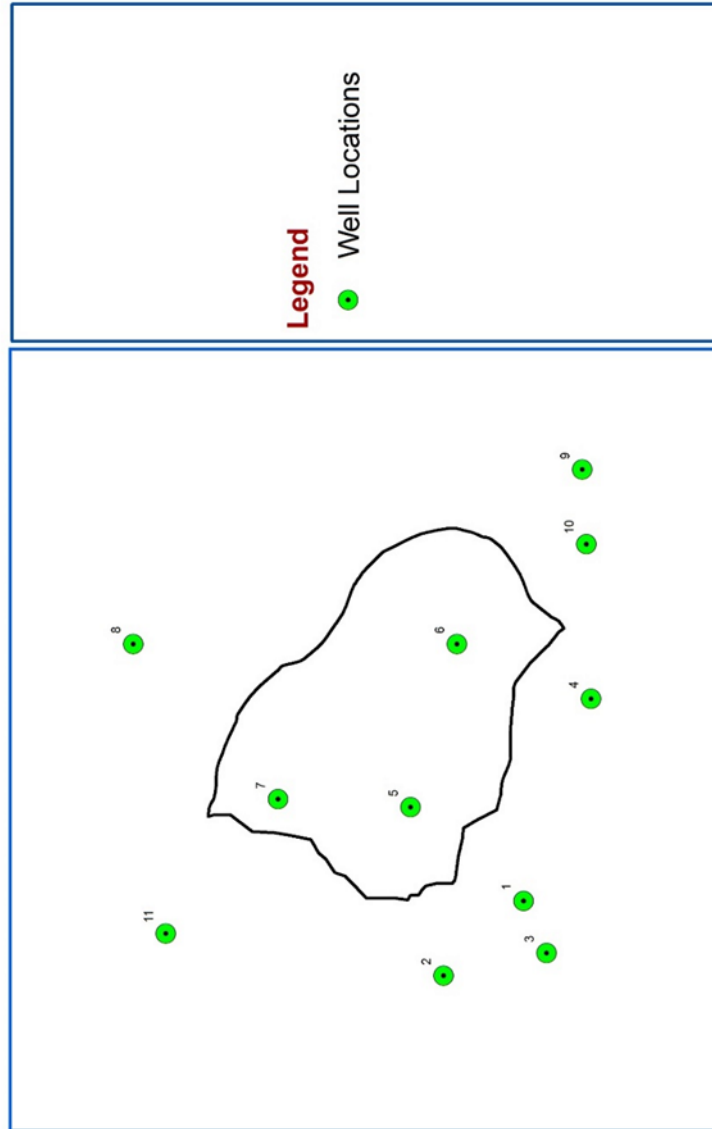


Figure 2.15: Well locations - Ground water quality map of Gundur GP

CHAPTER 3 DEMOGRAPHY

3.1 INTRODUCTION

The total population of Gundur GP was 10386 in the year 2011 (Census data, 2011). The population of Gundur GP has increased steadily from in 1961 to in 2011 (Table 3.1 & Figure 3.1).

Table 3.1 Demographic Characteristics

Year	1961	1981	1991	2001	2011	2019*
Total Population	1825	3850	5082	6506	10386	17500
Decadal Growth Rate	-	55.48	32.00	28.02	59.64	

Source: District Census Handbook, 1961, 1981, 1991, 2001 & 2011 * Mission Antyodaya Survey 2019

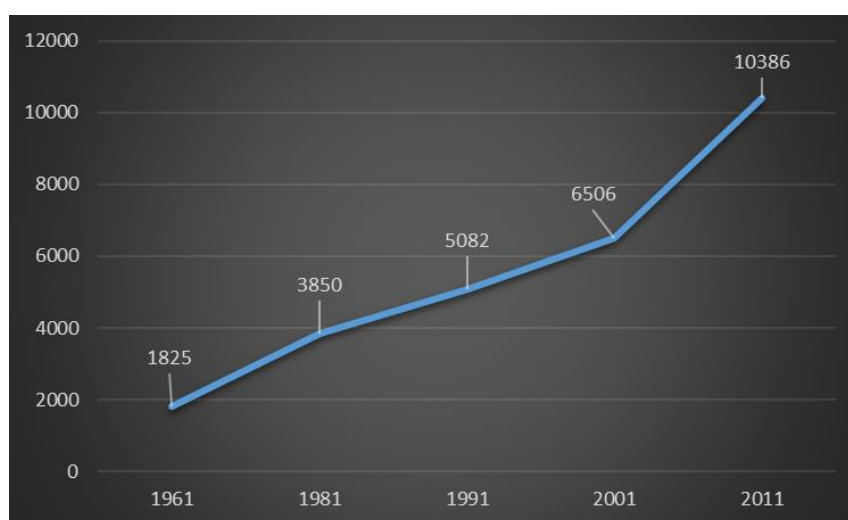


Figure 3.1: Decadal wise Population

Steady decline in the decadal growth rate of population was noticed in this gram panchayat from 1981 to 2001 and growth rate population was on an increasing trend since 2001. The decadal growth rate was 55.48 during 1971-1981, 32.00 during 1981-1991, 28.02 during 1991-2001 and 59.64 during 2001-2011 (Figure 3.2).

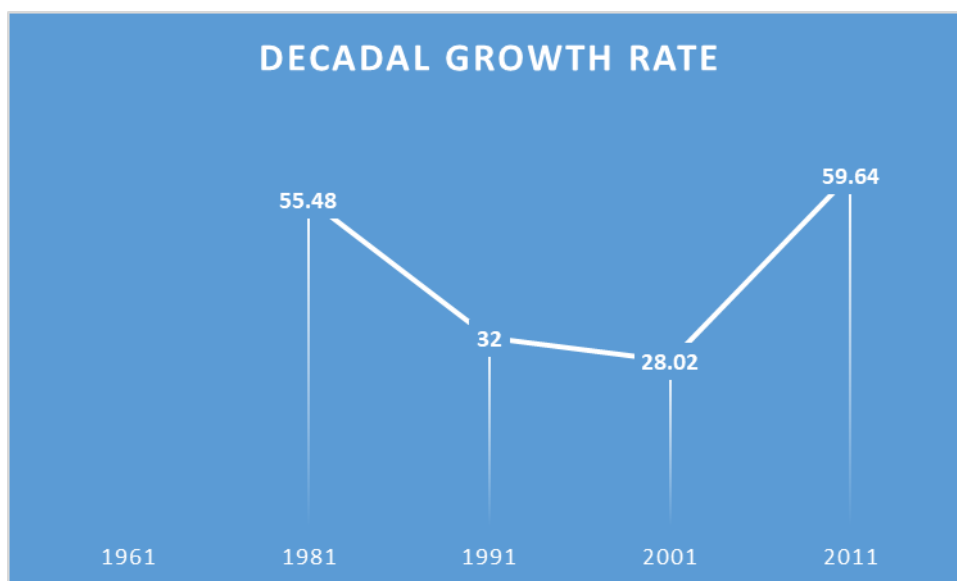


Figure 3.2: Decadal wise Population Growth Rate

3.2 SEX-RATIO

Out of the total population, 5186 are males while 5200 are females as per Population Census 2011. The percentage of male population is 49.93 and female population is 50.07. It is observed that the percentage of female population was slightly less than 50% as per 1991 and 2001 census, whereas increased to 50.49 during the period 2001 to 2011 (Table 3.2 & Figure 3.3). According to 2011 census, the sex-ratio was 1003 females for every 1000 males compared to the district sex-ratio of 1,013 females for every 1,000 males (Tiruchirappalli District Census Hand Book, 1961, 1981, 1991, 2001 & 2011).

Table 3.2: Details of Male and Female Population

Year	1961	1981	1991	2001	2011	2019*
Total Population	1825	3850	5082	6506	10386	17500
Male	904	1923	2572	3311	5186	8500
%	49.53	49.95	50.61	50.89	49.93	48.60
Female	921	1927	2510	3195	5200	9000
%	50.47	50.05	49.39	49.11	50.07	51.40

Source: District Census Handbook, 1961, 1981, 1991, 2001 & 2011 * Mission Antyodaya Survey 2019

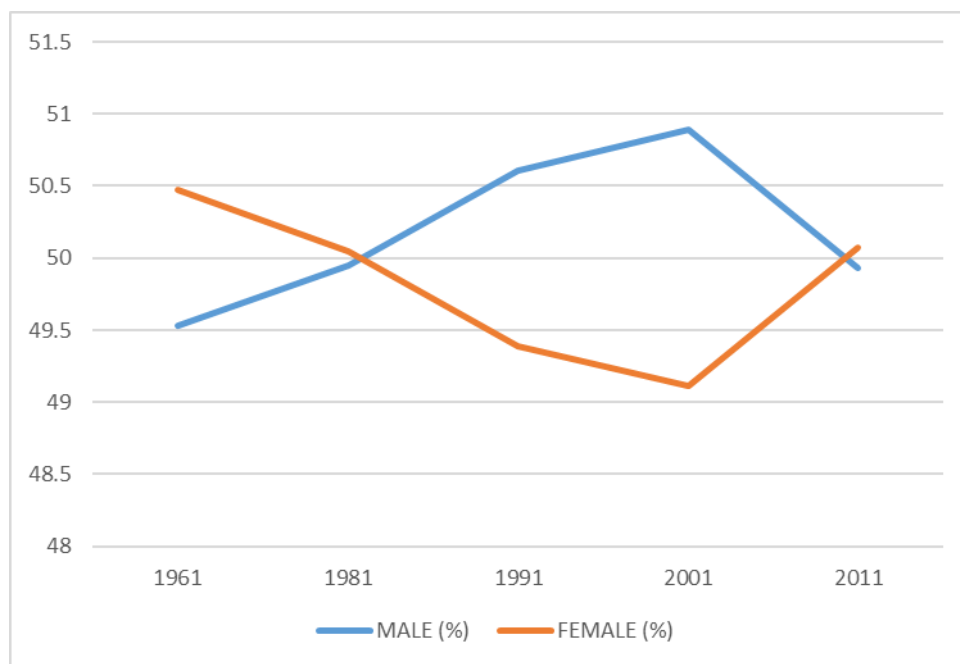


Figure 3.3: Percentage of Male & Female Population

3.3 LITERACY RATE

Gundur village has lower literacy rate compared to Tamil Nadu. In 2011, literacy rate of Gundur village was 76.20 % compared to 80.09 % of Tamil Nadu. In Gundur Male literacy stands at 81.12 % while female literacy rate was 71.27 % (Table 3.3 & Figure 3.4).

Table 3.3: Decadal wise Literacy Rate

Year	1961	1981	1991	2001	2011
Literates	366	1700	3030	4652	7913
%	20.05	44.15	59.62	71.50	76.20
Male Lit.	311	1131	1762	2624	4207
%	34.40	58.81	68.50	79.25	81.12
Female Lit.	55	569	1268	2028	3706
%	5.97	29.53	50.52	63.48	71.27



Figure 3.4: Decadal wise Literacy Rate

Only 5% of the people are post graduates, 16% of the people were graduates, 24% of the people have completed high school and 3% have completed the intermediate level in the households in which survey was carried out. About 37% of people have only below high school level of examination whereas 15% are illiterates (Figure 3.5).

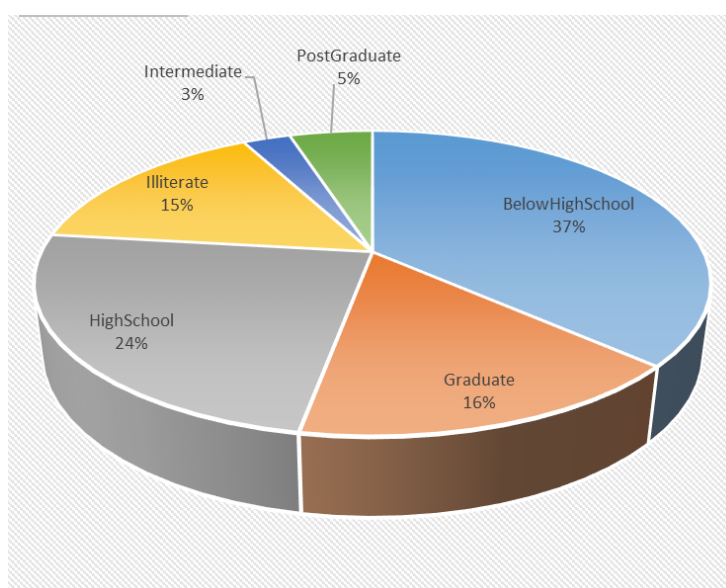


Figure 3.5: Literacy level among the people surveyed

3.4 POPULATION OF CHILDREN

As per 2011 census, in Gundur village population of children with age 0-6 is 1110 which makes up 10.69 % of total population of village. Though the average Sex Ratio of Gundur village is higher than Tamil Nadu state average, the Child Sex Ratio for the Gundur as per census 2011 is 907, lower than Tamil Nadu average of 943 (Table 3.4 & Figure 3.6).

Table 3.4: Details of Age Group (0-9)

Year	1991	2001	2011 (0-6)
Total Children	785	737	1110
Male	406	358	582
Female	379	379	528

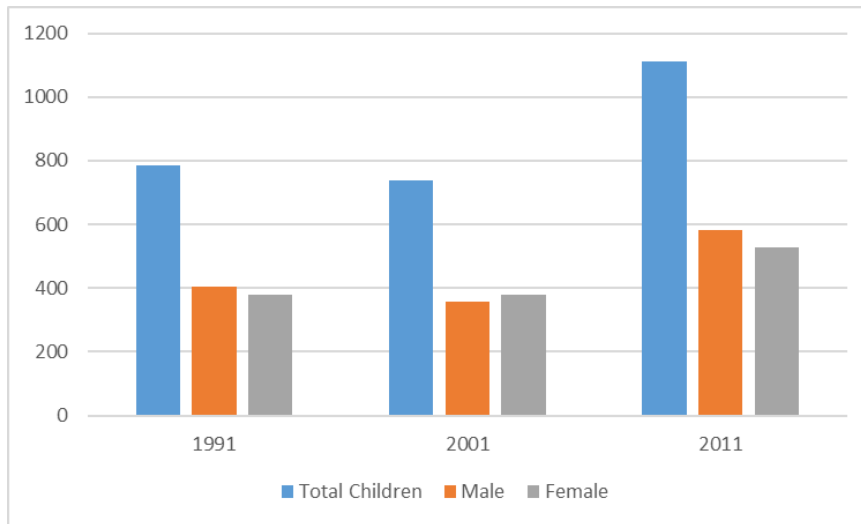


Figure 3.6: Decadal wise Children Population

CHAPTER 4

ECONOMIC DEVELOPMENT OF GRAM PANCHAYAT

4.1 DETAILS OF WORKERS

As per 2011 census, the total workers were 45.58% of total population and the percentage of non-workers was 54.42 (Table 4.1 & Figure 4.1).

Table 4.1: Details of Total Workers of Gundur

Year	Total Workers	%	Workers Male	Workers Female	Total Non-Workers	%	Non Workers Male	Non Workers Female
1961	1021	55.94	580	441	804	44.06	324	480
1981	1150	29.87	1037	113	2700	70.13	886	1814
1991	1891	37.20	1329	562	3191	62.80	1243	1948
2001	2485	38.20	1810	675	4021	61.80	1501	2520
2011	4527	45.58	2981	1546	5859	54.42	2205	3654

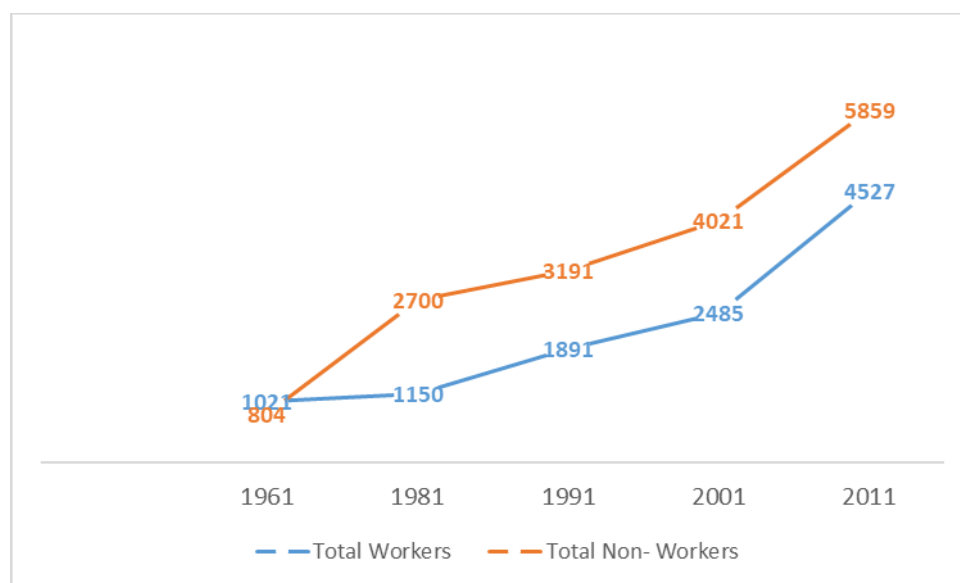


Figure 4.1: Decadal wise workers Details

It is observed that there was a steady increase in the number of male workers and female workers since 1961. However, higher rate of increase in the number of male workers and female workers was observed during the period 2001 to 2011.

4.1.1 WORKERS – CLASSIFICATION

The activities in which the workers have engaged has changed over decades. In 1961 majority of workers were cultivators, followed by people engaged as agricultural labourers, household

industries and other works. It is observed that there is a shift pattern of change in the activities the workers are engaged. In 2011, more number of people engaged in other works, followed by working as agricultural labourers and involved in cultivation (Table 4.2).

Table 4.2: Decadal wise Classification of Workers

Year	Total workers	Cultivators	Agri. Lab.	Household Ind.	Other Workers	Marginal Workers
1961	1021	569	345	05	102	-
1981	1150	415	270	15	441	09
1991	1891	556	509	09	771	46
2001	2485	424	483	114	1244	220
2011	4527	175	703	129	2682	838

There is a gradual decline in the number of cultivators from 1961 to 2011. Steady increase in the number of people work as agricultural labours from 1961 to 1991 and thereafter marginal decrease in the number of people work as agricultural labours from 1991 to 2001. Again the number of people work as agricultural labours increased from 2001 to 2011. The number of people engaged as other workers increased significantly from 1991 to 2011 (Figure 4.2). Steady increase of people engaged in household industries and also marginal workers from 1961 to 2011.

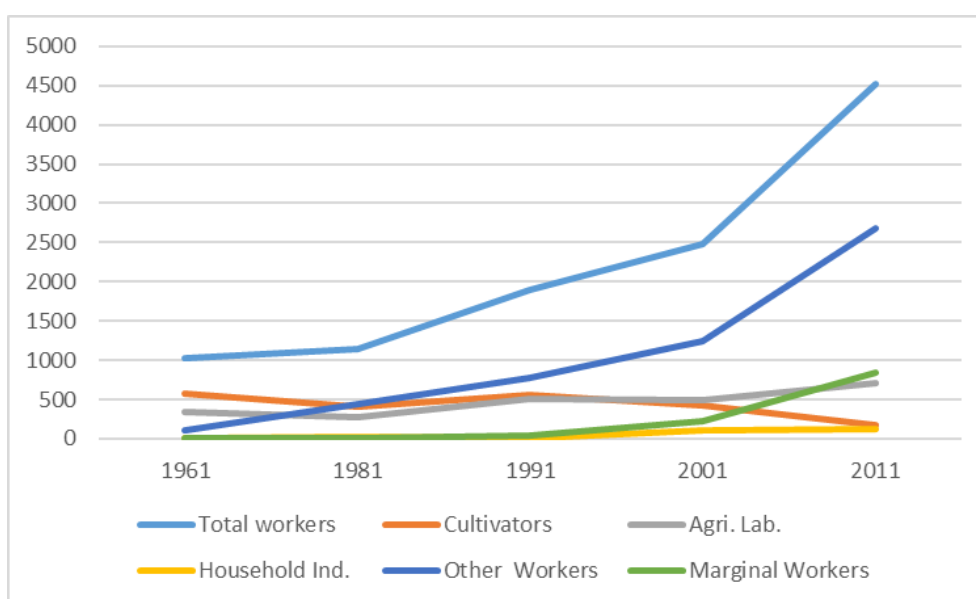


Figure 4.2: Decadal wise Classification of Workers

4.2 INCOME AND EXPENDITURE PATTERN OF HOUSEHOLDS

Household surveys revealed that the daily wages of people range from Rs. 100 (unskilled/ part-time labours) to Rs. 700 per day (Skilled labours). The monthly salary was Rs. 2000 (unskilled) to Rs. 15000 (Semi skilled/ skilled). Very few people working in large cities were getting salary of Rs. 30000 to Rs. 60000 per month. Most of the earnings of the household (Figure 4.3) is spent on food (74%), followed by health (13%) and education (13%).

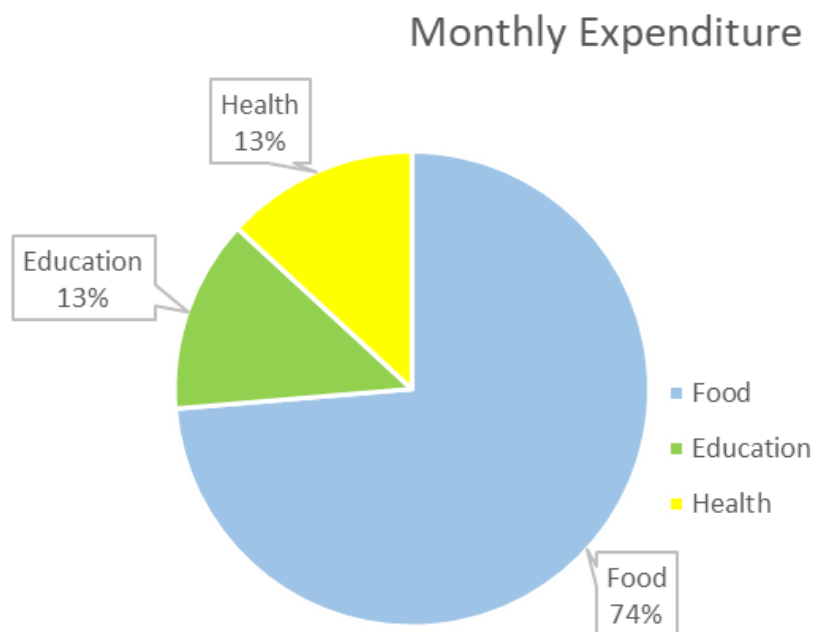


Figure 4.3: Expenditure Pattern of People

4.3 AGRICULTURE

The number of households engaged majorly in non-farm activities was 1500, whereas the number of households engaged majorly in farm activities was 3036 in year 2019 (Mission Antyodaya Survey Gaps 2019 report, Ministry of Rural Development, GOI). The extent of agricultural lands as per the land records of the village include 837 hectares 37.5 Ares dry lands and 168 hectares 96.0 Ares wet lands. Out of the total dry lands, single crop was planted in 72.33.5 hectares, two crops in 30.96.5 hectares. Out of the total wet lands, single crop was planted in 48.01.5 hectares, two crops in 104.05.5 hectares. The total irrigated land area is 251 hectares 58.5 Ares, out of which 100 hectares 65.0 Ares are dry lands and 150 hectares 93.5 Ares are wet lands (Table 4.3).

Table 4.3: Land Area under Agriculture

Classification	Area		Crop Land	%	Fallow	%	First crop	Second crop
	Hectare	Ares						
Wet Lands	168	96.0	152.07	90.0	16.89	10.0	152.07	104.05.5
Dry Lands	837	37.5	103.30	12.4	734.07.5	87.6	103.30	30.96.5

The major wet land crop is paddy and dry land crops are also paddy. Nearest fertiliser shop and seed centre for this GP is located at a distance of more than 10 kms. The nearest soil testing facility is also located at a distance of more than 5kms from this GP. This GP doesn't have facilities such as primary processing facilities for agricultural produces, warehouse/ storage facilities for food grains and agro equipment hiring facilities.



Figure 4.4: Paddy Fields (Wet lands)

4.4 ANIMAL HUSBANDARY

Approximately 25-30% of the people have cattle. Though large or medium scale dairy or poultry farming is not practised, individuals have cows, buffaloes, goats and chicken. Milk collection is being carried out by cooperative milk society functioning in the central village of this GP. A Veterinary hospital is located in this village. Facilities such as livestock extension services, poultry/ goatary development projects are lacking in this GP.



Figure 4.5: Animal Husbandry

4.5 INDUSTRIES

The industries present in this GP include small scale metal based industries, Automobile coach builders, Ready mix concrete and small scale service industries along the NH (Figure 4.6). All the industrial developments are located along the NH or in areas adjoining the NH. The industries are not providing employment opportunities for local people on a larger scale.

Lot of closed leather tannery units near Thiruvallarchipatty village and also there is a tannery effluent treatment plant adjacent to Chetti Udappu kulam.

About 100 weavers (relocated from Woraiyur, Tiruchirappalli) were provided plots for housing 25 years ago in Nesavalar colony. About 50% of them still practice handloom weaving (cotton sarees) while others have shifted to sales jobs in textile industry (Figure 4.7).



Tar factory



Concrete products industry



Small scale metal based industries



Coal storage



Closed leather tannery

TALCO-TRICHY TANNERY EFFLUENT TREATMENT COMPANY.			
Details on use of hazardous chemicals and generation of .. Hazardous waste...			
A. Hazardous chemicals			
Sl. No.	hazardous chemicals used/used	Qty/ day	Type of hazard
1.	Acid material	1000 Kg	Corrosive
2.	Acidic electrolyte	200 Kg	Corrosive
3.	Acidic waste	100 Kg	Corrosive
B. Hazardous waste			
Sl. No.	Identity of hazardous waste	Qty generated	Type of hazard
1.	Acidic waste	100 Kg	Corrosive
C. Trade Effluent			
Sl. No.	sources of generation	Qty generated	Mode of treatment
1.	Tanneries	10000	1. Collection tank 2. Equalization 3. Primary clarifier 4. Secondary clarifier 5. Sludge tank 6. Aeration tank 7. Trickling filter 8. Final clarifier
D. Emission			
Sl. No.	Source	Qty generated	Control measures



Tannery effluent treatment plant adjacent to Chetti udappu kulam

Figure 4.6: Industrial activities in Gundur GP area

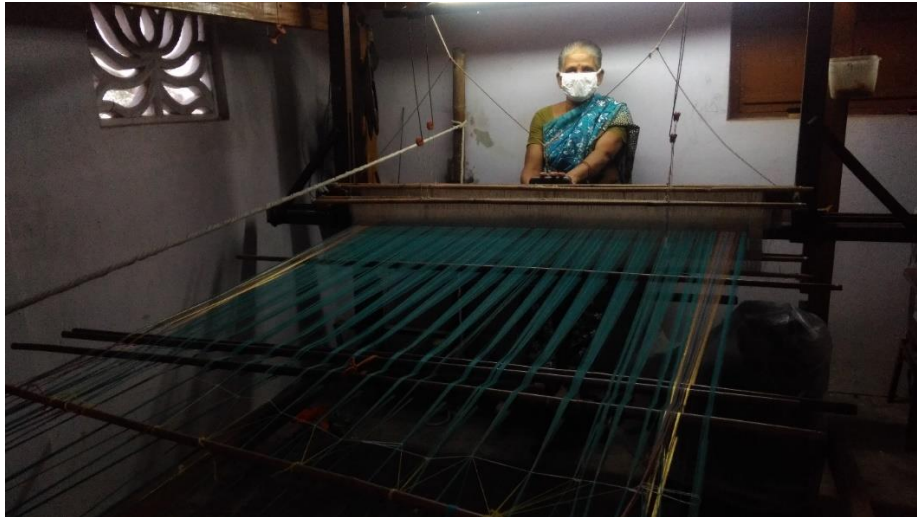


Figure 4.7: Handloom Weavers in Gundur Nesavalur Colony

4.6 SELF HELP GROUP

There are 52 self-help groups in this village. 742 Number of households are mobilized into SHGs. These self-help groups function with financial grant from Government and bank loan. Members of this groups twice in a month for planning their activities. The members stated that they need training and financial assistance and loan to diversify their activities in order to enhance their income. The members of these groups expressed training is required in fields such as tailoring, basket weaving, soap making, candle making and any such household industries.

4.7 MIGRATION PATTERN

The inward migration of people from other areas to this Gram Panchayat for permanent residency (working outside) in the last two decades has taken place in large scale due to the proximity of this GP to Tiruchirappalli, Tiruchirappalli airport and also to various large industrial developments. Very few individuals migrated to other places to work in industries and other offices. Lot of people commute nearby places and to Tiruchirappalli for work daily.

CHAPTER 5

HOUSING

5.1 INTRODUCTION

Housing is one of basic human necessities, the other two being food and clothing. Every habitat is facing with the problem of getting sufficient quantity and desired quality housing. In Gundur GP there were 4247 houses spread across 5 habitats, as per 2011 census.

Table 5.1 Habitation wise Distribution of Houses

Sl. No.	Habitation Name	Total Houses	%
1.	Gundur	1173	27.60
2.	Thiruvallarchipatti	870	20.50
3.	Iyyampatti	558	13.10
4.	G. Burma Colony	1057	24.90
5.	Iyanpudur	589	13.90
TOTAL		4247	100

Source: Gram Panchayat Office

Gundur has maximum number of habituated house (1173 nos.) followed by G. Burma Colony (1057 nos.), Thiruvallarchipatti (870 nos.). Iyanpudur (589 nos.) and Iyyampatti (558 nos.) (Table 5.1).

5.2 NUMBER OF HOUSEHOLDS

There are 2504 households in this GP in the year 2011. The number of households have increased from 386 in the year 1961 to 2504 in the year 2011 (Table 5.2).

Table 5.2 Number of Households and Household Size

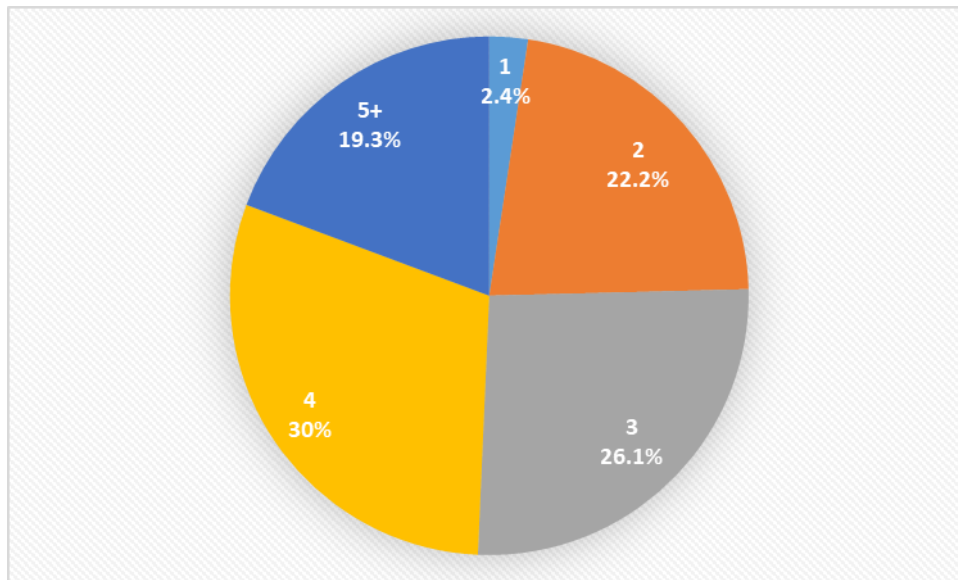
Year	Total Pop.	Households	Household size
1961	1825	386	4.73
1981	3850	834	4.62
1991	5082	1095	4.64
2001	6506	1432	4.54
2011	10386	2504	4.15
2019*	17500	4536	3.86

Source: District Census Handbook, 1961, 1981, 1991, 2001 & 2011 * Mission Antyodaya Survey 2019

5.2.1 HOUSE-HOLD SIZE

It is interesting to note that the average household size has decreased from 4.73 in the year 1961 to 4.15 in 2011(Refer Table 5.2).

In household survey carried out, it was observed that the percentage of households with 4 members (30%) was maximum (Refer Figure 5.1), followed by households with 3 members (26.1%), households with 2 members (22.2%), households with 5 members (19.3%) and households with 1 member (2.4%).



Source: Household Survey, 2020

Figure 5.1 Percentage Distribution of Households based on Household Size

5.3 LENGTH OF RESIDENCY

The length of residency 2036 households is less than 10 years, 10- 20 year for 1072 households, 20-40 years for 598 households and more than 40 years for 834 households (District Census Handbook, 1961, 1981, 1991, 2001 & 2011; & Mission Antyodaya Survey 2019). It is noticed that the increase in the population and the number of households is significantly high in the last two decades, clearly indicating that people migrated into this GP for permanent residency. This may be due to its proximity to Tiruchirappalli city.

5.4 RESIDENTIAL HOUSES – AGE OF THE BUILDINGS

Major percentage (55%) of the residential buildings are less than 20 years old, followed by buildings 20-50 years old (41.2%) among the surveyed households. Only 3.8% of residential buildings are more than 50 years old among the surveyed households (Refer Table 5.3).

Table 5.3 Classification of Residential Houses based on Age of the Buildings

Sl. No.	Age of the Buildings (years)	Percentage
1	<20	55.0
3	20 - 50	41.2
4	>50	03.8

5.5 RESIDENTIAL HOUSES – CONDITIONS

Among the houses surveyed, 60% were pucca houses, 29% were semi-pucca and 8% kacha houses (Figure 5.2).

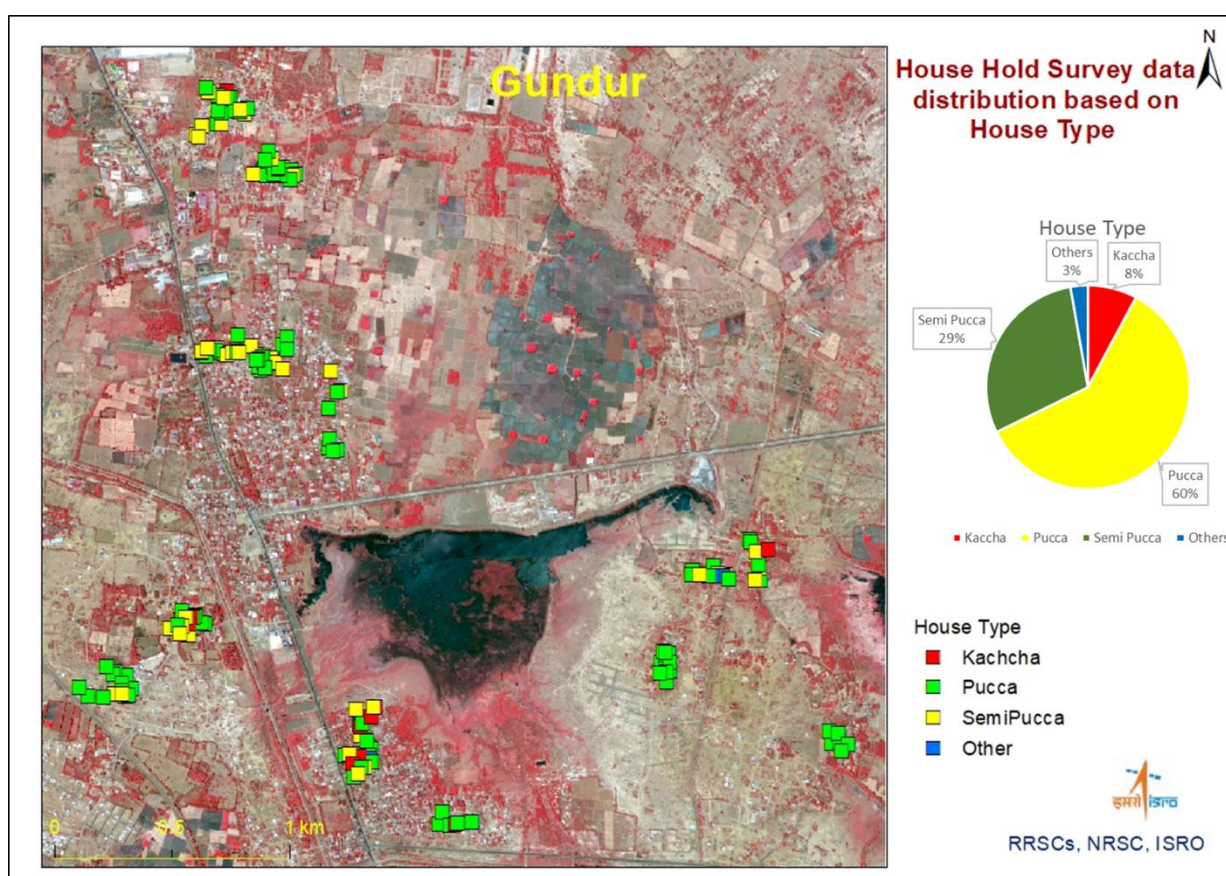
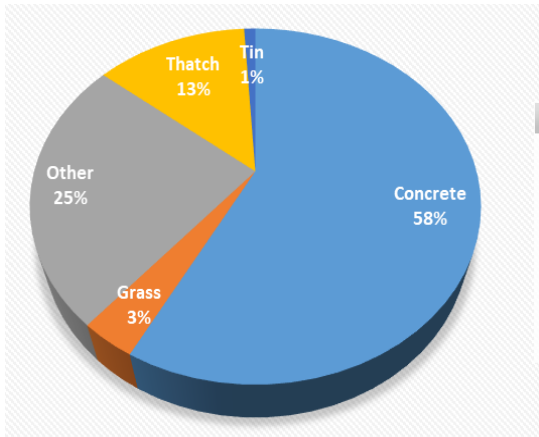
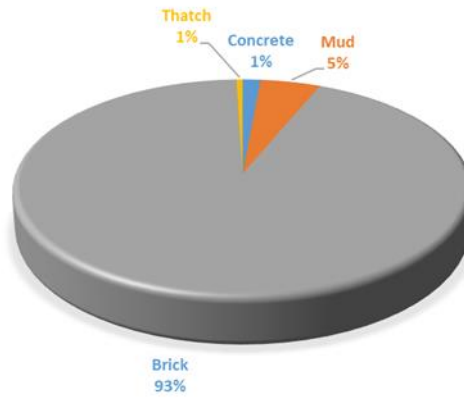


Figure 5.2 House Type Distribution

No of households live in residential buildings with kuccha wall and kuccha roof were 3.31% in the year 2019 (Mission Antyodaya Survey Gaps Report, Ministry of Rural Development, 2019). Among the household surveyed 58% of household live in houses with roof constructed with concrete, 25% live in houses with roof constructed with tiles and remaining 17% of households live in houses with roof constructed with thatch, tin sheets and grass (Figure 5.3a). Among the households surveyed 93% of people live in houses wall constructed of bricks, whereas 6% of households live in houses wall constructed of mud and thatch (Figure 5.3b).



(a)



(b)

Figure 5.3 House Type Distribution – (a) Roof Material (b) Wall Materials

The field survey also revealed that around 4% of residential buildings were in dilapidated conditions, 47% in liveable conditions and 49% in good conditions (Figure 5.4).

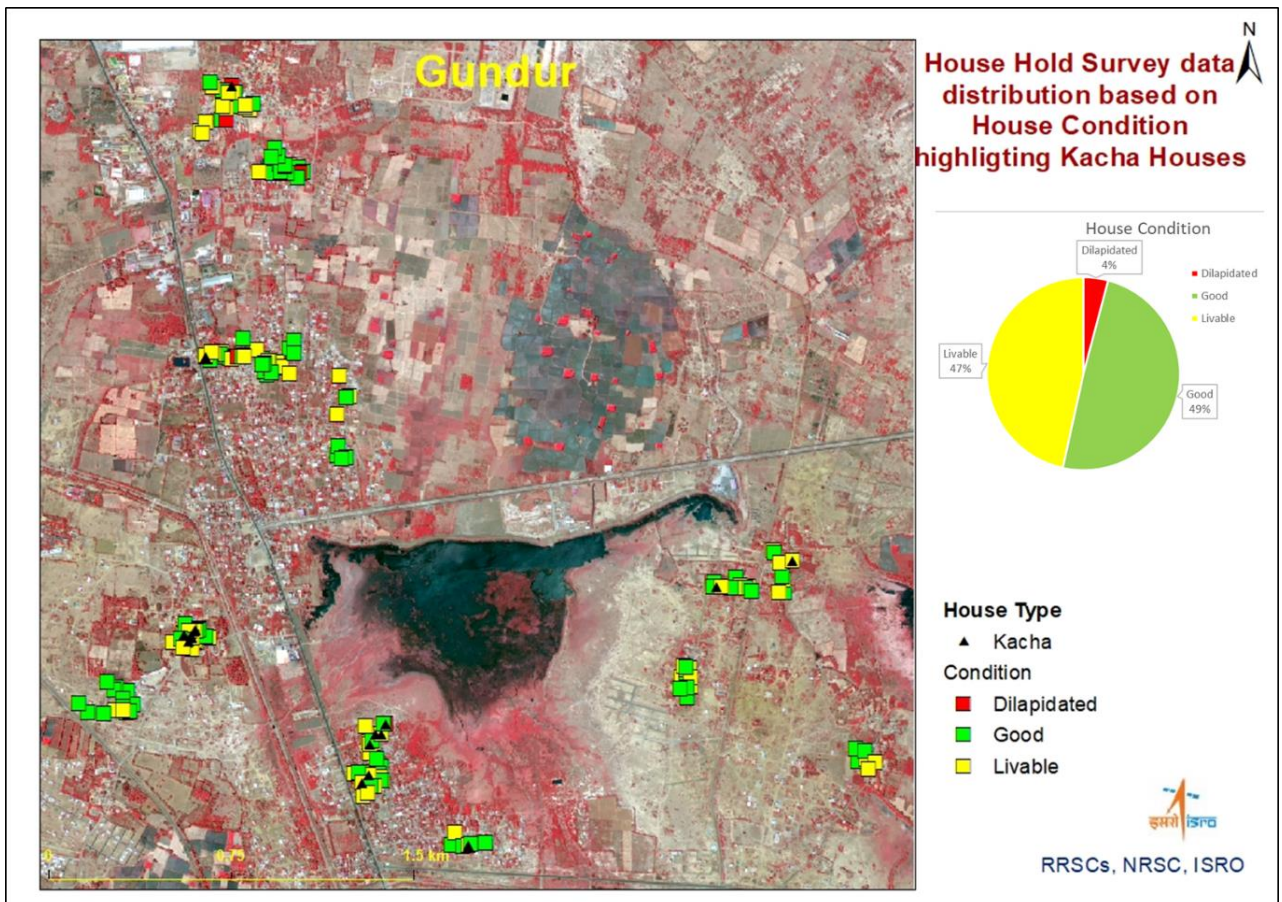


Figure 5.4 Residential Houses – Conditions



Figure 5.5 Types of Houses & Roof views of Ayyampatti and Gundur Hamlets

5.6 RESIDENTIAL BUILDINGS – OWNERSHIP STATUS

Among the houses surveyed, 89% household live in their own houses, whereas 11% live in rented buildings. The rent of the buildings was varying from Rs. 500 to Rs. 6000 depending on the area and type of the building (Figure 5.6).

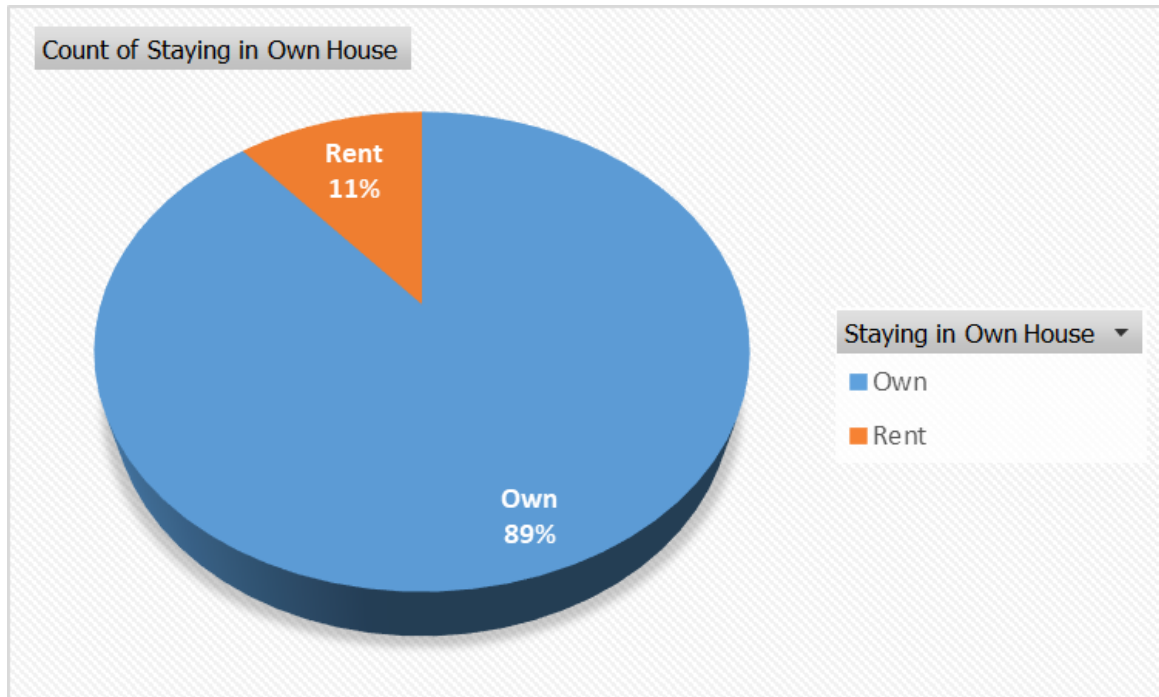


Figure 5.6 Residential Buildings – Ownership Status

5.7 HEIGHT OF RESIDENTIAL BUILDINGS

Most of residential buildings, i.e., 94.7% of surveyed buildings have only ground floor, whereas 5.3 of the buildings are of G+1 storey height. However, it is noticed that the recent housing developments taking place close to NH are G+1 or more stories (Figure 5.7)

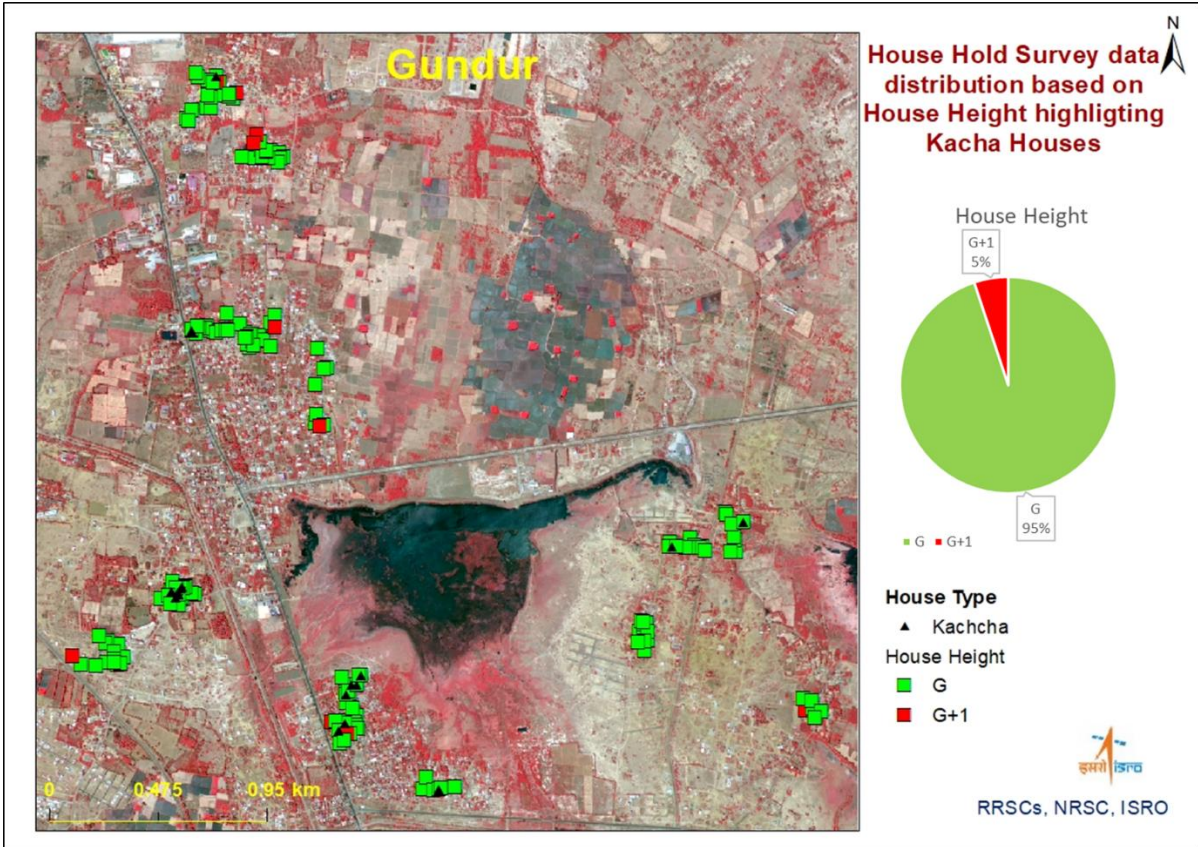


Figure 5.7 Height of Residential Buildings

5.8 CONSTRUCTION OF RESIDENTIAL BUILDINGS – BENEFICIARIES FROM GOVT. SCHEMES

42 households have constructed houses under PMAY scheme, whereas another 17 households are in the permanent wait list. 22 Households got benefitted from State specific housing scheme and 20 households are in the permanent wait list of State specific housing Scheme (Gram Panchayat office).

CHAPTER 6

COMMUNITY FACILITIES AND UTILITIES

6.1 INTRODUCTION

The details of presence of community facilities and utilities with regard to water supply, sanitation, drainage, road infrastructure, health services, community facilities, etc., were obtained from primary survey and secondary sources are presented in this chapter.

6.2 WATER SUPPLY

The gram panchayat has piped water supply scheme covering all the hamlets. The source for water supply distribution is river Kavery and also bore wells. The water supply distribution system has 19 overhead tanks with a total storage capacity of 6,80,000litres and 91 public taps on various streets of all hamlets. More than 50% of the (2460 nos.) individual houses are given water supply house service connection. In addition, there are about 43 hand pumps provided for water supply. Most of the areas in all hamlets are provided with water supply for a duration of 2 hours in a day. The water supply sources include 6 nos. wells also. The distribution of households (among the surveyed households) based on source of water supply is presented in Figure 6.1. During the household survey it is learnt that very small percentage of households use bore well and well as source of water supply. Among the household surveyed 54% households use public taps water supply and 31% of households have water supply connections at their individual houses. 14% of households use the borewells/ handpumps as source of water supply. A 1000 litre drinking water purifier plant had been installed in Gundur Burma colony for Rs. 8 lakhs in state govt scheme in 2018-19 (Figure 6.2).

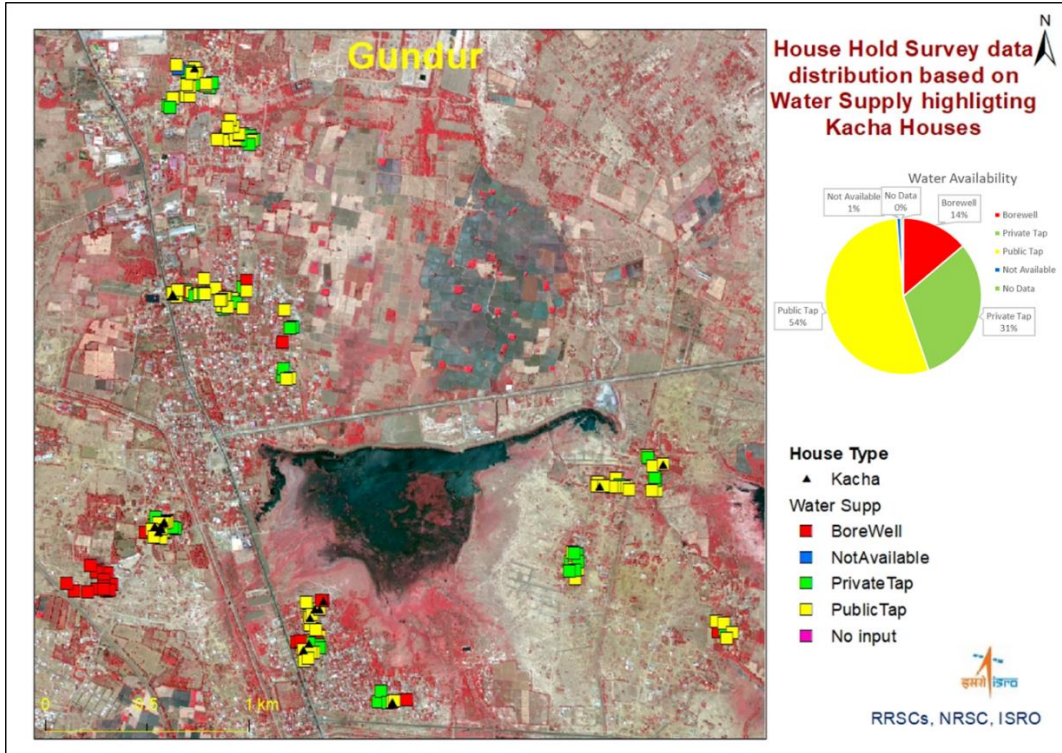


Figure 6.1: Distribution of Households (among the surveyed) Based on Source of Water Supply



Overhead Water tank

Water purifier plant



Public tap

Private taps

Figure 6.2: Water supply in Gundur GP

6.3 SOLID WASTE DISPOSAL

The solid waste disposal is carried out by Door to Door Collection from the individual houses through tricycles. The collected solid waste is disposed at two different places, i.e., Ayanputhur and Thiruvallur. It is observed during household survey that people have their own composting pits and also practice open dumping (Figure 6.3). It is observed that the segregation of waste is not being carried out properly. Lack of staff and distance of disposal points are expressed as the difficulty faced by gram panchayat regarding solid waste disposal (Figure 6.4).

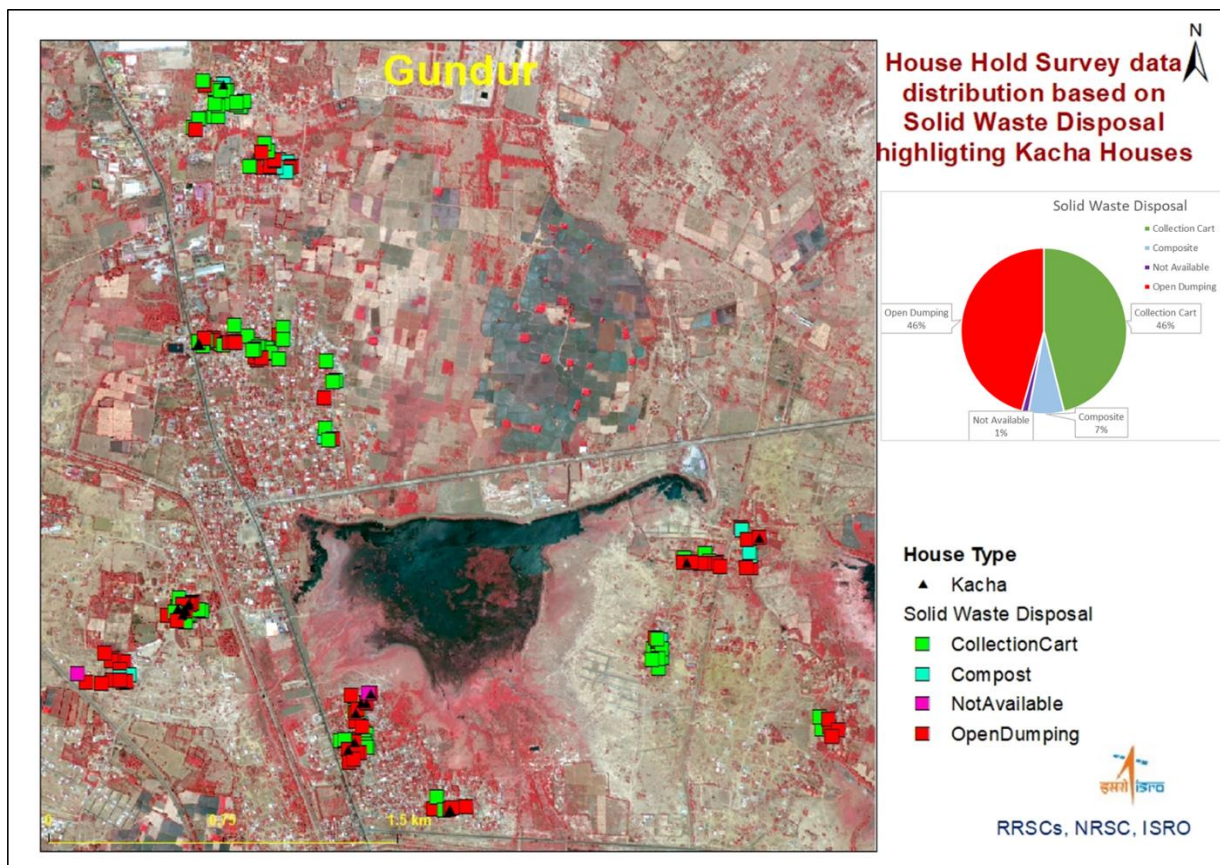


Figure 6.3: Solid Waste Disposal



Open dumping

Poor management of solid waste



Abandoned Segregation Shed & Vermicompost Yard New Vehicles for SWM

Figure 6.4: Solid Waste Management, Gundur GP

6.4 SANITATION

Large number of individual houses have Toilets. Public Toilets are constructed in the villages for the use people living residential houses without private toilets. There are 4248 houses with individual toilets and in addition 4 public toilets are also constructed Gram Panchayat office (Figure 6.5). Soil waste is disposed through Leech Pits/ Septic Tanks at individual houses. 215 households have constructed individual toilets using various government schemes such as SBM, MBA, LOB, MLOB. Household survey indicated that 84% of the residential houses have their individual toilets and about 16% of residential houses use public toilets or still practice open defecation in the entire village (Figure 6.6).



Figure 6.5 Private & Public Toilet

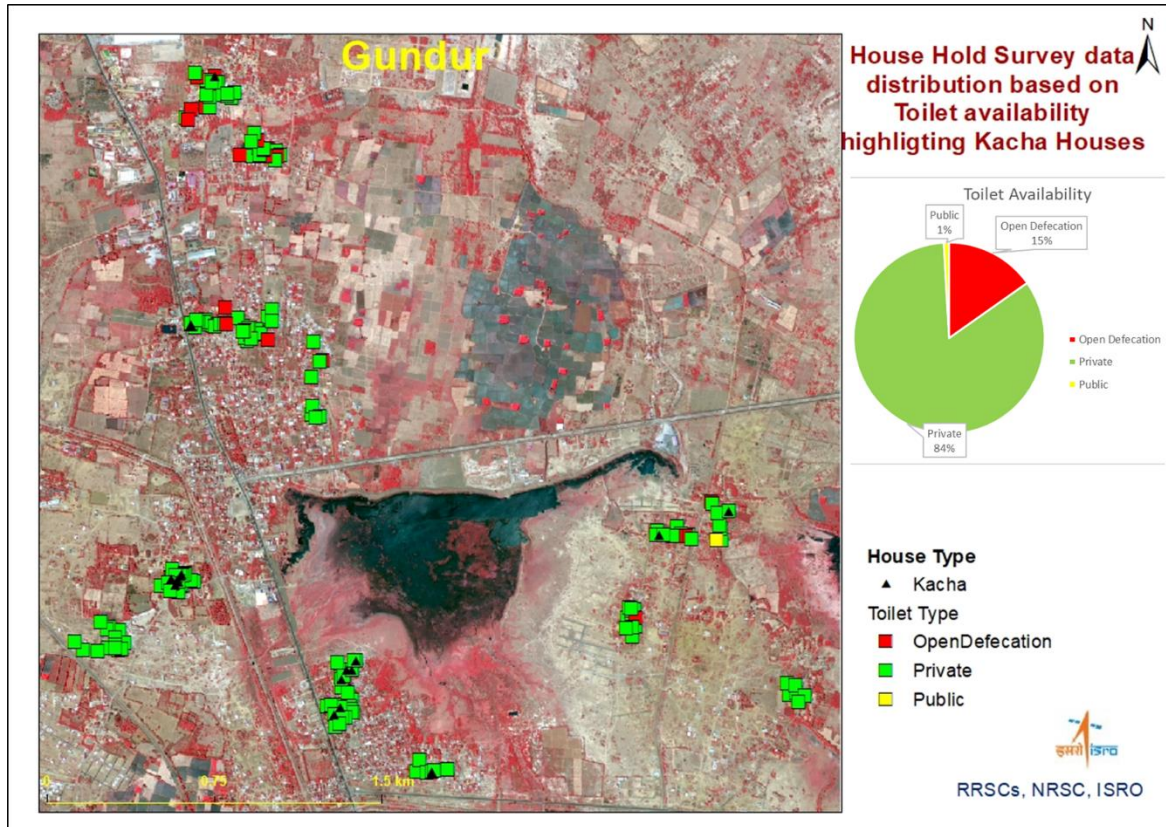


Figure 6.6: Toilet Availability

6.5 STORM WATER DRAINAGE

Storm water drains/ gutters are constructed mostly along cement concrete paved road stretches of 3km. It is observed that only few stretches tar topped and unpaved roads are provided with storm water drainage. Water stagnation noticed in the residential areas of hamlets of Burma colony, Gundur and in public buildings like school and play grounds also (Figure 6.7).



Figure 6.7a: Flooded street near lake



Figure 6.7b: Water stagnation in ground



Figure 6.7c: Poorly maintained drains



Figure 6.7d: Water stagnation in house



Figure 6.7e: Absence of proper storm water drains and grey water treatment



Figure 6.7f: Street stagnated with grey water Figure 6.7g: Closed drains

6.6 POWER

All hamlets have electricity supply as source of power. 24 - hours power supply is given for residential buildings, whereas 12 - hours power supply is given for pumps for agriculture irrigation. 30 Households use roof top solar panels for power.

6.7 STREET LIGHT

Pole mounted street lighting is provided in all the streets of this Gram panchayat. 6 high mast lighting fixtures are provided in this GP, 2 each in Gundur and Burma colony; 1 each in

Ayanputhur and Thiruvallarchipatti. The total number of street lighting poles are 1680 and all the street lighting lamps are energy efficient LEDs (Gram panchayat office).

6.8 PUBLIC TRANSPORT

Bus is the only mode of public transportation available for the people of various hamlets. Frequent bus services are available along the NH. In addition, bus services are available to the interior hamlets. The services of private taxis and autos are also available in this GP.

6.9 ROAD NETWORK

The gram panchayat is spread on either side of NH45 that connects this GP to Tiruchirappalli. Major road connects this gram panchayat to Tiruverumbur town and other large industrial developments around the village. The hamlets are connected to the major roads as well as interconnected by all-weather roads/ streets. The total length of the cement concrete roads is 2 kms, bitumen roads is 10 kms and the remaining 14 kms of road stretches are unpaved (Gram Panchayat Office).



Figure 6.8 Interior streets

6.10 BANKS/ ATMs

Two banks with ATMs are located in this GP, one each in Gundur and Burma colony, located along/ close to the National Highway.

6.11 PUBLIC DISTRIBUTION SHOP

5 PDS are located in this GP, one each in Gundur, Thiruvallarchipatti, Ayyampatti; Burma colony, Ayanpudur hamlets. The PDS shops are located in all hamlets of the GP. The PDS building in Burma colony is in very poor structural condition (Figure 6.9).



PDS Gundur



PDS, Burma colony

Figure 6.9: PDS in Gundur GP

6.12 EDUCATIONAL FACILITIES

6.12.1 SCHOOLS:

There are 04 government and 2 private Primary school, 1 Govt. Middle School, and 01 private Higher Secondary School are located in this GP (Figure 6.10). The schools are located in hamlets Gundur (1), Thirualarchipatti (3), Ayyampatti (2), Burma Colony (01) and Ayanpudur (01)



Private school, Ayyampatti



School kitchen, Burma colony



Middle School & play ground, Burma colony



Primary school, Ayyampatti



Primary school, Thiruvallarchipatti

Figure 6.10 Schools in Gundur GP

6.12.2 COLLEGES AND UNIVERSITIES:

One private college and one private polytechnic are located in this GP adjoining the NH.

6.13 HEALTH FACILITIES

This gram panchayat has a health facility Primary Health sub centre. The major health facilities such as district/ medical college hospital, private multi-speciality hospitals are located in Tiruchirappalli city, at a distance of about 10-15kms and travel time of 30 minutes. Maternity and child welfare centre and TB clinic are located within 10kms distance from this GP. Allopathic medical practitioner and medical practitioners with other degree are available in this GP for medical consultations. Pharmacies (medicine shops) are available in this GP.

6.14 POST OFFICES

One sub post office is located in this GP at Gundur Burma Colony.

6.15 OTHER FACILITIES

The other community facilities present in this GP include:

- i. Anganwadis 6 nos., 2 in Gundur and one each in other hamlets.
- ii. Community Ground
- iii. Shops catering the day to day needs of people
- iv. Burial grounds/ Crematorium for all sections of people
- v. Library
- vi. Play grounds
- vii. Public wells
- viii. Places of worship



Anganwadi



Library



Community play ground, Gundur



Ayyampatti Play ground



Public wells



Health Centre



Other facilities



Crematoriums

Figure 6.11 Other facilities in Gundur GP



Figure 6.12 Places of worship, Gundur GP

CHAPTER 7

PROJECTIONS AND PROPOSALS

7.1 INTRODUCTION

Agriculture is the major economic activities of the people of this GP. There is a gradual decline in the number of cultivators from 1961 to 2011. Steady increase in the number of people work as agricultural labours from 1961 to 1991 and thereafter marginal decrease in the number of people work as agricultural labours from 1991 to 2001. Again, the number of people work as agricultural labours increased from 2001 to 2011. The number of people engaged as other workers increased significantly from 1991 to 2011. People expressed that the profit from farming is only marginal. As agriculture related works are only seasonal, people shift to unskilled works in Tiruchirappalli and nearby areas.

In this GP, the literacy rate and skill level of people is low particularly in the population of residing in this GP for more than 20 years. Weaving is the only household/ Cottage industry practiced by a small section of the people. The educational institutions and couple of industries in this GP are offering employment for the local people to a very limited extent due to education and skill level of the people. Most community facilities, infrastructure and utilities are provided for in hamlets.

7.2 ISSUES/ DEFICIENCIES AND EXPECTATIONS OF RESIDENTS

The various issues/ deficiencies noticed and also the expectations pointed out by the residents of this GP are as given below:

- i. Conversion of Agricultural lands for housing development: Due to less profit from Agriculture and related activities and also due to real estate market forces agricultural dry lands (Fallow) are being converted to housing layouts/ housing development. Expect better pricing and also nearby marketing place for their agricultural produces.
- ii. Lack of Job Opportunities: The farm based activities and jobs are seasonal and remaining part the year people find difficult to get employment. People expect more number of work days under MGNREGS scheme.
- iii. Health Centre – As only primary health sub centre is located in this GP people go to Tiruchirappalli for better facilities. People living in interior hamlets expect a primary health centre located in the central village of this GP.

- iv. Bus Facilities: People informed that they incur expenditure in hiring private vehicles or using their own vehicles as available bus services connecting all hamlets to Tiruchirappalli is less frequent. People expressed that more frequent bus services connecting all hamlets to Tiruchirappalli.
- v. Absence of parks in all hamlets of this GP. Only 2 playgrounds are present in the entire GP. In all hamlets people expressed that parks and play grounds are required for the residents.
- vi. Storm water drainage: Due to the absence of storm water drains, water gets stagnated on streets, areas close to water bodies and in other low lying areas during the rainy days. Some places people let in the waste water from the houses on to the streets.
- vii. Dilapidated Houses: Good number of people got a PMAY houses and also houses (Pasumai Veedu) under state govt. housing scheme. Still very small percentage of people live in dilapidated houses and they expressed that they need assistance through government schemes for construction of houses.
- viii. Proper road facilities: At present roads length of 14kms are not paved (unpaved mud roads). People are facing difficulties during rainy season due to water stagnation (coupled with absence of storm water drains). People expect paved streets with proper arrangements for drainage.
- ix. Lack of greenary (on the roads and forestry)
- x. As most working class people are either semi-skilled or unskilled, people expressed that training may be provided to them to make them either skilled or semi-skilled by establishing skill development/ job training centres.
- xi. Ground water contamination: The ground water is contaminated to some extent in some parts of the GP.
- xii. Efficient drainage system: In few places waste water from residential houses and grey water are stagnated in empty plots cause health hazards.
- xiii. Financial support, i.e., loans and also availability raw materials at subsidised price are the needs of weaving community present in this GP.
- xiv. Absence of community halls, storage godowns for agricultural produces.

7.3 POPULATION PROJECTIONS

The population growth (natural and also net migration) of this GP is calculated using different population projection models. The population is projected for the next 30 years, i.e., 2051. It is

expected that growth rate of this GP will be similar or more than the past two decades due to its close proximity to the city of Tiruchirappalli. The maximum population arrived from various models is adopted for this study. The final adopted population is given in the table 7.1.

Table 7.1: Projected Population –Gundur GP

Year	2021	2031	2041	2051
Population	20500	29700	39000	48900

7.4 PROPOSALS - AGRICULTURE

Paddy is the major crop for 2 seasons in a year. People expressed that the prices for the agricultural produces have not increased in proportionate to increase in the prices of fertilisers, labour wages, etc. Due to real estate market forces agricultural dry lands (Fallow) are being converted to housing layouts/ housing development.

PROPOSALS (0-5 yrs.):

- Encouraging farmers for Rotation crops – Less water intensive crops can be cultivated during summer.
- Encourage farmers to practice organic farming.

PROPOSALS (5-10 yrs.):

- Encourage farmers to utilise Govt. schemes and adopt drip/ sprinkler irrigation
- Establishment of Warehouses and Dry/ Cold storage in the GP or in nearby place common to this and nearby GPs (Guidelines for Rurban clusters, SPA, Delhi, 2019). Small scale farmers market along the NH can be developed where farmers can sell their products directly.
- Encouragement/ support from the nearby Agriculture based industries for the farmers to go for alternate crops.

PROPOSALS (10-20 yrs.):

- Development of agricultural processing establishments such as Rice mill, pulse processing, etc., (Guidelines for Rurban clusters, SPA, Delhi, 2019).

7.5 PROPOSALS – AGRICULTURE RELATED ACTIVITIES

PROPOSALS (0-5 yrs.):

- Encouraging more people/ households to engage in animal husbandry/ Dairying/ Poultry related activities.
- State Govt. schemes, giving subsidy/ loans for cattle (being implemented) can be implemented in a large scale.

PROPOSALS (5-10 yrs.):

The self-help groups (SHGs) may be trained and supported for following activities:

- Milk Producers Co-operative Society
- Poultry Farms
- Organic manure can be produced from the waste and sold to farmers at subsidized rates.

PROPOSALS (10-20 yrs.):

People may be trained and supported for the following:

- Household/ Cottage industries for value added dairy/ poultry products
- Feeds for cattle & Poultry (mainly SHGs)

7.6 PROPOSALS - INDUSTRIAL/ OTHER ECONOMIC ACTIVITIES

PROPOSALS (0-5 yrs):

- Support in terms of technical and loans for the existing weaving community for sustaining the activities.
- Initiatives on enhancing the skill level of the people by imparting training (Ex: Construction related activities: Masons, Fitters, Welding, Electrical, Plumbing, etc.,) to enhance their employability. This can be carried out by developing a skill development workshops in collaboration with nearby technical institutions and industries.

PROPOSALS (5-10 yrs):

- People may be encouraged and supported for the development of Household/ Cottage industries related to Agriculture and Animal Husbandry and also service industries close to NH (with employment of local people).
- Skill development centre may be established for this GP or combined one all nearby GPs (Guidelines for Rurban clusters, SPA, Delhi, 2019).

7.7 PROPOSALS – HOUSING

The additional housing stock requirement calculated, assuming that the average household size shall be 4 and about 2% of the existing housing (dilapidated) need replacement. No additional land areas are required for residential use in the interior hamlets to accommodate the additional housing requirement as good amount vacant housing areas (Natham) is already available. The overall additional houses and the land area requirement are given in Table 7.2.

Table 7.2: Future Housing Requirements – Gundur GP

YEAR	NO. OF HOUSEHOLDS	ADDITIONAL HOUSES REQUIRED	ADDITIONAL LAND AREA REQUIRED
2021	5125	1000	240000 sq. m.
2031	7425	2400	576000 sq. m.
2041	9750	2475	594000 sq. m.
2051	12225	2665	639600 sq. m.

The strategies for housing development are as stated below:

1. The Short – Term strategies include

- Replacement of Dilapidated houses with central/ State Housing Schemes (Both schemes are being implemented);
- Priority in implementation of schemes for kutcha and dilapidated structures in the implementation of housing schemes.
- Need to regularize the conversion of dry agricultural land into residential plots and go for orderly development in areas along the NH and the main road from NH to the hamlets.

2. The Long – Term include

- Development of areas for future residential development mainly to accommodate migration of people for residing. Fallow lands, difficult for cultivation may be converted for residential and other developments.

7.8 PROPOSALS – INFRASTRUCTURE AND COMMUNITY FACILITIES

7.8.1 WATER SUPPLY

At present the water supply scheme covers all hamlets, providing sufficient water supply through individual connections and street taps. Water supply scheme need to be extended to all

new developing housing areas. The quantity of water requirement (Table 7.3) for entire is projected assuming a requirement of 70lpcd piped water supply for community without sewerage system (URDPFI Guidelines, Ministry of Urban Development, 2014).

Table 7.3 Water Supply Requirement

YEAR	POPULATION	REQUIREMENT OF WATER QUANTITY (in Litres)
2021	20500	1435000
2031	29700	2079000
2041	39000	2730000
2051	48900	3423000

The protected water supply scheme from the river Kauveri may be further augmented to meet the projected water supply requirements. At present, the water supply distribution system has 19 overhead tanks with a total storage capacity of 6,80,000litres. The water supply is limited to certain hours of the day only. The infrastructure for the projected water supply requirements in terms of overhead tanks, extending the water supply distribution network to newly developing layouts, provision street taps and individual connections need to be developed.

7.8.2 ELECTRICITY

All hamlets provided with continuous (more than 12 hours) domestic supply. Subsidies/ Grants may be provided for use of roof top solar panels for producing electricity to meet their requirements (Pucca houses) so that more percentage of people go for green energy. Electrical infrastructure also need to be augmented to meet the increasing needs of power.

7.8.3 SANITATION/ DRAINAGE

Most houses have individual toilets, constructed on their own funding or using subsidies given through Govt. schemes. All individual toilets have septic tanks/ leech pits for sewage treatment. Efforts need to be taken to educate the people to dispose the treated grey water from septic tanks through proper soak pits. Leach pits are not advisable close to water bodies. Public Toilets are provided at select locations. However open defecation is practiced in very few locations. More public toilets need to be provided in certain identified (selected) areas. In the long – term, houses without toilets may be identified through household surveys and construction of individual toilets in all houses may be encouraged using Govt. scheme. To avoid stagnation of waste water on open land and draining in storm water drains, people may be advised to use waste water such as kitchen waste for watering plants in and around the residential buildings.

7.8.4 STORM WATER DRAINAGE

Only about 3kms of road stretches/ length have storm water drains. The short-term proposals include cleaning and removing encroachments if any in the storm water natural drainage channels leading to agricultural fields and water bodies. In the long term, drains may be constructed in all streets and connecting them to the natural drainage channels leading to agricultural fields and water bodies.

7.8.5 SOLID WASTE DISPOSAL

The issues faced in this GP is practice of open dumping by few households, segregation at source and economic sustainability. The solid waste is also effectively segregated and recycled.

The strategies include

- Educating the people to segregate the waste at the household level
- Funds may be generated for employing more people for the collection and segregation of solid waste
- Development of proper infrastructure for collection, segregation and compost yard in each of hamlets.
- Production of manure from compost yard to increase the revenue with the involvement of SHGs
- Allocation of more funds – for efficient door to door collection of solid waste
- To avoid open dumping, community bins can be placed for the people to dispose the waste that can be collected at periodic intervals for processing and disposal.

7.8.6 TRANSPORTATION

Bus is the mode of public transportation available for the people. State Transport Corporation/ private operators may provide more frequent services connecting all hamlets to Tiruchirappalli. Alternatively, mini bus & Shared Auto (private) services may be explored.

7.8.7 HEALTH

Primary Health Centres need to be provided for every 30000 population and sub-centre for every 5000 population (Guidelines for Rurban clusters, SPA, Delhi, 2019). Hence, it is proposed to have health centre as 24 x 7 facility and also providing free ambulance facilities by 2031 in addition to the existing primary health sub centre. The land requirement is 0.30 hectares.

7.8.8 EDUCATION

The future requirements of primary, secondary and higher secondary schools based on URDPFI Guidelines, Ministry of Urban Development, (2014) are given in table 7.4

Table 7.4 Additional Educational Requirements

Year		2021	2031	2041	2051
Population		20500	29700	39000	48900
Additional Primary Schools (I-V)	No.	-	-	02	02
	Land Area (in Hectares)	-	-	0.8	0.8
Additional Senior Secondary Schools (VI-XII)	No.	01	01	01	01
	Land Area (in Hectares)	1.8	1.8	1.8	1.8

The Anganwadis/ Pre-primary schools and primary schools are proposed in all hamlets to adhere to the standard that primary schools need to be placed within 1 km distance from every habitation.

7.8.9 BANKS

As the distance is more between the ATMs and the interior villages, additional ATMs may be placed in the central village of the GP. At present there is no Agricultural Cooperative Society/ Bank (loan assistance) in GP. One such cooperative society/ Bank may be established in the long term.

7.8.10 COMMUNITY SPACES

One community open spaces cum play ground and one Play field is located in this village. The proposals include hamlets housing park area and Residential unit play area, with a land area of 5000sq.m each in all hamlets; and a park and play field in the central village with an extent of 1.20 and 1.50 hectares respectively (URDPFI Guidelines, Ministry of Urban Development, 2014). Authorities need to ensure that the new housing layouts provide open spaces and play ground as per development control guidelines.

7.9 ENVIRONMENTAL ISSUES

The issues noticed are lack of greenery and effective implementation of rain water harvesting/ Ground water recharging. The proposals include the following:

- Green cover proposal: Tree Plantation on either sides of highways and all major roads, greening of closed mine sites, afforesting the scrub lands in public property and providing green buffer at the edges of all water bodies (Figure 7.1)
- Rain water harvesting/ Ground water recharging structures in individual buildings
- Rain water harvesting at community level- storm water drains need to be connected to open natural drains leading to agricultural fields and water bodies.
- Proper efforts to prevent ground water pollution and plan large ground water recharge structures in areas where the ground water is already polluted. The infiltration of rain water might improve the water quality over a period of time.
- Lot of local and migratory birds species are spotted in the lakes of Gundur. Conservation of the water bodies will protect the biodiversity

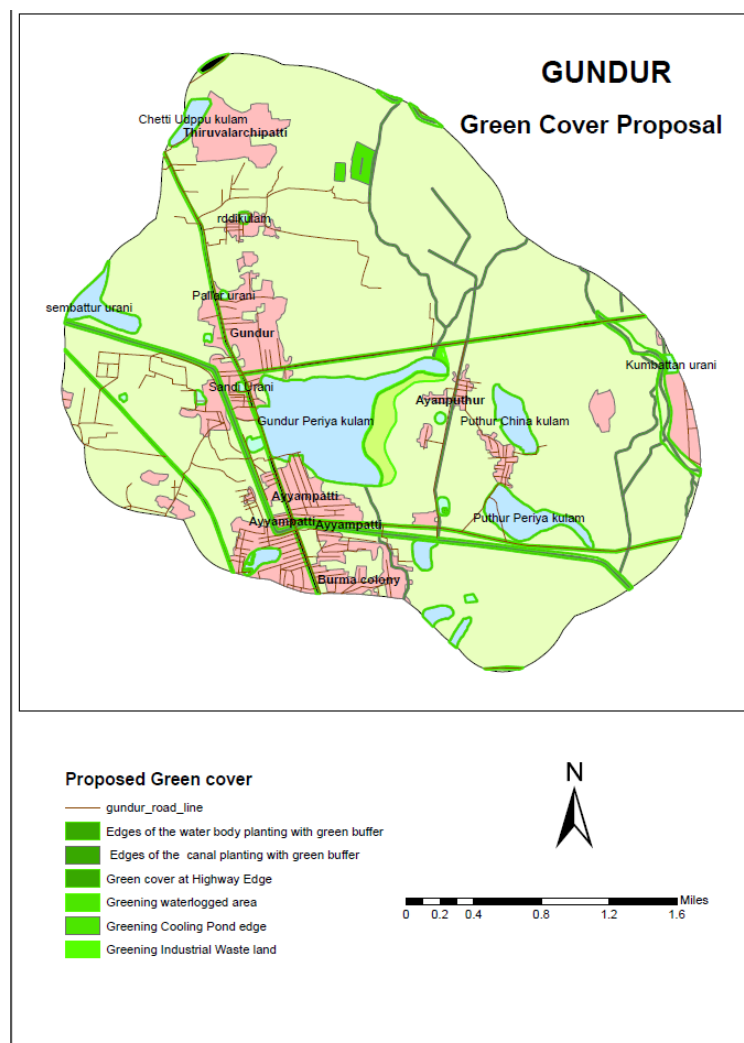


Figure 7.1 Green Cover Proposals

7.10 OVERALL DEVELOPMENT (LANDUSE/ LAND COVER) PROPOSALS

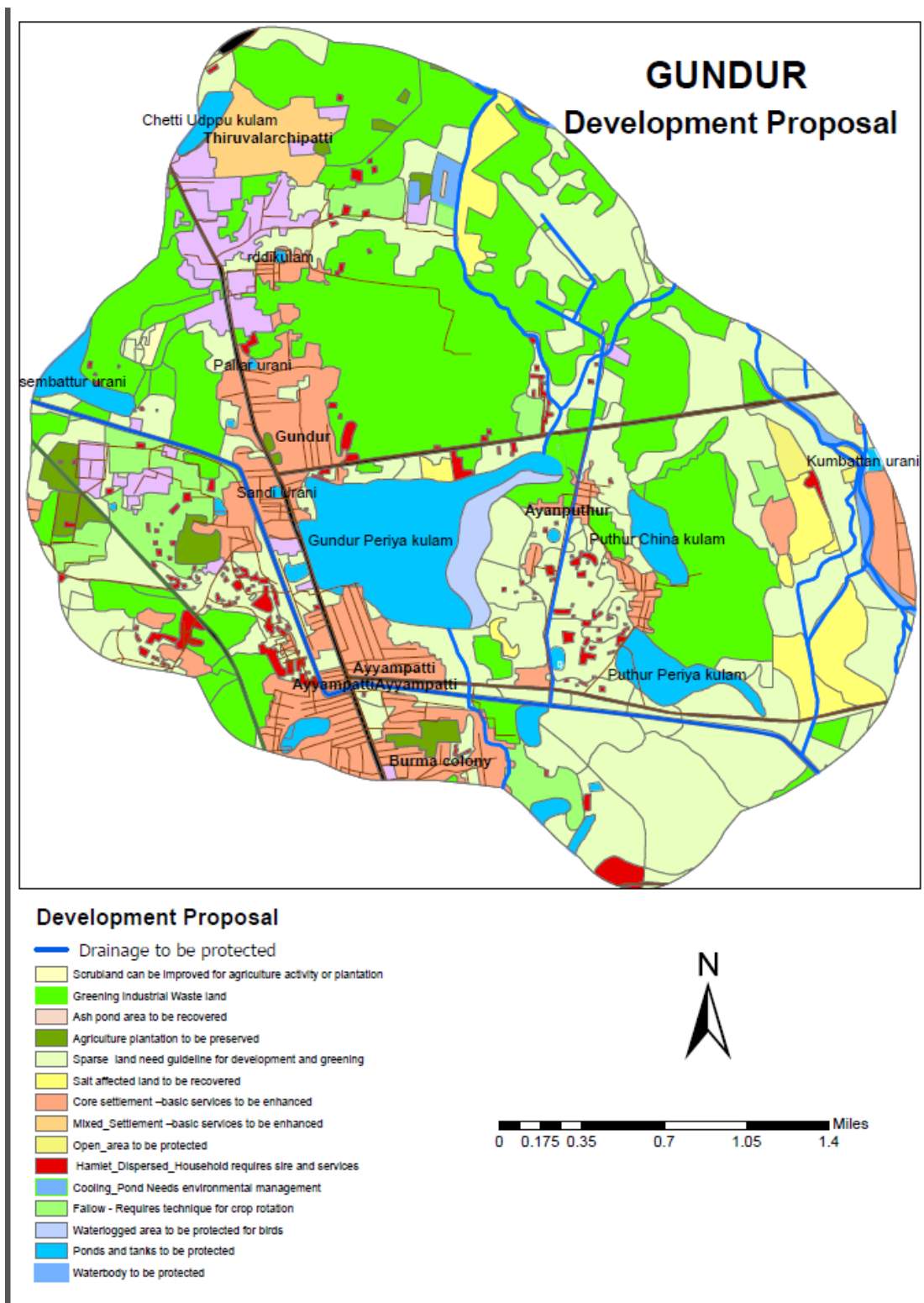


Figure 7.2 Development Proposal

The overall strategies (Figure 7.2) include:

- Protection of canals and water tanks by proposing suitable green cover around water bodies;
- Wet lands including marshy lands and Plantation areas to be protected;
- Environmental protection of cooling pond
- Identified areas for future residential, industrial and commercial establishments;
- Development of Community open spaces;
- Residential Development: Areas close to NH and the areas near main access road to main village to be developed on the principles of sites and services scheme;
- Basic services to be improved in core settlements and mixed settlements.
- Recovery of salt affected lands
- Greening of industrial wasteland
- Desilting of lakes and other ponds for effective storm drainage (to prevent flooding in the nearby residential and other areas)

7.11 GENERATION OF COMPREHENSIVE DEVELOPMENT PLAN FOR GP

(Regional Remote Sensing Centre - South, NRSC/ISRO, Govt. of India, Bengaluru)

Conservation and sustainable management practices requires the adoption of basic ecological principles in the management of natural resources to ensure the sustainability. To improve the land resources it is imperative to first improve the water resources of the region. So both the plans should complement each other.

7.11.1 WATER RESOURCES DEVELOPMENT PLAN

In the present study, WRDP has been achieved using a decision model that involves the logical combination of thematic maps as well as the ground and field knowledge shared by the Partner institution. The water resource development plan includes identification of suitable zones for taking up locale specific activities in the study area which are generally the areas, where certain type of water resource activity is recommended for implementation. Water conservation measures like check dam, percolation tank, bore wells, dug wells etc. fall under location specific activities. The main purpose of these activities is to improve the ground water condition within the GP area which means measures need to be taken to store the water as well

as allow water to percolate in to the ground by holding the water in water harvesting structures as much as possible.

In order to identify the suitable zones for location of recharge structures, different thematic layers viz., drainage network with drainage order buffer map, soil, slope and land use/cover and runoff potential were integrated. Subsequently, zones in which the defined conditions of the different thematic layers were fulfilled are identified for location specific activity. The guidelines for the selection of suitable zones for planning location specific activities are adopted from literature (IMSD, 1995). Implementation strategies of some of the recommendations for improving water resources are given in detail. The water resource development is shown in Figure 7.3.

1) Rainwater harvesting

Rainwater harvesting in the site has two components viz., harvesting the roof water and the other, harvesting the surface runoff. In addition, treated waste water is one important source of water.

a) Roof Water Harvesting to meet drinking water requirement of villages

Roof water from the buildings and other paved areas to be collected and stored in sumps for reuse and also for recharging the bore wells after filtering (using pebble, charcoal, sand beds). It would be advantageous to plan this activity while constructing any new building to collect as much roof water as possible and further for diverting this water to the sumps nearby and to the bore wells, after necessary filtering. Designs in this regard need to be worked out separately, taking into consideration of the roof area, rain fall, slope etc.

Roof water could be harvested by connecting the pipes and bringing the rainwater to a common pipe and then to sumps (size depends on roof area and requirement) after passing through filter beds. This water can be used for flushing, gardening, washing etc. For the new buildings under construction, harvesting of roof water, through sumps and recharging borewells could be planned.

b) Groundwater Recharging through rain water harvested:

Some of the common suggestions for ground water recharge and rain water harvesting to be adopted are

- Depth to Water levels during pre and post rainy seasons of all existing bore wells are to be monitored at regular intervals
- All existing bore wells to be directly recharged (after filtering the roof water)
- Existing drain / water ways should be cleaned & maintained and linked
- Direct recharging of bore wells will help in recharging depleted fractures and fissures to have sustainable yield from bore wells

2) Surface Water Harvesting

All pits / percolation ponds, check dams, dugout ponds (existing and the planned new ones) together will be able to hold considerable quantity of rainwater for recharging the ground water. Further, the rain water from the study area could be diverted during rainy season to the large covered under ground / Ground Level Reservoirs/ storage tanks (GLR), located on elevated locations and then transported to overhead tanks through pumping for water distribution in the villages. From these GLRs, water could be used for gardening and other purposes through gravity. Storing water in the GLRs will avoid the loss due to evaporation. For all the tanks, silt filters could be constructed to avoid silting of the tanks. This will also ensure that the water stored in the GLRs is free of silt.

- 3) Setting up of STPs** Setting-up of small STPs to recycle waste water which can be used for secondary uses like gardening, industrial cooling, flushing and other secondary purposes. A dual water supply systems can be planned within the GP for potable and non-potable water separately, as a viable option to minimize the pressure on fresh water supply.

4) Rejuvenation/ Restoration/ Desilting of Tanks:

The Rejuvenation / Restoration / Desilting of tanks is recommended for all bigger tanks which are partially silted up. Lakes are created basically for hydrological reasons for checking floods, recharging and maintaining the ground water table. They also act as sediment traps, prevent clogging up of natural valleys and reduce erosion by regulating runoff. Lakes and Tanks belong to wetland ecosystem and have a larger biological and ecological role. Hence, measures for rejuvenation / restoration / desiltation of tanks and lakes in the Gram-Panchayat will definitely build up ground water resources.

5) Drip irrigation

Drip irrigation systems deliver water directly to a plant's roots, reducing the evaporation that happens with spray watering systems. Timers can be used to schedule watering for the cooler parts of the day, further reducing water loss. Properly installed drip irrigation can save up to 80 percent more water than conventional irrigation, and can even contribute to increased crop yields.

6) Farm Ponds / dug out ponds

Capturing and Storing Water in small to medium sized Farm Ponds is another method of storing water. Polythene sheets were used to reduce the seepage / infiltration losses. Many farms rely on municipal water or wells (groundwater), while some have built their own ponds to capture and store rainfall for use throughout the year. Properly managed ponds can also help to minimize their impact on the surrounding watershed. This practice may be further encouraged to sustain horticulture, flori-culture & vegetable growing.



Gram Panchayat Spatial Development Planning - SISDP Update

Gundur (GP), Thiruverumbur Taluk Tiruchirappalli District, Tamilnadu

Water Resources Development Plan

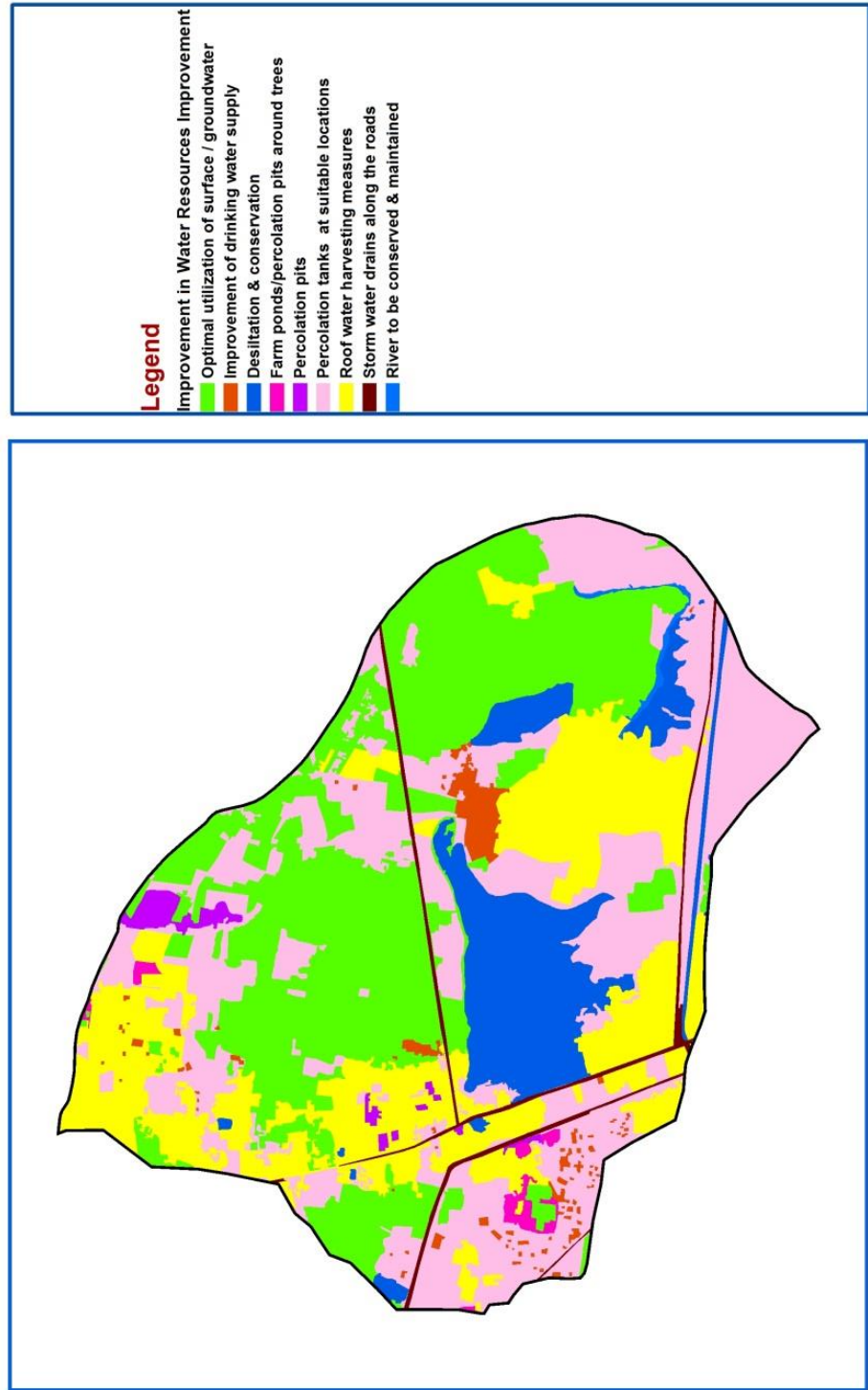


Figure 7.3: Water Resources Development plan for Gundur GP

7.11.2. LAND RESOURCES DEVELOPMENT PLAN (LRDP)

In the present study, LRDP has been achieved using a decision model that involves the logical combination of thematic maps as well as the ground and field knowledge shared by the Partner institution. For arriving at the suitability of a particular land use activity in the study area, thematic maps viz. land use/cover, soil, slope and groundwater potential maps which were generated using remote sensing and GIS were integrated. Expert's knowledge and the field situation was also considered for formulating the alternate land use plans. Methodology adopted from the GIS based land use planning project initiated in India entitled 'Integrated Mission for Sustainable Development', which generates, analyzes and integrates natural resource thematic data in 1:50000 scale, together with satellite remote sensing data has also been a guiding factor in the development plan formulations (IMSD, 1995). The land resource development is shown in Figure 7.4.

Land Resources Development Plan

Some of the general recommendations for LRDP are given below.

- 1) Improved Agro-horticulture / Agro-forestry practices (Horticulture Forestry plantations with interspaced cultivation) to bring better returns than the field crops.
- 2) **Intercropping** in horticulture plantations with vegetables in both seasons may bring better benefits to farmers. Different drought resistant tree species are recommended for forest nurseries.
- 3) **Soil and water conservation measures:** The surface run off could be channelized to recharge the existing and failed bore wells after due filtering. Soil conservation measures such as boulder / vegetative checks in the upper reaches, pits around trees could also be taken up in open areas. Vegetation cover to be improved with planting of trees, plants, etc within the open spaces in the village settlement area.
- 4) **Fodder / Tree Plantations:** These are suggested in the marginal lands with poor groundwater potential areas and not able to sustain crops. The open forest areas may be converted into grazing lands by over seeding grasses and fuel wood species and these are recommended to meet the demands of local cattle feeding and fuel requirement of local people.
- 5) **Afforestation:** Afforestation is proposed in the forest blanks / open forest areas to increase the density of vegetation. These gaps may have been caused due to several reasons which include grazing in the initial stage and unauthorized tree felling. The economic forest plantations are suggested for compensating forest degradation.
- 6) **Wasteland development:** Land with or without scrub (Scrub Lands) come under this category. Over seeding of grasses and agro-forestry plantation are recommended on upland with or without scrub.

- 7) **Crop cultivation based on soil texture:** Here clay soils are dominant and based on this Rice based cropping system suggested.
- 8) **Setting up of Industry:** Rice processing units and Market facility



Gram Panchayat Spatial Development Planning - SISDP Update
Gundur (GP), Thiruverumbur Taluk Tiruchirappalli District, Tamil Nadu
Land Resources Development Map

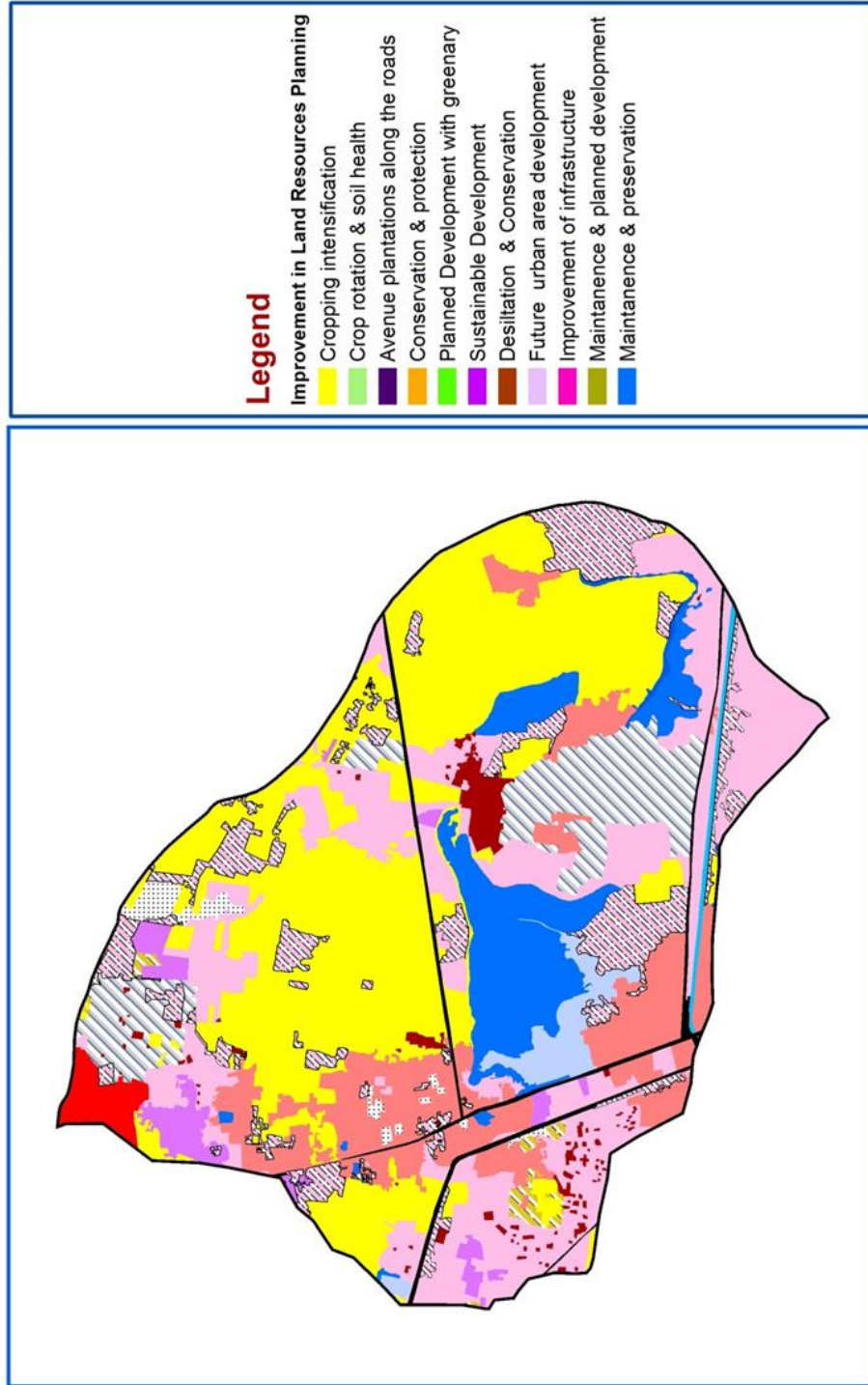


Figure 7.4: Land resources development plan for Gundur GP

7.11.3. RECOMMENDATIONS & SUGGESTIONS FOR IMPROVING NATURAL RESOURCES IN GUNDUR GP

Gundur GP is in close proximity to Trichy city. It has one third area under crop land which includes both cropped areas, fallow lands and agricultural plantations and one third area under scrub lands. The GP has dominantly clay soil with paddy as the dominant crop grown in two seasons with canal irrigation from Cauvery river. Some of the recommendations are to have crop intensification with crop rotation with pulses. In plantation areas it is suggested to go for intensification and multi tier cropping. The farm advisory and the Agricultural department can provide advisory to the farmers in their day to day agricultural activities, supply of quality seeds, monitoring and making available quality chemical fertilizers, bio fertilizers, bio pesticides besides making available the latest technologies from research institutions with a view to increase the food production and raw material production to cater to the growing needs of the food for the population and raw materials for the industries.

The GP needs to maintain and protect the rivers, canals and tanks. Desiltation of tanks needs to be taken up to protect the fragile tank eco system. The institutional areas need to have more greenery and follow recycling of water. Industries need to follow environmental norms.

The GP needs improvement of infrastructure and market facilities. Agro based industries like Rice processing related industries can be set up. Drinking water supply to the core village needs to be strengthened. In the core village, the pucca houses can follow roof water harvesting measures to recharge the ground water. Due to close proximity to Trichy the GP has more than 10 % area under layout and open land categories. These areas can have a proper planned development in terms of green avenues, storm water drains, waste water recycling etc. in place before actual residential development happens. Storm water drains need to be provided alongside of the major transportation network.

The farmers in the GP should be made aware of the various developmental schemes available viz. National Agriculture Development Programme, Pradhan Mantri Krishi Sinchayee Yojana , Collective Farming Seed Village Scheme, National Food Security Mission , National Mission On Sustainable Agriculture, Soil Health Card Mission, Soil health improvement through Bio-fertiliser including Green Manuring, adoption of Integrated Nutrient Management (INM) and Integrated Pest Management (IPM) technologies to achieve better return and value addition to

agricultural produce which in turn improve the economic status of the farming community.

The strategic planning is defined as the future directions for the development of land and water resources in the GP establishing the long-term objectives and mobilizing the financial resources and government policy to achieve hierarchical goals. Further, involvement of local people is quite necessary as part of education, awareness and consensus. Implementation, monitoring and maintenance of the schemes and evaluation of implemented schemes for their end benefits are also the part of strategic planning activities.

For successful implementation of land and water resource development plan in the study GP, suitable working scale needs to be identified for data analysis and implementation within the GIS framework. Most of the implementation by the implementing authorities of the government is being carried out with cadastral maps. The large-scale cadastral maps overlaid on the action plan details would be the best format for implementation.

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