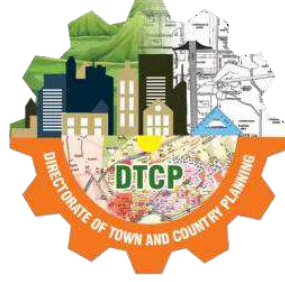


DIRECTORATE OF TOWN AND COUNTRY PLANNING



MASTER PLAN-2041 TIRUNELVELI LPA

AMRUT SUB-SCHEME GIS BASED
MASTER PLAN TIRUNELVELI LPA

DRAFT FINAL

HOUSING AND URBAN DEVELOPMENT DEPARTMENT
GOVERNMENT OF TAMIL NADU





DTCP File No :9015/2012/MP3/TCP6

TIRUNELVELI DISTRICT OFFICE FILE NO.6152/2020/TVLD3

AMRUT SUB-SCHEME GIS-BASED MASTER PLAN-2041 TIRUNELVELI LPA

DRAFT FINAL REPORT-2041

Member Secretary/ Joint Director,
Tirunelveli Local Planning Authority/
District Town and Country planning office, Tirunelveli.



PROFORMA

NAME OF THE OFFICE:

**DISTRICT TOWN AND
COUNTRY PLANNING
OFFICE, TIRUNELVELI
DISTRICT.**

NAME OF CLPA

**TIRUNELVELI LOCAL
PLANNING AUTHORITY**

I. PROPOSAL

1. Letter No and date of DTCP in which Proposals submitted to Government

II. NOTIFICATION

2. The G.O. details of Notification Under Section 10(1)(b)
G.O (Ms)No: 178 H&UD Dept dt.08.11.2017
3. The G.O. details which confirmation Was ordered under Section 10(4):
G.O (Ms)No:173 H&UD Dept dt.17.12.2018

III. CONSTITUTION

4. The G.O. details in which Tirunelveli appointment of members:
G.O (Ms)No:132 H&UD Dept dt.23.11.2021 and G.O (Ms)No:23 H&UD Dept dt.13.02.2023

IV. CONSENT

5. The G.O. details in which the Government accorded consent under Section 24(2)

V. PUBLICATION

6. Notification in form No. I in the Tamil Nadu Government Gazette Under Section 26.
7. Notification in form No. I in District Gazette under Section 26(1).
8. Letter No and date in which Director of Town and Country Planning has given advice on O&S under Section 26(2).



9. Resolution No and date in which the Tirunelveli LPA approved the Draft Master plan

VI. APPROVAL

10. Submission of master plan to Government for final approval Under section 28.

11. The G.O. details in which Government accorded its Approval under section 28.

VII. REPUBLICATION DETAILS OF APPROVAL

12. The Tamil Nadu Government Gazette Under section 30.

13. The Notice board of the local body

14. One or more leading daily newspaper circulation in the Local planning area

**Member Secretary / Joint Director,
Tirunelveli Local Planning Authority
District Town and Country Planning,
Tirunelveli District**



TIRUNELVELI LOCAL PLANNING AREA

Name of the Local Planning Authority: Tirunelveli Local Planning Authority

Reference:

Tirunelveli Local Planning Authority: Roc.No.6152/2020/TVLD3

DTCP Chennai : Roc.No.9015/2012/MP3/TCP6

Tirunelveli Local Planning Authority Resolution for Consent:

100/2023 dated 17/11/2023

**Member Secretary / Joint Director
Tirunelveli Local Planning Authority
District Town and Country Planning,
Tirunelveli District.**

**Assistant Director
Directorate of Town and Country Planning
Chennai**

**Deputy Director
Directorate of Town and Country Planning,
Chennai**

**Joint Director
Directorate of Town and Country Planning,
Chennai**

**Director
Directorate of Town and Country Planning,
Chennai**

**Secretary to Government,
Housing and Urban Development Department
Government of Tamil Nadu**



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ABBREVIATIONS

AD	ANNO DOMINI
AHP	AFFORDABLE HOUSING IN PARTNERSHIP
AMRUT	ATAL MISSION FOR REJUVENATION AND URBAN TRANSFORMATION
CLPA	COMPOSITE LOCAL PLANNING AREA
CBD	CENTRAL BUSINESS DISTRICT
CMP	COMPREHENSIVE MOBILITY PLAN
DDP	DETAILED DEVELOPMENT PLAN
DTCP	DIRECTORATE OF TOWN & COUNTRY PLANNING
ELCOT	ELECTRONICS CORPORATION OF TAMIL NADU LIMITED
ERM	ENVIRONMENTAL RESOURCE MANAGEMENT
FSI	FLOOR SPACE INDEX
G.O	GOVERNMENT ORDER
GDP	GROSS DOMESTIC PRODUCT
GIS	GEOGRAPHIC INFORMATION SYSTEM
GOI	GOVERNMENT OF INDIA
GOTN	GOVERNMENT OF TAMILNADU
HFA	HOUSING FOR ALL
HH	HOUSE HOLD
IDP	INTERNALLY DISPLACED PERSONS
IT	INFORMATION TECHNOLOGY
IPT	INTERMEDIATE PUBLIC TRANSPORT
IOT	INTERNET OF THINGS
ICL	THE INDIA CEMENTS LTD
ITMS	INTELLIGENT TRAFFIC MANAGEMENT SYSTEM
IRC	INDIAN ROAD CONGRESS
KV	KILO VOLT
KG	KILO GRAM
KLD	KILO LITRES PER DAY



LPA	LOCAL PLANNING AUTHORITY
LPCD	LITRES PER PERSON (CAPITA) PER DAY
MCC	MICRO COMPOSTING CENTRE
CM	MILLION CUBIC METERS
MSW	MUNICIPAL SOLID WASTE
MT	METRIC TON
MICE	MEETINGS, INCENTIVE, CONVENTION AND EXECUTIVES
MLD	MILLIONS OF LITERS PER DAY
MDR	MAJOR DISTRICT ROAD
MLCP	MULTILEVEL CAR PARKING
MOUHA	MINISTRY OF HOUSING AND URBAN AFFAIRS,
MMSCMD	MILLION METRIC STANDARD CUBIC METERS PER DAY
NEERI	NATIONAL ENVIRONMENTAL ENGINEERING RESEARCH INSTITUTE
NDDP	NET DISTRICT DOMESTIC PRODUCT
NH	NATIONAL HIGHWAYS
NMT	NON-MOTORISED TRANSPORT
ODR	OTHER DISTRICT ROAD
OC	OUTER CORDON
PMAY	PRADHAN MANTHIR AWAS YOJANA
PVC	POLYVINYL CHLORIDE
PCU	PASSENGER CAR UNIT
PWD	PUBLIC WORKS DEPARTMENT
PT	PUBLIC TRANSPORT
PPHPD	PERSONS PER HOUR PER DIRECTION
RF	RESERVED FOREST
RTO	REGIONAL TRANSPORT OFFICE
SEZ	SPECIAL ECONOMIC ZONE
SH	STATE HIGHWAYS
SIDCO	SMALL INDUSTRIES DEVELOPMENT CORPORATIONS
SIPCOT	STATE INDUSTRIES PROMOTION CORPORATION OF TAMIL NADU LIMITED
SNA	STATE NODAL AGENCY
SUTP	SUSTAINABLE URBAN TRANSPORT PLAN



SQ.KM	SQUARE KILO METER
T&CP ACT	TOWN & COUNTRY PLANNING ACT 1971
TWAD	TAMILNADU WATER SUPPLY AND DRAINAGE BOARD
TPD	TONNES PER DAY
TMICC	TRAFFIC MANAGEMENT AND INFORMATION CONTROL CENTRE
TP	TOWN PLANNING
TNSCB	TAMILNADU SLUM CLEARANCE BOARD (ERST WHILE)
TNUHDB	TAMILNADU URBAN HABITAT DEVELOPMENT BOARD
TNHB	TAMILNADU HOUSING BOARD
TNCDBR	TAMIL NADU COMBINED DEVELOPMENT AND BUILDING RULES
TNPL	TAMIL NADU PREMIER LEAGUE
TNUDF	TAMILNADU URBAN DEVELOPMENT FUND
TNUIFSL	TAMILNADU URBAN INFRASTRUCTURE FINANCIAL SERVICES
TNSTC	TAMILNADU STATE TRANSPORTATION CORPORATION
ULB	URBAN LOCAL BODY
URDPFI	URBAN AND REGIONAL DEVELOPMENT PLANS FORMULATION AND IMPLEMENTATION
VOC	V.O.CHIDAMBARAM
WHO	WORLD HEALTH ORGANIZATION

INTRODUCTION

CHAPTER 01



**MASTER PLAN
2041
TIRUNELVELI LPA**



1. INTRODUCTION

Overview of Tirunelveli

The Tirunelveli Local Planning Area Master Plan unfolds within the backdrop of Tirunelveli District, a distinguished region in the southern part of Tamil Nadu. This area is not just a geographical expanse but a cultural and historical tapestry that weaves together a story of significance and richness.

Spanning 3876.06 sq. km, Tirunelveli District is a microcosm of Tamil literature, showcasing its diversity through geographical divisions. From the majestic Western Ghats to the lush Kalakkadu and Mundanthurai forests, the lands irrigated by the Tamirabarani and other rivers, the picturesque Radhapuram sea coast, to the serene teri land—each division contributes a unique charm, creating a mosaic of natural beauty.

The district's rich heritage, steeped in history, is adorned with pilgrimage sites, architectural marvels, and memorials paying homage to the valiant warriors of Indian independence. Tirunelveli city, at the core of this narrative, stands as a testament to resilience, evolving through historical milestones under the Pandya kings, the Chola kingdom, and periods of British influence.

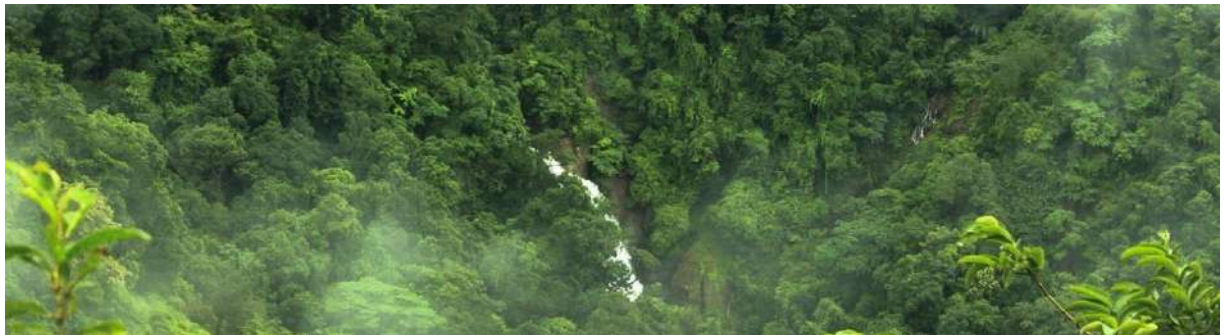
As we embark on the master planning process, this report seeks to articulate a vision that harmonizes the district's cultural richness, historical significance, and the aspirations of its community within the Tirunelveli Local Planning Area. Subsequent chapters will explore the intricacies of Tirunelveli's past, present, and future, shaping a sustainable and vibrant roadmap for its development.



Nellaiappar Kovil



Marutham - Ambasamudram Paddy Fields



Mullai - Kalakad Forest



Neithal - Uvari Sea Shore



Paalai – Radhapuram Terikkadu



Manjolai



Pattamadai – Korai Mat



Kaanis – Rituals



1.1 AN OVERVIEW –GIS BASED MASTER PLAN FORMULATION

Geographic Information System (GIS) plays a key role in decision making, planning and management of such urban areas. GIS offers the capability for dynamic query by analyzing reliable, seamless and reasonably accurate data, which displays information in efficient and analytical manner. Satellite imagery and Geographical Information System (GIS) are the tools that facilitate to develop datasets for preparation of rapid, comprehensive, rational, and implementable plans. GIS software is a technological tool for comprehending geography and making intelligent decisions. By introducing GIS, one can determine areas with inadequate public services, infrastructure, and provide basic solutions. GIS in urban planning, as an analytical and modeling tool, can be applied to a wide array of problems. This comprises addressing problems related to database structures, simple and complex analytical models alike. GIS is also useful in monitoring of an area or conducting a feasibility study of a location for a specific purpose.

Formulation of Master Plan of Tirunelveli LPA as per Provisions of Tamilnadu Town and Country Planning Act, 1971, includes demand assessment, identification of issues, projected requirements, development strategy and draft proposals on the GIS base map, and data analysis. The deliverables are in the form of base map, thematic maps specified, data analysis reports and Master plan document.

The Master Plan for Tirunelveli LPA 2041 has been developed utilizing Geographic Information System (GIS) technology. This plan adheres to the AMRUT (Atal Mission for Rejuvenation and Urban Transformation) guidelines and encompasses a comprehensive set of recommendations strategically designed to foster the LPA growth.



1.2 MASTER PLAN PREPARATION – PROVISION UNDER TAMIL NADU TOWN AND COUNTRY PLANNING ACT, 1971

The Master Plan for any planning area in the State of Tamil Nadu is prepared under the provisions of the Tamil Nadu Town and Country Planning Act, 1971. The Master Plan is to be revised once in every 5 years as per the provisions of Section 32 (2) (b).

Directorate of Town and Country Planning and the Local Planning Authority is exercising the powers, functions and performs duties under the provisions of the T&CP act 1971, as the Local Planning Authority for the Tirunelveli LPA. As per section 17(2) the master plan may propose or provides for all or any of the following matters namely:

- a) The manner in which the land in the planning area shall be used.
- b) The allotment or reservation of lands for residential, commercial, industrial and agricultural purposes and for parks, play fields and open spaces.
- c) The allotment or reservation of land for public buildings, institutions and for civic amenities.
- d) The making of provision for national highways, arterial roads, ring roads, major streets, lines of communication including railways, airports and canals.
- e) The traffic and transportations pattern and traffic circulation pattern.
- f) The major road and street improvement.
- g) The areas reserved for future development, expansion and for new housing.
- h) The provision for the improvement of areas of bad layouts or obsolete development and slum areas and for relocation of population.
- i) The amenities, services and utilities.
- j) The provision for detailed development of specific areas for housing, shopping, industries and civic amenities and educational and cultural facilities.
- k) The control of architectural features, elevation and frontage of buildings and structures.
- l) The provision for regulating the zone, the location, height, number of storey's and size of buildings and other structures, the size of the yards and other open spaces and the use of the building structures and land.
- m) The stages by which the master plan shall be carried out and,



n) Such other matters as may be prescribed.

1.3 NOTIFICATION OF LOCAL PLANNING AREA – TIRUNELVELI LPA

The Notified Tirunelveli LPA area covers Tirunelveli Municipal Corporation, Naranammalpuram Town Panchayats, Sankar Nagar Town Panchayat and 102 Revenue villages. As per 2011 Census, the area of the expanded Tirunelveli LPA is **861.97 Sq.km** with a population of 7,33,938. Tirunelveli city Municipal Corporation, which is the core of the LPA accounts for 12.60 % of the Total LPA area. The core city municipal corporation accounts for 68 % of the total population of the LPA.

The table 1.1 below shows the profile of the Tirunelveli Local Planning Area. It specifies the date of notification, its extent and the areas which are covered under it.

Table 1.1 NOTIFICATION OF LOCAL PLANNING AREA PROFILE

Name of the LPA		Tirunelveli	
CONSTITUTION OF THE LPA			
1	Date of Notification as per G.O.Ms. No:1565 H&UD	25, Nov 1988	
	Extent of the LPA	351.57Sq.km	
	Constituents of the LPA	Corporation	1
		Revenue Villages	44
INCLUSION OF ADDITIONAL AREA IN THE LPA			
2	Date of Notification as per G.O.Ms. No:	29.11.2017	
	Added area	510.40 Sq.km	
3	Total Extent of the LPA	861.97 Sq.km	
4	Constituents of the LPA	Number	
i	Tirunelveli Municipal Corporation	1	
ii	Town Panchayats	2	
iii	Taluks	3	
a	Entire Tirunelveli Taluk	40 Revenue Villages	
b	Entire Palayamkottai Taluk	39 Revenue Villages	
c	Part of Manur Taluk	23 Revenue Villages	
iv	Total Revenue Villages	102	
5.	Population of the LPA (2011)	7,33,938	



1.4 ADMINISTRATIVE UNITS IN LOCAL PLANNING AREA

The table below shows (Administrative units in LPA) the list of villages, town Panchayats and Corporation which are included in 10(4) as per **G.O.Ms. No: 173 H&UD Dept DT.17.12.201**

Table 1.2 ADMINISTRATIVE UNITS IN LPA

S. No	Local Body	Number	Name	Extent in sq.km
1	Municipal Corporation	1	Tirunelveli	108.65
2	Town Panchayats	1	Naranammalpuram	13.07
		2	Sankar nagar	6.77
Sub-Total (A)				128.49
3	Name of the Taluk	S. No	Village Name	Extent in sq.km
i	Tirunelveli	1	Gangaikondan	44.71
		2	Padhinalamperi	1.67
		3	Alangarapei	5.76
		4	Kuppakurichi	6.38
		5	Sivagurunathan thiruthu	0.09
		6	Alaganeri	0.5
		7	Udayaneri	1.05
		8	Kalkurichi	1.96
		9	Kattalai udayaneri	0.59
		10	Palamadai	5.41
		11	Kattampuli	0.97
		12	Rajavallipuram	4.81
		13	Pudur	14.47
		14	Uganthanpatti	4.33
		15	Seethaparpanallur	7.62
		16	Karuvanallur	9.22
		17	Velarkulam	2.8
		18	Vettuvankulam -I	6.03
			Vettuvankulam -II	
			Vettuvankulam -III	
		19	Sirukkankurichi	4.68
		20	Abishekapatti	7.41
		21	Ramayanpatti	14.74
		22	Veppankulam	0.53
		23	Thenpathu (part)	2.00
		24	Pettai (part)	3.29
		25	Megamudaiyarkulam	1.76
		26	Ramalinganeri	0.96
		27	Thirupanikarisalkulam	8.87
		28	Thulukkarkulam	2.29
29	Thirupani nellaiahpuram	2.72		
30	Sivaniyarkulam	1.82		



		31	Sankanthiradu	9.18		
		32	Melakkallur	5.45		
		33	Kodaganallur	13.71		
		34	Palavoor	4.59		
		35	Vaduganpatti	2.98		
		36	Thuvarasi	2.56		
		37	Kondanagaram	9.89		
		38	Suthamalli (part)	6.09		
		39	Narasinganallur (part)	2.89		
		40	Karungadu	1.84		
			Gangaikondan RF			
	Sub-Total(B)			228.63		
ii	Palayamkottai	41	Sivalaperi	25.86		
		42	Kansapuram	2.33		
		43	Maruthur	2.45		
		44	Thiruthu	0.76		
		45	Keelapattam	3.10		
		46	Thirumalaikolunthupuram	3.38		
		47	Melapattam	7.76		
		48	Manapadaiveedu	1.32		
		49	Keelanatham	8.99		
		50	Palayamchettikulam	3.24		
		51	Avinaperi	1.70		
		52	Naduvakurichi	3.81		
		53	Udaiyarkulam	1.01		
		54	Vagaikulam	1.92		
		55	Velankulam	1.03		
		56	Melaputhaneri	1.59		
		57	Ariyakulam	5.41		
		58	Uthamapandiyankulam	1.30		
		59	Paraikulam	1.49		
		60	Nochikulam	2.44		
		61	Parpakulam	4.19		
		62	Krishnapuram	9.07		
		63	Muthur	18.15		
		64	Reddiarpatti	8.25		
		65	Kunnathur	2.92		
		66	Melathiruvenkadanathapuram	3.00		
		67	Keelathiruvenkadanathapuram	1.48		
		68	Aaraikulam	0.93		
		69	Munneerpallam	14.58		
		70	Tharuvai	16.86		
		71	Melathidiyur	6.90		
		72	Thidiyur	5.32		
				73	Kuravarkulam	1.22
				74	Senkulam	11.60



		75	Ponnakudi	9.09
		76	Konganthanparai	2.46
		77	Pudukulam	13.80
		78	Itteri	7.6
		79	Sivanthipatti	19.31
			Wolf Hill RF	
			Melapattam RF	
			Sivalaperi RF	
Sub-Total (C)				237.62
iii	Manur	80	Ukkirankottai	9.59
		81	Therkupatti	4.18
		82	Kurichikulam	5.12
		83	Kalakudi	10.46
		84	Vagaikulam	14.77
		85	Alagiapandiyapuram	14.63
		86	Kattarankulam	8.91
		87	Pillaiyarkulam	13.08
		88	Shelliyallur	18.64
		89	Pirancheri	30.64
		90	Chittarchathiram	7.19
		91	Thalaiyuthu	15.54
		92	Thenkalam	15.43
		93	Pallikottai	16.26
		94	Kannarpatti	9.6
		95	Ettankulam	14.83
		96	Manur	13.36
		97	Mavadi	5.96
		98	Nanjankulam	7.13
99	Madavakurichi	20.87		
100	Vallavankottai	2.71		
101	Thulukarpatti	1.61		
102	Sethurayanpudur	6.75		
			Talaiyuthu RF	
Sub-Total (D)				267.23
Grant Total (A+B+C+D)				861.97sq.km



1.5 BACKGROUND OF THE STUDY

Atal Mission for Rejuvenation and Urban Transformation (AMRUT) was launched in June 2015. The main focus of AMRUT is to establish infrastructure that could ensure adequate robust sewage networks and water supply for urban transformation by implementing urban revival projects. The purpose of AMRUT is to

- I. Ensure that every household has access to a tap with the assured supply of water and a sewerage connection.
- II. Increase the amenity value of cities by developing greenery and well-maintained open spaces (e.g., parks)
- III. Reduce pollution by switching to public transport or constructing facilities for non-motorized transport.

One of the sub schemes of the AMRUT Mission is the Formulation of GIS based Master Plans, which will help in different types of urban planning exercises, e.g. preparation of Sectoral Plans, Development Plan, Zonal Plan, Utility Plan, Infrastructure Plan, etc. Priority is given to cities which do not have master plans and those cities whose Master Plans are about to expire by 2021. The objective of GIS-Based master plans for AMRUT cities is to develop common digital geo referenced base maps and land use maps using GIS. Formation of GIS-based Master Plans support decision making, efficient land use management and utilization, spatial growth management, enable project planning and urban management.

The urban sprawl has been towards the suburbs and rural vicinity, establishing an immediate need to regulate and integrate future growth and existing development with statutory planning framework for the comprehensive, holistic, integrated and sustainable development of natural and built environment, socio-economy and to provide good quality of life to its people. To meet this need, Tirunelveli LPA, Tamilnadu AMRUT city, has been included in the centrally funded reform of the GIS-based Master Plan.

Formulation scheme, which will be implemented by the State Government, with the Department of Directorate of Town and Country Planning and Urban Local Bodies acting as the State Nodal Agency (SNA).



1.6 OBJECTIVES OF THE ASSIGNMENT

The following are the objectives of the assignment:

- To formulate Master Plan to ensure systematic growth of Tirunelveli LPA
- It aims at utilizing existing Land use and infrastructure to propel the growth direction and the growth pattern of Tirunelveli LPA to satisfy the present conditions without compromising existing resources for the future developmental needs of the city.
- It arranges the pattern of a city to satisfy both the present and future requirements
- It helps in restricting the haphazard and unplanned growth.
- To develop a common geo referenced base maps and land use maps at 1:4000 scale for Tirunelveli LPA which shall be used by several line departments for policy decisions.

1.7 SCOPE OF WORK

Tirunelveli LPA Master Plan 2041 covers the following important aspects:

- Location, physiographic linkages, climate, regional setting, Historical background.
- Brief description of city, review of existing Master/ Development Plan, issues related to implementation of existing master plan.
- Spatial growth of the town & direction, incorporation of new areas
- Demographic data including population (urban/ rural, ward-wise, male & female), literacy rate, growth of population, workers and non-workers, occupational structure, etc., shall be collected – as per current & past Census data.
- Employment generating activities – existing and potential
- Industries - existing and potential, their nature, employment etc.
- Commercial activities including retail and wholesale business, warehousing and God owns mantis, rural markets, etc.
- Government and semi government offices and government reserved areas.



- Educational facilities (Govt./Private) including universities, colleges (engineering, medical, arts, science, commerce, law, etc.), schools (higher secondary, secondary, middle, primary, nursery, etc.) vocational training centers, etc.
- Medical facilities (Govt. /Private) including hospitals, dispensaries, primary health centers, veterinary, Ayurvedic, Homeopathic, Siddha, etc.
- Social, cultural and other religious activities.
- Other community facilities including cremation and burial grounds
- Physical infrastructure – electricity, water supply, sewerage, solid waste management, telephone, etc. Recreational facilities including parks, open spaces, grounds and playgrounds, semi-public recreation, etc.
- Agricultural use including dairies, orchards, nurseries, reserved forests, etc. and All forest lands
- Transport Circulation facilities including airport/railway stations and yards, road transport terminals, stands for buses and trucks, parking, etc.
- Proposals/ commitments by Central/ State Government concerned Local Body, development authority, etc.
- All vacant lands under government ownership (non-built).
- Places of tourist and heritage importance both natural and manmade including natural areas, fairs and festivals, etc.
- Legislative and Institutional Framework, institutional structure – municipal bodies, town panchayats, village panchayats, development authority, urban improvement trust, etc. Action Plan, identification of projects and phasing, resource mobilization



1.8 MASTER PLAN APPROACH

1.8.1 MASTER PLAN PROCESS

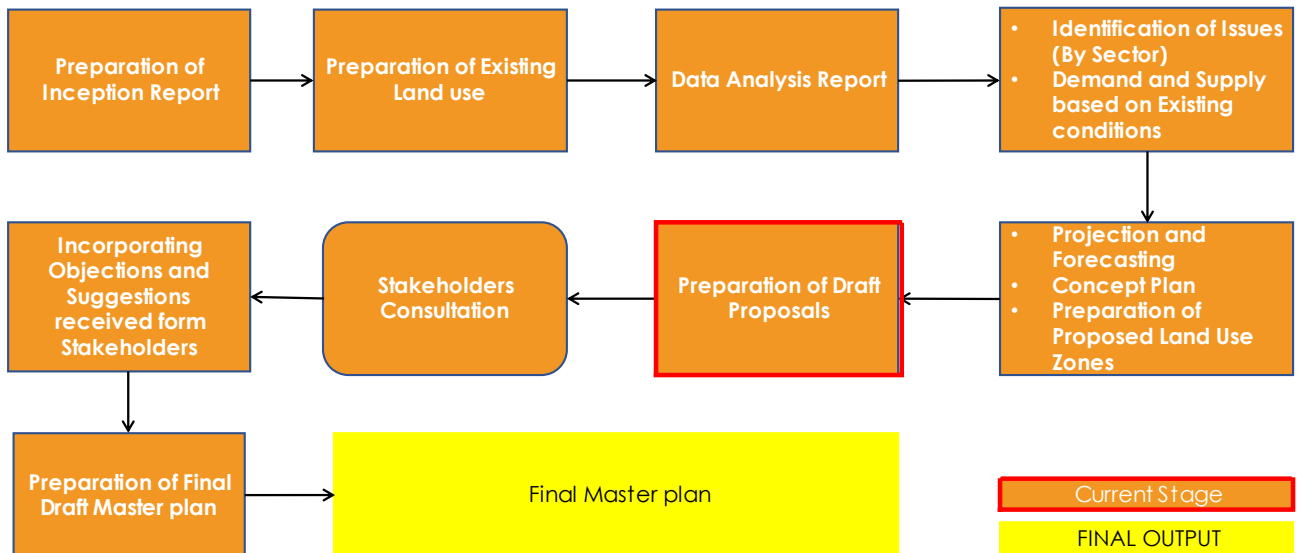
Master Plan/New Town Development Plan is a land use plan prepared for towns with regulatory guidelines to ensure orderly development of the planning area. In the broader sense, it aims at land use regulations and provision of effective road network, fixing alignment of bypass roads, ring roads etc. It involves a continuous process like deriving, organizing and presenting a broad comprehensive programme for urban development and renewal. It is designed to fulfil local objectives of the physical well-being and also indirectly including social, economic aspects considering both the immediate need and those of foreseeable future. The development is regulated according to the Master Plan/ New Town Development Plan prepared for the particular town, which paves way for fair development of the town improving the quality of life of the urban populace.

1.8.2 METHODOLOGY

Master Plans prescribe the spatial pattern on how the city should get developed for a period of twenty years in India. The time period for the preparation of Master Plan in India varied from 1 to 4 years and in some cases, it is beyond that also. As the time period for the preparation is too long, Ministry of Urban Development, Government of India, looked forward, on how the technology can be harnessed to prepare the master plans for the towns and Cities. In this context, the Government have thought to use High Resolution Satellite Imageries and GIS as a tool to speed up the preparation of Master Plan. In this context, Ministry of Human Development has formulated GIS Based Master Plans for Cities and Towns. It involves preparation of Existing Land use Plan using High Resolution Satellite Imagery using GIS, preparation of Concept Plan, Preparation of Infrastructure Plan and Preparation of Proposed Land use Plan.



METHODOLOGY



GENERAL METHODOLOGY

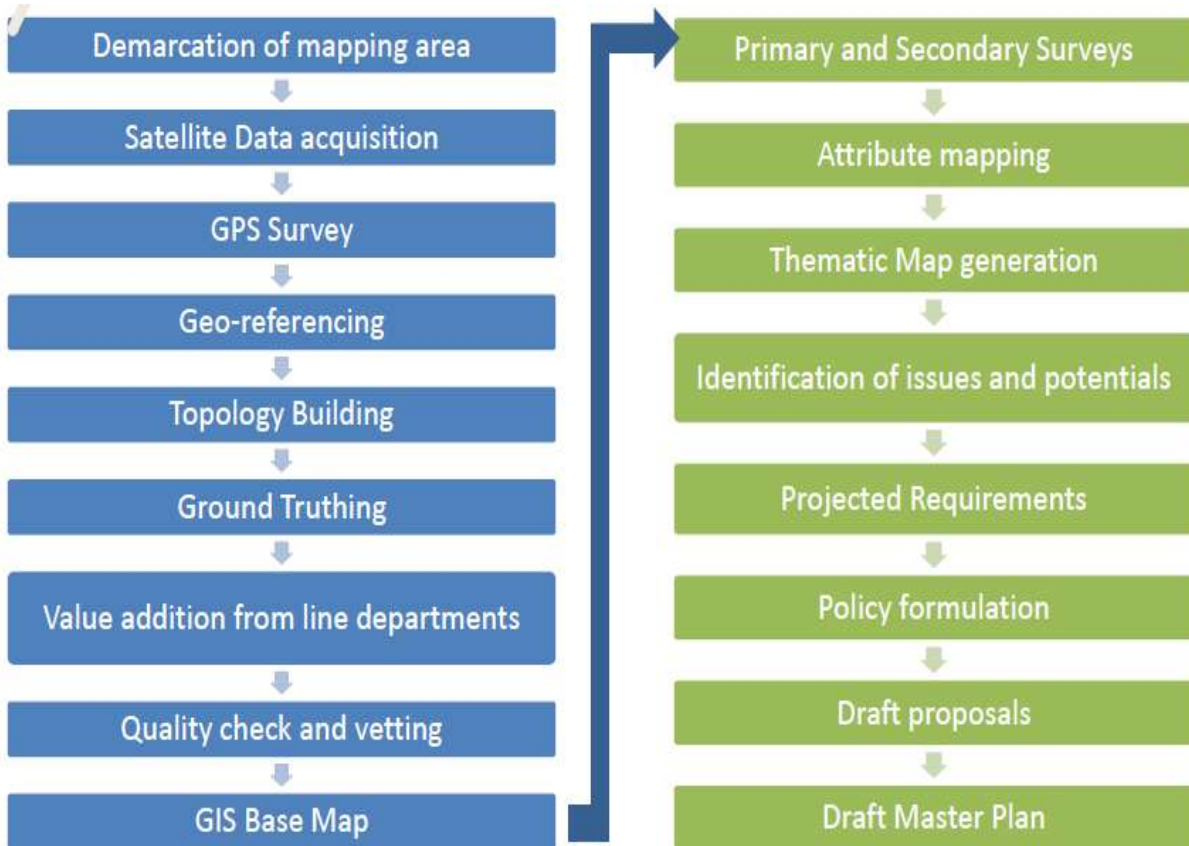


Figure 1.1 METHODOLOGY



1.8.3 SURVEY AND STUDIES

Planning Surveys will vary in content and scope from the surveys needed to be carried out for a Master Plan/ Development Plan etc. Basic data is collected generally by a sample survey and this data will broadly cover housing, transport, physical services, social services, amenities etc. Aspects like family income, means of livelihood, and nature of employment are also covered. In addition, depending in the nature of the exercise, a detailed surveys and projections are also required over the plan period / horizon year so that future requirements are adequately catered to. The preliminary planning survey may be considered to consist of the following components:

- Preparation of Base Map of the urban area.
- Existing Land Use Survey.
- Utilities and Services Surveys.
- Survey of Community facilities like Schools, Hospitals, Clinic, Parks and Playgrounds, etc.
- Sample household survey for collecting essential data on housing, transport services and amenities.

1.8.4 BASE MAP PREPARATION

In the absence of an accurate base map, no planning exercise can be undertaken. The base map should show all the streets, lanes and open spaces and division of area by plots with survey numbers. The base map should show all physical features including contours. In most of the urban areas, this map may not be available readily and where available, it may be outdated. The first step therefore, would be to get any available map on a scale in which the individual plots with their survey numbers, are/can be shown and then proceed to check that map, from part to whole. While checking, omission and errors and new sub-divisions should be entered on the map. For this survey, a team of experienced field staff working under a qualified town planner are required. While the field staff is engaged in checking the map and making it up-to-date, the town planner supervising the work may undertake other surveys which do not require a detailed base map. The amount of information to be represented on the map depends on scale, projection, conventional signs, draughting skill, methods of map-making, purpose of map, etc. and hence would vary from map to map.



Uniformity of base map with regard to presentation of features, scale, size and notations would facilitate the readability of these maps and comparison of one map with another. Every base map must be provided with a key map, chosen to a suitable scale at the right-hand upper corner. A map will not make sense unless a list comprising of various symbols, etc. used for various types of elements shown is provided in the form of a legend which is usually shown in the right-hand side of the map. It is essential to give every map a title. In the normal practice, titles of the study/project are written in a horizontal line at the bottom of the map.

Now a days, aerial photography is used for preparation of base map. Large scale aerial photography is being used for generation of base maps and other thematic maps for urban areas as it proves to be cost and time effective and reliable. Wealth of information pertaining to land features, land use, built-up areas, city structure and urban form, physical aspects of environment, etc. is available from the aerial photography. It is the skill of the interpreter who can extract the information useful for generation of various thematic maps and graphic data required for preparation of urban development plan. For preparation of base map, the following stages of work are generally involved are shown in the figure 1.2.

A base map is a fundamental map that contains information for those who need to refer to it repeatedly throughout the project or process. A base map should have following information:

- Village boundary
- Farm land and survey information
- Streams and rivers
- Slope
- Important local land marks within the village
- Settlements
- Road's network and connectivity
- Existing traditional /large water bodies

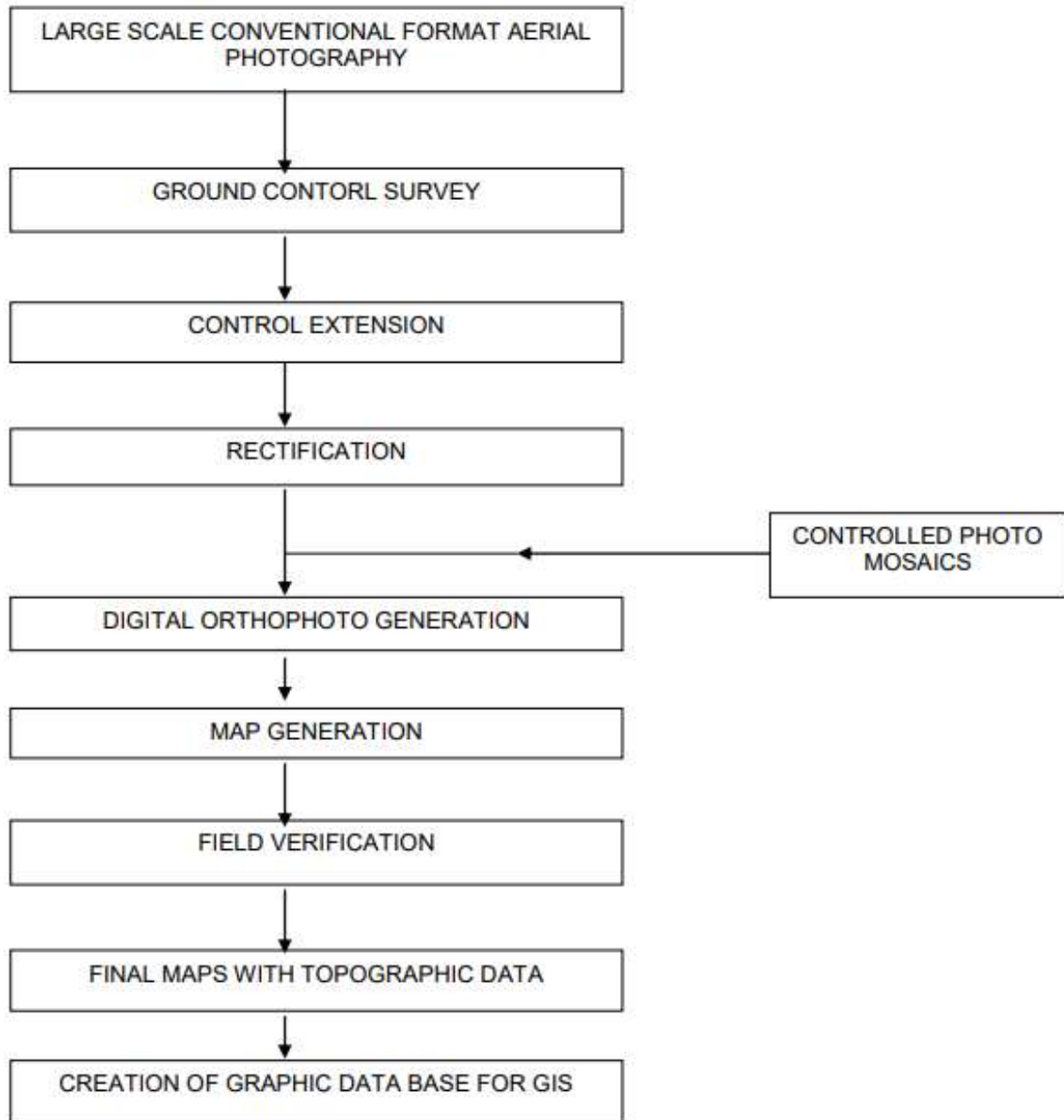


Figure 1.2 METHODOLOGY FOR BASE MAP PREPARATION

There is no single map that contains all of the above information and therefore to prepare a base map there needs to be two maps such as (1) Cadastral Map and (2) Toposheet which contain the above information. Along with these two maps, there needs to be some consultations with village people to identify and locate important local landmarks that people use to visualize the respective areas in their mind and to communicate to farmers and other stakeholder for an effective water management and planning at village and / or Gram Panchayat level.



Cadastral Maps are available at

- District Land Record Office
- Taluk or Panchayat Office

Contains Information about

- Farm Lands
- Local Roads
- Grazing Lands
- Traverse Land
- Settlements
- Tanks

Toposheets are available at

- Survey of India

Contains Information about

- River and Streams
- Roads
- Contours
- Height Points
- Water Bodies
- Important Landmarks

1.8.5 STANDARDIZATION OF DATA USING REMOTE SENSING AND GIS

GIS is a computer-based system, capable of input, storage, manipulation, analysis of data useful for planning, decision-making and implementation. GIS is a powerful tool which helps planners to view different scenarios and their outcome so that an optimal strategy may be chosen for planning and development. It is basically a map processing technique and not for generation of base maps. Once the spatial and attribute data is generated in GIS, its application areas are many and varied.



These include resource inventory and management, planning and monitoring, land records for taxation and ownership controls, facilities and services management, environment impact assessment, etc. The PC-based GIS system is available in the market both in raster and vector modes and data from remote sensing and other sources can be integrated. Planning agencies can acquire such system to have quick analysis of geo-referenced data for planning and development. Remote sensing data is used to study and monitor land features, natural resources and dynamic effects of human activities on urban areas. Today, with the resolution available, the application of remote sensing data for urban development plans could mainly be for assessment of natural resources, land use monitoring and planning and map-making. A broad base map of the city and city-region, indicating physical features including major road network, may be prepared quickly with the help of satellite imageries. Applications of remote sensing data are numerous and it can be interpreted with the help of computer aided analysis. Both methods require certain amount of ground support information which should normally be collected by an interpreter to develop a key and is generally referred as ground truth. Using the ground truth or interpretation key, the remote sensing data is analysed, interpreted and maps related to existing features, land use, broad settlement structure, resource analysis, etc. could be generated. Visual interpretation is easy technique and personnel having elementary training can make use of remote sensing data for generation of maps.

1.9 SALIENT FEATURES OF TIRUNELVELI LPA MASTER PLAN

The following aspects have been kept in mind while drafting this Master Plan:

- To discourage the unplanned and unorganized growth of the city and vicinity area.
- To regulate the urban development in a systematic and scientific manner through proper land allocation and zoning
- To plan and account for existing migration of rural population to the urban area
- To achieve 100% coverage and quality of basic amenities such as water supply, sewerage, sanitation, solid waste management, etc.
- To address the evolving challenges in various fields such as Housing, Infrastructure, means of transport, open space development and insufficiency in public amenities, recreational facilities, etc.,
- To conserve environmentally sensitive land parcels through green practices and sustainable development.

ABOUT TIRUNELVELI LPA

CHAPTER 02

MASTER PLAN
2041
TIRUNELVELI LPA





2.ABOUT LOCAL PLANNING AREA-TIRUNELVELI

2.1 LOCATION OF TIRUNELVELI LPA

Tirunelveli is a major city in Tamil Nadu. It is the administrative headquarters of Tirunelveli District and is the sixth largest city Municipal Corporation in the State. Tirunelveli LPA comprises of three taluks which includes entire Tirunelveli Taluk, Palayamkottai Taluk and Part of Manur Taluk. **The LPA has the City Municipal Corporation, Two Town Panchayats and 102 Revenue villages.** Map 2.1 shows the location of the Tirunelveli LPA.

Tirunelveli is located in the southern part of Tamil Nadu. It is situated between 8°05' and 9°30' north latitude and 77°05' and 78°25' east longitude. The total geographical area of the Tirunelveli LPA is 861.97 Sq.km.

2.2 PAST PLANNING EFFORTS

The Tirunelveli Local Planning area (Expansion of CLPA) was notified in Part-II, Section-2, of the Tamil Nadu Government Gazette Dated -29th November 2017 as per Government order G.O. No-178, Housing and Urban Development Department [UD4(2)] dated-8th November 2017 under section 10(1)(b) of the Tamil Nadu Town Country Planning Act,1971. The same area was confirmed under section 10(4) of the Tamil Nadu Town Country Planning Act,1971 and notified in Part-II, Section-2 of the Tamil Nadu Government Gazette as per Government order G.O. No-173, Housing and Urban development department [UD4(2)] dated-7th December 2018.

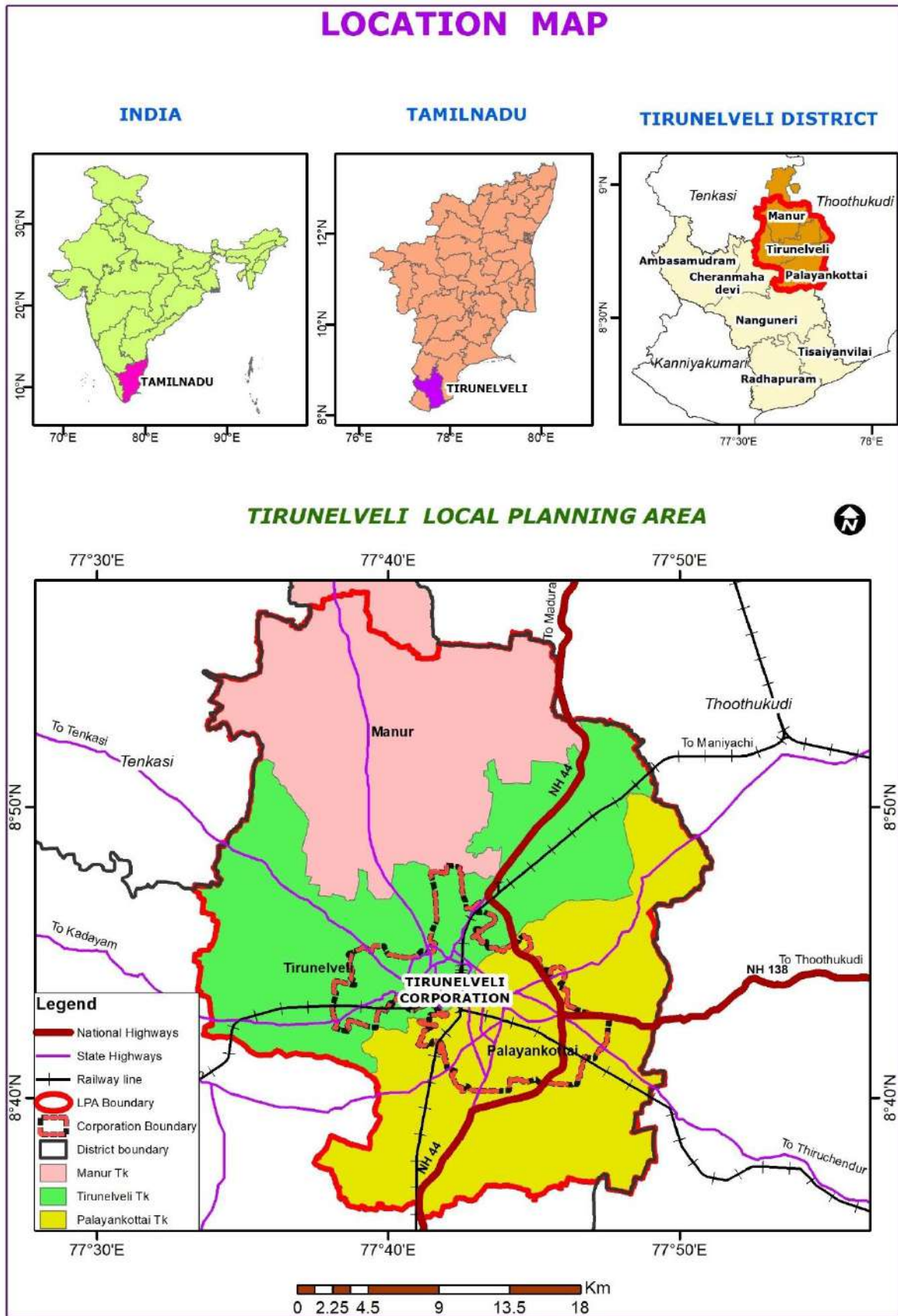
2.3 REGIONAL CONTEXT

Tirunelveli is considered to be a heritage Town. Tirunelveli district has borders with Tenkasi district on the north, Kanyakumari District on the south and Tirunelveli District on the east and Kerala state on the west. Tirunelveli City Municipal Corporation is located at a distance of 54km from Thoothukudi and 84 km from Kanyakumari, 52km from Tenkasi.

The downtown is located on the west bank of the Tamirabarani River; its twin town Palayamkottai is on the east bank. Palayamkottai is called as the Oxford of the south India. It is a hub of many schools, colleges and many important government offices.

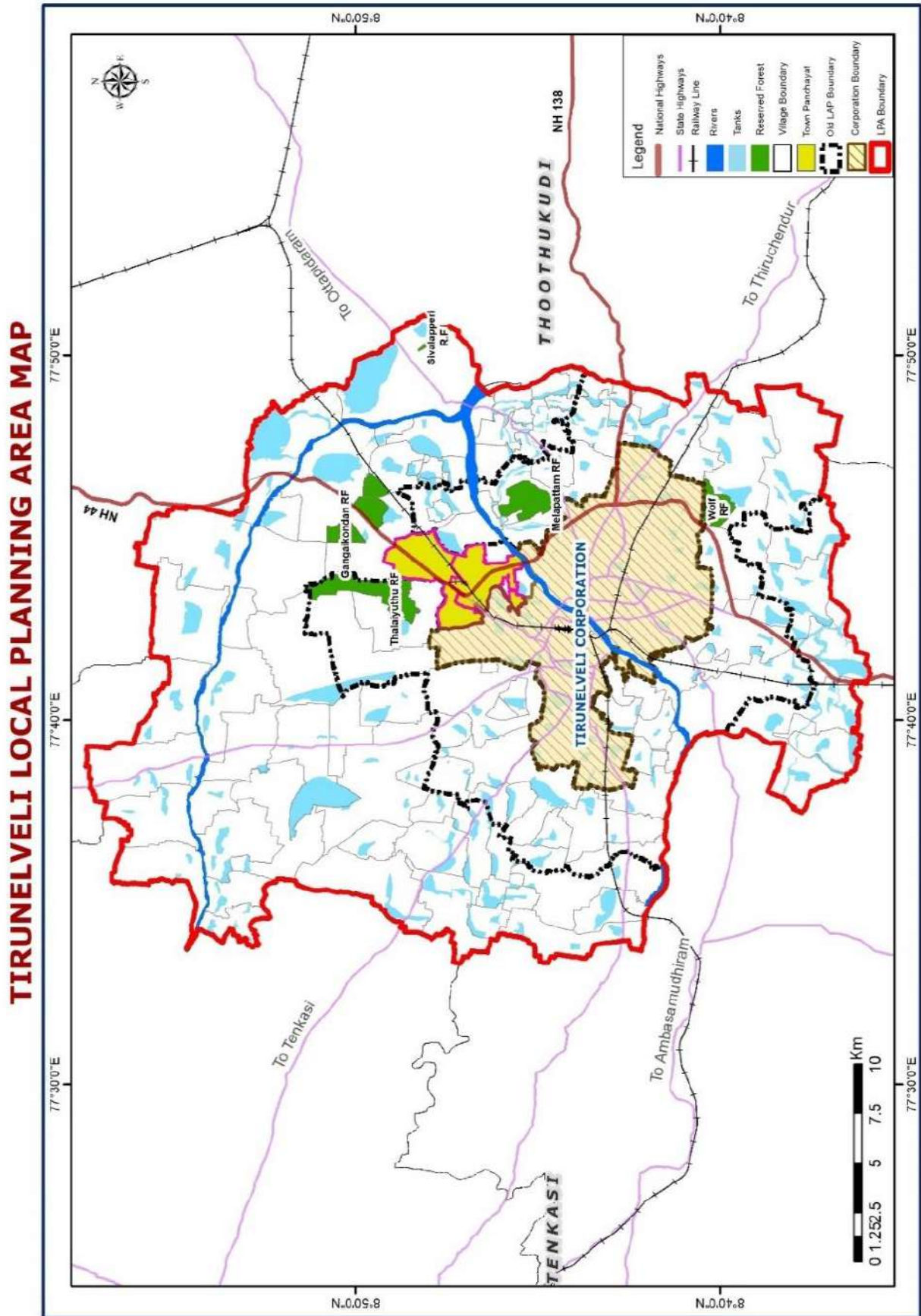


Map 2.1 LOCATION OF TIRUNELVELI LPA





Map 2.2 ADMINISTRATIVE BOUNDARY MAP OF TIRUNELVELI LPA





2.3.1 CLASS I TOWNS WITHIN 100KM FROM TIRUNELVELI LPA

Class I towns are those whose population is more than 1 Lakh. Tirunelveli LPA has three Class I towns within a radial distance reach of 100 km.

Table 2.1 CLASS I TOWNS

S. No	Town Name	Total Population (2011)
1	Rajapalayam (M)	130442
2	Thoothukudi (M Corp.)	237830
3	Nagercoil (M. Corp)	224849

2.3.2 CLASS II TOWNS WITHIN 100KM FROM TIRUNELVELI LPA

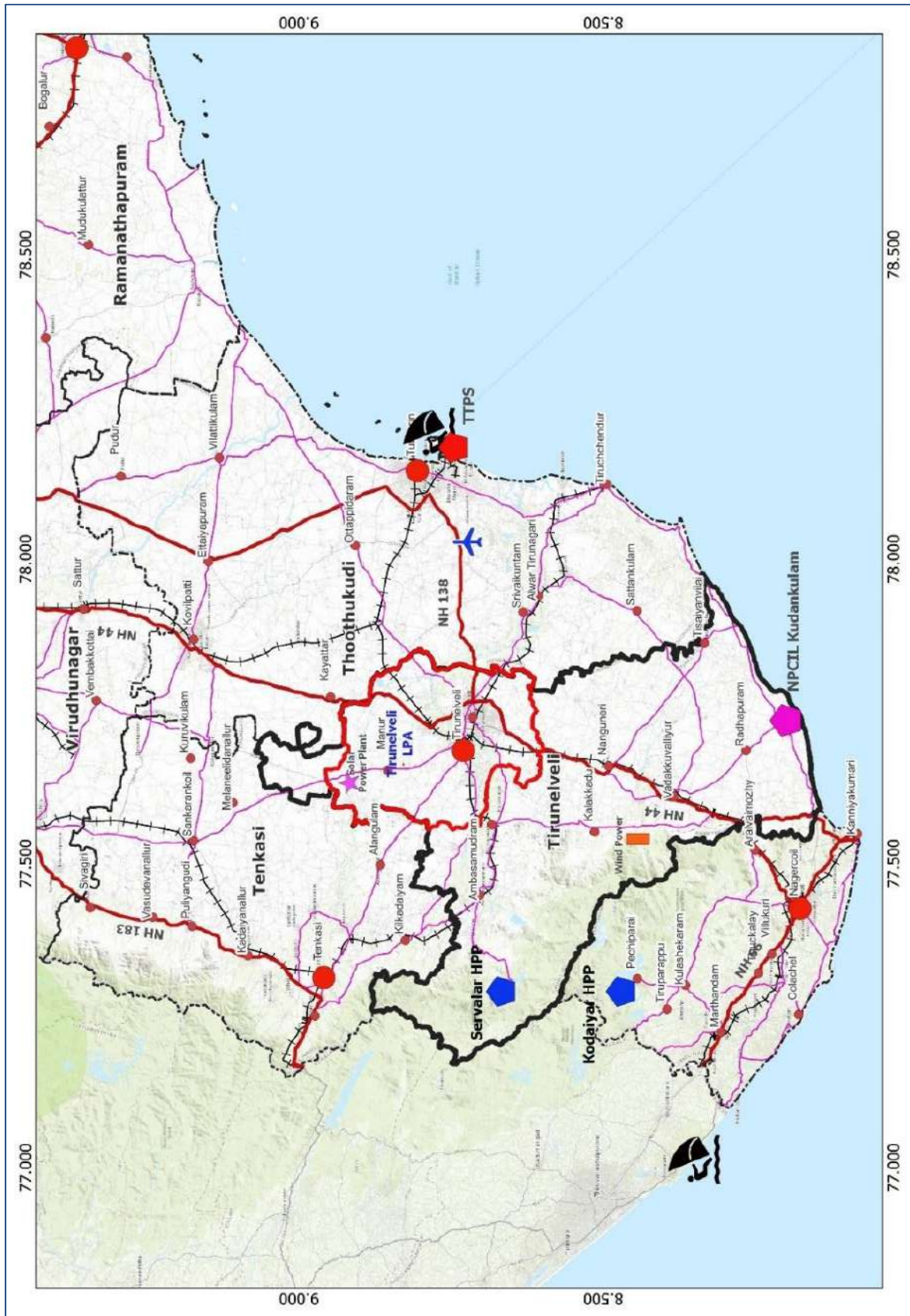
Class II towns are those whose population is between 50,000 and 1 Lakh. Tirunelveli LPA is surrounded by ten Class II towns from the neighboring Districts Virudhunagar, Thoothukudi and Tenkasi within a radial distance reach of around 100 km.

Table 2.2 CLASS II TOWNS

S. No	Town Name	Name of the District	Total Population
1	Srivilliputhur (M)	Virudhunagar	75396
2	Thiruthangal (M)	Virudhunagar	55362
3	Sivakasi (M)	Virudhunagar	71040
4	Virudhunagar (M)	Virudhunagar	72296
5	Aruppukkottai (M)	Virudhunagar	87722
6	Kovilpatti (M)	Thoothukudi	95057
7	Puliankudi (M)	Tenkasi	66034
8	Sankarankoil (M)	Tenkasi	57277
9	Tenkasi (M)	Tenkasi	70545
10	Kadayanallur	Tenkasi	90364



Map 2.3 REGIONAL CONNECTIVITY





2.4 SETTLEMENT DEVELOPMENT PATTERN IN LPA OVER YEARS 2011- 2021

The development of Tirunelveli LPA shows that the transport corridors influenced the growth in Tirunelveli LPA. The major growth is seen along the NH 44, SH 40A, SH 41 and villages near the Municipal Corporation.

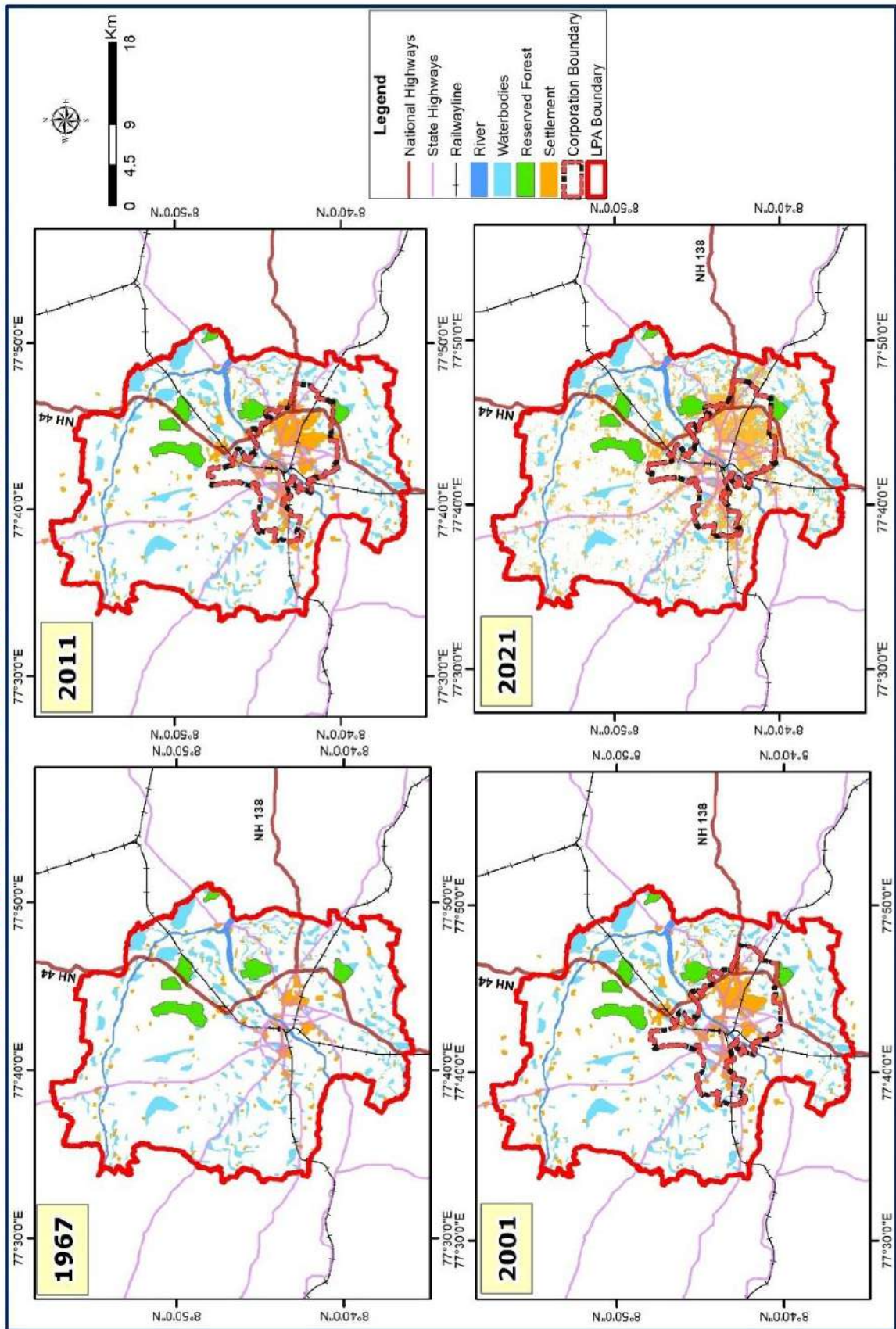
The city has a unique background of spatial development. The existing structure is a result of urbanization from four different urban centers which have experienced an organic growth around each of them. Such a growth pattern has resulted in creation of various large vacant plots around the present geometric center of the city. Such huge disparity in urban spatial development which is rarely observed in other Indian cities acts as a potential for the city's development as the vacant plots provide plenty of spaces for retrofitting the missing urban infrastructure in the city. However, the confluence of the road networks of these urban centers might not merge to a structure which would efficiently address the city's present urban travel demand pattern.

Therefore, unlike other cities, several chunks of saturated land parcels separated by large vacant spaces is the unique characteristics of this city. Nevertheless, city can be seen growing towards east towards the side of Srinagar Kanyakumari National Highway and Thoothukudi. (Refer Map 2.4).



Map 2.4 SETTLEMENT DEVELOPMENT PATTERN IN TIRUNELVELI LPA

TIRUNELVELI LPA - SETTLEMENT PATTERN MAP





2.5 PHYSICAL CHARACTERISTICS

2.5.1 TOPOGRAPHY

The general topography of the L.P.A. is a flat terrain in nature and the altitude is 47 m above MSL and is endowed with small mountains and hillocks. It has natural slope towards the river. The type of growth is linear ribbon development.

2.5.2 CLIMATE AND RAINFALL

The climate of Tirunelveli is said to be equable. The maximum temperature is 39.4°C in the month of May and minimum is 21.7°C in the month of January. From about the middle of February temperature increases steadily. In May which is usually the hottest month in the interior, the mean daily maximum temperature is 39.4°C. The weather is quite hot in April, May and June. Sometimes reaches 42.5°C with the onset of the southwest monsoon by the end of May or beginning of June, there is some drop in temperature. By about the middle of October, both day and night temperatures decrease are appreciable. The period from November to January is the coolest part of the year with the mean daily maximum temperature of about 30 to 31°C in the interior parts. The mean daily minimum temperature in these months is about 22 to 23°C. The mean daily maximum temperature ranges from 30 to 35°C. And the mean daily minimum temperature ranges from 22 to 27°C.

The rainfall in Tirunelveli District ranges from 383.11mm to 1332.60mm. The average actual rainfall is around 953.41mm.



TABLE 2.3 ACTUAL RAINFALL IN TIRUNELVELI

Actual Rainfall in mm				
2015	2016	2017	2018	2019
1332.6	383.11	988.86	968.90	1093.6

Source: Statistical Handbook

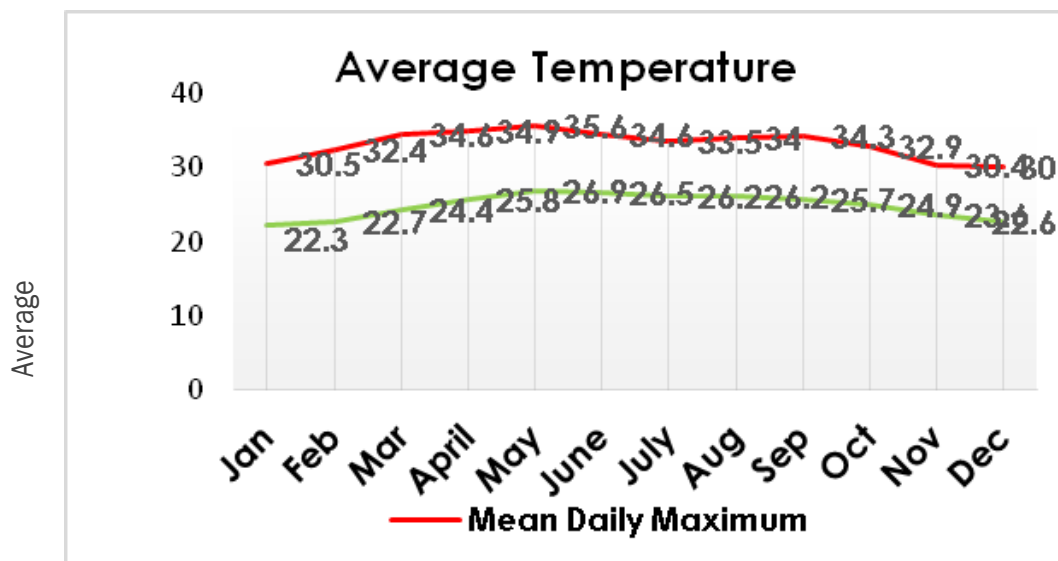


Figure 2.1 AVERAGE TEMPERATURE

2.5.3 PRECIPITATION

The precipitation in Tirunelveli District ranges from 13 to 195. The highest precipitation of 195 is recorded in the month of November. Even though the rainfall estimated is normal, the LPA experienced a record rainfall of average 69cm in 24 hours on 17th December 2023 and 18th December 2023 due to cyclone. This resulted in releasing of more than one lakh cusecs of water in Tamirabarani river leading to heavy floods in the area of railway junction.

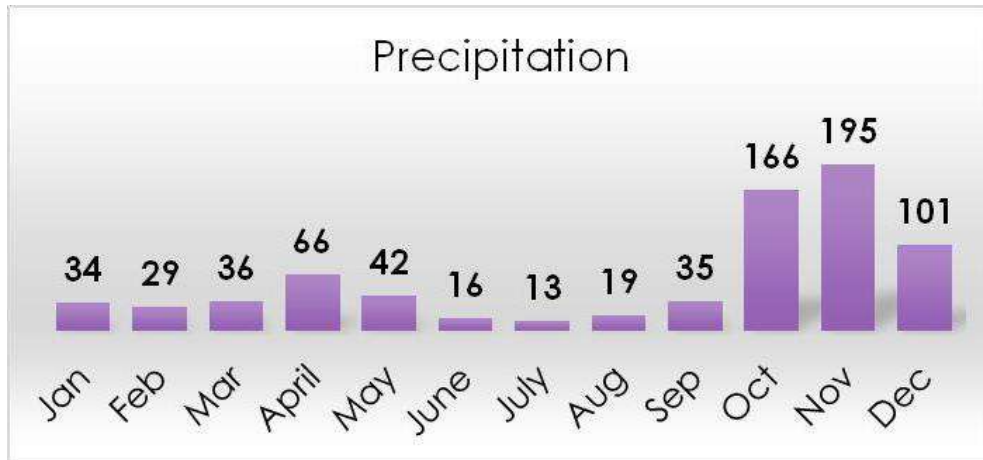


Figure 2.2 PRECIPITATION

Source: Statistical Handbook

2.6 SOIL

The predominant soil type in the city is red loam or the sand with strip of black loam. The black soil is of high value when compared to red soil. The black soil is predominant in river valley and overlies a yellow colour strip. Red soil patches are poor but along the river streams with irrigation facilities they are good.

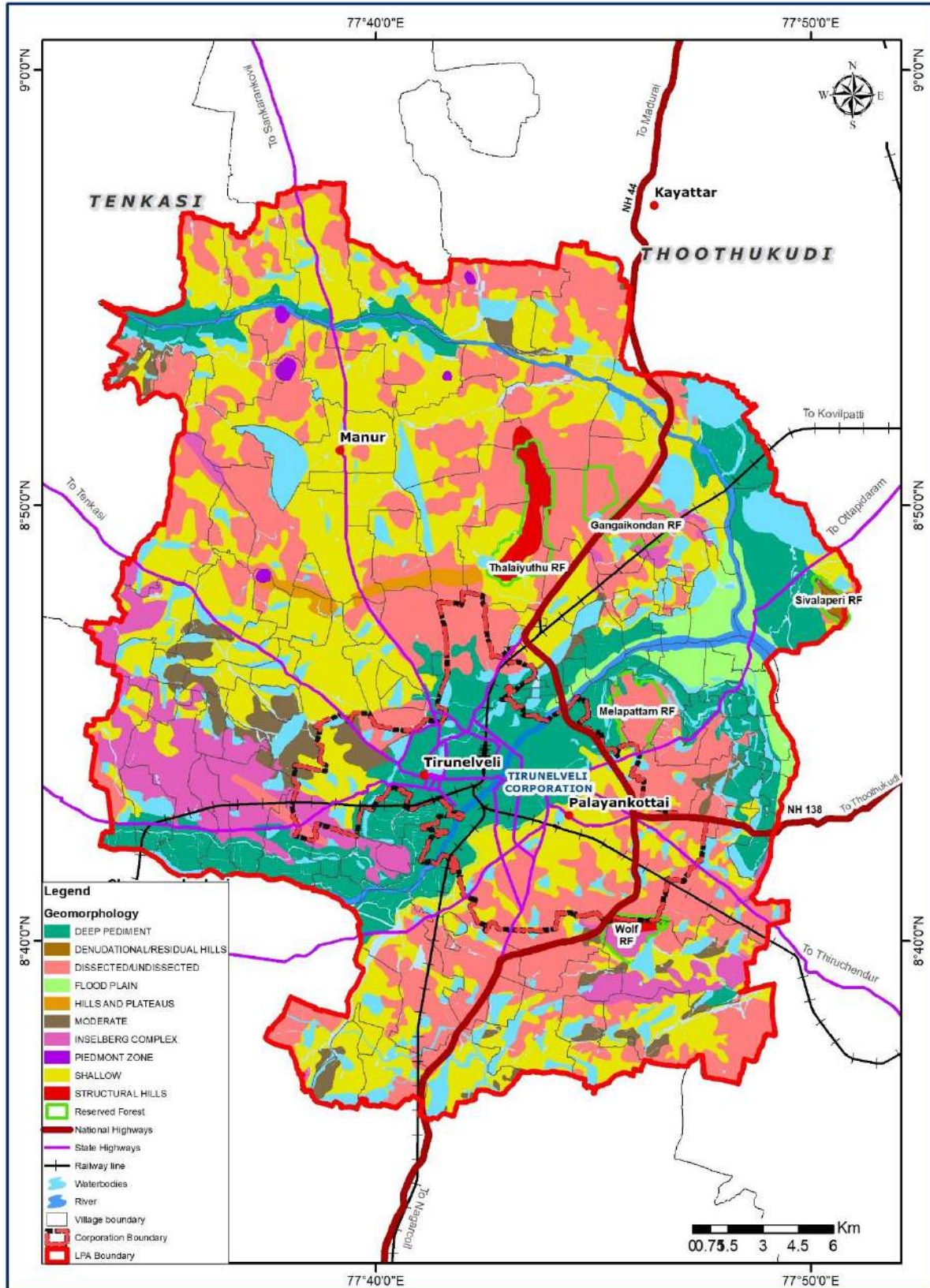
2.7 Geomorphology

The entire area of Tirunelveli LPA is covered by Archaean crystalline rocks comprising of various types of gneiss and charnockite. Nearly 99% of the district is covered by hard rock formation. Charnockites, which occur in this district, are acidic to intermediate type. Generally black cotton soil and Kankar overlies the charnockite. Garnetiferous Biotite Gneisses are white to grey in colour whereas Garnetiferous Sillimanite Gneiss are pure white in colour. In this district, Quartzite occur as small hills and ridges. Hill types are seen in Sivanthipatti and kunnathoor village areas. Ridge types are seen near Alangulam and Pettai areas. It occurs as bands in Garnetiferous gneiss also. Such bands which occur near Palayamkottai and Reddiarpatti villages are considerable in size. Crystalline limestone mainly occurs near Thirunelveli and Nangunerialuk areas. High qualities of these limestones are seen near Seliyanallur and Ramayanpatti areas, and being quarried for India Cements at Thalaiyoothu. Bands of Calcareous Gneiss are seen around Kalakkadu and Nanguneri areas.



Map 2.5 GEOMORPHOLOGY OF TIRUNELVELI LPA

GEOMORPHOLOGY MAP
TIRUNELVELI LOCAL PLANNING AREA





Map 2.6 GEOLOGY MAP OF TIRUNELVELI LPA





2.8 TRANSPORT NETWORK

2.8.1 ROAD CONNECTIVITY

- Tirunelveli is connected by NH 44. It is a major north–south National Highway in India and connects Tirunelveli with Madurai in the North and Kanyakumari in the South. NH 138 which connects Tirunelveli and Thoothukudi.
- Tirunelveli is well connected by 5 State Highways namely SH 39, SH 40, SH 41, SH41A and SH 75.

Table 2.3 EXISTING STATE HIGHWAYS

S. No	Name of the SH	Routes
1	SH-39	Tirunelveli to Tenkasi (Via Alangulam)
2	SH-40	Tiruchendur to Sengottai (Via Tirunelveli, Ambasamudram,)
3	SH-41	Tirunelveli to Rajapalayam (Via Sankarankoil)
4	SH-41A	Tirunelveli to Pottalpudhur
5	SH-75	Tirunelveli to Ottapidaram(Via Maniachi)

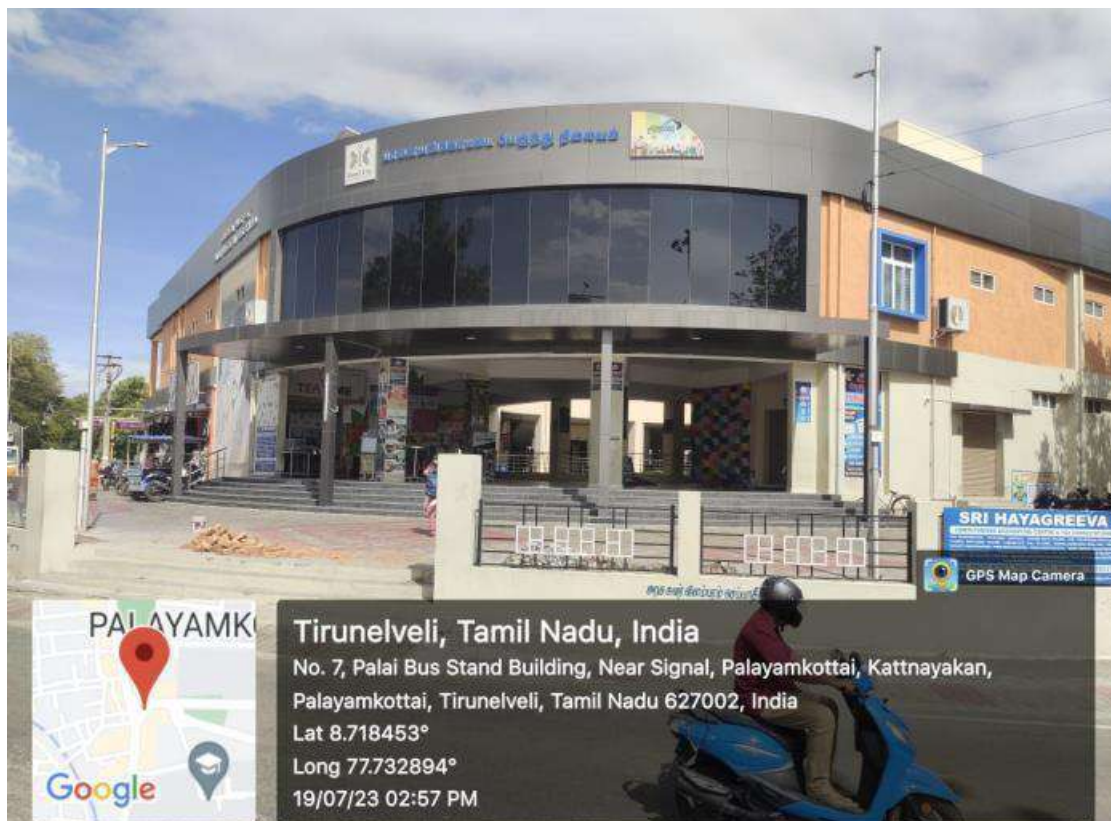


Figure 2.3 PALAYAMKOTTAI BUS STAND



Figure 2.4 DR.M G R NEW BUS STAND

2.8.2 RAIL CONNECTIVITY

Tirunelveli Junction is one of the oldest and most popular stations in the Indian Railway network and it falls under the administrative control of Madurai division of southern railway. The passenger count per day is arrived 50,000.



Figure 2.5 TIRUNELVELI RAILWAY JUNCTION



2.8.3 AIR CONNECTIVITY

The nearest airports are Thoothukudi domestic airport (32 km), Madurai International Airport (150 km) and Thiruvananthapuram International Airport (158 km).

Growing human population and current global environmental crises involving land degradation, biodiversity loss, and climate change with many areas facing water crisis and air pollution, the need to address these at all scales is being increasingly felt. The United Nations has been clearly concerned about dangers to our planet and living species. However, insufficient attempts are made to tackle climate changes.

2.9 INTEGRATING ESSENTIAL COMPONENTS IN TIRUNELVELI LPA MASTER PLAN

The following are the essential planning components that are integrated in the Tirunelveli LPA Master plan.

Transportation network/ Mobility plan: Proposal for new roads (ROW of 18m and more), junctions, transportation hubs, etc. apart from the widening of the existing road network. Mobility plan including inter and intra city Connectivity.

Blue and Green infrastructure: Identifying and integrating the existing water bodies with master plans along with clear contour survey and urban flood prevention plan. Proposal for green public spaces, urban forest, lakefronts, riverfronts, canal fronts, etc.

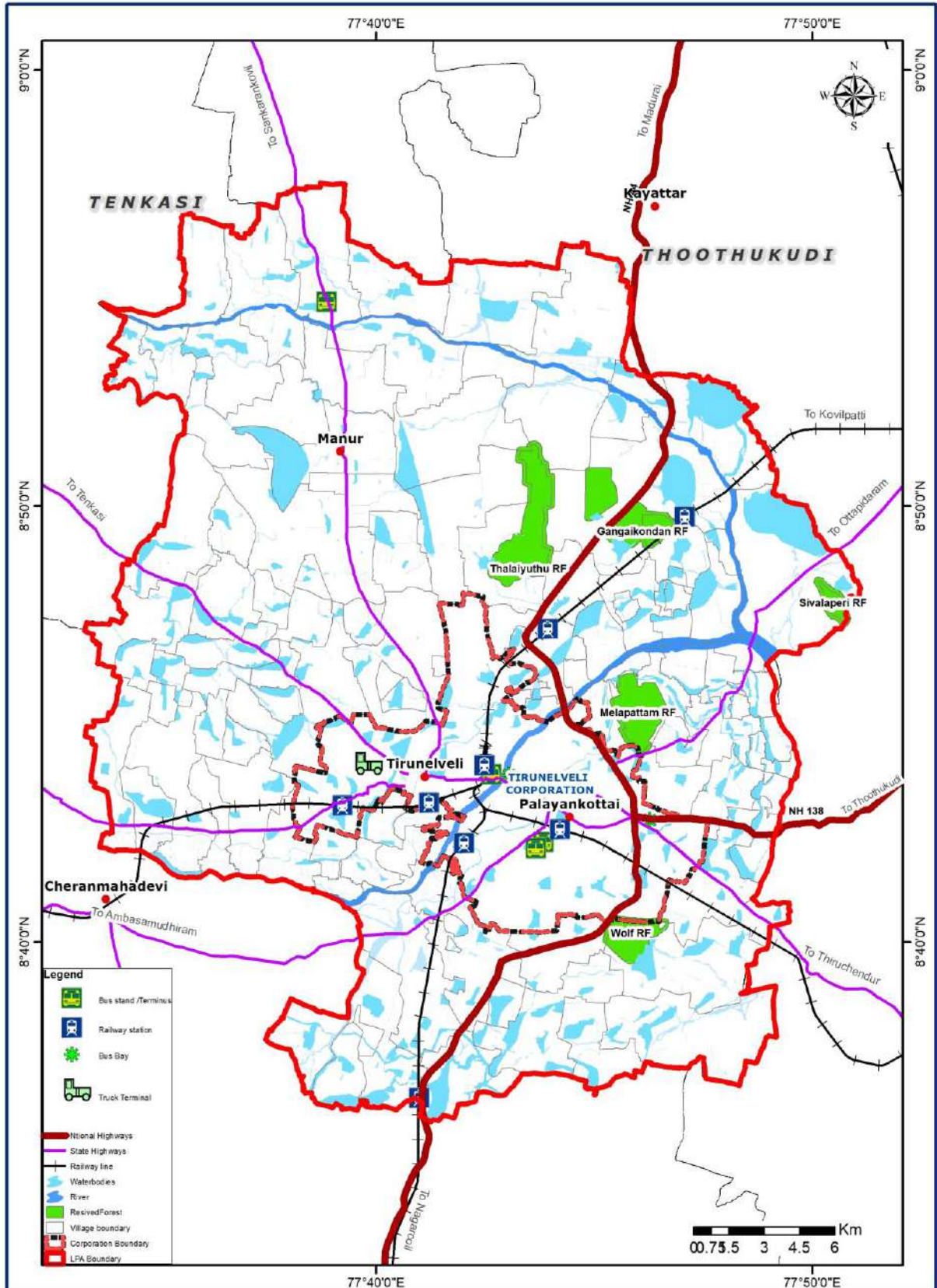
Economic Planning: Identification of economic activities, resources, and their integration with transport network.

Land use plan: Proposed land use plan including area dedicated for Economic activities/ industrial development, business districts, markets/trading centers, transportation hubs and Affordable Housing.



Map 2.7 MAJOR ROADS AND RAILWAY NETWORK

EXISTING ROAD NETWORK MAP
TIRUNELVELI LOCAL PLANNING AREA





2.10 THE SUSTAINABLE DEVELOPMENT GOALS AND NEW URBAN AGENDA

Sustainable development adopted in 2015 has addressed from a global perspective and relates to the urbanizing world. The goal on cities and urban development in the 2030 Agenda – Sustainable Development Goal 11, states that we need to “make cities and human settlements inclusive, safe, resilient and sustainable”.

There is also recognition of the cross-cutting nature of urban issues, which have an impact on a number of other Sustainable Development Goals. UN-Habitat’s New Urban Agenda, adopted as the outcome document from the Habitat III Conference in 2016, seeks to offer national and local guidelines on the growth and development of cities through 2036. Through the New Urban Agenda, leaders have committed to the following:

Provide basic Services for all Citizens

These services include: access to housing, safe drinking water and sanitation, nutritious food, healthcare and family planning, education, culture and access to communication technologies.

Ensure that all citizens have access to equal opportunities and face no discrimination

Everyone has the right to benefit from what their cities offer. The New Urban Agenda calls on city authorities to take into account the needs of women, youth and children, people with disabilities, marginalized groups, older persons, indigenous people, among other groups.

Promote measures that support cleaner cities

Tackling air pollution in cities is good both for people’s health and for the planet. In the Agenda, leaders have committed to increase their use of renewable energy, provide better and greener public transport, and sustainably manage their natural resources.

Strengthen resilience in cities to reduce the risk and the impact of disasters

Many cities have felt the impact of natural disasters and leaders have now committed to implement mitigation and adaptation measures. Some of these measures include better urban planning, quality infrastructure and improving local responses.

Take action to address climate change by reducing their greenhouse gas emissions

Leaders have committed to involve not just the local government but all actors of society to take climate action taking into account the Paris Agreement on climate change. This seeks to limit the increase in global temperature to well below 2 degrees Celsius. Sustainable cities that reduce emissions from energy and build resilience can play a lead role.



Fully respect the rights of refugees, migrants and internally displaced persons regardless of their migration status

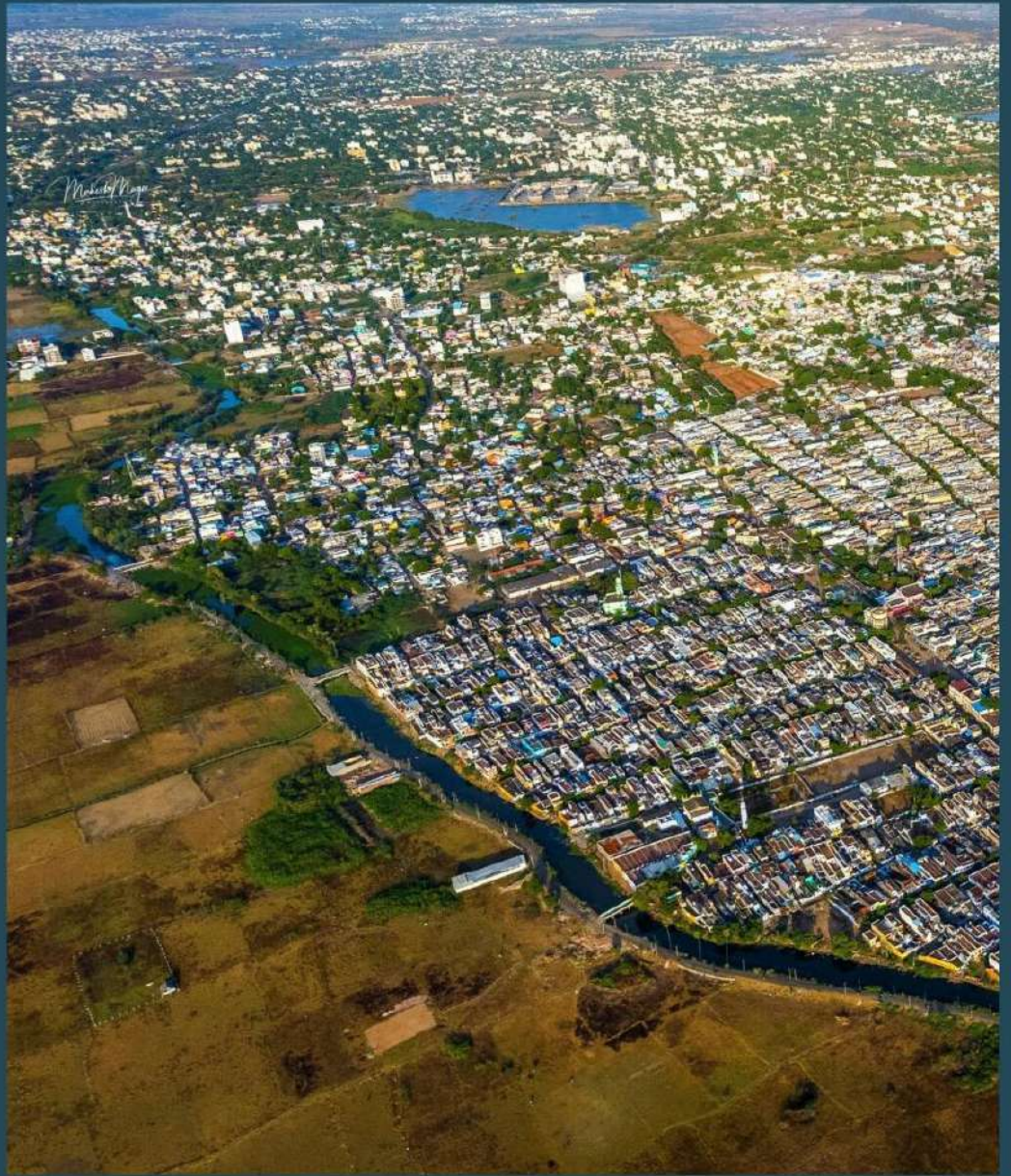
Leaders have recognized that migration poses challenges, but it also brings significant contributions to urban life. Because of this, they have committed to establish measures that help migrants, refugees and IDPs make positive contributions to societies.

Improve connectivity and support innovative and green initiatives

This includes establishing partnerships with businesses and civil society to find sustainable solutions to urban challenges

Promote safe, accessible, and green public spaces

Human interaction should be facilitated by urban planning, which is why the agenda 30 calls for an increase in public spaces such as sidewalks, cycling lanes, gardens, squares, and parks. Sustainable urban design plays a key role in ensuring the livability and prosperity of a city. The New Urban Agenda will require new urban rules and regulations, improved urban planning and design, and municipal finance, among other things. It emerges that the various deliberations at global level have substantially outlined the road map for sustainable development of human settlements and this is the challenge that countries face in formulating enabling policies, legislations, rules and guidelines to mainstream sustainable development in human settlement planning.



DEMOGRAPHY

CHAPTER 03

MASTER PLAN
2041
TIRUNELVELI LPA



3. DEMOGRAPHY

Demography is an important tool in preparing Master plan for an area. It is an essential tool in knowing the characteristics of an area in terms of population. It also forms a base for knowing the future trends in population for which the planning process is carried out.

3.1 POPULATION AND ITS GROWTH IN MUNICIPAL CORPORATION

The population dynamics of Tirunelveli Municipal Corporation reveal a consistent and linear growth pattern since 1901. The population, which stood at 80,014 in 1901, has steadily increased over the years, reaching approximately 4,73,637 by the year 2011. The growth in population has exhibited a linear trend throughout this period.

The increase in population from 1901 to 1941 ranged from 10,000 to around 18,000, with growth rates varying between 11% and 18%. Remarkably, the Corporation has maintained growth rates within the range of 11% to 30% since 1901.

The population experienced gradual growth from 1901 to 1961, with the highest increases recorded in the years 2001, followed by 2011, 1971, and 1981. During these significant years, the population variation ranged from more than 50,000 to around 70,000.

Table 3.1 illustrates the population increase over the past decades, providing a clear overview of the growth trends.

Table 3.1 GROWTH RATE OF TIRUNELVELI MUNICIPAL CORPORATION FROM 1901 -2011

S. No	Year	Population	Increase in Population	Growth Rate in %
1	1901	80,014	-	-
2	1911	89,714	9,700	12.12
3	1921	1,00,426	10,712	11.94
4	1931	1,18,551	18,125	18.05
5	1941	1,31,920	13,369	11.28
6	1951	1,60,929	29,009	21.99
7	1961	1,90,048	29,119	18.09
8	1971	2,47,365	57,317	30.16
9	1981	2,99,818	52,453	21.2
10	1991	3,39,598	39,780	13.27
11	2001	4,11,831	72,233	21.27
12	2011	4,73,637	61,806	15.01

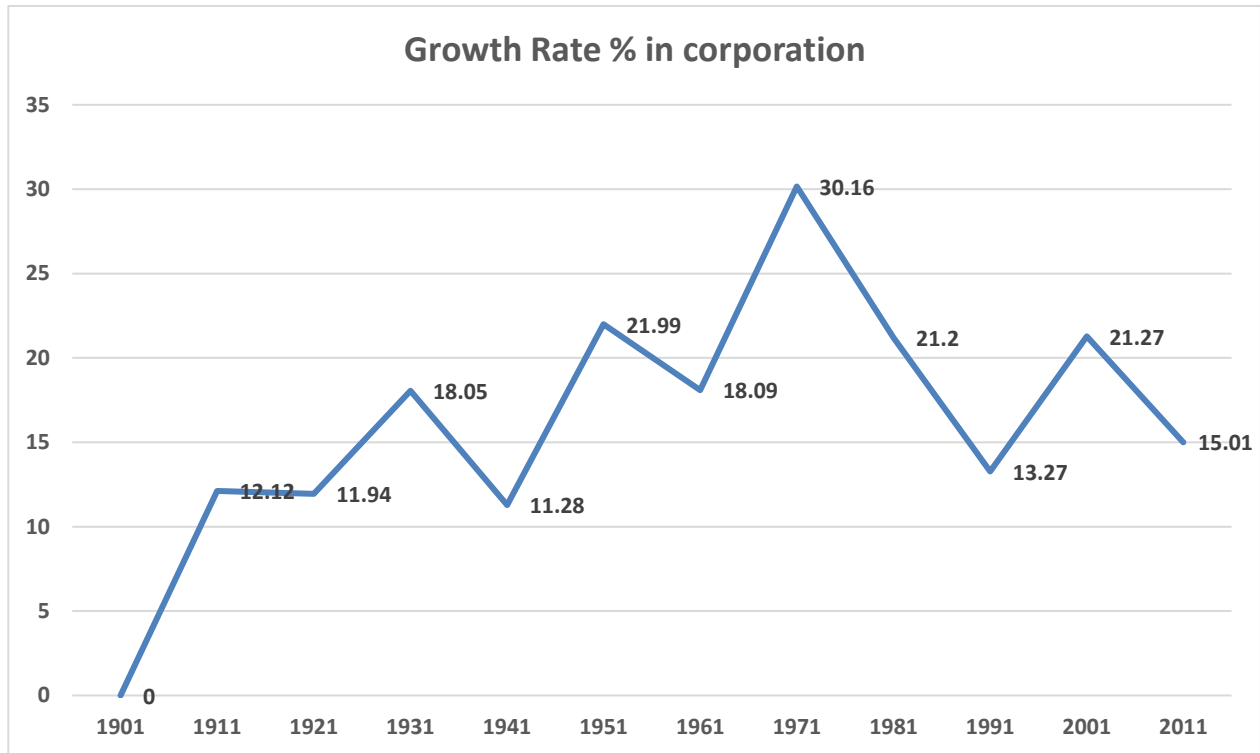


Figure 3.1 COMPARATIVE POPULATION GROWTH RATE 1901-2011

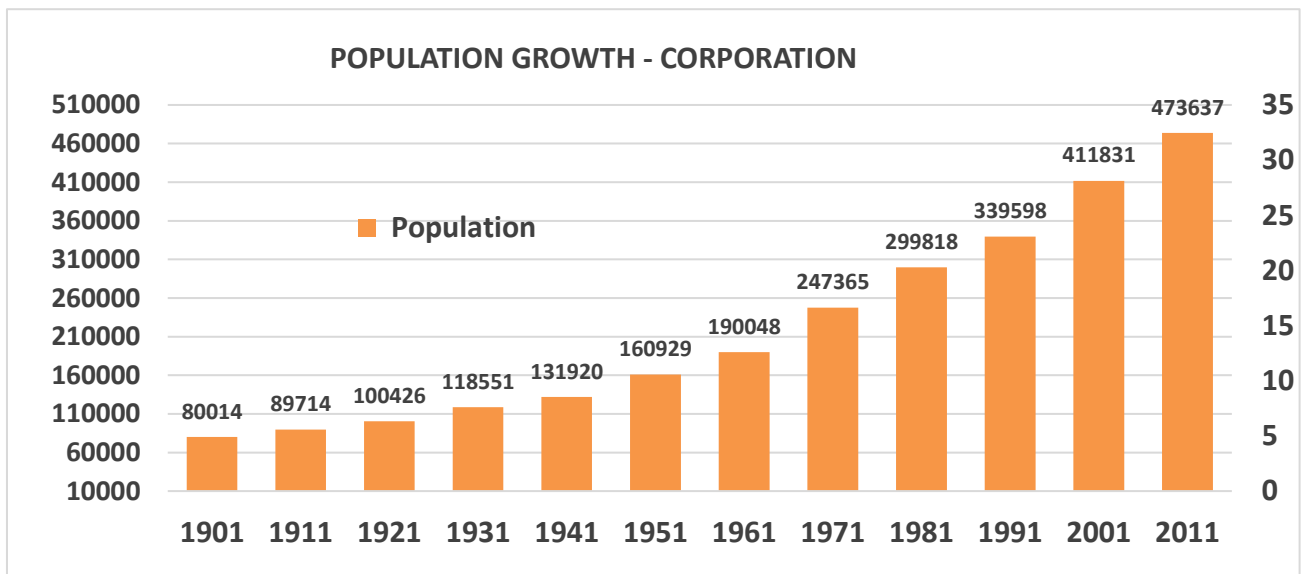


Figure 3.2 POPULATION GROWTH OF TIRUNELVELI CORPORATION

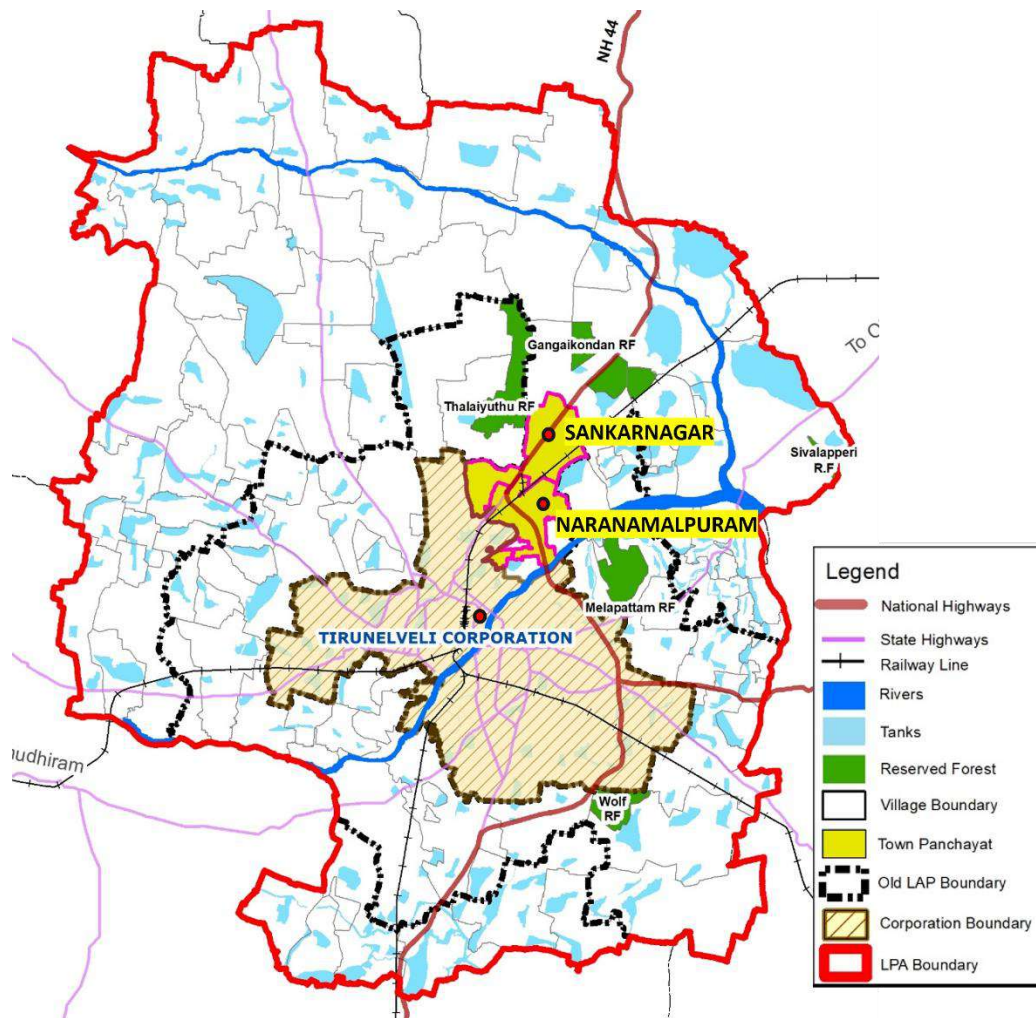


3.2 URBAN AGGLOMERATION

An urban agglomeration is a continuous urban spread constituting a town and its adjoining outgrowths (OGs), or two or more physically contiguous towns together with or without outgrowths of such towns.

According to the 2011 Census, the Tirunelveli urban area encompasses the Tirunelveli City Municipal Corporation, with a population exceeding 1 lakh (4,73,637), and two town panchayats—Sankar Nagar (7,095) and Naranammalpuram (17,094)—with populations each less than 1 lakh. The Tirunelveli Local Planning Area (LPA) covers the entire Tirunelveli urban region, including these towns. This information is crucial for effective planning and development, enabling authorities to comprehend population distribution for improved governance and infrastructure planning.

Map 3.1 CENSUS TOWNS OF THE LPA



CENSUS TOWN – TIRUNELVELI CORPORATION, NARNAMALAPURAM, SANKAR NAGAR



3.3 POPULATION DISTRIBUTION IN TIRUNELVELI LPA

The total population of the Tirunelveli LPA is about 7,33,938 in the year 2011 as per census of which the urban area population is 4,97,826. The total urban area comprises nearly 68% of the total population of the LPA. The revenue villages have a population of around 2,36,112 which is about 32% of the total population. The figure shows the distribution of population within the urban and rural areas.

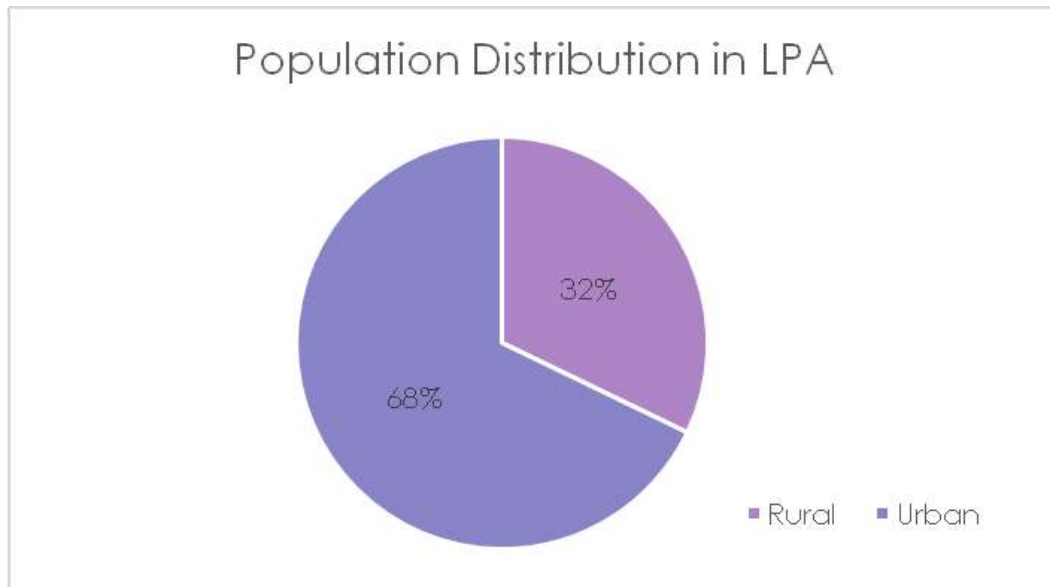
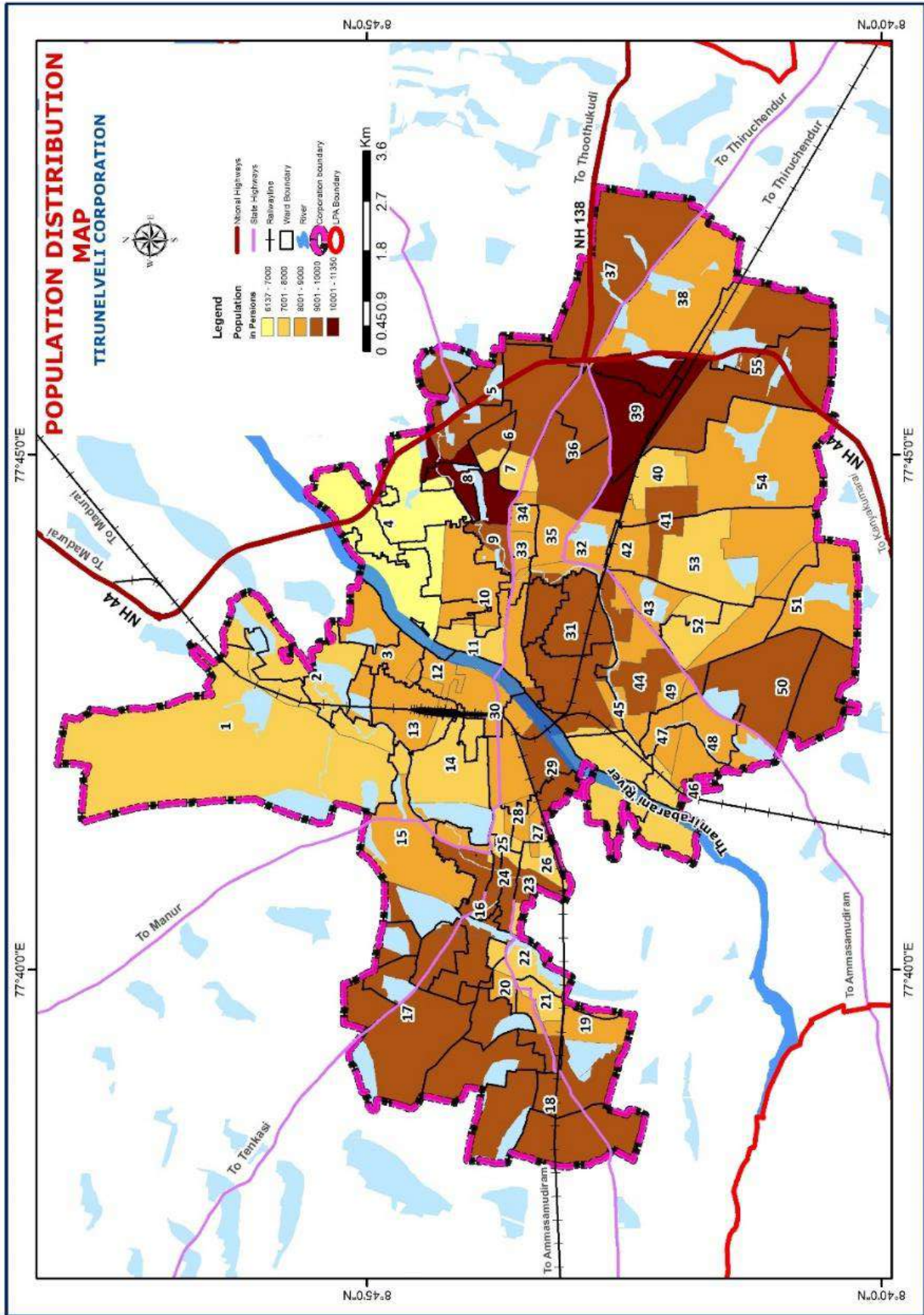


Figure 3.3 POPULATION DISTRIBUTION IN TIRUNELVELI LPA

Source: Census 2011



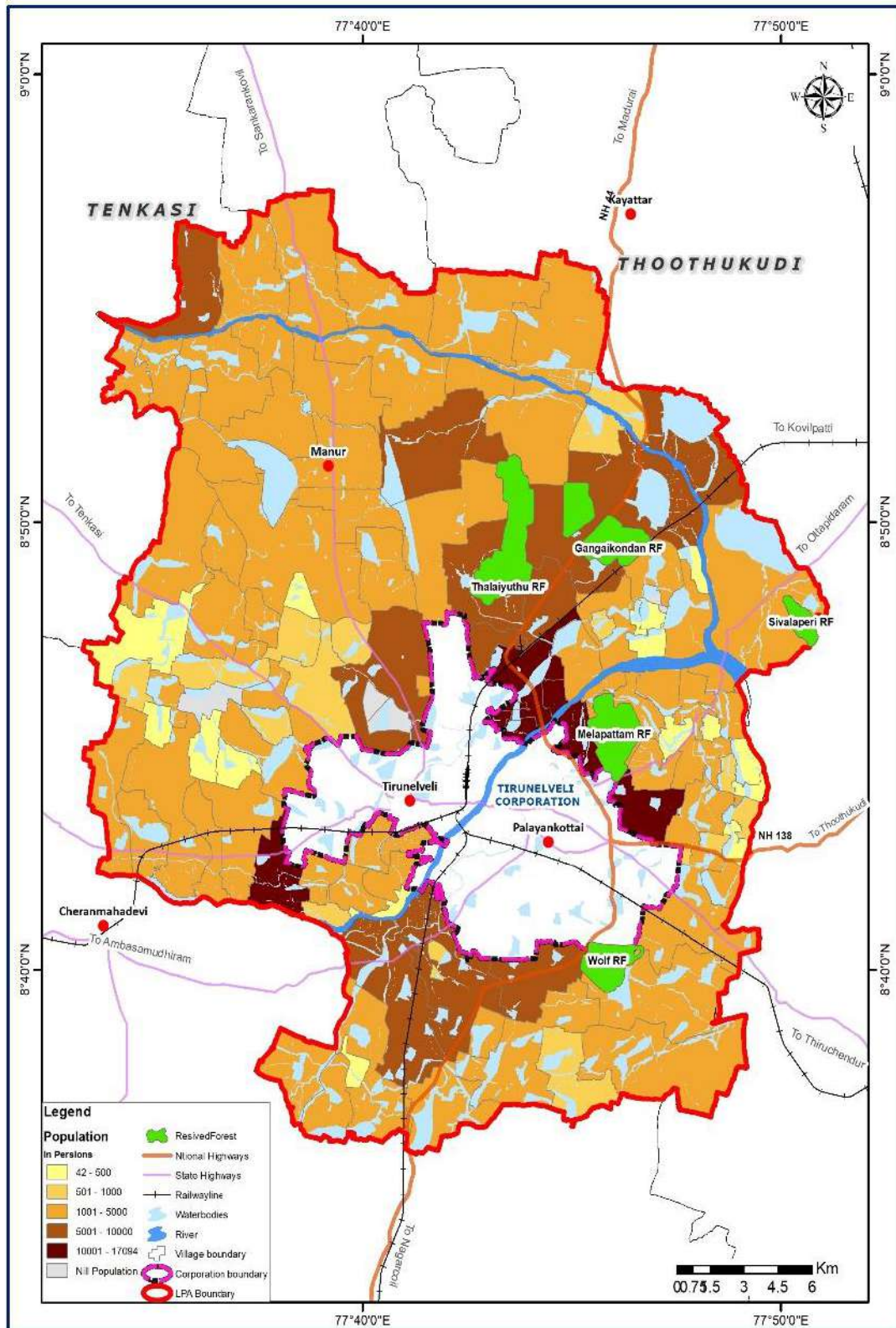
Map 3.2 POPULATION DISTRIBUTION IN TIRUNELVELI CORPORATION





Map 3.3 POPULATION DISTRIBUTION IN TIRUNELVELI REST OF LPA

POPULATION DISTRIBUTION MAP
TIRUNELVELI LOCAL PLANNING AREA





The Tirunelveli City Municipal Corporation has houses around 95% of the total urban population. With respect to the rural area, the Revenue villages/Village Panchayats Gangaikondan, Keelanatham, Muneerpallam, Pallikottai, Ramaiyanpatti, Reddiarpatti, Suthamalli, Thalaiyuthu, Tharuvai, and Ukkirankottai have more than 5000 population. Keelanatham has a population of around 11,570 recorded the highest population in regard to village. Suthamalli village has a population of around 10,954 which ranks second. Table 3.2 shows the reason for higher population in the villages due to the urban sprawl of the Tirunelveli Municipal Corporation.

Table 3.2 VILLAGES WITH HIGHER POPULATION

S. No	Village name	Reason for increase in Population
1	Keelanatham	Adjacent to municipal corporation
2	Suthamalli	Adjacent to municipal corporation
3	Gangaikondan	Development of SIPCOT, ELCOT(SEZ)

3.4 TREND OF POPULATION GROWTH RATE IN TIRUNELVELI LPA

The decadal growth rate in the rural areas is higher when compared to the urban areas. The growth rate of the LPA as a whole is higher than the previous decade. Sankar Nagar TP has a growth rate of about 36.63% in the decadal year of 2001- 2011. Naranammalpuram TP has a growth rate of 4.76% in the decadal year of 2001 and 2011. Tirunelveli Municipal Corporation has a growth rate of 15.01% for the decadal year 2001 and 2011. Table 3.3 shows the trend of population growth of the urban areas in Tirunelveli LPA.

Table 3.3 TREND OF POPULATION GROWTH IN TIRUNELVELI LPA- URBAN

Description	Population			Decadal growth Rate (%)	
	1991	2001	2011	1991-2001	2001-2011
URBAN AREA					
Tirunelveli Corporation	3,78,972	4,11,831	4,73,637	8.67	15.01
Naranammalpuram TP	14,884	16,318	17,094	9.63	4.76
Sankar nagar TP	4,533	5,203	7,095	14.78	36.36
Tirunelveli LPA	571556	605633	733938	5.96	21.19

(Source-Census of India)

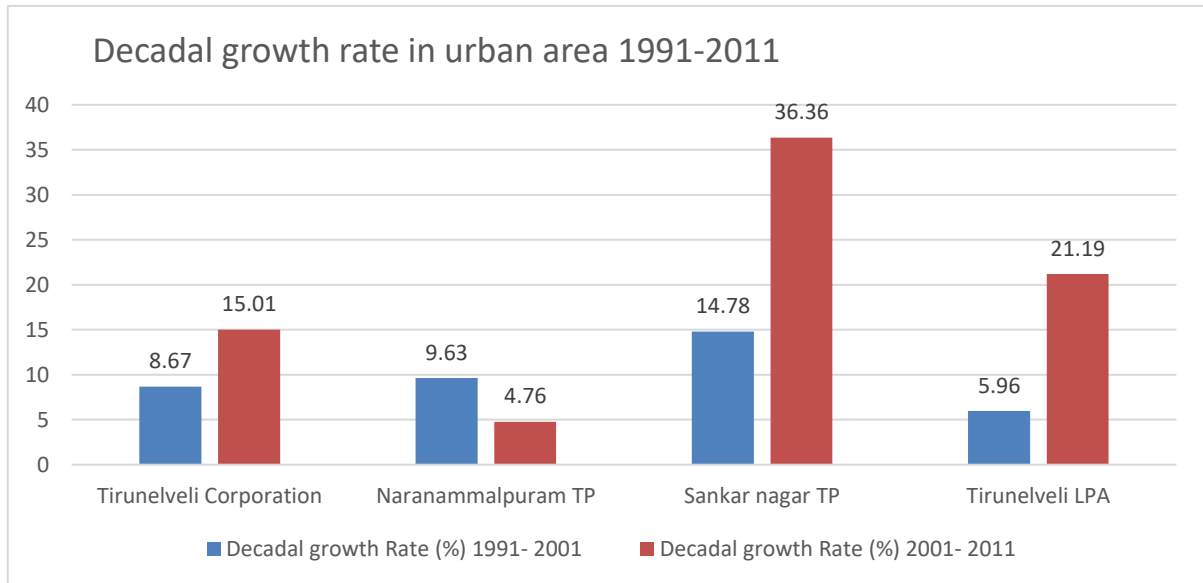


Figure 3.4 POPULATION GROWTH RATE IN TIRUNELVELI LPA

Table 3.4 shows the population growth rate in rural areas in Tirunelveli LPA. The villages namely Alagiapandiapuram, Manur, Gangaikondan, Rajavallipuram, Naduvakurichi, Uthamapandiyakulam, Kondanagaram, Kongandanparai, Suthamalli, Palavoor, Narasinganallur, Velarkulam, Vettuvankulam, Seethaparpanallur have growth rates of 50%-100% between the decadal year 2001-2011.

Ugandanpatti, Pettai, Reddiarpatti, Thalaisyuthu, Palamadai, Keelanatham, Kansapuram have growth rates between 100%-200%.

Kodaganallur, Melathidiyur, Parpakulam have growth rate of more than 200% between the decadal year 2001- 2011. The villages namely Alaganeri, Megamudayarkulam, Ramalinganeri, Sivagurunathan Thiruthu and Tiruppani Nelliapuram are uninhabited. Below map shows the population growth rate in Tirunelveli LPA between the years 2001 and 2011.



Table 3.4 POPULATION GROWTH IN TIRUNELVELI LPA- RURAL (102 REVENUE VILLAGES)

S.no	Village name	Population			Decadal growth rate		Density
		1991	2001	2011	1991-2001	2001-2011	
1	Abishekapatti	1,381	1,514	514	9.63	-66.05	69
2	Alaganeri	0	0	0	0	0	0
3	Alagiapandiapuram	3,321	2,697	4,946	-18.79	83.39	338
4	Alangaraperi	655	1,485	1,738	126.72	17.04	302
5	Araikulam	662	1,414	827	113.6	-41.51	885
6	Ariyakulam	2,444	3,013	4,130	23.28	37.07	763
7	Avanapperi	396	354	358	-10.61	1.13	212
8	Chittar Chatram	885	717	870	-18.98	21.34	121
9	Ettankulam	1,853	1,935	2,184	4.43	12.87	147
10	Gangaikondan	7,641	6,275	9,999	-17.88	59.35	224
11	Itteri	867	757	824	-12.69	8.85	108
12	Kalakudi	2,366	2,495	2,660	5.45	6.61	254
13	Kalkurichi	1144	296	245	-74.13	-17.23	125
14	Kanarpatti	1,392	1,739	1,982	24.93	13.97	206
15	Karungadu	883	752	686	-14.84	-8.78	373
16	Karuvanallur	441	463	483	4.99	4.32	51
17	Kattalai Udayaneri	1,996	517	107	-74.1	-79.3	181
18	Kattampuli	658	929	600	41.19	-35.41	615
19	Kattarankulam	2,187	2,271	2,488	3.84	9.56	279
20	Kansapuram	935	503	1,042	-46.2	107.16	447
21	Keelanatham	2,542	4,438	11,570	74.59	160.7	1289
22	Keelapattam	2,611	2,179	2,365	-16.55	8.54	768
23	Kilathiruvengadanat hapuram	295	356	279	20.68	-21.63	202
24	Kodaganallur	3,334	913	3,770	-72.62	312.92	275
25	Kondanagaram	1,239	1,252	2,055	1.05	64.14	208
26	Kongandanparai	925	753	1,203	-18.59	59.76	510
27	Krishnapuram	573	1,268	1,820	121.29	43.53	201



28	Kunnathur	1,702	1,805	2,067	6.05	14.52	707
29	Kuppakurichi	1,660	1,498	1,868	-9.76	24.7	293
30	Kuravankulam	75	657	75	776	-88.58	61
31	Kurichikulam	1,151	947	1,194	-17.72	26.08	232
32	Madhavakurichi	2741	3123	3684	13.94	17.96	476
33	Manappadaividu	1576	1518	1674	-3.68	10.28	1272
34	Manur	3098	2176	4348	-29.76	99.82	325
35	Maruthur	1374	1277	1247	-7.06	-2.35	508
36	Mavadi	1753	1666	1972	-4.96	18.37	331
37	Megamudaiyarkulam	86	0	0	-100	0	0
38	Melapattam	1613	1867	2054	15.75	10.02	265
39	Melaputhaneri	949	969	920	2.11	-5.06	597
40	Melathidiyur	837	897	3040	7.17	238.91	470
41	Melathiruvengadan athapuram	2131	2274	2659	6.71	16.93	891
42	Melkallur	897	967	1153	7.8	19.23	211
43	Munnirpallam	4672	5022	7183	7.49	43.03	494
44	Muthur	2596	2786	3173	7.32	13.89	174
45	Naduvakurichi	2793	2539	3859	-9.09	51.99	1019
46	Nanchankulam	1431	1633	1724	14.12	5.57	243
47	Narasinganallur	2109	2040	3183	-3.27	56.03	460
48	Nochikulam	981	2111	2670	115.19	26.48	1100
49	Pathinalamperi	535	364	446	-31.96	22.53	267
50	Palayamchettikulam	1794	1379	2034	-23.13	47.5	474
51	Palamadai	605	1463	3688	141.82	152.08	682
52	Palavoor	1848	969	1925	-47.56	98.66	419
53	Pallikkottai	4438	4654	5045	4.87	8.4	310
54	Paraikkulam	430	358	413	-16.74	15.36	285
55	Parpakulam	900	169	1182	-81.22	599.41	281
56	Pettai	952	1060	2345	11.34	121.23	917
57	Pillaiyarkulam	3522	3138	4107	-10.9	30.88	314
58	Pirancheri	3395	3775	4033	11.19	6.83	132



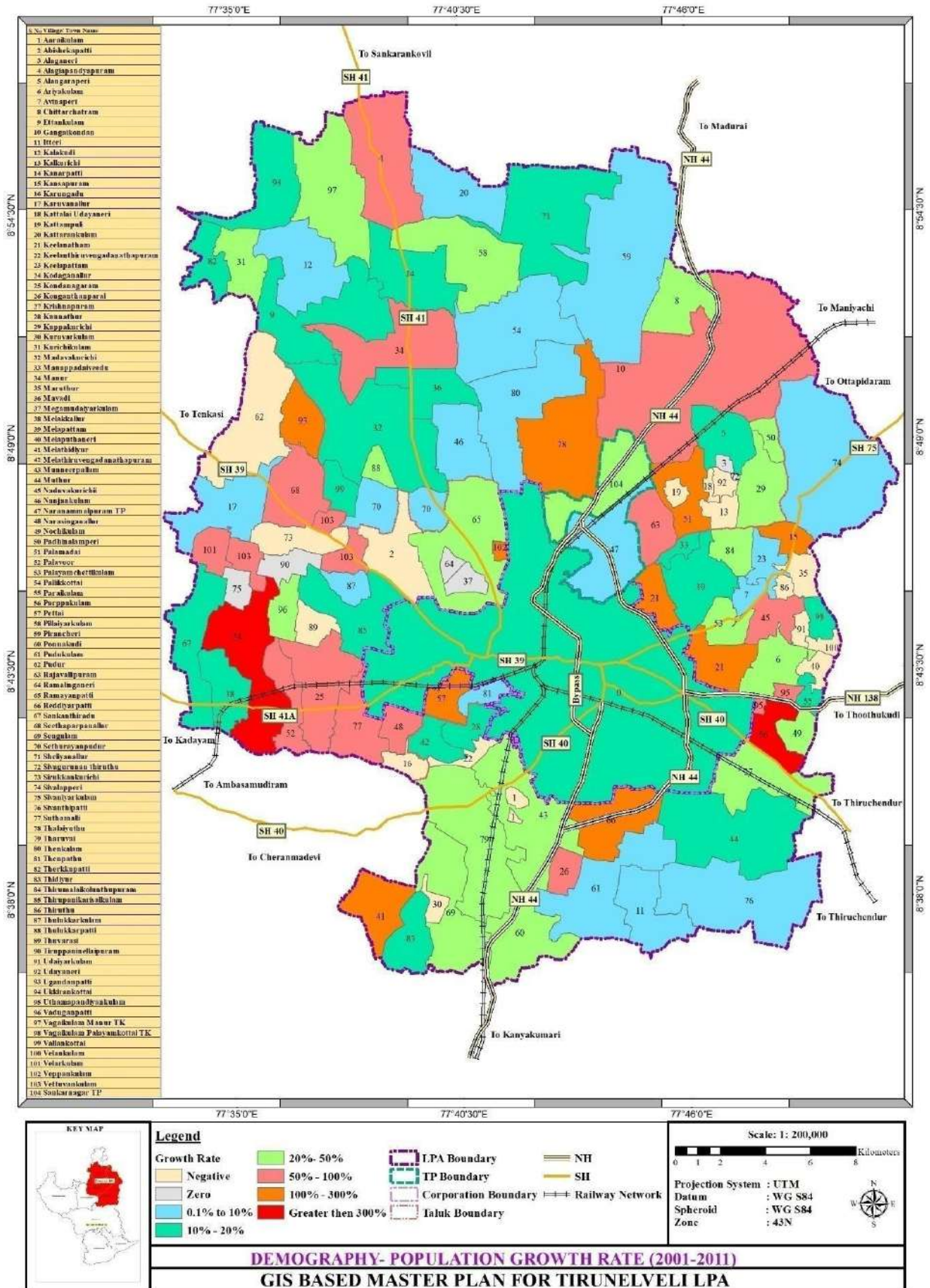
59	Ponnakkukdi	882	1242	1631	40.82	31.32	183
60	Pudukkulam	1871	2102	2163	12.35	2.9	158
61	Pudur	1486	1589	1328	6.93	-16.43	92
62	Rajavallipuram	3717	2568	3947	-30.91	53.7	819
63	Ramalinganeri	0	0	0	0	0	0
64	Ramayanpatti	3360	4812	7153	43.21	48.65	485
65	Reddiarpatti	2953	2492	5166	-15.61	107.3	628
66	Sanganhiradu	1218	1277	1518	4.84	18.87	165
67	Seliyanallur	3409	3184	3537	-6.6	11.09	190
68	Sengulam	2368	2223	2692	-6.12	21.1	233
69	Sethurayanpudur	853	927	931	8.68	0.43	138
70	Sidaparppanallur	1470	972	1606	-33.88	65.23	211
71	Sirukkankurichi	234	932	612	298.29	-34.33	131
72	Sivagurunathantiruthu	0	0	0	0	0	0
73	Sivalaperi	4125	4214	4571	2.16	8.47	177
74	Sivandipatti	3166	3229	3454	1.99	6.97	179
75	Sivaniyarkulam	59	59	59	0	0	33
76	Suttamalli	6003	6575	10954	9.53	66.6	1430
77	Thenkulam	2915	2840	2911	-2.57	2.5	189
78	Thenpathu	1476	1612	1766	9.21	9.55	637
79	Therkupatti	2377	2603	3066	9.51	17.79	733
80	Thalaiyuthu	6902	4192	9013	-39.26	115	580
81	Tharuvai	3993	4162	6126	4.23	47.19	364
82	Thidiyur	1571	1771	2007	12.73	13.33	379
83	Thiruthu	67	344	52	413.43	-84.88	69
84	Thulukarpatti	594	249	365	-58.08	46.59	226
85	Thuvarasi	22	303	42	1277.27	-86.14	17
86	Thirumalaikolunthupuram	1760	1910	2422	8.52	26.81	741
87	ThiruppaniKarisalkulam	2458	2611	3052	6.22	16.89	343
88	Tiruppani Nelliapuram	0	0	0	0	0	0
89	Tulukarkulam	518	499	543	-3.67	8.82	237



90	Udayaneri	0	626	177	0	-71.73	168
91	Udayarkulam	1204	1023	955	-15.03	-6.65	948
92	Uganthanpatti	377	450	1099	19.36	144.22	253
93	Ukkirankottai	4906	4679	5341	-4.63	14.15	557
94	Uthamapandiyankulam	284	315	547	10.92	73.65	425
95	Vaduganpatti	301	282	380	-6.31	34.75	128
96	Vagaikulam P(TK)	360	330	364	-8.33	10.3	189
97	Vagaikulam T(TK)	3349	3511	4489	4.84	27.86	302
98	Vallankottai	573	1076	1258	87.78	16.91	464
99	Velarkulam	329	286	285	-13.07	-0.35	274
100	Velarkulam	388	412	687	6.19	66.75	245
101	Veppankulam	662	548	1537	-17.22	180.47	2905
102	Vettuvankulam	337	864	1596	156.38	84.72	264
	Rural	173167	172281	236112	-0.51	37.05	323
	Total LPA	571556	605633	733938	5.96	21.19	859



Map 3.4 POPULATION GROWTH RATE (2001- 2011)





3.5 POPULATION BY AGE GROUP (0-6 YEARS)

The total population comprising of ages between 0 and 6 of the Tirunelveli LPA is 74891 which accounts 10.20 percent in total population as per the 2011 Census, which is higher than the previous decade by 7000. The growth rate is about 10.23% from the previous decade in Tirunelveli LPA. With respect to the urban population in age group 0 to 6, Naranammalpuram TP has a decline in population when compared to the previous decade. Similarly, 35 villages show a decrease in population. However, In Rural areas, the total population in age group 0 to 6 shows an increasing trend. Tirunelveli Corporation has around 9.84% child population and a growth rate of around 4.70%. Table 3.5 shows the population of age group 0 to 6.

Table 3.5 VILLAGE/ TOWN WISE TOTAL & POPULATION AGE GROUP (0 -6 YEARS) FROM 2001-2011

Area	Total Population	Population by age group (0 to 6)		% of Variation	% of Population	
	2011	2001	2011	(2001-2011)	age group 2011	
URBAN						
i	Tirunelveli Municipal Corporation	4,73,637	44,530	46,624	4.70	9.84
ii	Sankar nagar TP	7095	497	699	40.64	9.85
iii	Naranammalpu ram TP	17,094	2,025	1,820	-10.12	10.65
RURAL (102 REVENUE VILLAGES)		2,36,112	20,891	25,748	23.25	10.90
Tirunelveli LPA		7,33,938	67,943	74,891	10.23	10.20

(Source-Census of India)

3.6 POPULATION DENSITY

In Tirunelveli LPA, the density is about 858.57 persons per sq.km in the year 2011 which is higher than that of the past decade. Tirunelveli Municipal Corporation has the highest density of about 4359.29 persons per sq.km. The town Panchayats has an average density of around 908.68 persons per sq.km. The average density of the revenue villages within the LPA is about 323.44 persons per sq.km which is higher than that of the previous decade. The change in density is higher in the rural areas than that of the LPA. Ariyakulam, Keelanatham, Manappadaividu, Nochikulam, Suthamalli and Veppankulam have density of more than 1000 persons per sq.km. These villages are situated near the Municipal Corporation which may have influenced their density.



Table 3.6 POPULATION DENSITY IN TIRUNELVELI LPA

S. No	Description	Density		Change in Density
		2001	2011	
	URBAN AREAS	(Persons/ Sq.km)		%
1	i Tirunelveli Municipal Corporation	3,790.44	4,359.29	15.01
	ii Sankar nagar TP	612.84	835.69	36.36
	iii Naranammalpuram TP	900.06	942.86	4.75
2	Rural Area (102 Revenue Villages)	236	323.44	37.05
3	Tirunelveli LPA	709.55	858.57	21.19

(Source-Census of India)

3.7 LITERACY

The literacy rate of the Tirunelveli LPA is higher than that of the District and State average. Tirunelveli LPA has a literacy rate of about 86.89% which is higher than that of the Tirunelveli District having a literacy rate of about 82.5% and that of the State having a rate of about 80%. Correspondingly, both the urban and rural areas within the LPA show an increased literacy rate when compared with the State and District.

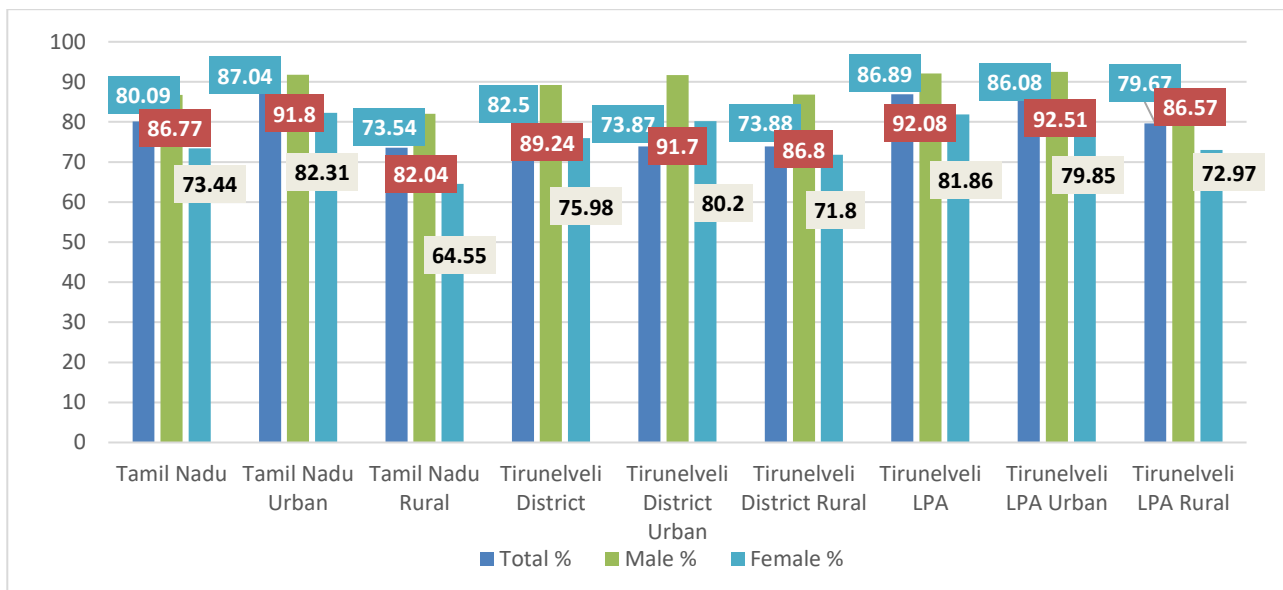
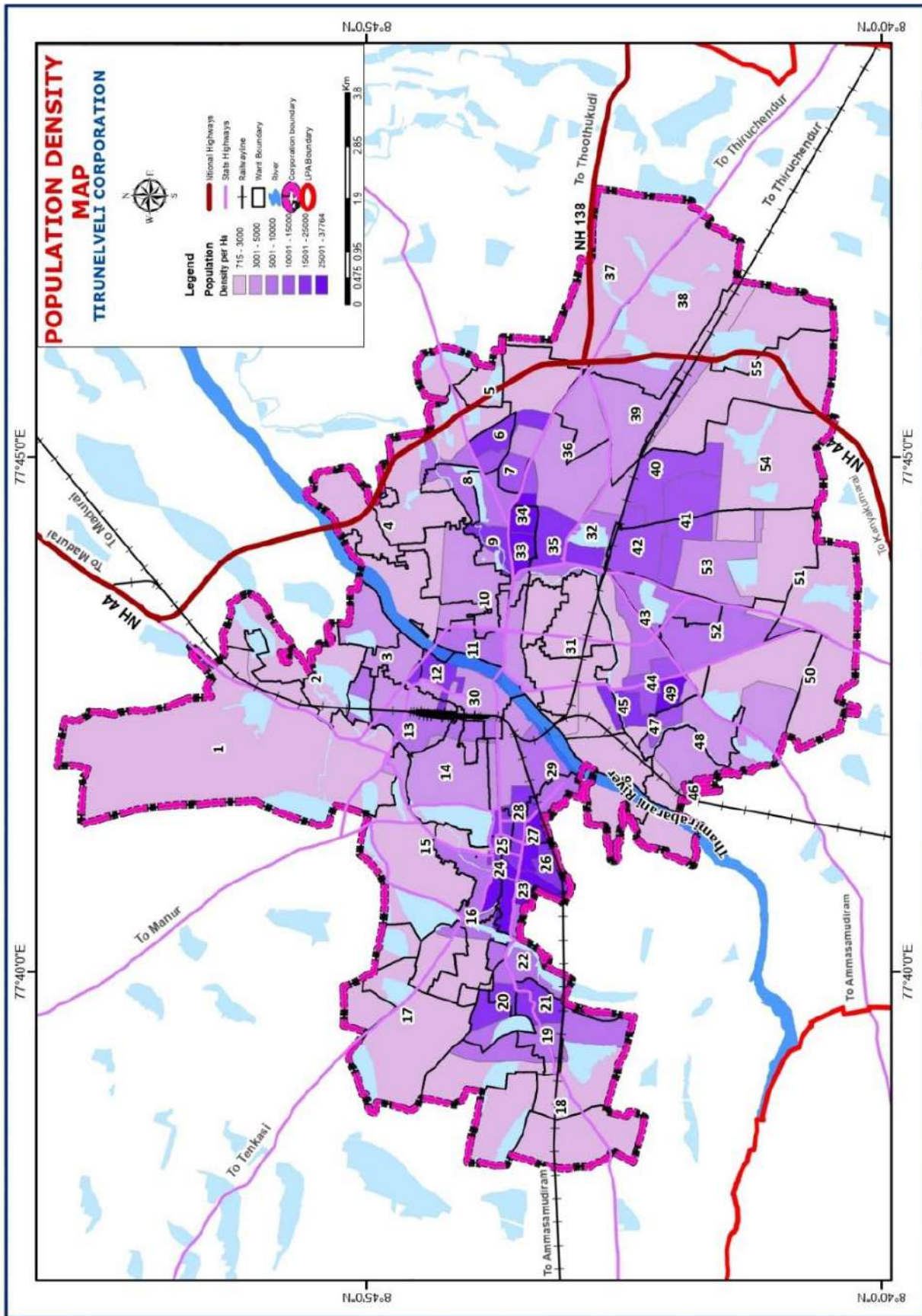


Figure 3.5 COMPARATIVE LITERACY RATE- 2011



Map 3.5 POPULATION DENSITY CORPORATION (2011)





Map 3.6 POPULATION DENSITY REST OF LPA (2011)

**POPULATION DENSITY MAP
TIRUNELVELI LOCAL PLANNING AREA**

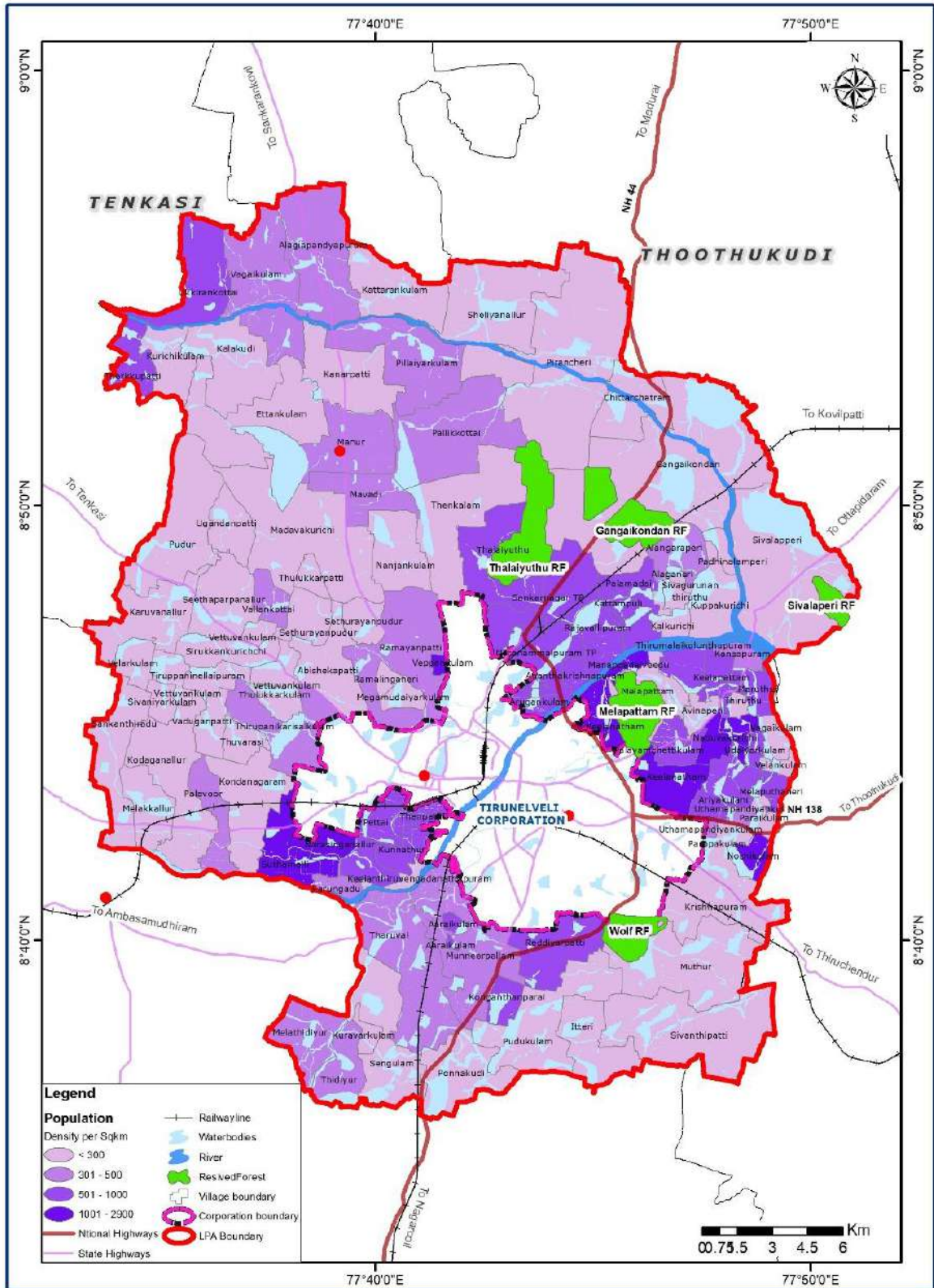




Table 3.7 COMPARISON OF LITERACY RATE- 2011

Description	Total %	Male %	Female %
Tamil Nadu	80.09	86.77	73.44
Tamil Nadu Urban	87.04	91.80	82.31
Tamil Nadu Rural	73.54	82.04	64.55
Tirunelveli District	82.5	89.24	75.98
Tirunelveli District Urban	73.87	91.7	80.2
Tirunelveli District Rural	73.88	86.8	71.8
Tirunelveli LPA	86.89	92.08	81.86
Tirunelveli LPA Urban	86.08	92.51	79.85
Tirunelveli LPA Rural	79.67	86.57	72.97

(Source-Census of India 2011)

The literacy rate has increased to around 5.29% from the year 2001 in the LPA. The total percentage of literates in the rural areas has considerable increase from 70.18% to 79.67%. The Municipal Corporation shows an increase of around 4.21% from the previous decade. Table 3.8 shows the comparison of the Literacy rates of Tirunelveli LPA between the years 2001 and 2011.

Table 3.8 LITERACY RATE OF TIRUNELVELI LPA FROM 2001 -2011

Description	Total Literates in %		Male Literates in %		Female Literates in %	
	2001	2011	2001	2011	2001	2011
Tirunelveli Corporation	86.18	90.39	92.63	94.75	79.95	86.18
Other Urban Areas (2 TP)	84.11	87.89	90.26	93.00	77.82	82.75
Rural Areas (102 Revenue Villages)	70.18	79.67	79.94	86.57	60.99	72.97
Tirunelveli LPA	81.60	86.89	89.00	92.08	74.49	81.86

(Source-Census of India)

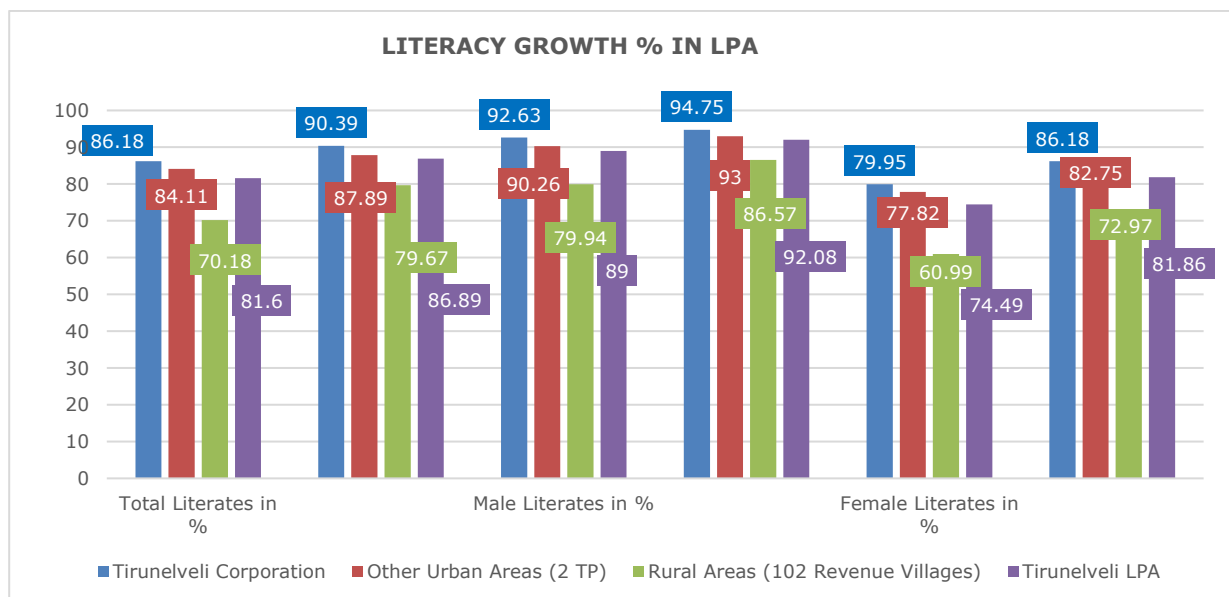


Figure 3.6 LITERACY RATE OF TIRUNELVELI LPA FROM 2001 -2011

(Source-Census of India-2011)

3.8 SEX RATIO

Sex Ratio is defined as the number of females per thousand males. Tirunelveli LPA has a sex ratio of about 1024 which is higher than that of the State and identical to that of the district (1023). The urban areas have the highest sex ratio of about 1026 which is higher than that of the State (1000) and District (1021). The average rural sex ratio is about 1020 which is higher when compared with the State's rural sex ratio and falls slightly behind than that of the district.

Table 3.9 COMPARISON OF SEX RATIO

S.No	Area	Sex Ratio	Age Group (0-6) Sex Ratio
1	Tamil Nadu	996	943
2	Tamil Nadu Urban	1,000	952
3	Tamil Nadu Rural	993	936
4	Tirunelveli District	1,023	960
5	Tirunelveli District Urban	1,021	958
6	Tirunelveli District Rural	1,025	961
7	Tirunelveli LPA	1,024	950
8	Tirunelveli LPA Urban	1,026	954
9	Tirunelveli LPA Rural	1,020	940

(Source-Census of India-2011)



3.7.1 COMPARISON OF SEX RATIO IN TIRUNELVELI LPA

The above bar diagram shows the sex ratio and child sex ratio for the years 2001 and 2011. Sex ratio of Tirunelveli LPA in the year 2001 was about 1030 which is higher than that of the year 2011. Similarly, the average rural sex ratio (1046) is higher in the year 2001 and has a decrease in the year 2011 which is around 1020. However, the urban areas within Tirunelveli LPA show a slightly increased value (1026) in the year 2011 when compared with 2001. In terms of the child sex ratio, the year 2001 shows higher ratios than that of 2011. In Tirunelveli LPA the child sex ratios are below than 1000.

Table 3.10 SEX RATIO IN TIRUNELVELI LPA

S. No	Area	Sex Ratio		Child Sex Ratio	
		2001	2011	2001	2011
1	Urban	1024	1026	961	954
	Tirunelveli Municipal Corporation	988	1,027	962	951
	Sankar nagar TP	1,026	985	957	963
	Naranammalpuram TP	932	1,030	947	1,031
2	Rural (102 Revenue villages)	1046	1020	945	940
3	Tirunelveli LPA	1030	1024	956	950

Source-Census of India

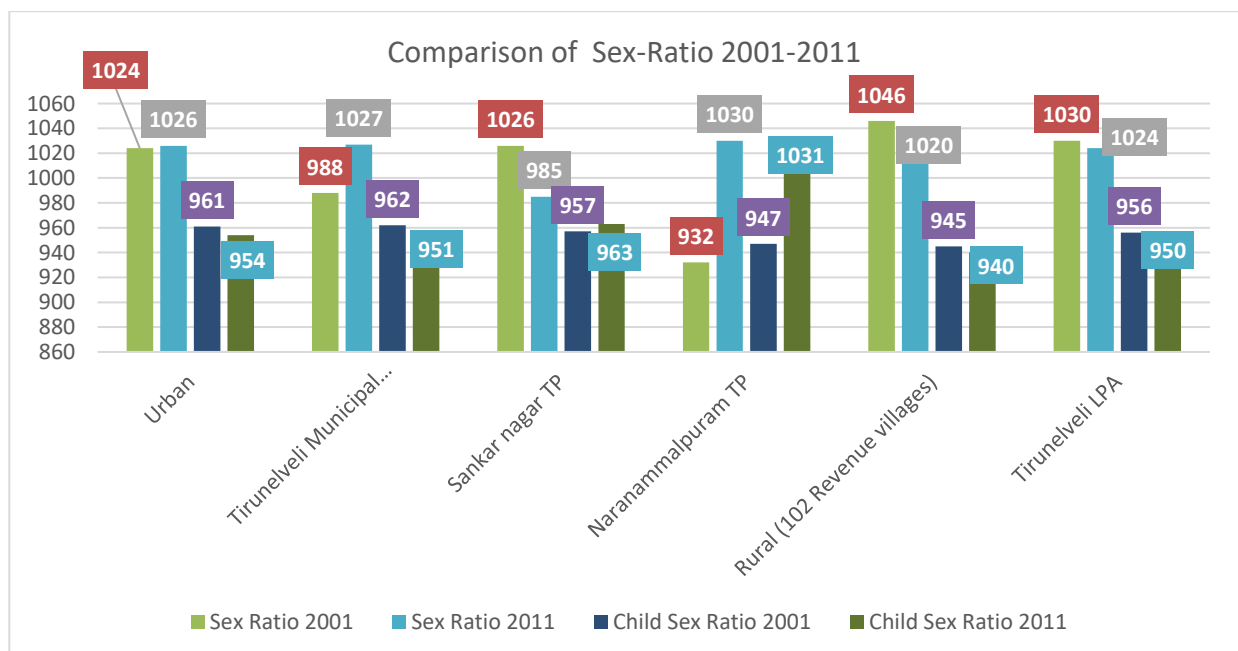


Figure 3.7 COMPARISON OF SEX RATIO



3.9 HOUSEHOLD CHARACTERISTICS

The household size of the Tirunelveli LPA is similar to that of the State and District. The household size of the villages ranges from 3 to 4. The workforce participation rate in this village is 17.70% which would have impacted in the household size. Table 3.11 shows the comparison of household size of the State and District with Tirunelveli LPA and its urban and rural areas.

Table 3.11 COMPARISON OF HOUSEHOLD SIZE

Description	Population	No of Households	Household Size
Tamil Nadu	72,1,47,030	18,5,24,982	3.9
Tirunelveli District	6,1,54,466	1,6,31,056	3.8
Tirunelveli (M Corp.)	4,73,637	1,20,466	3.9
Other Urban areas in LPA (2 TP)	24,189	6,434	3.8
102 Revenue Villages in LPA	2,36,112	62,601	3.8
Total Tirunelveli LPA	7,33,938	1,89,501	3.9

(Source-Census of India-2011)

3.10 POPULATION PROJECTION

Population projection provides a picture of how a village, town or an area would liberate in terms of population. It is basically arrived by knowing the past trends of the area. These projections would serve as a basis for long term planning.

The past trends of the population in Tirunelveli LPA are studied in three aspects; these include the growth of the villages from the year 1951, the growth of the urban areas within the LPA, and the LPA as a whole. Three population projection methods were applied and the suitable method is chosen.

Table 3.12 POPULATION IN TIRUNELVELI LPA (1951- 2011)

Description	1951	1961	1971	1981	1991	2001	2011
Rural	1,10,854	1,20,756	1,39,413	1,52,154	1,73,167	1,72,281	2,36,112
Urban	1,79,871	2,13,129	2,80,483	3,33,805	3,98,389	4,33,352	4,97,826
Total LPA	2,90,725	3,33,885	4,19,896	4,85,959	5,71,556	6,05,633	7,33,938

(Source-Census of India)



The population of 2041 was projected by utilizing available census data from 1951 to 2011. The projected value was then compared with the actual 2011 census population to identify the suitable method. From analyzing the past trends in Tirunelveli LPA as a whole, its rural areas and urban areas individually, the projected population obtained from **Arithmetic Increase Method** is best suited for the current trend. Therefore, for the future decades, the same method was adopted.

Table 3.13 POPULATION PROJECTION

Description	Method	2011	2021	2031	2041
Urban	Arithmetic Increase Method	4,97,826	5,50,819	6,03,811	6,56,804
	Geometric Increase Method	4,97,826	5,54,657	6,18,110	6,88,983
	Incremental Increase Method	4,97,826	5,77,056	6,85,796	8,24,048
Rural	Arithmetic Increase Method	2,36,112	2,56,988	2,77,865	2,98,741
	Geometric Increase Method	2,36,112	2,55,742	2,77,003	3,00,033
	Incremental Increase Method	2,36,112	2,67,774	3,10,222	3,63,456
Tirunelveli LPA	Arithmetic Increase Method	7,33,938	8,07,807	8,81,676	9,55,545
	Geometric Increase Method	7,33,938	8,10,399	10,01,256	9,89,016
	Incremental Increase Method	7,33,938	8,44,830	9,96,018	18,13,064

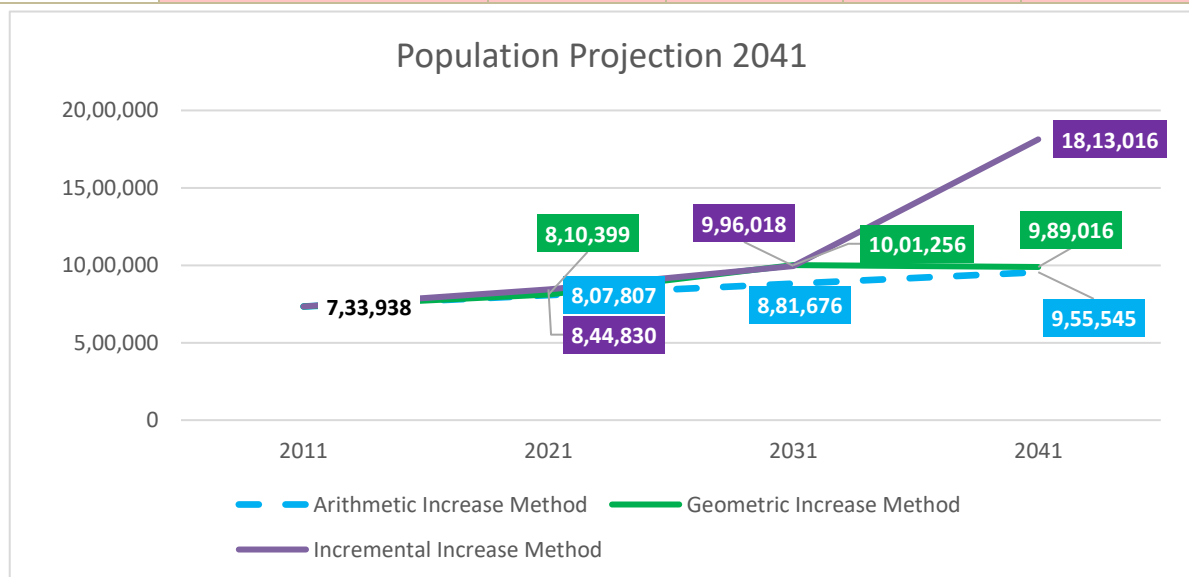


Figure 3.8 POPULATION PROJECTION OF TIRUNELVELI LPA



3.11 SUMMARY

The population dynamics of Tirunelveli Municipal Corporation depict a consistent and linear growth pattern from 1901 to 2011. With a steady increase over the years, the population has shown growth rates ranging from 11% to 30% since 1901. Notably, the Tirunelveli Local Planning Area (LPA) had a total population of approximately 7,33,938 in 2011, with urban areas accounting for nearly 68% of the total population. The Tirunelveli City Municipal Corporation accommodates about 95% of the total urban population, emphasizing the significant urbanization within the LPA. The rural areas, represented by revenue villages, constitute around 32% of the total population.

Examining the age group of 0 to 6, the LPA experienced an increase of 7,000 individuals compared to the previous decade, with a growth rate of 10.23%. The rural areas displayed a higher decadal growth rate compared to urban areas, and specific town panchayats, like Sankar Nagar TP and Naranammalpuram TP, exhibited varying growth rates. The population density in the LPA increased to approximately 858.57 persons per sq.km in 2011, with the Tirunelveli Municipal Corporation having the highest density at 4359.29 persons per sq.km. The literacy rate in the LPA surpassed district and state averages, reflecting a commitment to education, with a notable increase since 2001.

The sex ratio in Tirunelveli LPA is higher than state and district averages, with urban areas exhibiting the highest sex ratio. The household size of 3.9 is generally consistent with the state and district, except for outliers like Melathidiyur, where abnormal household size patterns are observed. Population projection, based on past trends and utilizing the Arithmetic Increase Method, is deemed suitable for anticipating future demographic changes, providing a foundation for informed long-term planning in the region.



ECONOMY

CHAPTER 04

**MASTER PLAN
2041
TIRUNELVELI LPA**



4. ECONOMY

The Economy of the LPA is dominated by the service and Industrial sectors. The agriculture and Industry sector have witnessed varying growth with wide variations from year to year. The Industrial sector has witnessed a slower growth. At sub-sector level, Manufacturing, Real Estate, Trade & Tourism, Construction & Livestock are the major contributors to the LPA's economy.

4.1 ECONOMY IN PRIMARY SECTOR

4.1.1 AGRICULTURE

Agriculture provides sustenance to around 12.35% of total workers in LPA as per the 2011 Census. About 47% of total land in LPA is currently used for agriculture. Productivity of agriculture is influenced by numerous factors such as soil, climate, irrigation, marketing and credit facilities, and agricultural practices and techniques. The main crops cultivated include Paddy, Millets, pulses, cotton and Oil seeds. Other crops like maize and banana are also grown. The table 19 below shows the detailed breakdown by blocks provides a granular understanding of the types of crops cultivated and their respective areas, in each block.

Table 4.1 BLOCK-WISE CROP CULTIVATION

AGRICULTURE - AREA COVERAGE IN HECTARE 2021-2022						
Block Name	Paddy	Millets	Pulses	Cotton	Oilseeds	Crop wise Total
Manur	3756	648	7268	643	237	12552
Palayamkottai	4277		1305	29	5	5616
Papakudi	5054	20	85	48	11	5218
Total	13087	668	8658	720	253	23386

Tirunelveli Regulated Market handles 37% Quantity (9774 M.T. (2021-2022) of the total district arrivals (26065 M.T)

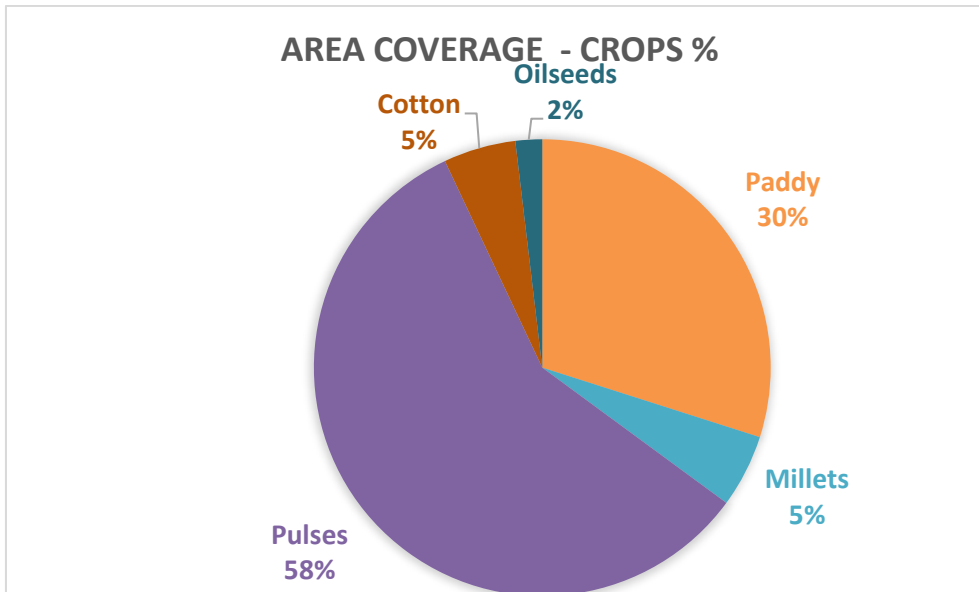


Figure 4.1 CROP CULTIVATION - AREA COVERAGE

4.1.2 IRRIGATION

Data extracted from the Tirunelveli District Statistical Report for the year 2021-22 provides valuable insights into the irrigation practices within the Tirunelveli Local Planning Area (LPA). Taluk-level details reveal that the primary sources of irrigation in the LPA are the canals deriving water from the Tamirabarani River. Notably, the LPA extensively relies on wells for irrigation, contributing to the highest number of wells utilized for this purpose in the entire district.

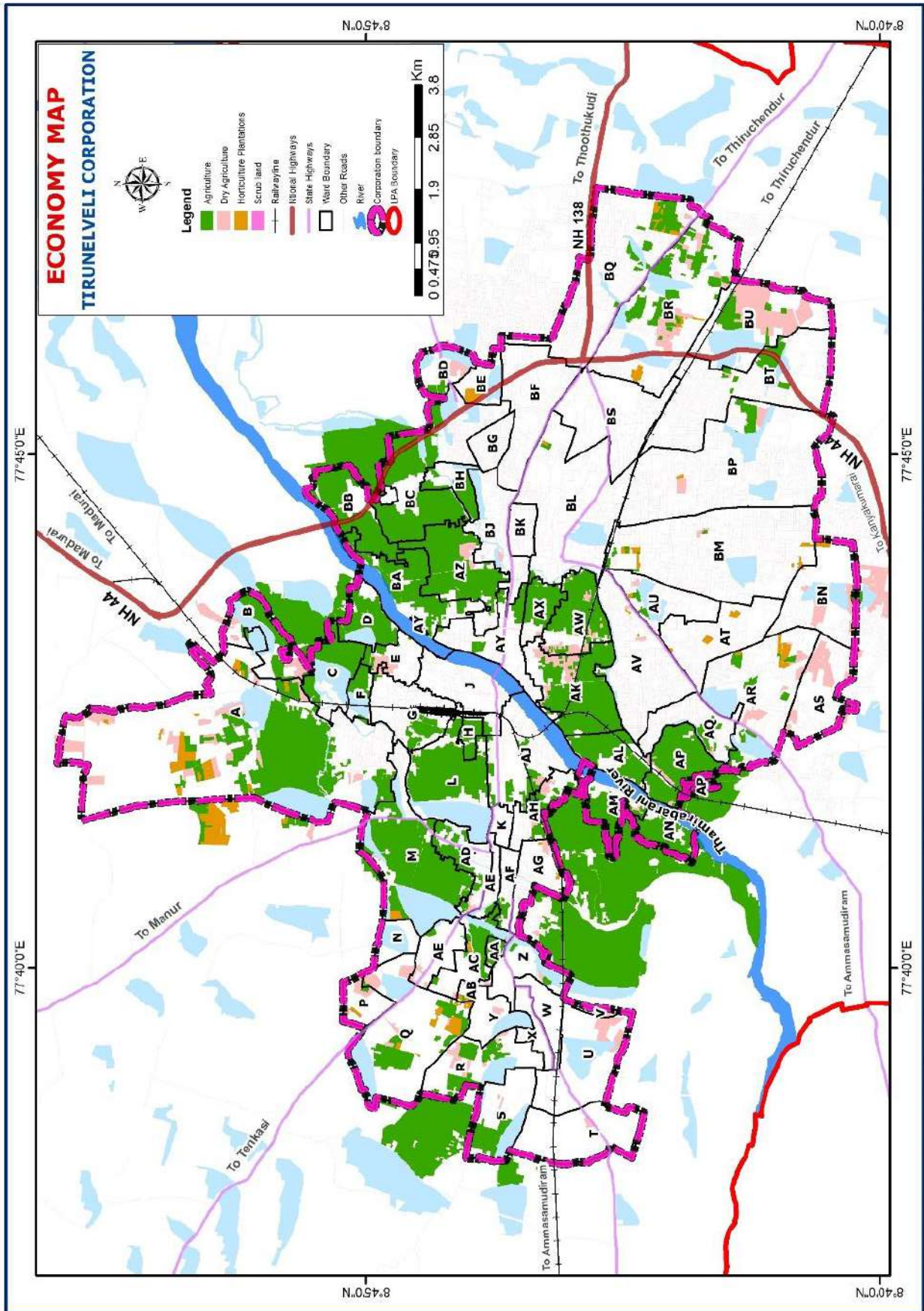
Contrastingly, the data indicates a lack of reservoirs within the Tirunelveli LPA to support agricultural practices. This underscores the significance of the Tamirabarani River canal and wells as crucial components of the irrigation infrastructure, highlighting the need for sustainable water management strategies in the region.

Table 4.2 TYPES OF IRRIGATION USED

S. no	Name of the Taluk	Canal Numbers	Length (km)	well used for irrigation purpose only	Tube wells & Bore wells	Wells used for Domestic purpose only	Reservoirs	Tanks
1	Tirunelveli	6	24	1995	52	1225	-	84
2	Palayamkottai	2	43	1749	-	1285	-	124
3	Manur	3	10	5998	76	818	-	61



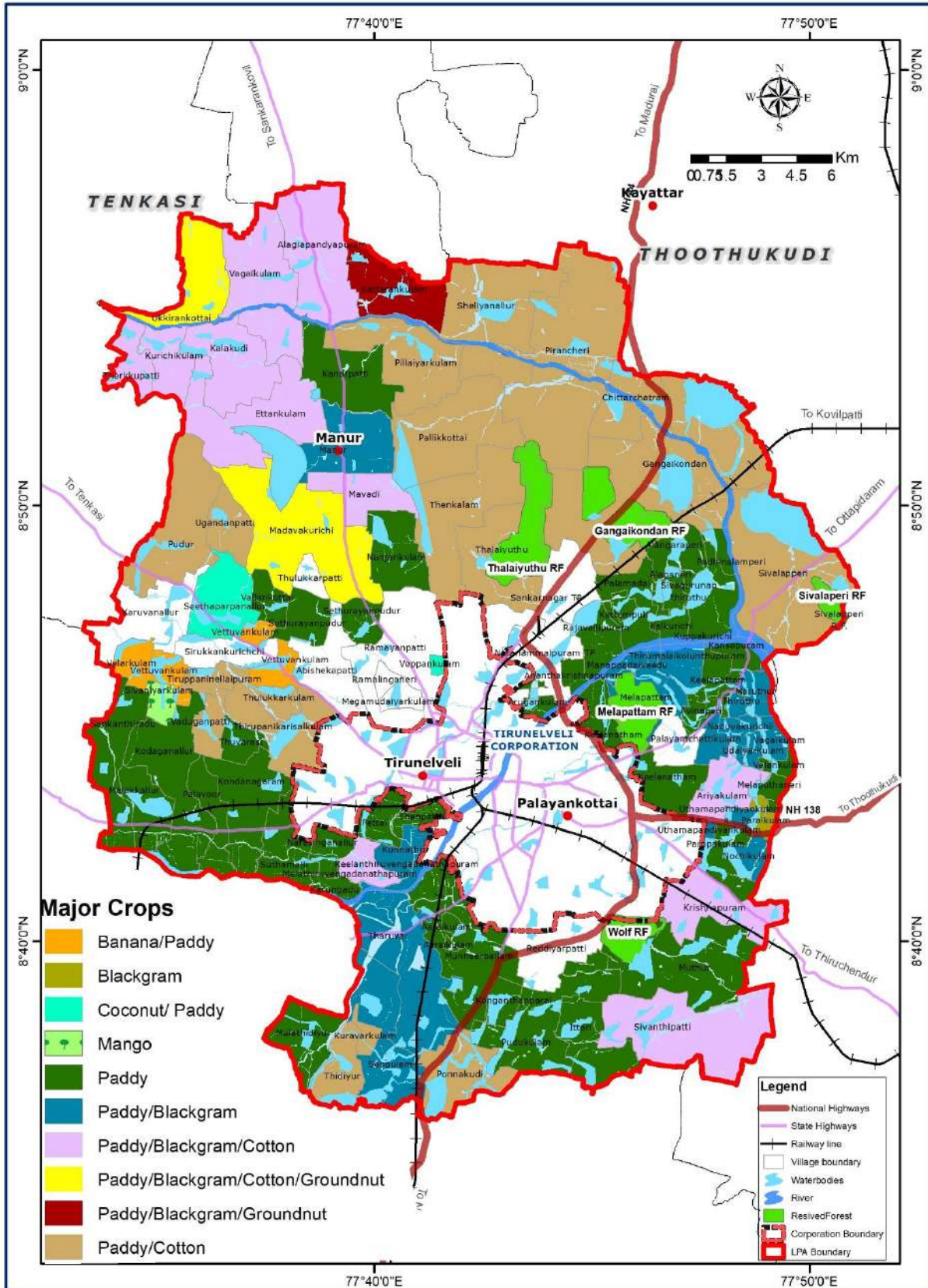
Map 4.1 AGRICULTURE MAP OF TIRUNELVELI CORPORATION





Map 4.2 MAJOR CROPS CULTIVATED IN REST OF LPA

**MAJOR CROP CULTIVATION MAP
TIRUNELVELI LOCAL PLANNING AREA**





4.1.3 SERICULTURE

Sericulture stands out as a crucial economic activity within the Tirunelveli Local Planning Area (LPA), playing a significant role in the region's economic landscape. In the fiscal year 2021-2022, Tirunelveli LPA emerged as a major contributor to the district's sericulture production. The LPA accounted for an impressive 32% of the total district production of cocoons, yielding a substantial quantity of 23,590 kg.

Table 4.3 DETAILS OF SERICULTURE

Name of the block	Area under Mulberry (in Acre)	Production of Cocoons (in Kg)
Palayamkottai	23	7550
Papakudi	62	8850
Manur	49	7190

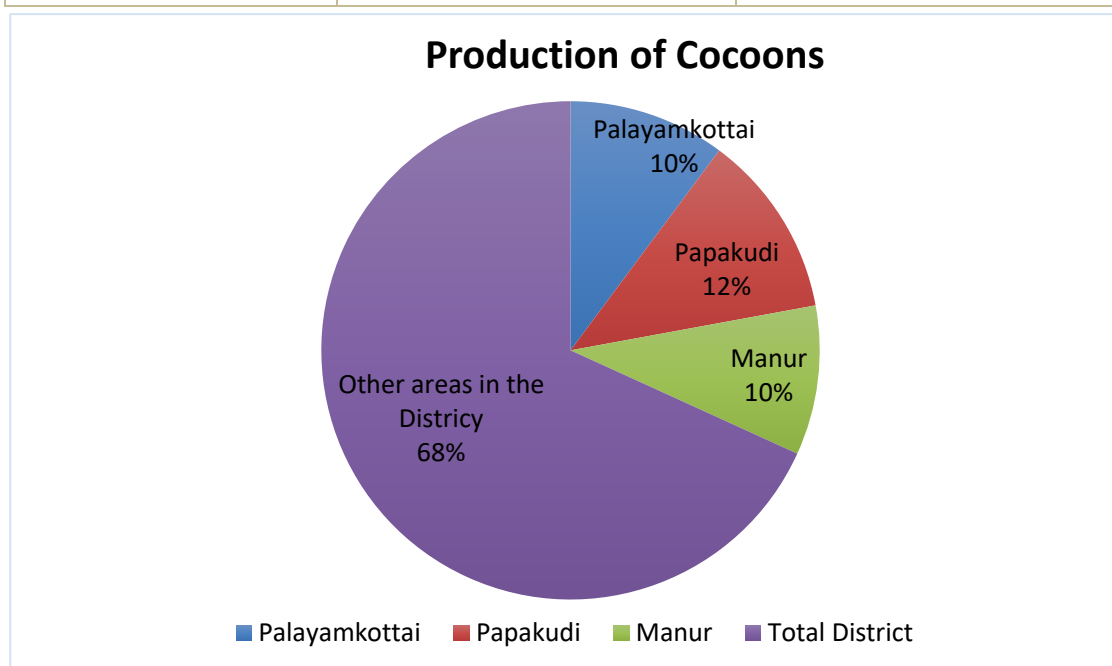


Figure 4.2 COCOON PRODUCTION DETAILS



4.2 ECONOMY IN SECONDARY SECTOR

4.2.1 INDUSTRIES

Tirunelveli LPA is witnessing robust industrial development, marked by strategic initiatives such as the IT Special Economic Zone (SEZ) established by ELCOT in Gangaikondan village, at an investment of Rs. 55.88 crore, covering an extensive 500 acres. Notably, SEZ approval has been granted for 290 acres, indicating a significant economic zone poised for growth. Complementing this, an administrative-cum-IT building spanning 56,720 sq. ft. has been constructed by ELCOT and is ready for occupancy.

The State Industries Promotion Corporation of Tamil Nadu (SIPCOT), located at Gangaikondan, hosts Alliance Tire Company Tires Private Limited, owned by Yokohama Rubber Company. This tire manufacturing facility, with a 400-million-rupee investment, boasts an annual production capacity of 54,000 tons, employing approximately 1800 and 5800 persons directly and indirectly. Bosch India Limited operates a plant within SIPCOT, specializing in manufacturing gasoline systems division systems, producing power-trained sensors, fuel delivery modules, and air management components for automobiles and two-wheeler systems.



Figure 4.3 EXISTING
INDUSTRIAL CORRIDOR - SIPCOT AND
ELCOT



Adding to the industrial landscape is the Indane LPG bottling plant, the largest in the state, with an operational capacity of filling 36,000 cylinders daily. This facility not only contributes to the region's economic growth but also significantly enhances employment opportunities within the Tirunelveli LPA. Currently, around 5283 workers are employed across different industries within SIPCOT. Further contributing to industrial diversity are SIDCO Industrial estates, strategically positioned at two locations within Tirunelveli LPA—Pettai and Gangaikondan. Pettai Industrial estate, covering an area of approximately 50.55 acres, employs around 1000 workers. The major products manufactured here include aluminum vessels, PVC pipes, corrugated boxes, and fabrication works.

This industrial surge signifies Tirunelveli LPA's emergence as a dynamic economic zone, fostering innovation, employment, and economic prosperity. The concerted efforts of ELCOT, SIPCOT, and SIDCO underscore the region's commitment to sustainable and diversified industrial growth.



The Trade Centre at Tirunelveli Corporation, a recent addition to the cityscape (2023), plays a pivotal role in fostering economic development within the urban landscape. Serving as a dynamic hub for commercial activities, the Trade Centre becomes a catalyst for growth by providing a centralized platform for businesses to converge and flourish. Its strategic location and modern infrastructure attract both local and international enterprises, facilitating trade, networking, and collaboration. Furthermore, the Trade Centre often hosts exhibitions, conferences, and events, creating opportunities for knowledge exchange and business expansion. This multipurpose facility not only stimulates economic growth directly by boosting commerce but also indirectly contributes to the enhancement of the city's overall image, attracting investments and fostering a vibrant economic ecosystem.



Figure 4.5 NEWLY CONSTRUCTED TRADE CENTRE UNDER SMART CITY MISSION



JOBS CREATED BY MSME IN TIRUNELVELI LPA

The table below shows the list of micros, medium and small industries functioning and the number of jobs it renders. Around 2040 units is functioning in the LPA providing jobs for around 15,033 people. The number of micro industries is higher when compared to the other two categories. It generates jobs for almost 10,103 persons in the LPA.

Table 4.4 JOBS CREATED BY MSME

Industry type	Units	Jobs	Sector	Units	Jobs
Micro	1976	10103	Services	1483	7332
			Manufacturing	493	2771
Small	60	4597	Services	44	611
			Manufacturing	16	3986
Medium	4	333	Services	1	7
			Manufacturing	3	326

(Source-District Industry Centre, Tirunelveli)

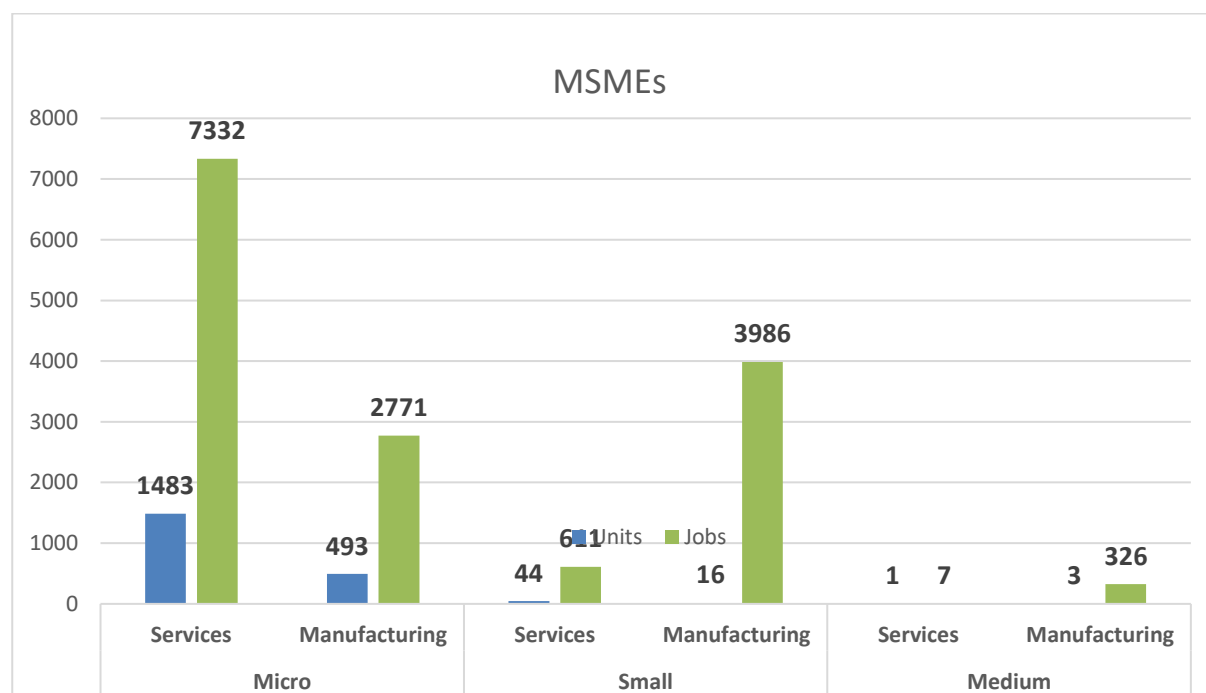


Figure 4.6 JOBS CREATED BY MSME



4.3 ECONOMY IN TERTIARY SECTOR

4.3.1 SERVICE SECTOR

In terms of scale, there are no sizable enterprises in the tertiary or quaternary sectors, which contribute in large to the economy. The list of enterprises in the LPA region, as per DIC records, is listed in Table 4.5 and represented visually in Fig. 4.4.

Table 4.5 LIST OF ENTERPRISES

Manufacturing	5824
Services	21190
Trading	1399
Total Enterprises List	28413

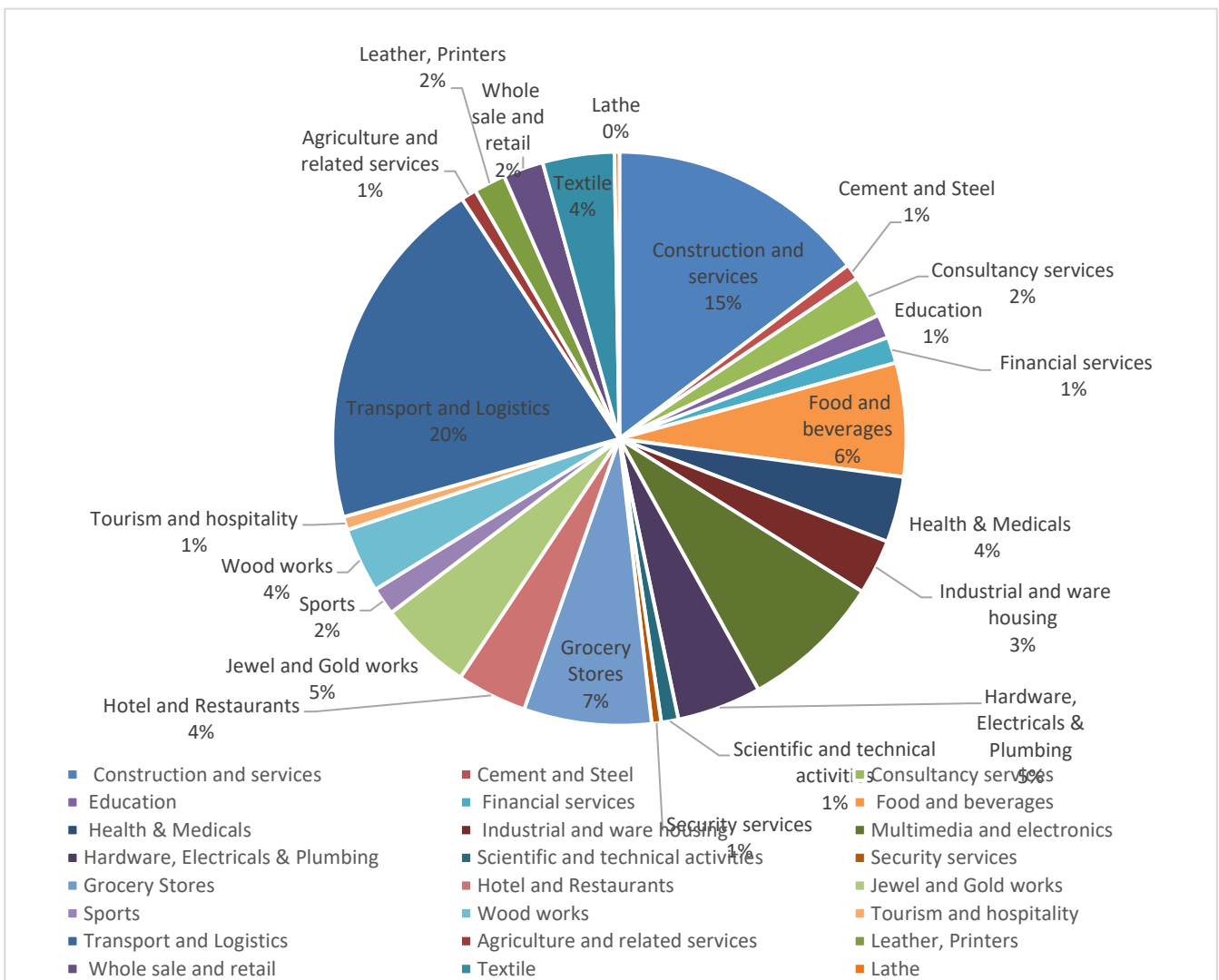


Figure 4.7 TYPES OF SERVICE SECTOR

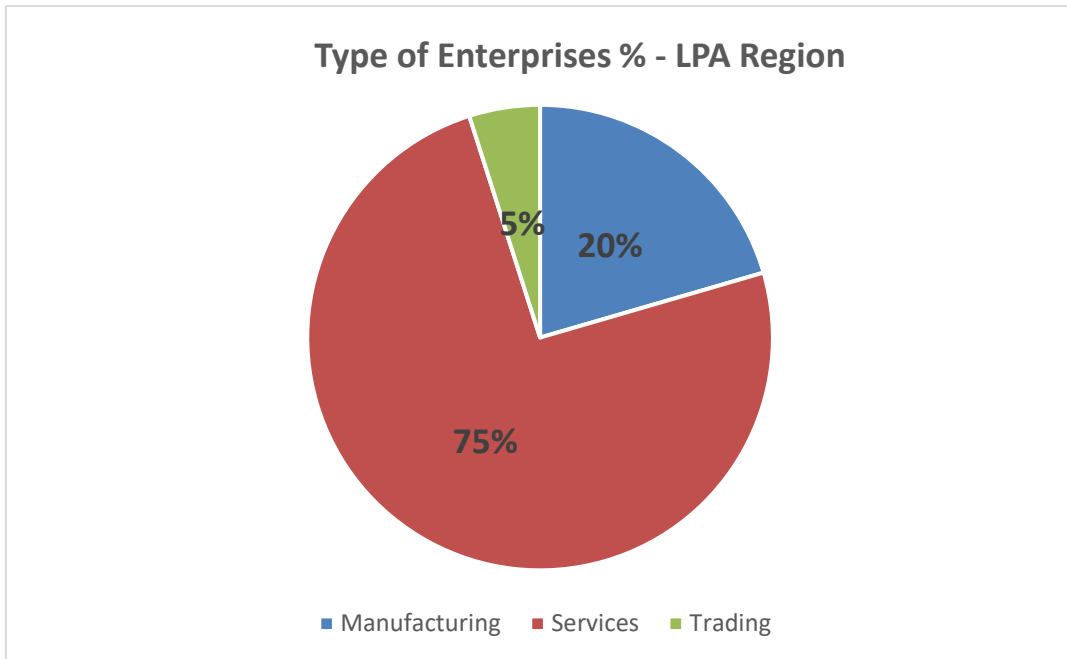


Figure 4.8 TYPES OF ENTERPRISES

4.4 WORKFORCE & OCCUPATIONAL PATTERN

The occupational pattern of Tirunelveli LPA mainly consists of service sector activities including agricultural trading, administration, banking, tourism, cement manufacturing, information technology and educational services. The major agricultural produces in the LPA area are cotton and paddy. It is also a major area for wind production. Most of the wind electricity power generation units are situated in Tirunelveli District. IT SEZ is located in Gangaikondan along NH 44. SIDCO is stationed at Pettai and SIPCOT at Gangaikondan.



4.5 OCCUPATIONAL STRUCTURE

The occupational structure of Tirunelveli LPA is compared with both the State and District. The percentage of main workers (36.77%) in the LPA is comparatively lower than that of the State and District. The percentage of marginal workers is around 4.59% which is lower than both the State and District. In regard to the percentage of non-workers population within the LPA it shows higher value when compared with both the State and District. Figure 4.6 shows comparison of occupational structure of Tirunelveli LPA with the State and District and Map 4.4 shows the workforce participation rate of the Tirunelveli LPA.

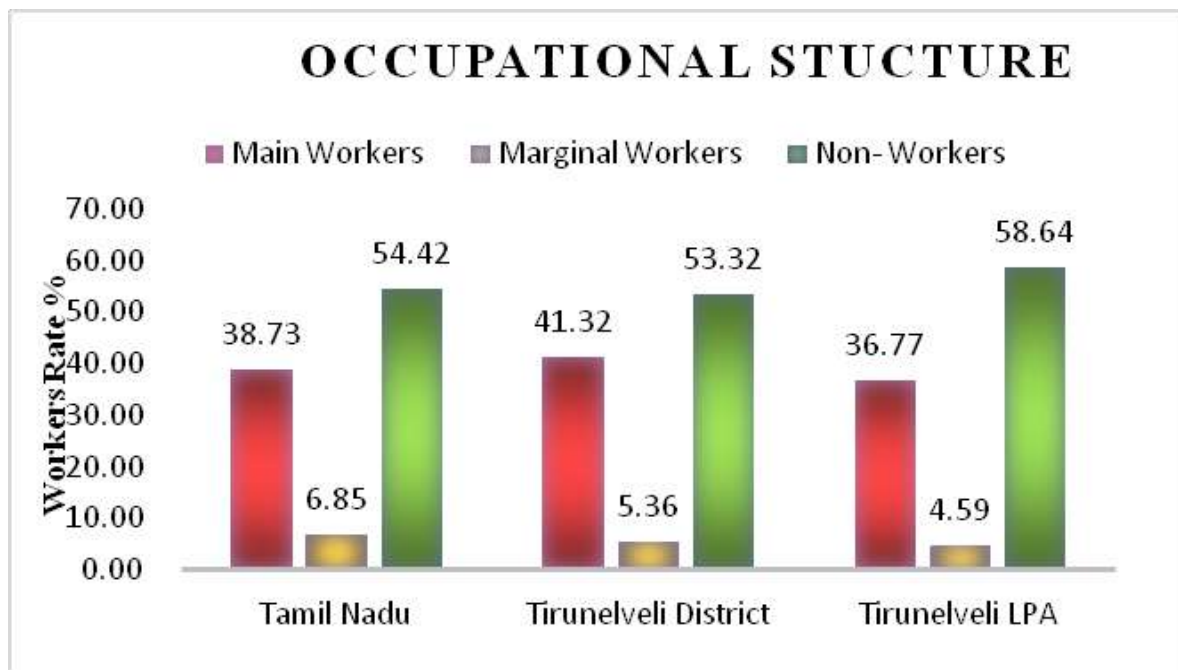


Figure 4.9 COMPARISON OF OCCUPATIONAL STRUCTURE

4.6 WORKFORCE PARTICIPATION RATE

The workforce participation rate of Tirunelveli LPA is compared with both the State and District. The combined average workforce participation rate for both the urban and rural areas is slightly lower than that of the State and Tirunelveli District.

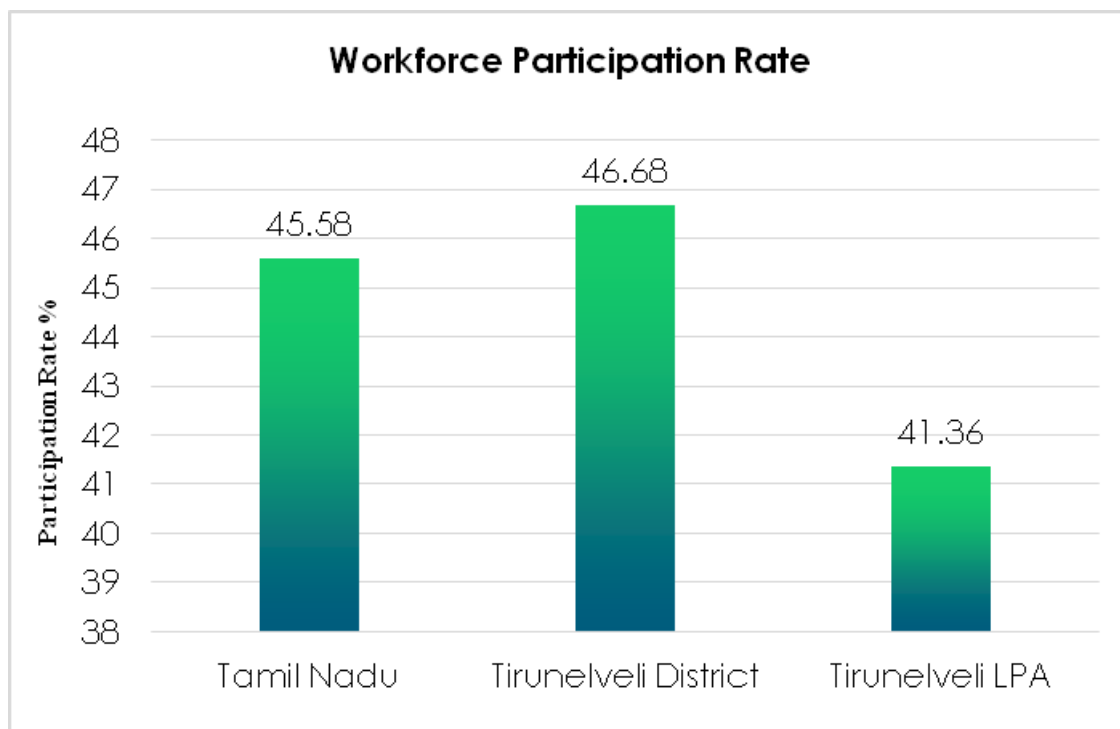


Figure 4.10 WORKFORCE PARTICIPATION RATE

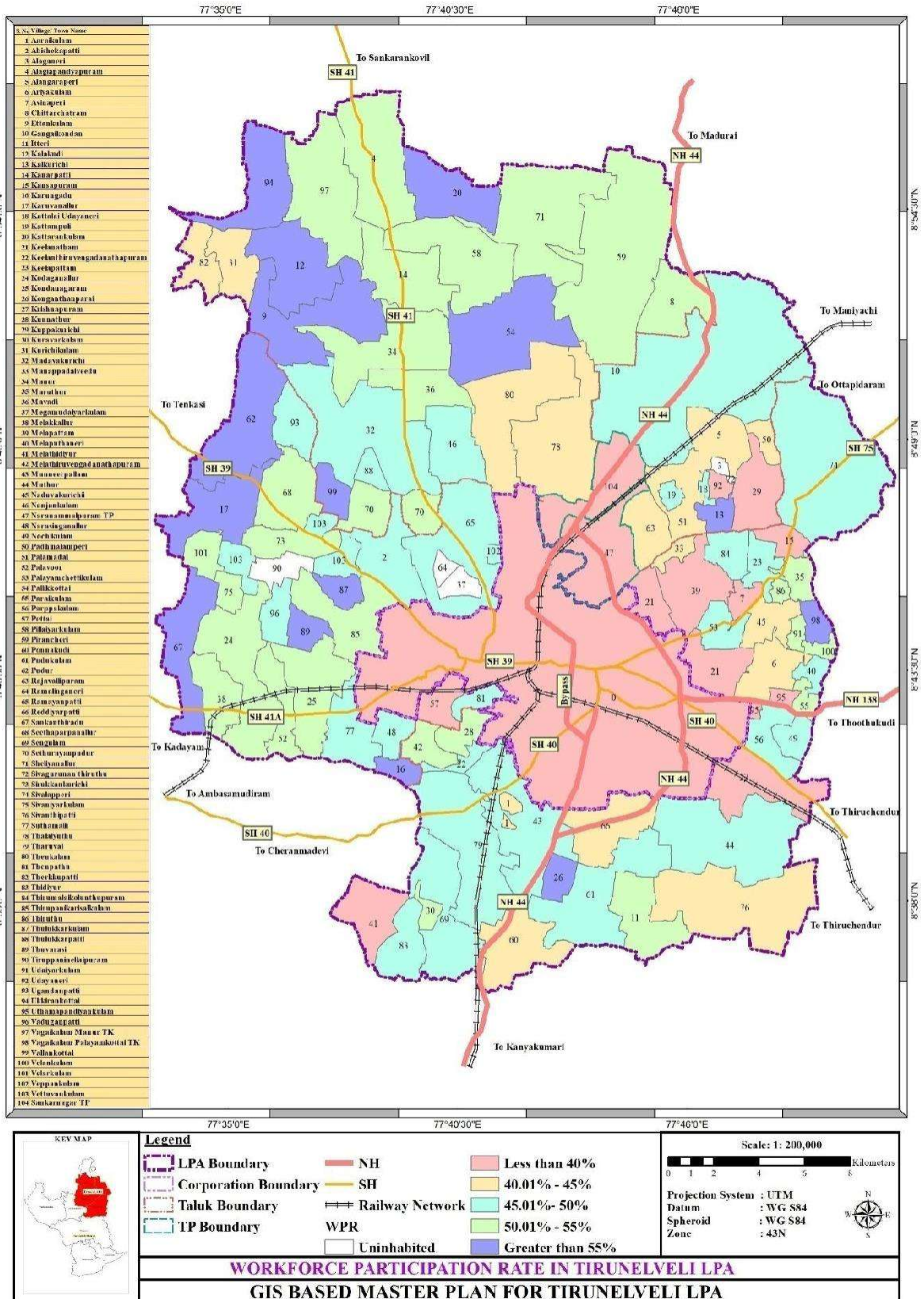
Table 4.6 COMPARISON OF WORKFORCE PARTICIPATION RATE

Area	Total Population	Workers Population	Workforce Participation Rate %
Tamil Nadu	7,21,47,030	3,28,84,681	45.58
Tirunelveli District	30,77,233	14,36,454	46.68
TIRUNELVELI LPA	7,33,938	3,03,557	41.36

(Source-Census of India-2011)



Map 4.4 WORKFORCE PARTICIPATION RATE





4.7 MAIN AND MARGINAL WORKERS

The percentage of main and marginal workers to the total workers of the LPA is compared with both the State and District. The main workers in Tirunelveli LPA are around 88.89% which is higher than the State and is slightly higher than that of the district. It is concluded that most of the working population in the LPA are main workers.

Table 4.7 MAIN AND MARGINAL WORKERS (%)

Description	Main Workers	Marginal Workers
Tamil Nadu	84.97	15.03
Tirunelveli District	88.51	11.49
TIRUNELVELI LPA	88.89	11.11

(Source-Census of India-2011)

4.8 SPLIT UP OF MAIN WORKERS

The percentage of Cultivators accounts to about 5% to the total population of the main workers as per the 2011 census in Tirunelveli LPA. The Agricultural laborer's percentage is around 12% in the entire LPA. The percentages of primary sector workers are higher in the rural areas owing to its agrarian nature. However, it is still lower when compared to the combined percentage of secondary and tertiary sector. Table 4.8 shows the split up of main workers in Tirunelveli LPA, its urban and rural areas.

Table 4.8 SPLIT UP OF MAIN WORKERS (%)

Description	Cultivators	Agricultural Laborers	HH Industrial Workers	Other Workers
Urban	1.33	3.60	10.92	84.15
Rural	12.05	29.13	10.58	48.24
LPA	5.01	12.35	10.80	71.84

(Source-Census of India-2011)

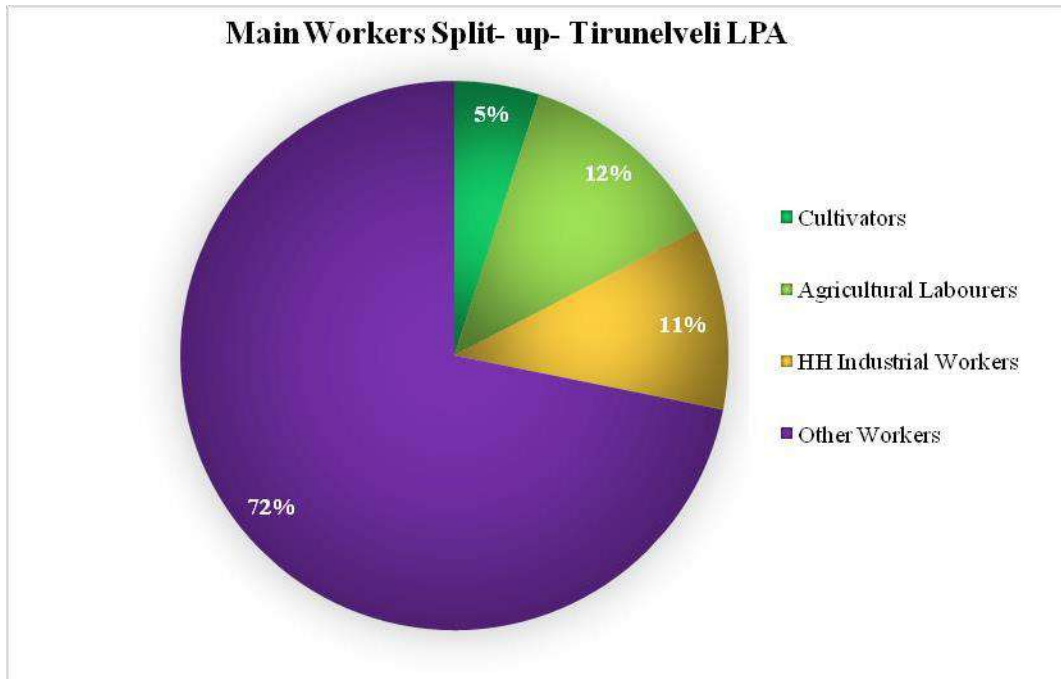


Figure 4.11 SPLIT UP OF MAIN WORKERS

The classification of main workers for the year 2011 is shown in the Table 4.9. The percentage reveals that in rural areas, the percentage of agricultural laborers was high when compared to other sectors which are followed by cultivators having a percentage of 29.84%. Workers in Manufacturing, processing, services and repairs in Household industries in the rural areas are around 10.47%. In the Municipal Corporation, the percentage of main workers in Trade and Commerce sector is more when compared to other sectors and is having a percentage of 22.97%.

The percentage of workers in Manufacturing, processing, services and repairs in both households and other than households are more or less equal in the Municipal Corporation. Main workers participating in Manufacturing, Processing, Services & Repairs in other than HH Industries is higher having a percentage of 28.65% in the town Panchayats. In Tirunelveli LPA, workers contributing in Agricultural sector are high. Following this is the trade and commerce, manufacturing sector and other services.



Table 4.9 CLASSIFICATION OF MAIN WORKERS - 2011 (%)

Classification of Main Workers	Rural Areas	Town Panchayats	Tirunelveli M. Corp	Tirunelveli LPA
Cultivators	29.84	12.54	6.38	15.41
Agricultural Laborers	37.92	17.88	8.25	19.72
Livestock, Forestry, Fishing, Hunting & Plantations	1.46	0.58	0.36	0.78
Mining & Quarrying	1.26	1.87	0.05	0.56
Manufacturing, Processing, Services & Repairs in HH Industries	10.47	6.04	15.34	13.24
Manufacturing, Processing, Services & Repairs in other than HH Industries	6.04	28.65	16.32	12.79
Construction	1.37	4.60	2.89	2.36
Trade & Commerce	4.02	7.55	22.97	15.39
Transport, Storage & Communication	1.60	6.58	6.73	4.79
Other Services	6.01	13.72	20.70	14.96

(Source-Census of India-2011)

The Table 4.10 shows the percentage of main workers in different sectors as per the Census of India for the years 2001 and 2011. The total percentage contributing to the agricultural sector and household industrial sectors are showing a slight decrease in trend. The percentage of other workers has increased from 61.84 % to 71.84%.

Table 4.10 COMPARISON OF MAIN WORKERS BETWEEN 2001 AND 2011 (%)

Description	Cultivators		Agricultural Laborers		HH Industrial Workers		Other Workers	
	2001	2011	2001	2011	2001	2011	2001	2011
Tirunelveli Municipal Corporation	0.88	1.24	4.22	3.26	19.39	11.19	75.51	84.31
Town Panchayats- 2	5.51	3.30	9.01	10.27	12.80	5.46	72.67	80.97
Revenue Villages- 102	17.82	12.05	31.52	29.12	18.11	10.58	32.56	48.24
TIRUNELVELI LPA	6.38	5.01	13.00	12.35	18.78	10.81	61.84	71.84

(Source-Census of India)

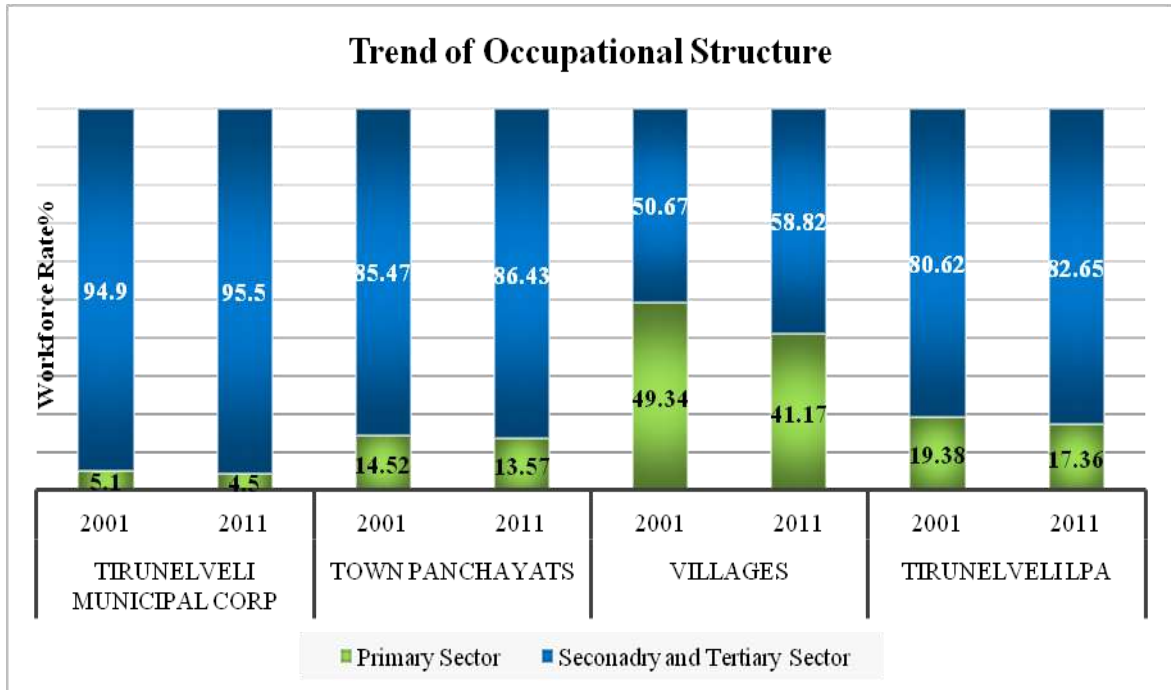


Figure 4.12 TREND OF OCCUPATIONAL STRUCTURE IN TIRUNELVELI LPA

The percentage of total workers is about 41.36% in Tirunelveli LPA which is around 0.4% higher than the previous decade. The percentage of workers in Tirunelveli Municipal Corporation, Sankar nagar TP and Naranammalpuram TP are around 38.53%, 35.31% and 37.75% respectively. Tirunelveli Municipal Corporation and Sankar nagar TP shows increasing trend in percentage.

Whereas, Naranammalpuram TP shows somewhat similar values through the decades. The average percentage of total workers in the villages is around 47.49%. Though it is higher than the urban areas, it shows a decreasing trend through the years. Figure 4.9 and Table 4.10 shows the Comparison of Workers and Non-Workers in Tirunelveli LPA.

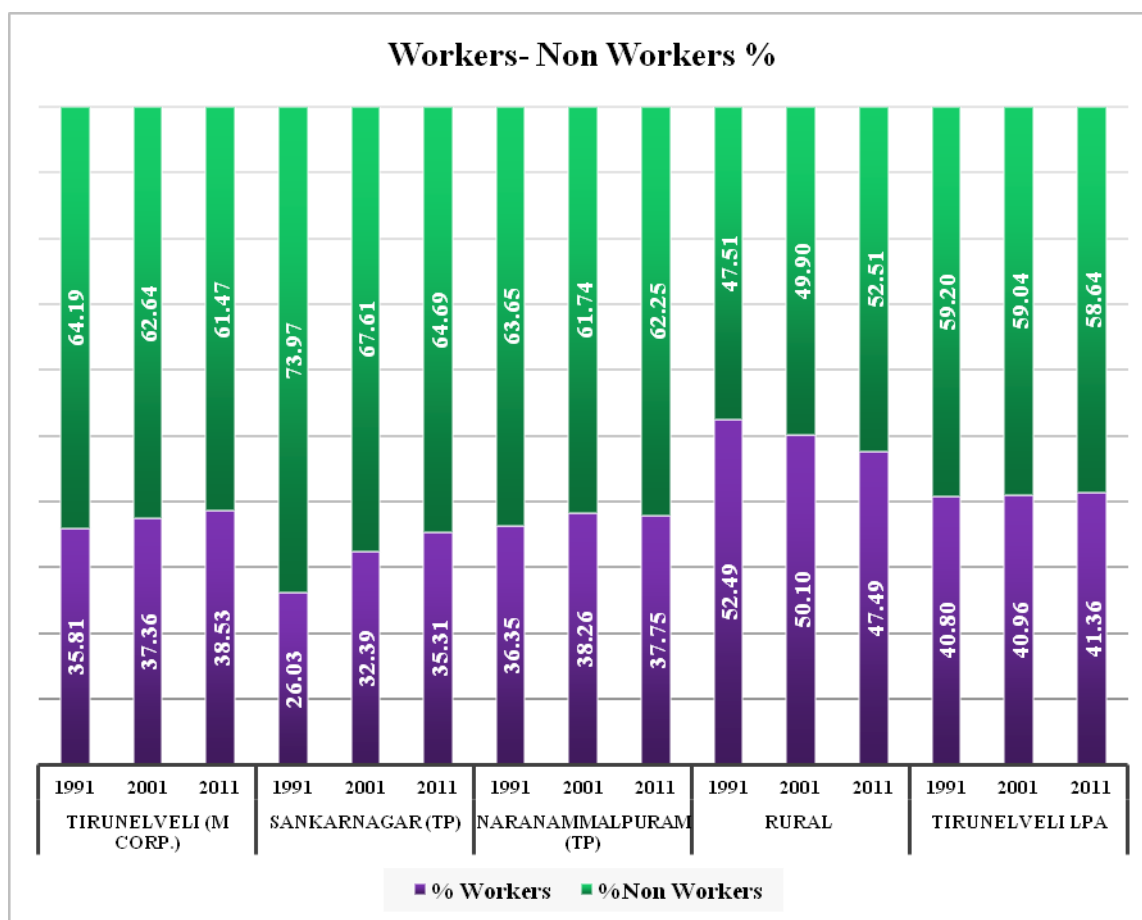


Figure 4.13 COMPARISON OF WORKERS AND NON-WORKERS IN TIRUNELVELI LPA

Table 4.11 COMPARISON OF WORKERS AND NON-WORKERS IN TIRUNELVELI LPA

Description	Year	% Workers	% Non-Workers
Tirunelveli (M Corp.)	1991	35.81	64.19
	2001	37.36	62.64
	2011	38.53	61.47
Sankar nagar (TP)	1991	26.03	73.97
	2001	32.39	67.61
	2011	35.31	64.69
Naranammalpuram (TP)	1991	36.35	63.65
	2001	38.26	61.74
	2011	37.75	62.25



Rural (102 Revenue Villages)	1991	52.49	47.51
	2001	50.10	49.90
	2011	47.49	52.51
TIRUNELVELI LPA	1991	40.80	59.20
	2001	40.96	59.04
	2011	41.36	58.64

(Source-Census of India)

The decadal difference of the percentage of main workers shows a decreasing trend in the villages. The percentage of workers engaged in primary sector is slowly diminishing in the rural areas. The previous table also justifies this result. The main workers in the Municipal Corporation show a slight increase while comparing it with the previous decade. Sankar nagar TP has the highest increase in main workers with a percentage of 4.28 between the years 2001 and 2011. Table 4.12 shows the decadal difference of main workers between the years 1991 and 2001 and between 2001 and 2011.

Table 4.12 DECADAL DIFFERENCE OF MAIN WORKERS POPULATION TO THE TOTAL POPULATION

Main Workers %	Main Workers in %			Decadal Difference	
	1991	2001	2011	1991-2001	2001-2011
Tirunelveli (M Corp.)	34.09	35.33	35.67	1.24	0.34
Sankar nagar (TP)	25.92	29.29	33.57	3.37	4.28
Naranammalpuram (TP)	33.48	33.36	35.22	-0.12	1.86
Rural (102 Revenue Villages)	47.38	40.92	39.17	-6.46	-1.75
TIRUNELVELI LPA	35.22	34.73	35.91	-0.49	1.18

(Source-Census of India)

The decadal difference of the marginal workers in the Municipal Corporation shows a slight increase. The value is increasing slightly in the overall LPA having a percentage of around 0.44% between the years 2001 and 2011. The percentage of marginal workers in the villages has decreased to about 0.86% for the decade 2001- 2011.



Table 4.13 DECADAL DIFFERENCE OF MARGINAL WORKERS POPULATION TO THE TOTAL POPULATION

Marginal Workers %	Marginal Workers in %			Decadal Difference	
	1991	2001	2011	1991-2001	2001-2011
Tirunelveli (M Corp.)	1.71	2.03	2.85	0.32	0.82
Sankar nagar (TP)	0.11	3.09	1.73	2.98	-1.36
Naranammalpuram (TP)	2.87	4.91	2.53	2.04	-2.38
Rural (102 Revenue Villages)	5.12	9.18	8.32	4.07	-0.86
TIRUNELVELI LPA	2.76	4.15	4.59	1.39	0.44

(Source-Census of India)

The percentage of total workers in the rural areas shows a decreasing trend (Table 4.13). It has been decreased from 50.10% to 47.49% having a decrease of 2.61% between the years 2001 and 2011. Moreover, from comparing tables 4.7 and 4.8 and it is observed that some of the main workers in the rural areas may be converted into marginal workers. It is essential to provide better opportunities for employment in these areas.

4.9 DISTRICT DOMESTIC PRODUCT AT CURRENT AND CONSTANT PRICES FOR TIRUNELVELI DISTRICT

4.9.1 CURRENT GDP (2017-2018)

For the year 2017-18 is estimated at ₹54.13 lakh as against ₹48.50 lakh for the year 2016-17, showing a growth of 11.61% during 2017-18 as compared to contraction of 1.25 % during 2016-17.

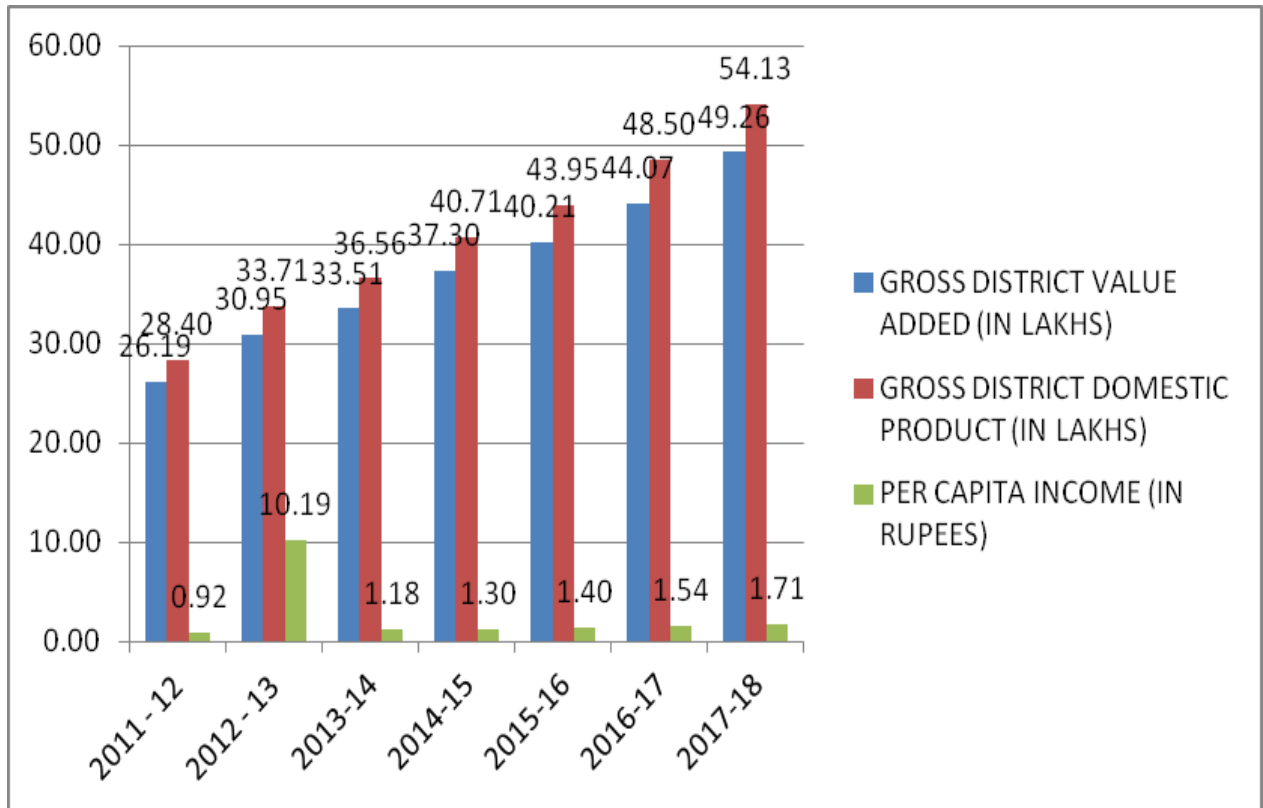


Figure 4.15 GROSS DISTRICT DOMESTIC PRODUCT AT CURRENT PRICE FROM 2011-2018 IN LAKHS

Source: District Income Estimate Report no: 14/2019, Department of Economics and Statistics



Figure 4.14 SECTOR WISE GROSS DISTRICT DOMESTIC PRODUCT AT CURRENT PRICE FROM 2011-2018 IN LAKHS

Source: District Income Estimate Report no: 14/2019, Department of Economics and Statistics



4.9.2 CONSTANT GDP (2017-18)

For the years 2017-18 and 2016-17 stands at 41.63 lakh and 38.61 lakh, respectively, showing a growth of 7.25 % during 2017-18 as compared to contraction of 0.7% during 2016-17.

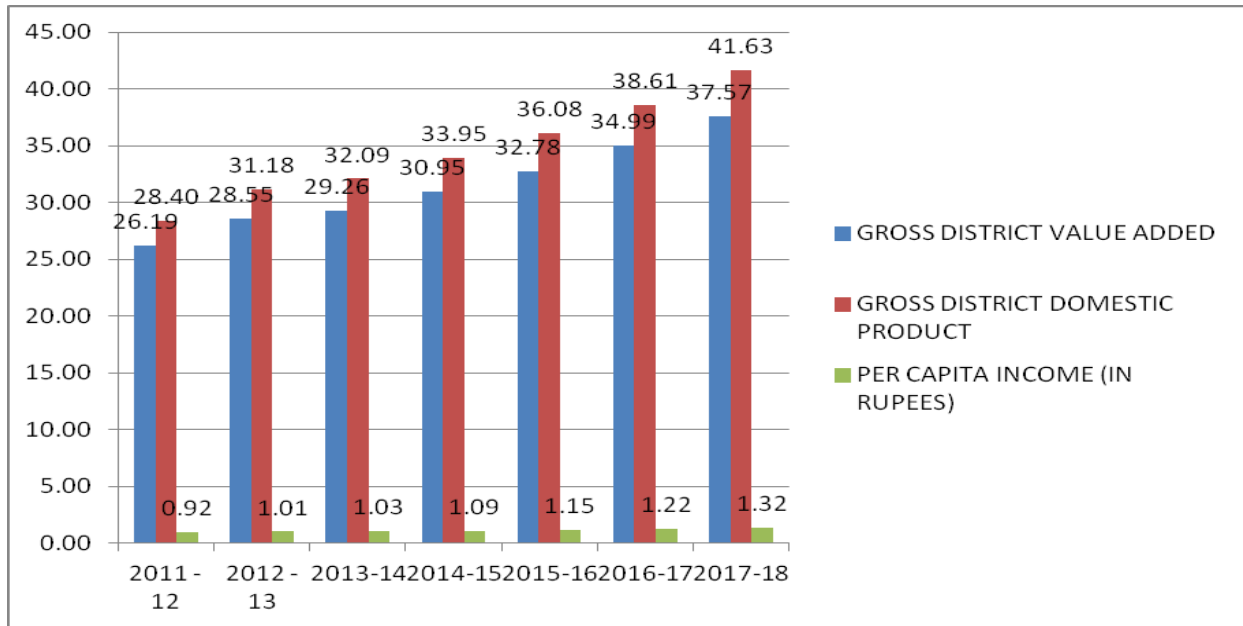


Figure 4.16 GROSS DISTRICT DOMESTIC PRODUCT AT CONSTANT PRICE FROM 2011-2012 TO 2017-2018 IN LAKH

Source: District Income Estimate Report no: 14/2019, Department of Economics and Statistics

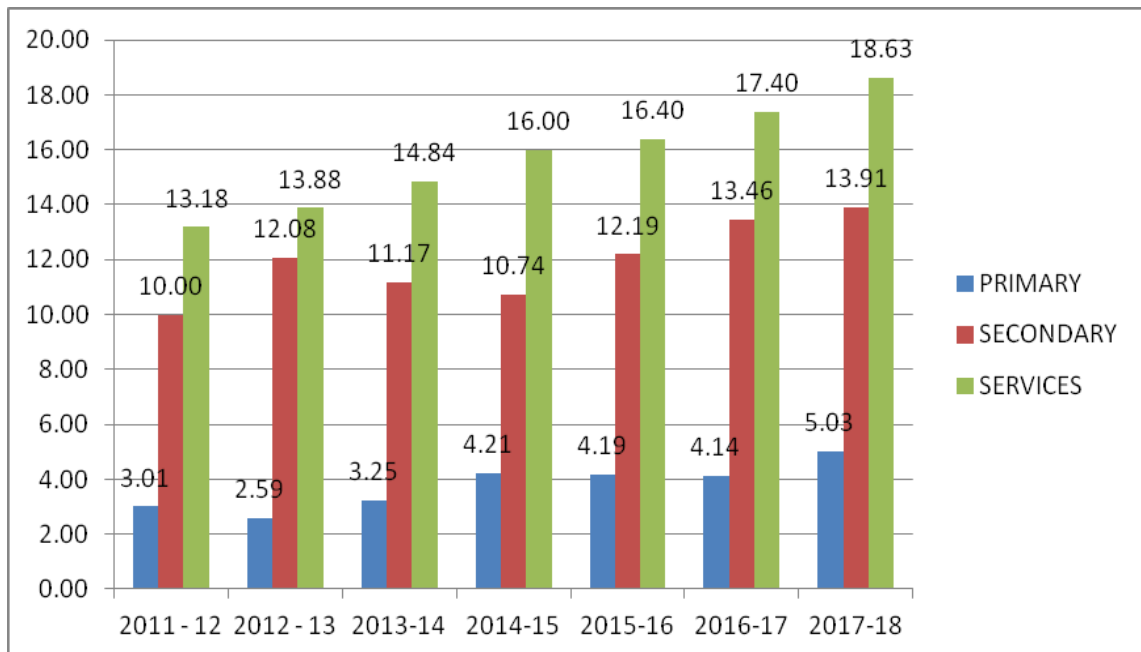


Figure 4.17 SECTOR WISE GROSS DISTRICT DOMESTIC PRODUCT AT CONSTANT PRICE FROM 2011- 2012 TO 2017-2018 IN LAKH

Source: District Income Estimate Report no: 14/2019, Department of Economics and Statistics



4.10 ONGOING PROPOSALS – INDUSTRIES

4.10.1 SIPCOT PHASE II EXPANSION

Land Acquisition for the proposed SIPCOT phase-II with an extent of about 1664.73 acres is under process in Gangaikondan, Chittar Chathiram and Pirancheri villages as per G.O No 103 Industries Department, Dated 26.02.2021.

4.10.2 TATA POWER SOLAR PROJECT

The SIPCOT has allotted 313.59 acres of land in Gangaikondan village, Tirunelveli district to m/s Tata Power solar as standalone project for setting up of green field 4 GW solar cells and 4 G W solar module manufacturing plant Industrial building at an estimated investment cost of 3000 crores a total buildup with an area of 2,83,134Sq.km.This will simulate clean energy transition and will create directly or indirectly over 2000 employment opportunities with majority of them are expected to be women employees.

The new plant in Gangaikondan will integrate mono PERC (Passive Emitter and Real Cell) bifacial technology with future type technology of Tunnel oxide passivity contacts (TOPCON) and will produce High voltage modules with industry leading efficiencies. For the smooth navigation of equipment, the facility will implement Autonomous Mobile Robots (AMR) which uses lasers and cameras for transporting parts,

Another highlight of the technological advancement of this plant will be the implementation of industry standards- a fully interconnected factory comprising smart manufacturing tools and technology.



Figure 4.18 TP SOLAR UNDER CONSTRUCTION - OCT 2023



Tata power solar in Gangaikondan, within the Tirunelveli LPA limit will be the second manufacturing plant of this kind in India, after Bangalore and the technical clearance has been issued.

4.10.3 WIND ELECTRICITY GENERATORS

Tamil Nadu Electricity Board is a pioneer organization among the other State Electricity Boards in India in promoting Renewable Energy Programme. Tamil Nadu is blessed with conducive natural metrological and topographical settings for wind power generation. Subsequently various wind farms were erected by TNEB and Others at places in Manur, Gangaikondan and Thalaisyuthu areas.

Totally **457** windmills are erected to a capacity of **461450 KW**. Based on the successful functioning of these demonstration wind farms, developers which has now led to an installed capacity of Private Wind Mills.

At present around 11,000 to 13,000 million units per annum are generated from the above windmills, contributing to about 14% of the yearly energy need of the State.

To meet the load growth due to increased industrial activity and population, TNEB is preparing and implementing a master plan for infrastructure development for every 5 years to meet out the load growth / demand with a perspective view to supply reliable and quality power to the consumers.

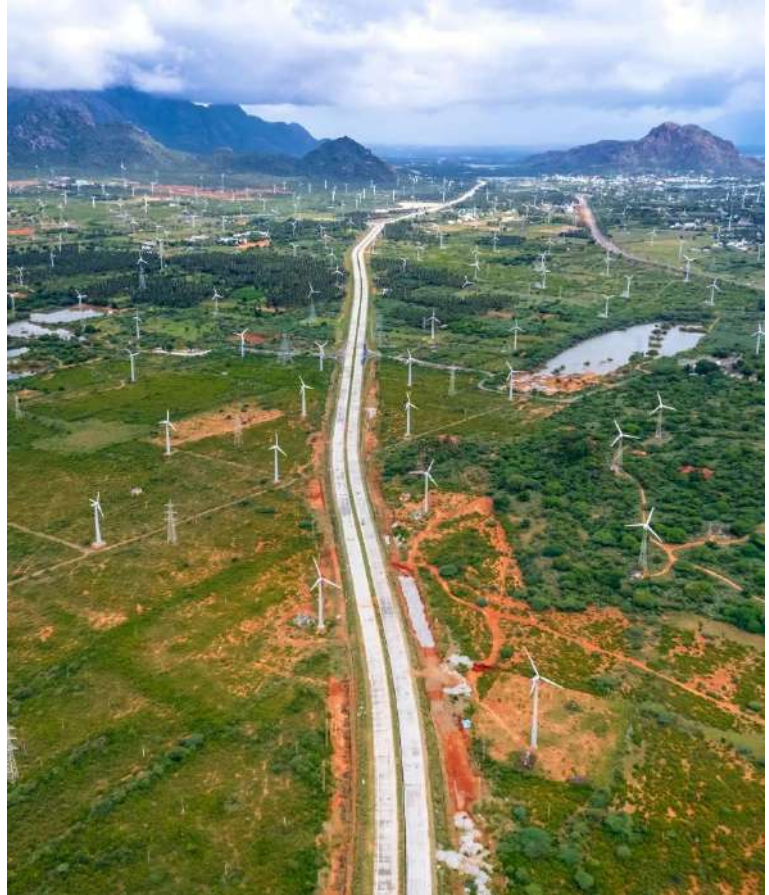


Figure 4.19 AERIAL VIEW OF EXISTING WINDMILLS NEAR MANUR VILLAGE



4.11 ESTIMATES FOR EMPLOYMENT GENERATION

Employment is a very essential component and important measure for overall development of an area. Employment is necessary to cater the domestic demand for goods and services and stimulates overall growth. The percentage of main workers in Tirunelveli LPA shows a decreasing trend from -1.23% to 0.05%. More or less the similar percentage is increased in the marginal workers (1.39% and 0.44%). It is noted in the percentage of total workers in the years 1991, 2001 and 2011; almost all values equal to 40%. Thus, it is considered that some of the main workers have been transformed into marginal workers. Moreover, the highest impact is in the rural areas which have influenced the result of the total Tirunelveli LPA. The urban areas including Tirunelveli Municipal Corporation, Sankar nagar TP and Naranammalpuram TP show increasing percentage of main workers.

Considering the current possibilities for employment including SIPCOT, SIDCO and TANSI, it is assumed that the main workers would increase in the future decades. Thus, for the urban areas, the average percentage of increase in main workers in both decades is taken for estimating the future main workers.

The employment projection for the year 2041 has been made based on the male & female workforce participation rate. The total workforce participation rate for Tirunelveli LPA has been estimated as 55.3 % in 2041. Around 49.3 % male and 30.01 % female are projected to be workers among the total eligible workers' population in 2041. The additional jobs to be created have been determined as 1,22,704 for 2041. Expanding the job market for the projected workforce in Tirunelveli LPA will enhance the prospect for future growth. Developing the secondary and tertiary sectors will create more employment opportunities, in addition, the planning area has good scope for the generation of employment through the promotion of tourism, Renewable- energy based industries, and Agro-based industries. The projection of workforce participation rate for Tirunelveli LPA up to 2041 is given in Table 4.14.



Table 4.14 PROJECTION FOR EMPLOYMENT GENERATION

Description	2011	2021	2031	2041
Total Population	733938	807807	881676	955545
Eligible Workers 15-69 (65%)	3,00,915	3,31,201	3,61,487	3,91,773
Male Population (49.3%)	3,61,831	3,98,249	4,34,666	4,71,084
Female Population (50.7%)	3,72,107	4,09,558	4,47,010	4,84,461
Male Willing to Work (% of Male Workers to total Eligible workers)	49.30	49.30	49.30	49.30
Male Willing to Work	2,94,712	3,24,374	3,54,036	3,83,698
Female Willing to Work (% of Female Workers to total Eligible workers)	30.01	30.01	30.01	30.01
Female Willing to Work	1,11,669	1,22,908	1,34,148	1,45,387
Total Workers	4,06,381	4,47,282	4,88,183	5,29,085
% to total eligible workers	74.05	74.05	74.05	74.05
Workforce Participation Rate	55.37	55.37	55.37	55.37
Additional Jobs to be Created	Ideal Equal Employment Opportunity			1,22,704

4.12 SHARE OF SALES TAX

Share of sales tax is an important index to reflect the economic stability. LPA accounts for three-fourth of the total sales tax collection in the district. The percent share of the LPA has increased.

4.13 BANKING

Banking operations form a vital pointer to indicate the economic process of a city. This is considered a great accomplishment of the city.

4.14 SUMMARY

The Workforce Participation Rate in Tirunelveli LPA is around 41.36%. Secondary and Tertiary sector is dominant than the Primary Sector. The total workers in the LPA are almost constant in the years 1991, 2001 and 2011 (40%). The main workers in the LPA are around 36.77% in the LPA which accounts to around 89% of the total workers. The decadal difference of the main workers shows a decreasing trend in the villages. The workers engaged in primary sector are slowly diminishing in the rural areas. The percentage of marginal workers in the villages



has decreased for the decade 2001- 2011 to about 0.86 %.

Since the total workers have almost a constant value in the previous two decades, some of the main workers in the rural areas may be converted into marginal workers. Suthamalli Rurban cluster which would enhance the economy to a certain extent. Employment projection for Tirunelveli LPA by 2041 is estimated by considering the following factors namely eligible working population, population willing to work and workforce participation rate. Based on the employment projection, the workforce participation rate of Tirunelveli LPA in 2041 is estimated as 55.3% and to achieve this workforce participation rate 1,22,704 additional jobs need to be created. These additional jobs can be created by proposing new projects based on the potential of the planning area.

SIPCOT, SIDCO and TANSI are also present in the LPA which would contribute to the economy of the LPA as a whole. Plan should also focus on improving the agriculture sector to cater the diminishing effect of the primary sector in the rural areas. Tourism can also be improved to contribute to the economy.



4.15 POLICIES AND STRATEGIES

SURVEY

A comprehensive study of LPA economy and employment profile should be taken up to identify the activities and initiatives, both in the formal and informal sectors that can accelerate employment and income generation for the poor and low-income groups.

INDUSTRIAL DEVELOPMENT:

Promotion of industries is an indispensable requirement for strong economic base of the LPA. Therefore, the following efforts may be initiated to stimulate industrial development.

- a) A study can be undertaken to assess the scope for expansion of existing industries and developing new industries.
- b) Essential infrastructure as per standards can be provided for prospective potential industries by concerned government agencies in designated locations to stimulate industrial growth.
- c) Process of obtaining clearance for industrial units can be simplified by making the single window system more effective.
- d) Numbers of unskilled and semi-skilled workers are bound to rapidly increase due to distress migration from rural areas and saturation of agriculture sector. Therefore, vocational educational institutions in the LPA have to be strengthened and reoriented to meet the market demand.
- e) Small-scale industrial sector is a powerful tool to generate more industrial employment. Therefore, infrastructure facilities may be upgraded for industrial estates and relief measures can be initiated to rehabilitate viable sick units.
- f) Existing SIPCOT at Gangaikondan has to be expanded to meet the increasing demand.
- g) Cluster concept for industries to be promoted.
- h) Steps to upgrade infrastructure facilities in the existing industrial estates have to be taken in order to improve competitiveness of industry.



- i) To make available adequate supply of developed land for manufacturing and quality space for high technology industries and start-ups, land banks have to be developed for industrial parks in and around LPA with quality infrastructure including social infrastructure like housing, business centers, skill development centers etc.
- j) Inclusive industrial development should be promoted by giving due opportunity in skill development and employment covering differently-abled persons also.

PROMOTION OF INFORMAL SECTOR

The National Policy for Urban Street Vendors confers legal status on vendors and insists on creation of hawking zones and establishment of participatory mechanism for orderly conduct of urban vending activities. Local bodies within the LPA may institute action accordingly.

PROMOTION OF SERVICE SECTOR

Attention should be given to the service sector such as health, education and recreational facilities and municipal/local body services, which would not only increase employment opportunities but also improve standard of living in this people.

CENTRAL BUSINESS DISTRICT

Thriving CBD is an asset to the city and it will not be desirable to reduce its importance. At the same time, it should be seen that it functions to its capacity and contributes to the city economy. The decongestion measures taken to shift some of the wholesale activities to planned locations.

SHELTER

CHAPTER 05



MASTER PLAN
2041
TIRUNELVELI LPA



5. SHELTER

Shelter is a basic need. When the need for shelter is not satisfied, it becomes almost impossible for an individual to think of satisfying his/her family aspirations and intellectual needs. Primary responsibility of any city is to provide its residents with a decent and habitable shelter. A standard housing does not mean merely land and building, but includes basic service like water supply, sanitation and access roads. Demand for housing is a universal phenomenon, which exists in all societies, but it varies from “no shelter” to “better shelter”; consequently, it is related to economic level of households. An assessment of housing need, demand and supply becomes necessary to work out a meaningful shelter strategy.

5.1 HOUSING SCENARIO IN LPA

Tirunelveli LPA has a total household count of around 1, 89,501 as per the census of 2011. The number of households in Tirunelveli Corporation has a share of around 64% of the total households in the LPA. The rural areas comprise about 33% of the total households in the LPA. The remaining 3% is present in the town Panchayats Sankar nagar and Naranammalpuram. Figure 5.1 represents the percentage of households in Tirunelveli LPA.

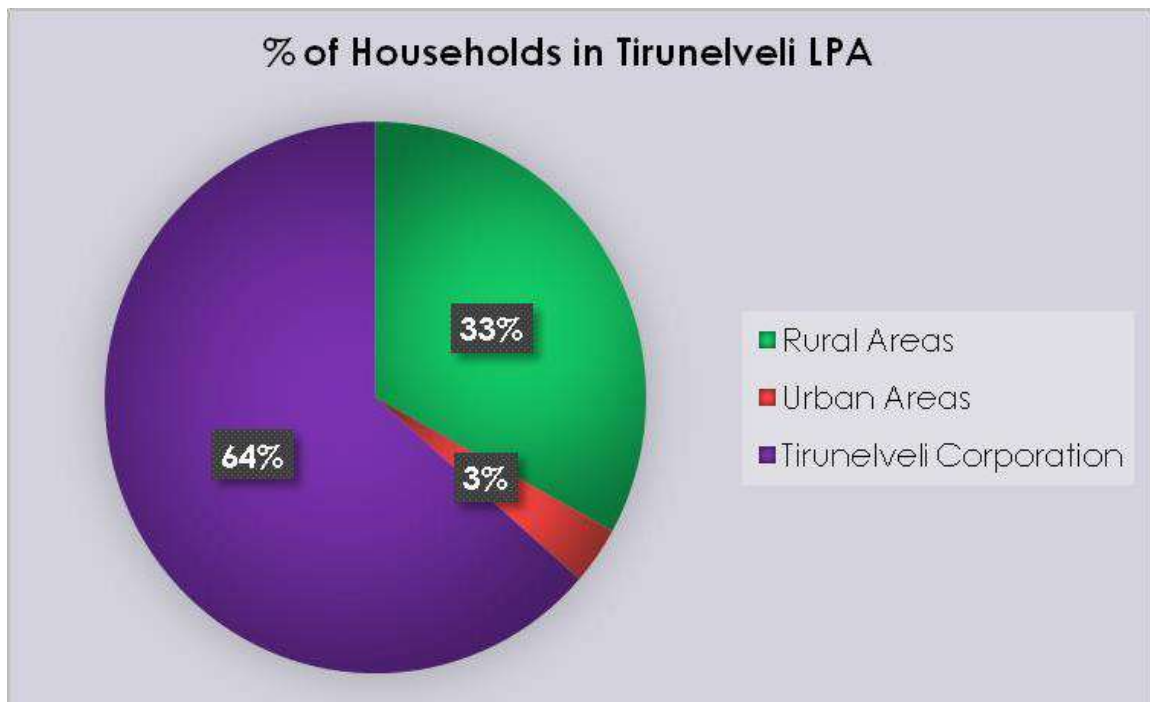


Figure 5.1 HOUSEHOLDS IN TIRUNELVELI LPA



While comparing the growth in the number of households between 2001 and 2011, it is observed that there is an increase of around 33.36% for Tirunelveli LPA. The urban areas comprising Sankar nagar and Naranammalpuram town Panchayats has a combined growth rate of 27.60% higher than the year 2001. Tirunelveli Municipal Corporation has a household count of around 1, 20,466. Its growth rate is around 27.6% higher than the previous decade.

Among the rural and urban areas including the corporation, the average rate of growth in households is highest in the rural areas. Its growth rate is about 47.55% which is nearly 2 to 3-fold higher than that of the urban areas. Table 5.1 shows the growth rate of the households in Tirunelveli LPA.

Table 5.1 GROWTH RATE OF HOUSEHOLDS IN TIRUNELVELI LPA (2001 -2011)

Area	Households		Growth rate in %
	2001	2011	
Rural Areas	42426	62601	47.55
Urban Areas	5269	6434	22.11
Tirunelveli Corporation (M)	94407	120466	27.6
Total Households in Tirunelveli LPA	142102	189501	33.36

(Source-Census of India)

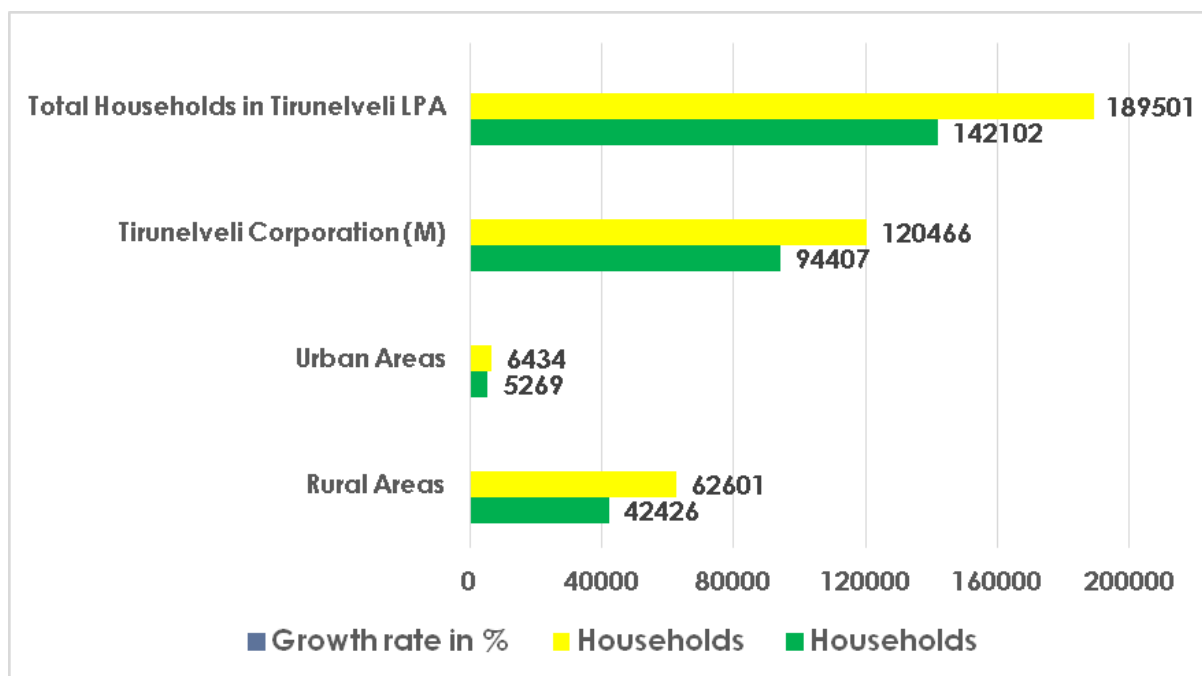


Figure 5.2 GROWTH RATE OF HOUSEHOLDS IN TIRUNELVELI LPA
(2001 -2011)



While comparing with the district's growth rate, Tirunelveli LPA has a growth rate of about 33.36% which is higher than that of the district's average (23.20%). Table 5.2 shows the comparison of growth rate of households between the years 2001 and 2011.

Table 5.2 COMPARISON OF GROWTH RATE OF HOUSEHOLDS (2001-2011)

Description	Households		Growth Rate %
	2001	2011	
Tirunelveli District	661944	815528	23.2
Tirunelveli LPA	142102	189501	33.36

(Source-Census of India)

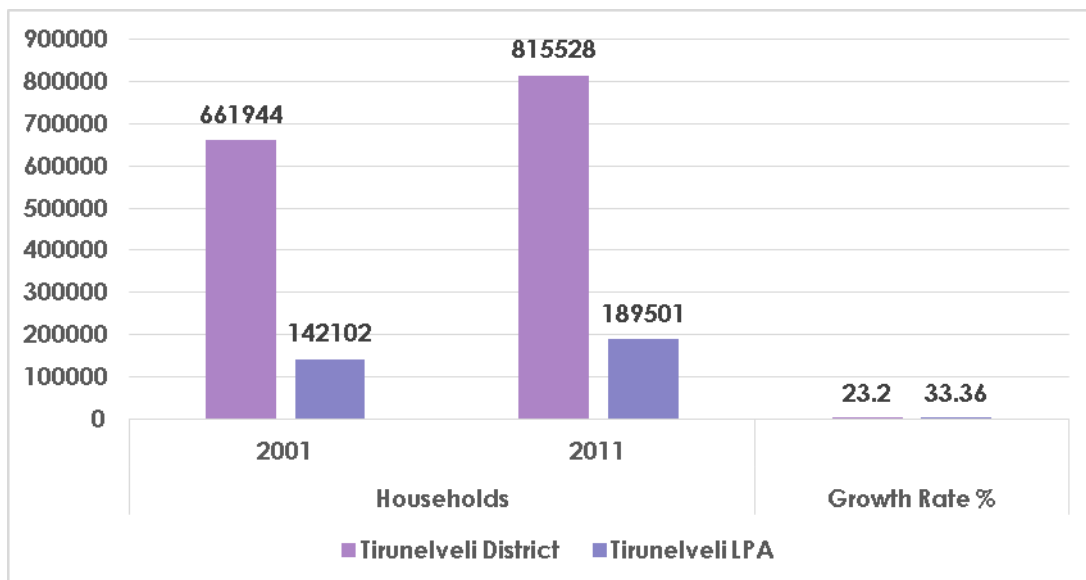


Figure 5.3 GROWTH RATE OF HOUSEHOLDS IN TIRUNELVELI LPA (2001 -2011)

5.2 HOUSING TYPOLOGY

Housing typology is classified into three types namely Pucca, Semi Pucca and Katcha houses. The number of pucca houses in Tirunelveli LPA is around 1,51,355 in which around 100830 houses are within the Tirunelveli Corporation.

The remaining is split between the town Panchayats and the revenue villages. Similarly, there are 31,450 semi pucca houses in the LPA, among which 15,540 is present in the Tirunelveli Corporation. The rural areas comprise 14,950 semi pucca houses. The number of kutchra houses (6696) in the LPA is less when compared to other categories. It is observed that more than 70% of the houses are pucca houses regardless of the nature of the area within the LPA (rural and urban).



The percentage of pucca houses in the LPA as a whole is around 79.87%. The villages Avanapperi, Kansapuram, Kongandanparai, Mavadi, Melkallur, Paraikulam, Sivaniyarkulam, Udayaneri, Udayarkulam and Velankulam has lower percentage of pucca house (below 50%) when compared with other villages within the LPA. The figure 5.3 depicts the percentage of pucca, semi pucca and kutcha houses in Tirunelveli LPA.

Table 5.3 HOUSING TYPOLOGY

Description	Total Households	Pucca	% Share	Semi Pucca	% Share	Kutcha	% Share
Rural Areas (102 Revenue villages)	62601	45168	72.15	14950	23.88	2483	3.97
Other Urban Areas (2 Town Panchayats)	6434	5357	83.26	960	14.92	117	1.82
Tirunelveli Corporation	120466	100830	83.7	15540	12.9	4096	3.4
Tirunelveli LPA	189501	151355	79.87	31450	16.6	6696	3.53

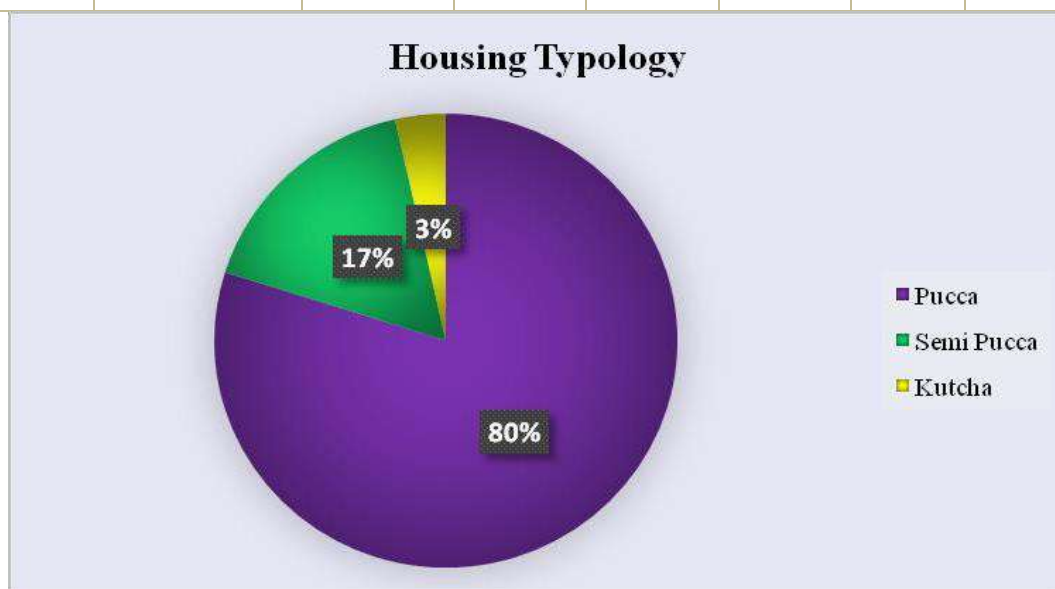


Figure 5.4 HOUSING TYPOLOGY

(Source-Census of India-2011)



5.3 HOUSING OWNERSHIP

Housing tenure in Tirunelveli LPA is predominantly owned rather than rented. Around 65.60% of the households are owned by the residents and about 32.45% of the houses are rented. The other category includes leased houses which accounts for around 1.94% in the entire LPA. The share of rental ownership is elevated in the urban areas when compared to the rural areas. This may be due to the migration of rural population to urban areas for better employment opportunities.

Table 5.4 HOUSING OWNERSHIP

Description	Total Households	Owned		Rental		Others	
		Number	% Share	Number	% Share	Number	% Share
Rural Areas (102 Revenue villages)	62601	53008.37	84.68	8644.94	13.81	947.68	1.51
Other Urban Areas (Town panchayats- 02)	6434	3845.98	59.78	2260.74	35.14	327.27	5.09
Tirunelveli (M Corp.)	120466	67460.96	56.00	50595.72	42.00	2409.32	2.00
Tirunelveli LPA	189501	124315.32	65.60	61501.39	32.45	3684.28	1.94

(Source-Census of India-2011)

5.4 HOUSING STOCK

The percentage of EWS households is around 2% in the entire LPA as per census 2011. The share of MIG households is higher than other categories in the LPA. The percentage of LIG households comes second with a score of around 31.74% of the total households in the LPA. The number of HIG households is around 14.82% in Tirunelveli LPA. Similar percentage is reflected in both the urban and rural areas within the LPA.

Table 5.5 HOUSING STOCK

Description	Total Households	EWS	% Share	LIG	% Share	MIG	% Share	HIG	% Share
Rural Areas (102 Revenue villages)	62601	1065	1.70	23034	36.79	32993	52.70	5509	8.80
Other Urban Areas (2Town Panchayat)	6434	183	2.84	1325	20.59	3663	56.93	1263	19.64
Tirunelveli (M Corp.)	120466	2530	2.10	35778	29.70	60835	50.50	2132	17.70
Tirunelveli LPA	189501	3777	1.99	60139	31.74	97495	51.45	28091	14.82

(Source-Census of India-2011)



5.5 URBAN SLUM - TIRUNELVELI CORPORATION

Tirunelveli city, a significant urban center in Tamil Nadu, grapples with the challenge of urban slums, reflective of broader issues related to migration, affordability, and inadequate access to essential services. As of the latest data, there are 133 slum pockets distributed across 38 out of the total 55 wards in the Tirunelveli Municipal Corporation. Notably, 17 wards remain unaffected by the presence of slums.

The slum population within the Corporation stands at 82,102 persons, constituting approximately 17.33% of the total municipal population. The Palayamkottai zone emerges with the highest share, hosting about 23,784 individuals distributed across various slum pockets. Ward No. 10 in Thachanallur houses the largest slum population, totaling 7,521 persons.

In response to the challenges posed by urban slums, the Corporation has undertaken and executed various development works. These initiatives focus on providing essential services such as water supply, stormwater drains, public toilets, sanitation, road improvements, and street lighting. The National Slum Development Programme (NSDP) has played a pivotal role in enhancing basic services within the notified slums.

However, it's crucial to note that these improvement works have been limited to notified slums, as legal constraints hinder the Corporation/TNUHDB from undertaking such developments in un-notified slums.

The growth of unauthorized squatter settlements and slums in Tirunelveli can be attributed to factors such as high rents, exorbitant land prices, limited access to credit facilities for the urban poor, and their lack of creditworthiness. Additionally, Tirunelveli's role as a commercial and service center for the rural hinterland contributes to the influx of migrants, further fueling the expansion of these settlements.

Addressing the challenges posed by urban slums requires a multifaceted approach, encompassing affordable housing solutions, improved access to credit, and comprehensive urban planning strategies to ensure sustainable and inclusive development within the Tirunelveli Municipal Corporation. The below pie-chart, figure 5.5 provides the details of urban slum population.

Identification of High-Priority Slum Settlements in Flood-Prone Areas

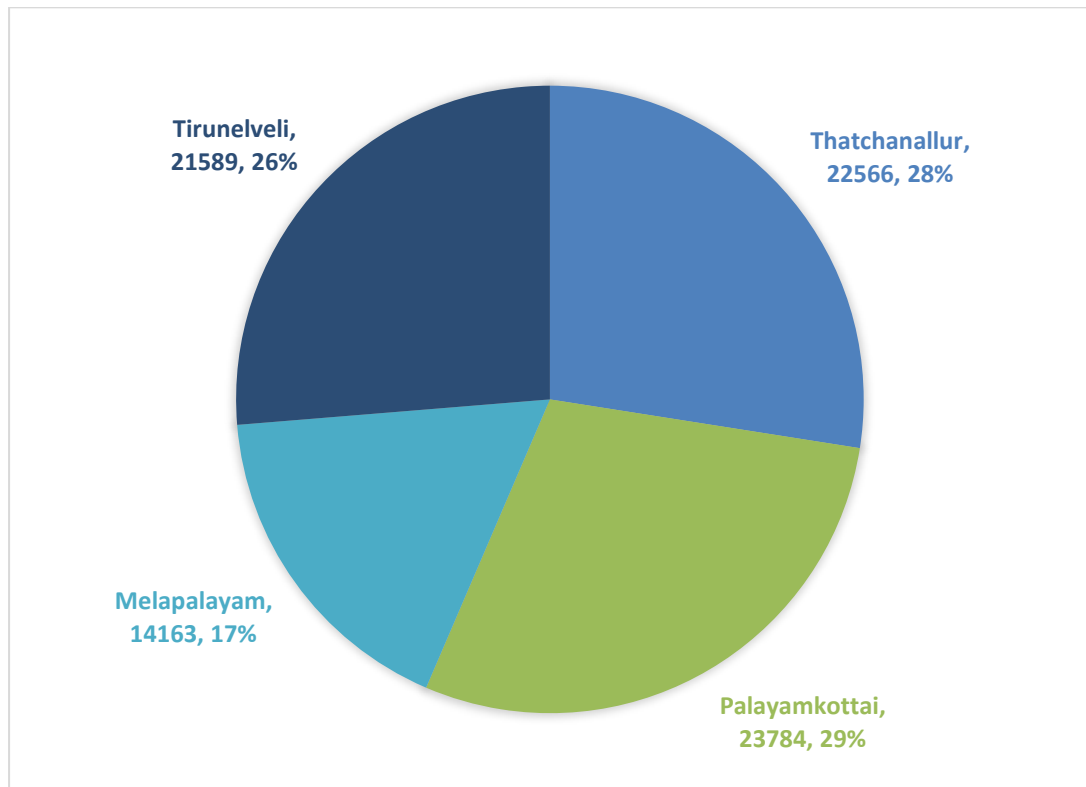


Figure 5.5 TIRUNELVELI ZONE WISE URBAN SLUM POPULATION AND PERCENTAGE

Table 5.6 SLUM POPULATION

S.NO	Description	Tirunelveli Corporation
1	Total population	733938
3	Total slum population	82102
4	% Share of slum population	17.33

(Source-TIRUNELVELI CORPORATION)



Identification of High-Priority Slum Settlements in Flood-Prone Areas

In the wake of an extensive field study, specific flood-vulnerable zones within Tirunelveli city have been meticulously identified. The subsequent crucial phase involves the detailed mapping of slum settlements situated in close proximity to these vulnerable areas. This comprehensive mapping effort is thoroughly documented in Map 5.1, offering a visual representation of areas demanding immediate attention and prioritization.

The slum settlements identified in the vicinity of flood-prone regions have been categorized as **high-priority settlements, specifically encompassing Wards 7, 10, 13, 15, 25, 32, 33, 35, 38, 44, and 49.** Recognizing the inherent risks associated with these areas, strategic interventions are imperative to enhance resilience and safeguard the well-being of the residents.

Proposed measures for these high-priority settlements include, but are not limited to:

1. **Relocation Strategies:** A critical evaluation of the feasibility of relocating the identified slum settlements to safer areas that are not prone to flooding. This may involve the establishment of new, secure housing options for the affected population.
2. **Infrastructure Enhancement:** Implementation of targeted infrastructure improvements within the existing slum settlements to mitigate the impact of flooding. This could encompass the development of proper drainage networks, establishment of flood relief centers, and the reinforcement of residential structures to withstand flooding.
3. **Community Engagement:** Active involvement of the residents of these high-priority settlements in the decision-making process. Their insights and needs are integral for the successful execution of any relocation or infrastructure enhancement initiatives.
4. **Government Support:** Collaboration with relevant government agencies and authorities to secure the necessary resources and approvals for implementing proposed measures. This may include funding for infrastructure development, relocation support, and community empowerment programs.



5. **Long-Term Resilience Planning:** Formulation of a comprehensive, long-term resilience plan addressing both immediate concerns and future vulnerabilities of these high-priority slum settlements. This may involve the integration of urban planning strategies, environmental considerations, and community education programs.

The identification of these high-priority settlements marks a critical milestone in proactively addressing the challenges posed by flooding in Tirunelveli. Subsequent sections will delve into the specific strategies and initiatives devised to ensure the safety, well-being, and sustainable development of these vulnerable communities.



Map 5.1 MAP SHOWING THE LOCATION OF EXISTING SLUMS AND FLOOD VULNERABLE AREAS

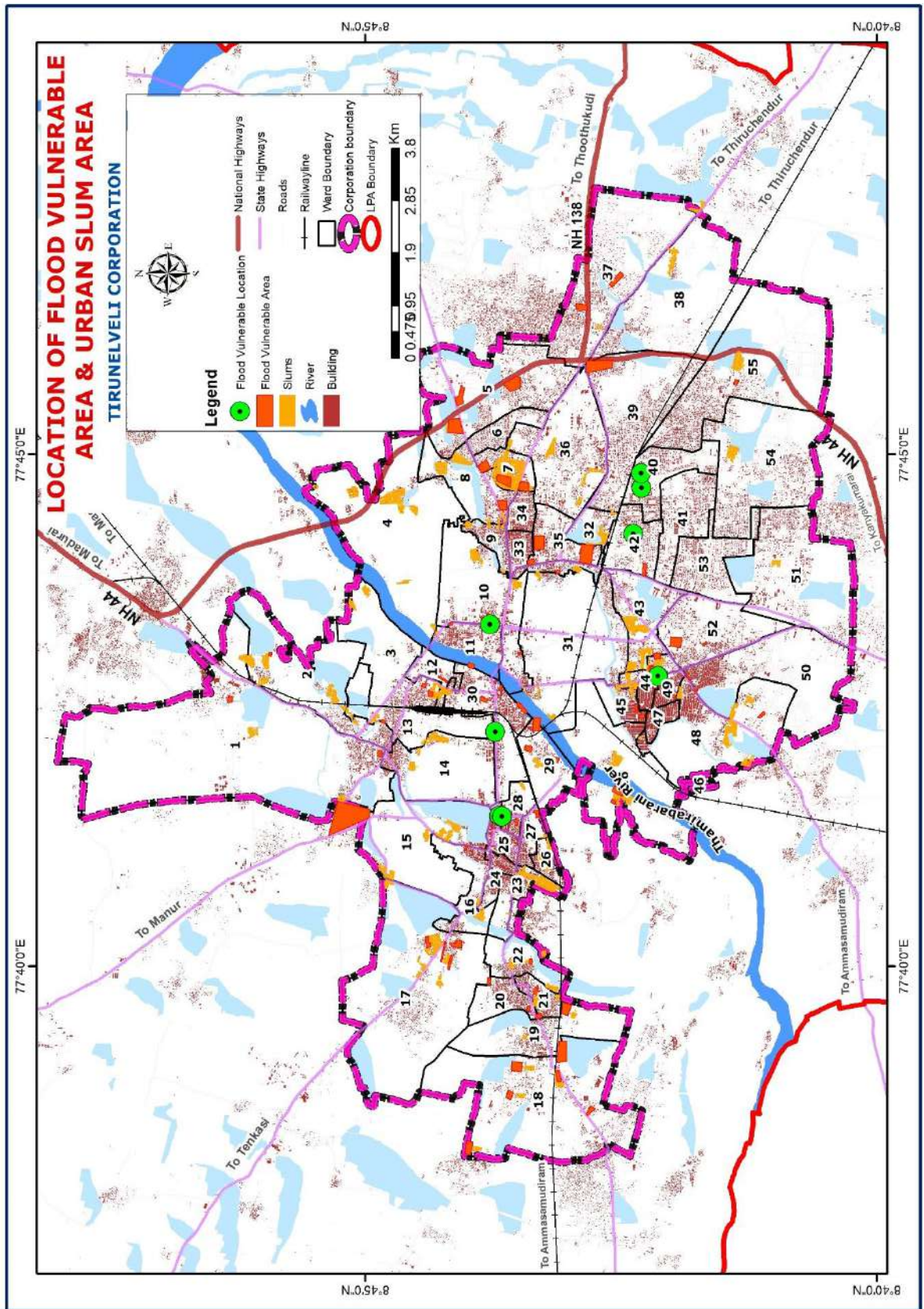




Table 5.7 DETAILS OF URBAN SLUM POPULATION - TIRUNELVELI CORPORATION

City	Zone	Ward Name	Ward No.	Slums No. Notified Slums	Slum Population - Total
Tirunelveli	Thachanallur	Thachanallur	1	2	1139
		Thachanallur	2	5	4218
		Thachanallur	3	4	2642
		Thachanallur	4	1	247
		Thachanallur	5	0	0
		Thachanallur	6	0	0
		Thachanallur	7	2	1576
		Thachanallur	8	1	674
		Thachanallur	9	1	121
		Thachanallur	10	8	7521
		Thachanallur	39	1	902
		Thachanallur	54	0	0
		Thachanallur	55	6	3526
		Palayamkottai	Palayamkottai	11	3
	Palayamkottai		12	3	1585
	Palayamkottai		13	2	1070
	Palayamkottai		14	2	1017
	Palayamkottai		15	12	7837
	Palayamkottai		16	0	0
	Palayamkottai		17	1	639
	Palayamkottai		18	3	1654
	Palayamkottai		20	4	2545
	Palayamkottai		21	3	2053
	Palayamkottai		22	0	0
	Tirunelveli	Melapalayam	Palayamkottai	23	0
Palayamkottai			24	0	0
Palayamkottai			25	3	2257
Melapalayam			19	1	645
Melapalayam			26	3	1803
Melapalayam			27	1	268
Melapalayam			28	2	923
Melapalayam			29	0	0
Melapalayam			30	8	5430
Melapalayam			31	1	446
Melapalayam			32	0	0
Melapalayam			33	0	0
Melapalayam			34	1	948
Melapalayam			35	0	0
Melapalayam	36	0	0		
Melapalayam	37	0	0		
Melapalayam	38	7	4345		



Tirunelveli	Tirunelveli	40	1	303
	Tirunelveli	41	0	0
	Tirunelveli	42	2	1181
	Tirunelveli	43	4	1961
	Tirunelveli	44	2	571
	Tirunelveli	45	7	2931
	Tirunelveli	46	3	2535
	Tirunelveli	47	4	2413
	Tirunelveli	48	7	4346
	Tirunelveli	49	2	776
	Tirunelveli	50	6	3289
	Tirunelveli	51	4	1283
	Tirunelveli	52	0	0
	Tirunelveli	53	0	0

5.6 HOUSELESS POPULATION

Houseless households are defined as households who do not live in buildings or census houses but live in the open on roadsides, pavements, in home pipes, under flyovers and staircases, or in the open in places of worships, mandaps, railway platforms, etc. according to census.

The table below shows the number of Houseless households as per census 2011 in Tirunelveli Municipal Corporation.

Table 5.8 HOUSELESS POPULATION 2011

Description	Houseless households (As per census 2011)	Total Population	Houseless Population	% Share
Tirunelveli Municipal Corporation	168	473637	716	0.15

(Source-Census of India-2011)

The percentage of Houseless population in Tirunelveli Municipal Corporation is around 0.15% having a count of around 168 households.

5.7 AFFORDABLE HOUSING SCHEMES

The Government of India and the Tamil Nadu Government offer several affordable housing schemes to curb the problem of homelessness in the country. Some of them include Pradhan Mantri Awas Yojana (PMAY), Pradhan Mantri Gramin Awas Yojana, Tamil Nadu Housing Board Scheme.



5.7.1 TNHB PROJECTS

TNHB is an organization formed in 1948 as City Improvement Trust to cope the housing demand of Madras City and has developed into a full-fledged organization in the year 1961 to cope up with the housing sector all over the state. The following table shows the list of housing schemes implemented by TNHB in Tirunelveli LPA.

Table 5.9 LIST OF HOUSING SCHEMES BY TNHB

S.No	Name of the Scheme	Extent in acres	No of Plots	No of houses
1	Naranammalpuram Phase I	56.71	1675	-
2	Naranammalpuram Phase II	77.60	2144	-
3	Keelanatham Phase I	31.86	404	404
4	Keelanatham Phase II	50.08	656	153
5	Keelanatham Phase III	37.15	460	460
6	V.M.Chathiram Phase I	6.72	78	-
7	V.M.Chathiram Phase II	6.54	89	-
8	V.M.Chathiram Phase III	26.33	432	33
9	Palai Phase I	25.50	287	-
10	Palai Phase II	98.70	-	1156
11	Palai Phase III	31.68	-	411
12	Palai Phase IV	11.73	-	107
13	Palai Phase V	24.01	-	312
14	Palai Phase VI	12.59	-	176
15	Palai Phase VII (ADS)	65.22	892	-
16	Kulavanigarapuram TNUDP	56.73	1867	-

(Source: Tamil Nadu Housing Board, Tirunelveli Division)



5.7.2 TNUHDB PROJECTS

Tamil Nadu Urban Habitat Development Board (erstwhile TNSCB) established in September 1970 has been implementing various Housing, Slum Development and Rehabilitation and Resettlement programs to improve the quality of living of the slum families in Tamil Nadu. Similar to TNHB, the board initially started its activities in Chennai and was gradually extended its service to other urban areas all over Tamil Nadu since 1984 in a phased manner. Tables 5.9 and 5.10 show the list of completed and proposed projects in Tirunelveli LPA by TNUHDB respectively.

Table 5.10 LIST OF PROJECTS COMPLETED BY TNUHDB

S. No	Project Name	Name of the scheme	No of units
1	Scavengers' Colony	Slum clearance scheme	366
2	South Mount Road	Slum clearance scheme	272
3	SamugarengayanKattalai	Shelter for Shelter less	176
4	Suthamalli Gandhi Nagar	XII finance commission	166
5	Nehru Nagar	XII finance commission	306
6	VOC Nagar	XII finance commission	207
7	VOC Nagar	Rajiv Awas Yojana	432

(Source: Tamilnadu urban habitat development board, Tirunelveli division)

Table 5.11 PROPOSED TNUHDB PROJECTS

S. No	Project Name	Name of the scheme	No of units	Status (Jan 2024)
1	Reddiarpatti Phase-I	PMAY (U) -HFA-AHP	480	Completed
2	Reddiarpatti Phase-II	PMAY (U)-HFA-AHP	768	Ongoing
3	Jeba garden, Palayamkottai	PMAY (U)-HFA-AHP	320	Completed
4	Ambedkar Nagar, Palayamkottai	PMAY (U)-HFA-AHP	408	Ongoing

(Source: Tamil Nadu Urban Habitat Development Board, Tirunelveli Division)



5.8 EXISTING HOUSING SHORTAGE

The existing housing shortage is arrived by taking into consideration of both the qualitative and quantitative characteristics of households present in the LPA. In terms of qualitative character, the kutcha houses and dilapidated houses in the LPA are taken into account. Correspondingly, in respect of the quantitative character, the house-less households are taken into consideration.

Table 5.12 HOUSING DEMAND

Description	No. of Households
Kutcha houses	6696
House- less households	168
Dilapidated Houses	2007
Total	8871

5.9 ADDITIONAL REQUIREMENT OF HOUSING IN TIRUNELVELI LPA

The table shows the additional requirements of housing units for the projected population.

Table 5.13 PROJECTED HOUSEHOLD

Demographic Profile	Tirunelveli Municipal Corporation	Sankar Nagar TP	Naranammalpuram TP	Rest of LPA	Total LPA
Existing Population	473637	7095	17094	236112	733938
Projected Population (2041)	622714	10643	23448	298740	955545
Estimated Households 2041	163872	2801	6171	78616	251459
Existing Slum households-2011	299897				299897
Existing Houseless households - 2011	168				168
Existing Households - 2011	120466	1854	4580	62601	189501
Total Required households-2041	62348	947	1591	16015	80900
Land Required for projected residential area (Hec) assuming 2400sq.ft/housing unit	1391	21	35	357	1804



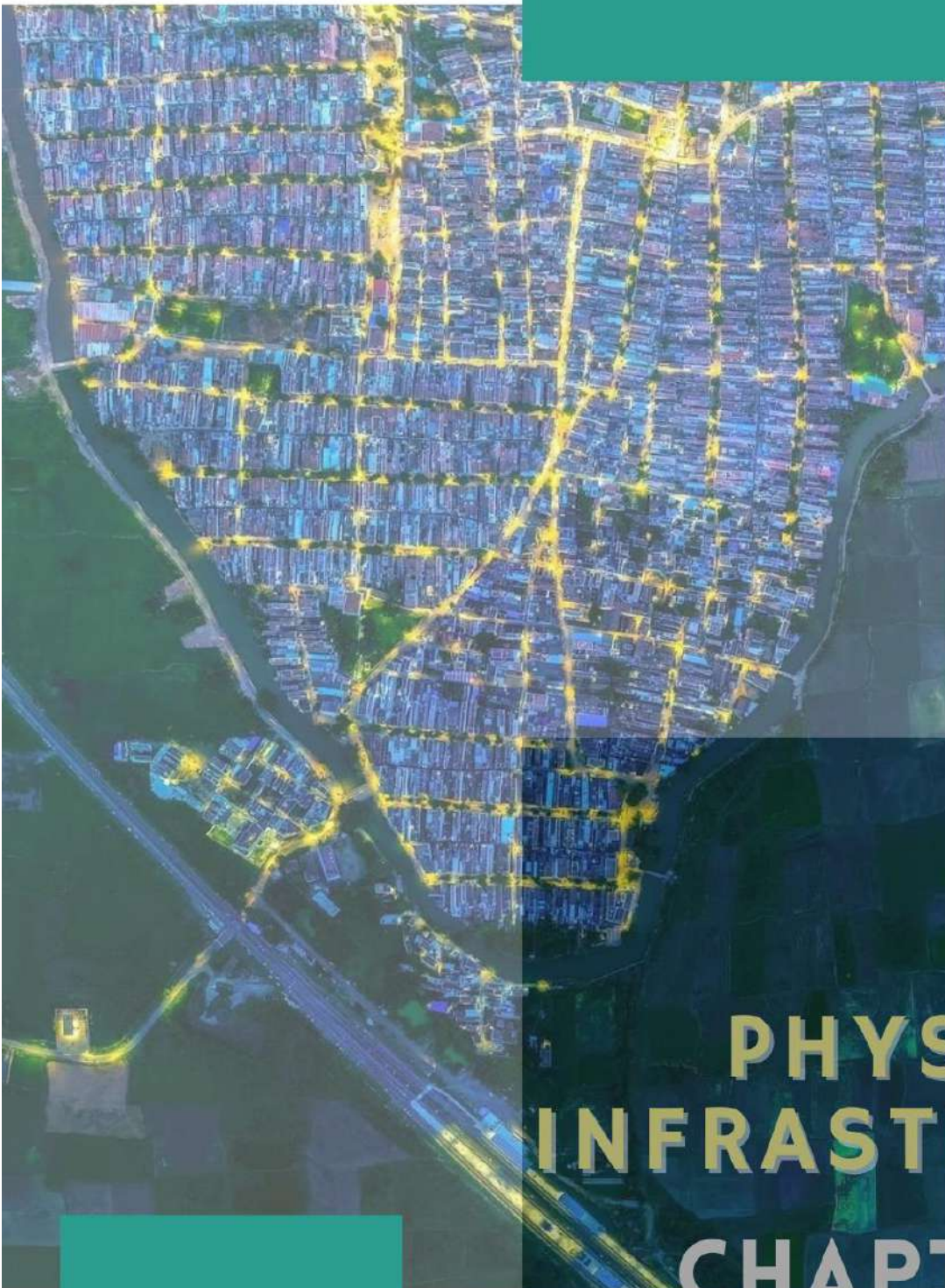
Optimal Land area per house (2400Sq.ft) SQ.KM	18
10% OSR IN SQ.KM	1.8
6% INFRASTRUCTURE (sq. km.)	1.1
20% ROADS & LAYOUTS (sq. km.)	3.6
3% FOR COMMERCIAL (sq. km.)	0.5
1% PUBLIC PURPOSE (sq. km.)	0.2
Optimal Land area required for Residential Development in (sq. km.)	25.3
Existing Residential area (sq. km.)	100.1
Minimum Residential Area Required in 2041 (Sq. km.)	30 sq. km.

5.10 SUMMARY

The overall housing typology in the Planning area is Pucca houses having a percentage of about 80%. The percentage of Kutcha houses in the LPA is only around 3% of the total households.

In terms of housing stock, the percentage of MIG households in the LPA. Around half of the households in the LPA comprises of MIG followed by LIG households. The economic status of the people might have influenced the household typology and stock. The house-less population, Kutcha houses and dilapidated houses are considered for calculating the existing housing shortage of around 8871 in the LPA. The estimated increase in population for the year 2041 is around 2, 21,607 from 2011. This would require housing units of around 80,900 units along with the current shortage.

**MASTER PLAN
2041
TIRUNELVELI LPA**



**PHYSICAL
INFRASTRUCTURE
CHAPTER 06**



6. PHYSICAL INFRASTRUCTURE

Physical infrastructure is one of the major assets of a city in terms of capital investment, critical services provisions, and sustainable and resilient urban development. It comprises of water supply, sewerage networks and energy. Physical infrastructure is facing increased challenges in sustaining its services under pressures of urbanization and climate change factors, yet Physical infrastructure itself can be used as an effective policy tool to govern urban expansion and wider land use.

6.1 WATER SUPPLY

6.1.1 SOURCE AND QUANTITY

The existing quantity of water supply for Tirunelveli LPA is taken from Thamirabarani River. As per TWAD norms the existing quantity of water supply is inadequate in the Corporation Area which is to be improved. In Naranammalpuram Town Panchayats and Sankar nagar Town Panchayats the existing water supply is sufficient.

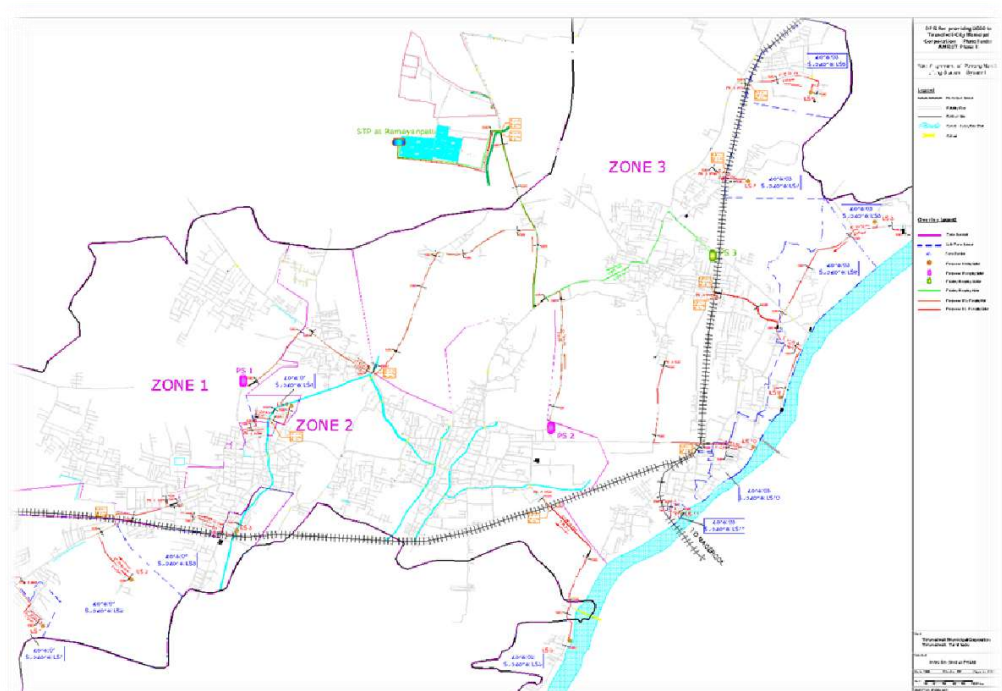
Table 6.1 SOURCE OF WATER SUPPLY IN TIRUNELVELI LPA

Description	Source	Quantity (MLD)
Tirunelveli Corporation	Tamirabarani river	47 MLD
Naranammalpuram TP	Tamirabarani river @ Palamadai CWSS	1.02 MLD
	Tamirabarani river SAS Arugankulam	0.39 MLD
Sankar nagar TP	Tamirabarani river @ Palamadai CWSS	0.2 MLD
	Tamirabarani river	0.4 MLD
Rural (102 Revenue Villages)	Own Source (tube well, infiltration well, surface water, open well)	11.95 MLD

(Source-Tirunelveli Corporation, TWAD Board, DRDA (Jal Jeevan mission))

6.1.2 MODE OF WATER SUPPLY

Tirunelveli LPA has different systems of water supply namely Tap water system, Wells, Hand pumps, Tube well/ bore well and other miscellaneous systems. The majority of water supply is through Tap water system within the LPA. It accounts to about 85% in the rural areas, 81% in Naranammalpuram Town Panchayats, 92% in Sankar Nagar Town Panchayats and 89% in the Municipal Corporation. The following figure 6.1 depicts a clear view regarding the mode of water supply in Tirunelveli LPA.



Source: Tirunelveli Municipal Corporation

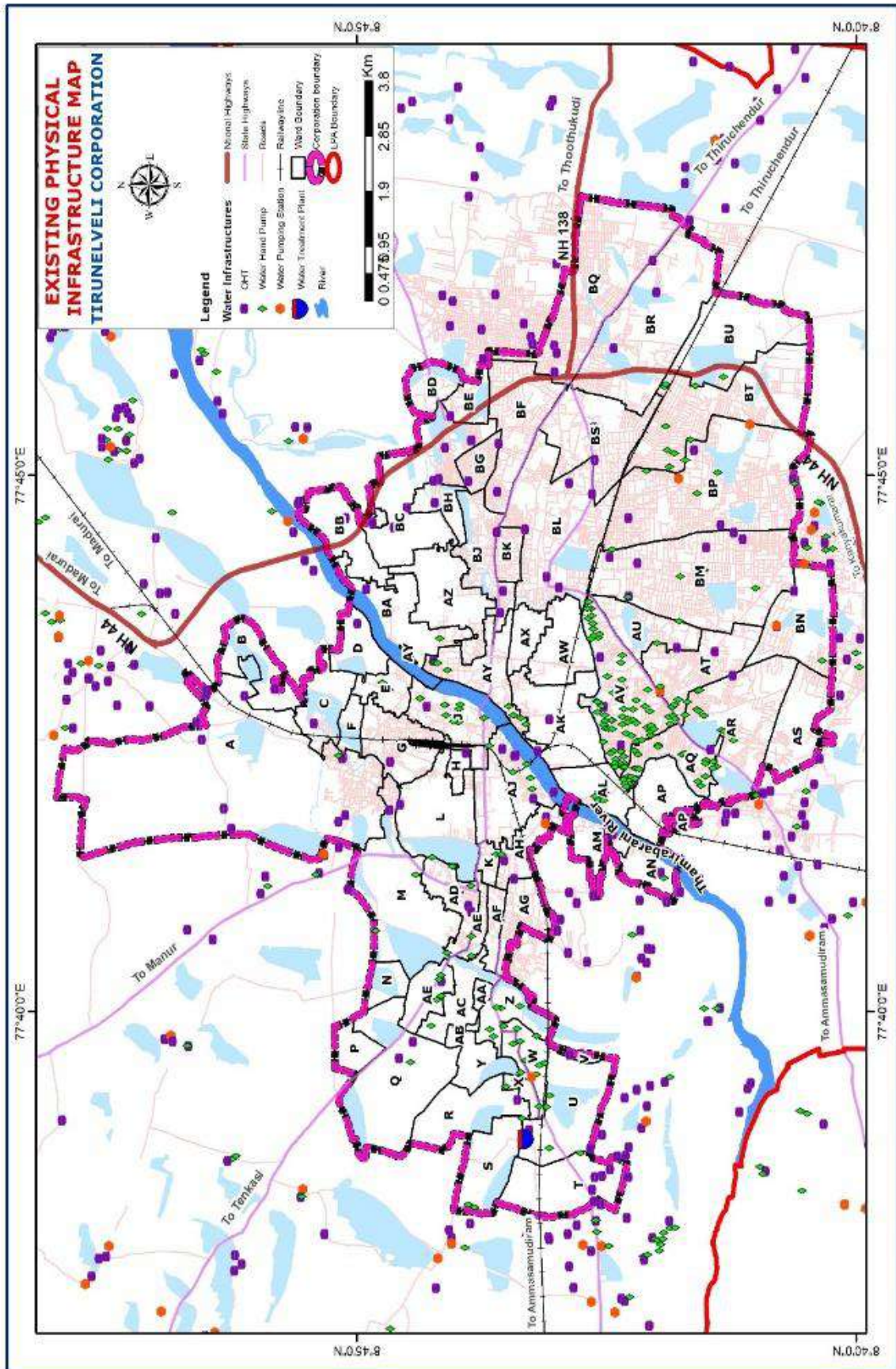
Figure 6.1 EXISTING WATER SUPPLY NETWORK

6.1.3 INFRASTRUCTURE FOR WATER SUPPLY

Tirunelveli LPA is receiving water supply through a combined water supply scheme (CWSS). Tirunelveli Corporation has about 71 OHT's, Naranammalpuram Town Panchayats has around 8 OHT's, Sankar nagar Town Panchayats has about 7 OHT's there are around 461 OHT's in the revenue villages. Map 6.1 shows the location of OHT's in Tirunelveli LPA.



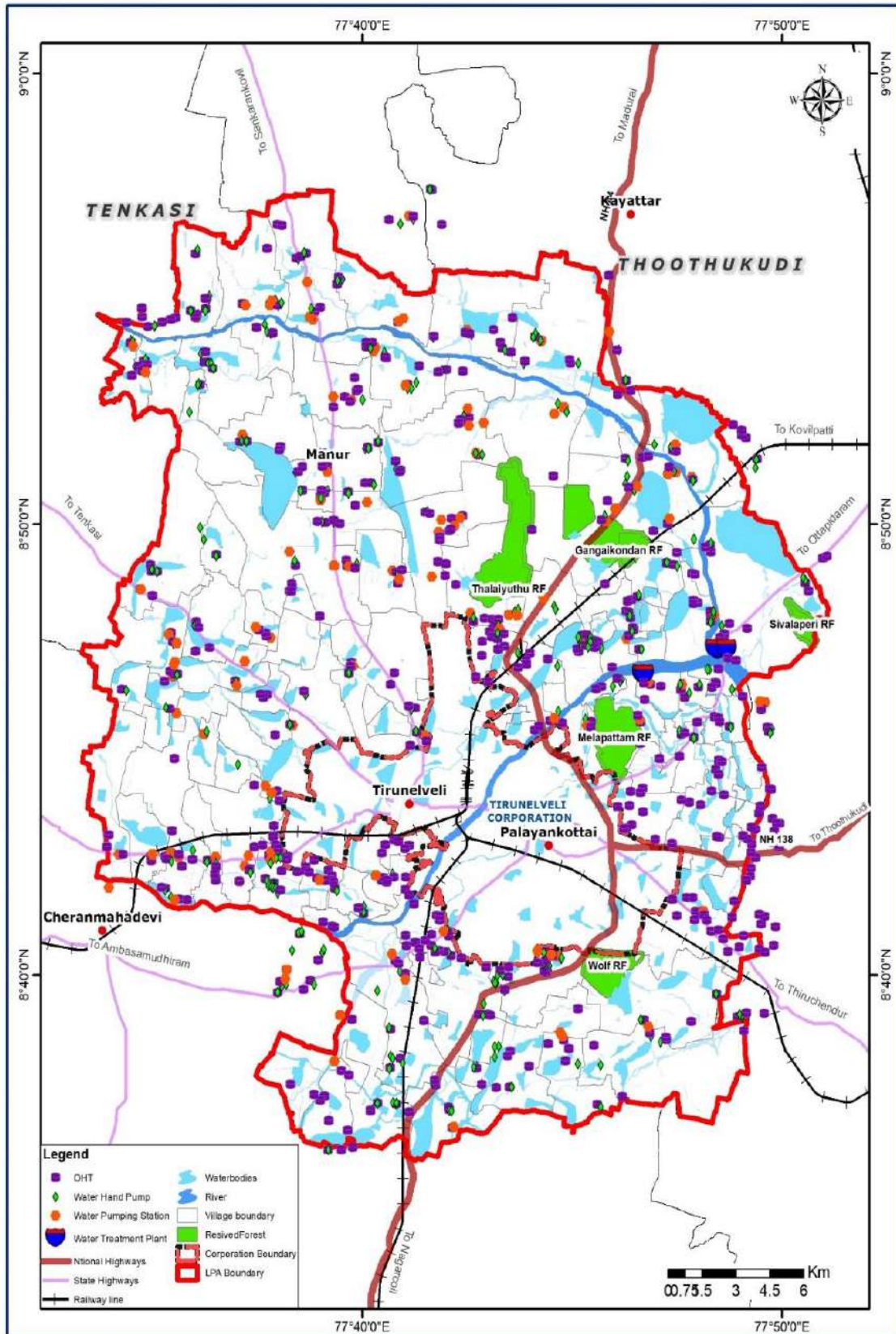
Map 6.1 LOCATION OF OHT IN TIRUNELVELI CORPORATION





Map 6.2 PHYSICAL INFRASTRUCTURE- WATER SUPPLY LPA

EXISTING PHYSICAL INFRASTRUCTURE MAP
TIRUNELVELI LOCAL PLANNING AREA





6.1.4 EXISTING DEMAND IN WATER SUPPLY

As per TWAD norms per capita water supply is 135 liters per capita per day for Corporation area, 70 liters per capita per day for town Panchayats (Without sewage network) and 55 liters per capita per day for villages.

Table 6.2 EXISTING DEMAND IN WATER SUPPLY

Water Supply Profile	Tirunelveli Municipal Corporation	Sankar Nagar TP	Naranammalpuram TP	Rest of LPA	Total LPA
Existing Population 2011	4,73,637	7,095	17,094	2,36,112	7,33,938
Floating Population (5%)	23,681				1,42,091
Area in sq.km	108.65	8.49	18.13	733.48	868.75
Households	1,24,641	1,867	4,498	62,134	1,93,141
Source of water supply	Tamirabarani river	Tamirabarani river	Tamirabarani river	Own source (tube well, surface water)	Tamirabarani river, own source
Mode of water Supply	Piped water distribution network, tap water, wells, hand pump, tube well/ borehole,	Tap water, wells, hand pump, tube well/ borehole	Tap water, wells, hand pump, tube well/ borehole	Tap water, wells, hand pump, tube well/ borehole	Tap water, wells, hand pump, tube well/ borehole
Water storage (No. of OHTs)	72	7	8	461	548
OHT Capacity MLD	23.82	1.10	1.50	36.80	63.22
Per capita Supply Norms (TWAD) in LPCD	135.00	70.00	70.00	55.00	
Existing per capita supply in LPCD	100.00	84.56	82.48	44.58	
Total quantity Supplied in MLD	49.73	0.60	1.41	10.53	62.27
Existing Demand in MLD	17.41	-0.10 (Excess)	-0.21 (Excess)	2.46	19.55
Proposed land for water supply infra. In Hectare. (Existing demand)	0.34			0.10	0.44

(Source-Tirunelveli Corporation, TWAD Board, DRDA (Jal Jeevan mission))



The existing per capita supply in Tirunelveli Corporation is 100 LPCD, and Naranammalpuram Town Panchayats is around 82.48 LPCD and Sankar nagar Town Panchayats is 84.56 LPCD. The current supply is sufficient for the existing population in Naranammalpuram Town Panchayats and Sankar nagar Town Panchayats. The existing demand for the Corporation area is about 17.41 MLD and the revenue villages is around 2.46 MLD.

6.1.5 PROJECTED REQUIREMENTS – WATER SUPPLY

The projected population of the Tirunelveli Municipal Corporation in the year 2041 would be around 622714. The water requirement would be about

88.27 MLD for the year 2041. The projected population for Naranammalpuram and Sankar nagar TP for 2041 is 23448 and 10643 and the corresponding water supply requirement is 3.17 MLD and 1.44 MLD respectively. The projected water supply requirement for the year 2041 for the rural population is 16.39 MLD. Table 6.3 shows the projected water supply requirements for Tirunelveli Municipal Corporation, Town Panchayats, and revenue villages within Tirunelveli LPA.

Table 6.3 PROJECTED WATER SUPPLY REQUIREMENTS FOR TIRUNELVELI LPA

PROJECTION 2041					
Water Supply Profile	Tirunelveli Municipal Corporation	Sankar Nagar TP	Naranammalpuram TP	Rest of LPA	Total LPA
Projected Population (2041)	6,22,714	10,643	23,448	2,98,740	9,55,545
Floating Population in 2041 (5%)	31,135.7				1,86,814
Per capita Supply Norms (TWAD) in LPCD	135.00	135.00	135.00	90.00	
Total Quantity required (in MLD)	88.27	1.44	3.17	26.89	119.76
Quantity available in MLD	49.73	0.60	1.40	10.50	62.23
Additionally required water supply in MLD	38.54	0.84	1.77	16.39	57.53
5% of Transmission loss					2.88
Additional Required Water Supply In MLD	60.40				
Proposed land demand for projected and existing water supply infra in Hectare	0.77	0.02	0.04	0.33	1.15 +0.44=1.6



6.1.6 POLICIES AND STRATEGIES

- Since all major sources have been tapped, Corporation water's emphasis should now shift to holistic management of water and optimizing local resources.
- Corporation water supply should be ensured that the quality of water supply conforms to those prescribed by the Central Public Health and Environmental Engineering Organization (CPHEEO).
- Corporation water should be made responsible only for the allocation of water resources to constituent local bodies based on their population and standard of supply arrived at.
- Expensive underground sewerage system should be limited to dense areas outside the city where Corporation-water would be responsible for construction, operation and maintenance of the systems.
- Provision of integrated sewerage systems for the urban local bodies that are contiguous to each other should be planned so that the sewage generated from more than one local body can be treated in a single sewerage treatment plant.
- The existing and proposed sewage treatment plants should be able to deliver treated water that can be used for industrial use, for other non- potable uses and for recharging surface reservoirs and underground aquifers.
- Corporation Water supply can use a GIS based information system for long-term assets management and strengthening

6.2 ELECTRICITY

Power is a basic infrastructure influencing the growth of industrial, agricultural and service sectors and ultimately the economic development. One of the determinants for quality of life is the level of availability and acceptability of affordable and quality power.



It is one of the sectors, to which Government is giving priority in fixing the plan outlays at national as well as state levels.

In Tirunelveli LPA, there are around 8 substations having a combined capacity of about 880 KV. In Tirunelveli LPA a substation with a capacity of 400/200 KV owned by Power Grid Corporation of India is located at Abishekapatti.

S. No	Population 2011	7,33,938
1	Projected population 2041	9,55,545
2	Additional population	2,21,607
3	No of substations existing	8
4	Existing capacity of substation	8 x 110 KV
5	As per URDPFI guidelines	11 KV/15000 population

6.2.1 PROJECTED REQUIREMENTS - ELECTRICITY

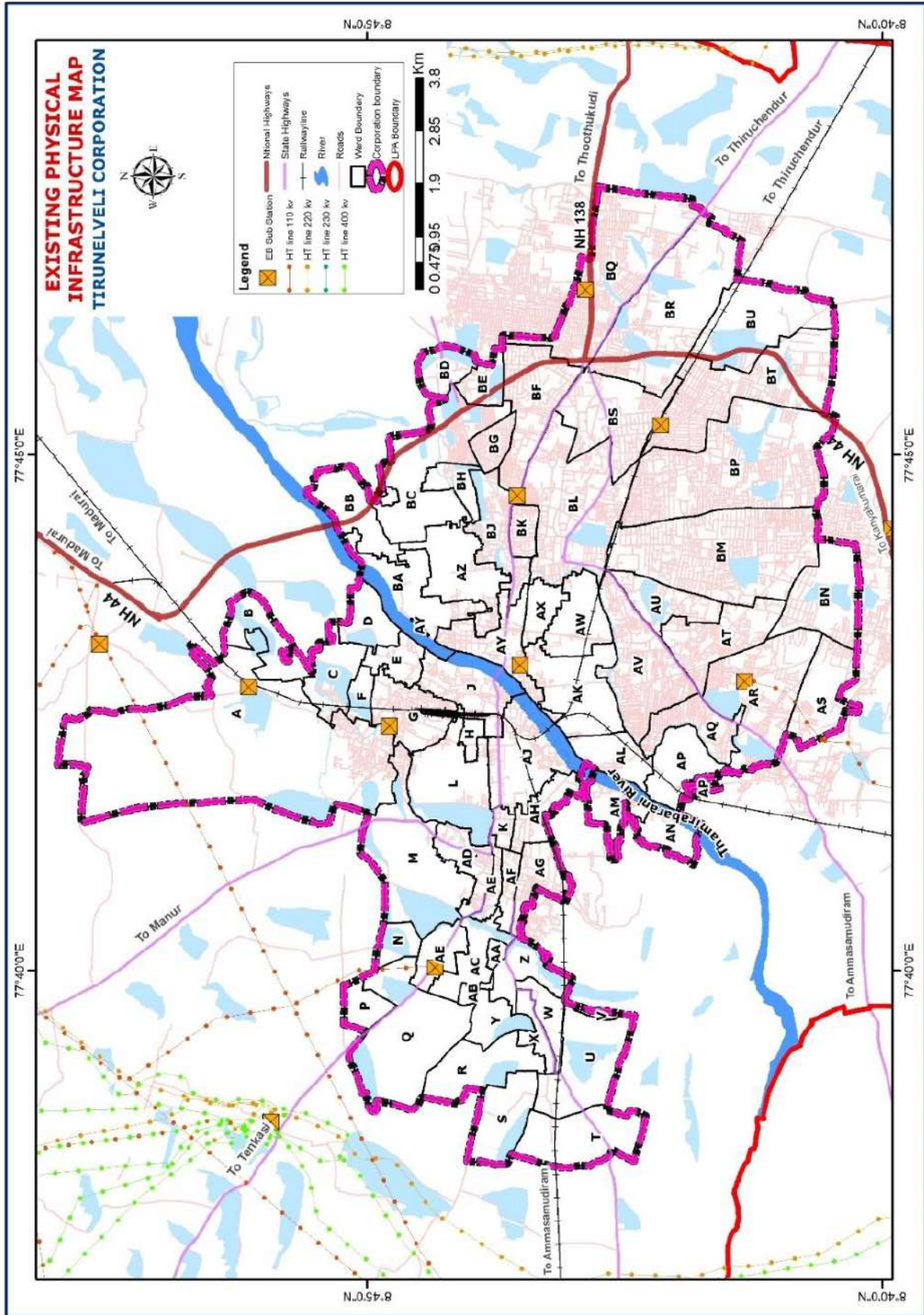
The Electricity demand for the projected population and the land requirement is given below,

Table 6.4 PROJECTED REQUIREMENT OF ELECTRICITY

Description	Tirunelveli Municipal Corporation	Sankar Nagar TP	Naranammalpuram TP	Rest of LPA	Total LPA
Existing Population	4,73,637	7,095	17,094	2,36,112	7,33,938
Estimated Population (2041)	6,22,714	10,643	23,448	2,98,740	9,55,545
Difference in Population	1,49,077	3,548	6,354	62,628	2,21,607
Capacity required KV	66	11	11	66	154
No of sub stations required	3	1	1	2	7
Land requirement in Hectare	1.2	0.4	0.4	0.8	2.8



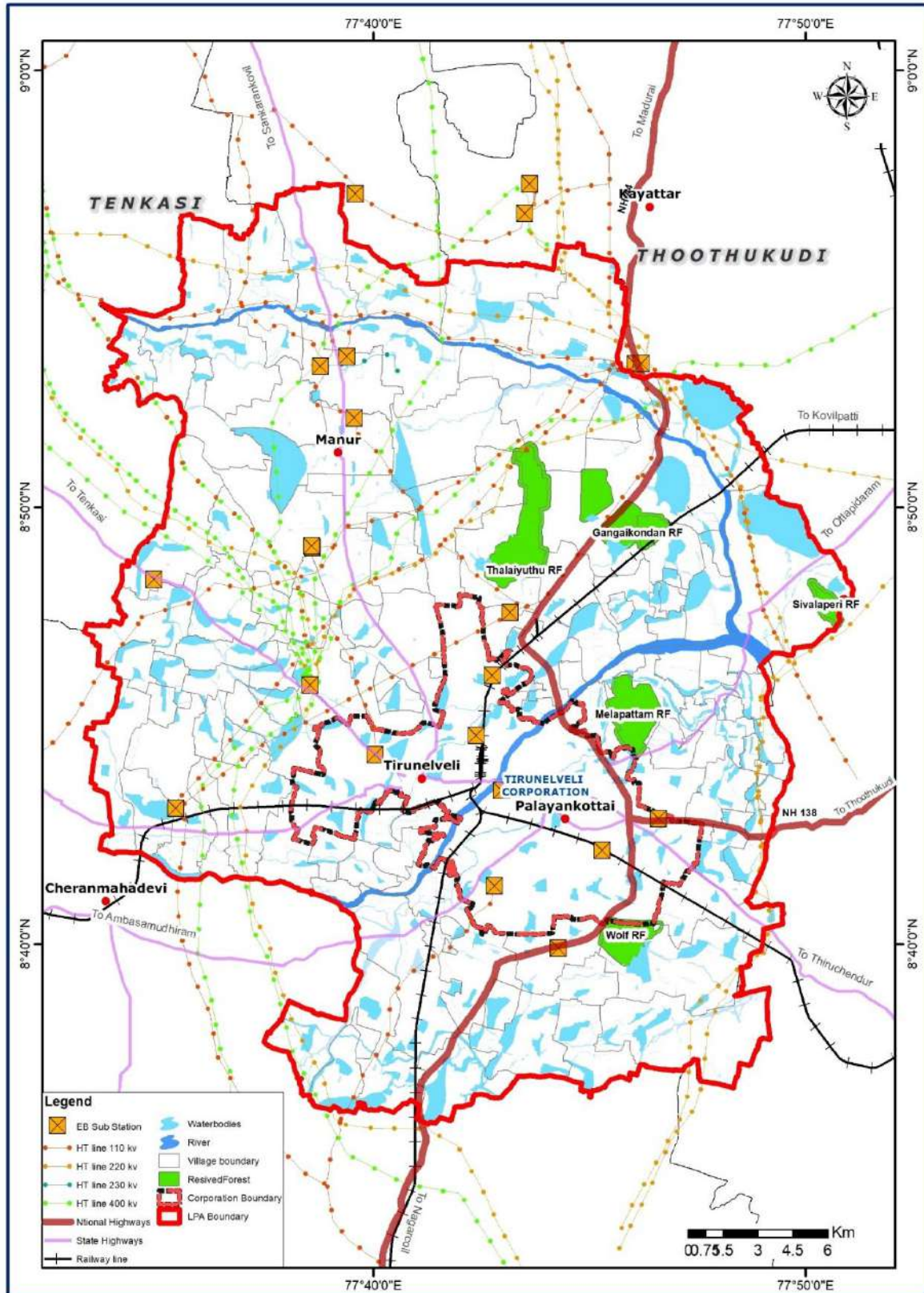
Map 6.3 EXISTING PHYSICAL INFRASTRUCTURE - ELECTRICITY IN TIRUNELVELI CORPORATION





Map 6.4 EXISTING PHYSICAL INFRASTRUCTURE – ELECTRICITY THE REST OF LPA

EXISTING PHYSICAL INFRASTRUCTURE MAP
TIRUNELVELI LOCAL PLANNING AREA





6.3 SEWAGE AND SANITATION

The Under Ground Sewerage Schemes in Tirunelveli have been taken up at a cost of 66 crores. The implementation of these projects is done on cost sharing basis from the funds provided by various funding agencies namely GOI, GOTN, ULB and Public Contribution. The total area of the Tirunelveli Municipal Corporation is **108.65 sq. km**. It is divided into 4 zones. The sewage generated from each zone is collected through a network of street sewers to a collection well. The sewage collected in each zone is pumped into the sewage treatment plant constructed at Ramaiyanpatti with an estimated capacity of 24.20 MLD by adopting Waste Stabilization Pond system. The treated effluent is let into the open channel and utilized for Agriculture. The total length of sewer line is **187.272 km with 7924 manholes**

6.3.1 SEWAGE GENERATION AND TREATMENT

The total sewage generated from Tirunelveli Corporation, Sankar nagar Town Panchayats, Naranammalpuram Town Panchayats and the villages within the LPA are presently estimated about 8.5 MLD, 0.472 MLD, 1.11 MLD and 9.56 MLD respectively. Tirunelveli corporation area has a sewage treatment plant with a capacity of 24.2 MLD, so the existing STP is adequate to treat the present generated sewage in Tirunelveli Corporation. Villages do not have proper method for treating sewage.

6.3.2 ACCESS TO SANITATION FACILITIES

As per Census 2011, 65.35 % of total households in Tirunelveli LPA had latrine facilities within the premises while 34.64 % of total households do not have latrine facilities within the premises. The following figures depict the percentage of households having latrine facilities in the villages, Naranammalpuram TP, Sankar nagar TP and Municipal Corporation.

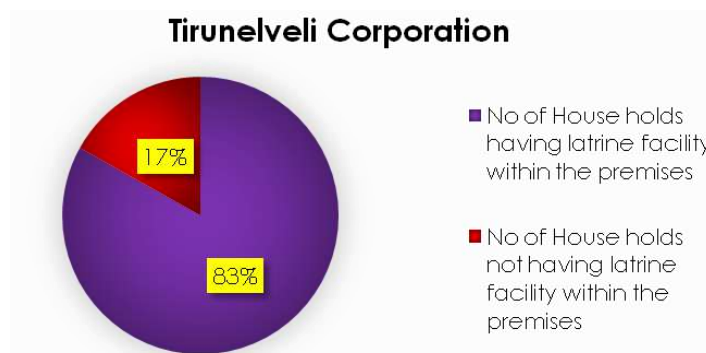


Figure 6.2 ACCESS TO LATRINE FACILITIES IN TIRUNELVELI CORPORATION

Source: Census of India 2011

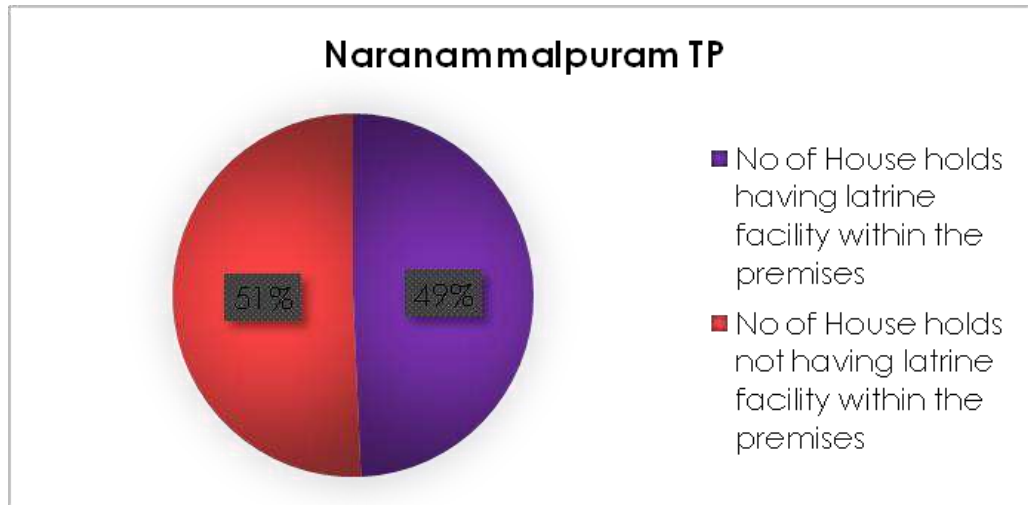
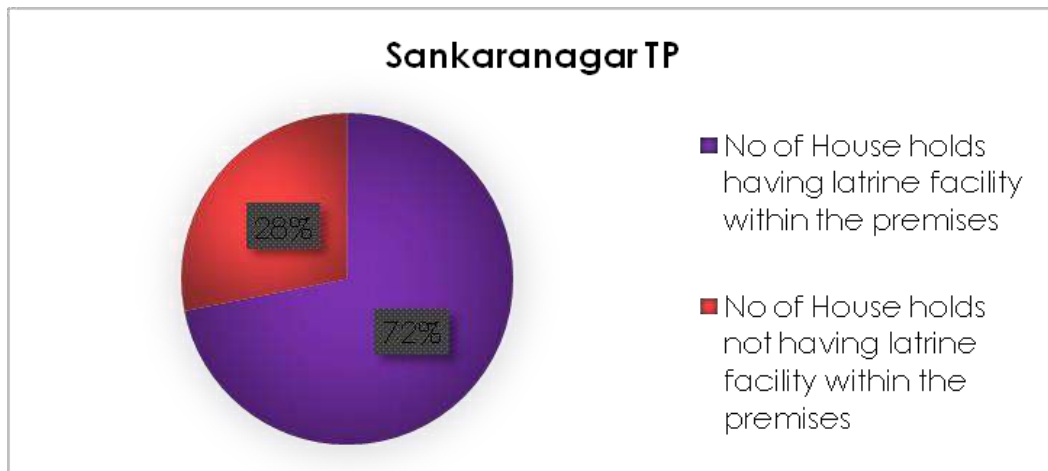


Figure 6.3 ACCESS TO LATRINE FACILITIES IN NARANAMMALPURAM TP

Source: Census of India 2011



(Source: Census of India 2011)

Figure 6.4 ACCESS TO LATRINE FACILITIES IN SHANKAR NAGAR TP

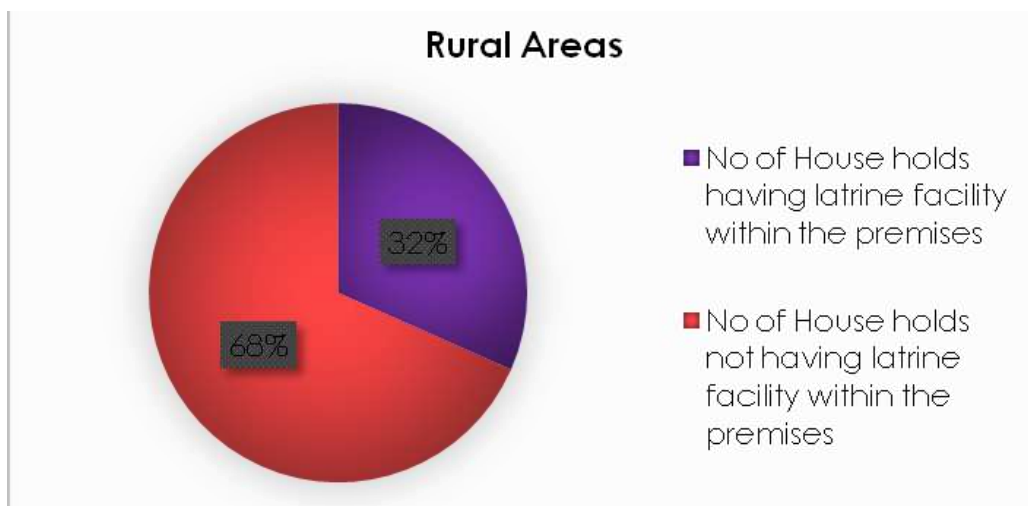
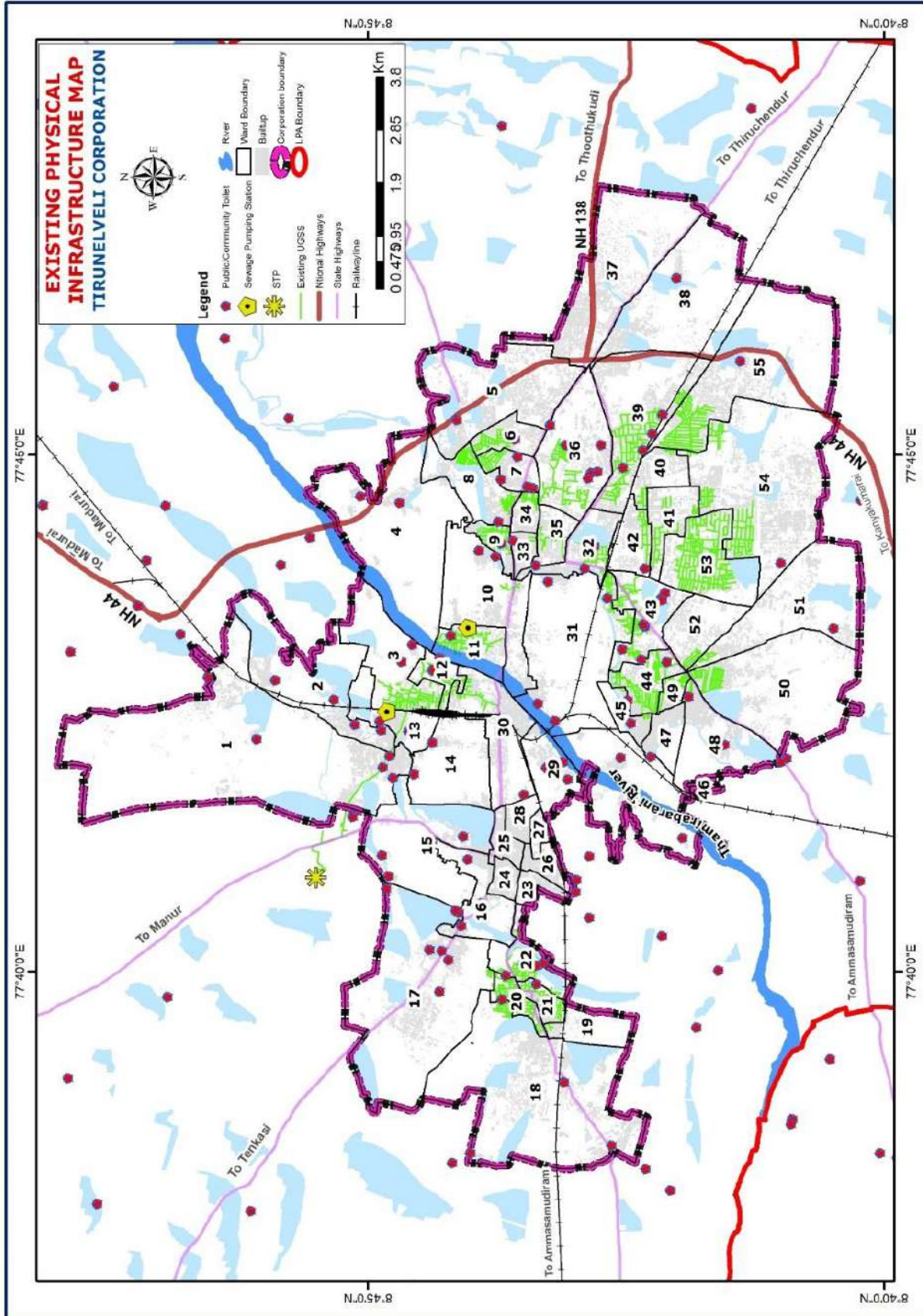


Figure 6.5 ACCESS TO LATRINE FACILITIES IN REVENUE VILLAGES

(Source: Census of India 2011)

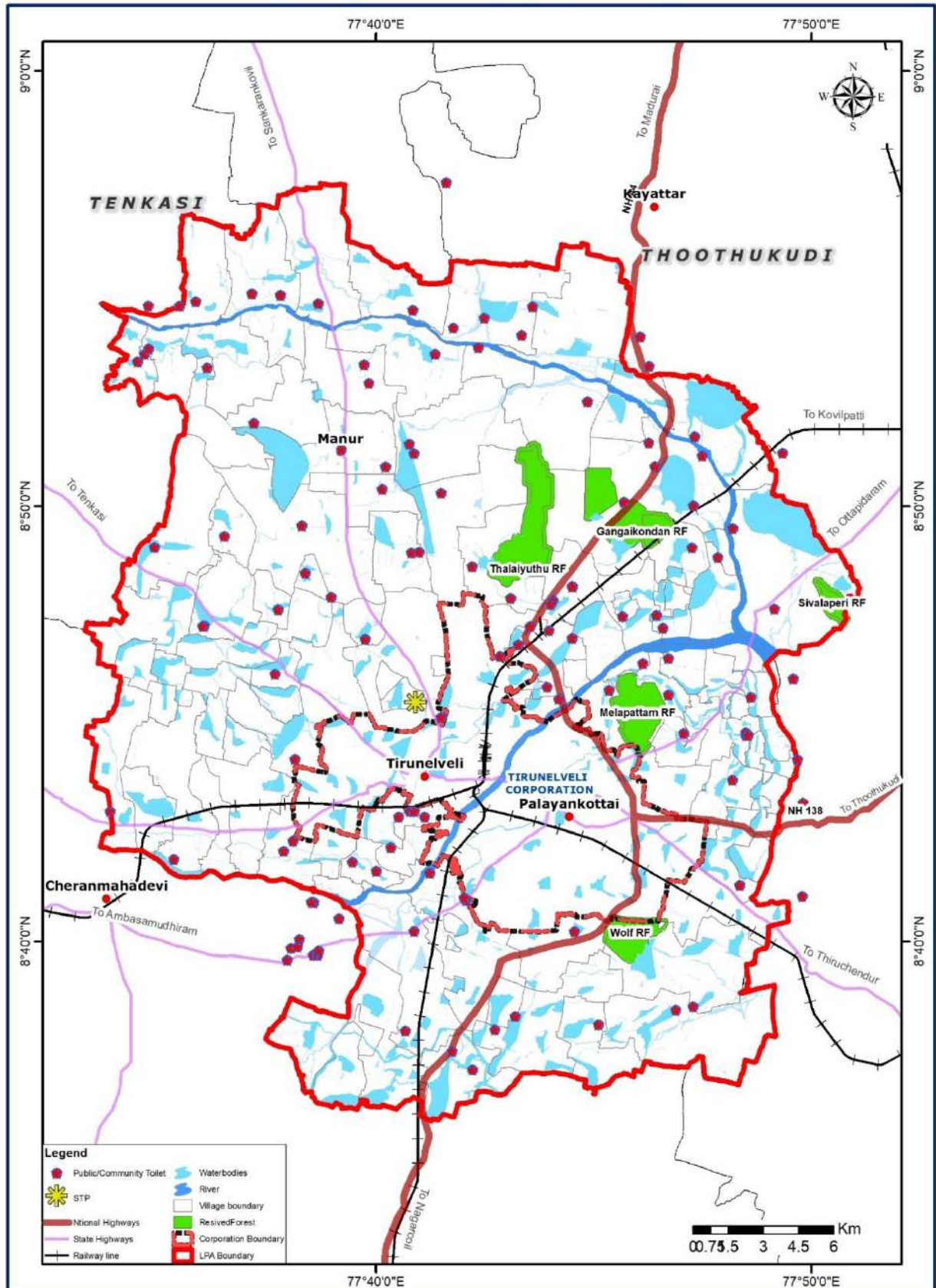


Map 6.5 EXISTING PHYSICAL INFRASTRUCTURE – SEWAGE AND SANITATION- IN TIRUNELVELI CORPORATION





Map 6.6 EXISTING PHYSICAL INFRASTRUCTURE – SEWAGE AND SANITATION- IN REST OF LPA





6.3.3 SEWAGE DISPOSAL SYSTEM

The Households having latrine facilities within the premises in Tirunelveli LPA have different types of disposal system namely Piped sewer system, Septic tanks, Pit latrine, open drain etc. Most of the households in Tirunelveli LPA adopt septic tanks for disposing sewage disposal, followed by piped sewer system.

Table 6.5 SEWAGE DISPOSAL SYSTEM IN TIRUNELVELI LPA

Description	Piped sewer system	Septic tank	Pit Latrine	Other Systems
Tirunelveli LPA Rural	1135	15469	3677	2194
Tirunelveli LPA Urban	43951	45334	6888	7524
Total LPA	45086	60803	10565	9718

(Source-Census of India-2011)

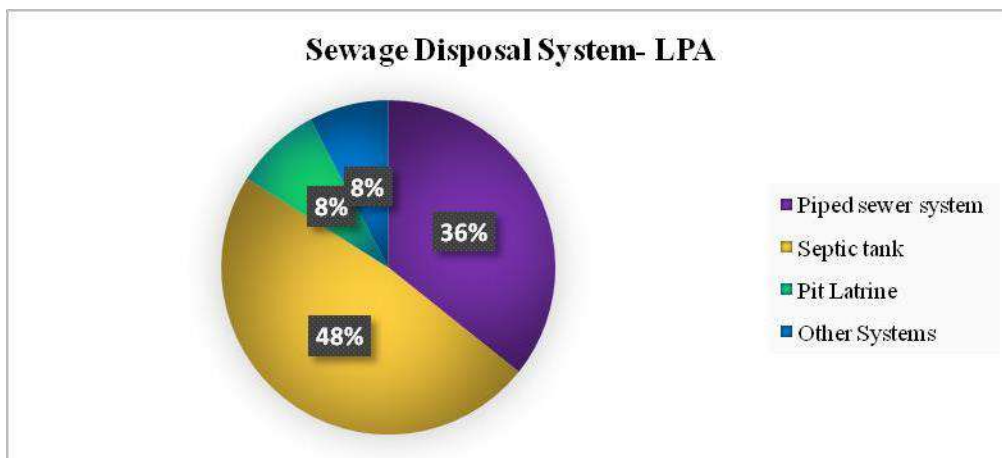


Figure 6.6 SEWAGE DISPOSAL SYSTEM IN TIRUNELVELI LPA

(Source: Census of India 2011)

6.3.4 EXISTING GAP IN SEWAGE TREATMENT

Tirunelveli Corporation generates around 8.5 MLD sewage and the Municipal Corporation has a STP at Ramaiyanpatti having a storage capacity of about 24.2MLD. This indicates that the existing STP is adequate for the treatment of sewage generated in the Corporation area.

Sankar nagar Town Panchayats generates an estimated quantity of 0.472 MLD and Naranammalpuram Town Panchayats generates an estimated quantity of 1.11 MLD. There are no sewage treatment facilities in these Town Panchayats and Villages.



Table 6.6 STATUS OF EXISTING SEWERAGE NETWORK AND STP'S IN TIRUNELVELI LPA

Description	Coverage of sewage network	Households connected to sewer system	Length of sewer lines	No of existing STP's	Total installed capacity of STP's (MLD)	Disposal area
Tirunelveli Municipal Corporation	30.65%	26902	187.272 Km	1	24.2	Ramayanpatti
Naranammalpuram TP	No Provision					
Sankar nagar TP						
Rural (Villages)						

The following table shows the existing sewage gap in Tirunelveli Municipal Corporation, the Town Panchayats and the revenue villages of Tirunelveli LPA.

Table 6.7 EXISTING GAP IN SEWAGE TREATMENT

Sewerage Sanitation Profile and	Tirunelveli Municipal Corporation	Sankar Nagar TP	Naranammalpuram TP	Rest of LPA	Total LPA
Population	4,73,637	7,095	17,094	2,36,112	7,33,938
Area in sq.km	108.65	8.49	18.13	733.48	868.75
Households	1,20,466	1,854	4,580	62,601	1,89,501
Sanitation Coverage %	83.00	72.00	49.00	96.00	
sewerage disposal system	UGSS, septic tank	septic tank	septic tank	septic tank	UGSS
Length of roads	829.39	31.17	33.45	461.40	1,355.41
Length of Sewer line in KM	187.27	11.04	11.34	240.17	187.27
Coverage of Sewage network (%)	22.58				
Existing water Supplied in MLD	49.73	0.60	1.40	10.50	74.11
Existing Sewerage generation in MLD	39.79	0.48	1.12	8.40	49.79
Existing STP Capacity	31.74MLD	NOT AVAILABLE			



Note: Existing STP is underutilized since the coverage of Sewage network in Tirunelveli Municipal Corporation is only around 30.65%. Entire quantity (37.92 MLD) will be discharged into UGSS when corporation completes UGSS Scheme Phase I and Phase II



Figure 6.7 EXISTING SEWER SYSTEM IN TIRUNELVELI MUNICIPAL CORPORATION



Source: Tirunelveli Municipal Corporation



6.3.5 PROJECTED REQUIREMENTS - SEWERAGE

In anticipation of the year 2041, the estimated sewage generation for Tirunelveli Municipal Corporation is projected to be 67.24 million liters per day (MLD). This calculation considers that approximately 80% of the water supply will translate into sewage. For the same year, Naranammalpuram and Sankar Nagar Town Panchayats (TP) are expected to generate 2.53 MLD and 1.15 MLD of sewage, respectively. Meanwhile, in the rural areas within the Tirunelveli Local Planning Area (LPA), the sewage generation is anticipated to reach 21.51 MLD by 2041. To manage and treat the sewage in the urban area, the existing Underground Sewerage System (UGSS) shall be augmented and developed. In contrast, for the rural areas, the proposed solution involves the implementation of Decentralized Wastewater Treatment Systems (DEWATS). A detailed breakdown of the projected sewage generation for Tirunelveli LPA, encompassing both urban and rural areas, is provided in Table 6.8.

Table 6.8 PROJECTED SEWAGE GENERATION IN TIRUNELVELI LPA

PROJECTION 2041					
Profile	Tirunelveli Municipal Corporation	Sankar Nagar TP	Naranamma Ipuram TP	Rest of LPA	Total LPA
Estimated Population (2041)	6,22,714	10,643	23,448	2,98,740	9,55,545
Projected water supply (in MLD) 2041	88.27	1.44	3.17	26.89	130.32
Estimated sewerage in MLD 2041	70.62	1.15	2.53	21.51	104.26
PROPOSED STP CAPACITY in MLD	43.00			21.51	
Land Requirement for sewerage Infrastructure as per (650 Sqm/MLD) in Hectare	2.80			1.40	4.19
TREATMENT METHOD	UGSS(urban areas), DEWATS CAN BE PROPOSED (Rest of LPA)				



Table 6.9 PROJECTED SANITATION INFRASTRUCTURE IN TIRUNELVELI LPA

	CLUSTER 1- MANUR BLOCK	CLUSTER 2 PALAYAMKOTTAI BLOCK	CLUSTER 3 PAPAKUDI BLOCK
No of households	53,896	53,808	6,899
No of existing hh's with toilets	51,658	52,730	6,625
Sanitation coverage %	96	98	96
Existing gap in hh	1,724	1,078	274
Req.toilet blocks (10 persons / block)	23	14	4
Land requirement per block 5 sqm as per swm (sqm)	122.82	74.76	21.36
PRIORITIZED VILLAGES FOR LAND ALLOCATION FOR PUBLIC TOILET PROVISION			
KURICHIKULAM	PONNAGUDI	SANGANTHIRUTU	
PILLAYARKULAM	MELAPATTAM		
THENPATHU	SEEVALAPERI		

6.4 SOLID WASTE MANAGEMENT

Solid-waste management involves the collection, treatment, and disposal of garbage. Improper disposal of municipal solid waste can create unsanitary conditions, and these conditions in turn can lead to pollution of the environment and outbreaks of vector-borne disease, that is diseases spread by rodents and insects. The tasks of solid-waste management present complex technical challenges. They also pose a wide variety of administrative, economic, and social problems that must be managed and solved.



Figure 6.8 EXISTING SOLID WASTE MANAGEMENT SITES IN LPA



6.4.1 SOLID WASTE GENERATION

The solid waste generation in Tirunelveli Corporation as per NEERI standards is around 236.81 TPD. The Solid waste generation in Naranammalpuram TP is around 3.42 TPD and that of Sankar nagar TP is about 1.41 TPD. The total solid waste generation in the revenue villages is around 47.22 TPD

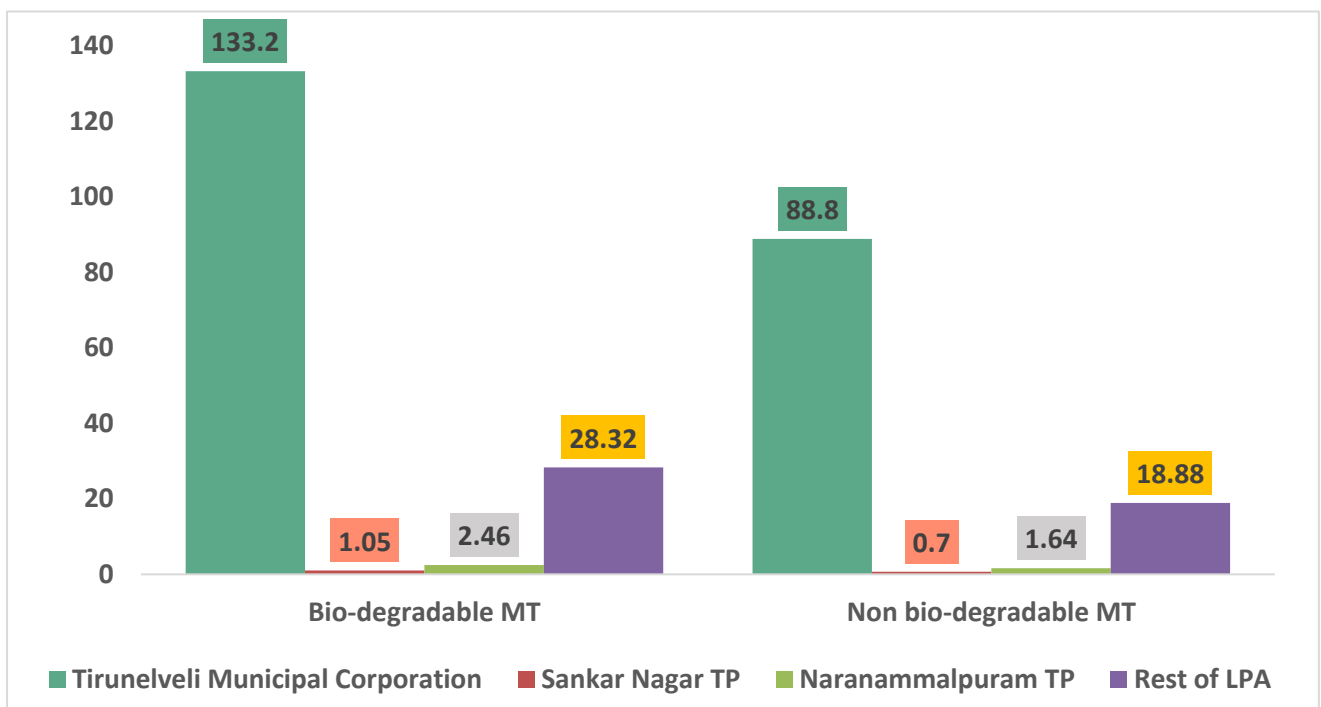
Table 6.10 EXISTING SOLID WASTE GENERATION IN TIRUNELVELI LPA

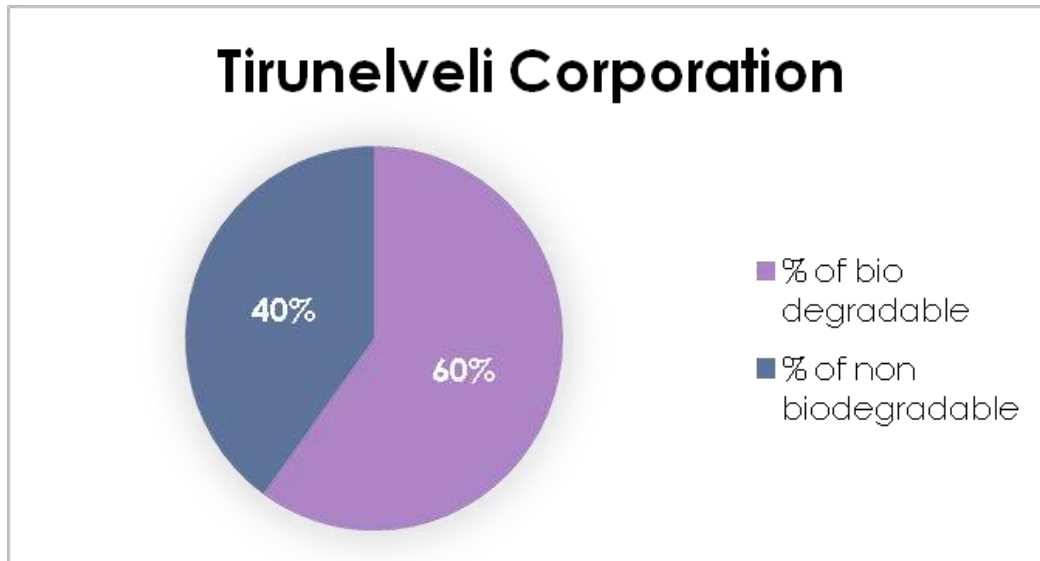
S. No	Local body	Population 2011	NEERI Standards (kg/capita/day)	Quantity generate d as per norms (TPD)	Actual Quantity Generated
1	Tirunelveli Corporation	473637	0.5	248.66	222 MT
2	Naranammalpuram TP	17094	0.3	5.13	4.10 T
3	Sankar nagar TP	7095	0.3	2.13	1.75 T
4	Rural (Villages)	236112	0.3	70.83	47.2 T

(Source-Tirunelveli Corporation, Naranammalpuram and Sankar nagar TP)

6.4.2 COMPOSITION OF SOLID WASTE

Municipal solid waste consists of 60% biodegradable waste and 40% of non-biodegradable waste. The below figure shows the detailed composition.





Source: Tirunelveli Corporation

6.4.3 WASTE COLLECTION AND TRANSPORTATION

TIRUNELVELI CORPORATION

Door to door garbage collection is covered for 55 wards. Type of the Vehicles used for the solid waste collection in Tirunelveli Corporation is listed in the table below.

Table 6.11 EXISTING FACILITIES FOR WASTE COLLECTION- TIRUNELVELI CORPORATION

S. No	Type of Vehicle	Numbers
1	BOV	270
2	Compactor	4
3	Compactor bin	430
4	Dumper placer	4
5	Dumper bin	112
6	Tipper lorry	8
7	JCB	3
8	TATA Ace	1
9	Open lorry	4
10	Tipper Tractor	1

Source: Tirunelveli Corporation



Tirunelveli Corporation in Tamil Nadu is set to achieve the feat of achieving 100% segregation of waste at source across households and establishment. It involves collecting waste from each household to segregate biodegradable and non-biodegradable waste. In Tirunelveli Corporation 1,335 sanitary workers, including 358 permanent workers, 744 sanitary workers affiliated to self-help groups, 233 outsourced sanitary workers have been employed to collect the garbage from the houses, streets and the collected garbage is sent to the garbage dump at Ramaiyanpatti either to the micro compost centers using through 4 compactors, 4 dumper placers, 8 tipper lorries, a tractor, four lorries, a light commercial vehicle apart from the 270 battery operated vehicles.

22 tonnes of solid waste are being generated by 97 bulk waste generators in the city. Since source segregation of degradable and non- degradable wastes is mandatory in Tirunelveli Corporation, the waste is being collected separately by 270 battery operated vehicles deployed in all four zones of the Corporation. Section of the residents, despite the source segregation of waste put in place in the Corporation, has nurtured the habit of packing both degradable and non-degradable waste getting generated in their house in one bag and put it into the bins; garbage bins in these areas were identified and removed to inculcate the habit of source segregation.

NARANAMMALPURAM TOWN PANCHAYAT

The waste disposal per day is around 4.65 tonnes. There is no landfill site in Naranammalpuram Town Panchayats and the waste generated is dumped in Sankar nagar Landfill site. There are around 41 sanitary workers engaged in sanitation, sewage disposal and solid waste management, out of which 16 members are permanent staff and remaining are contract-based staffs. The type of the vehicles used for the solid waste collection in Naranammalpuram Town Panchayat is listed in the Table 6.12.

Table 6.12 EXISTING FACILITIES FOR WASTE COLLECTION- NARANAMMALPURAM TP

S. No	Type of Vehicle	Numbers
1	Tipper Lorry	1
2	Tipper Auto	1
3	Push Cart	15

Source: Naranammalpuram TP



SANKAR NAGAR TOWN PANCHAYAT

The waste disposal per day is around 3.08 tons and is dumped in Sankar nagar Landfill site located at the backside of Sankar nagar TP office. There are around 32 sanitary workers engaged in sanitation, sewage disposal and solid waste management, out of which 12 members are permanent staff and remaining are contract-based staffs. The type of Vehicles used for the solid waste collection in Sankar nagar Town Panchayat is listed in the Table 6.13.

Table 6.13 EXISTING FACILITIES FOR WASTE COLLECTION- SANKAR NAGAR TP

Type of Vehicle	Numbers
Tipper Lorry	1
Tipper Auto	1
Push Cart	12

Source: Sankar nagar TP

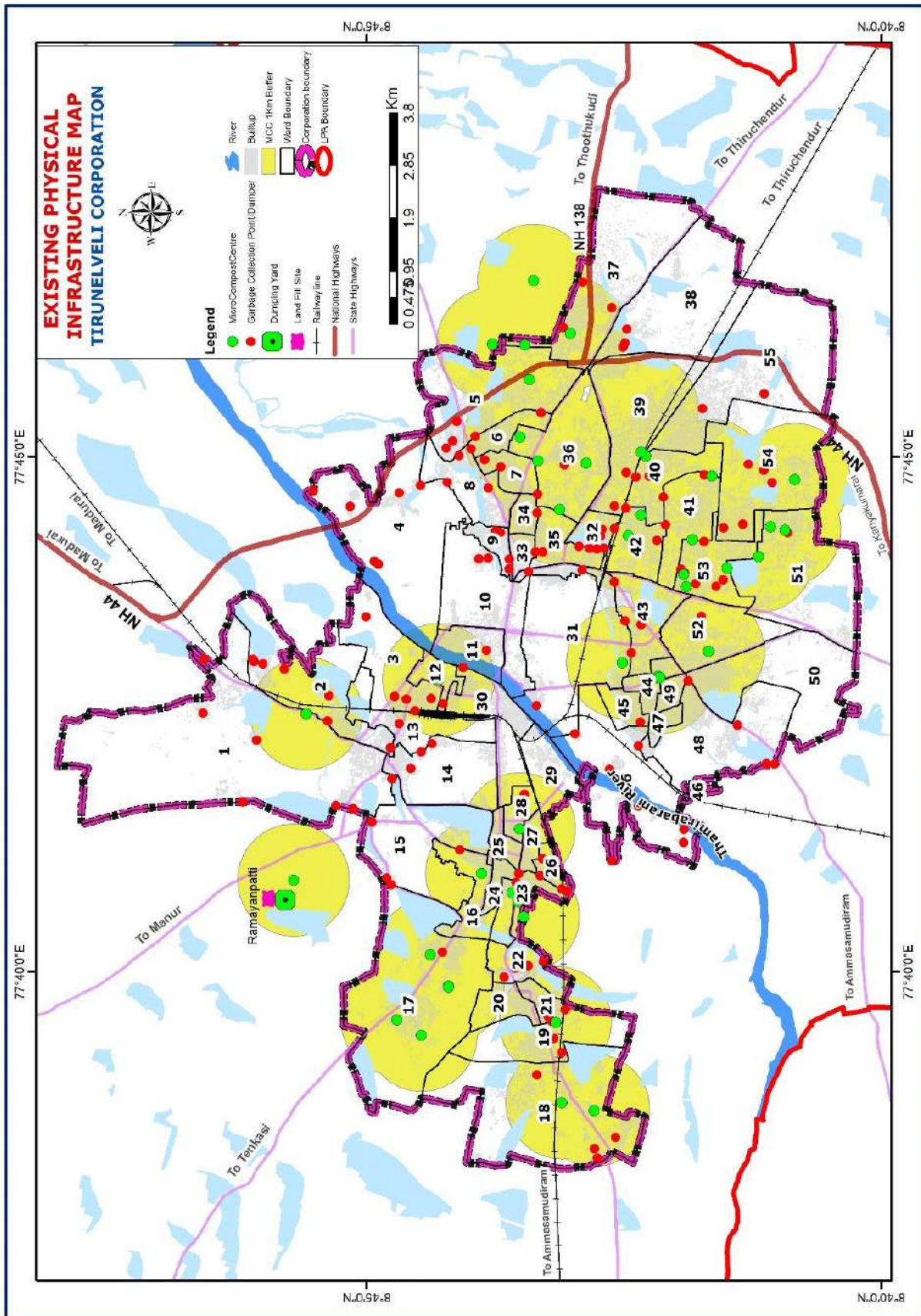
6.4.4 TREATMENT FACILITIES

Tirunelveli Municipal Corporation generates about 170 MT of solid waste per day. After collecting the 102 tonnes of Bio degradable waste, 35 tonnes are being taken to the micro composting centres (47 numbers within corporation limit) where it is converted into manure which is to be given to the public while 5 tonnes of degradable waste is taken to the bio-methanation plant and 40 tonnes to the Ramaiyanpatti compost yard.

The remaining 22 tonnes being generated by the bulk waste generators have been informed to establish their own solid waste management system. The 68 tonnes of solid waste, mostly plastic waste, is being sent to the recyclers and also to the cement factory nearby where it is being used as supplementary fuel or the fuel derived from the refuse. The women self-help groups involved in shredding the plastic waste into granules sell it at the rate of ₹ 30 per kg for road laying. The city, having 62 hospitals, has put in place an appropriate biomedical waste management system through a private firm. Windrow composing method is carried out in both the Town Panchayats. It is an aerobic process where the organic material is broken down into CO₂, water, minerals and stabilized organic material. The organic material so formed is converted into compost.



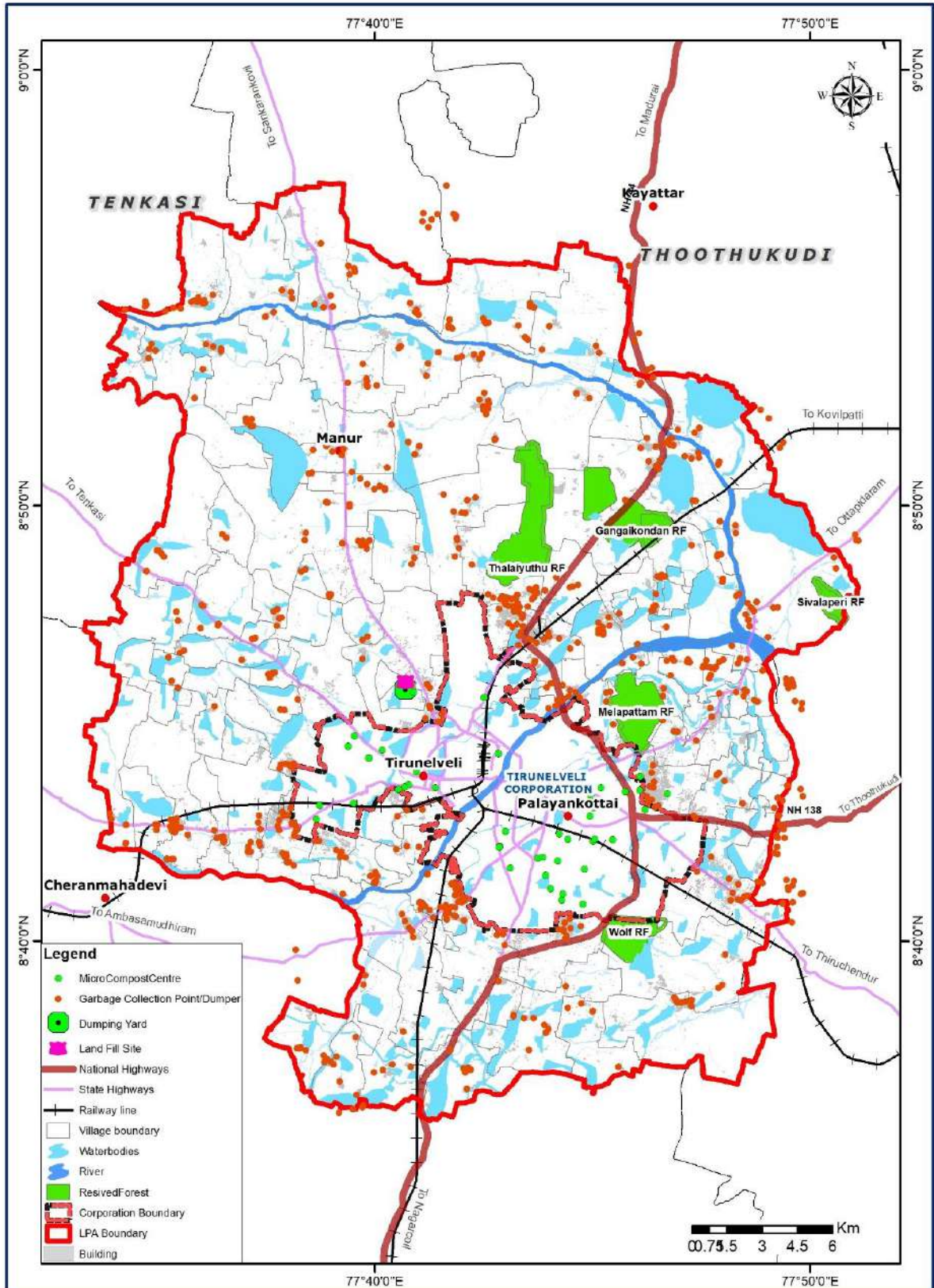
Map 6.7 PHYSICAL INFRASTRUCTURE IN TIRUNELVELI CORPORATION





Map 6.8 PHYSICAL INFRASTRUCTURE IN TIRUNELVELI REST OF LPA

EXISTING PHYSICAL INFRASTRUCTURE MAP
TIRUNELVELI LOCAL PLANNING AREA



N

ii



Table 6.14 EXISTING SOLID WASTE MANAGEMENT GAP

Solid waste management Profile	Tirunelveli Municipal Corporation	Sankar Nagar TP	Naranammalpuram TP	Rest of LPA	Total LPA
Population	4,73,637	7,095	17,094	2,36,112	7,33,938
Floating Population (5%)	23,681				
Area in sq.km	108.65	8.49	18.13	733.48	868.75
NEERI Standards (kg/capita /day)	0.50	0.30	0.30	0.30	
Quantity generated as per norms	248.66	2.13	5.13	70.83	326.75
Actual quantity generated MT	222.00	1.75	4.10	47.20	275.05
Bio-degradable MT	133.20	1.05	2.46	28.32	165.03
Non-bio-degradable MT	88.80	0.70	1.64	18.88	110.02
Available Land fill site area in Hectare	120.00				

The current Municipal Composting Center (MCC) facilities have a combined processing capacity of 85 metric tons (MT) for organic solid waste. However, the operational capacity is currently limited to 29 MT, resulting in an existing gap of 56 MT. It is imperative to address and minimize this gap in the future, emphasizing the need for optimizing the utilization of the existing MCC. Efforts should focus on enhancing operational efficiency to ensure that the MCC operates at its full capacity, effectively managing and processing the organic solid waste generated in the region.



6.4.5 PROJECTED REQUIREMENTS – SOLID WASTE MANAGEMENT

Considering the per capita generation of solid waste, it is projected that by the year 2041, approximately 246.72 tons per day (TPD) of biodegradable solid waste will be generated in Tirunelveli Local Planning Area (LPA). According to the standards set by the National Environmental Engineering Research Institute (NEERI), the existing windrow composting landfill site lacks the capacity to accommodate the anticipated 246.72 TPD of municipal solid waste. To address this shortfall, a proposal suggests the establishment of an additional six Municipal Composting Centers (MCC) sites.

In contrast, for landfill purposes, there is no immediate requirement for an additional site. Instead, the existing landfill is recommended for expansion by 12.86 hectares to meet the future waste disposal needs. Additionally, at the village level, a community waste disposal system is proposed, likely indicating decentralized waste management solutions to enhance efficiency and sustainability.

Table 6.15 PROJECTED DEMAND FOR SOLID WASTE MANAGEMENT

Solid waste management Profile	Tirunelveli Municipal Corporation	Sankar Nagar TP	Naranammalpuram TP	Rest of LPA	Total LPA
Estimated Population (2041)	6,22,714	10,643	23,448	2,98,740	9,55,545
Projected quantity in MT	311.36	3.19	7.03	89.62	411.21
Bio degradable MT	186.81	1.92	4.22	53.77	246.72
Non bio degradable MT	124.54	1.28	2.81	35.85	164.48
Available MCC capacity in MT	85.00				
Present Gap (Excess) in MT	56.00				
Proposed MCC capacity for biodegradable waste	107.95			53.77	
Land required for proposed MCC in HEC as per CPHEEO 2 Hectare/50MT	4.00			2.00	
Additional area to be expanded in existing Landfill for non-bio degradable waste in Hectare	12.86			3.58	16.45



6.5 STORM WATER DRAINAGE

The existing drainage condition of the Tirunelveli LPA Consists of the natural river Tamirabarani. The corporation area has a storm water drain for a length of 267.688 km which is 33 % of total length of the road. 67% of the length of the road remains uncovered in the corporation area. Water logging prevails in the corporation area during rainy season. So, the remaining area to be covered under storm water network to prevent water stagnation in roads. In Naranammalpuram TP, the length of the storm water drains is around 13.50 km. The length of storm water drains in Sankar nagar TP is 9.04 km.

Table 6.16 EXISTING STORM WATER DRAINAGE GAP

Storm Water Management Profile	Tirunelveli Municipal Corporation	Sankar Nagar TP	Naranammal puram TP	Rest of LPA	Total LPA
Population	4,73,637	7,095	17,094	2,36,112	7,33,938
Area in sq.km	108.65	8.49	18.13	733.48	861.97
Length of roads in KM	923.41	31.17	33.45	450.00	1,438.03
Storm water drain length in KM	269.78				269.78
Storm water Coverage in %	29.22				18.76
Existing gap in km	653.63	31.17	33.45	450.00	1168.25

6.5.1 POLICIES AND STRATEGIES

- The most important policy would be to convert the present constraints in disposal of flood waters as an opportunity to manage and use the excess water for augmenting urban water supply through creation of additional storage capacity.
- Developing a network of open spaces to provide green environment would enable them to be used as flood moderators during critical months of the year.
- The PWD needs to be made the nodal agency for holistic planning and maintenance of existing water bodies by preventing encroachments and implementation of macro drainage systems.
- Micro drainage would be the responsibility of the local bodies and they would need to be fully and effectively integrated with the macro system.



Map 6.9 NATURAL DRAINAGE WITH CONTOUR





6.5.2 SUMMARY

Physical Infrastructure deals with water supply, sewage and sanitation, solid waste management, electricity. It can be considered as one of the indicators which would determine the quality of urbanization in an area. In terms of water supply, Tirunelveli LPA is receiving water supply through a combined water supply scheme (CWSS) and Tamirabarani River.

The demand in water supply is around 17.41 MLD in Tirunelveli Corporation and 2.23 MLD in the revenue villages. The water supply in the Town Panchayats is adequate for the current population.

The additional water requirement would be about 38.54 MLD for the year 2041 for Tirunelveli Municipal Corporation. The water supply requirement for Naranammalpuram and Sankar nagar TP for 2041 is 1.77 MLD and 0.84 MLD respectively. The projected water supply requirement for the year 2041 for the rural population is 16.39 MLD.

With respect to sewage and sanitation, Tirunelveli LPA has a single STP at Ramayanpatti having a capacity of 24.20 MLD. The total sewage generated from Tirunelveli Corporation, Sankar nagar Town Panchayats, Naranammalpuram Town Panchayats and revenue villages within the LPA is about 8.5 MLD, 0.472 MLD, 1.11 MLD and 9.56 MLD respectively.

The river Tamirabarani is polluted due to the discharge of untreated sewage generated from the nearby local bodies. Proper treatment facilities should be ensured in the urban areas to minimize this pollution. Coverage of Sewage network in Tirunelveli Municipal Corporation is only around 30.65%, this reflects the low value in sewage generation. Entire quantity will be discharged into UGSS when corporation completes UGSS Scheme Phase I and Phase II. The storm water coverage should be extended to avoid water logging.

6.5.3 POLICIES AND STRATEGIES

- The provisions of the Central Act relating to solid waste management and the MSW (Handling and Management) Rules, 2000 should be strictly enforced by the concerned agencies within LPA.
- Environmental assessment has to be made for existing landfill sites and suitable measures have to be taken for their improvements.
- Solid waste management is one area where citizens and private sector participation is crucial to ensure health and safety in cities. Awareness should be generated about the need for source segregation and differential disposal.



- Resident's associations and NGOs have attempted to reduce the burden on the local bodies through local segregation of solid waste, composting and recycling but these have not made any sustained impact due to several reasons including little encouragement from local bodies.
- Under the "Polluters Pay" principle, local bodies can collect a levy from bulk garbage generators such as hotels, marriage halls, markets and commercial complexes.
- Mechanical handling of wastes using auto-tippers, tricycle and push carts can be encouraged to minimize human contact.
- Since solid waste management is becoming complex, the technical and managerial skills including project formulation, financing and monitoring and supervision of personnel in the local bodies should be strengthened.
- A separate solid waste management action plan will be required to be made with the principal stakeholders and including the citizens and private sector following the comprehensive Environmental Recourse Management study.



**SOCIAL
INFRASTRUCTURE**
CHAPTER 07

MASTER PLAN
2041
TIRUNELVELI LPA

Arshesh Magee
PHOTOGRAPHY





7. SOCIAL INFRASTRUCTURE

Social infrastructure plays an important role in the quality of life of people. Physical and social infrastructures are inter-related components for the sustainable healthy environment. Good and adequate social infrastructure is the key to achieve progressive development. It deals with healthcare facilities, education facilities, recreational facilities.

7.1 EDUCATIONAL FACILITIES

The literacy rate in Tirunelveli LPA has increased by 5.29% from 2001 to 2011. According to the census, the literacy rate in the Tirunelveli LPA is 89.8 % is higher than that of Tirunelveli district. The total literacy rate of Tirunelveli district is 82.5 % which is greater than the state average rate of 80.09 %. Due to the several schools and colleges located in the Tirunelveli LPA area, the twin town of the Tirunelveli named Palayamkottai is known as the Oxford of the South India. Tirunelveli LPA has good numbers of educational institutions in its jurisdiction.

7.1.1 SCHOOLS

Tirunelveli LPA has approximately 503 numbers of schools which is managed by both Government and Private sector. There are 2 pre-primary schools, 318 primary schools, 57 Middle schools, 47 High schools, 75 higher secondary schools and 4 schools for disabled students in the Tirunelveli LPA. The table below shows the distribution of the schools in the LPA.

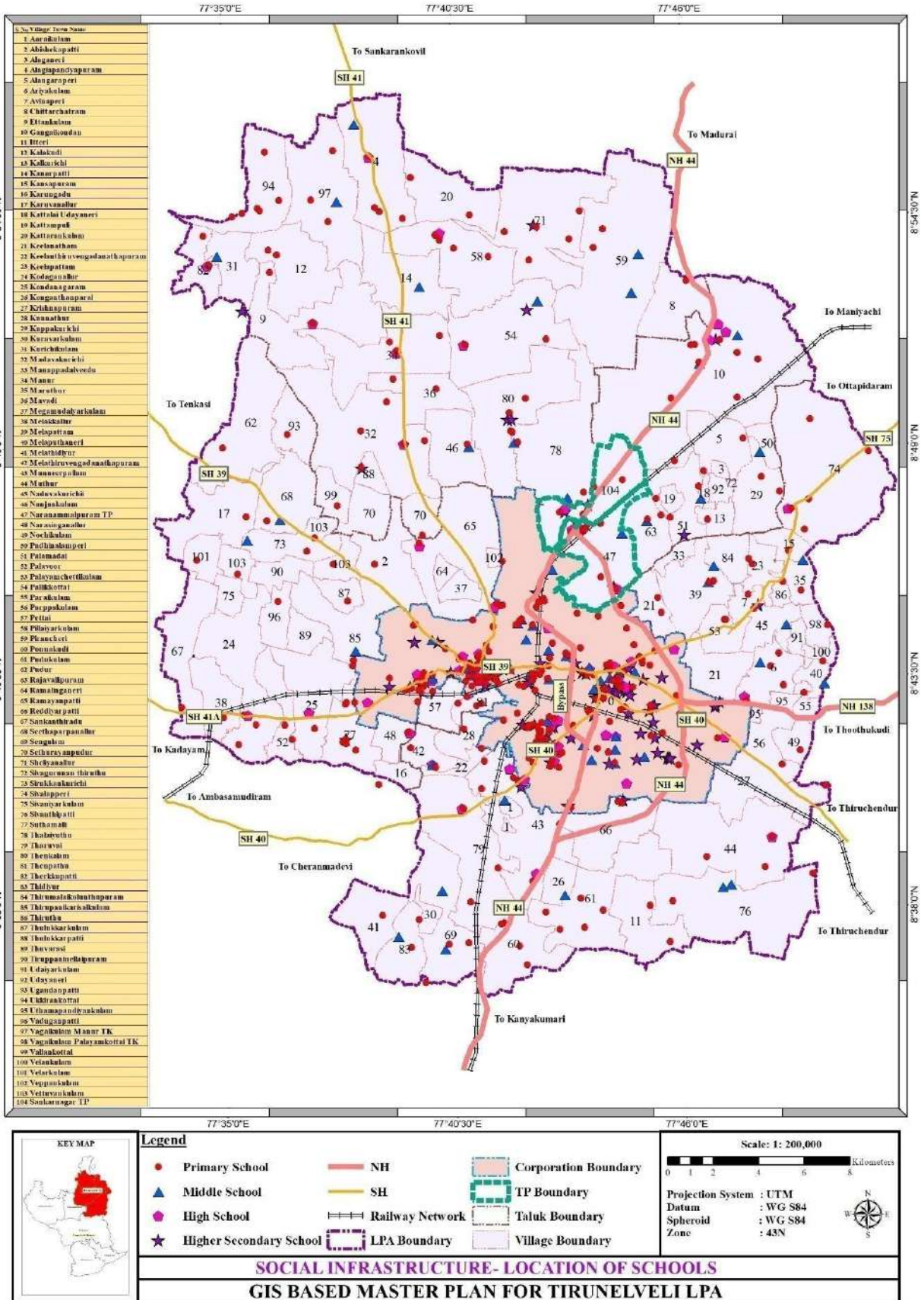
Table 7.1 NO OF SCHOOLS AVAILABLE WITHIN THE TIRUNELVELI LPA

S.No	Description	Pre-primary schools	Primary schools	Middle schools	High schools	Higher secondary schools	Schools for Disabled people
1	Tirunelveli Rural	1	174	32	20	22	0
2	Tirunelveli Urban	1	144	25	27	53	4
3	Tirunelveli LPA	2	318	57	47	75	4

(Source- Chief Education Officer, Tirunelveli)



Map 7.1 LOCATION OF SCHOOLS





The adequacy of school infrastructure is analyzed based on URDPFI guidelines and Tamil Nadu School Education Norms. URDPFI Suggests requirement of one pre-primary school for every 2500 population, one primary school for every 5000 population, one senior secondary school for every 7500 Population.

According to RTE Act 2009, a primary school must be having access within 1km radial distance and middle school within 3 km radial distance. Similarly, the accessibility of a high school should be within 5km and for Higher Secondary Schools, it should be around 8km.

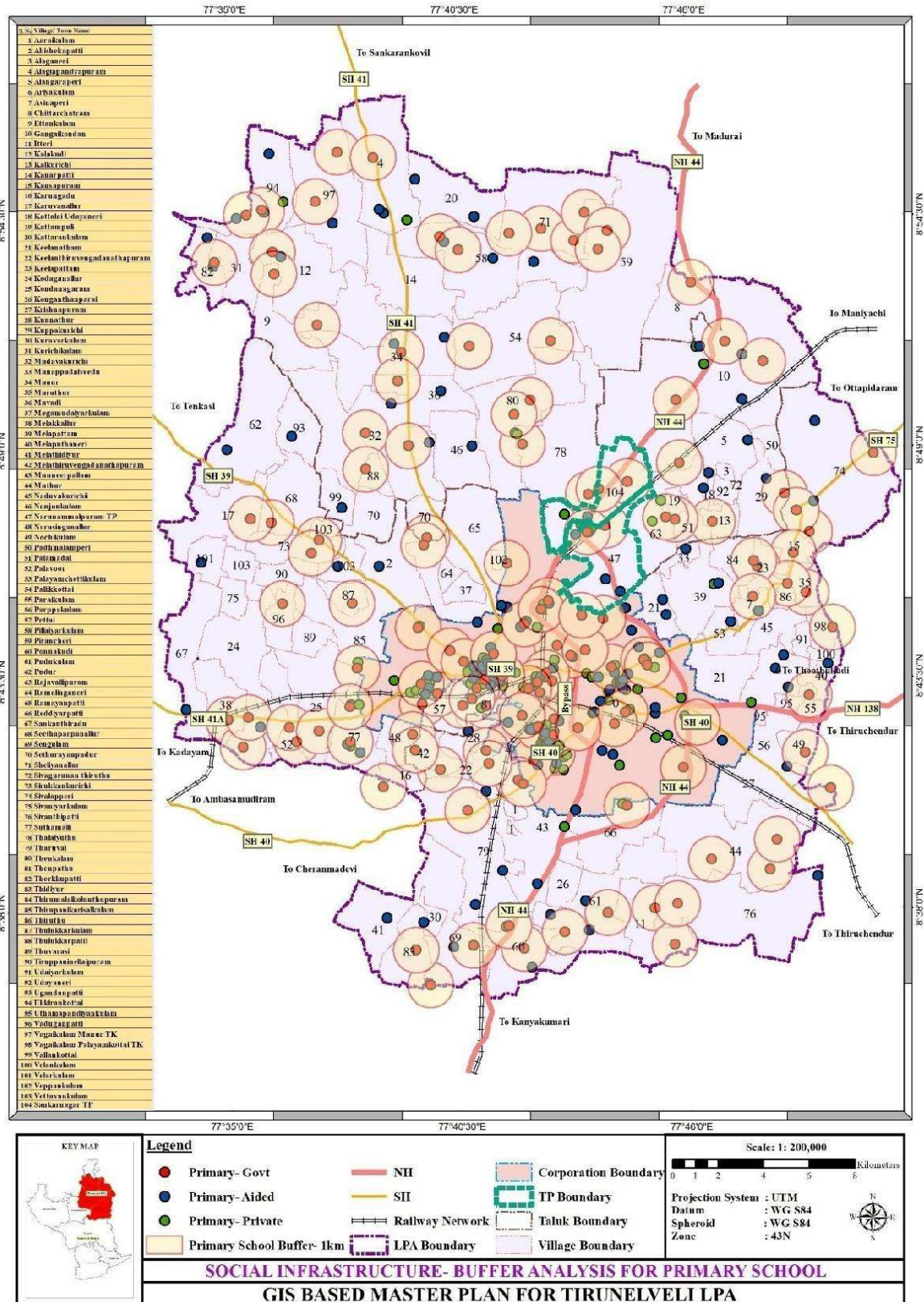
Table 7.2 TAMIL NADU SCHOOL EDUCATION NORMS FOR SCHOOLS

S. No	Type of institution	Radial Distance criteria for Location of Schools
1	Primary Schools	1 km
2	Middle Schools	3 km
3	High Schools	5 km
4	Higher Secondary Schools	8 km

At present all the urban areas in Tirunelveli LPA have sufficient access as per Tamil Nadu School education norms and also by the buffer analysis. However, some of the rural areas are deprived of middle and high school within a distance of 3 km and 5 km respectively.

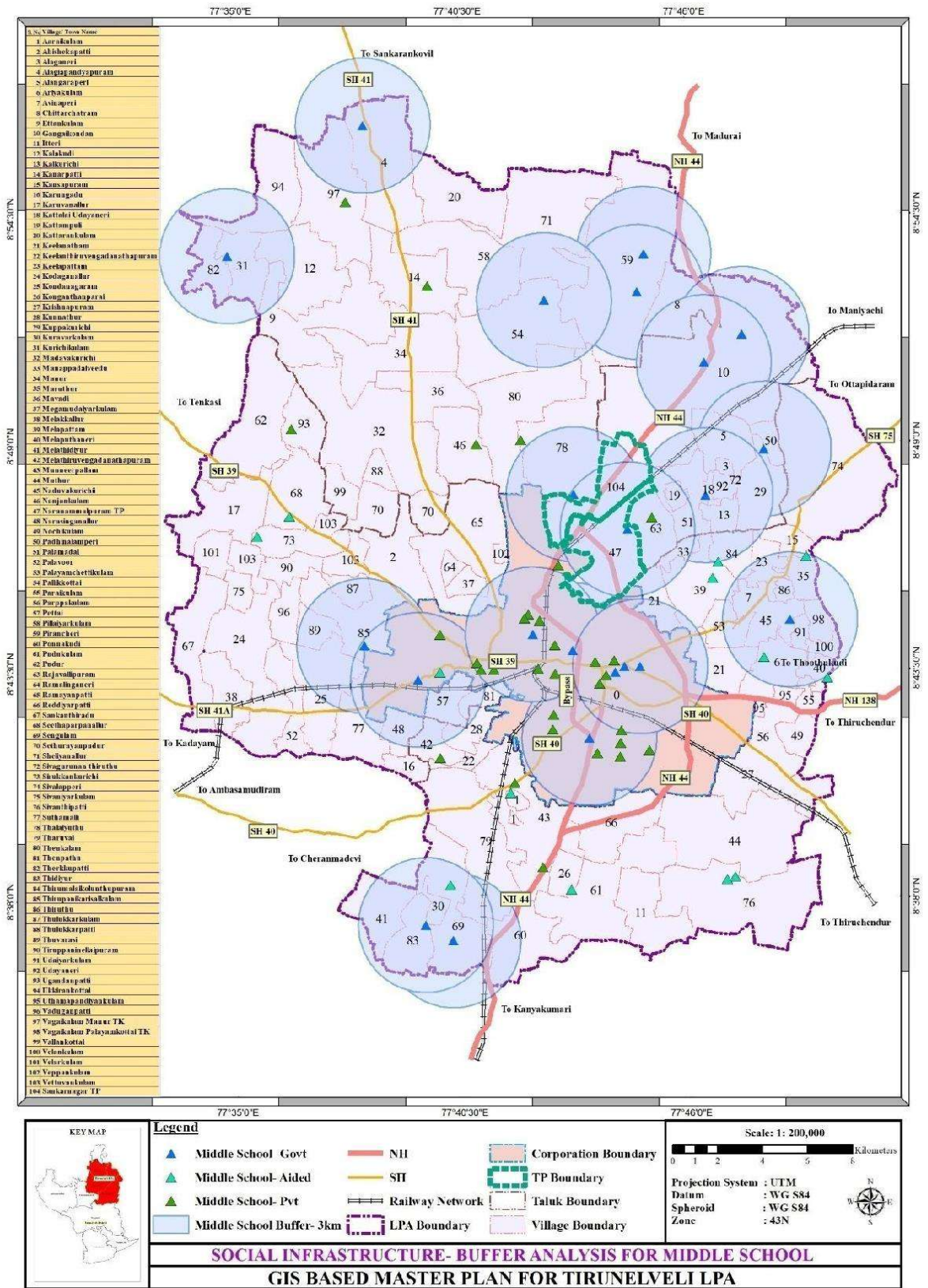


Map 7.2 BUFFER ANALYSIS FOR PRIMARY SCHOOL



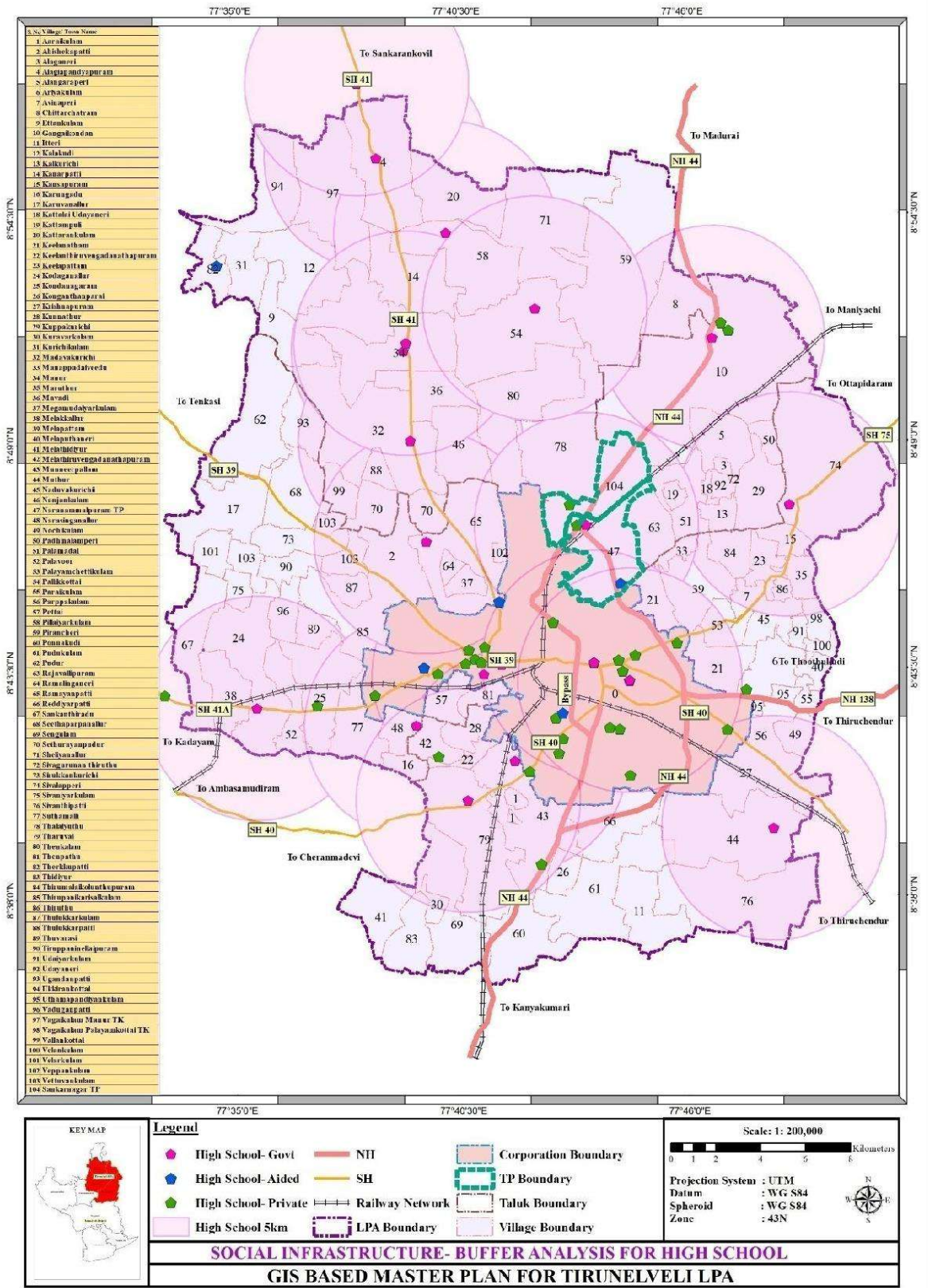


Map 7.3 BUFFER ANALYSIS FOR MIDDLE SCHOOL



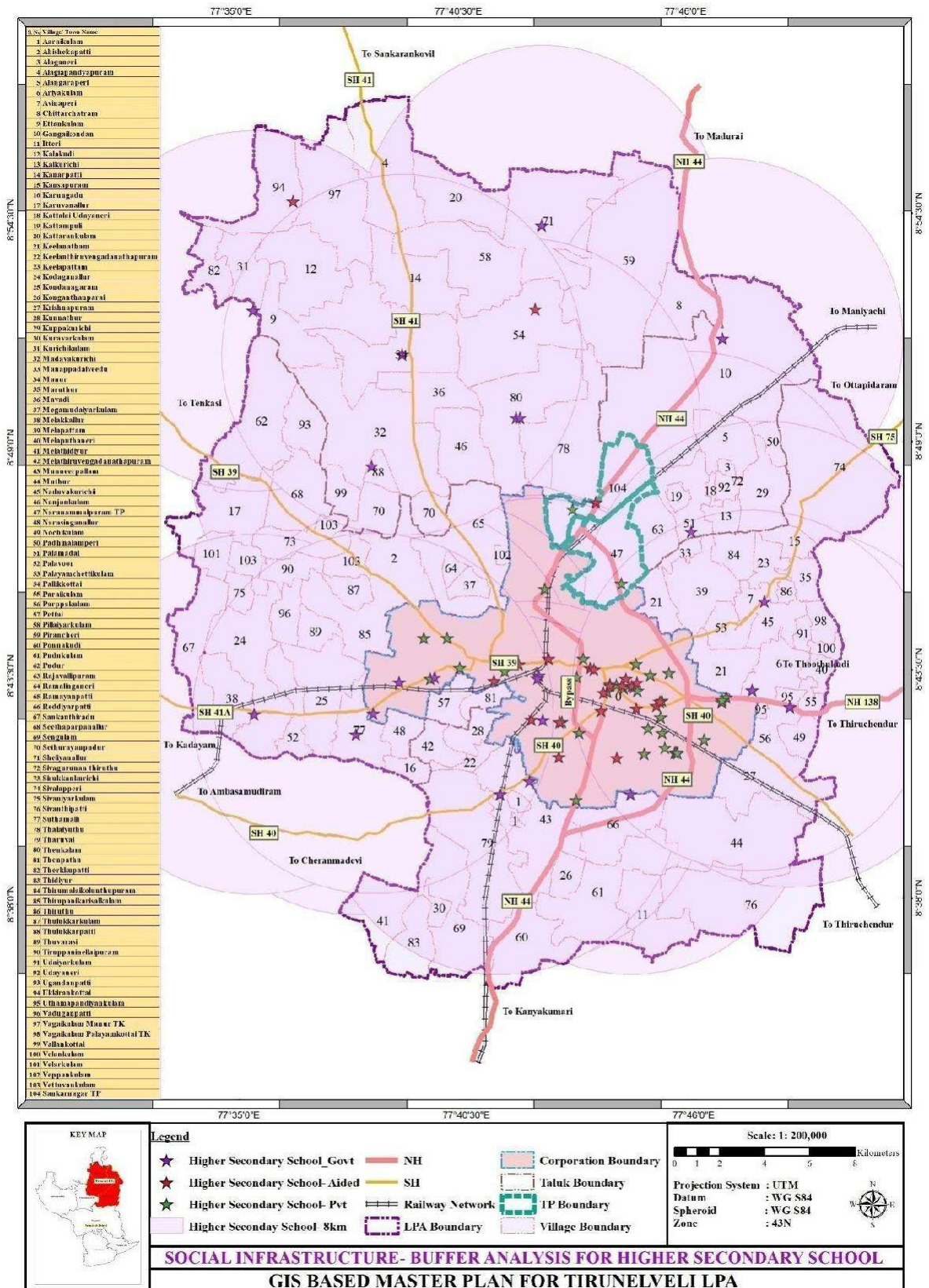


Map 7.4 BUFFER ANALYSIS FOR HIGH SCHOOL





Map 7.5 BUFFER ANALYSIS FOR HIGHER SECONDARY SCHOOL





7.1.2 STRATEGY

- The future plans should take into account the projection made in the Master Plan decision should be taken on the share of government sector and public sector in the opening of new schools.
- Spatial distribution of schools as per standards should be ensured.
- Further reduction in the drop-out rate and increase in enrollment, especially of girl's students should be pursued.
- Recruitment of trained teachers should be done on a regular basis.
- In-service training at periodic intervals especially in science subjects and in English should be given priority

7.1.3 HIGHER EDUCATION

Tirunelveli ranks high for the number of educational institutions in districts of Tamil Nadu. Tirunelveli has a large number of educational institutions both in the government and the private sector. In Tirunelveli district, there are two universities (1. Manonmaniam Sundaranar University, 2. Anna University), about twenty-five arts and science colleges, one government medical college with hospital, Government Siddha medical college, twenty engineering colleges, one law college. In Tirunelveli LPA, there are two universities, six engineering colleges, 12 Arts and science colleges, 8 Polytechnic colleges, 5 ITI's, one Government Siddha College, One government medical college, One Veterinary College.

Manonmaniam Sundaranar University has been established in the year 1990. The university is named after the famous poet, Prof. Sundaram Pillai. It has a strong network of about one hundred and two affiliated colleges. A number of these colleges have contributed considerably to the cause of higher education for many decades. There are five colleges in this District which are more than one hundred years old. Government Siddha Medical College was established in the year 1964. Government Law College, Tirunelveli started in the year 1996, affiliated to the Tamil Nadu Dr. Ambedkar Law University, Chennai is a pioneer institution catering to the needs of the Southern districts of Tamil Nadu.

As per URDPFI guidelines, the number of available educational institutions is satisfying the planning norms in Tirunelveli LPA. Existing educational institution caters the good education to the present LPA population.



7.2 HEALTHCARE FACILITIES

The WHO defines health as a state of “complete physical, mental and social well-being and not merely the absence of disease or infirmity.” The basic objective of the Health and Medical Department is to provide accessible, affordable and acceptable healthcare in Rural and Urban areas. The Tirunelveli LPA has 3 Government Hospitals at Melapalayam, Kandiyaperi and Palayamkottai. One Government Siddha college along with hospital is located at Palayamkottai. The following table shows the details of healthcare facilities in Tirunelveli LPA.

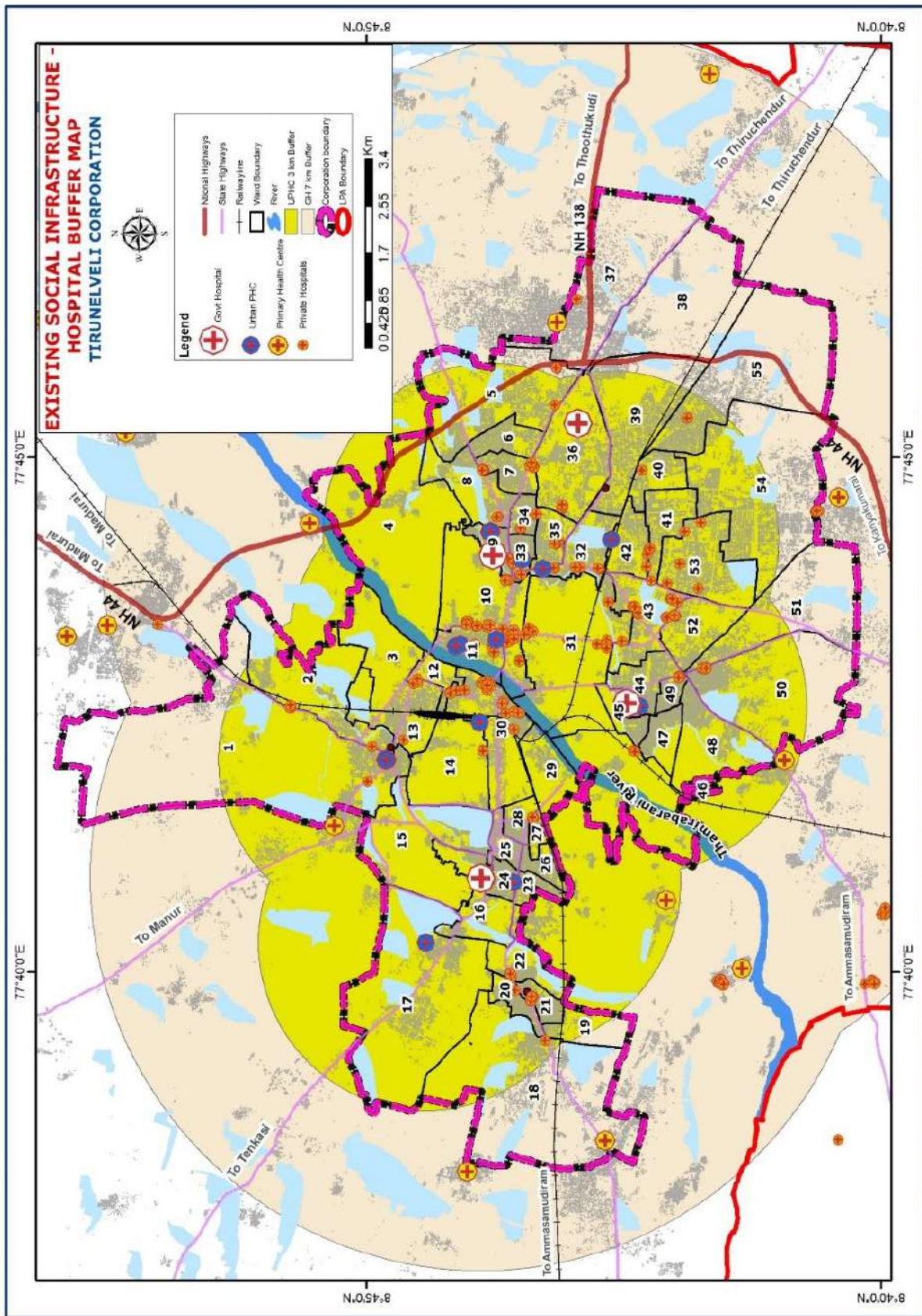
Table 7.3 LIST OF HEALTHCARE FACILITIES IN TIRUNELVELI LPA

S. No	Description	Numbers	Beds
1	Government Hospital (Allopathic-03, Siddha-01)	04	2344
2	Primary health centre	11	121
3	Urban Primary health centre	10	24
4	Private Hospitals	64	1663
5	Nursing homes	10	155
6	Clinics	286	96
7	Dispensary	6	-

(Source- Joint Director of Health Services, Tirunelveli)



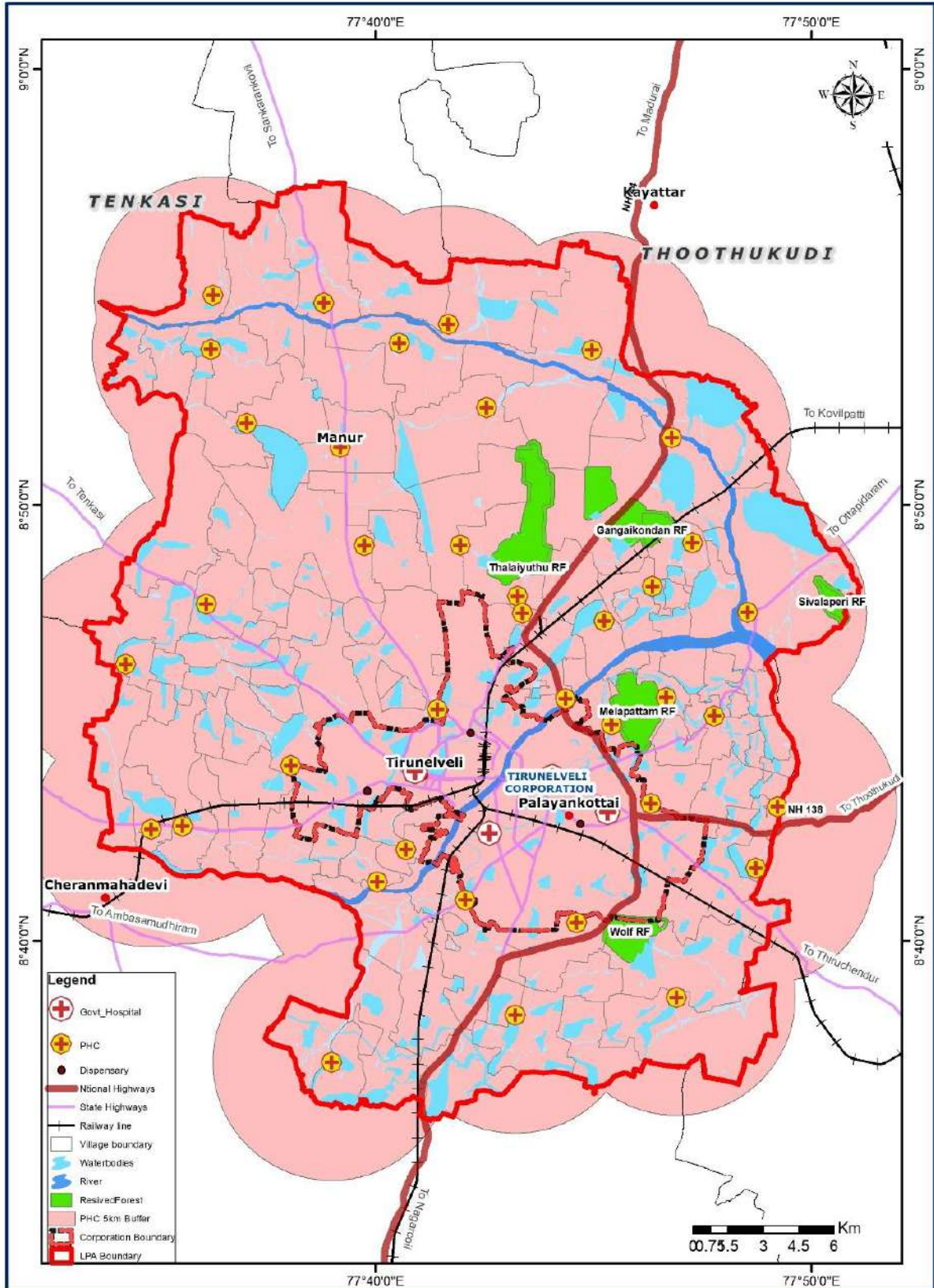
Map 7.6 HEALTH FACILITIES IN TIRUNELVELI CORPORATION





Map 7.7 HEALTH FACILITIES IN TIRUNELVELI LPA

EXISTING SOCIAL INFRASTRUCTURE HOSPITAL BUFFER MAP
TIRUNELVELI LOCAL PLANNING AREA





The norms for provision of various health care facilities based on the population are given in the URDPFI guidelines. It recommends one nursing home for 45000 to One lakh population, One General hospital for 2.5 Lakh Population, one dispensary for 15000 population. Tamilnadu Health policy suggests one primary health centre for 30,000 Population. As per norms, existing health facilities satisfies the requirement for healthcare in Tirunelveli LPA. Existing healthcare facilities has to be improved for the better service in Tirunelveli LPA.

A detailed study on the health infrastructure in LPA, delivery to poor, accessibility spatially, future requirements, contribution by private sector, modernization requirements in govt. sector etc. has to be made which may be a basis for formulation of Master Plan for health infrastructure in LPA. The position may be reviewed every 10 years and suitable measures taken on health infrastructure investments. Considering that in the plan period, majority of population will be in the rest of LPA, Govt. / Govt. agencies should concentrate on provision of higher order / specialty hospitals in the rest of LPA.

For human resource development in this field, complementing colleges should be located in the rest of LPA

7.3 RECREATION FACILITIES

Parks and open spaces are necessary for the residents of any town as this provides ample facilities for children and the grown up for a proper recreation. The VOC playground at Palayamkottai is owned by the Tirunelveli Corporation. The area of play ground is about 1.42 hectare. In addition, a public stadium (Anna Stadium) has been constructed at the Palayamkottai town near the High ground hospital. Sufficient galleries and rest rooms have been provided and maintained by district sports club.

In the Municipal Corporation area few recreations clubs are located at Palayamkottai Zone, the Cosmopolitan club, Lion's club, Rotary and Ladies club are the major clubs. In Tirunelveli there is one Sangeetha Sabha; where in musical concerts are often conducted apart from religious discourses. In Melapalayam Zone there is no recreational club. There is one district library located in Palayamkottai in which people read books and taking notes; this building is functioning in Government land.

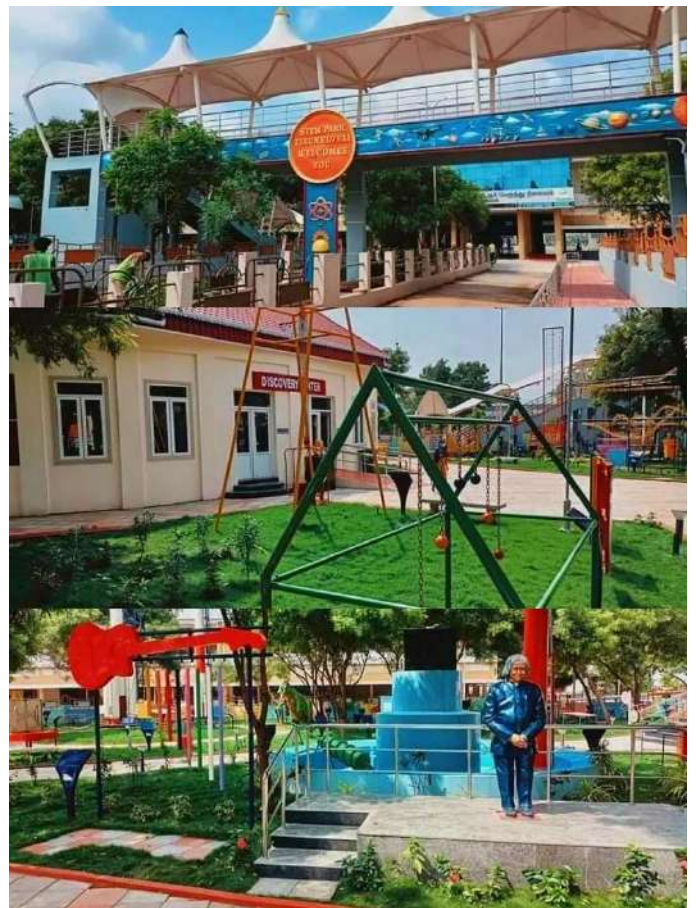


Figure 7.1 RECENTLY CONSTRUCTED (2023) RECREATIONAL FACILITIES IN LPA VOC STADIUM (Left) STEM PARK (Right)



In addition to that three branch libraries are in the Corporation area and 11 magazines reading centres are also conducted by voluntary organizations. In the Corporation area there are 14 cinema theatres which serve the people of the Corporation area, in respect of recreation

Indian Cement Company Ground, also known as ICL Sankar Nagar Cricket Ground is a major cricket ground located in Sankar nagar town Panchayat. The ground is in Bala Vidyalaya School run by India Cements. It is adjacent to the NH 44 in Thalaiyuthu village. From 2016, the ground has been used for hosting Tamil Nadu Premier League (TNPL) matches. As of 2023, it has hosted eight first-class and two Lists a cricket matches.



Figure 7.2 ICL SHANKAR NAGAR CRICKET GROUND





Figure 7.3 RECREATION FACILITIES IN LPA

S. No	Facilities	Numbers	Area (hec)
1	Available Park area in LPA	160	32.25
2	Play Grounds VOC stadium Anna Stadium India Cement Cricket stadium	1 1	0.84 1.43
3	Other Play fields in LPA	11	8.16
4	Cinema theatres	14	

(Source: Tirunelveli Municipal Corporation)

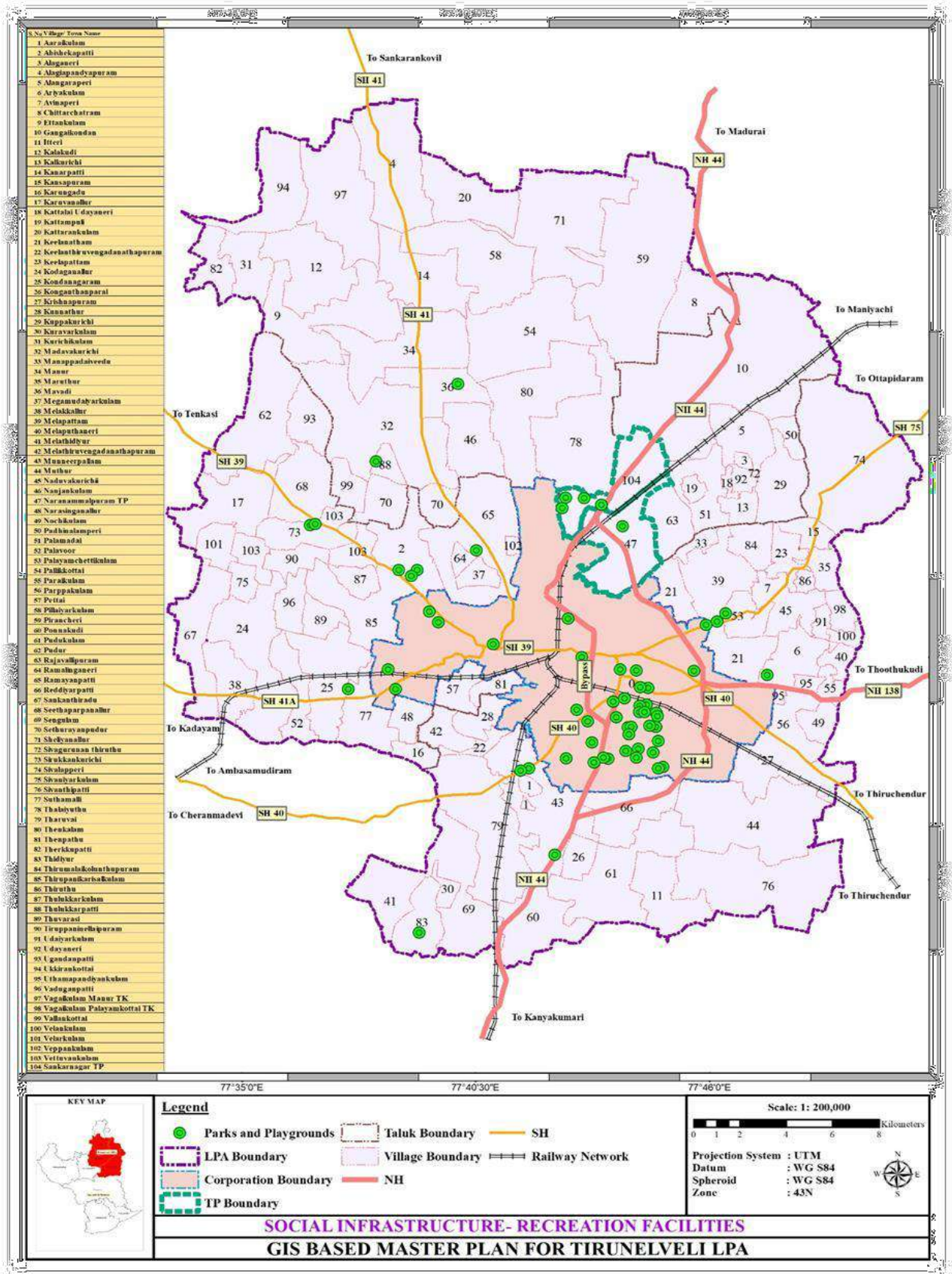
In Tirunelveli Corporation there are 160 Parks and a Playground. Recreational space including open space spreads over an area of 0.76 sq. km in the Tirunelveli LPA. According to NBC 2016, 3 Sq.m/Person is the minimum norm for open space in built-up area. This rule demands an additional area of 1.44 sq.km as open space for the present population and 2.1 sq. km. for the projected population.

Open Space Reservation	Tirunelveli Municipal Corporation	Sankar Nagar TP	Naranammal puram TP	Rest urban	of Total LPA
Population 2041	6,22,714	10,643	23,448	2,98,740	9,55,545
Existing Open space in HEC	32.25				
No. of Housing area parks required	125	2	5	60	191
Area required (0.5hec / unit)	62	1	2	30	96
No. of neighbourhood parks required	42	1	2	20	64
Area required (1.0hec / unit)	42	1	2	20	64
No. of community parks required	6			3	9
Area required (5.0hec / unit)	31			15	46
No. of district parks required	1				1
Area required (5.0hec / unit)	5				5
TOTAL AREA REQUIRED FOR OPEN SPACE IN SQ.KM			2.1		

The open space reserved for park in any layout should not be less than 100 sq. m, with a minimum width of 10m as recommended in TNCDBR-2019 for proposed layouts with area exceeding 10000sq.m.



Map 7.8 PARKS AND PLAYGROUNDS IN TIRUNELVELI





7.4 MISCELLANEOUS FACILITIES

7.4.1 FIRE SERVICE STATION

There are 3 fire service stations in Tirunelveli LPA. As per URDPFI standards one fire service station is required for every 2 Lakh Population with a service radius of 5-7 km. The one of existing fire service stations is required for the safety of the Present Population. The table 7.4 below shows the list of Fire Service Stations in Tirunelveli LPA.

Table 7.4 FIRE SERVICES STATIONS IN TIRUNELVELI LPA

S. No	Fire service station	Service radius of the stations
1	Palayamkottai	Northeast-Melapattam(8Km) East-Krishnapuram (10km) West-Tirunelveli Junction(6km) North-Sankar nagar (10km) Southwest-Tharuvai(10km)
2	Pettai	East-Sripuram (8km) West-Melakallur (8km) South-Gopalamudram(7km) North-Rastha(15km)
3	Gangaikondan	East-Sivalaperi(7km) West-Ukkirankottai(28km) South-Thalaiyuthu(8km)

Source: Fire and rescue services department, Tirunelveli

Table 7.5 REQUIRED AND DEMAND AND EXISTING FIRE SERVICES STATIONS IN TIRUNELVELI LPA

year	Population	URDPFI	Existing fire Stations	Required	Existing Demand
2011	733938	200000/1unit	3	4	1
2041	955545	200000/1unit	3	5	2

7.4.2 BURIAL GROUND

In Tirunelveli LPA, there are 77 numbers of burial grounds. Following table 7.6 shows the existing burial grounds in Tirunelveli LPA. And there are 2 Numbers of gasifier crematorium in Tirunelveli Corporation.

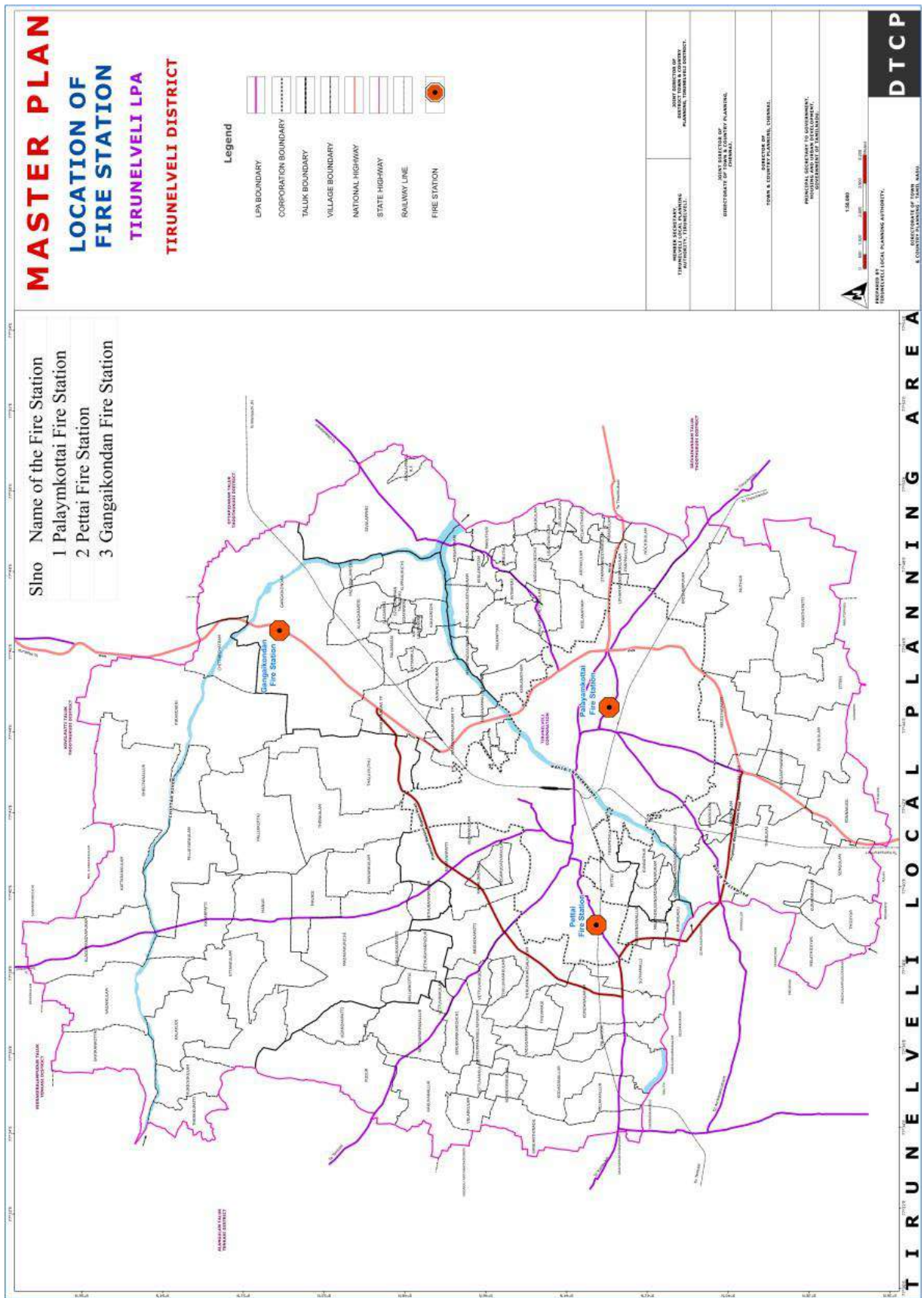
Table 7.6 NUMBER OF BURIAL GROUNDS IN TIRUNELVELI LPA

S. No	Description	Numbers
1	Tirunelveli Corporation	11
2	Sankar nagar and Naranammalpuram TP	02
3	Revenue Villages	64

Source: Primary Survey

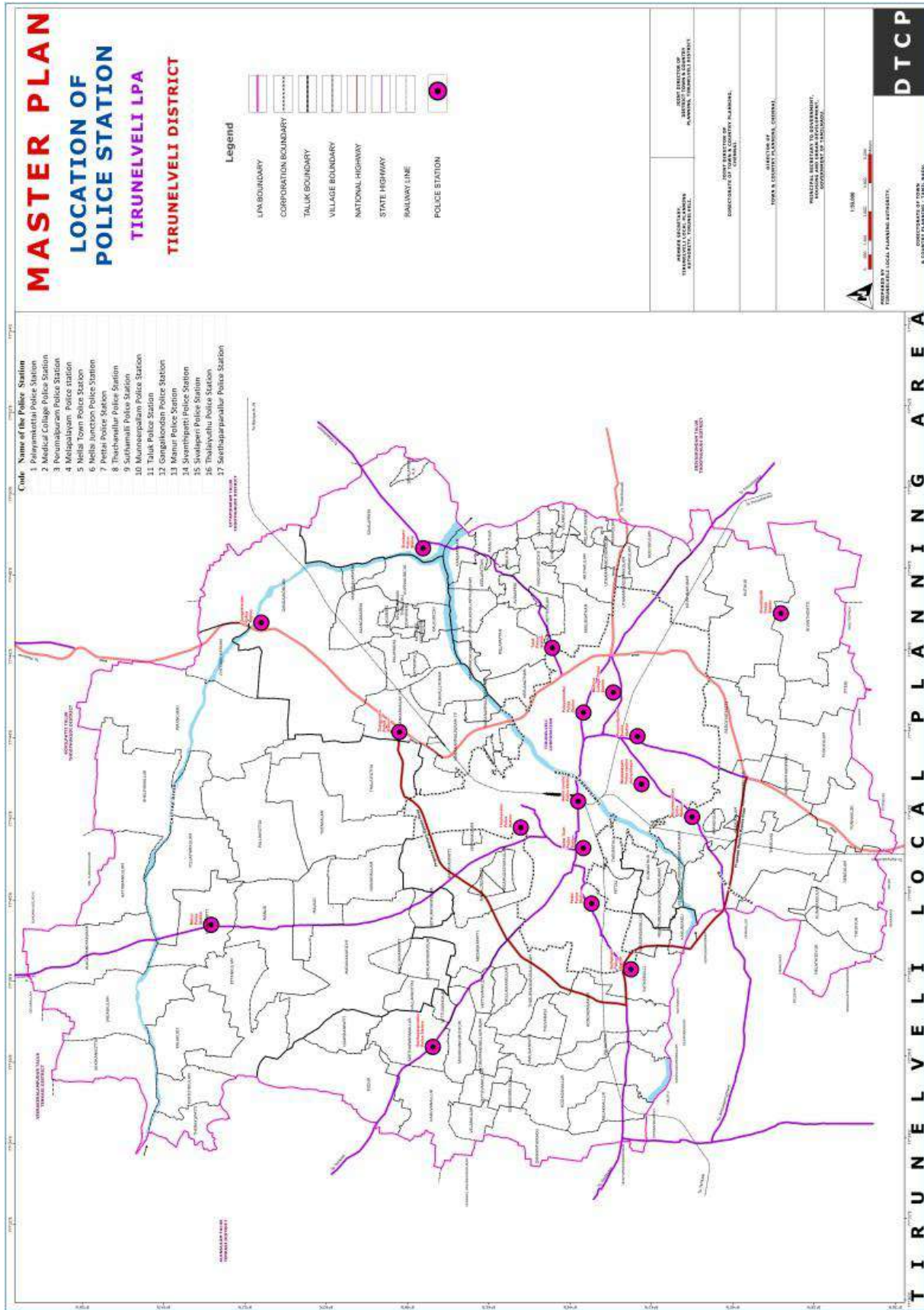


Map 7.9 LOCATIONS OF FIRE STATIONS IN LPA



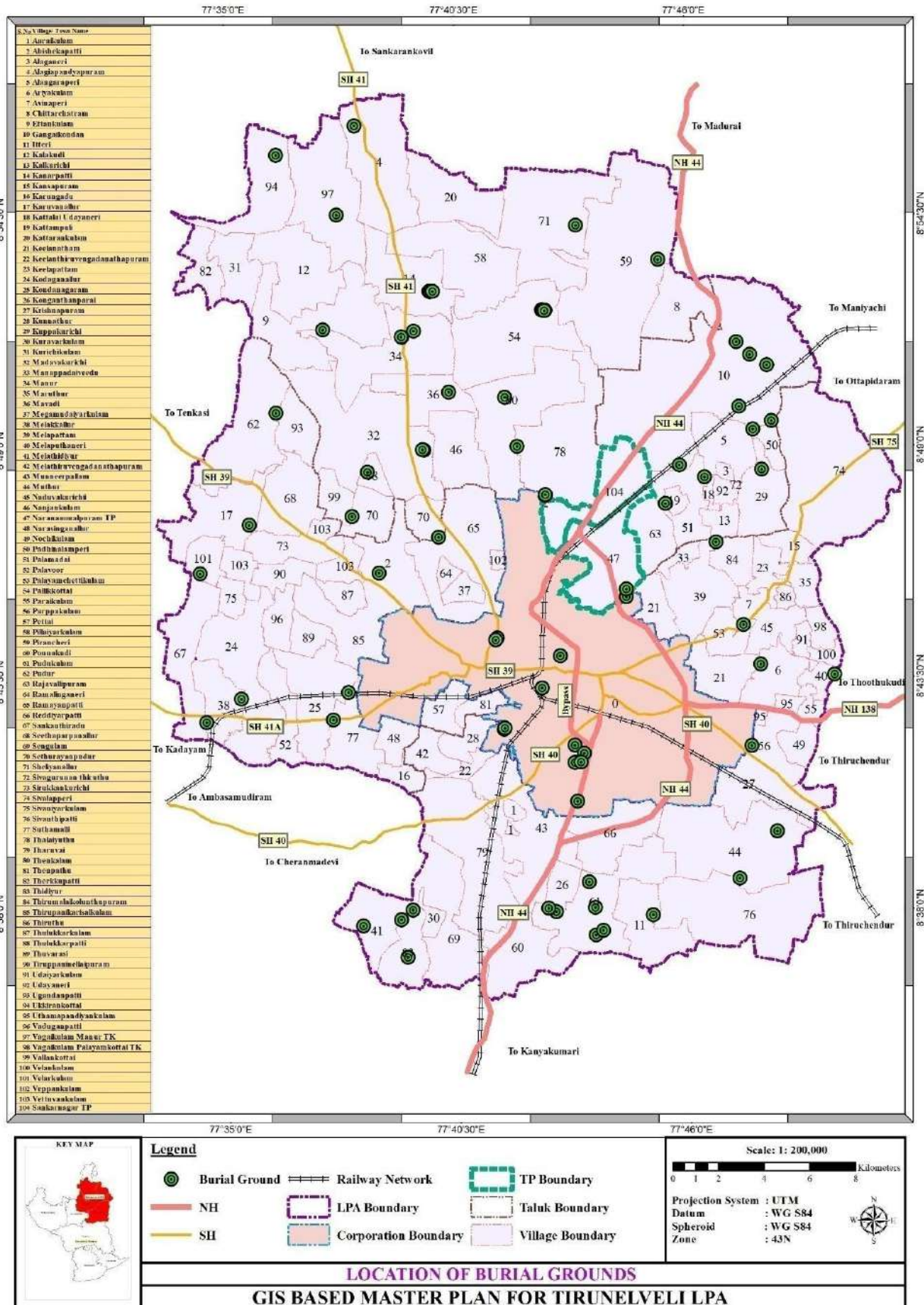


Map 7.10 LOCATIONS OF POLICE STATIONS IN LPA





Map 7.11 BURIAL GROUNDS IN TIRUNELVELI LPA





7.4.3 POSTAL SERVICES

For growth and modernization, an efficient postal system is crucial and postal system is fast emerging as an important component of modern communication and I.T. sector. Our Indian postal system is one of the largest in the world. It also plays a crucial role in resource mobilization, apart from providing a variety of postal services. Major initiatives envisaged in the Tenth Plan include- Up-gradation constituting the bulk of outlay proposed, identifying computerization and connectivity as the core activity in the tenth Plan, coupled with modernization and mechanization programme and – Expansion of postal network business development and –Financial services

7.4.4 TELECOMMUNICATION

Telecommunication is an important tool for socio-economic development. Department of Telecommunication has been formulating development policies for accelerating the growth of telecom services in our country. There have been far-reaching developments in the recent past in the telecom, IT, consumer electronics and media industries worldwide. Considering the above and also to facilitate India's vision of becoming an IT superpower and develop a world-class telecom infrastructure in India, a New Telecom Policy was announced in 1999. The New Policy Framework will focus on creating an environment, which enables continued attraction of investment in the sector including private sector and allow creation of communication infrastructure by leveraging technological development.

7.4.5 SUMMARY

Social infrastructure plays a vital role in improving the quality of life in an area as well as the overall economic development. It provides basic services that will improve the physical and mental well-being of the people. In terms of education, Tirunelveli LPA has a fair share of infrastructure facilities. The Tirunelveli Corporation, Town Panchayats and the villages within the LPA are well served with Primary School within a reach of 1km. In case of middle school is concerned, The Tirunelveli Corporation and Town Panchayats are well served. Several villages are deprived of Middle Schools within 3km. The same is reflected for the High schools in the LPA. Some of the villages located away from the Corporation are deprived of High Schools within a reach of 5km. New facilities can be proposed at Pudukulam and Pudur which would satisfy the needs of middle and high schools in the LPA. While looking at the Higher Secondary Schools, the rural areas deprived of Higher Secondary Schools are within the accessible distance (8km) from the nearest Higher Secondary School. As per norms, existing health facilities satisfies the need for healthcare in Tirunelveli LPA.



Strategy

- Maintenance of existing parks / playgrounds and provision of new parks and playgrounds in the rest of LPA require attention.
- A database on the existing parks & playgrounds within LPA can be created which is required for planning and its development.
- DTCP can create OSR fund out of the OSR charges collected apportioning proportionately with reference to the amounts collected in the jurisdiction of the local bodies concerned, reserving a certain percentage for overall recreational facility development at LPA level
- The local bodies concerned should identify lands for development as open spaces and initiate and complete action for acquisition/alienation and provide these facilities.



TRAFFIC AND TRANSPORTATION

CHAPTER 08

**MASTER PLAN
2041
TIRUNELVELI LPA**



8. TRAFFIC AND TRANSPORTATION

Tirunelveli is well connected to its neighboring districts via road and rail. It also lies in close proximity to Thoothukudi Airport, which offers daily flights to Chennai and Bangalore and V.O.C Port. Road network in Tirunelveli with 9 radials emerging from the heart of the city provides good connectivity to all major urban centres situated around the city. Out of these, two are National Highways - NH 44 and NH 138 and six are state highways, SH 75A, SH 75, SH 41, SH 40, SH 41A and SH 39. Almost 10 railway Stations can be found in and around Tirunelveli Urban Area, out of which Tirunelveli Junction acts as the most important one. It is also an important node in the railway routes of Southern Railway, where the Tenkasi line and Tiruchendur line meet with Kanyakumari and Vanchi Maniachi line.

8.1 VEHICULAR REGISTRATION AND CHARACTERISTICS

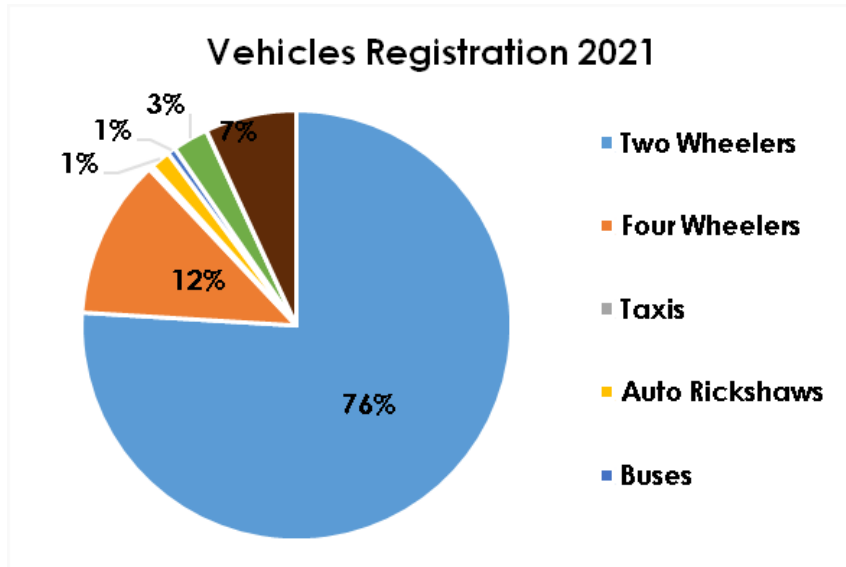
8.1.1 VEHICULAR REGISTRATION TRENDS

The vehicle population growth of Tirunelveli is not as rapid as compared to other cities in Tamil Nadu. Nevertheless, it is observed that a good portion of the newly registered vehicles are two wheelers which shows a growing dependency on the private modes for transportation – as shown in Table 8.1. As of 2021, 16603 vehicles were registered under Tirunelveli RTO, out of which 76% were two wheelers (refer figure 43).

Table 8.1 VEHICLE REGISTRATION IN TIRUNELVELI FROM 2017 TO 2021

Year	2017	2018	2019	2020	2021
Two Wheelers	15960	15617	17484	16813	12612
Four Wheelers	2420	2809	2692	2397	1995
Taxis	187	211	221	223	55
Auto Rickshaws	533	422	380	495	248
Buses	88	30	43	58	102
Goods Vehicles	363	406	696	673	444
Tractors and Trailers	19	20	5	1	4
Others	226	244	604	1443	1143
Total	19796	19759	22125	22103	16603

Source: CMP for Tirunelveli LPA



Source: CMP for Tirunelveli LPA

Figure 8.1 VEHICLE REGISTRATION- 2021

It is observed that, the city has not been experiencing a rapid growth; vehicular growth can also be seen to follow this pace of development. There has been a sharp decline in the number of vehicular registrations in the year 2020; this is believed to be as a result of the impact of COVID on the economy. The past few years has also seen a slight growth in electric two- wheeler registrations in the city. The comparison of passenger and goods vehicles registered over the

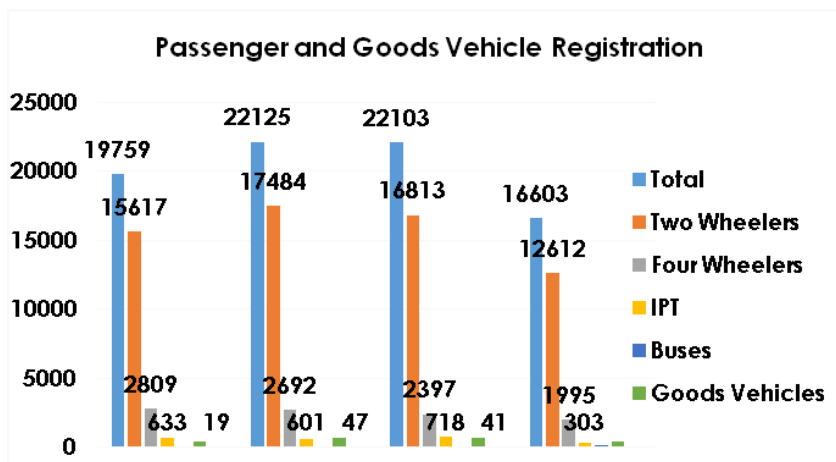


Figure 8.2 PASSENGER AND GOODS VEHICLES REGISTERED FROM 2018 TO 2021

past few years is shown in FIGURE 8.2.

Source: CMP for Tirunelveli LPA

8.2 ROAD NETWORK INVENTORY

The existing road pattern in Tirunelveli LPA is more of a radial pattern. Based on the capacity and functions, the roads in Tirunelveli LPA can be categorized as Arterial Roads, Sub-Arterial Roads, Collector Roads and Local Roads.



Table 8.2 ROAD NETWORK HIERARCHY IN TIRUNELVELI LPA

S. No.	Road Type	Length (km)
1.	Arterial Roads	99
2.	Sub-Arterial Roads	58
3.	Collector Roads	377

Source: CMP for Tirunelveli LPA

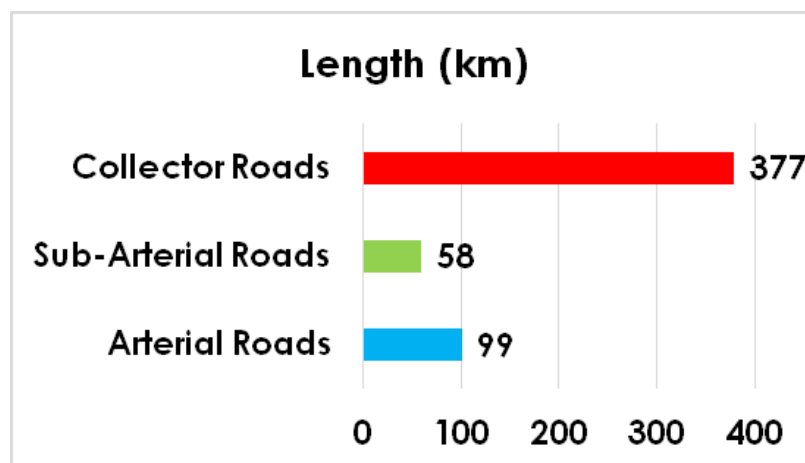


Figure 8.3 ROAD NETWORK HIERARCHY IN TIRUNELVELI LPA

Source: CMP for Tirunelveli LPA

Table 8.3 ROAD DETAILS IN CORPORATION

S. No	Type of road	Length in km
1	Bituminous Tar Road	687.76
2	Cement Concrete Road	227.31
3	Metal road	1.93
4	Paver block	15.42
5	Earthen road	0.90
Total		933.32
1	NH	23.20
2	SH	60.93
3	MDR	9.19
4	ODR	21.75
Total		115.07

Source: Tirunelveli City Municipal Corporation



8.2.1 EXISTING FOOTPATH CONDITIONS AND AVAILABILITY

Availability of footpath in the Tirunelveli LPA is presented in table 8.4 the inventory showed that majority of roads do not have footpath. About 70% of surveyed road do not have footpath.



Figure 8.4 EXISTING FOOT PATH CONDITIONS AROUND THE LPA

Table 8.4 FOOTPATH AVAILABILITY

S.No	Footpath Width (Mtrs)	% Road Length- Paved
1	No Footpath	70
2	Up to 1.2m	28
3	1.2 to 1.8	2
5	More than 1.8m	0

Source: CMP for Tirunelveli LPA



8.2.2 MODE SHARE

Two-wheelers dominate the transportation landscape, constituting 49% of the total trips. Following closely are Public Transport Trips vehicles at 23%, while cars make up 17% of the mode share. Walk trips contribute 11% to the overall transportation mode distribution.

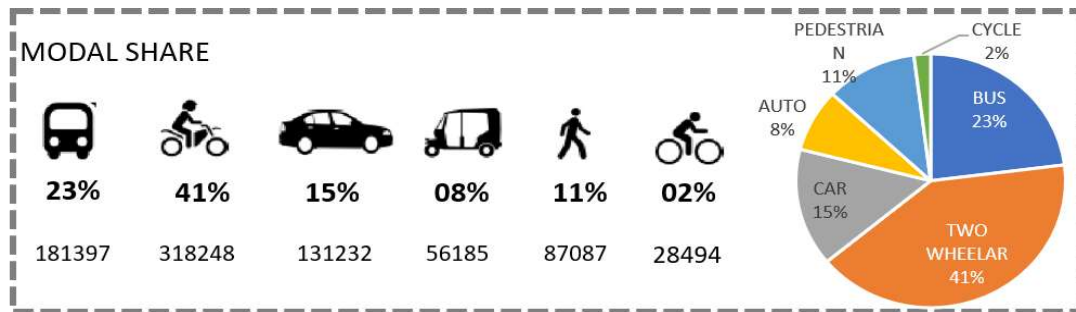


Figure 8.5 MODE SHARE IN TIRUNELVELI BASED ON HOUSE HOLD SURVEY

Source: CMP for Tirunelveli LPA

8.3 TRAFFIC SAFETY IN TIRUNELVELI LPA

8.3.1 ACCIDENT PATTERN

Road Safety is a crucial factor in evaluating the efficiency of the transportation infrastructure. On analyzing the five-year accident data it's observed that the city has high number of accidents, especially grievous ones, whose number has remained more or less the same over these years. A drop in the total accident cases in 2020 is due to the lockdown related to Covid.

Table 8.5 FIVE YEAR ACCIDENT DATA

Year	Fatal		Grievous Injury (need hospitalization)		Minor Injury (not needing hospitalization)		Non-Injury	Total no of Accidents	Total (injuries and fatalities)
	NA	NPK	NA	NPI	NA	NPI			
2017	78	85	132	205	116	153	28	354	443
2018	118	124	183	276	65	90	13	379	490
2019	91	95	203	283	46	66	17	357	444
2020	72	72	132	162	75	91	1	280	325
2021	66	66	132	160	136	188	17	351	414
NA-Number of Accidents			NPK- Number of People Killed				NPI- Number of People Injured		

Source: CMP for Tirunelveli LPA



It was also seen that the road where the highest number of accidents have happened is NH 44. North and South Bypass Road SH 75A is the second highest in terms of number of accidents. Refer FIGURE 8.6 for accident details in Tirunelveli.

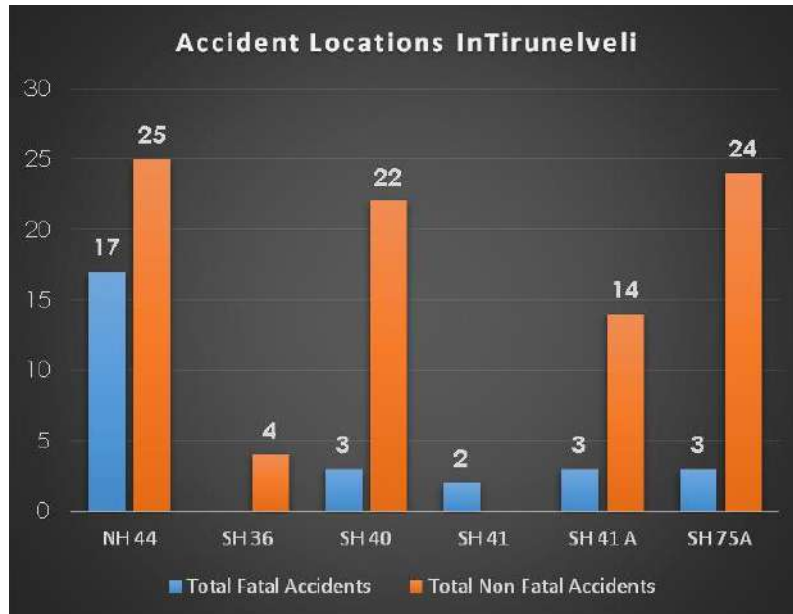


Figure 8.6 ACCIDENTS IN TIRUNELVELI

Source: CMP for Tirunelveli LPA

Blind Spots at junctions and road visibility related issues were the main reported reasons for the accidents. The FIGURE 8.7 shows the number of accidents that took place at junctions, highest number of accidents took place at staggered junctions.

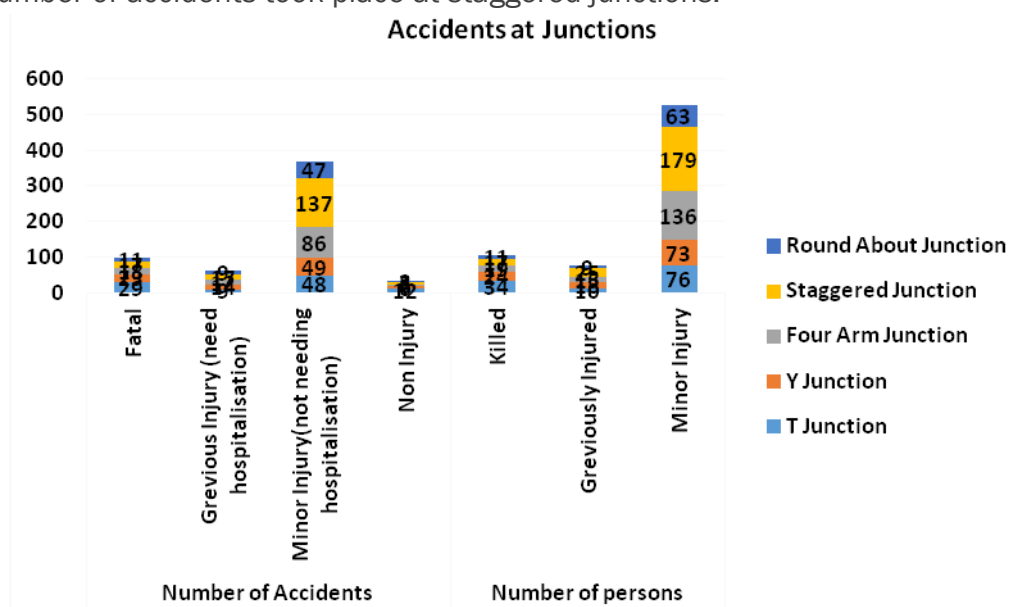


Figure 8.7 ANALYSIS OF ACCIDENTS AT JUNCTIONS

Source: CMP for Tirunelveli LPA



There are a total of seven black spots within the Tirunelveli LPA.

Table 8.6 ACCIDENT BLACK SPOTS IDENTIFIED BY TRAFFIC POLICE, TIRUNELVELI

Place	2021		
	Fatal	Non-Fatal	Total
Pottal Villakku		3	3
Keelathanam Villakku	1	1	2
Peddiyarpatti Hills		3	3
IRT Palam	1	1	2
Rajagopal Nagar		1	1
Reliance Junction	1	4	5
Thatchanallur Railway Station		4	4

Source: CMP for Tirunelveli LPA

8.4 TRAFFIC ANALYSIS

Traffic analysis is an important component which is essential in determining the demand and supply of a transportation facility and its efficiency in serving the demand. It is one of the methods used to evaluate the transportation needs during the planning phase.

To determine the existing conditions of traffic in Tirunelveli LPA the following surveys were conducted namely; Volume Count Survey, Parking Survey, Moving Car Method

8.4.1 VOLUME COUNT SURVEY

OUTER CORDON SURVEY

Outer Cordon volume counts were carried out at ten cordon locations to understand the interaction of vehicles coming in and going out from the city. The name of the cordon locations, considered as part of this survey, is shown in Table 8.7



Table 8.7 OUTER CORDON SURVEY LOCATIONS

S.No.	Cordon Location Name
OC 1	SH 41A (Near HP Petrol Pump - Hayagriva Agency)
OC2	Tenkasi road
OC3	Puliangudi-Tirunelveli Road (Supreme Home Goods Store)
OC4	NH 44 (Pandarakulam Esaki Amman Temple)
OC5	SH 75 (Near CSI Christ Church Sivalapperi)
OC6	Vasavappapuram police check post
OC 7	Indian Oil Petrol Pump Vitthal Puram
OC8	Essar Petrol Pump Perinbapuram
OC9	SH 40 (Near Indian Oil Petrol Pump)

Source: CMP for Tirunelveli LPA

Daily Volume Counts at Cordon Locations

As per the primary survey, the maximum traffic coming in and going outside Tirunelveli was observed along NH 44 (Pandarakulam Esaki Amman Temple), at OC 4. Temporal variation of the traffic at outer cordon locations is shown in map 8.1.



Map 8.1 TRAFFIC VOLUME COUNT LOCATIONS

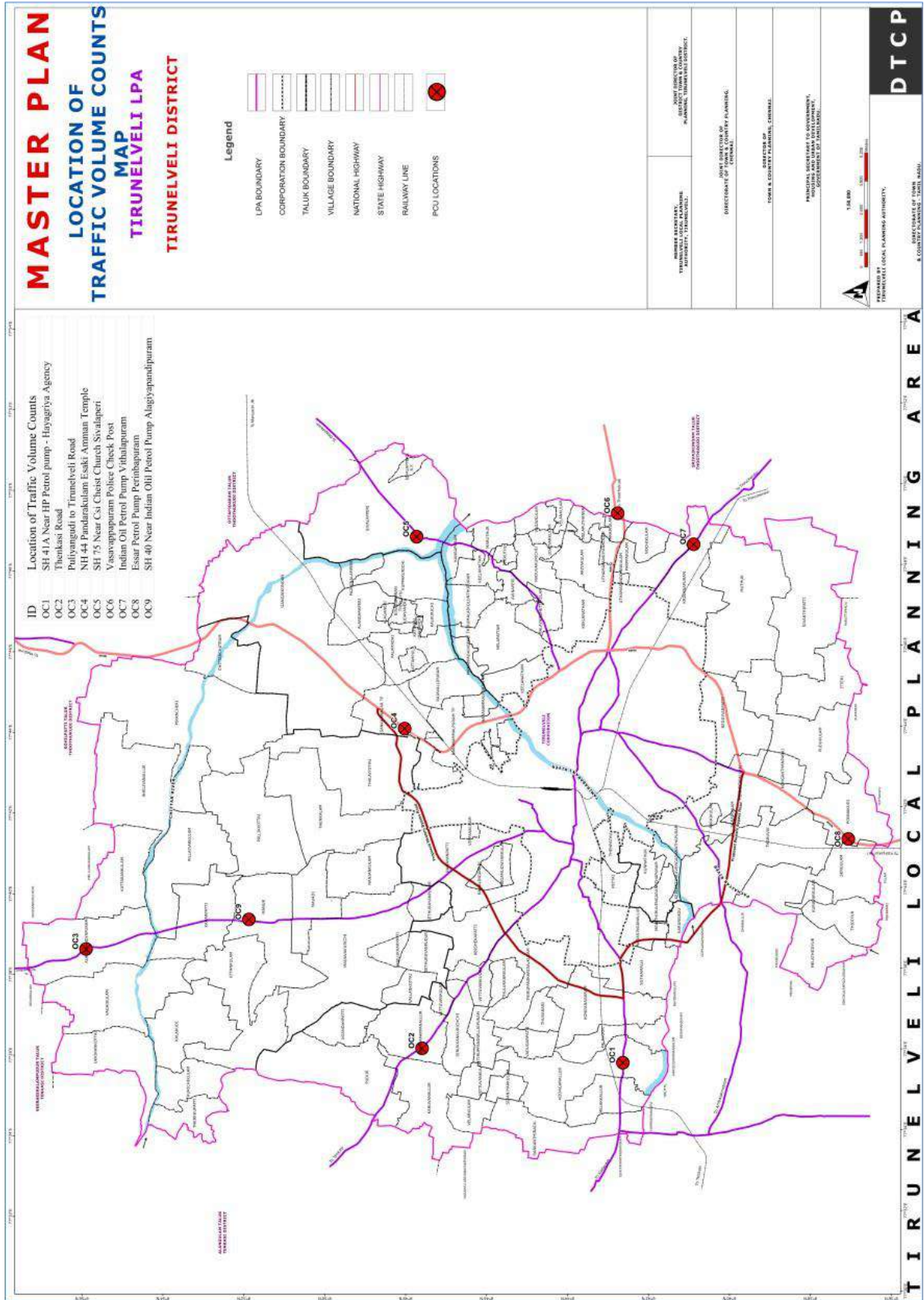




Table 8.8 TRAFFIC VOLUME COUNTS AT CORDON LOCATIONS

S. No		Locations	Direction	Vehicle	PCUs	Total Vehicle	Total PCU																																																																																											
1	OC 1	SH 41A (Near HP Petrol Pump - Hayagriva Agency)	Towards Tirunelveli	6060	5456	11918	10751																																																																																											
			Outside Tirunelveli	5858	5294			2	OC 2	Tenkasi road	Towards Tirunelveli	4165	4933	8205	9486	Outside Tirunelveli	4040	4553	3	OC 3	Puliangudi- Tirunelveli Road (Supreme Home Goods Store)	Towards Tirunelveli	5515	5590	11226	11403	Outside Tirunelveli	5711	5814	4	OC 4	NH 44 (Pandarakulam Esaki Amman Temple)	Towards Tirunelveli	9796	11475	20383	23743	Outside Tirunelveli	10587	12268	5	OC 5	SH 75 (Near CSI Christ Church Sivalaperi)	Towards Tirunelveli	2004	2256	4015	4472	Outside Tirunelveli	2011	2217	6	OC 6	Vasavappapuram police check post	Towards Tirunelveli	9049	9506	18256	19869	Outside Tirunelveli	9207	10362	7	OC 7	Indian Oil Petrol Pump Vitthal Puram	Towards Tirunelveli	9523	9355	18343	17768	Outside Tirunelveli	8820	8413	8	OC 8	Essar Petrol Pump Perinbapuram	Towards Tirunelveli	10021	12029	19390	22937	Outside Tirunelveli	9369	10908	9	OC 9	SH 40 (Near Indian Oil Petrol Pump)	Towards Tirunelveli	8389	7830	16311	15221	Outside Tirunelveli	7922	7391	TOTAL		
2	OC 2	Tenkasi road	Towards Tirunelveli	4165	4933	8205	9486																																																																																											
			Outside Tirunelveli	4040	4553			3	OC 3	Puliangudi- Tirunelveli Road (Supreme Home Goods Store)	Towards Tirunelveli	5515	5590	11226	11403	Outside Tirunelveli	5711	5814	4	OC 4	NH 44 (Pandarakulam Esaki Amman Temple)	Towards Tirunelveli	9796	11475	20383	23743	Outside Tirunelveli	10587	12268	5	OC 5	SH 75 (Near CSI Christ Church Sivalaperi)	Towards Tirunelveli	2004	2256	4015	4472	Outside Tirunelveli	2011	2217	6	OC 6	Vasavappapuram police check post	Towards Tirunelveli	9049	9506	18256	19869	Outside Tirunelveli	9207	10362	7	OC 7	Indian Oil Petrol Pump Vitthal Puram	Towards Tirunelveli	9523	9355	18343	17768	Outside Tirunelveli	8820	8413	8	OC 8	Essar Petrol Pump Perinbapuram	Towards Tirunelveli	10021	12029	19390	22937	Outside Tirunelveli	9369	10908	9	OC 9	SH 40 (Near Indian Oil Petrol Pump)	Towards Tirunelveli	8389	7830	16311	15221	Outside Tirunelveli	7922	7391	TOTAL						128047	135650						
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Source: CMP for Tirunelveli LPA

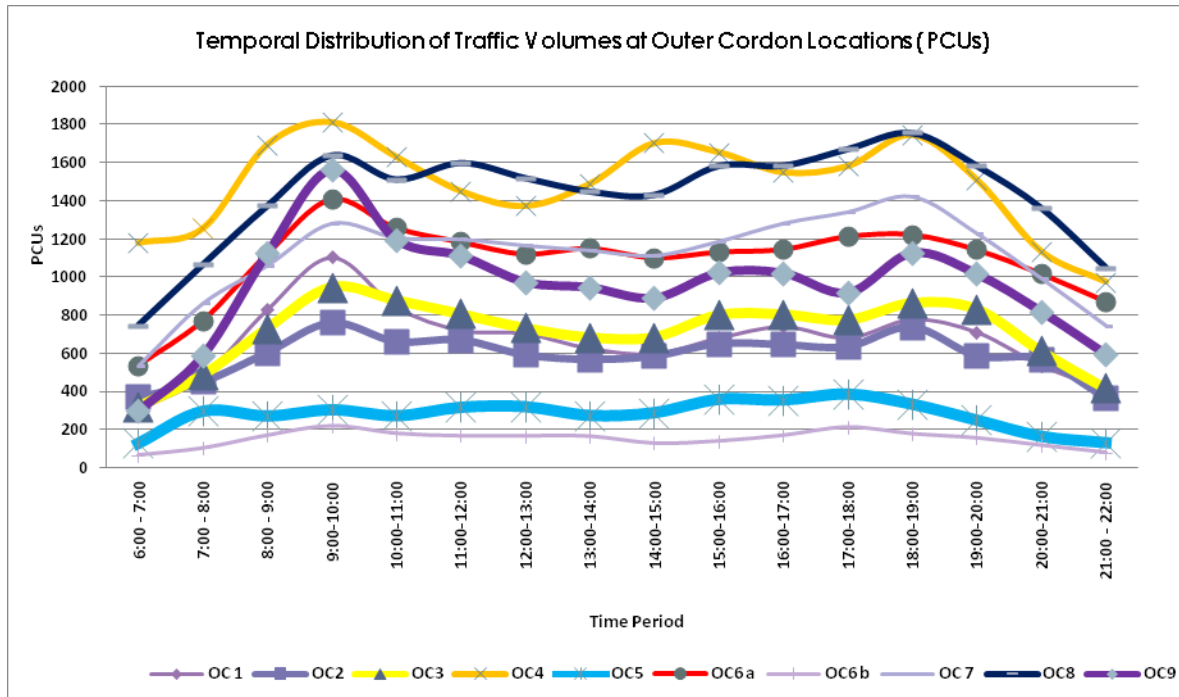


Figure 8.8 TEMPORAL VARIATION OF PCUS ON ALL CORDON LOCATIONS

- Major flow observed on NH 44 destined towards Nagercoil & Kanyakumari. 23,473 PCU per day traffic observed near Pandarakulam Esaki Amman Temple, which is a gateway to Tirunelveli for vehicles coming from the North.
- The average daily traffic entering the city is 6843
- The average daily traffic leaving the city is 6722

8.4.2 TRAFFIC VOLUME COUNT AT INTERSECTIONS

Intersection Turning/Traffic Volume Counts (CVC) were carried out at 17 critical locations, names of which are given in table 8.9.

Table 8.9 SURVEY LOCATIONS OF CVC AT INTERSECTIONS

S. No.	Junction Name
JN 1	Chellapandyan Flyover Junction
JN 2	NH 44 and Madurai Road Intersection
JN 3	Veerapandiya Kattabomman Statue Junction
JN 4	Pettai Roti Kadai Junction
JN 5	Trivandrum Road-South By Pass Road Junction



JN 6	NH 44 - Trivandrum Road Junction
JN 7	Samadhanapuram Junction
JN 8	NH 44- NH 138 Junction
JN 9	Trivandrum Road - Ambai Road Junction
JN 10	Reliance Petrol Pump Junction
JN 11	Town Arch Junction
JN 12	Tyagaraja Nagar Railway Gate Junction
JN 13	West Car Street- South Car Street Junction
JN 14	Madurai Road North By Pass Road Junction
JN 15	Nainarkulam Road, Tirunelveli Sankarankovil Road Junction
JN 16	NH 44 Sivalaperi Road Junction
JN 17	Swami Nellaiappar Highroad- Tirunelveli Old Bus Stand Road Junction

Source: CMP for Tirunelveli LPA

Chellapandyan Flyover Junction, Reliance Petrol Pump Junction, Tirunelveli Old Bus Stand Road Junction carry more than 85,000 vehicles (80,000 PCUs) per day and more than 7,000 vehicles during peak hour. Town Arch Junction, Veerapandiya Kattabomman Statue Junction and Trivandrum Road-South bypass Road Junction serve more than 60,000 vehicles every day.

8.4.3 PEDESTRIAN COUNT SURVEY

Pedestrian count data will be used frequently in planning applications. The data collected will be used to evaluate sidewalk and crosswalk needs, to justify pedestrian signals, and to time traffic signals.

A pedestrian count was carried out for a period of 16 hours in the 6 identified critical locations (ref Table 8.10) in Tirunelveli. The analysis enabled identification of the High-Risk Pedestrian Zones in the Tirunelveli LPA and will enable in improvement options for pedestrian facilities in the Tirunelveli LPA.



Table 8.10 PEDESTRIAN COUNT SURVEY LOCATIONS

Code	Pedestrian Counts
Ped 1	Palayamkottai Market
Ped 2	Car Street Entrance
Ped 3	Chellapandyan Flyover Junction
Ped 4	Thachenellur Junction
Ped 5	Tirunelveli New Bus Stand/ Smart City Park
Ped 6	Railway Station/ Old Periya Bus Stand

Source: CMP for Tirunelveli LPA

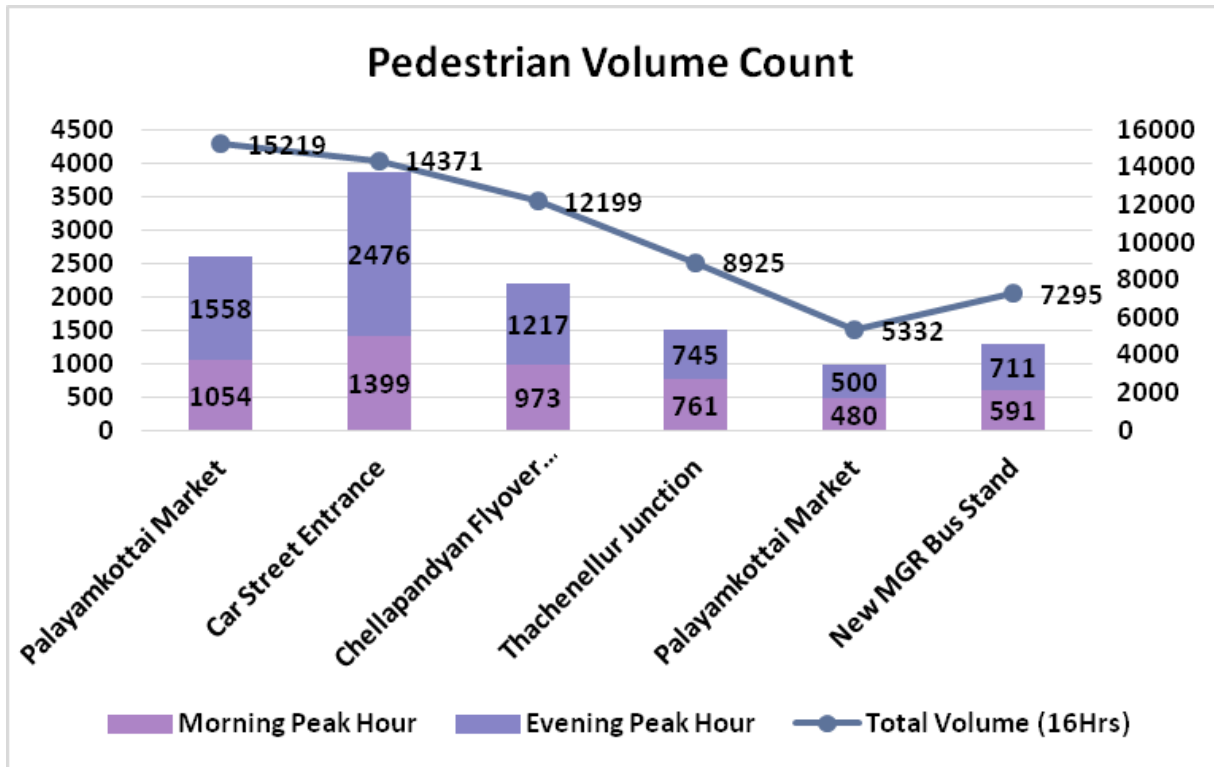


Figure 8.9 TIRUNELVELI PEDESTRIAN SURVEY- MORNING AND EVENING PEAK

Source: CMP for Tirunelveli LPA



Table 8.11 SUMMARY OF PEDESTRIAN FLOW CHARACTERISTICS

S. No	Location Name	Morning Peak Hour		Evening Peak Hour		Total Volume (16Hrs)
		Volume	Time	Volume	Time	
1	Palayamkottai Market	1054	09:00 - 10:00	1558	19:00 - 20:00	15219
2	Car Street Entrance	1399	12:00 - 13:00	2476	18:00 - 19:00	14371
3	Chellapandyan Flyover Junction	973	09:00 - 10:00	1217	16:00 - 17:00	12199
4	Thatchanallur Junction	761	11:00 - 12:00	745	20:00 - 21:00	8925
5	Palayamkottai Market	480	09:00 - 10:00	500	18:00 - 19:00	5332
6	New MGR Bus Stand	591	12:00 - 13:00	711	19:00 - 20:00	7295

Source: CMP for Tirunelveli LPA

8.4.4 PEDESTRIAN SURVEY OBSERVATION

Sixteen-hour count has been conducted at 7 locations in the Tirunelveli LPA. Some of the major observations are given below.

- Heavy pedestrian crossings are observed in CBD/ commercial areas compared to other locations.
- Pedestrian crossings at junctions/roads in the city ranged from 5332 to 15219 for sixteen hours duration.
- Among all the locations within the Tirunelveli LPA, heavy pedestrian crossing was observed at Palayamkottai Market followed by Car Street Entrance and Chellapandyan Flyover Junction.

8.5 PUBLIC TRANSPORT

Tirunelveli, with its present fleet of 299 buses run by TNSTC and 92 buses run by private operators, has sufficient public transport fleet to cater to its mobility needs, however currently lacks coordination between different stakeholders along with a structure for the timely up gradation of the existing fleet size. The challenges related to public transport in Tirunelveli is given in TABLE 8.12.



Table 8.12 CHALLENGES OF THE CURRENT SYSTEM

S. No.	Challenge/ Issue	Solution/ Recommendation
1	Lack of integration with other modes	Multi-modal integration with IPT systems and Rail based Systems to ensure IPT modes function as a complementary mode to the bus system.
2	Unequal Distribution of bus stops and Poor bus stops and infrastructure	Need to provide a bus stop at every 250 m to 500 m distance to ensure accessibility to the system.
3	Regulation of IPT Operations to strengthen the Public Transport Ridership.	Regulation of IPT operations on Dedicated High demand Public Transport Corridors.

Keeping in mind the current issues posed by the city bus system, it is understood that there is a need for a more organized fleet up gradation structure.

The following improvements have been proposed under the public transport system strategy for the Tirunelveli LPA:

- Organized system for fleet up gradation
- Creation and up gradation of supporting transport infrastructure
- Dedicated high demand public transport corridor

ENVIRONMENT

CHAPTER 09



MASTER PLAN
2041
TIRUNELVELI LPA



9. ENVIRONMENT

9.1 CLIMATE AND RAINFALL

The district has a peculiar climatic condition throughout year. The climate in Tirunelveli is tropical. While comparing winter and summer, the summers have much more rainfall. The average annual temperature is around 28.99 °C/ 84.182 °F in Tirunelveli. The average annual relative humidity is around 69.48%.

Table 9.1 NORMAL AND ACTUAL RAINFALL

Year	Normal Rainfall	Actual Rainfall
2005	736.9	953.1
2006	736.9	1056.5
2007	736.9	1261.5
2008	736.9	841.4
2009	736.9	901.1
2010	757.9	947.60
2011	845.1	919.0
2012	844.9	668.3
2013	845.1	1034.3
2014	845.1	1303.7
2015	845.1	1332.6
2016	845.1	383.11
2017	845.1	988.86
2018	845.1	968.9
2019	819.5	1093.6

Source: Statistical Handbook

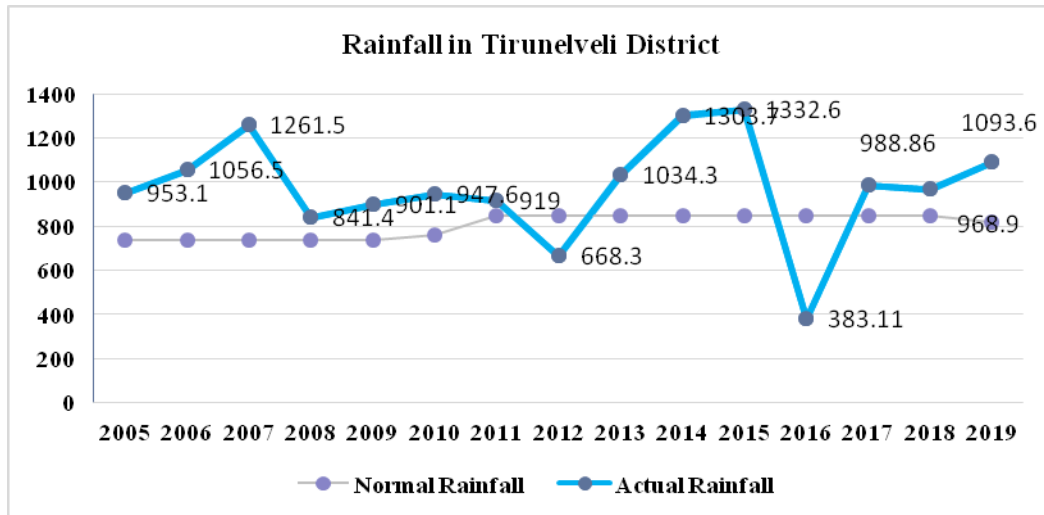


Figure 9.1 RAINFALL IN TIRUNELVELI DISTRICT

9.2 ENVIRONMENTAL ASSETS

9.2.1 WATER BODIES

The total area of water bodies constituting river, stream and lakes comprise about 122.18 sq. km of Tirunelveli LPA. It accounts to about 14.16 % of the total area of Tirunelveli LPA. River Tamirabarani is a perennial river in southern Tamil Nadu. In Tirunelveli District the River Tamirabarani starts at Agastyarkoodam peak of the Pothigai hills and leaves at Sivalaperi and enters in Thoothukudi District at Kaliyavur and finally confluences in Gulf of Mannar at Punnaikayal. It accounts to about 15.52 sq. km in area and 1.82 % of the LPA. The water from the river is used for industries to a certain extent. The SIPCOT located at Gangaikondan draws around 3785 KLD (Sanctioned- 11355 KLD) quantity of water from the river.



9.2.2 THAMIRABARANI RIVER BASIN

The Tamirabarani River Basin is one of the 17 river basins and having 7 sub basins and covers the district of Tirunelveli and Thoothukudi. Tamirabarani River Basin lies between geographic co-ordinates N. lat.8° 26' 45" to 9° 12' 00" and E. long 77° 09' 00" to 78° 08' 30" and falls within the survey of India Degree sheets 58G, 58 H and 58 L. The entire basin covers an area of about 5717.08 sq. km and lies in the revenue districts of Tirunelveli, Thoothukudi taluk of Thoothukudi District in southern Tamil Nadu. The index map is given in Figure 9.2.

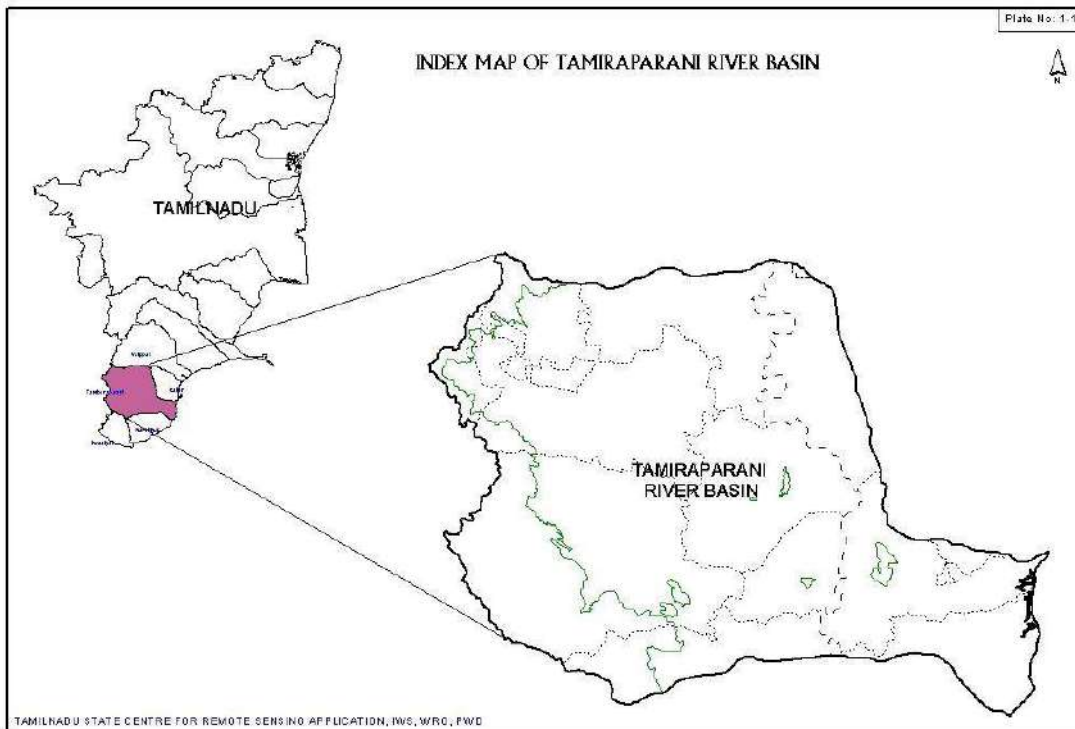


Figure 9.2 INDEX MAP OF THAMIRABARANI RIVER BASIN

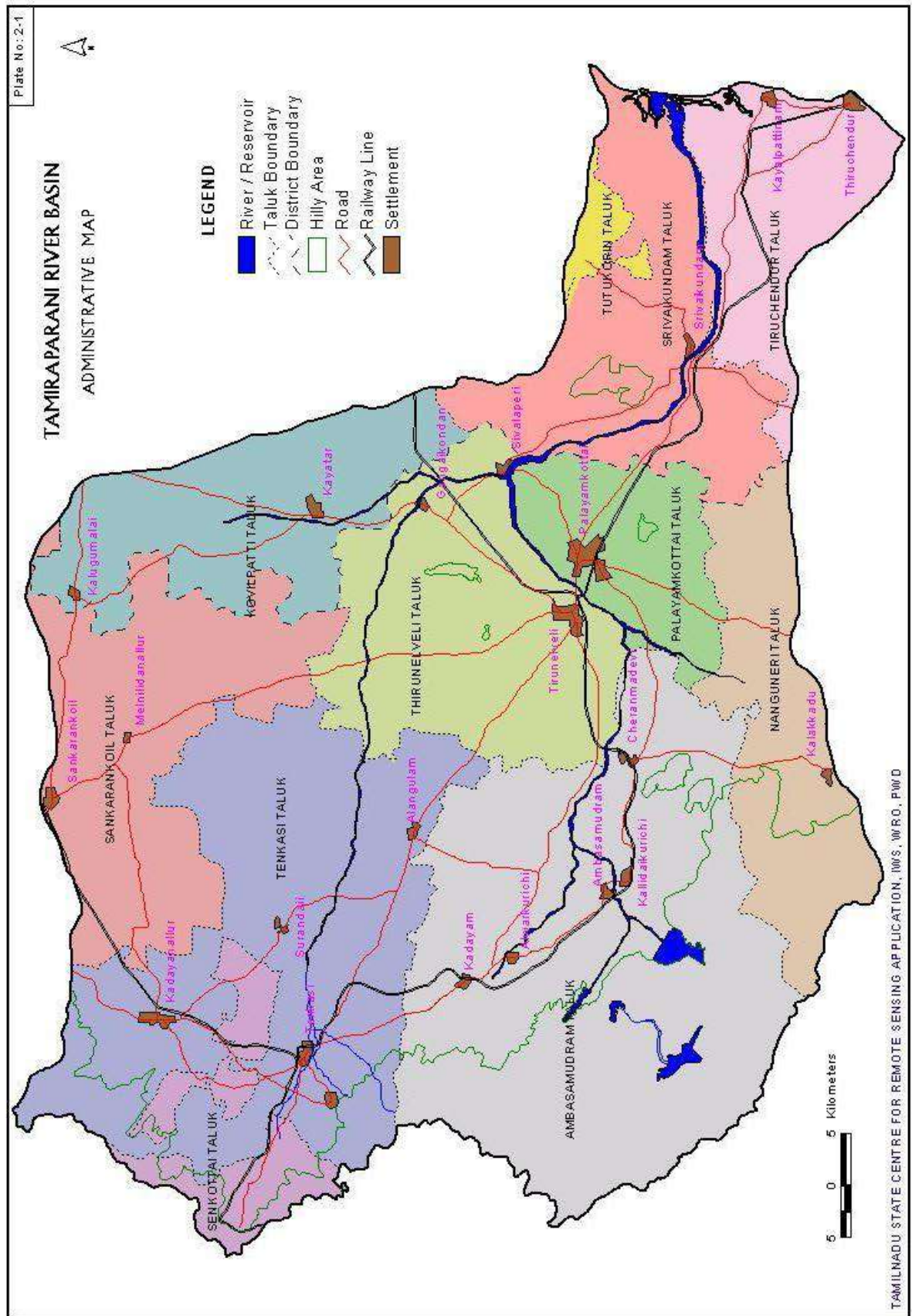


The total extent of the basin area is covered within the administrative boundaries of Sankarankoil, Tenkasi, Shencottah, Alangulam, Ambasamudram, Nanguneri, Sivagriri, Veerakeralamputhu, **Palayamkottai & Tirunelveli taluk** of Tirunelveli District, and Kovilpatti, Ottapidaram, Srivaikundam and Thoothukudi taluks of Thoothukudi District. This basin area is bounded on the north by Vaippar river basin and on the south by Nambiyar and Kodaiyar river basins. The eastern ridges of the western Ghats which is the interstate boundary of Tamilnadu and Kerela- forms the western boundary of the basin. While the Gulf of Mannar forms the eastern boundary of the basin. The length of basin is about 126 km and its width varies from 20 to 85 kms.

The sub basins forming the Thamirabarani river basin are Chittar, Uppodai, Gatana, Manimuthar, Pachchaiar, Upper Thamirabarani and Lower Thamirabarani.



Figure 9.3 ADMINISTRATIVE MAP OF THAMIRABARANI RIVER BASIN





Drainage

Tamiraparani and its tributaries originate at the eastern slope of Western Ghats ridge connecting Aduppkal Mottai, Agasthiyamalai and Chemmunji Mottai etc., at an altitude of 1869 m (6132 ft.). More than 12 (Twelve) tributaries join the river as it runs down, of which Servalar, Manimuthar, Gadana nadhi, Pachaiar and Chittar can be termed as major ones. Tamiraparani after travelling a distance of 22 km from its origin is jointed by its tributary Servalar. The Manimuthar originates from the Mukkuttukal and confluence with Tamiraparani at its 36th km. The tributary Gadana nadhi joins Tamiraparani on its left at the 43rd km.

The river flows through Cheranmahadevi Town and takes in the next tributary (viz.) pachayaru on its right. Tamiraparani thereafter winds its way through Tirunelveli and at a distance of 73 km from its origin, its tributary Chittar confluence with it near Sivlapperi. From this point, the river flow southwards and then eastwards and at its 96th km, the Srivaikundam anicut spans across the river, Then the river Tamiraparani, after traversing another 30 km drains into the Gulf of Mannar, just south of the village, Palayakayal. The drainage map of Tamiraparani river basin is given in Figure 3.

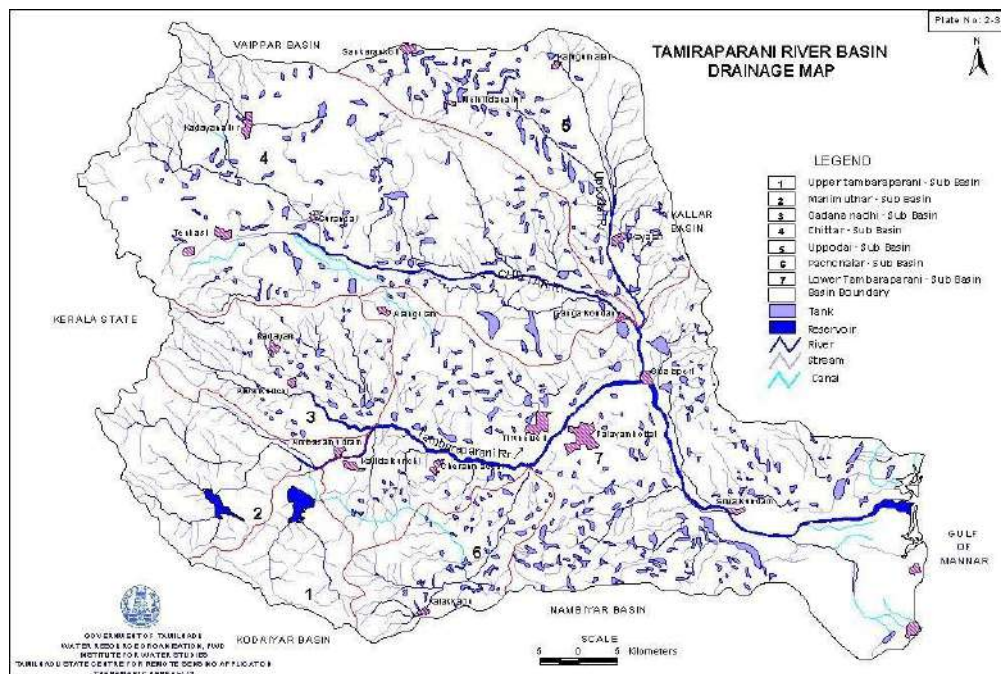


Figure 9.4 DRAINAGE MAP OF THAMIRABARANI RIVER BASIN



Land use

The land use classification of Thamirabarani river basin is given in Table 9.2

Table 9.2 LANDUSE CLASSIFICATIONS IN TAMIRABARANI RIVER BASIN

SL. NO.	LANDUSE CATEGORY		AREA IN SQ.KM.	PERCENTAGE %
	Ist Level	IInd Level		
1	Built up Land	Settlement	173.24	3.03
2	Crop Land	Paddy, Sugarcane, Banana	988.46	17.29
	Dry Land	Groundnut, Cholan, floriculture Groves	166.46	2.91
3	Forest Land	Dense Forest	991.49	17.34
		Dense Forest and Plantation		
		Medium Dense Forest	33.57	0.59
		Shrubs		
4	Waste Land	Reserve Forest	39.40	0.69
		Barren Sand, Barren land,	1689.95	29.56
		Barren Land covered by	1501.92	26.27
		Outcrop	40.49	0.71
		Duri crust	80.11	1.40
		Salt Pan & Sand Dune		
5	Water Bodies	Tanks & Rivers	11.99	0.21
Total Geographical Area			5717.08	100

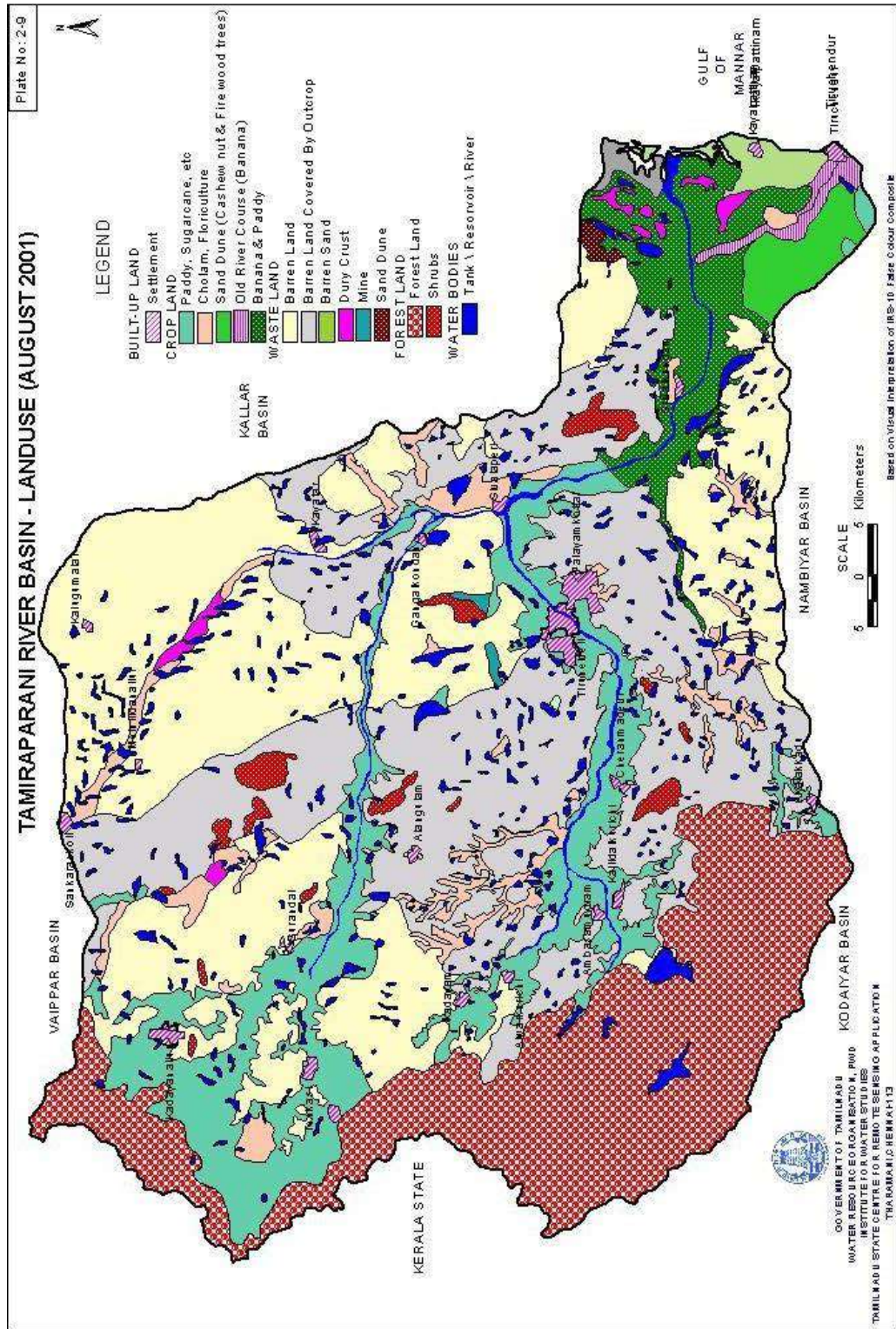


Figure 9.5 LANDUSE MAP OF THAMIRABARANI RIVER BASIN



Surface water potential

The Tamirabarani system is one among the oldest irrigation systems in Tamilnadu. The river basin is divided into 7 sub basins namely Upper Tamirabarani, Manimuthar, Gadanadhi, Pachaiyar, Chittar, Uppodai and Lower Tamirabarani.

There are 8 anicuts across Tamirabarani Main River. There are 17 anicuts across Chittar, 12 anicuts across Pachaiyar, 7 anicuts under Gadanadhi, 9 anicuts under Ramanadhi and 56 anicuts in the tributaries of Chittar.

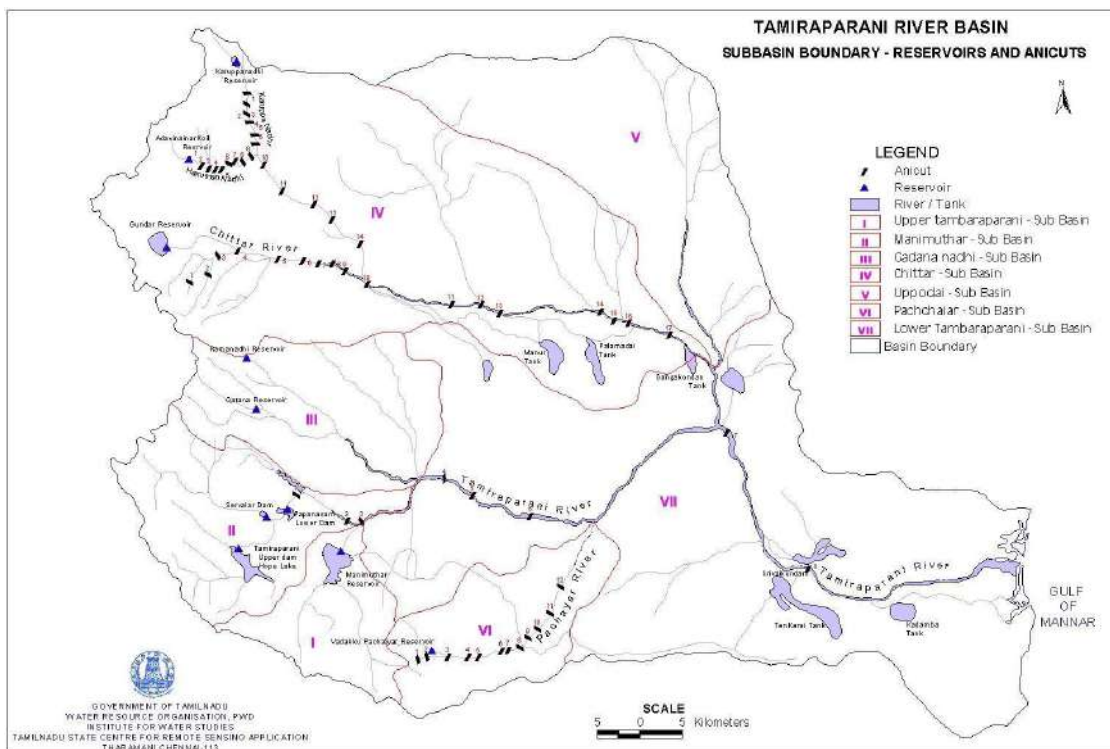


Figure 9.6 IRRIGATION SYSTEM MAP OF THAMIRABARANI RIVER BASIN

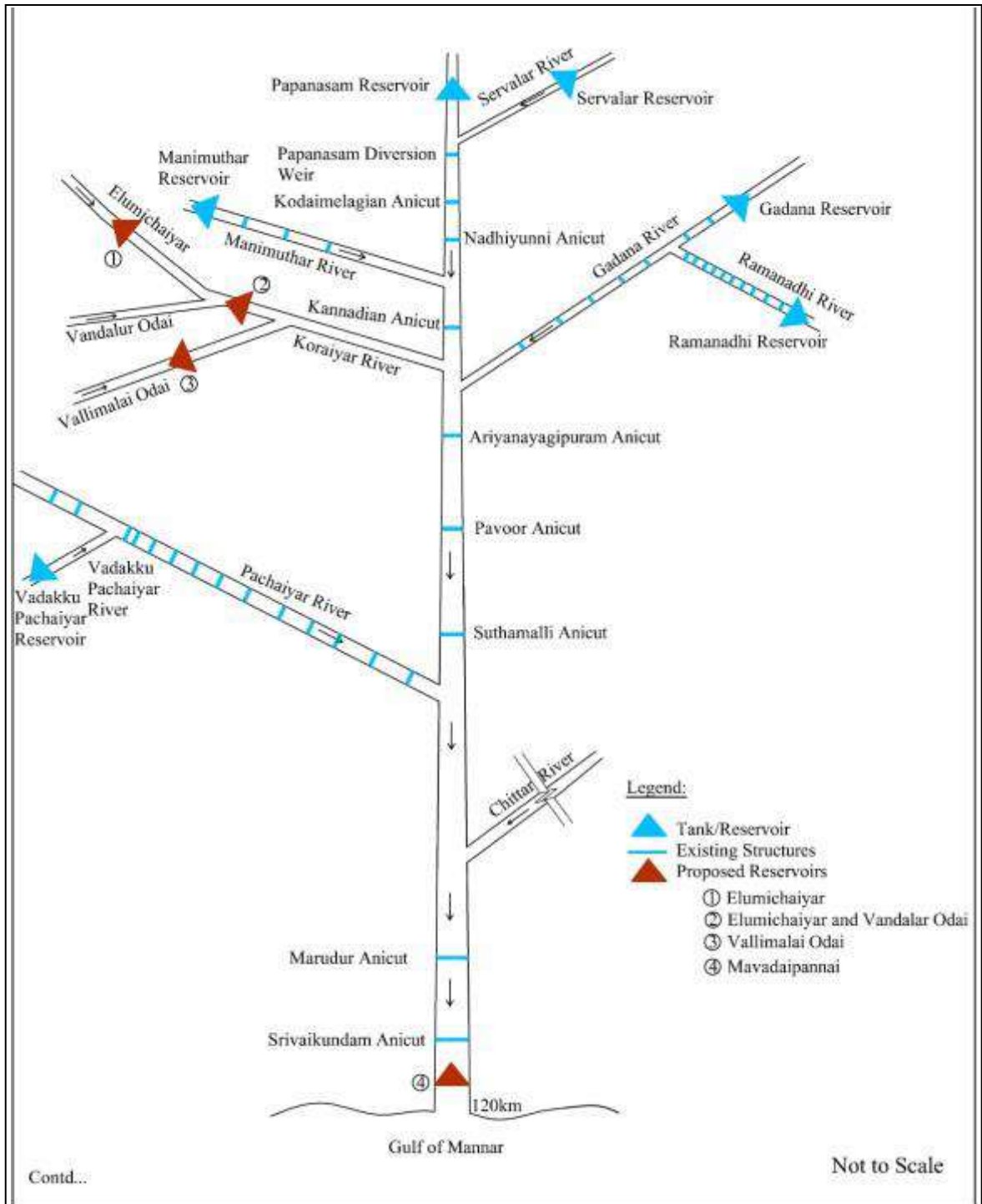


Figure 9.7 FLOW DIAGRAM OF THAMIRABARANI RIVER BASIN

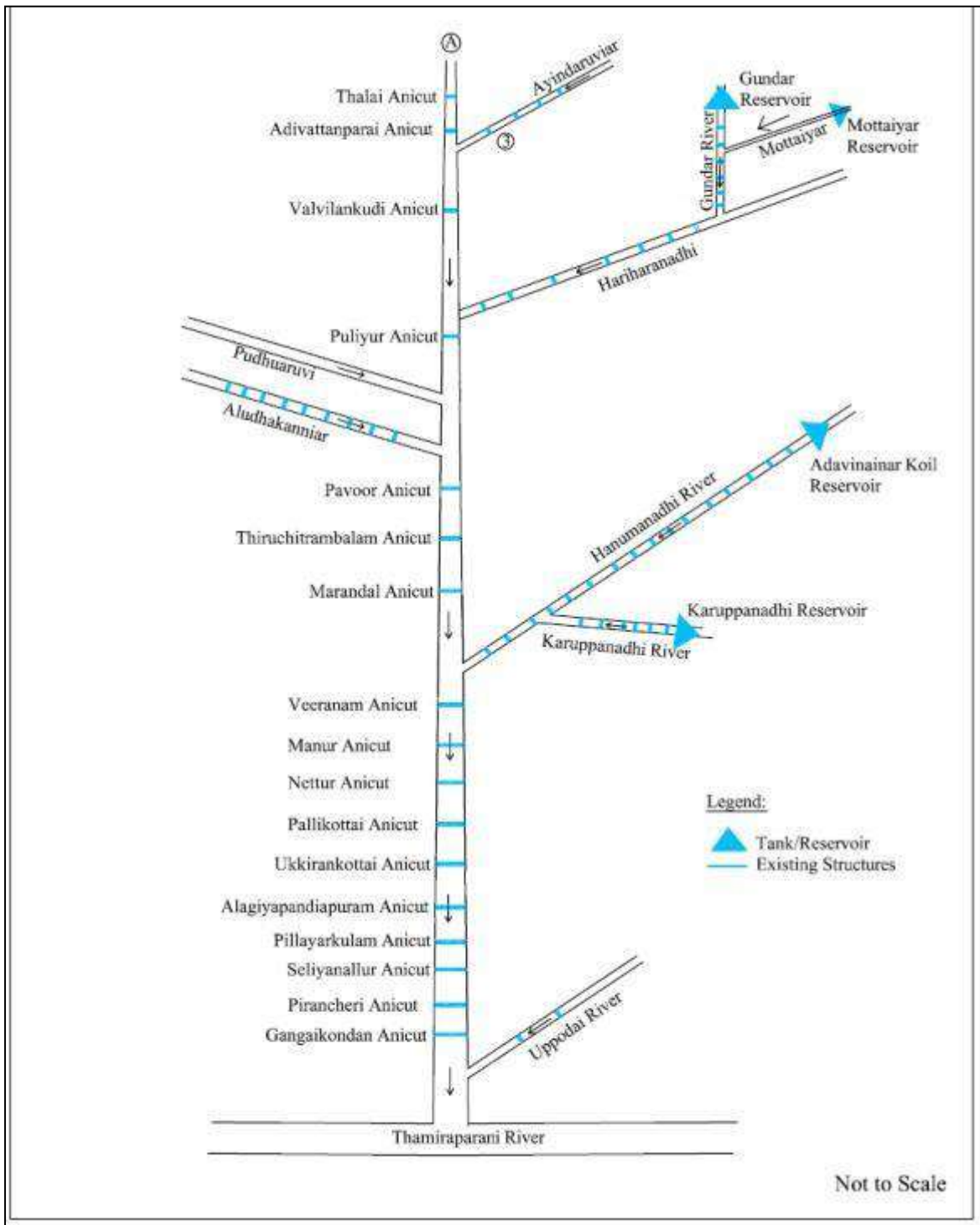


Figure 9.8 FLOW DIAGRAM OF CHITTAR RIVER BASIN



9.3 GROUND WATER SCENARIO

9.3.1 HYDROGEOLOGY

The LPA is underlain by both porous and fissured formations. The important aquifer systems in the district are constituted by

- I. Weathered and fractured hard rock formations of Archaean age.
- II. Porous sedimentary formations ranging in age from Tertiary and Recent.

The porous formations are found as small patch in the south-eastern part of the LPA and include sand stones, Limestone's, late rite and Clays from Tertiary to Quaternary. Isolated occurrence of calcareous sandstone and fossiliferous limestone are seen in coastal area on the south-eastern side. The fossiliferous limestone is found south west of Kudankulam covering an area of 3 sq.km. Late rites are exposed as patches along Radhapuram-Edakkadu, Vijayanarayanam-Kumarapuram, Ittamoli, Nanguneri and Uramozi area. Beach sand occurs as a patch along the coast with a width varying from 50- 250m in Idindakarai-Ovari Belt. The river alluvium is found along the river courses and the thickness of alluvium is restricted to 5-6m.

The exploration in sedimentary tract has revealed that the depth to basement occurs at a depth of 120m BGL and granular zones are encountered between the depths of 20 to 92 m BGL. The yield of bore wells varies from 1-4.5 LPS. The aquifer at the shallow depth is under unconfined condition and aquifer at depth is under semi-confined to confined condition. The shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The dug well can sustain a pumping of 4 to 6 hours while the tube wells can sustain a pumping of 6-8 hours. The water-bearing properties of crystalline formations, which lack primary porosity, depend on the extent of development of secondary inter granular porosity. These aquifers are highly heterogeneous in nature due to variation in litho logy, texture and structural features even within short distances. Ground water generally occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fissured and fractured zones at deeper levels.

The thickness of weathered zone in the district is in the ranges up to 30m BGL. The yield of large diameter wells in the district, tapping the weathered mantle of crystalline rocks ranges from 50 to 250 lpm and are able to sustain pumping for 3 to 5 hours per day. The Specific capacity of large diameter wells tested in crystalline rocks ranges from 25 to 300 lpm / m. of drawdown.



The yield characteristics of wells vary considerably depending on the topographic set-up, lithology and nature of weathering. The groundwater exploration in the district down to a depth of 200m BGL has revealed that in the western part of the district potential fractures are encountered beyond 100m BGL while in the rest of the area, potential fractures are restricted to 100m BGL. The yield of the wells varies from 1 to 3.6 LPS. In general, the wells drilled by various State agencies mainly for domestic purposes have yield in the range of 63 to 270 lpm. The depth to water level in the district varied between 1.19 to 13.35 m BGL during pre-monsoon depth to water level (May 2006) and varied between 0.18 to 7.97 m BGL during post monsoon depth to water level (Jan 2007).

The seasonal fluctuation shows a fall in water level, which ranges from -0.12 to -2.14 m BGL, and rise in water level, which ranges from 0.33 to 11.24 m BGL. The piezo metric head varied between 1.72 to 13.65 m BGL (May 2006) during pre-monsoon and 0.47 to 13.25 m BGL during post monsoon.

9.4 GROUND WATER QUALITY

Ground water quality of phreatic aquifers in Tirunelveli LPA, in general, is colorless, odorless and slightly alkaline in nature. The specific electrical conductance of ground water in phreatic zone (in Micro Seimens at 250 C) during May 2006 was in the range of 510 to 9320 $\mu\text{S}/\text{cm}$. And major parts are having the electrical conductivity below 1500 $\mu\text{S}/\text{cm}$. The quality of formation water in the fractured aquifer varies from place to place. Electrical Conductivity varies from 487 (Kuruvikulam) to 3620 $\mu\text{S}/\text{cm}$ (Tharuvai) at 250 C and Chloride content varies from 28 to 1049 mg/L.

Electrical conductivity in major parts of the district is less than 2000 $\mu\text{S}/\text{cm}$ at 250C. The quality of groundwater in porous formation shows variations with depth. The exploration at Puttataruvai (near the boundary of Thoothukudi District) revealed the presence of good quality water in the depth range of 24-32m while the saline water was noticed in the depth range of 49-54 & 75-78m BGL. It is observed that the ground water is suitable for drinking and domestic uses in respect of all constituents except few places are having higher concentration of NO₃ than the BIS permissible limit.



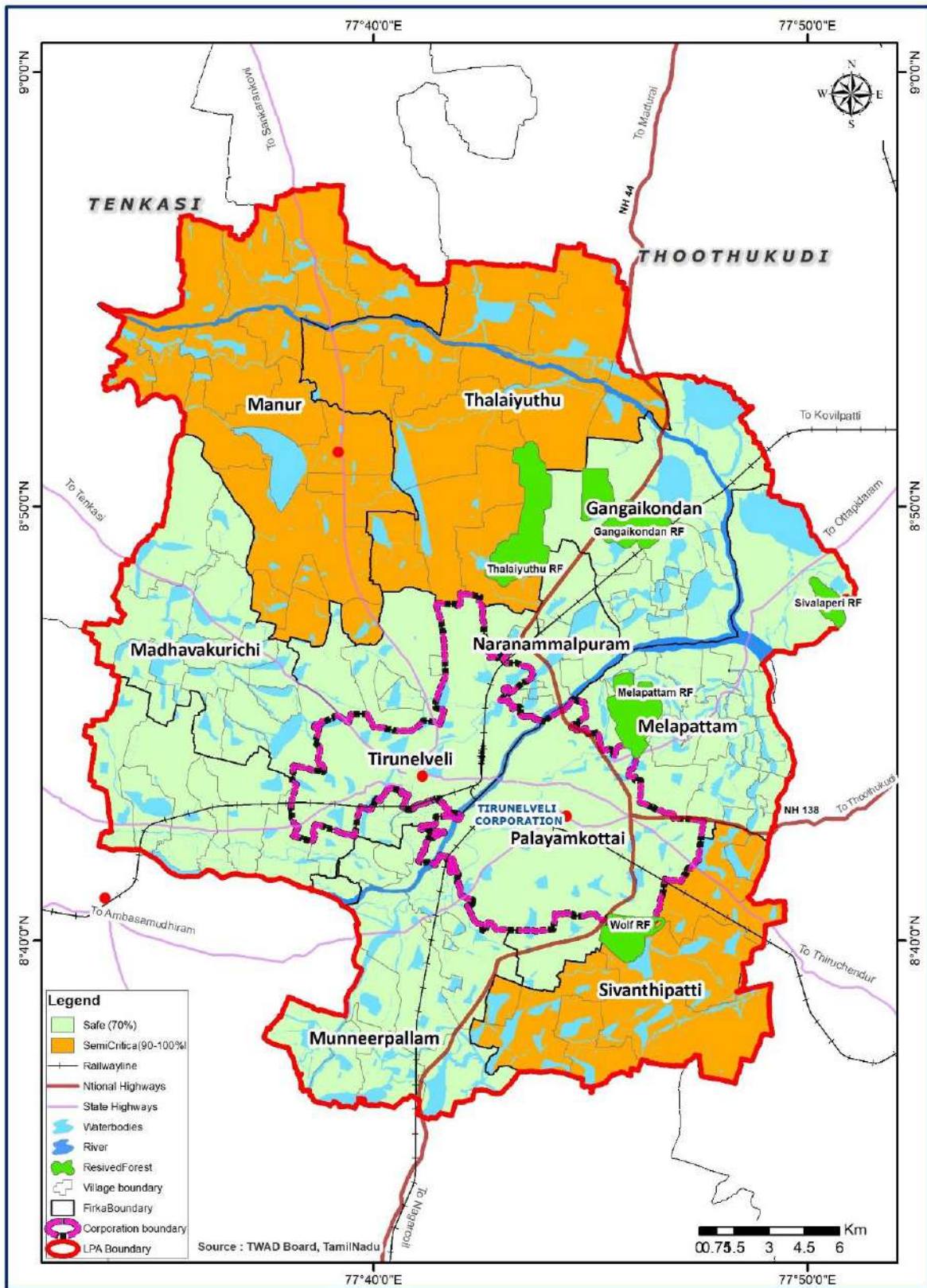
9.5 STATUS OF GROUND WATER DEVELOPMENT

The estimation of groundwater resources for the LPA has shown in the below map9.1 that 3 blocks are “Semi Critical”, Manur, Thalaisyuthu and Sivanthipatti whereas all other blocks are in safe zone. The shallow alluvial aquifers along Thamirabarani river serve as an important source of drinking water and irrigation development for Tirunelveli LPA. Dug wells are the most common ground water sources used for irrigation in the LPA.

The yield of dug wells range from 15 to 100 Cu.m per day for a pumping of 4-6 hours while the bore well can yield about 30-100 Cu.m per day for a pumping of 8-10 hours in a day.



Map 9.1 GROUND WATER STATUS OF TIRUNELVELI LPA





9.6 RECOMMENDATIONS

As the development of ground water has still in safe stage in many blocks of Tirunelveli LPA, further development of ground water for creation of additional irrigation potential has to be carried out with extreme caution. Necessary measures for regulating the exploitation of ground water may be implemented in the Semi critical blocks of the LPA.

9.7 ARTIFICIAL RECHARGE PLAN - LOCAL PLANNING AREA

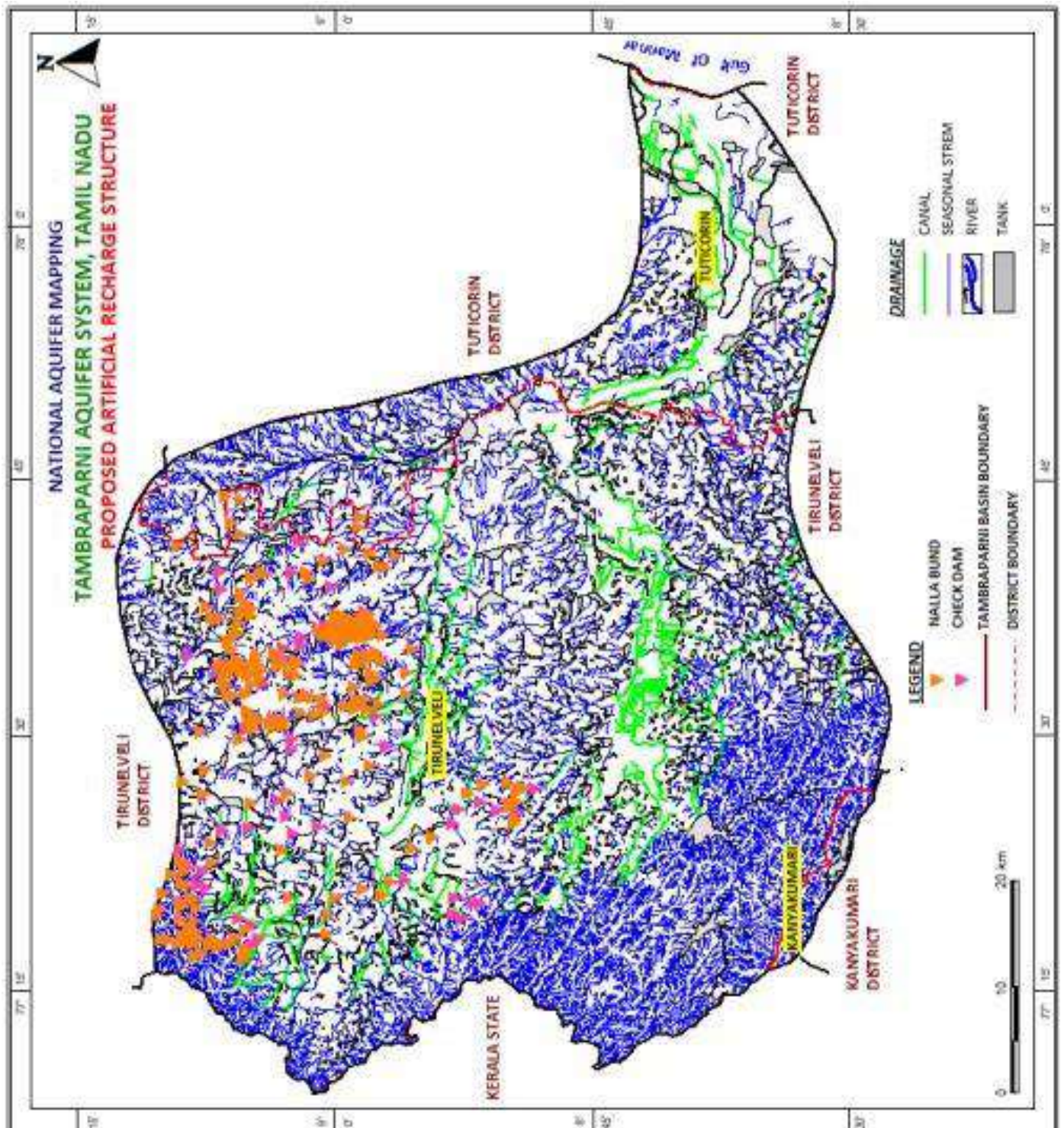
In the comprehensive Tamirabarani River Basin study, an in-depth analysis of water levels during different seasons and an understanding of the aquifer system through methods such as exploratory drilling and pumping tests have been conducted. The study focuses on the 15 Over Exploited and Critical firkas within the basin area.

Key Findings:

- The estimated potential volume of void space within the weathered zone of the first aquifer is 360 MCM.
- The annual uncommitted runoff is observed to be 166 MCM, which is less than 50% of the required water to fill the available void space of aquifer-I.



Figure 9.9 TAMIRABARANI AQUIFER SYSTEM



**Proposed Solution:**

An Artificial Recharge and Water Conservation Plan has been formulated for the over-exploited and critical firkas with a focus on harnessing the annual uncommitted runoff of 33 MCM.

Artificial Recharge Structures:

- Masonry check dams, Nala bunds, Recharge ponds, and Recharge Shafts are suggested as the primary structures for artificial recharge.
- Selection of site locations is based on critical analysis of hydrogeological, geophysical, and exploration data, giving priority to geomorphologic and drainage aspects.
- A total of 52 check dams, 229 nala bunds, 334 recharge shafts, and 1300 recharge ponds are proposed in the Over Exploited and Critical firkas.
- Additionally, 132 Recharge Rejuvenation ponds are selected for desilting, followed by the construction of recharge shafts within the tanks.

Expected Outcomes:

The expected recharge through these artificial recharge structures is estimated to be 33 MCM. The proposed benefit includes arresting the decline in groundwater levels, increasing pumping hours, and enhancing the sustainability of well yields.

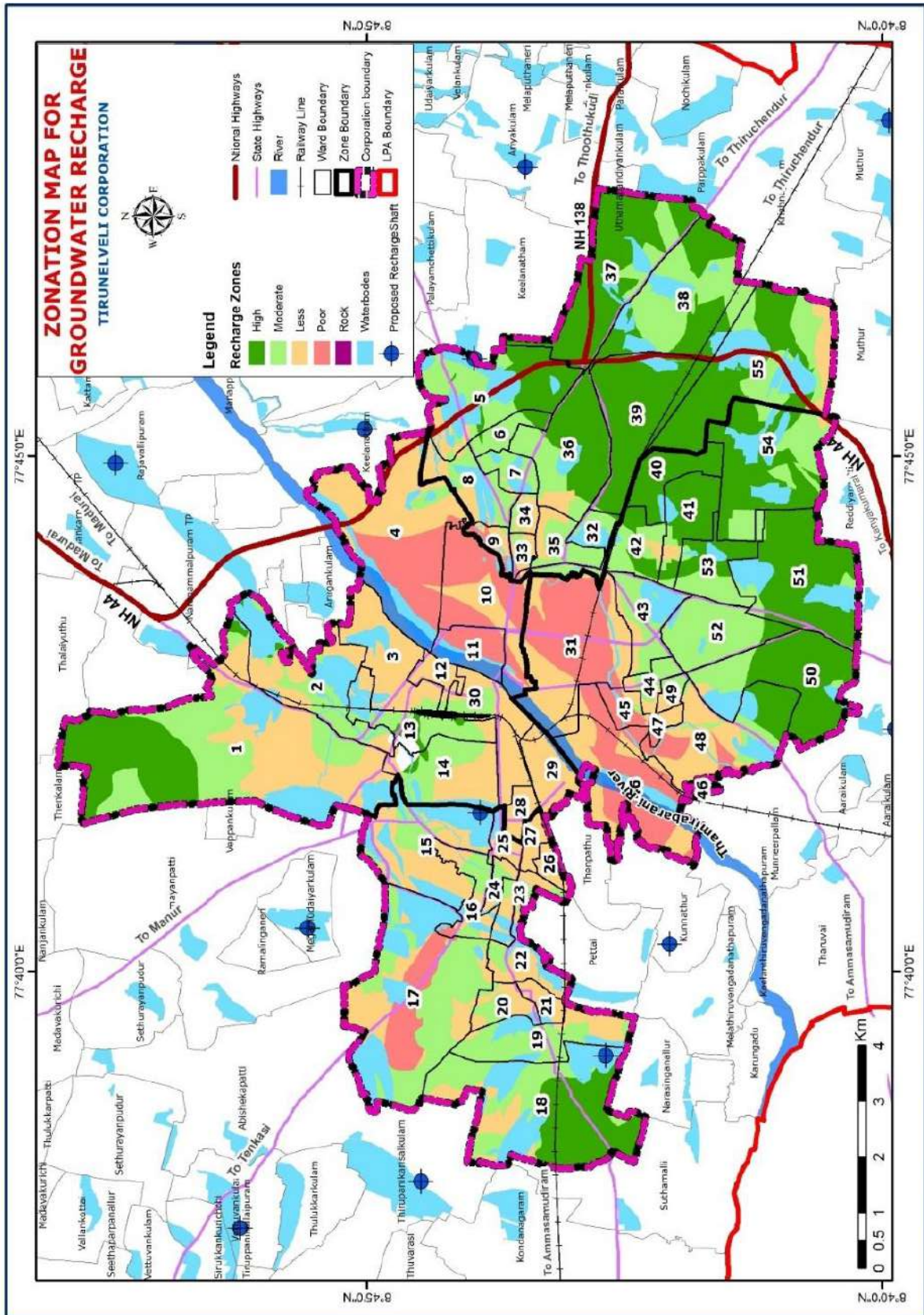
Identification of Groundwater Recharge Zones:

The study identifies specific areas within the **corporation and the rest of the Local Planning Area (LPA)** as potential groundwater recharge zones.

These areas are classified as high, medium, and low based on their capacity to recharge water.

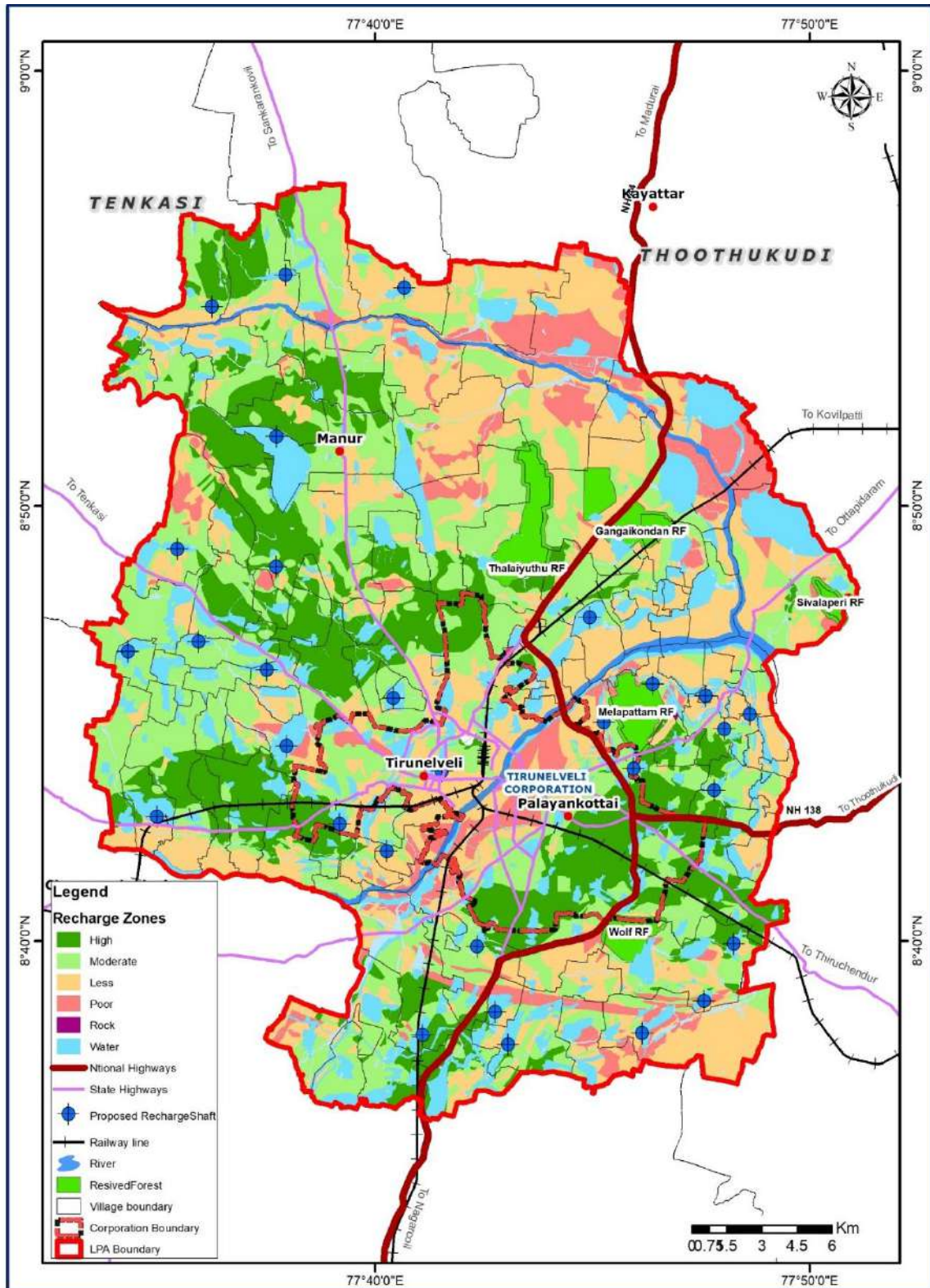


Map 9.2 GROUNDWATER RECHARGE FOR TIRUNELVELI CORPORATION





Map 9.3 GROUNDWATER RECHARGE FOR TIRUNELVELI LPA



Source - Department of Hydrology, Anna University, Chennai



9.8 RESERVED FOREST

The reserved forest (RF) is a protected forest with a natural habitat with a high degree of protection from all activities, such as hunting, poaching, grazing, cutting of trees. There are five numbers of reserved forests located in Tirunelveli LPA; namely Gangaikondan RF, Thalayuthu RF, Sivalaperi RF, Melapattam RF and Wolf Hill RF. The combined area of the reserved forests is 17.26 Sq. Km which is 2.0 % of the total LPA. Map 9.5 shows the location of RF in Tirunelveli LPA.

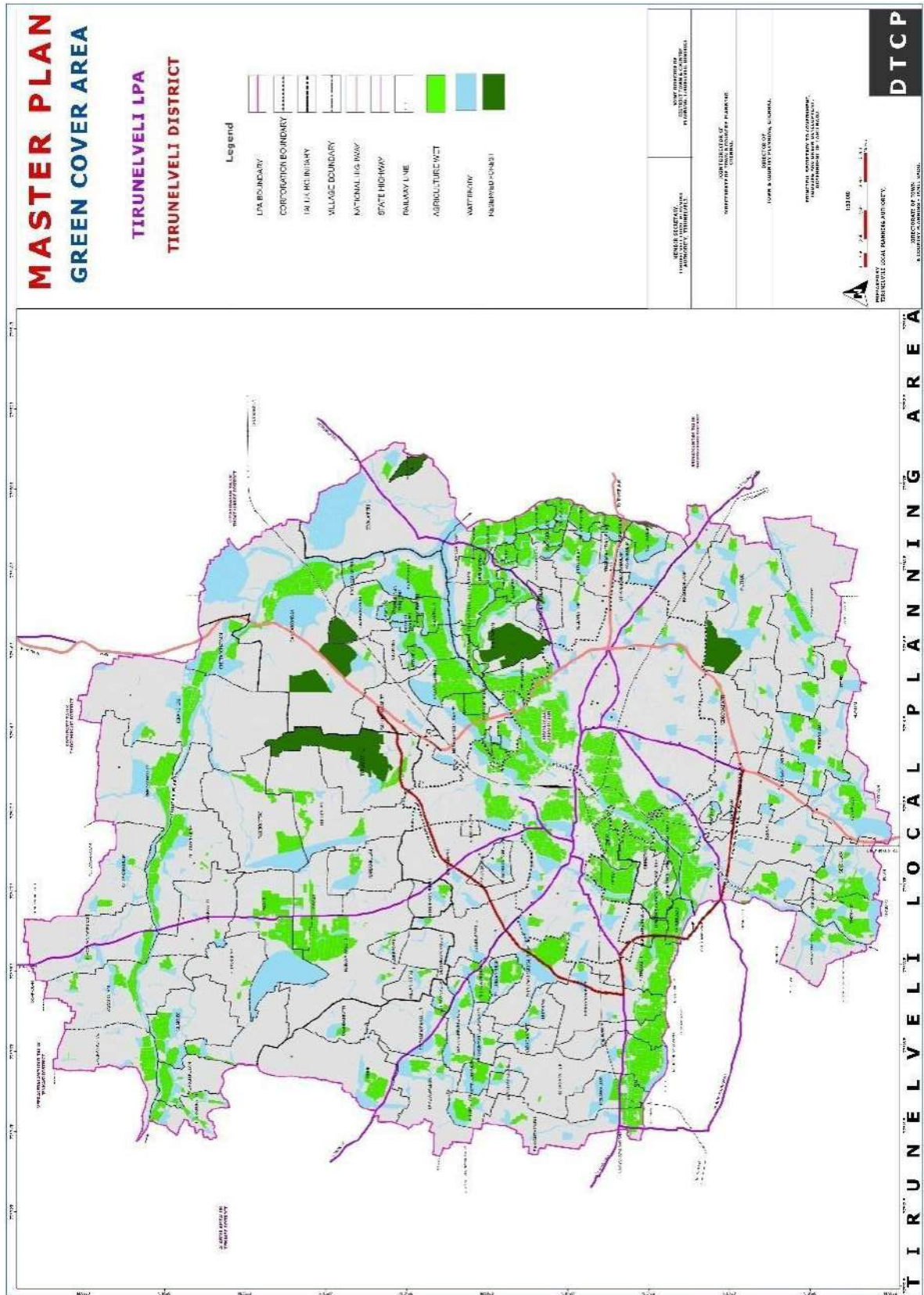
Table 9.3 RESERVED FOREST IN TIRUNELVELI LPA

S.No	Reserved Forest	Area (Sq. Km)	% to Total LPA
1	Gangaikondan RF	4.33	0.51
2	Thalayuthu RF	5.9	0.69
3	Sivalapperi RF	0.87	0.10
4	Melapattam RF	3.74	0.44
5	Wolf Hill RF (Muthur RF)	2.42	0.28
	Total area	17.26	2.00

Source-Secondary Data

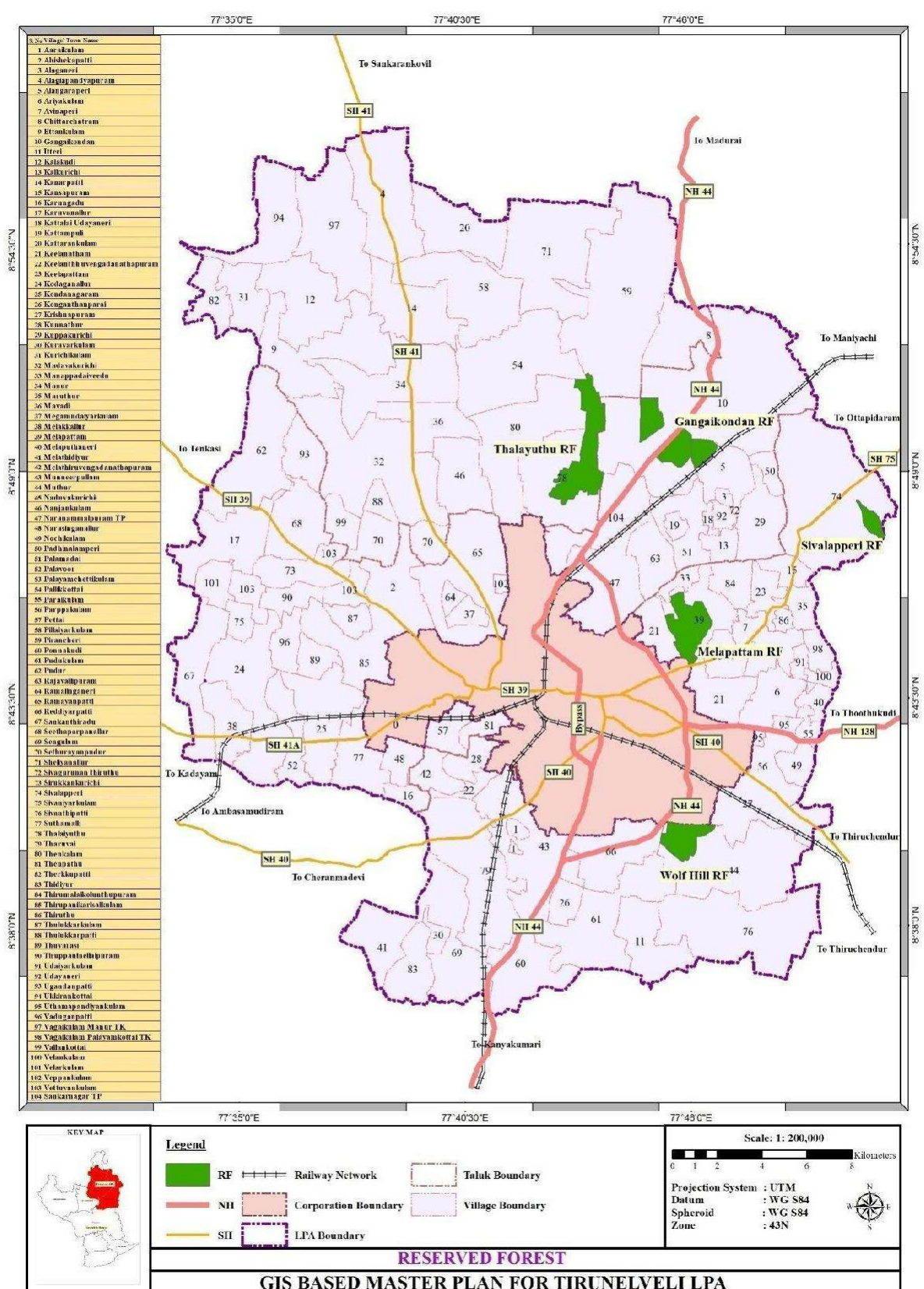


Map 9.4 GREEN COVER AREA IN TIRUNELVELI LPA





Map 9.5 RESERVED FOREST IN TIRUNELVELI LPA





9.9 ENVIRONMENTAL DEGRADATION

9.9.1 AIR POLLUTION

Air quality is a measure of the suitability of air for breathing by people, plants and animals. On an average, a person inhales around 14,000 liters of air every day. Therefore, poor air quality can influence the present quality of life and for future generations by affecting the health, the environment, the economy and the city's livability. The table below shows the pollutants and the prescribed National Standards along with the average annual data of the pollutant levels in Tirunelveli. It is observed that the values are within the prescribed limits except PM10.

Table 9.4 AIR QUALITY IN TIRUNELVELI LPA

Pollutant	National Ambient Air Quality Standards ($\mu\text{g}/\text{m}^3$)	Annual AQI in Tirunelveli ($\mu\text{g}/\text{m}^3$)
S02	50	18.99
N02	40	9.07
NH3	100	35.46
PM10	60	61.13
PM2.5	40	14.35
O3	50	7.48

(Source-TNPCB, Tirunelveli)



9.9.2 WATER POLLUTION

River Tamirabarani flowing through the Tirunelveli LPA is being polluted. The main sources of pollution in this river are mainly due to the discharge of untreated domestic sewage generated from the nearby local bodies into the river. The Tirunelveli City Municipal Corporation is operating a STP comprising of stabilization ponds with a designed capacity of 24.2 MLD at Ramayanpatti.

Part of the city sewage is treated in the STP and discharged into irrigation channel. The Remaining city sewage generated is now being discharged into River Tamarabarani without treatment. The quality of river water will be improved only when the Tirunelveli Municipal Corporation completes UGSS scheme Phase-I & II by which the entire quantity of city sewage will be discharged in to the existing STP. The existing 24.2 MLD capacity STP (Stabilization ponds) is being operated and maintained by Tirunelveli Municipal Corporation shall also be upgraded to take care of the entire quantity of anticipated sewage is treated to satisfy the standards prescribed by the TNPCB Board. Also, the Municipalities and Town Panchayats located along the river stretch shall prepare DPR for treatment of sewage so as to avoid the discharge of sewage into irrigation channel.



9.10 URBAN FLOODING- TIRUNELVELI

The Thamirabarani River Basin, encompassing Tirunelveli and Thoothukudi districts, has a profound history of flooding, especially during the northeast monsoon. This report explores the historical context of flooding, draws lessons from past calamities, examines modern challenges, and proposes comprehensive urban planning measures to enhance the region's resilience.

Historical Context: Dating back to the 19th century, historical records reveal the Thamirabarani River's susceptibility to flooding during the northeast monsoon. Notable floods in 1810, 1827, 1847, 1867, 1869, 1874, 1877, 1880, 1895, 1914, 1923, 1925, 1931, and 1992 are associated with this seasonal pattern. Three-fourths of the annual rainfall in the composite Tirunelveli district occurs between October and December.



Figure 9.10 COMPARISON OF FLOODED AREA IN 1992 AND 2023



Lessons from Historical Floods: The calamities of 1877, where floods, famine, and a cholera outbreak occurred simultaneously, provide insights into the vulnerability during the northeast monsoon. Torrential rains in December exacerbated the situation, emphasizing the region's sensitivity during this period. Historical rainfall data indicates flooding occurrences when rainfall surpasses 300 mm in October-December, particularly in Tirunelveli and Thoothukudi.

9.10.1 FLOOD VULNERABILITY – TIRUNELVELI LPA

Tirunelveli LPA is also subjected to annual flooding, including flash floods, floods due to cloudbursts, monsoon floods of single and multiple events, cyclonic floods. Once in a while, number of people are affected, some succumbing to the floods, thousands are rendered temporarily homeless and several hectares of crops are damaged. Floods in the Tirunelveli LPA are mainly caused during north east monsoon and heavy rains, and due to release of excess water from Manimutharu dam and western ghats.

9.10.2 FLOOD VULNERABILITY RATING

As per Tamil Nadu State Disaster Management Plan (SDMP) 2018-2030 guidelines, the vulnerability due to flooding is categorised as Areas of very high vulnerability, Areas of high vulnerability, Areas of very medium vulnerability, Areas of low vulnerability based on the inundation of water level as follows

Areas of Very High Vulnerability:	<ul style="list-style-type: none"> a. Where inundation of water was more than 5 feet, or b. Where rescue operations were carried out with the help of Central forces/State Disaster Response Force(SDRF), or c. Which were cut-off and became inaccessible, or d. Where loss of lives was reported or large-scale evacuation was carried out.
Areas of High Vulnerability	Where inundation of water was from 3 to 5 feet.
Areas of Medium Vulnerability	Where inundation of Water was from 2 to 3 feet.
Areas of Low Vulnerability	Where inundation of water was below 2 feet.

The Tirunelveli LPA experienced unprecedented extremely heavy rain fall for about 24 hours with a rain fall of more than 69cm recorded in Palayamkottai. Further Tamirabarani river and its tributaries are at spate with more than 1lakh cusecs of water being released from dams which caused further flooding of low-lying areas with in Tirunelveli LPA and its surroundings.



Several areas in the Tirunelveli corporation as well as villages on the banks of Thamirabarani river were marooned which includes Tirunelveli railway junction, junction bus stand and sindupoondurai. From the above table it is observed that Tirunelveli LPA is categorized under area of Areas of very high vulnerability with regard to urban flooding.

Hence Risks emanating from recurring Urban floods are more pronounced in Tirunelveli LPA at regular intervals ranging from decade to century.

The broad goals of State Disaster Management Plan (SDMP) 2018-2030 with regard to Tirunelveli LPA is stated as follows

- Comprehensive Flood Protection through structural and non-structural interventions to reduce the risks and enhance resilience and resistance of the Community with special reference to Tirunelveli LPA.
- Minimize the risk of urban floods with special focus on Tirunelveli city municipal corporation and LPA.
- Enhance the resilience of farmers to face the vagaries of monsoon and impacts of Climate Change.
- Recharge the aquifers in Blocks where Ground Water is currently overexploited/Critical/Semi Critical categories and convert into Safe Category.
- Restore and Strengthen Water bodies and enhance the capacity of the Water Bodies through DE siltation to mitigate floods and drought.
- Promote Sustainable Agricultural practices in Rainfed Areas and wet lands with special focus on Tirunelveli LPA.
- Reduce the risks in areas which are prone to specific Disasters like flood, inundation etc with a special focus on the Tirunelveli LPA.
- Enhance Multi stakeholder participation, especially community participation with social inclusion.
- Strengthen Non-structural measures to reduce the risks due to Man- made and Natural Disasters.
- Deliver climate resilient hydraulic infrastructure for irrigation and drainage to reduce inundation and flood damages.



9.10.3 DISASTER MANAGEMENT ACT 2005

Primarily disasters are triggered by natural hazards or human-induced or result from a combination of both. In particular, human-induced factors can greatly aggravate the adverse impacts of a natural disaster. Even at a larger scale, globally, the UN Inter-Governmental Panel on Climate Change (IPCC) has shown that human-induced climate change has significantly increased both the frequency and intensity of extreme weather events.

While heavy rains, cyclones, or earthquakes are all natural, the impacts may, and are usually, worsened by many factors related to human activity. The extensive industrialization and urbanization increase both the probability of human-induced disasters, and the extent of potential damage to life and property from both natural and human-induced disasters. The human society is also vulnerable to Chemical, Biological, Radiological, and Nuclear (CBRN) disasters.

Identification of Vulnerable Areas:

Identification of vulnerable areas due to North East Monsoon activities was done throughout the LPA based on legacy data and 87 areas have been identified and they are classified into 3 categories as detailed below.

- Areas of High vulnerability
- Areas of Medium Vulnerability
- Areas of Low vulnerability



Table 9.5 LIST OF VULNERABLE AREAS IN TIRUNELVELI LPA

Category of Vulnerability	Taluk		Location
Highly Vulnerable	Palayamkottai	1	Vellakoil
		2	Palayamkottai-I (Vannarpettai)
		3	Keelaveeraraghavapuram
		4	Seevalaperi
		5	Melanatham
		6	Karuppandurai
Medium Vulnerable	Palayamkottai	7	Munnirpallam
		8	Tharuvai
		9	Melapalayam
		10	Meelathiruvengadanathapuram
		11	Thimmarajapuram
		12	Kansapuram
		13	Muthoor
	14	Sivanthipatti	
	Tirunelveli	15	Sinthupoonthurai
Low Vulnerable	Palayamkottai	16	Keelanatham
		17	Thirumalaikulunthupuram
		18	Kilapattam
		19	Thiruvannathapuram
		20	Konganthanparai
		21	Pudukulam
		22	Ponnakudi
		23	Manappadaiveedu
	Tirunelveli	24	Tirunelveli Junction
		25	Melaveeraragavapuram
		26	Thenpathu
27		Pettai	

(Source-www.tirunelveli.nic.in)



9.10.4 VULNERABILITY MAPPING

A District Vulnerability Assessment has identified 87 vulnerable locations in Tirunelveli district from the Disaster management point of view. The vulnerable areas are categorized into four broad classifications namely, very highly Vulnerable, Highly Vulnerable, Medium Vulnerable and Less Vulnerable. Out of the 87 locations of vulnerable areas, 31 locations are within Tirunelveli LPA. Tirunelveli Taluk houses around 7 vulnerable location and Palayamkottai Taluk houses the remaining locations out of which 6 locations are in the highly vulnerable category. The Manur Taluk has zero vulnerable locations. The aftermath of the 2023 flooding has to be analysed to further refine strategies for disaster preparedness and response.



Location of Flood Vulnerable Area - Tirunelveli Corporation

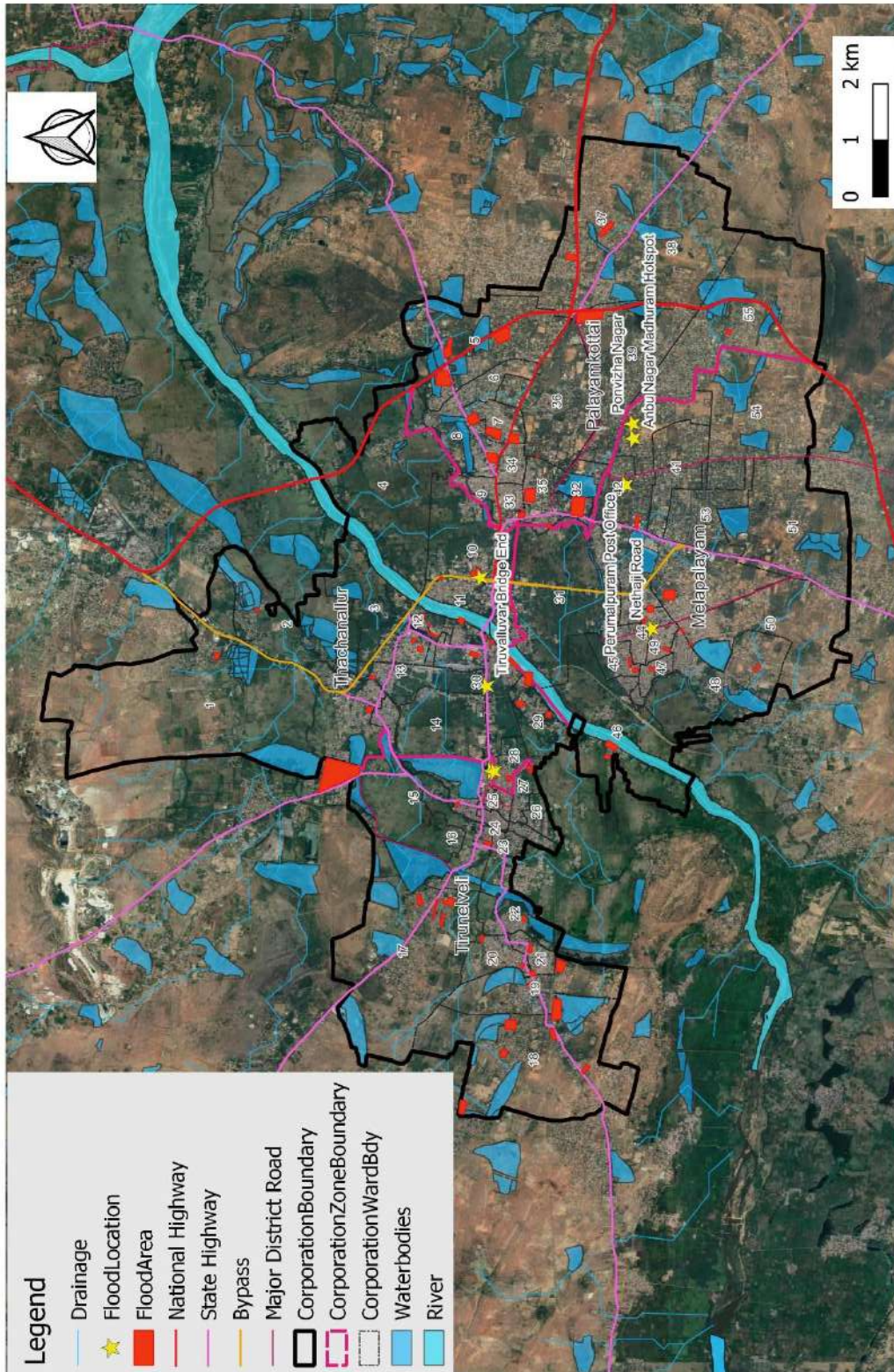
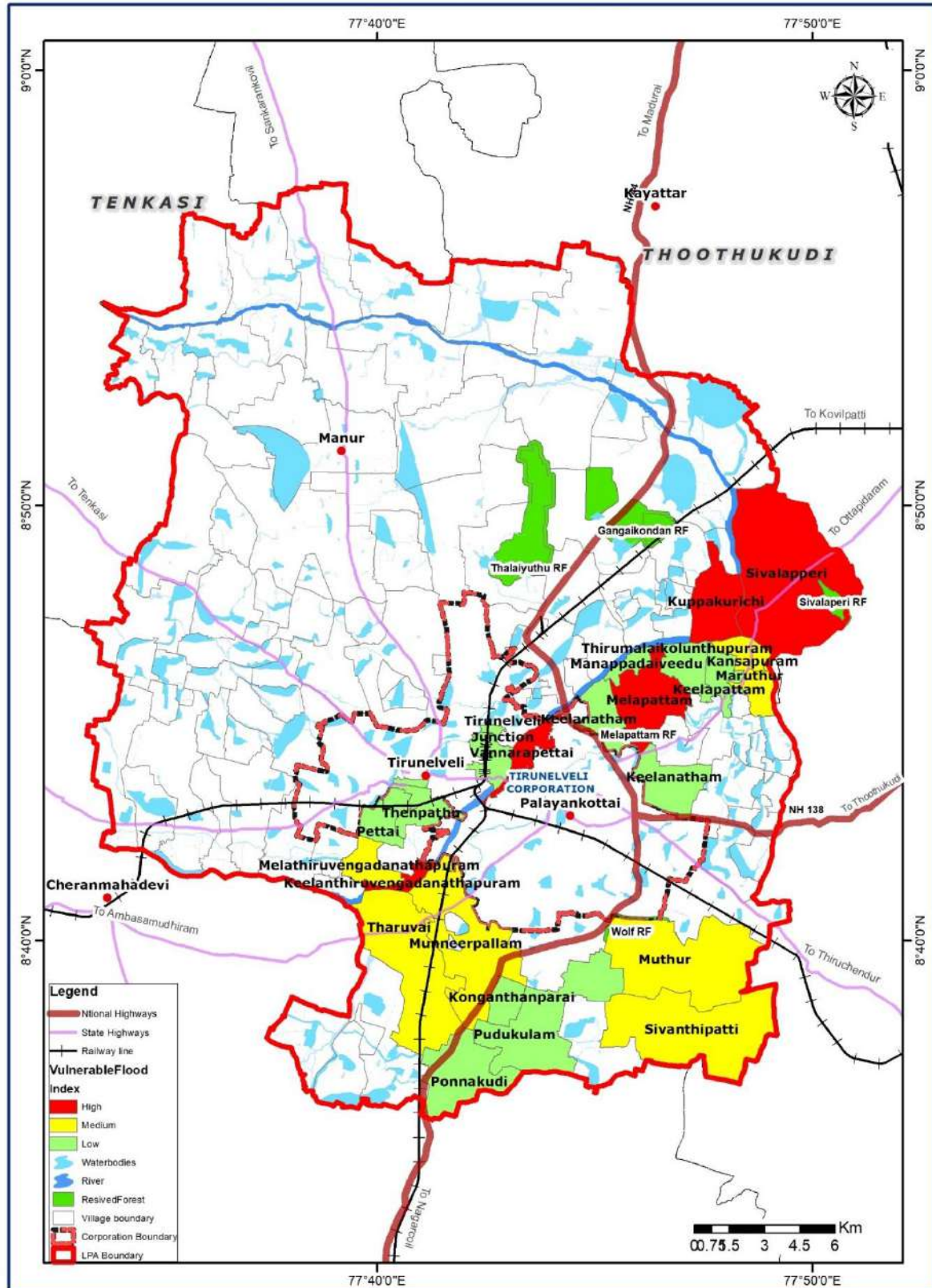


Figure 9.11 LOCATION OF FLOOD VULNERABLE AREAS IN TIRUNELVELI CORPORATION



Map 9.6 VULNERABLE AREAS IN TIRUNELVELI LPA





9.10.5 2023 FLOODS - TIRUNELVELI

Floods are often a result of heavy rains associated with the natural course of surplus water flow being hindered by encroachments, unplanned development and the like. The Central Water Commission has developed a network of flood forecasting stations and it issues Daily Flood Bulletins during the Monsoon seasons for all the major river basins in the following categories:

- Category IV: Low Flood stage (Water level of the river is flowing between Warning Level and Danger Level)
- Category III: Medium Flood (Water Level below 0.50m. less than HFL and above Danger Level)
- Category II: High Flood (Water Level less than Highest Flood Level but still within 0.50m. of the HFL)
- Category I: Unprecedented Flood (Water Level equal and above Highest Flood Level (HFL))

The recent occurrences of 2023 Tirunelveli flood comes under category 1 “Unprecedented Flood (Water Level equal and above Highest Flood Level (HFL))”

9.10.6 FLOOD MANAGEMENT GUIDELINES

a. state disaster management plan 2018-2030

- It is not uncommon to note that the risks due to disasters being exacerbated due to inadequate understanding of the topography while under taking projects for housing, commercial, industrial and public infrastructure.
- Construction of public & private facilities in water bodies water ways, change in land use pattern from agriculture to residential and industrial purposes, building public infrastructure on water ways due to the rapid urbanization to name a few have compounded the intensity of several disasters.
- Many of these issues will be addressed through regulations and prevent serious risks that exist today.



GoTN is undertaking physical planning measures to minimise the risks as noted below:

- Regulatory Mechanisms and Redesigning As part of mainstreaming of risk concerns into developmental plans,
- GoTN consciously decided to re-examine the designs & codes relating Buildings,
- Irrigation Structures, drinking water, State Disaster Management Perspective Plan - 2018-2030
- supply systems, Power Infrastructure, Bridges & Culverts in National and State highways & Rural Roads are being redesigned to reduce risks that arise due to flooding.
- For instance, in order to ensure that the gushing water during the flood, seamlessly flows through the culverts & Bridges, the existing piped culverts are being converted into box type RCC structures & low-level bridges and cause ways are being converted into slightly elevated structures providing adequate space for flood waters to flow even during extreme weather events.
- Redesigning of these structures will prevent inundation of the surroundings areas which is happening currently now due to inadequate no. of vent ways and inadequate capacity of the piped culverts. In the power sector cables are being laid underground and junction boxes are being located on 1 to 2 feet tall support structures.

b. National Building Code Standards

- As per TNCDDBR 2019, regulating the constructions with reference to zone, location, height, number of floors, size of buildings, setback spaces to be left around and the use of the building and land.
- Building rules under the Local Bodies Acts provide for regulation of location of buildings, foundations, plinths, superstructures-walls, floors and rooms, licensing of surveyors and inspection of municipal engineers at various stages of constructions, wind load/ pressure, reinforced cement concrete and framed structures, construction materials, etc.
- Structural safety and soundness are being regulated under the building rules under the Local Body Acts.



- The special provisions contained in the TNCDBR 2019, regulate structural design of buildings to reduce risks due to natural hazards viz. earth quake, cyclone, flood flow or inundation, tsunami, etc. The Public Works Departments also adopts the NBC standards for guiding the construction of buildings.

c. Guidelines for Planning, design and construction of Multi Hazard Resistant buildings

- Disaster prevention involves engineering intervention in buildings and structures to make them strong enough to withstand natural hazard so that the exposure of the society to hazard situation could be avoided or minimized.
- Every building shall be so Planned, Designed, Constructed, equipped, maintained and operated so as to provide not only adequate comfort to the occupants but also to take meticulous care to avoid undue danger to the life and safety of the occupants from Fire, Earthquake, Tsunami, Cyclone, Flood and other hazards. The Public Works Department has brought comprehensive guidelines including, but not limited to, the above features. The public buildings are constructed based on the Codes published by the Bureau of Indian standards including the National Building code 2016.



9.10.7 URBAN FLOOD PREVENTION PLAN - TIRUNELVELI LPA

The Tirunelveli Local Planning Area (LPA), nestled between the Western Ghats to the West and the Gulf of Mannar and Indian Ocean to the East and South, encompasses the Thamirabarani river basins. The region is traversed by significant rivers such as Vaippar, Kallar (Korampallam), Thamirabarani, along with their tributaries and distributaries like Chittar, Gadana, Ramanadhi, Manimutharu, Nambiyar, Hanumanadhi, Pzhayaru, Valliar, and Kodaiyar.

Despite benefiting from both the northeast and southwest monsoons, the Tirunelveli LPA faces the dual challenges of floods and droughts. To address these issues, various schemes are in progress and being considered. Notably, the Thamiraparani–Karumeniyar–Nambiyar Rivers Link project aims to mitigate flood risks in rural areas of Tirunelveli and Thoothukudi Districts, while also enhancing livelihoods in drought-prone zones.

The project involves **inter-linking Thamirabarani, Karumeniyar, and Nambiyar rivers** through the excavation of a new flood carrier canal spanning 75.175 km. This canal, stretching from LS 6.5 km of the existing Kannadian channel near Vellankuzhi Village to M.L. Theri near Thisayanvilai, is designed to divert excess flows from the Thamirabarani basin to water-deficient Karumeniyar and Nambiyar basins. Currently, the project is in progress, with some stages near completion, and the estimated cost is Rs. 872.45 crore.

During the December 2023 floods, a trial run successfully diverted a portion of the floods into the flood carrier canal, showcasing its effectiveness in managing excess water from the Kannadian canal. This initiative demonstrates a proactive approach to water management and disaster mitigation in the region,

Early Warning Systems:

- Establish technologically advanced early warning systems for timely alerts.
- Integrate sensors and real-time monitoring for detecting rising water levels in the Thamirabarani River.



Zoning and Land Use Planning:

- **Enforce strict zoning regulations** to prohibit construction in flood-prone areas. In the aftermath of the 2023 flood, it has become evident that areas near the Tamirabarani River in Tirunelveli are susceptible to flood damage. In LPA, there are a few areas along the Tamirabarani River and low-lying areas, which are susceptible to flooding/inundation during heavy storms. As part of the master planning initiative, it is proposed to preserve these flood-prone areas as agricultural wetlands, recognizing the importance of maintaining them in their natural state. Additionally, recommendations include the implementation of a robust stormwater management network to mitigate flood risks effectively. Furthermore, a watershed interconnectivity plan is suggested, aiming to enhance the overall resilience of the water management system. These measures align with the goal of sustainable urban development, ensuring the harmonious coexistence of the city with its natural environment
- Prioritize land use planning emphasizing green spaces, parks, and retention ponds. A provision of 50m buffer is provided surrounding the all the rivers and major waterbodies and whereas a buffer of 15m is provided all along the streams, to restrict any form of urban development and the lands falling under this buffer shall remain as agriculture use.

Infrastructure Improvement:

- Upgrade stormwater drainage systems for efficient runoff.
- Strengthen embankments, levees, and flood walls along the Thamirabarani River.
- Existence of macro and micro drainage networks in Tirunelveli Local Planning Area facilitates draining of these areas within a reasonable time. Developments in such low-lying areas are allowed only when a proposed development conforms to standards and after getting clearance from PWD on the measures to be taken to make it free from inundation.

**Flood-Resilient Building Codes:**

- Implement codes prioritizing flood resilience, including elevated foundations.
- Encourage flood-proof structures in vulnerable areas.

Community Engagement and Education:

- Engage communities in disaster preparedness and response.
- Conduct regular awareness programs about flood risks and safety measures.

Earth Quake-Prone Areas: Tirunelveli Local Planning Area falls under Seismic Zone – III,II. The whole of Tirunelveli Local Planning Area falls in this zone which is a moderate to low seismic risk.

TOURISM

CHAPTER 10



MASTER PLAN
2041
TIRUNELVELI LPA



10. TOURISM

Tourism industry is important due to its role as a commercial activity that creates demand and growth for many more industries. Tourism brings tremendous economic value for a country. It impacts several industries directly and indirectly. Tourism not only contributes towards more economic activities but also generates more employment, revenue, and foreign exchange earnings and plays a significant role in development.

First the tourism specific demand which creates is necessity for travel and transport to reach tourist destinations which involves air, water, rail and road transport. Secondly, it creates various demands for the hospitality industry which includes accommodation, food& beverages, resorts, etc. The third demand which is for accommodation bookings and reservation industry. These industries, specifically transportation and hospitality, by themselves are huge and span across various sub industries, and therefore play important role in the economy of any area. In Tirunelveli LPA, many religious institutions are present and are more of a heritage-based tourism. The place has its vast history and cultural background.

10.1 PLACES OF INTEREST IN TIRUNELVELI LPA


Tirunelveli also known as Nellai and historically as Tinnevely is the sixth- largest city municipal corporation in tamilnadu. It is famous for the sweet made with wheat, sugar and ghee also called as 'Irutukadai halwa'. Tirunelveli halwa was popularized by Irutukadai Halwa, a shop opened in 1900 which sells the sweets only during twilight and it still exists and which became a geographical indicator also. The river Tamarabarani passing around Tirunelveli area is popularly said as "Vatratha Jeeva Nathiyaam Engal Tamarabarani Nathi" in Tamil. The Tamirabarani is a symbol of Tamil culture and civilization and an identity of the far south of India.

Tirunelveli has many historically significant places like religious temples, spotted deer sanctuaries, Thiruvalluvar two Tier Bridge and Krishnapuram sculptures in LPA area. Most pilgrims are attracted towards the district due to the availability of religious institutions such as Swamy Nellaiappar Kandhimadhiamman temple in Tirunelveli town, Tirunelveli district science centre is present in the LPA which is established to popularize science and technology among public and to supplement science education in schools and colleges. It would encourage a spirit of scientific enquiry among the students. Therefore tourism is a major economic driver in Tirunelveli district. The important tourist places in Tirunelveli LPA are situated in Tirunelveli Corporation, Krishnapuram, Kodaganallur and Sivalaperi.



10.1.1 TOURISM SPOTS IN TIRUNELVELI CORPORATION

Tirunelveli is a famous pilgrimage centre that attracts many pilgrims. Numerous historic temples, Thiruvalluvar two tier bridges and museum are located here. Some of the most popular temples are Swami Nellaiappar Kandhimadhi Ambal Temple, Sri Subramanian Swamy Temple, Sree Salaikumaran Temple, Perratchiyammal Temple, Holy Trinity Cathedral, The Catholic Mission Cathedral and St Antony's Church.

<p>1. Swamy Nellaiappar Kandhimadhi Amman Temple</p> 	<p>The temples where Shiva is believed to have performed the Cosmic Dance. This temple is called Tamira Sabha (copper hall) based on the dance pose of Nataraja. The Distance between Tirunelveli Bus Stand and Nellaiappar Kandhimadhi Ambal Temple is 7 kms.</p> <p>Vasantha mandapam with 100 pillars is present within the centre of the flower garden in square shape.</p> <p>The unique feature of the temple is the 'Mani Mandapam' located near the Nandi mandapam with two giant pillars carved out of a single stone and each one is having 48 sub pillars which produce musical notes when struck.</p> <p>Other mandapam in the temple include Oonjal Mandapam and the 1000 pillared hall.</p>
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This Murugan temple is located in Kurukkuthurai, on the bank of Tamarabarani river and it is also involved closely with the venerated Murugan temple at Tiruchendur. It is believed that the image of Subramanian here is made out of the same piece of rock which was used in making the image of Subramanyar at Tiruchendur in mid-17th century. This temple is also closely connected to the Nellaiappar temple at Tirunelveli.

2. Sri Subramanian swamy temple



3. Sri Salai Kumaran Temple



The presiding deity is Lord Palayam Salai Kumaraswamy. Lord Kumaran is seated on a peacock with Valli and Devasena. There is a Peacock Hall in the temple.

This temple is about 350 years old and is situated in the heart of Tirunelveli city. It is very near to the railway station and city bus stand. Good hotels, sweet stalls, confectionery shops are present near the temple and is one of the famous temples in Tirunelveli junction.



4. Holy Trinity Cathedral (Oosi gopuram)



Holy Trinity Cathedral a small, elegant and beautiful church was built in 1826 by Rev. Rhanius and opened to public for worship on 26 June 1826.

This church is locally well known as “Oosi gopuram” as a land mark. In 1940 Bishop Stephen Nellai raised its status as the Holy Trinity Cathedral, painting, flooring and other extensions were made in the succeeding years.

This church is involved in many social services like paying visit to hospitals. This church plays a vital role not only in spiritual upliftment of the people but also in the material upliftment like providing education, distributing free food and clothing and helping them in the construction of their houses etc.,

The Two Tier Over Bridge, namely Thiruvalluvar Bridge at Tirunelveli junction is constructed to avoid the railway line crossing. The total length of bridge is 800 meters. This type of Two-Tier Bridge constructed in Tirunelveli is said to be the first of its kind in India. This bridge has been opened for traffic in 1972. This Two Tier Over Bridge consist of 25 spans of which 13 arc of bow string arch, each with a width of 30.30 meters and 12 are single tier R.C.C. girder each having a width of 11.72 meters.

5. Thiruvalluvar two tier bridge





**6. District Science center, Tirunelveli
(National council of science
museums, Govt. of India)**



The district science centre is unique Institution, situated on the banks of the Tamirabarani at 1.5 km from Tirunelveli Railway Station. This autonomous body is a unit of the National Council of Science Museums, attached to the Department (HRD), Government of India. This is one among the 24 centres in the country.

At present, the Centre has four galleries on the topics namely Fun Science, Popular Science, Electronics and a New Wing of Electronics. It has a well- equipped planetarium and a sky observatory, where one could enjoy the view of heavenly bodies through a telescope. A science park, spread over 6 acres, is also situated within the premises of this centre. The Mirror Magic Corner is an added attraction of the Centre. Cassettes on wildlife, computers and nature are exhibited at this centre. This centre organizes video and planetarium shows and other programs are also organized, such as the temporary exhibition, science fair, mobile science exhibition and science drama.



7. Venkatachalapathy temple, Krishnapuram



The Venkatachalapathy temple at Krishnapuram village on the Tirunelveli- iruchendur main road about 12 Kms from irunelveli is one of the few specimens depicting the architectural marvel and grandeur. This temple is dedicated to Lord Venkatachalapathy with his consorts.

On either side the temple is complete in itself since it is following temple agamas. Many pilgrims are gathered during weekends for worship.

Kodaganallur is situated at a distance of 23 KMs from Tirunelveli. Lord Shiva is the presiding deity and called as Kailasanathar with Goddess Sivakami. This is PariharaSthalam for doshas related to Sevvai/ Angarahan/ Mangal Graha (MARS).

Kailasanathar Temple in Kodaganallur stands third in the Nava Kailasam temples.

8. Kailasanathar temple, Kodaganallur





9. Vishnu durgai amman temple, Sivalaperi



Ragu Kala Puja is performed by the villagers around Sivalapperi Durga and people from various districts of Tamil Nadu.

The Rajagopuram of the temple is 33 feet high. The statue of Ambal in the meditation hall is carved in white stone. This statue was brought from Jaipur. Sivalapperi is a beautiful village located on the banks of the Tamirabarani River at the distance of 17 km from Tirunelveli.

The Suthamalli Dam, built across the Tamarabarani River, which irrigates the area of about 2,500 hectares to sustain agricultural activity.

10. Suthamalli Dam





10.1.2 TAMIRABARANI RIVER

The Tamirabarani River in Tirunelveli is also proudly said as "Vatratha Jeeva Nathiyaam Engal Tamirabarani Nathi" passing through the LPA. The old Tamil name of the river is Porunai. The Tamirabarani is a symbol of Tamil culture and civilization and an identity of the far south of India. In Tamil and Sanskrit literature of earlier times, the Pandyas were referred to as the rulers of the land where the Tamirabarani flows. Tamirabarani is the major river of the district which has a large network of tributaries which includes the Peyar, Ullar, Karaiyar, Servalar, Pampar, Manimuthar, Varahanathi, Ramanathi, Jambunathi, Gadanathi, Kallar, Karunaiyar, Pachaiyar, Chittar, Gundar, Aintharuviar, Hanumanathi, Karuppanathi and Aluthakanniar. The Tamirabarani originates from the peak of the Periyapothigai hills of the Western Ghats above Papanasam in the Ambasamudram taluk. The Tamirabarani is fed by the south west and the north-eastern monsoon and is seen in full spate twice a year in general.

10.1.3 TOURIST DESTINATION IN TIRUNELVELI

Table 10.1 TOURIST ATTRACTION SPOTS AND THEIR TYPE

S.No	Tourist Attraction	Type	Season
1	Swamy Nellaiyappar Kandhimadhi amman Temple	Pilgrimage	Throughout the year
2	Sri subramaniya swamy temple	Pilgrimage	Throughout the year
3	Sree salaikumaran temple	Pilgrimage	Throughout the year
4	Holy Trinity Cathedral (Oosigopuram)	Pilgrimage	Throughout the year
5	St. Antony's Church	Pilgrimage	Throughout the year
6	District Science Centre	Cultural	Throughout the year
7	Krishnapuram Sculptures (Venkatachalapathy Temple).	Pilgrimage	Throughout the year
8	Kailasanathar Temple, Kodaganallur.	Pilgrimage	Throughout the year

Source: Tourist Office, Tirunelveli



10.1.4 TOURIST FOOTFALL

Table 10.2 TOURIST FOOTFALL

Location	Year	Tourist Footfall
Tirunelveli District	2017	2854092
	2018	1887437
	2019	3028284
	2020	1837476
	2021	1185354

Source-Tourist Office, Tirunelveli

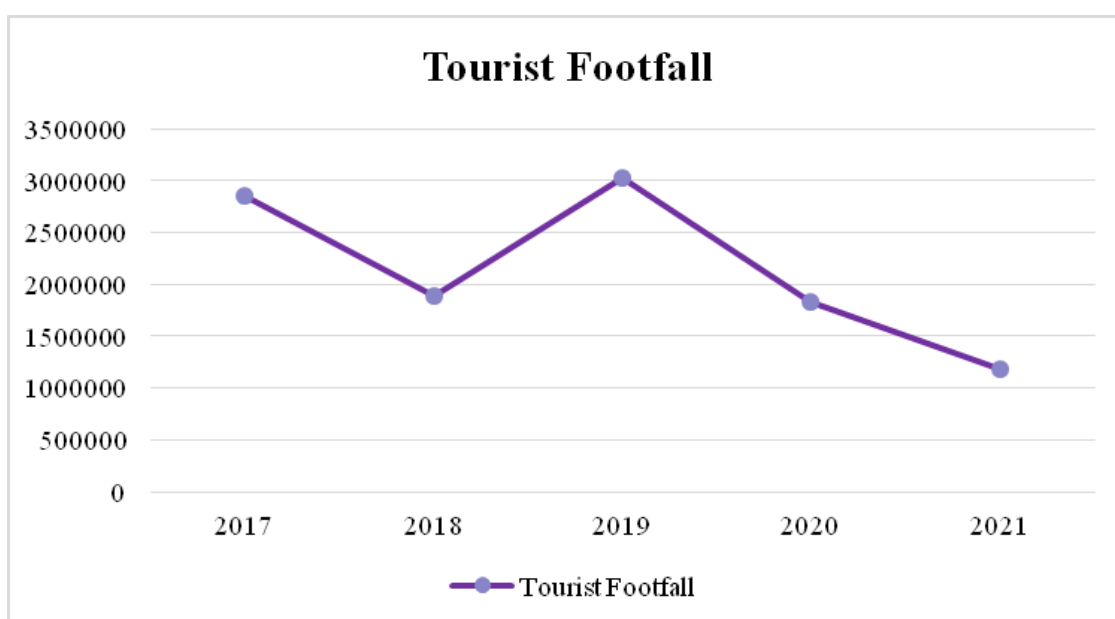


Figure 10.1 TOURIST FOOTFALL

10.1.5 ACCOMMODATION DETAILS IN TIRUNELVELI

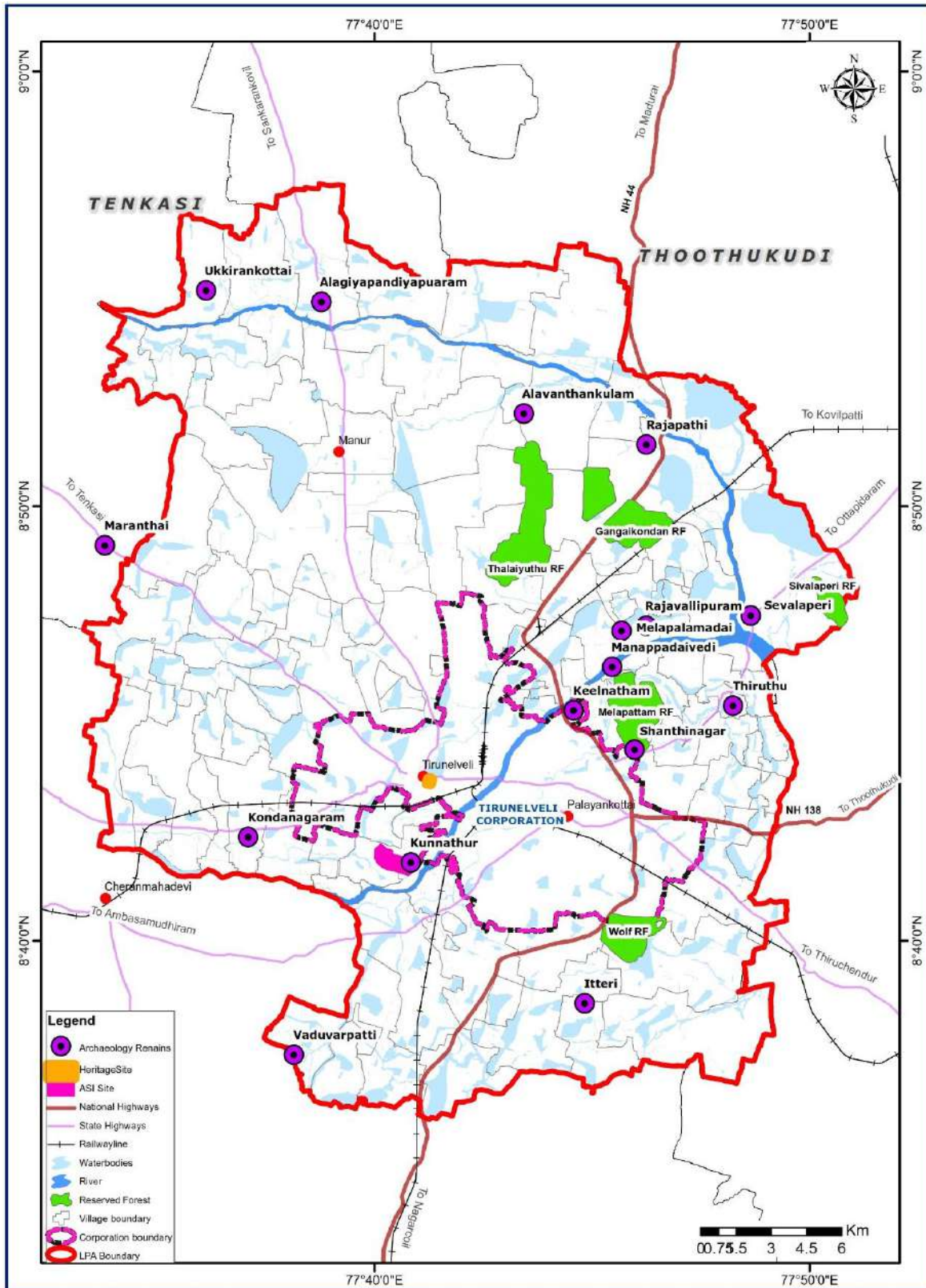
Table 10.3 ACCOMMODATION DETAILS

Tourist Facilities	No. of Hotels/ Lodges	No. of Rooms	
		A/C	Non-A/C
Hotel with restaurants and lodging	29	557	987

(Source- District Tourist Office, Tirunelveli)



Map 10.1 TOURIST PLACES AND ARCHAEOLOGICAL REMAINS IN TIRUNELVELI LPA





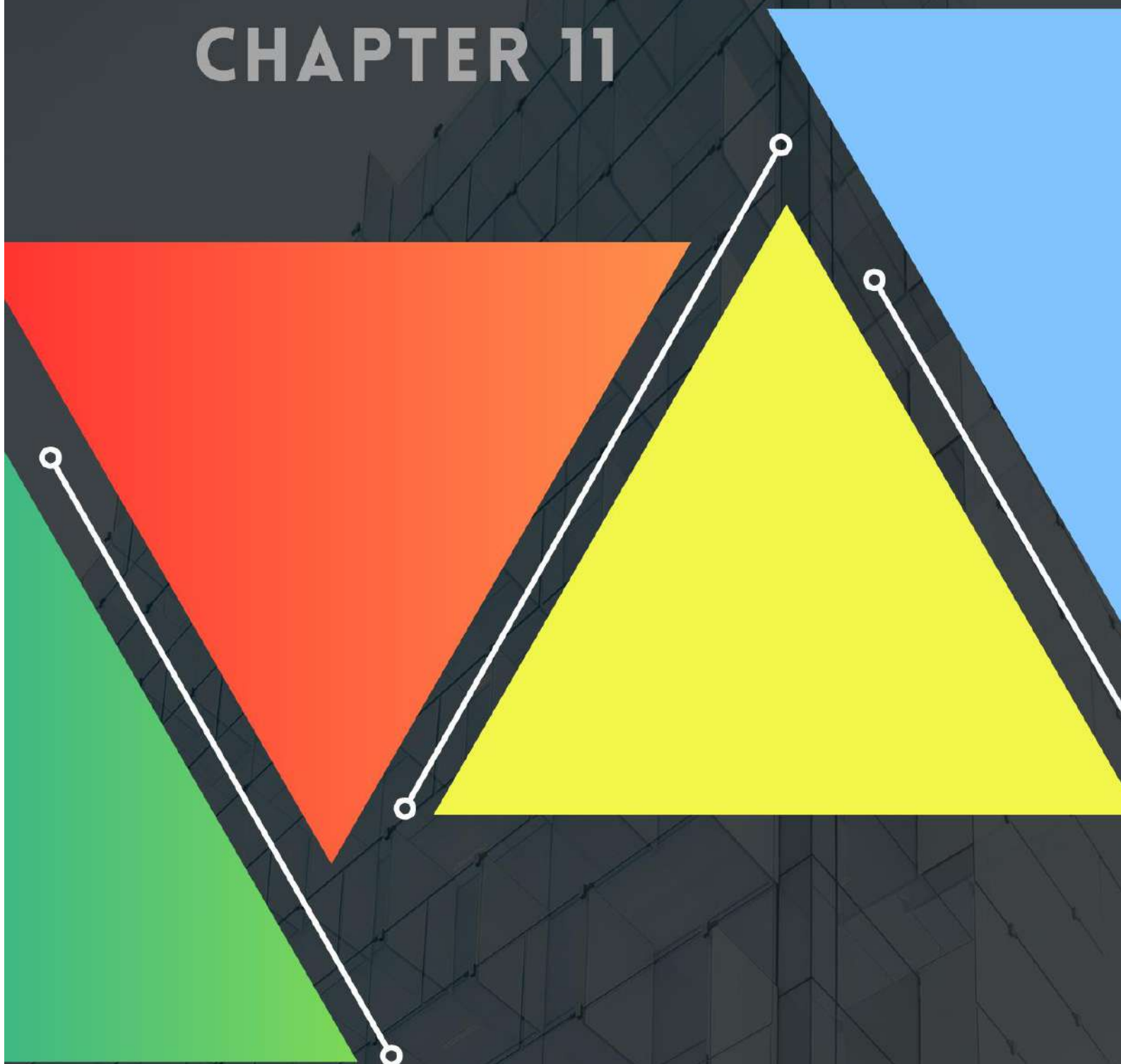
10.2 STRATEGIES

The Department of Tourism has the following proposals on hand to attract tourists

- **Construction of a Convention Centre:** With the advances in the industrial front, Tirunelveli offers plenty of scope for MICE (Meetings, Incentives, Convention and Exhibitions) Tourism in a big way. Construction of a Convention centre within the LPA with suitable parking lots, infrastructure facilities, attractive layouts, etc. will attract business tourists in a big way.
- **Lighting of Memorials:** Illumination of memorials of great leaders can attract tourists in large numbers. Flood-lighting heritage buildings and monuments
- **Art Gallery:** Showcasing the artistic wealth of Tamil Nadu by displaying the works of outstanding personalities in an art gallery would be a fitting tribute to the genius of several artists who have enriched the culture and tradition of Tamil Nadu. Different types of paintings that have evolved over a period of time, specimens of mural paintings, etc. can be part of the gallery including **Porunai museum.**

EXISTING LANDUSE

CHAPTER 11



MASTER PLAN
2041
TIRUNELVELI LPA



11. EXISTING LAND USE

11.1 EXISTING LAND USE

The existing land use is the important input in devising the future growth strategy of any town or area. The existing land use maps show various current land use indicating Agriculture, Residential, Commercial, Industrial, Public and semi-public, Recreational, Vacant land, Water bodies etc. Land use policy making and the decision to control over the land is crucial part of the master plan preparation. Initially the existing land use status and the growth pattern and direction of the city are assessed. With the technological advancement the preparation of land use and analysis become much easier. In order to regulate the growth in an orderly manner and also to ensure its economic development, social stability for the present and the future, the master plan with zoning and development regulation is necessary. From the existing land use pattern of the town, suitable locations of the future developments can be identified.

11.2 LAND USE BREAKUP ANALYSIS (2021)

The existing land use map has been prepared through field survey across the LPA. The land use breakup is listed in the table 11.1 along with its percentage. The agricultural land use constitutes the highest percentage of 64.20 %. The second highest being the residential land use comprising of 11.82% of the total LPA area. The water bodies constitute an area of 122.118 with a percentage of 14.16 % to the total planning area. This is followed by industrial and institutional with a percentage of 1.89 % and 1.98 % respectively.

The development trend of Tirunelveli is taken into account and analyzed in the previous section. Table 11.1 shows the existing land use with the standards recommended in URDPFI guidelines.



Table 11.1 EXISTING LAND USE BREAKUP 2021

S.No	Land use	Area in sq. km	Percentage
1	Residential	100.77	11.69
2	Commercial	2.77	0.32
3	Industrial	10.89	1.26
4	Institutional	18.24	2.12
5	Transport and Communication	27.02	3.13
6	Open space and Recreational	1.07	0.12
7	Agriculture	561.95	65.19
8	Water Bodies	121.97	14.15
9	Reserved forest	17.28	2.00
	Total Area	861.97	100.00

Source: URDPFI Guidelines, Primary Data

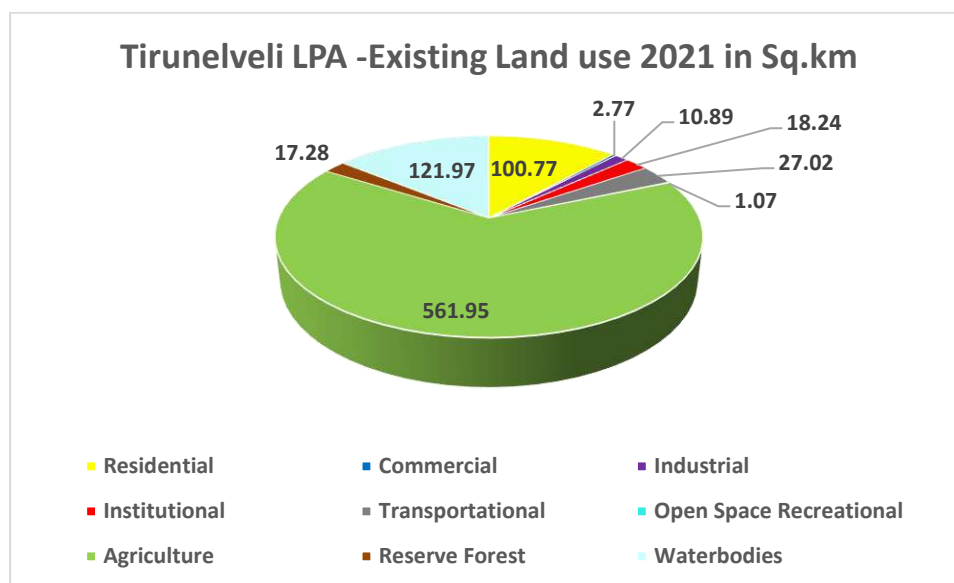
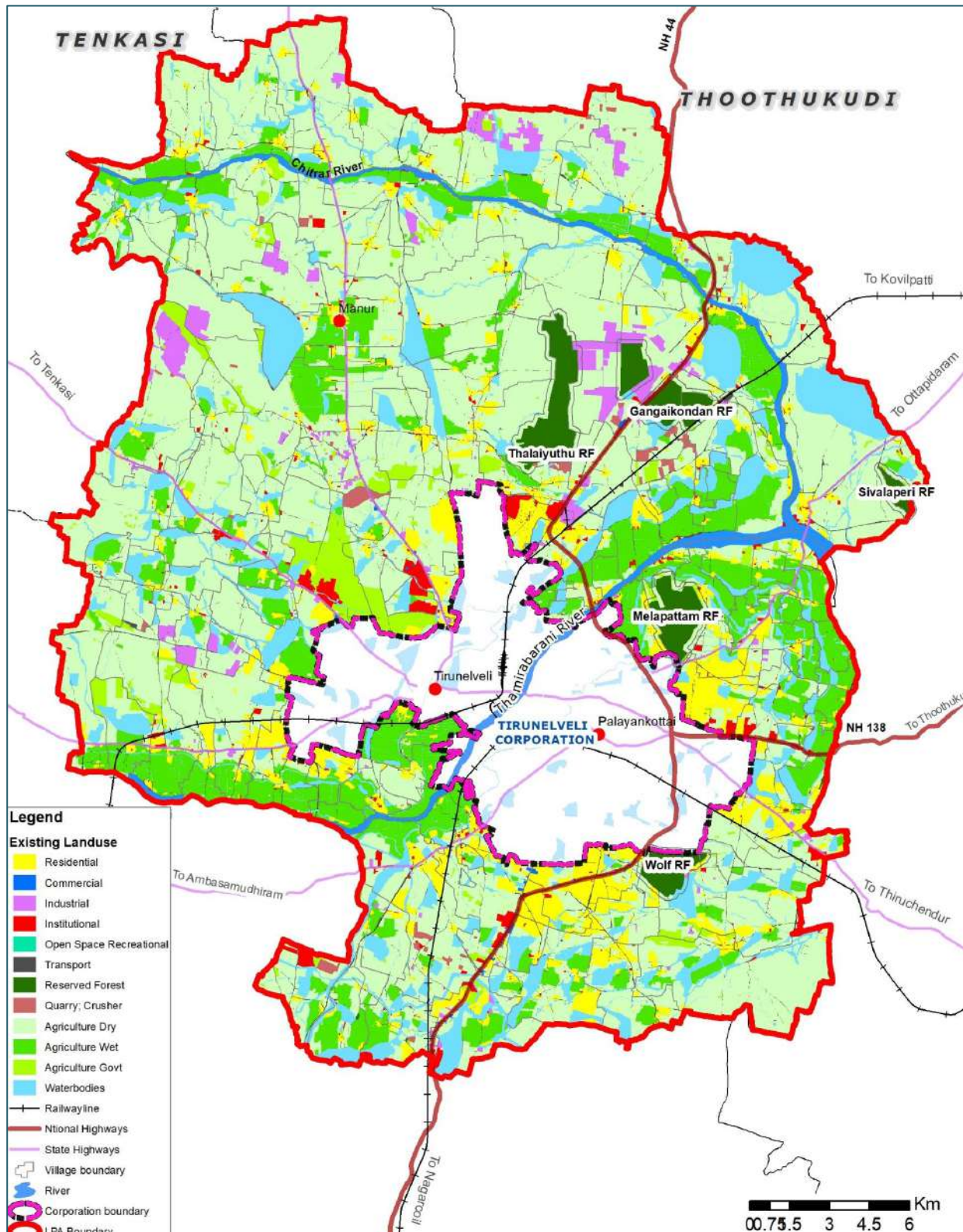


Figure 11.1 EXISTING LAND USES 2021 IN SQ.KM



Map 11.2 EXISTING LAND USE 2021 – TIRUNELVELI REST OF LPA





11.3 REVIEW OF RECONSENTED MASTER PLAN-2011

11.3.1 CURRENT SITUATION

Analysis of the proposed land use in the review consented master plan for the corporation and vicinity area.

CORPORATION AREA-108.65 Sq.km

- The proposed land use for residential sector for corporation area is 37.56 Sq.km, whereas the existing residential use in the corporation area is 37.42 Sq.km. This shows that the residential area 0.14 Sq.kms coincides with the projected growth.
- The commercial use zone area proposed is 2.65 Sq.km, whereas the existing commercial use zone area in 2021 is 2.20 Sq.km. This shows that the commercial potential of 0.45 Sq.km is yet unutilized. However, with the TNCDBR, 2019, envisages the deemed commercial use zone for roads with more than 9.0m width, the percentage of area in commercial use zone is achievable.
- In the industrial use zone, the proposed area allotted is 2.84 Sq.km, whereas, the existing industrial area in 2021 is 0.89 Sq.km. There is unutilized potential of 1.95 Sq.km. As per TNCDBR, 2019, most of the uses are permitted except institutional use. Therefore, the land use allotted is expected to be achieved.
- In the educational use zone, the area allocated is nil, whereas, the area proposed for public and semipublic use zone is 5.66 Sq.km. The existing land use area in 2021 under the institutional use zone in corporation is 9.86 Sq.km. This implies that an increase of 4.20 Sq.kms than the proposed land use. And the growth under this use is more than two times.

Under the developed area, the total proposed developed area in corporation area is 48.71 Sq.km. Whereas, the developed area in 2021 in the corporation limit is 61.84 Sq.km, therefore, there is an increase of 13.13 Sq.km under the developed area is observed. It is inferred that in the corporation area the development exceeded the proposed land use.

Similarly, under the undeveloped area (agriculture, water bodies etc), the proposed un developable area as per review consented master plan is 59.94 Sq.km, whereas the existing land use under the un developable area category is 46.81 Sq.km. This shows the decrease in agriculture etc to an area of 13.13 Sq.km and marking the urban development takes place in a rapid manner.



VICINITY AREA-242.92 Sq.Km

- The proposed land use for residential sector for Vicinity area is 76.54 Sq.km, whereas the existing residential use in the Vicinity area is 37.84 Sq.km. This shows that the area under residential use zone to an area of 38.70 Sq.km is still to be developed.
- Under the commercial use zone, in the vicinity area proposed is 0.92 Sq.km, whereas the existing commercial use zone area in 2021 is 0.38 Sq.km. This shows that the commercial potential of 0.54 Sq.km is yet unutilized. However, with the TNCDBR, 2019, envisages the deemed commercial use zone for roads with more than 9.0m width, the percentage of area in commercial use zone is achievable
- Under the industrial use zone, the proposed area in the review consented master plan is 8.70 Sq.km. But as per the existing land use, the industrial use zone area in 2021 is 2.09 Sq.km. There is unutilized potential of 6.61 Sq.km. In the vicinity area of Tirunelveli, TNCDBR, 2019, more industries such as expansion of SIPCOT PHASE II, Tata power solar are expected to come up. Therefore, the land use allotted is expected to be achieved.
- Under the education zone zero land use zone was allotted for vicinity area and under public and semi public use zone an area of 9.60 Sq.km are proposed. As per existing land use 2021, area under the institutional use zone is 4.67 Sq.km. There is a deficit of 4.93 Sq.km of area to be achieved

Under the developed area, the total proposed developed area in the vicinity area is 95.76, Sq.km. Whereas, the developed area in 2021 in the vicinity area is 51.08 Sq.km, therefore, there is decrease of 44.68 Sq.km under the developed area is observed. It is inferred that in the vicinity area the development is lagging behind in the proposed land use.

Similarly, under the undeveloped area (agriculture, water bodies etc), in the vicinity area, the proposed developable area as per review consented master plan is 147.16 Sq.km, whereas the existing land use under the developable area category is 191.84 Sq.km. This shows the increase in agriculture and allied activities etc to a more available area of 44.68 Sq.km and marking the urban development takes place in a slow pace.

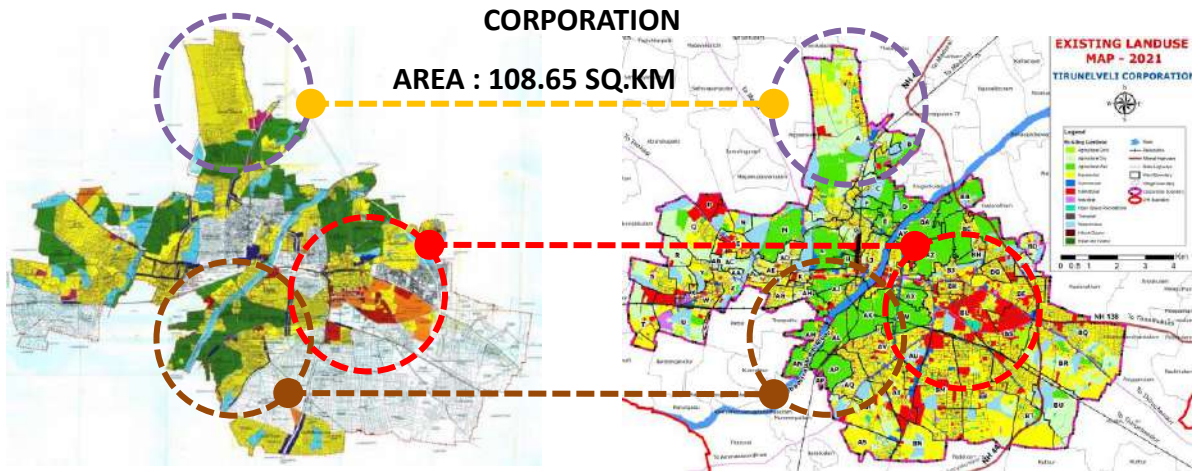


Table 11.2 COMPARISON OF REVIEW CONSENTED MASTER PLAN PROPOSED LAND USE LPA
2010 & 2021 VS EXISTING LAND USE 2021

Land use	Review Consented Master Plan – Land use LPA 2010		Review (2010) Consented Proposed Master Plan 2021 Vs Existing Land Use LPA 2021					
	Corporation Existing 2010 (Sq.Km)	Vicinity Existing 2010 (Sq.Km)	Corporation Estimated Area 2021 (sq. km)	Corporation Existing 2021 (sq. km)	Land use Area Difference (sq.km)	Vicinity Estimated Area 2021 (sq. km)	Vicinity Existing 2021 (sq. km)	Land use Area Difference (sq.km)
Residential	12.02	8.07	37.56	37.42	-0.14	76.54	37.84	-38.7
Commercial	0.91	0.87	2.65	2.2	-0.45	0.92	0.38	-0.54
Industrial	2.16	2.85	2.84	0.89	-1.95	8.7	2.09	-6.61
Educational	2.39	1.96	-	21.33	21.33	0	10.77	10.77
Public And Semi Public	2.91	3.09	5.66	-	-5.66	9.6	-	-9.6
Developed Area	20.39	16.84	48.71	61.84	13.13	95.76	51.08	-44.68
Undeveloped Area (Agriculture, Water Bodies Etc.)	88.26	226.08	59.94	46.81	-13.13	147.16	191.84	44.68
Total Area	108.65	242.92	108.65	108.65		242.92	242.92	
TOTAL LPA								351.57 SQ.KM

In Tirunelveli Corporation, the comparison of residential and commercial land uses with the projected land use indicates a consistent and steady growth in the past decade. This alignment suggests that the development and utilization of land for residential and commercial purposes have closely followed the projections made in the planning phase.

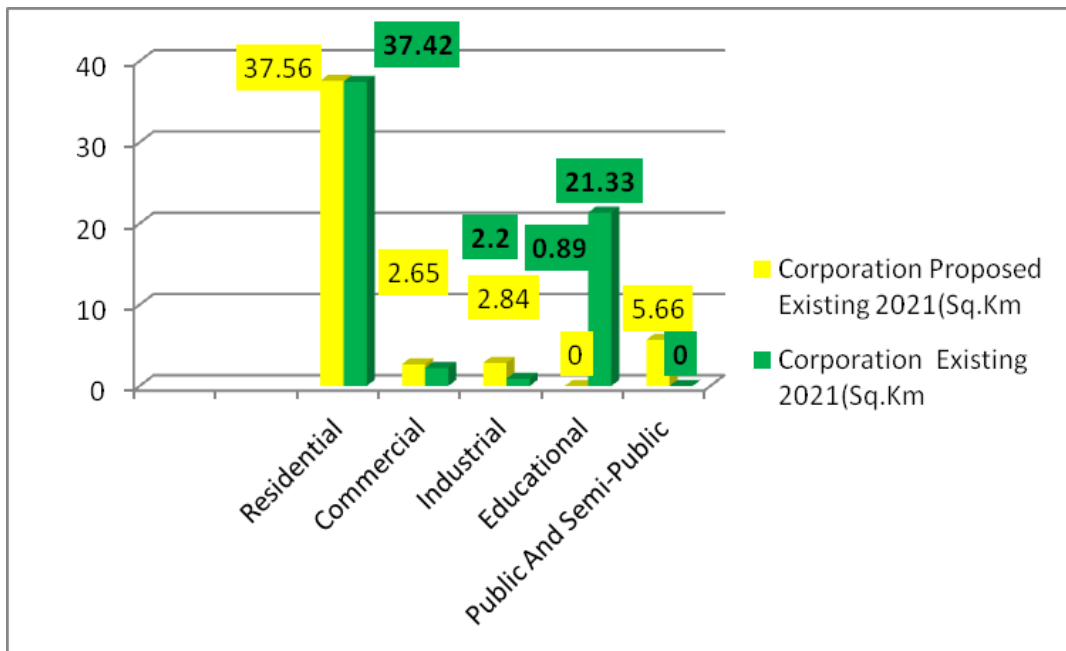
Tirunelveli Rest of LPA, A notable disparity exists between projected and existing land use for residential and industrial purposes outside Tirunelveli's corporation area, emphasizing the need for urban planning intervention in economic development and spatial distribution of the settlement.



2021 PROPOSED MASTER PLAN OF CORPORATION AREA - PREPARED IN THE YEAR 2010

2021 EXISTING LAND USE OF CORPORATION AREA

Figure 11.2 COMPARISON OF REVIEW CONSENTED MASTER PLAN PROPOSED LAND USE LPA 2021 VS EXISTING LAND USE 2021 (CORPORATION AREA)



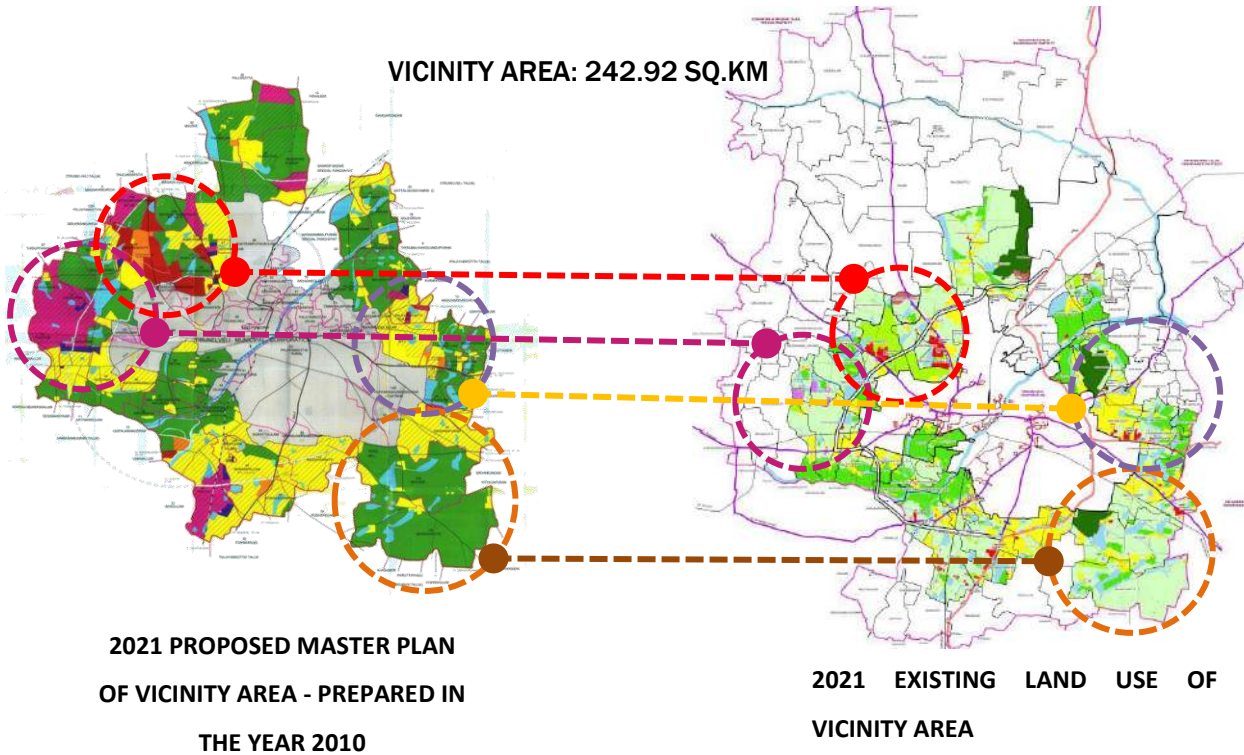


Figure 11.3 COMPARISON OF REVIEW CONSENTED MASTER PLAN PROPOSED LAND USE LPA 2021 VS EXISTING LAND USE 2021 (VICINITY AREA)

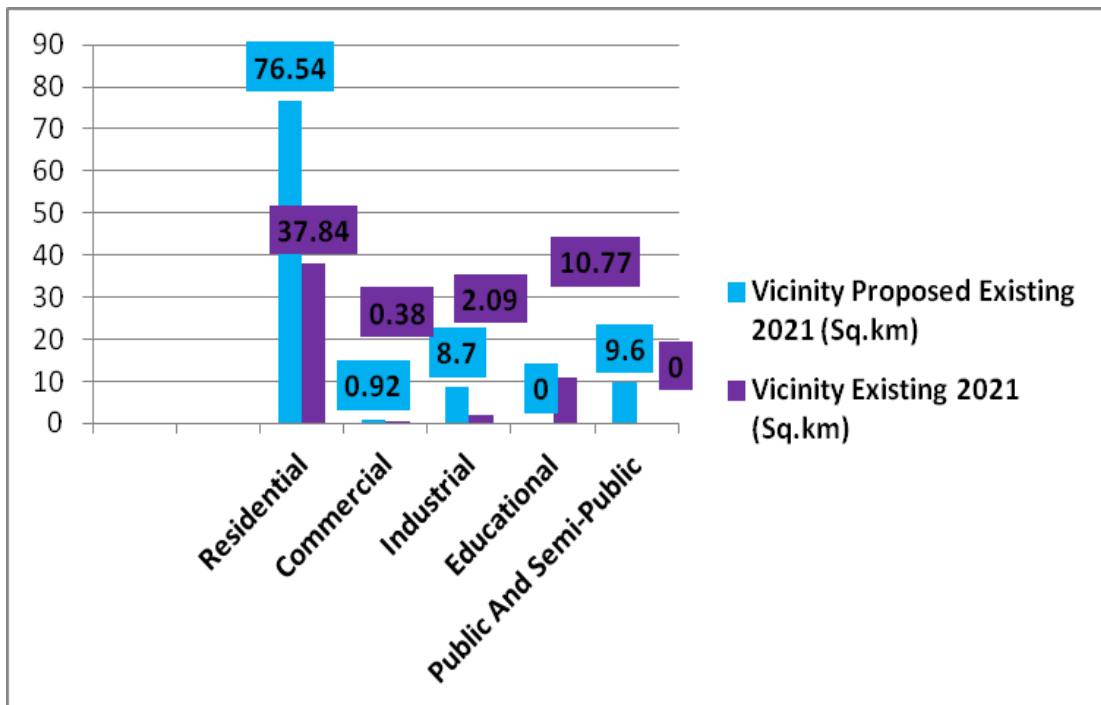




Table 11.3 REVIEW CONSENTED MASTER PLAN LAND USE LPA 2011

(At Present Approved Review Consented MASTER PLAN Land use -2011)

SI NO.	Land Use	Corporation Existing 2010(Sq.Km)	Vicinity Existing 2010(Sq.Km)
1	Residential	12.02	8.07
2	Commercial	0.91	0.87
3	Industrial	2.16	2.85
4	Educational	2.39	1.96
5	Public And Semi-Public	2.91	3.09
Developed Area		20.39	16.84
Undeveloped Area (Agriculture, Water Bodies Etc)		88.26	226.08
Total Area		108.65	242.92

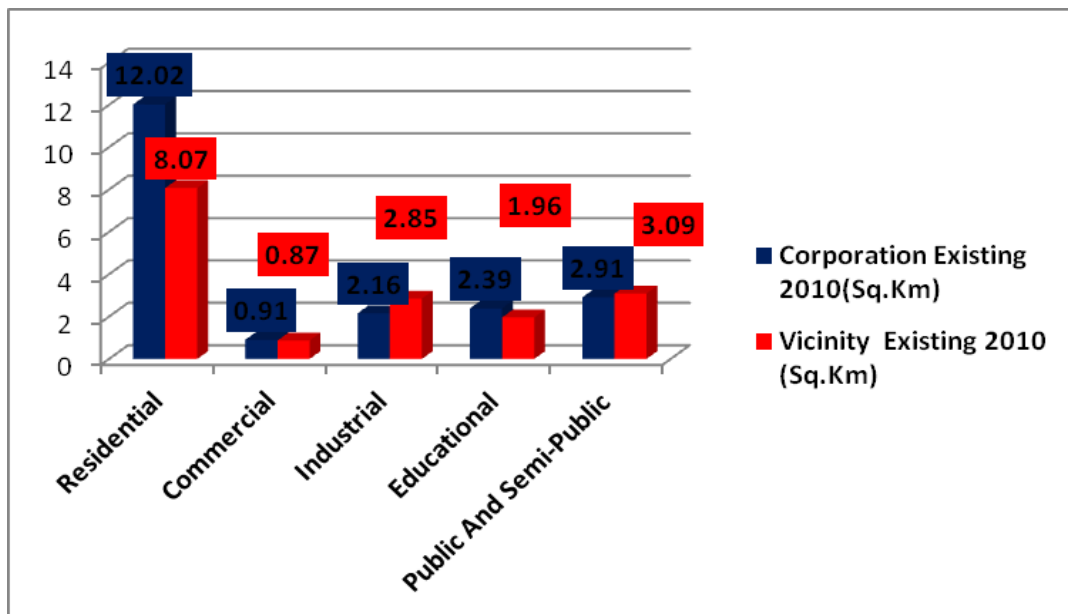
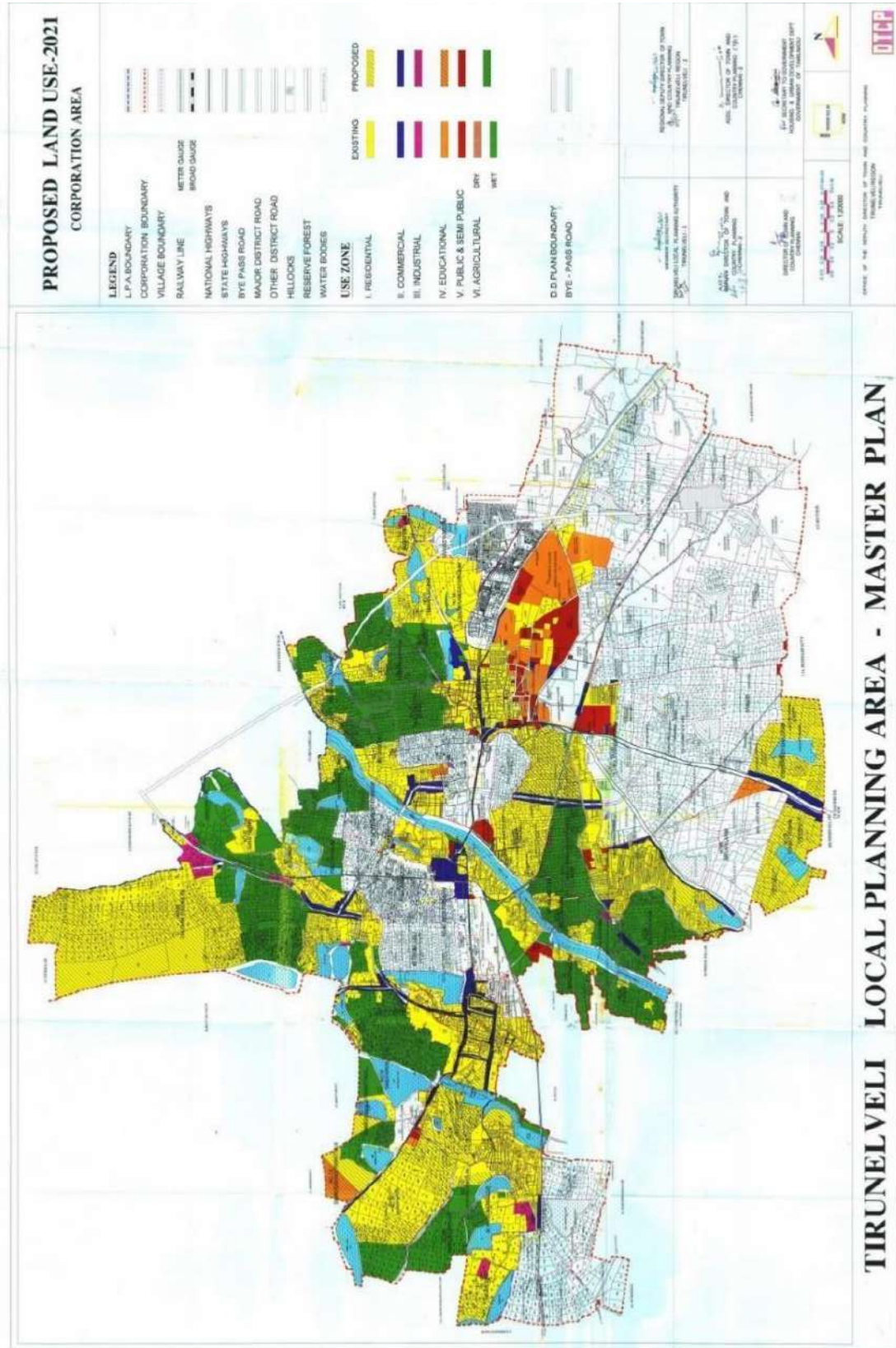


Figure 11.4 REVIEW CONSENTED MASTER PLAN LAND USE LPA 2011

The following Maps shows the Proposed landuse of Tirunelveli Municipal Corporation and Vicinity area for the year 2021.

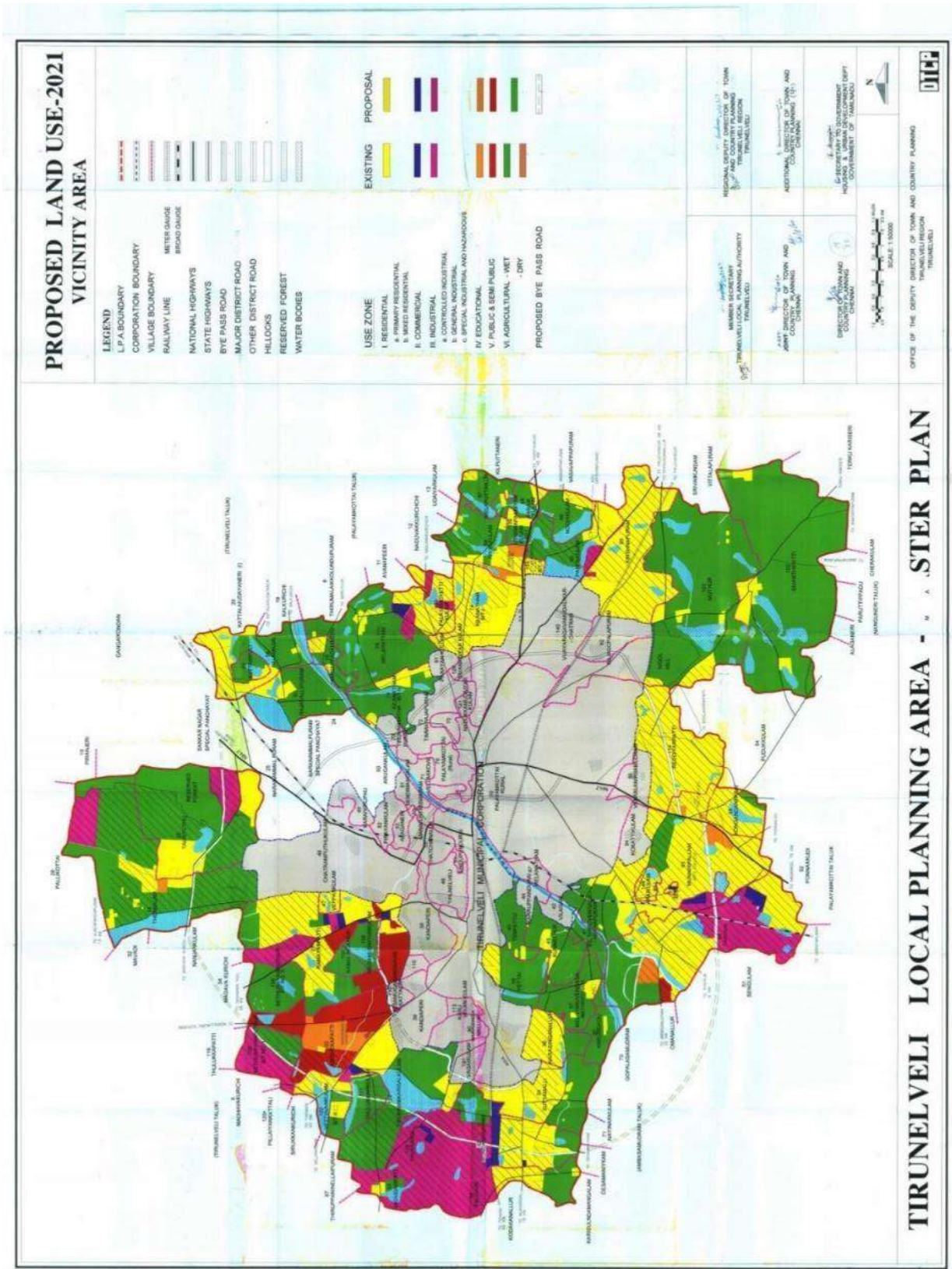


Map 11.3 REVIEW CONSENTED LAND USE (2011) – CORPORATION





Map 11.4 REVIEW CONSENTED LAND USE-VICINITY AREA-2011





The Master Plan 2010 stands as a testament to effective implementation, with almost all proposed initiatives successfully realized. This accomplishment not only signifies a clear understanding of the region's requirements and projections but also underscores a proactive approach to planned urban development. Among the major completed projects are infrastructure enhancements, residential zone expansions, and the development of commercial and retail spaces. The Master Plan's commitment to sustainable practices is evident in ongoing waste management efforts. Notably, the proposal to **shift the wholesale grain market from the west and north car street area**, aimed at optimizing land usage and aligning with tourism needs, remains pending. This crucial initiative is carried forward in the current master plan, emphasizing its significance in maintaining a harmonious urban landscape.

Table 11.4 STATUS OF THE MAJOR PROPOSALS IDENTIFIED IN THE MASTER PLAN 2010

Formation of outer By-pass Road connecting NH7 (Madurai Road), NH7A (Tuticorin road), Tiruchendur road and NH7 (Kanniyakumari road) including construction of two rail over bridges and one river bridge	ONGOING
Link road from 2/4 of Tirunelveli-Rajapalayam road to 6/2 of Tirunelveli-Potal pudur road including R.O.B	
Provision of new link road between Sankarankoil road and Madurai Road (to join near Bye pass junction)	
Link road inter-connecting Kurukkuthurai road and Bye pass road (near New Bus stand) including R.O.B and a river bridge across Tamiraparani	
Provision of link between Kanniyakumari road (NH7) to Ambasamudram road	
Redesign of the junction Bus stand as Town bus terminal with pedestrian sub-way and other facilities.	COMPLETED
Improvements to Storm Water Drains - Improving the storm water drains and drainage channels in and around the old town	



11.3.2 DETAILED DEVELOPMENT PLANS IN TIRUNELVELI LPA

The DD plans are prepared under section 19 of T & CP act 1971, there are 89 numbers of detailed development plan in Tirunelveli, which are various stages as detailed below and the list of DD plans is enclosed as **annexure IV**

Table 11.5 NUMBER OF DD PLANS

AREA	STAGE	TOTAL
TIRUNELVELI	NOTIFIED	11
	MAP NO 2 APPROVED	11
	CONSENTED U/S 25	08
	APPROVED U/S 29	41
	REVIEW CONFIRMED U/S 33 (2)	17
	DROPPED	01
TOTAL		89

Out of 89 no. of Detailed development plans the land use specified in the approved / sanctioned and comprehensively varied detailed development plans are retained.

During the preparation of the Tirunelveli Master Plan 2041, a comprehensive review brought to light a noteworthy observation: the areas encompassed by the 8 Detailed Development Plans listed below exhibited a lack of development, as discerned from the insights gleaned during the primary survey. This discovery prompted a strategic reevaluation of the land uses within these regions.



Taking into account a thorough land suitability analysis, particularly emphasizing the proximity to the Tamirabarani River, a decision was made to revert the designated land uses in these areas. Specifically, the shift was from their originally intended residential purpose to a more agriculturally oriented designation, encompassing both dry and wet practices. This decision was guided by a consideration of the conditions prevalent before the initiation of the Detailed Development Plan.

The Detailed Development Plans affected by this adjustment are as follows:

1. Krishna Puram Detailed Development Plan 2
2. Melapalayam Detailed Development Plan 1
3. Thatch Nallur Detailed Development Plan 4
4. Vannarapettai Bye-pass Road Detailed Development Plan 2
5. V.M. Chattram Detailed Development Plan 6
6. Krishna Puram Detailed Development Plan 6
7. V.M. Chattram Detailed Development Plan 12
8. Pettai Rural Detailed Development Plan 2

This nuanced modification reflects a commitment to ensuring the optimal and sustainable utilization of these areas, aligning with the evolving needs and considerations in the ongoing urban planning process.



11.4 SWOT ANALYSIS

Tirunelveli LPA, an ancient city of 2,000-year-old is situated in the southern part of Tamil Nadu. It is the administrative headquarters of Tirunelveli District and sixth-largest Municipal Corporation in the state. Following an extensive citizen engagement and city profiling exercise, the SWOT analysis for Tirunelveli is as follows

11.4.1 STRENGTHS

STRONG HERITAGE BASE

- City is known for its resplendent history and indigenous heritage, having a number of monuments with Nellaiappar temple being the most famous one in the world which was built during 7th century at an extent of 14 acres attracts tourists from all over the world.

STRATEGIC LOCATION

- Proximity to urban centers like Thoothukudi, Nagercoil, Thiruvananthapuram, Kollam, Madurai and Kochi aids in ease of resource flow and also attracts floating population (4600 per day on an average).
- The state's only perennial river, Tamirabarani divides the city into the Tirunelveli quarter and the Palayamkottai area.

EXCELLENT CONNECTIVITY

- Tirunelveli is well connected through air, rail, road and ports in the region.
- Convenient access to all parts of the city and NH-7 passes through the city
- Any train passing through the Tirunelveli junction halts at one of the five platforms, regardless of destination.
- The nearest domestic airport Thoothukudi Airport (TCR) is located at 22 km east of the city and the international airports are at Madurai (150 km) and Thiruvananthapuram (130 km)
- Thoothukudi Port Trust One of the 12 Major ports in India located at a commuting distance of 60km.



HISTORY OF SUCCESSFULLY EXECUTED SIGNATURE PROJECTS

- Related to solid waste Management project 'LIFT' has bagged 'The Best Corporation Award' for 100% segregation of waste at source.

EDUCATION HUB

- Tirunelveli is also often dubbed as the 'Oxford of the South'. Almost all the best schools, colleges and institutions of higher education are located in this district some of which date back to more than a century.
- The district has a literacy rate of 76.97%, which is above the National average of 74.04%. the district has a total of 2,494 schools. It has one university, 4 government colleges, 11 government-sponsored colleges and 7 private colleges

STRONG ECOLOGICAL BLEND

- Tamirabarani, a perennial river located at the city is the main strength for the water sources and sustaining City's Growth
- City has over 55 ponds and lakes which occupy over 30% of the land-area
- Picturesque and congenial natural setting with a long stretch of the Western Ghats Mountain ranges and lowland fields, including arenaceous soil and productive alluvial deposit, and an assortment of plant life, animal life and reserved wildlife.
- The districts possess minerals like Limestone, granite and garnet sand. With a total of 407 mines and quarries

DIVERSE ECONOMY

- It is the major producer of rice, coconuts, bananas, spices and forest-based products.
- A cement factory is located in Sankar nagar in Tirunelveli which is the stated to be third largest cement factory in India.
- Major industries include textile, food and forestry products.
- SEZ was introduced at Nanguneri in 2001. A pharma park and windmill spare-parts and television-manufacturing factories have been planned in this SEZ.



HEALTH FACILITIES

- City has adequate health facilities with one government medical college, super specialty hospital, 31 hospitals and 9 primary health centers.

HIGH PUBLIC LAND OWNERSHIP

- The urban growth pattern is linear in development and there is ample vacant land available in the vicinity of the city owned by ULB.

TOURISM

- Diverse tourist attractions like religious places (Nellaiappar Temple), Dams (Papanasam), Waterfalls (Kuttralam, Alayar) and wildlife sanctuaries (Mudanthurai Tiger Reserve). Being the nodal center for the southern part of the state the influence of floating population is higher (4600 per day).



11.4.2 WEAKNESS

OUT-MIGRATION

- The city has witnessed a dip in the growth rate of the resident population from 28% to 15% between 1991-2001 and 2001-2011 resulting in net out-migration

CONGESTION

- Concentration of major commercial activities within CBD area, causing High congestion
- Insufficient Heritage management and lack of civic awareness
- Pressure on roads in CBD area due to encroachment, excessive commercialization and vehicular movement
- Lack of parking space and Traffic Management in city
- Lack of infrastructure facilities and public conveniences near and around tourist places

HAPHAZARD URBAN GROWTH

- Haphazard growth of city and overcrowding of businesses and people in the CBD area
- Lack of lung spaces/ open spaces and pedestrian pathways.
- High rate of population growth and urbanization is leading to slum formation, strain on infrastructure facilities and deteriorating living environment
- The slum population is 68,202 which is 14.4% of the total city population making it a functional imperative to design policies and programme with a special focus on the poor.

LACK IN INSTITUTIONAL CAPACITY

- Lack of e governance systems coordination among various departments

ENCROACHMENT OF BLUE INFRASTRUCTURE

- Encroachment by development of natural drainage zones including Wetlands and drains has resulted in urban flooding and water pollution



11.4.3 OPPORTUNITIES

POTENTIAL TO EMERGE AS A KEY 'HERITAGE HUB' IN THE SOUTH

- It can attract many tourists because of its rich heritage, culture, and Picturesque and congenial Natural Setting
- 24*7 uninterrupted water supply through source augmentation due to abundance of surface water sources
- With good regional and location advantage, city has the capacity to attract many potential developers in economic and tourism sectors
- High ridership and demand for public transport provides an opportunity to improve public transport infrastructure with transport hubs/ nodes and also NMT zones.

THE RENEWABLE ENERGY HUB

- City's close proximity to Thoothukudi, which currently forms part of the natural gas grid (Ennore- Thoothukudi Natural gas pipeline of capacity 84.6 MMSCMD), offers it with an opportunity to move towards clean and efficient energy sources
- Geographic location and climatic condition offer greater scope for renewable energy production from the source of wind and Solar power.

ECONOMIC COMPETITIVENESS

- The strategic blend of a significant talent pool and adequate land, power and water resources present the city with promising opportunities for investment and ardent business.



11.4.4 THREAT

- Encroachment and contamination of natural drainage paths including Tamirabarani river (by sewage and waste discharge) in particular coupled with inadequate public green/open spaces pose threat for the city
- Traffic congestion, rapid increase in private vehicles and lack of adequate multi-modal public transport options, unless mitigated shall continue to degrade air quality adversely impacting public health and increased commute times.
- It has limited employment opportunities for educated youth and is perceived to be facing out-migration.



11.5 STAKEHOLDER CONSULTATION

On April 3, 2023, a stakeholder meeting convened at the District Collectorate in Tirunelveli, presided over by Dr. K. P. Karthikeyan I.A.S, the District Collector. The meeting included representatives from the Directorate of Town and Country Planning (DTCP), the Corporation Commissioner, and various line department officials. The discussion primarily centered around a comprehensive review of the existing Comprehensive Mobility Plan, analyzing the current state of transportation infrastructure and identifying areas for improvement. Significant attention was devoted to the provision of a Western Bypass Road, with considerations for potential routes and the expected impact on traffic management and urban development. Link roads were also explored to optimize traffic flow, and proposals for the expansion of industrial areas were thoroughly examined, ensuring alignment with sustainable development goals. Key infrastructure projects, including bridges, flyovers, and road widening, were discussed to enhance mobility. The meeting also addressed public transportation enhancement, community engagement strategies, the development of a timeline and action plan, and considerations for budgetary allocations. This collaborative discussion aimed to address mobility challenges and contribute to the sustainable and well-planned development of Tirunelveli, with a focus on inclusivity and efficient resource utilization.



On November 17, 2023, a crucial Local Planning Authority (LPA) meeting transpired at the District Collectorate in Tirunelveli, under the leadership of Dr. K. P. Karthikeyan I.A.S, the District Collector. The meeting witnessed the participation of key stakeholders, including members of the Legislative Assembly, officials from the Directorate of Town and Country Planning (DTCP), the Corporation Commissioner, and representatives from various line departments.



The focal points of discussion during the meeting encompassed strategic initiatives aimed at fostering sustainable growth and development within the region. To address demographic and economic considerations, there was a deliberate focus on increasing population and employment projections. The utilization of treated wastewater for industrial purposes emerged as a significant agenda item, aligning with environmentally conscious practices and resource optimization.

The meeting also deliberated on enhancing public spaces and recreational amenities. Specifically, plans were proposed for the creation of a walking area along the Tamirabarani River, emphasizing the importance of ecological conservation and community well-being. Additionally, the integration of commercial and residential zones along the proposed Western Bypass Road was discussed to ensure a balanced and well-connected urban landscape.

The need for essential infrastructure projects took precedence, with discussions revolving around the provision for an Integrated Market Complex and the establishment of a new bus terminal along the Nagercoil Road. These proposals aimed at bolstering economic activities, improving transportation networks, and enhancing the overall quality of life for the residents of Tirunelveli.

The collaborative efforts and insights shared during this LPA meeting underscored a commitment to a comprehensive and inclusive approach to urban planning, addressing diverse aspects ranging from economic development to environmental sustainability



11.6 ISSUES AND POTENTIALS

Population and Urbanization:

- Tirunelveli experiences a slow population growth rate, attributed to migration towards larger cities with better opportunities.
- Rural areas witness a decrease in population, impacting service distribution and increasing pressure on urban areas.
- To stabilize growth, the proposal emphasizes expanding the job market, improving infrastructure, and enhancing amenities.

Agriculture and Economic Growth:

- The agricultural sector faces a reduction in the share of cultivators and laborers in the total working population.
- Despite comprising 64% of the land use, the agricultural workforce is diminishing.
- Promoting sustainable urbanization and ensuring food security require revitalizing and developing the agricultural sector.

Infrastructure Gaps:

- Stormwater drainage network coverage in Tirunelveli Corporation is at 30%, posing flooding risks. The proposal advocates achieving 100% coverage to address flooding concerns.
- Recreational spaces, covering 1.07 sq.km, fall short of NBC rules. Increasing investment in parks and open spaces is recommended for social integration and a healthier lifestyle.
- Commercial and industrial land use is below URDPFI guidelines, highlighting the need to boost these sectors for economic growth.

Potential for Carbon Neutrality:

- Tirunelveli has the potential to become a carbon-neutral city by balancing carbon emissions and removal.
- The proposal advocates adopting renewable energy sources, including solar installations and solar farms, to reduce the city's carbon footprint.
- Economic opportunities, community engagement, and environmental



sustainability are highlighted as key benefits of transitioning to renewable energy.

Mobility Planning:

- Significant potential exists for non-motorized transport (NMT), hierarchical grid roads, and transit corridors in Tirunelveli.
- Establishing well-designed bus terminals, truck terminals, and a multi-modal hub is recommended for efficient public transportation.
- Emphasizing the importance of strategic placement for effective transportation network integration.

Water Management:

- Tirunelveli has potential for riverfront development, desilting and deepening of water bodies, construction of stormwater drains, and DEWATs.
- Exploring treated water usage for agriculture and industrial purposes is suggested to address water scarcity and promote sustainable water management.
- Establishing watershed interconnectivity enhances the overall resilience of the water management system.

Economic Development:

- Identifying and developing industrial and freight corridors can significantly boost economic activities in Tirunelveli.
- Establishing an integrated market complex is proposed to provide a centralized hub for various commercial activities.

Environmental Conservation:

- Initiatives to revive reserved forests (2%) and develop a district park and urban forest are highlighted for biodiversity conservation and environmental sustainability.

Social and Tourism Initiatives:

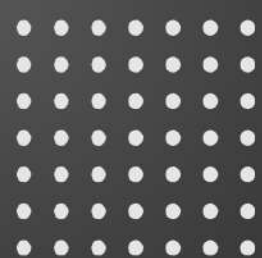
- Developing a sports complex and sports village aims to promote physical fitness, recreational activities, and sports talent.
- Establishing a heritage hub around landmarks like the Nellaiappar Temple can



attract tourists, support local businesses, and celebrate cultural richness.

Challenges and Recommendations:

- Challenges include slow population growth, a decline in agricultural laborers, inadequate stormwater drainage, lack of recreational space, and concentration of commercial areas in the core municipality.
- Recommendations include job market expansion, agricultural sector development, achieving stormwater drainage coverage, increasing recreational spaces, and decentralizing commercial areas for improved urban aesthetics.
- Overall, the proposal underscores the importance of balanced urban development, sustainability, and community engagement for Tirunelveli's future growth and well-being.

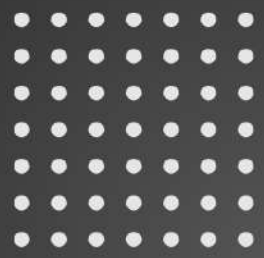


LAND SUITABILITY ANALYSIS

CHAPTER 12



MASTER PLAN
2041
TIRUNELVELI LPA





12. LAND SUITABILITY ANALYSIS

Site Suitability Analysis is conducted to arrive at lands desirable for protection and lands having potential for development. Parameters like, Connectivity, Environment, Urban nodes and landuse are considered. Each of these parameters are given weights and a weighted overlay method of land suitability analysis is done using ArcGIS.

12.1 WEIGHTAGE FOR THE SUB-ASPECTS OF CONNECTIVITY

Transportation is a fundamental element of livable cities. Its system is often called "the veins of the city" because it provides the essential links between various functions and activities that shape the city. In big cities, public transport and its transit areas play an essential role in the public system; they are inclusively available for most people, not just vehicle owners. An accessible transportation system is defined as the ease with which individuals can reach various services, activities, and destinations.

Table 12.1 WEIGHT AGE FOR THE SUB-ASPECTS OF CONNECTIVITY.

Components	Weightage
Road network	50%
Major Railway station	10%
Public transport Terminals	10%
Proposed western by pass	30%

Table 12.2 ASSESSMENT CRITERIA (DISTANCE)

Sub- aspects	Access suitability			
	Very High	High	Moderate	low
NH	Within 2 km	2 to 5 km	5 to 10 km	Above 10 km
SH	Within 2 km	2 to 5 km	5 to 10 km	Above 10 km
MDR		Within 2 km	2 to 5 km	Above 5 km
Other roads		Within 1 km	1 to 2.5 km	Above 2.5 km
Proposed western by pass	Within 10 km	10 -20 km	20 to 30 km	Above 30 KM
Major Railway station	Within 10 km	10 -20 km	20 to 30 km	Above 30 km
Public transport Terminals		Within 2 km	2 to 5 km	Above 5 km



12.2 WEIGHTAGE FOR THE SUB-ASPECTS OF ENVIRONMENT

Table 12.3 WEIGHTAGE FOR THE SUB-ASPECTS OF ENVIRONMENT

Components	Weightage
Water Bodies	40%
Forests	30%
Quarries and Crushers	30%

Table 12.4 ASSESSMENT CRITERIA (DISTANCE) FOR ENVIRONMENT

Sub - aspects	Access suitability			
	High	Moderate	Low	Not Suitable
River	Above 500m	100 to 500m	15 to 100 m	Below 15m
Lakes and ponds	Above 100m	30m to 100m	3 to 30m	Below 3m
Forests	Above 500m	200m to 500m	150 to 200m	Below 150m
Quarries and crushers	Above 500m	400m to 500m	300 to 400m	Below 300m

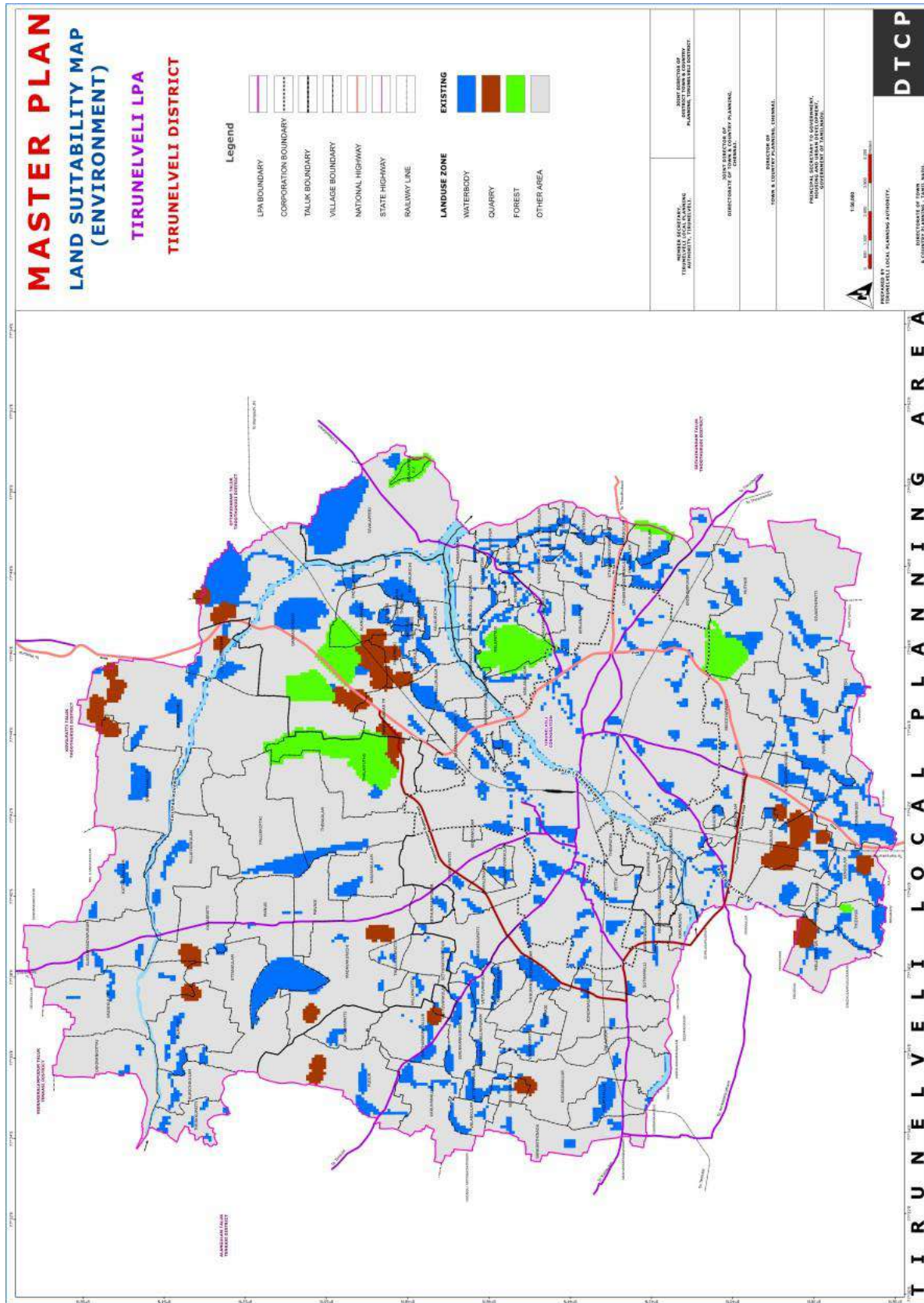
12.1 OVERALL WEIGHTAGE

Table 12.5 ASSESSMENT CRITERIA FOR LAND USE

S.no	Components	Weightage
1	Connectivity	30%
2	Environment	30%
3	Urban Node	10%
4	Land use	30%



Map 12.2 WEIGHTAGE FOR THE SUB-ASPECTS OF ENVIRONMENT





Map 12.3 ASSESSMENT CRITERIA FOR LAND USE

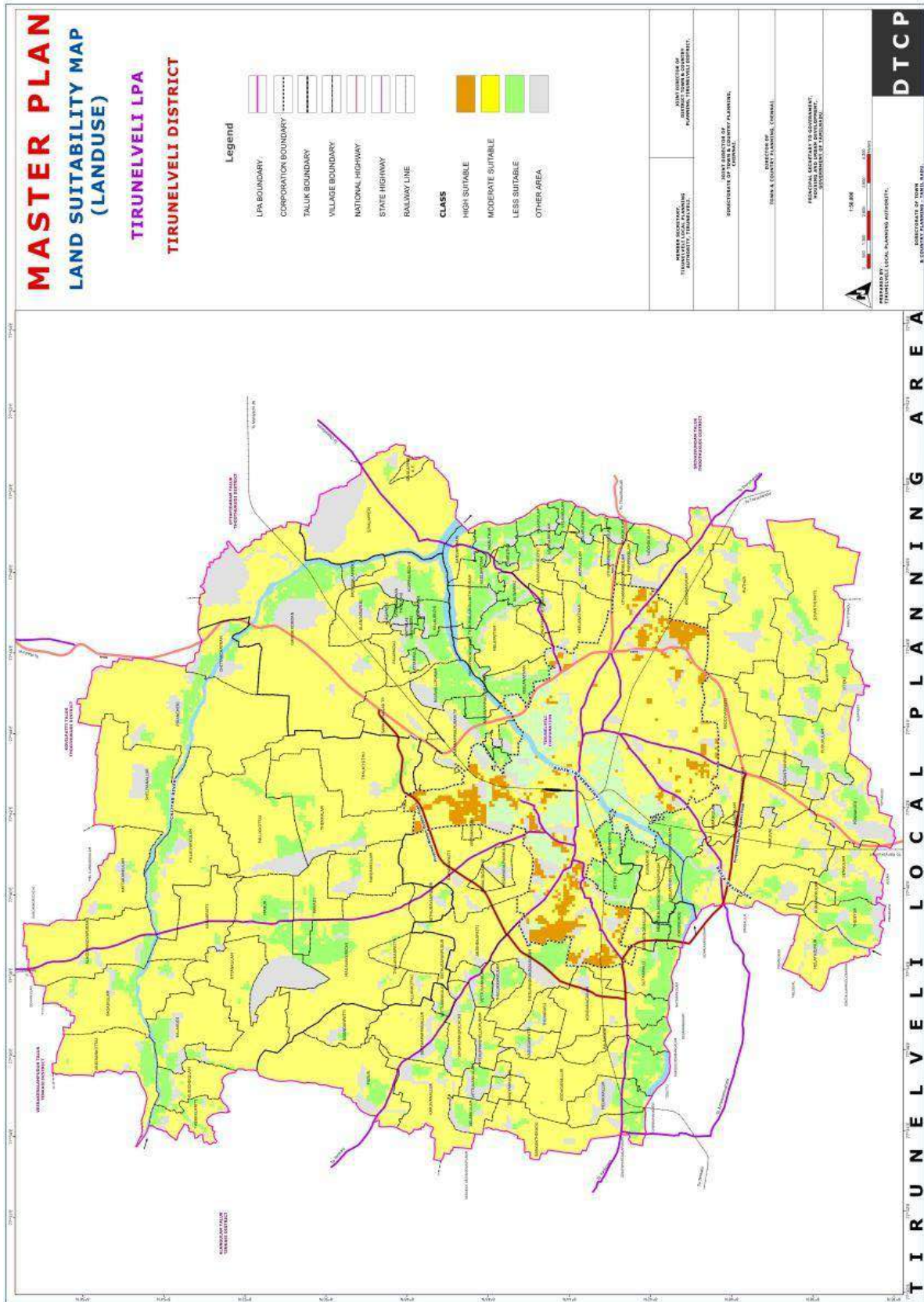


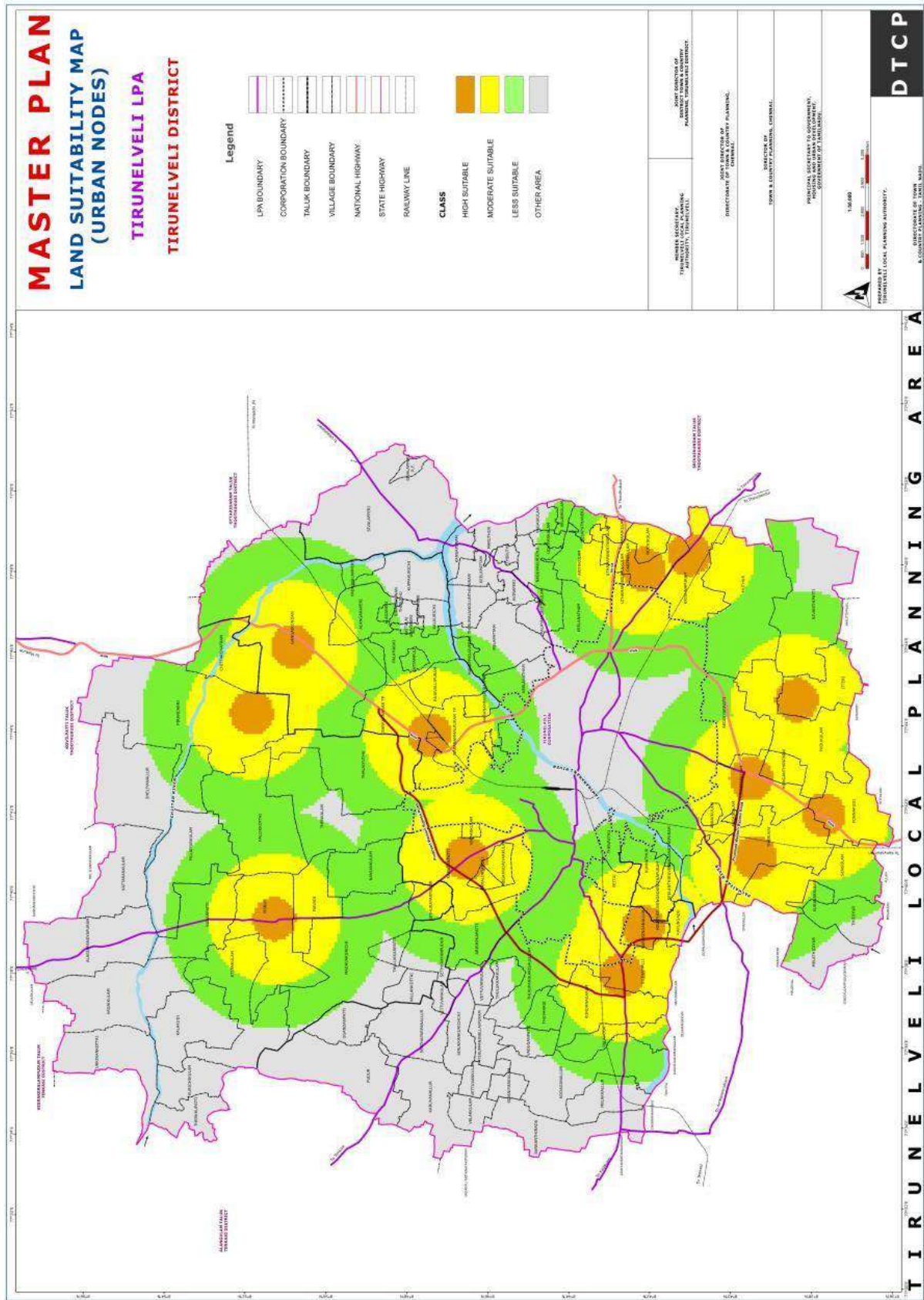


Table 12.6 ASPECTS FOR SUB ASPECTS OF URBAN NODE

S.no	Villages
Urban node 1	Manur
Urban node 2	Gangaikondan
Urban node 3	Chittarchattram
Urban node 4	Ramayanpatti
Urban node 5	Sankar Nagar
Urban node 6	Suthamalli
Urban node 7	Narasinganallur
Urban node 8	Parpakulam
Urban node 9	Krishnapuram
Urban node 10	Tharuvai
Urban node 11	Munnerpallam
Urban node 12	Ponnakudi
Urban node 13	Itteri

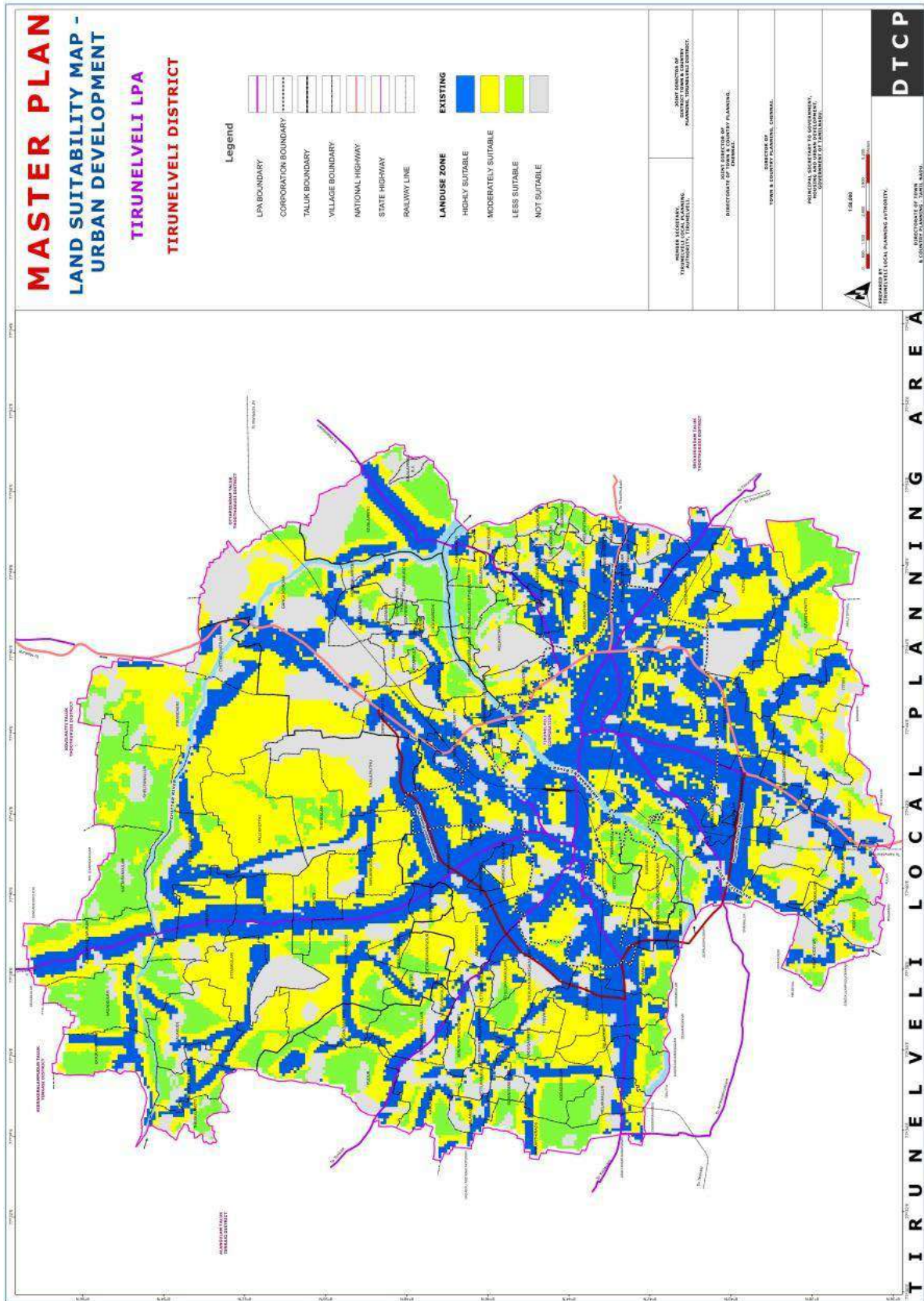


Map 12.4 ASSESSMENT CRITERIA FOR URBAN NODES





Map 12.5 OVERALL WEIGHTAGE

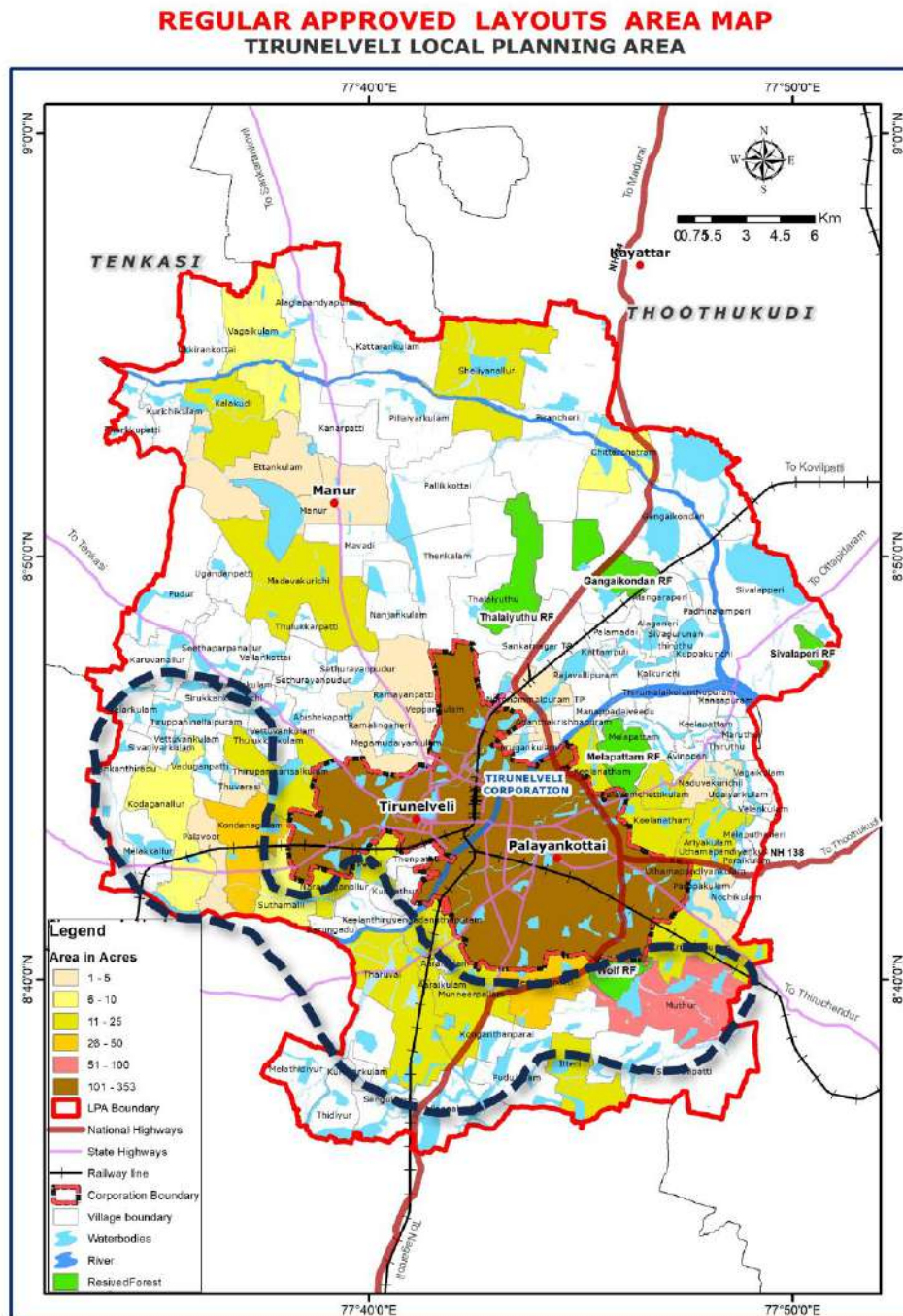




12.2 PAST DECADAL GROWTH TREND ANALYSIS

In addition to the land suitability analysis, the proposed zonation takes into account the growth trends observed over the past decade (2013-2023). This analysis involved mapping both approved and unapproved layouts by Tirunelveli DTCP as shown in the below figures, revealing a clear pattern of growth primarily concentrated in the south and western directions.

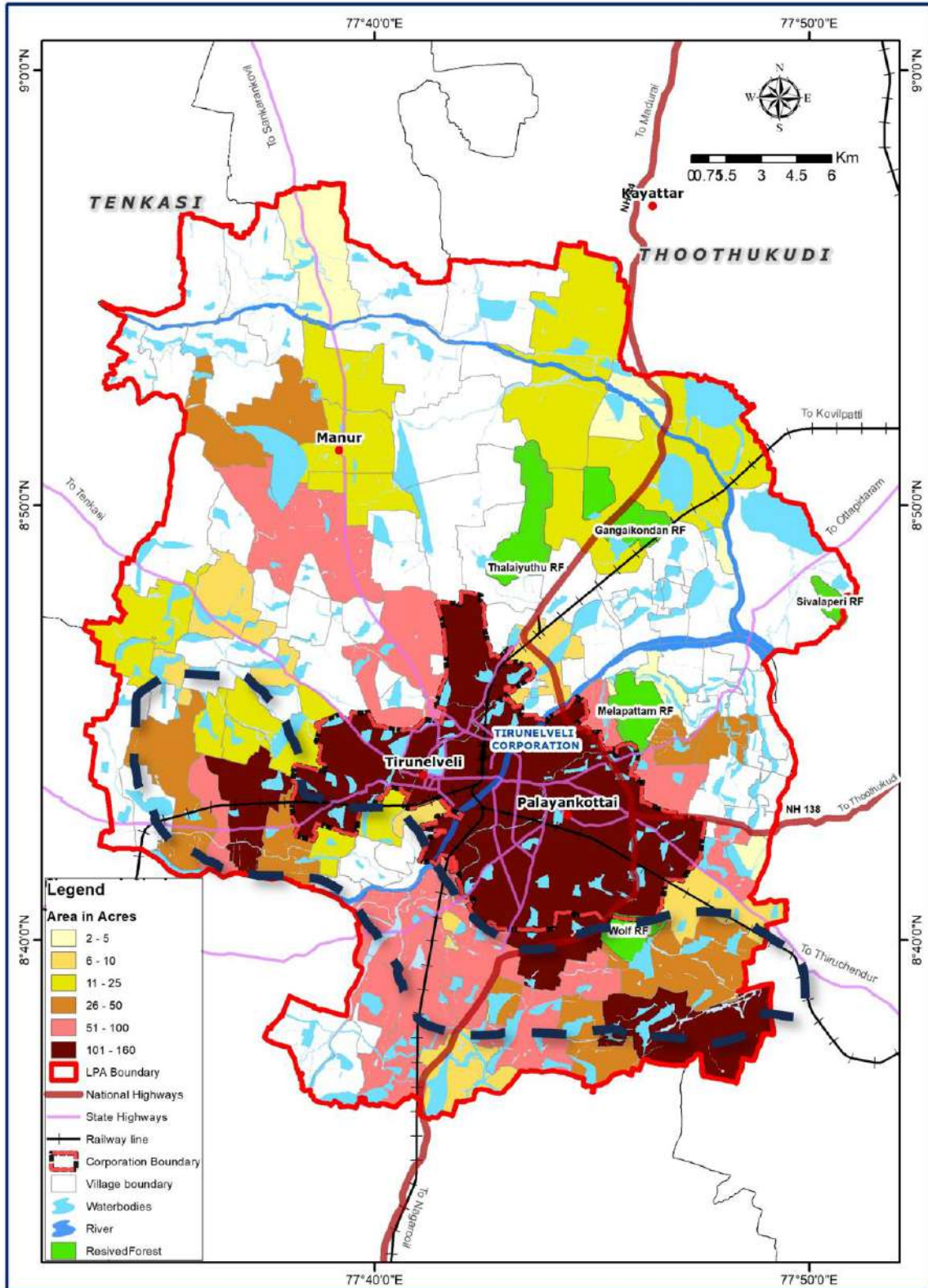
Map 12.6 GROWTH TREND APPROVED LAYOUTS IN THE PAST DECADE





Map 12.7 GROWTH TREND OF UNAPPROVED LAYOUTS IN THE PAST DECADE

REGULARISATION OF UNAPPROVED LAYOUTS AREA MAP
TIRUNELVELI LOCAL PLANNING AREA



PROPOSED LANDUSE 2041

CHAPTER 13



MASTER PLAN
2041
TIRUNELVELI LPA



13. LAND USE PLANNING FOR TIRUNELVELI LPA -2041

13.1 VISION FOR TIRUNELVELI LPA

The Vision 2041 is to make Tirunelveli more livable, Sustainable Urban Transport, economically vibrant and achieve a Carbon Neutral city status with better assets for the future generations.

13.2 OBJECTIVES OF THE PROPOSED MASTER PLAN

The objectives of the Master Plan for Tirunelveli LPA are to provide:

- Optimum utilization of land by channelizing the developments in the right directions and locations.
- The future land needs of the Urban area by recognizing the existing growth trends and strengthening the infrastructure links needed.
- Efficient transportation network integrating work, living, shopping and recreation areas to arrive at balanced developments.
- Wider scope for decentralized employment locations and economic development.
- Preservation and conservation of ecologically sensitive areas and natural and built heritage

To regulate the growth of the local Planning in an orderly manner and also to ensure its economic viability, social stability, and sound management for the present and the foreseeable future, the Master Plan with zoning and development regulation is necessary. The idea of zoning is that the segregation of certain uses from others reduces the effect of negative externalities, that some uses have on others. Based on the Project Proposals Proposed land use Plan is prepared for Tirunelveli LPA. Table 13.1 shows the Proposed Land structure for Corporation area, Rest of LPA and Tirunelveli Total LPA.



13.3 PROPOSED LANDUSE FOR CORPORATION AREA - 2041

The proposed land use plan for **Tirunelveli Municipal Corporation** in 2041, as compared to the existing scenario in 2021, outlines a comprehensive vision for sustainable urban development. The key aspects highlighted in the master plan report perspective are:

Residential Focus: With an anticipated increase in residential areas from 34.42% to 43.64%, the master plan envisions addressing the growing housing needs of the population within the municipal limits. This emphasizes the importance of planned and inclusive residential development.

Economic Expansion: The substantial growth in commercial space (from 2.05% to 9.03%) and industrial land use (from 0.81% to 1.82%) signals a strategic approach towards fostering economic development and attracting commercial activities. The plan aims to create dedicated zones for commerce and industry.

Institutional Infrastructure: The rise in institutional areas from 8.53% to 11.20% indicates a focus on strengthening educational, healthcare, and other public service facilities. This aligns with the goal of enhancing the overall quality of life and services available to residents.

Stable Transport Networks: While maintaining a stable share of land for transport (from 10.19% to 10.54%), the master plan suggests a commitment to sustaining and potentially improving existing transportation networks, ensuring efficient connectivity within the municipal area.

Agricultural Transformation: The significant decrease in dry agricultural land (from 30.92% to 10.62%) reflects a shift in land-use policies, possibly towards urbanization. The plan acknowledges the need for balancing agricultural interests with urban development. While protecting the agricultural wet lands



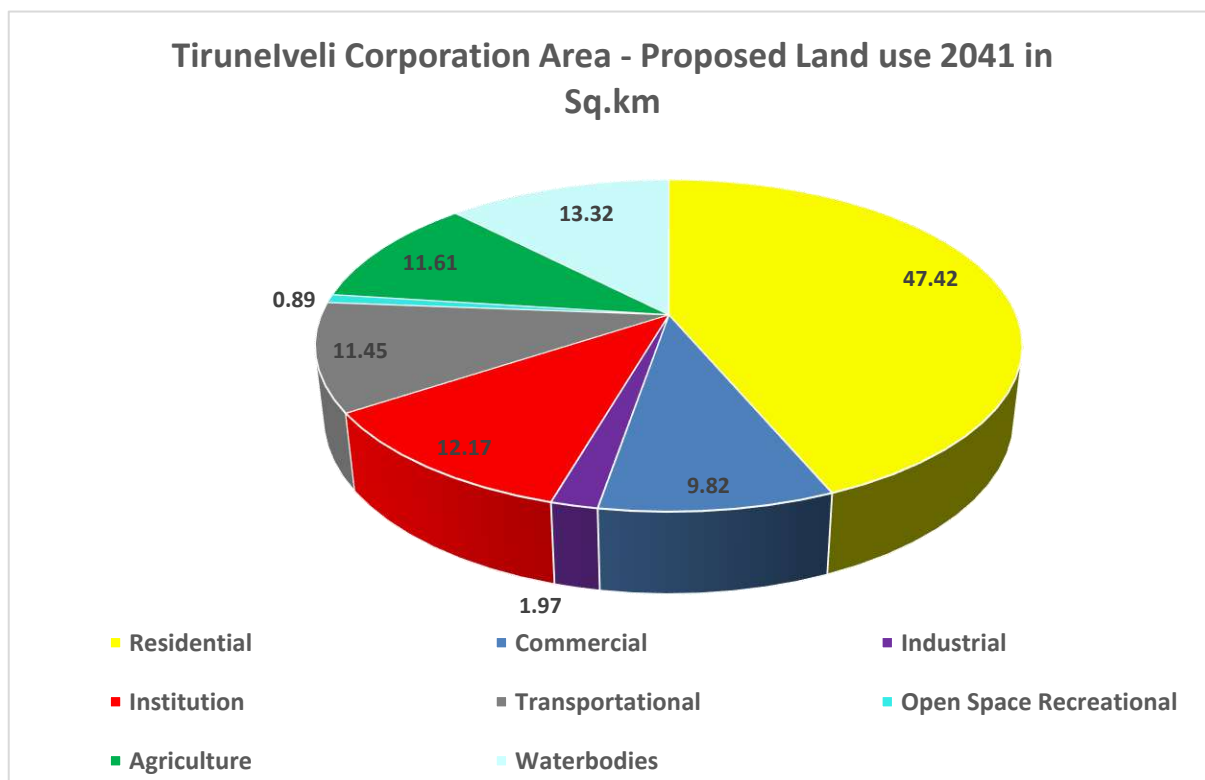
Environmental Preservation: The preservation of waterbodies at 12.26% underscores the master plan's commitment to conserving natural resources and promoting environmental sustainability within the municipal boundaries.

In summary, the master plan for Tirunelveli Municipal Corporation in 2041 strives for a balanced and sustainable urban development approach, taking into account the residential, economic, institutional, and environmental aspects. The plan aims to create a vibrant and resilient urban landscape that caters to the evolving needs of the community while preserving the city's natural resources.



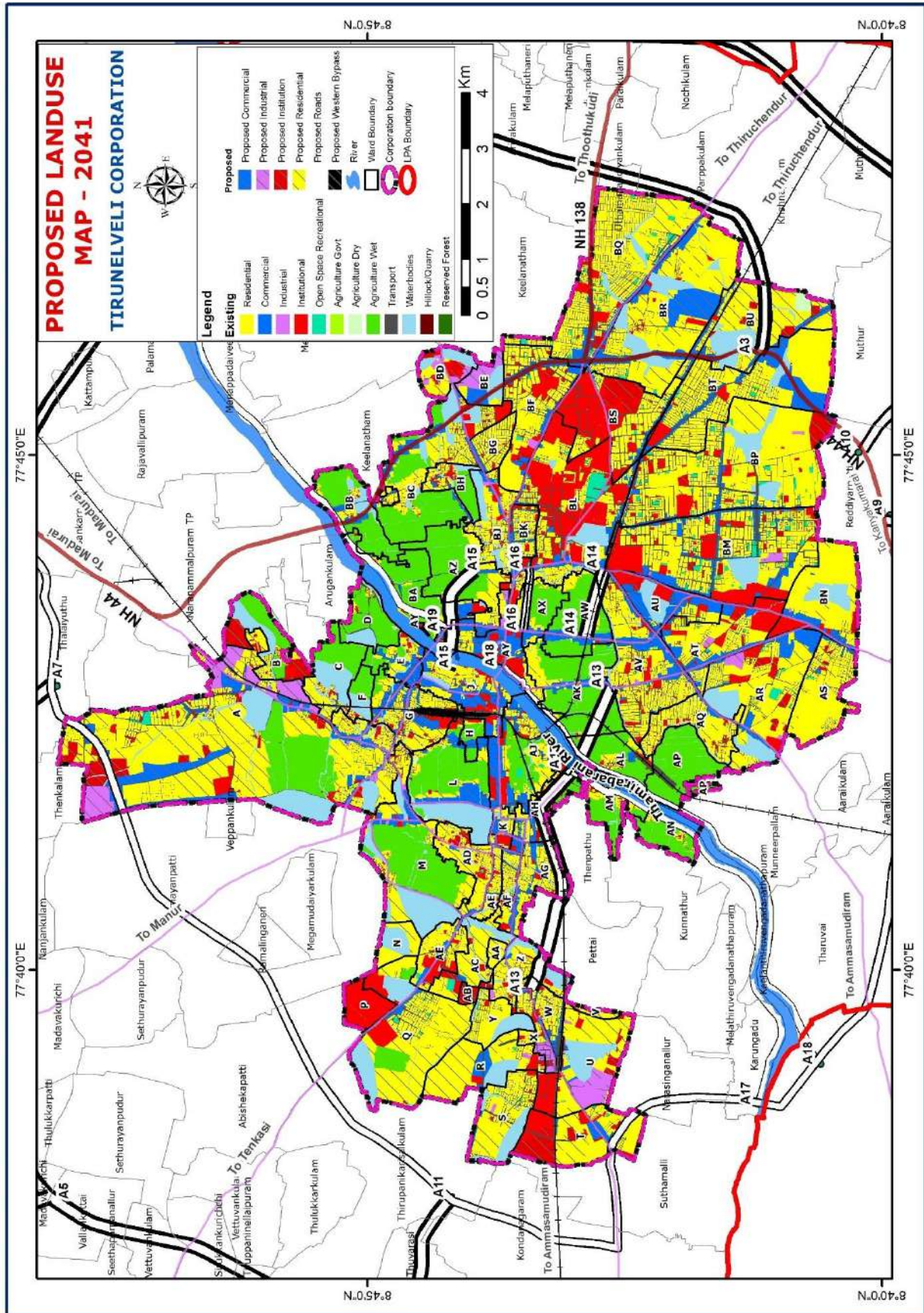
Table 13.1 LAND USE - TIRUNELVELI CORPORATION AREA (2041)

LANDUSE	Existing Land use 2021 in Sq.km	Existing Land use 2021 in %	Proposed Land use 2041 in Sq.km	Proposed Land use 2041 in %	%Developable Area (As per URDPFI)
Residential	37.40	34.42	47.42	43.64	36-39
Commercial	2.23	2.05	9.82	9.03	5-6
Industrial	0.88	0.81	1.97	1.82	7-8
Institution	9.26	8.53	12.17	11.20	10-12
Transport	11.07	10.19	11.45	10.54	12-14
Open Space Recreational	0.89	0.82	0.89	0.82	Balance
Agriculture	33.59	30.92	11.61	10.68	
Waterbodies	13.32	12.26	13.32	12.26	
Total	108.65	100.00	108.65	100.00	





Map 13.1 PROPOSED LAND USE CORPORATION-2041





13.4 PROPOSED LANDUSE FOR REST OF LPA - 2041

The proposed land use plan for **Tirunelveli Rest of Local Planning Area (LPA)** in 2041 indicates a thoughtful approach to sustaining rural livelihoods, preserving natural resources, and fostering a balanced development in the rural landscape. Key observations and inferences from this perspective are:

Agricultural Focus: The plan underscores a commitment to agriculture, with a significant portion of land designated for agriculture, both wet and dry. While there is a decrease in dry agricultural land (from 70.14% to 57.41%), there remains substantial acreage dedicated to agricultural activities (39.03%). This reflects an understanding of the importance of agriculture in rural livelihoods.

Environmental Preservation: The presence of reserved forest areas and the preservation of waterbodies at 14.42% demonstrate an awareness of the need to conserve natural resources. This is crucial for maintaining ecological balance, supporting biodiversity, and ensuring sustainable rural development.

Limited Industrial and Commercial Zones: The plan suggests controlled growth in industrial and commercial areas within the rural landscape (from 1.33% to 4.92% for industrial and from 0.07% to 1.84% for commercial). This approach aims to prevent over-commercialization of rural areas while allowing for sustainable economic activities.

Institutional Development: The increase in institutional areas (from 1.19% to 4.36%) reflects an acknowledgment of the need for educational and healthcare facilities in rural regions. This can contribute to improving the quality of life for rural residents.

Transport Infrastructure: The rise in the land allocated for transport (from 2.12% to 3.06%) suggests a measured approach to enhancing transportation networks in rural areas. This is essential for connectivity and accessibility for rural communities.

Balanced Residential Growth: The increase in residential areas (from 8.38% to 11.85%) indicates a consideration for housing needs in rural regions. This can help in maintaining a balance between urban and rural development.

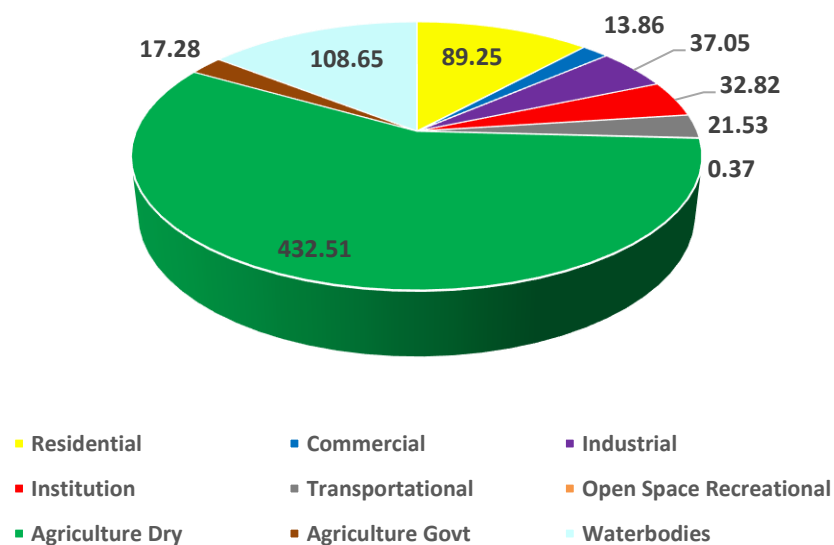


In summary, the proposed land use plan for Tirunelveli Rest of LPA in 2041, from a rural planning perspective, prioritizes sustainable agriculture, environmental conservation, controlled economic development, and improved rural infrastructure. This approach aims to create resilient and self-sufficient rural communities while preserving the natural and cultural heritage of the region.

Table 13.2 LANDUSE COMPARISON - TIRUNELVELI REST OF LPA (2041)

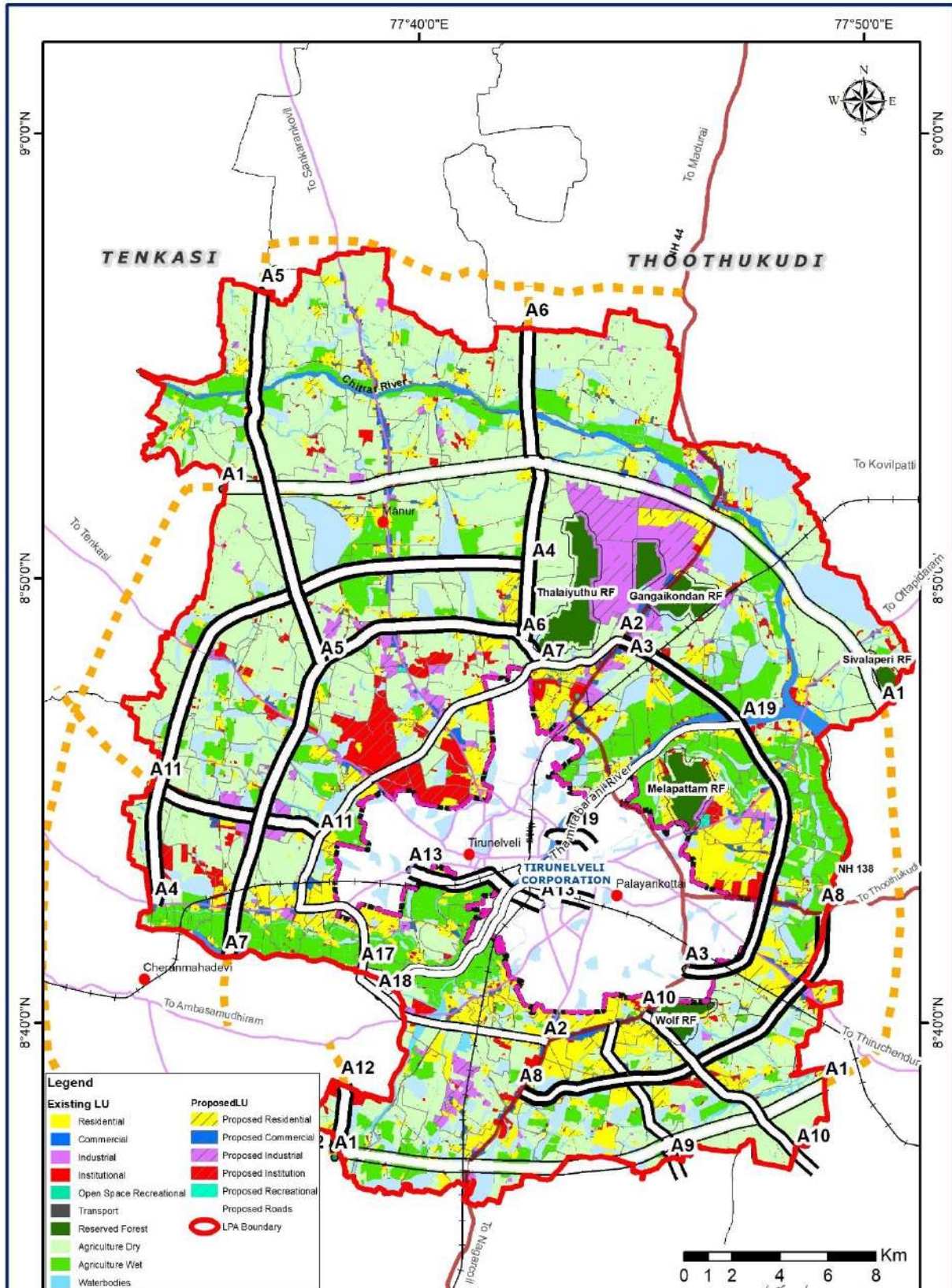
For rest of LPA	Existing Land use 2021 in Sq.km	Existing Land use 2021 in %	Proposed Land use 2041 in Sq.km	Proposed Land use 2041 in %
Residential	63.37	8.41	89.25	11.85
Commercial	0.54	0.07	13.86	1.84
Industrial	10.01	1.33	37.05	4.92
Institution	8.98	1.19	32.82	4.36
Transportational	15.95	2.12	21.53	2.86
Open Space Recreational	0.18	0.02	0.37	0.05
Agriculture	528.36	70.14	432.51	57.41
Reserve Forest	17.28	2.29	17.28	2.29
Waterbodies	108.65	14.42	108.65	14.42
	753.32	100.00	753.32	100.00

Rest of LPA -Proposed Land use 2041 in Sq.km





Map 13.2 PROPOSED LAND USE MAP 2041 -REST OF LPA





13.5 PROPOSED LANDUSE FOR TIRUNELVELI LPA – 2041

The proposed land use for Tirunelveli Total Local Planning Area (LPA) in 2041 indicates significant changes compared to the existing scenario in 2021. The key observations and inferences are:

Residential Expansion: The residential area is expected to increase from 11.66% to 15.86%, reflecting a substantial expansion in housing infrastructure to accommodate the growing population towards southeast direction (Tiruchendur and Thoothukudi) of the city.

Commercial and Industrial Growth: Commercial space is projected to increase from 0.32% to 2.75%, while industrial land use is expected to grow from 1.26% to 4.53%. This suggests a focus on economic development and the establishment of commercial and industrial zones. The land parcels adjacent to the proposed roads with width more than 9m are provided with commercial land use.

Institutional Development: The area designated for institutions is set to rise from 2.12% to 5.22%, indicating a planned growth in green infrastructure, educational, healthcare, and other institutional facilities.

Transport Infrastructure: The land allocated for transport is expected to increase marginally from 3.13% to 4.00%, suggesting a consideration for the expansion and improvement of transportation networks.

Agricultural Changes: While the dry agricultural area is projected to decrease, wet agricultural land is expected to remain relatively stable. This shift may indicate a transition in agricultural practices or land-use policies.

Conservation and Natural Reserves: Reserved Forest areas and waterbodies are maintained at 2.00% and 14.15%, respectively, emphasizing the importance of environmental conservation and preserving water resources.

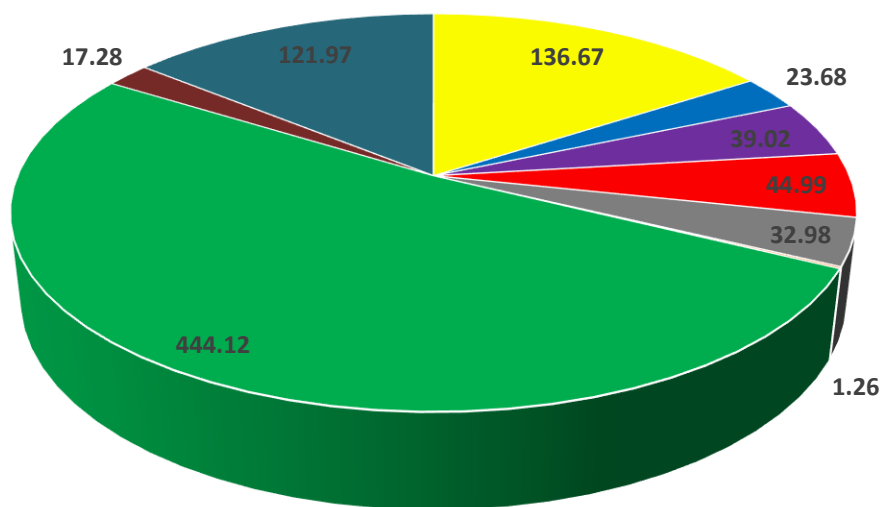
Overall, the proposed land use reflects a strategic planning approach for Tirunelveli LPA in 2041, with an emphasis on balanced urban development, economic growth, and environmental sustainability.



Table 13.3 PROPOSED LAND USE FOR TIRUNELVELI LPA-2041

Land use Zones	Existing Land use 2021 in Sq.km	Existing Land use 2021 in %	Proposed Land use 2041 in Sq.km	Proposed Land use 2041 in %
Residential	100.77	11.69	136.67	15.86
Commercial	2.77	0.32	23.68	2.75
Industrial	10.89	1.26	39.02	4.53
Institutional	18.24	2.12	44.99	5.22
Transportational	27.02	3.13	32.98	3.83
Open Space Recreational	1.07	0.12	1.26	0.15
Agriculture	561.95	65.19	444.12	51.52
Reserve Forest	17.28	2.00	17.28	2.00
Waterbodies	121.97	14.15	121.97	14.15
Total	861.97	100.00	861.97	100.00

Tirunelveli LPA _ Proposed Land use 2041 in Sq.km

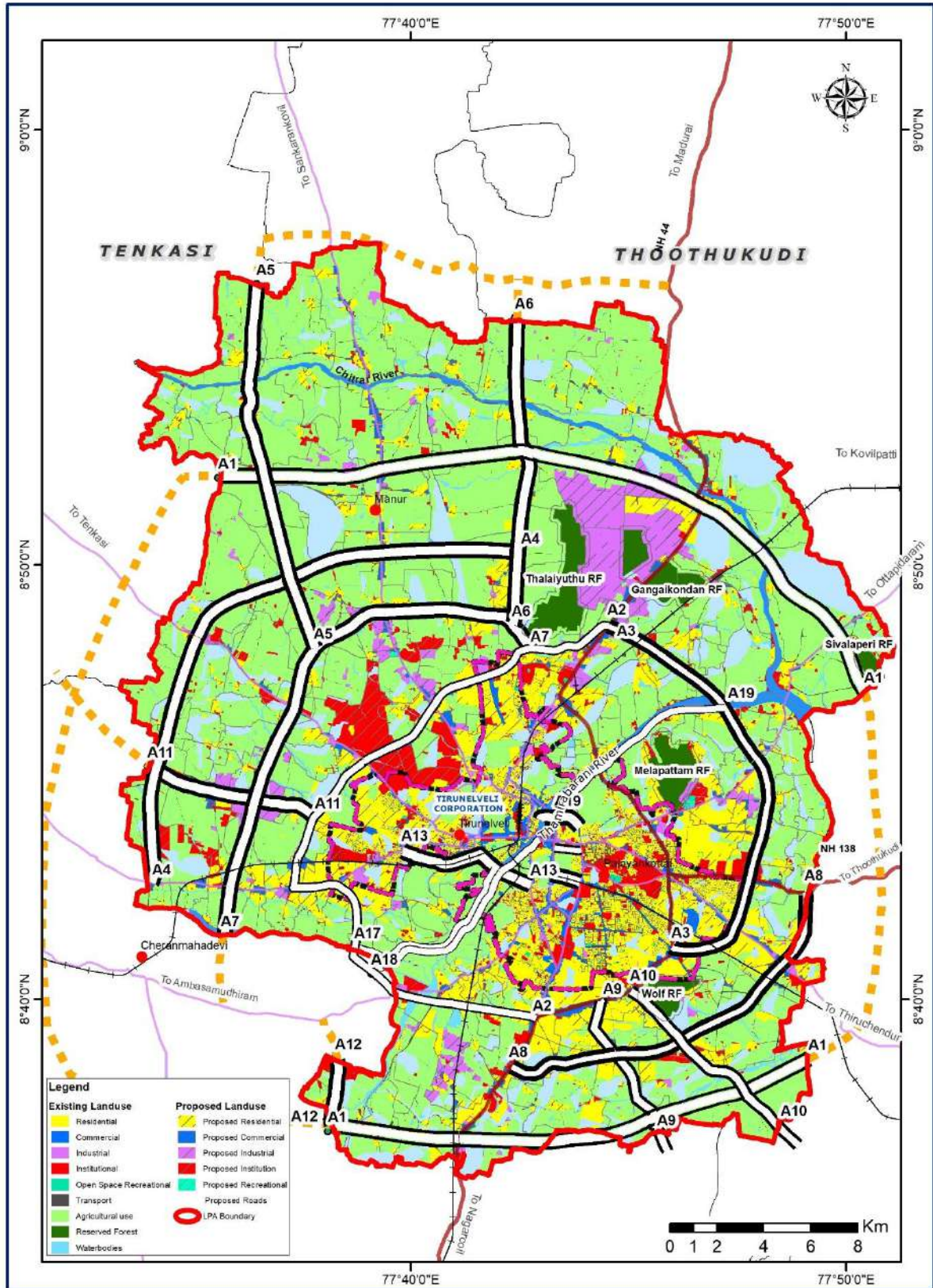


- Residential
- Commercial
- Industrial
- Institutional
- Transportational
- Open Space Recreational
- Agriculture
- Reserve Forest
- Waterbodies



Map 13.3 PROPOSED LAND USE MAP 2041

PROPOSED LAND USE MAP - 2041
TIRUNELVELI LOCAL PLANNING AREA





13.6 SUMMARY

The proposed land use plan for Tirunelveli LPA in 2041 indicates a strategic approach to urban development. Key highlights include a significant expansion in residential areas (from 11.69% to 15.36%), with a focus on accommodating the growing population, particularly in the southeast direction. Commercial and industrial growth is emphasized, with projections of increased space for economic development and specific areas designated for commercial use based on road width.

Institutional development is a priority, with an expected rise from 2.12% to 5.22%, indicating a planned growth in green infrastructure, education, healthcare, and other institutions. There's a marginal increase in land allocated for transport (from 3.13% to 3.83%), suggesting a focus on improving transportation networks. While there is a decrease in dry agricultural land, the stability of wet agricultural land indicates a potential transition in agricultural practices.

The preservation of reserved forest areas (2.00%) and waterbodies (14.15%) underscores the commitment to environmental conservation and sustainable water resource management.

Overall, the proposed land use plan demonstrates a holistic and balanced approach to urban development, economic progress, and environmental sustainability in Tirunelveli LPA by 2041.



13.7 AREA DEVELOPMENT PLANS

While this Master Plan lays down policies and strategies and programmes at the LPA level many of the actions for improving the quality of life would have to be translated at the area level namely neighborhoods and city or town sectors under each local body including the City Corporation. While the Town Planning Act provides for the making of Detailed Development Plans (DDPs) for this purpose, elaborating the land use linkages in each area, the substantial investments that are now available for infrastructure such as roads, water and sewerage, drainage and civic amenities under the AMRUT and TNUDF programmes provide opportunities to attempt comprehensive Area Development Plans in a systematic way. While the initiative for developing appropriate Area Development Plans would be that of the local bodies the DTCP would facilitate establishing these DDPs with the participation of the parastatal agencies and departments of government. While preparing DDPs the requirements at local area level will be considered and reservation of space as may be required for facilities such as schools, playgrounds and formation of missing road links etc. will be made. These DDPs would form the basic units or building blocks for improving quality of life to the citizens and at the same time promote sustainable development.

One of the important components of the Area Development Plans particularly in the outlying areas would be the integration of unapproved subdivisions and layouts that have come up by supplying the missing parts of development so as to make these areas fit for urban habitation. Evidently this will have to be carried out with the full cooperation and consent of the owners of land as well as the local bodies concerned with appropriate fees levied to finance the missing infrastructure.

PROJECT PROPOSALS

CHAPTER 14

MASTER PLAN
2041
TIRUNELVELI LPA





14. PROJECT PROPOSALS

14.1 TIRUNELVELI LPA – A CARBON NEUTRAL LPA

Climate change is a critical global concern impacting human life, the economy, and the environment. Cities worldwide are setting targets to reduce carbon emissions in response to the rise in extreme climate events. Tirunelveli, with its abundant natural resources, is poised to play a proactive role in combating climate change. This chapter outlines proposals to guide Tirunelveli towards achieving Carbon Neutrality over the next two decades, addressing challenges posed by climate change and promoting sustainable development in the Local Planning Area (LPA).

14.1.1 CONCEPT OF CARBON NEUTRAL CITY

A carbon-neutral city balances greenhouse gas emissions with removal or offset measures, resulting in a net-zero carbon footprint. Key elements include reducing emissions from various sources, carbon offsetting through initiatives like afforestation, adopting renewable energy, enhancing energy efficiency, sustainable urban planning, waste management, promoting public transportation, and community engagement. Reducing Emissions: Implementing measures to reduce carbon emissions from various sources such as transportation, industries, and energy production. This may involve transitioning to renewable energy sources, improving energy efficiency, and promoting sustainable practices.

- Carbon Offsetting: Compensating for unavoidable emissions by investing in projects that remove or reduce an equivalent amount of greenhouse gases. This could include initiatives like afforestation, reforestation, or investments in renewable energy projects.
- Renewable Energy Adoption: Shifting towards renewable energy sources such as solar, wind, and hydropower to meet the city's energy needs. This reduces reliance on fossil fuels, a major source of carbon emissions.
- Energy Efficiency: Enhancing the energy efficiency of buildings, infrastructure, and transportation systems to minimize energy consumption and associated carbon emissions.



- **Sustainable Urban Planning:** Designing cities in a way that promotes efficient land use, minimizes the need for extensive transportation, and incorporates green spaces. This can contribute to lower energy demands and reduced emissions.
- **Waste Management:** Implementing effective waste management practices, including recycling and waste-to-energy technologies, to reduce methane emissions from landfills.
- **Public Transportation:** Encouraging the use of public transportation, cycling, and walking to reduce reliance on private vehicles and decrease emissions from the transportation sector.
- **Community Engagement:** Involving the community in sustainable practices, raising awareness about carbon neutrality, and fostering a sense of responsibility among residents and businesses.

The concept of a carbon-neutral city aligns with broader global efforts to combat climate change and create resilient, environmentally friendly urban environments. It requires a comprehensive and collaborative approach involving local governments, businesses, communities, and other stakeholders.



14.1.2 GLOBAL INITIATIVES – CARBON REDUCTION

The Paris Agreement is an international treaty adopted in 2015 under the United Nations Framework Convention on Climate Change (UNFCCC), its primary goal is to limit global warming to well below 2 degrees Celsius above pre-industrial levels, with efforts to limit the temperature increase to 1.5 degrees Celsius.

To achieve these temperature goals, countries that are parties to the Paris Agreement (referred to as Parties) submit Nationally Determined Contributions (NDCs), outlining their individual climate action plans and targets. These contributions include efforts to reduce greenhouse gas emissions and enhance resilience to the impacts of climate change.

Many countries, when updating their NDCs, have expressed commitments to achieving carbon neutrality or net-zero emissions by a certain target year. The concept of carbon neutrality involves balancing the amount of greenhouse gases emitted with an equivalent amount removed or offset, effectively resulting in no net increase in atmospheric greenhouse gas concentrations.

The Paris Agreement, through its global framework, encourages countries to enhance their climate ambitions over time, and achieving carbon neutrality has become a key goal for many nations to align with the broader objective of limiting global temperature rise and addressing climate change impacts.

14.1.3 INDIA'S COMMITMENT IN CARBON REDUCTION

India has been actively engaged in addressing climate change and has made significant climate-related commitments. As of 2022, India's approach to carbon neutrality and its role in global efforts against climate change include:

- **Renewable Energy Targets:** India has set ambitious targets for expanding its renewable energy capacity, including solar and wind power. The country aims to increase the share of non-fossil fuel energy capacity to 40% of the total capacity by 2030.
- **Afforestation and Sustainable Practices:** India is working on large-scale afforestation and reforestation programs to enhance carbon sink capacity. Sustainable agricultural practices are also being promoted to reduce emissions.



- **International Commitments:** While not committing to carbon neutrality, India has pledged to reduce the emissions intensity of its GDP by 33-35% from 2005 levels by 2030, as part of its Nationally Determined Contributions (NDCs) under the Paris Agreement.
- **Electric Mobility:** The country is increasingly focusing on electric mobility to reduce the carbon footprint of the transportation sector.
- **Energy Efficiency Measures:** India is implementing various energy efficiency measures in industries, buildings, and transportation to reduce overall energy consumption and associated emissions.
- **Sanchi Solar City - A case study:** It has a capacity of 3 megawatts in Nagauri near Sanchi, which will reduce annual carbon dioxide emissions by 13,747 tonnes. This is equivalent to more than 2,38,000 trees. Sanchi has become India's first solar city. Additionally, rooftop solar panels will be installed on residential and office buildings in Sanchi, including the Sanchi Railway station. Residents in Sanchi are encouraged to use solar products such as solar study lamps, solar dryers, solar water heaters, or solar lanterns.



Figure 14.1 SANCHI - SOLAR FARM



14.1.4 POTENTIAL FOR TIRUNELVELI AS A CARBON NEUTRAL CITY

The strategic location of Tirunelveli provides a unique advantage for the city to pursue carbon neutrality, bolstered by various factors. The proximity to the Indian Ocean and the ports of Thoothukudi and Vizhinjam enhances economic activities and logistics, contributing to the city's overall growth.

Renewable Energy Integration: Tirunelveli can harness its abundant renewable energy resources, especially solar power, to facilitate a transition towards a clean energy model. This involves promoting the widespread adoption of rooftop solar installations, solar street lamps, and establishing solar farms for large-scale energy generation. A recent proposal from Tata Power to invest in a significant solar manufacturing plant in the district aligns with this vision, attracting further investments in compatible setups.

Wind Energy Contribution: In Vagaikulam, Alagiyapandiyapuram, Pillaiyar kulam, Kalakudi, Sheliyanallur, Kattarakulam, Pallikottai, Ettankulam villages majority of the windmills are located and the wind electricity generators produce electricity and the electricity thus generated is connected to the common power grid of TNEB. In Tirunelveli LPA the above cluster stands as a notable wind energy sources. Functioning as a wind power installation, it plays a pivotal role in contributing to the region's renewable energy capacity. Wind energy projects in the Tirunelveli LPA are crucial in promoting sustainable and clean energy sources, aligning with efforts to reduce carbon emissions and combat climate change.

Environmental Conservation: Initiatives promoting environmental sustainability, including reforestation and the conservation of reserved forests such as Thalayuth, Sivalperi, Wolf, and Melapattam, contribute to carbon sequestration. These measures not only enhance biodiversity but also strengthen ecological resilience. Additionally, leveraging the potential of the Tamirabarani River can foster greenery and conservation, turning these areas into natural assets and promoting eco-tourism.

Community Involvement and Sustainable Mobility: With the current modal share indicating that 23% of people use public transport and 11% are pedestrians, Tirunelveli has the potential to develop Non-Motorized Transport (NMT) corridors, cycle tracks, and e-buses. Engaging the community in the carbon-neutral journey through educational programs, public campaigns, and incentives can encourage residents and businesses to adopt eco-friendly practices, contributing significantly to reducing the city's carbon footprint.



In summary, Tirunelveli's commitment to carbon neutrality is supported by its advantageous location, emphasis on renewable energy, environmental conservation initiatives, and active community involvement. The proposed interventions across different sectors aim to guide Tirunelveli on its path to becoming a sustainable and carbon-neutral city.

14.1.5 ECONOMIC SECTOR - RENEWABLE ENERGY CORRIDOR

Tirunelveli LPA's Geographic location and climatic condition offer greater scope for renewable energy production from the source of wind and Solar. The existing solar and wind farms are mapped and shown in map 14.1 below, indicating that the majority of these infrastructures are situated in the Manur block. This corridor has a greater potential to be developed as a Renewable Energy Corridor.

A Renewable Energy Corridor is a designated area or region strategically planned and developed to harness and integrate various forms of renewable energy sources. The primary goal of such corridors is to create a concentrated and efficient space for the generation, transmission, and utilization of clean and sustainable energy. Here are key characteristics and components of a Renewable Energy Corridor:

1. Diverse Renewable Energy Sources:

- A Renewable Energy Corridor typically incorporates various renewable energy technologies, such as solar, wind, hydropower, geothermal, and potentially others. This diversity allows for optimal utilization of the region's natural resources.

2. Power Generation Facilities:

- The corridor includes power generation facilities that harness energy from renewable sources. These facilities could range from solar and wind farms to hydropower plants and geothermal installations.

3. Smart Grid Infrastructure:

- Advanced smart grid infrastructure is often a crucial component of a Renewable Energy Corridor. Smart grids enable efficient transmission, distribution, and management of renewable energy, ensuring stability and reliability in the electrical grid.



4. Energy Storage Solutions:

- Incorporation of energy storage technologies, such as battery storage systems, to store excess energy generated during peak times for use during periods of low renewable energy production.

5. Research and Development Centers:

- Many Renewable Energy Corridors integrate research and development centers, fostering innovation in renewable energy technologies. These centers may collaborate with universities, research institutions, and private companies to advance the state of renewable energy.

6. Industrial Zones and Business Clusters:

- Designated zones for renewable energy-related industries, creating a business-friendly environment. This may include manufacturing facilities, technology development centers, and headquarters for renewable energy companies.

7. Incentives and Policy Framework:

- Governments often implement supportive policies and incentives to attract businesses and investors to the Renewable Energy Corridor. These may include tax incentives, subsidies, and streamlined regulatory processes.

8. Environmental and Economic Benefits:

- The corridor aims to reduce reliance on traditional fossil fuels, mitigate environmental impacts, and contribute to sustainable economic development by creating jobs and fostering a green economy.

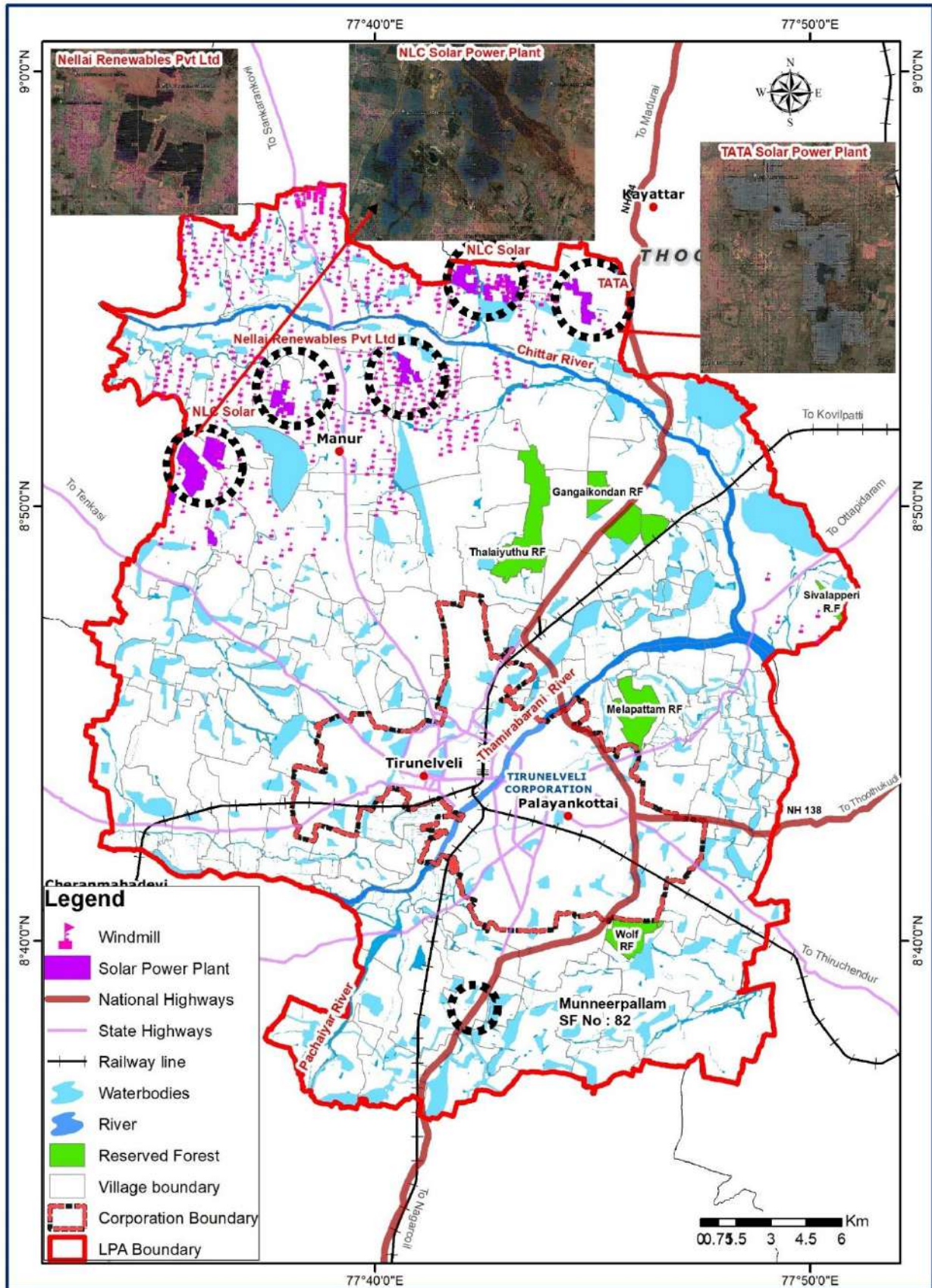


Renewable Energy Corridors are strategic initiatives that align with global efforts to transition towards a more sustainable and environmentally friendly energy landscape. They play a crucial role in promoting the adoption of renewable energy and achieving long-term energy sustainability goals. City's proximity to Thoothukudi, which currently forms part of the natural gas grid (Ennore-Thoothukudi Natural gas pipeline of capacity 84.6 MMS CMD), offers it with an opportunity to move towards clean and efficient energy sources.

As discussed earlier, this zone boasts several advantages, including being a non-vulnerable area, offering land at an affordable cost, having compatible existing industries, featuring road connectivity, and experiencing suitable solar radiation. This **Manur village area** as shown in the below map 14.1 has the greater potential to become a renewable energy corridor with industrial parks supporting this sector. In the proposed master plan 2041, these areas are provided with more industrial uses.



Map 14.1 LOCATION OF EXISTING RENEWABLE ENERGY INFRASTRUCTURE





14.1.6 PROPOSAL FOR A SOLAR FARM

A significant step towards sustainable energy in Tirunelveli involves the proposal for a **12-hectare solar farm** near Manur village. This solar farm is designed to have a capacity of **8 megawatts (MW)**, equivalent to approximately 30% of the Tirunelveli Corporation's consumption, harnessing the abundant sunlight in the region to generate clean and renewable energy. The initiative aligns with the broader goal of reducing the carbon footprint of Tirunelveli and transitioning towards more environmentally friendly energy sources. The solar farm not only contributes to the local power supply but also represents a commitment to harnessing clean energy for the future development and growth of the region. In addition to the proposed 12-hectare solar farm near Manur village, the region boasts other solar farms and solar-based manufacturing industries.

This demonstrates a collective effort and commitment to leveraging solar energy for sustainable development in Tirunelveli. The presence of multiple solar initiatives underscores the region's recognition of the importance of renewable energy sources and positions Tirunelveli as a hub for solar-related activities. Together, these endeavors contribute to the broader goal of reducing reliance on conventional energy, fostering environmental sustainability, and promoting the growth of solar-based industries in the area.



14.1.7 GREENERY SECTOR – RIPARIAN BUFFER ALONG TAMIRABARANI AND CHITTAR RIVER

A riparian buffer, often referred to as a riparian zone or riparian area, is a vegetated strip of land situated along the banks of a river, stream, or other water bodies. This zone serves as a transitional area between aquatic environments and adjacent upland areas. The primary purpose of a riparian buffer is to provide a range of ecological functions that benefit both water ecosystems and surrounding landscapes. The term "riparian" itself relates to the banks of a river or other watercourse. Development of this buffer along the **Tamirabarani river bank for 35 km and Chitrarau for 36 km** in Tirunelveli LPA serves a dual purpose: enhancing carbon sequestration and mitigating flood damage.

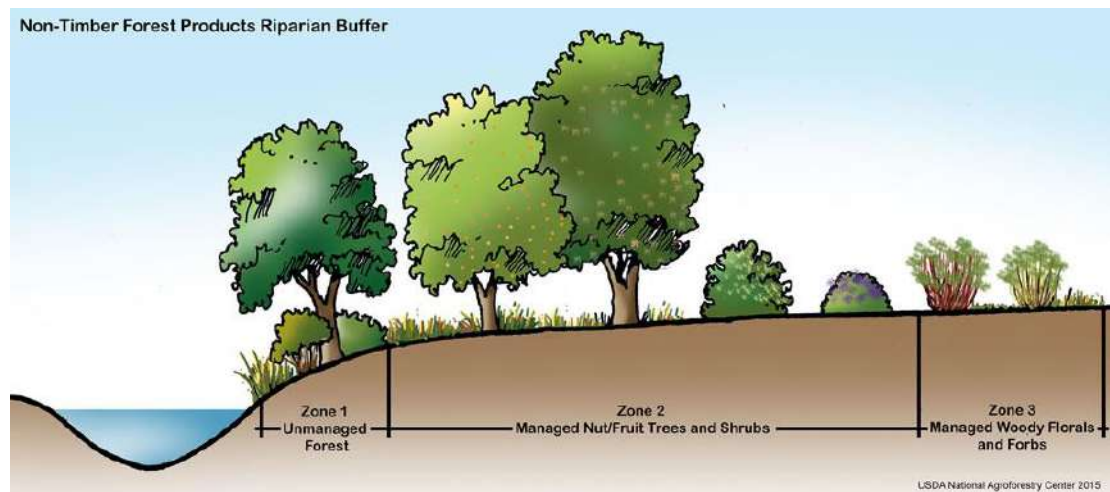


Figure 14.2 SCHEMATIC REPRESENTATION OF A RIPARIAN BUFFER

Key Characteristics of Riparian Buffers:

1. **Vegetation:** Riparian buffers typically consist of a diverse array of native trees, shrubs, grasses, and other plants. The selection of vegetation is crucial for stabilizing the soil, preventing erosion, and providing habitat for various species.
2. **Width:** The width of a riparian buffer can vary and depends on factors such as the size of the water body, slope of the bank, and local environmental conditions. Wider buffers generally offer increased benefits.



3. Functions:

- **Water Quality Improvement:** Vegetation in riparian buffers filters pollutants and sediments, improving water quality by preventing runoff from reaching the water body.
- **Habitat Protection:** Riparian buffers provide critical habitat for aquatic and terrestrial species, supporting biodiversity and ecological balance.
- **Flood Mitigation:** The vegetation in riparian zones can absorb excess water during floods, reducing the risk of downstream flooding.

Riparian Buffer Proposal:

A riparian buffer proposal involves a deliberate plan to establish, enhance, or maintain these buffer zones along watercourses. It typically includes:

1. **Identification of Areas:** Assessing and designating specific stretches along rivers or streams that would benefit from riparian buffers.
2. **Vegetation Planning:** Selecting appropriate native plant species based on local conditions to ensure the stability of the buffer and maximize ecological benefits.
3. **Community Engagement:** Involving local communities, authorities, and environmental organizations in the planning, implementation, and maintenance processes.
4. **Implementation Steps:** Outlining the practical steps involved in establishing the riparian buffer, including site preparation, planting, and ongoing monitoring.
5. **Monitoring and Maintenance:** Establishing systems to monitor the health of the riparian buffer over time and implementing maintenance activities to ensure its long-term effectiveness.



In summary, a riparian buffer proposal aims to harness the ecological functions of riparian zones to improve water quality, enhance habitat, and contribute to overall environmental sustainability along riverbanks or water bodies like the Tamirabrani and Chitharu Rivers. This vegetation contributes significantly to carbon sequestration, as trees absorb carbon dioxide during photosynthesis, helping to offset greenhouse gas emissions. This aligns with broader environmental goals, fostering a healthier and more sustainable ecosystem.

Moreover, the riparian zone cover acts as a natural buffer against flood damage. The intricate root systems of trees help stabilize the soil, preventing erosion and reducing the risk of landslides. Additionally, the trees act as a natural barrier, absorbing excess rainwater and regulating water flow, which can contribute to lowering the impact of floods.

This initiative not only supports environmental conservation but also promotes resilience against the adverse effects of climate change, showcasing a holistic and sustainable approach to riverbank management in Tirunelveli.



14.1.8 ENVIRONMENTAL SECTOR - PROPOSAL FOR COMPREHENSIVE CLIMATE ACTION PLAN

A Climate Action Plan (mitigation and adaptation) has to be developed for the LPA in a comprehensive manner covering all sectors, including waste management, integrated water management, mobility and air pollution, energy & green buildings, biodiversity, green cover, disaster risk preparedness and urban planning. The plan can be adapted from similar initiatives such as the Mumbai Climate Action Plan, and can,

- Act as a policy document based on data leading to an evidence-based planning approach
- Provide inputs to mobilise required resources for implementation
- Be aligned to various existing state, national and international policies and goals
- Follow an inclusive and participatory approach to mobilise people and thus leading to wide spread awareness about climate change
- Identify solutions, technologies, key performance indices along with the governance tools
- Help manage the implementation strategy to achieve climate adaptation and resilience
- Be a strategic document which shall lead to a resilient action leading to sustainable solutions to mitigate climate change
- Be prepared and the implementation be monitored by the Department of Environment and Climate Change, Government of Tamil Nadu through the District Climate Change Mission in which the Collector is the mission director and the District Forest Officer is the climate officer.

Objectives of the Climate Action Plan

The climate action plan can help develop but is not limited to:

- Assessment and evaluation of local institutional capacity for adaptation measures
- Identification of the required institutional mechanism
- Setting LPA wide emission reduction goals



- Developing a multi stakeholder and cross sectoral backup
- Conducting vulnerability and risk assessments especially towards flood, which Tirunelveli, faced in the month of December 2023
- Regular Monitoring, Reporting and Verification (MRV) of the plan to qualify and quantify the measures implemented for achieving accountability, and therefore improved impact
- Engagement with the community to inform the plan, outline the social, environmental and economic benefits expected from implementing the plan, and establish ways to ensure equitable distribution of these benefits to the residents in city.
- Identification of key stakeholders in public, private and industrial domain within the city and formation of a climate council with multiple stakeholders including public representatives alongside the aforementioned list to help detail the city's governance, powers and capacity, as well as identify the partners who need to be engaged in order to accelerate climate adaptation and goals towards sustainability.



Key sectors to be Covered

The following are the key sectors which should be covered:

- Sustainable waste management practices and its impact which includes reducing landfill waste, enhanced and better waste segregation at source, scientific management of waste and landfills
- Urban greening and biodiversity which includes increasing vegetation cover and permeable surfaces in recharge areas, reducing heat island effect, restoring and enhancing biodiversity and providing equal opportunity to access green spaces
- Sustainable mobility which includes shift to zero emission vehicles, increase in public transport ridership and increased access to NMT and related infrastructure, ensuring optimal air quality
- Pollution reduction of water bodies and aquifers to support aquatic ecosystem
- Localize water conservation and efficiency
- Transition to clean fuels and resource efficiency
- Promote low carbon buildings and passive design strategies
- Decarbonize electricity grid



Achieving 33% Green Cover in LPA

As mentioned previously, the LPA is blessed with perennial river Tamirabarani and 4 reserved forests, plantations and vast amount of water bodies. Among these, the water bodies cover 14.16% of the LPA, reserved forests 2.0%. These areas should be fully utilized to increase tree cover. Awareness should be created among the private landowners in the Eco sensitive zones to go for medicinal trees and plants which are native to the area to achieve green cover. The Departments should be encouraged in planting trees on the banks of water bodies and the channels which interconnect these water bodies. Water bodies and channels should not only be seen as blue spaces but the banks to be seen as green spaces. Aquifer recharge potential areas identified should be used for promoting tree cover. The proposed road network and the RoW have designated tree cover areas which should be considered and prioritized while implementing such projects. This would also ensure protection of the land and help in increasing the biodiversity as well as creating a chain of interconnecting networks connecting the reserved forests, water bodies, water channels and eco-sensitive zones.

14.1.9 TRANSPORTATION AND INFRASTRUCTURE SECTOR

Energy-efficient Devices and Infrastructure:

In the pursuit of sustainable urban development, initiatives within the transportation and infrastructure sector play a crucial role. To enhance energy efficiency, a plan is proposed to distribute low-energy-consumption devices such as fans, lights, and LEDs to every household. Additionally, the integration of e-charging stations, solar streetlights, and solar water pumps for civic use is recommended. This approach aligns with the city's commitment to promoting clean and sustainable energy solutions. Notably, in anticipation of future transportation needs, the plan includes the introduction of 100 electric buses by the year 2041.

Corporate Social Responsibility (CSR) Collaboration:

Recognizing the significance of collaboration, efforts will be made to engage corporate entities in supporting these initiatives. Facilitating partnerships through CSR initiatives, the plan aims to tap into corporate funds for the procurement of necessary equipment related to energy-efficient projects. This collaboration is designed to have a positive and far-reaching impact, benefiting various sectors of the community and contributing to the overall sustainability goals of Tirunelveli.



14.2 PROPOSALS FOR BLUE INFRASTRUCTURE

14.2.1 INTERLINKING OF WATER RESOURCES

Tirunelveli LPA, situated within the Tamirabarani River Basin, is characterized by a significant network of surface water bodies, constituting approximately 15% of the total LPA area. The region is endowed with the Tamirabarani Perennial River, primarily utilized for agricultural purposes, and falls within the Tamirabarani basin.

Addressing water resource management is imperative for sustainable development in the Tamirabarani River Basin. At current situation the water bodies located in the LPA seems to be well connected it requires rejuvenation and maintenance of the water bodies. The World Bank defines water resource management as the holistic approach to planning, developing, and overseeing water resources, encompassing both quantity and quality aspects across all water uses. Collaborative efforts involving the Water Resources Department (WRD), District Collector, and the Department of Environment and Climate Change are essential to formulate a comprehensive Water Management Action Plan tailored to the unique characteristics of the Tamirabarani River Basin. The plan should focus on key aspects such as institutional frameworks, infrastructure development, incentives, and information systems to guide effective water management strategies.

Short-term Restoration Measures (0-5 years)

- Preparation of Watershed interconnectivity plan
- Providing 50m buffer along River and 15m buffer along waterbodies
- Mechanism and models to undertake regular desilting and cleaning of water bodies and thereby maintaining the quality of water resource
- Mechanism and models to undertake frequent removal of encroachments in the water body/ spread area
- Identify and install smart monitoring meters to cover quantity and quality of water
- Update regular readings from observation borewells on LPA level
- Update of water parameters on regular basis or a weekly level online in a transparent manner



Mid-term Restoration Measures (0-10 years)

- Mechanism and models for strengthening of bund, fencing/ re-fencing (bio-fencing) of water bodies
- Trees specific to wetland species to be planted along the water body and other ecosystem to ensure their protection
- Conserve/ rejuvenate water sources and springs in the eco-sensitive zone as a part of water management action plan Conduct a micro-level feasibility study to explore the possibility of re-meandering the course of the Mudangiyaru river. This will help recharge naturally as well as improve the habitat diversity and biodiversity
- Identify recharge structures and recharge borewells along with the funding source. Ensure all these are setup within a five-year plan
- Preparation of Annual Water Balance Plan

Long-term Restoration Measures (0-20 years)

- Administer water bodies such that only treated water is allowed to discharge into the catchment of the water bodies
- Involve the community to manage the water level and water quality measurement
- Form a Water Resource Monitoring Committee – As part of the Action plan a monitoring committee under Water Resources Department (WRD) for irrigation should be formed including PWD officers, Agricultural officers, Fisheries department and the farmer community to periodically check the water level in tanks, wells and guide farmers about their cropping pattern based on the water availability.



Policy and Management

- Identifying roadmaps, institutional systems and strategic framework
- Protocol to involve local communities, especially women, in planning and recharge works, maintaining and sharing of water sources
- Knowledge dissemination and communication to ensure sustainability mechanism to strengthen the existing Water Users Association
- Prepare polices to ensure the water is sustainably harnessed and utilized

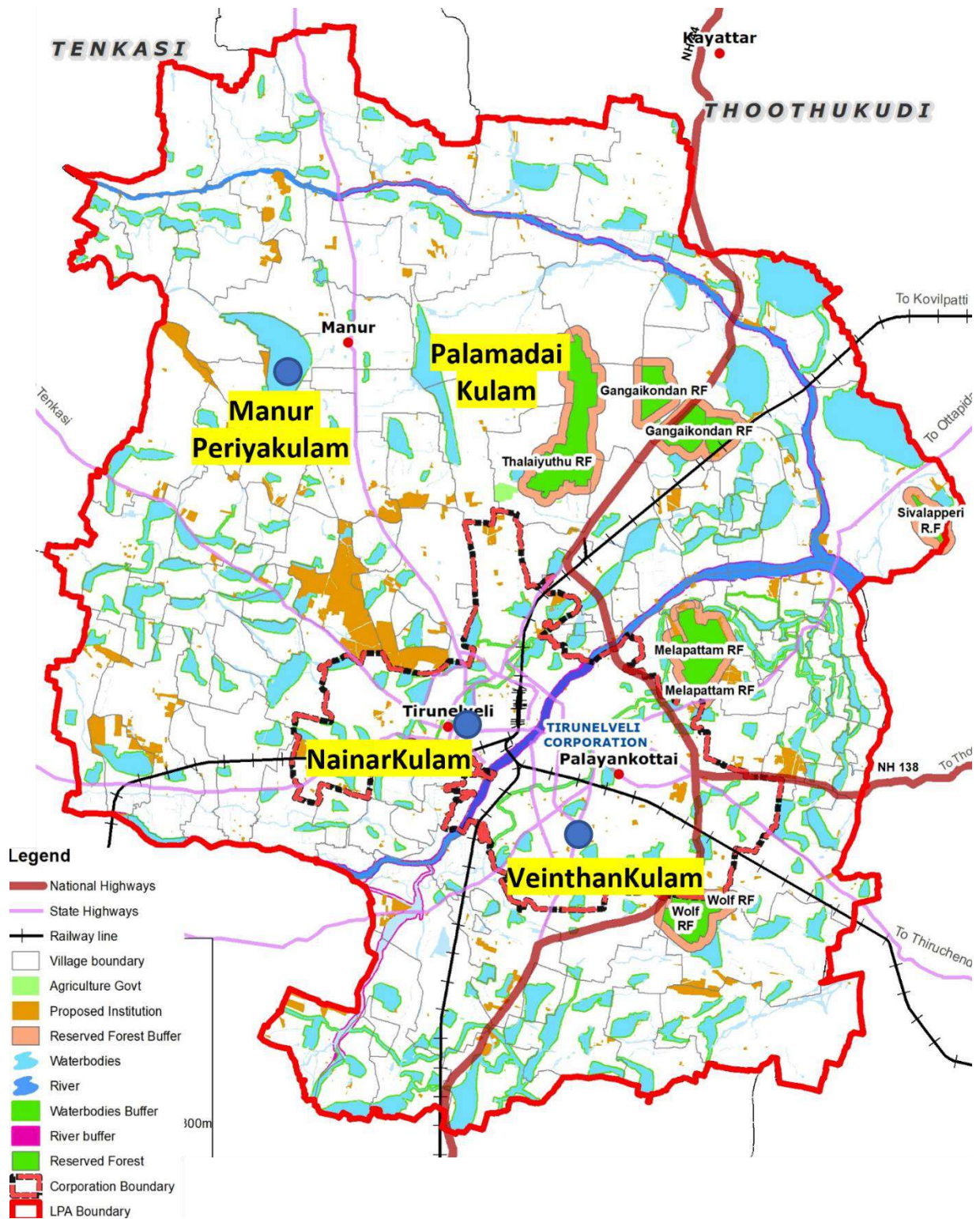
14.2.2 REJUVENATION & MAINTENANCE OF LAKES AND TANKS

A crucial step toward efficient water resource management in the Tamirabarani River Basin involves the desilting and deepening of key water bodies within the Tirunelveli LPA. Noteworthy water bodies targeted for this initiative include **Nainar Kulam, Veithankulam, Palamadai Kulam, and Manur Periyakulam Lake**. Desilting and deepening these water bodies are essential measures to enhance their storage capacity, improve water quality, and mitigate the impacts of sedimentation. This proactive approach aligns with sustainable water management practices, contributing to increased water availability for agricultural and other purposes, fostering ecological balance, and fortifying the resilience of the Tamirabarani River Basin against potential water-related challenges. Collaborative efforts involving local authorities, environmental agencies, and community participation are integral to the success of these initiatives.

S.No	Name of Water Body	Catchment Area in sq. km.	Ownership
1	Nainar Kulam	0.52	PWD
2	Veinthankulam	2.85	PWD
3	Palamadaikulam	4.92	PWD
4	Manur Periyakulam	17.16	PWD



Map 14.2 LOCATION OF WATER TANKS FOR DEVELOPMENT





14.2.3 BUFFER ZONE FOR WATERBODIES

A buffer zone is provided all along the rivers and major water bodies:

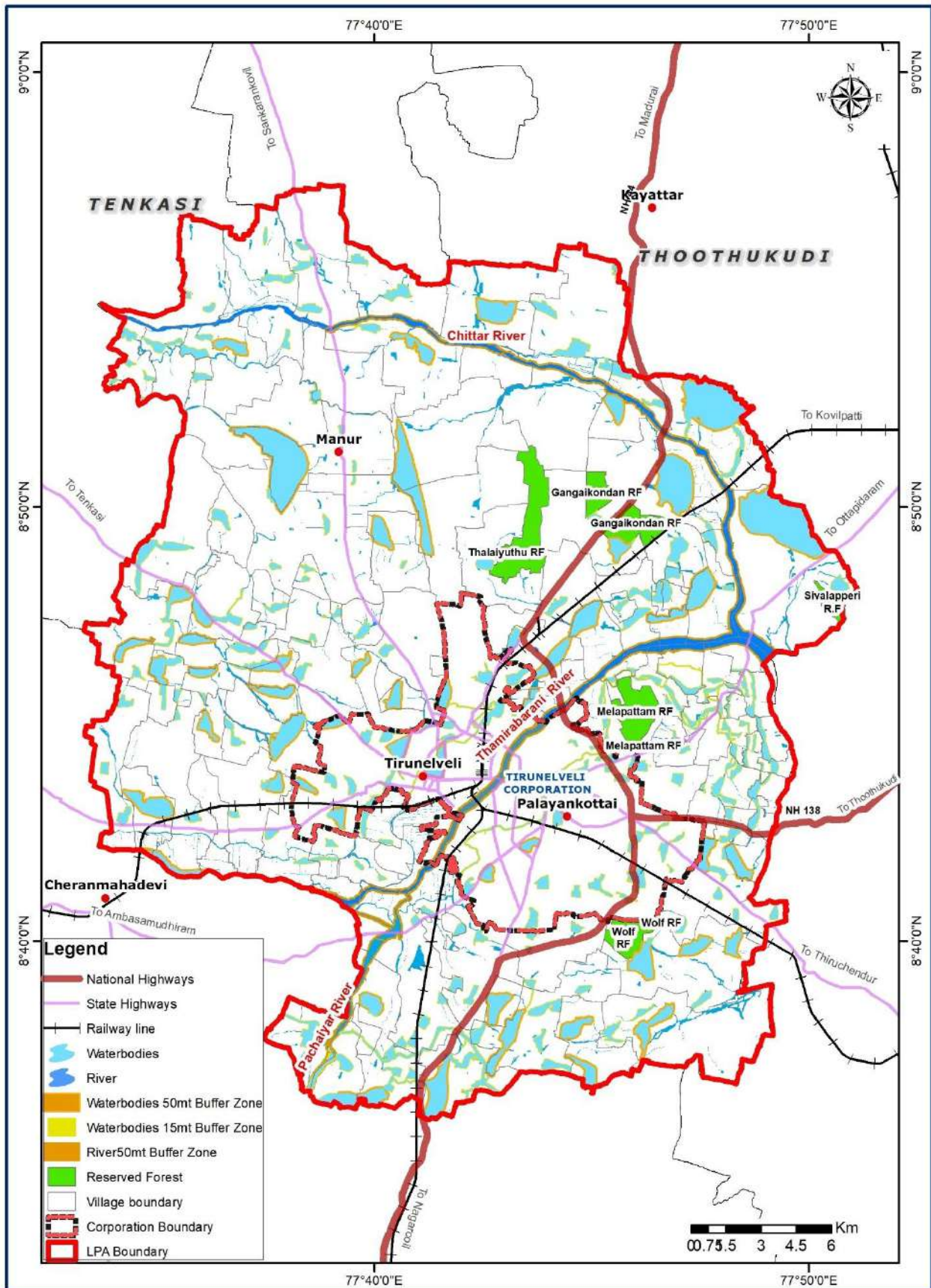
- Rivers and Major Water Bodies: A buffer zone of 50 meters is established along these larger water bodies.
- Streams, Nallas, and Smaller Water Channels: A 15-meter buffer is provided along these smaller water channels.

Land Use Restrictions:

- Agricultural Practice Only: The lands falling within these buffer zones are restricted to agricultural activities only.
- Non-Urbanizable Area: The designated buffer zones are demarcated as non-urbanizable areas, emphasizing the prohibition of urban development within these zones.
- Development Restriction along Water Bodies:
- No Development Proposed: The proposed land use concept is aligned with the restriction of development within the buffer zones along water bodies.
- Conceptual Basis: The entire land use plan is developed based on the concept that no development will take place within the specified buffer areas.



Map 14.3 WATER BUFFER ZONE PROPOSAL MAP





Implications and Benefits:

Environmental Protection:

- The establishment of buffer zones helps protect the ecological health of water bodies by minimizing the impact of urban development, reducing pollution, and preserving natural habitats.

Water Quality Conservation:

- Agricultural activities within the buffer zones can be managed in ways that promote water quality conservation, minimizing runoff and soil erosion.

Biodiversity Conservation:

- The buffer zones contribute to the conservation of biodiversity by providing a protected space for various flora and fauna along watercourses.

Flood Mitigation:

- The presence of buffer zones with vegetation can help mitigate the impact of floods by absorbing excess water and stabilizing soil along riverbanks.

Sustainable Land Use Planning:

- The concept of restricting non-agricultural development within buffer zones reflects a commitment to sustainable land use planning, balancing human activities with environmental conservation.

Community Awareness and Engagement:

- The implementation of buffer zones often involves community awareness programs to educate local residents about the importance of these zones and their role in environmental protection.
- This approach aligns with best practices in environmental management, emphasizing the importance of balancing human activities with the preservation and sustainable use of natural resources, particularly along water bodies.



14.2.4 TAMIRABARANI RIVER FRONT DEVELOPMENT

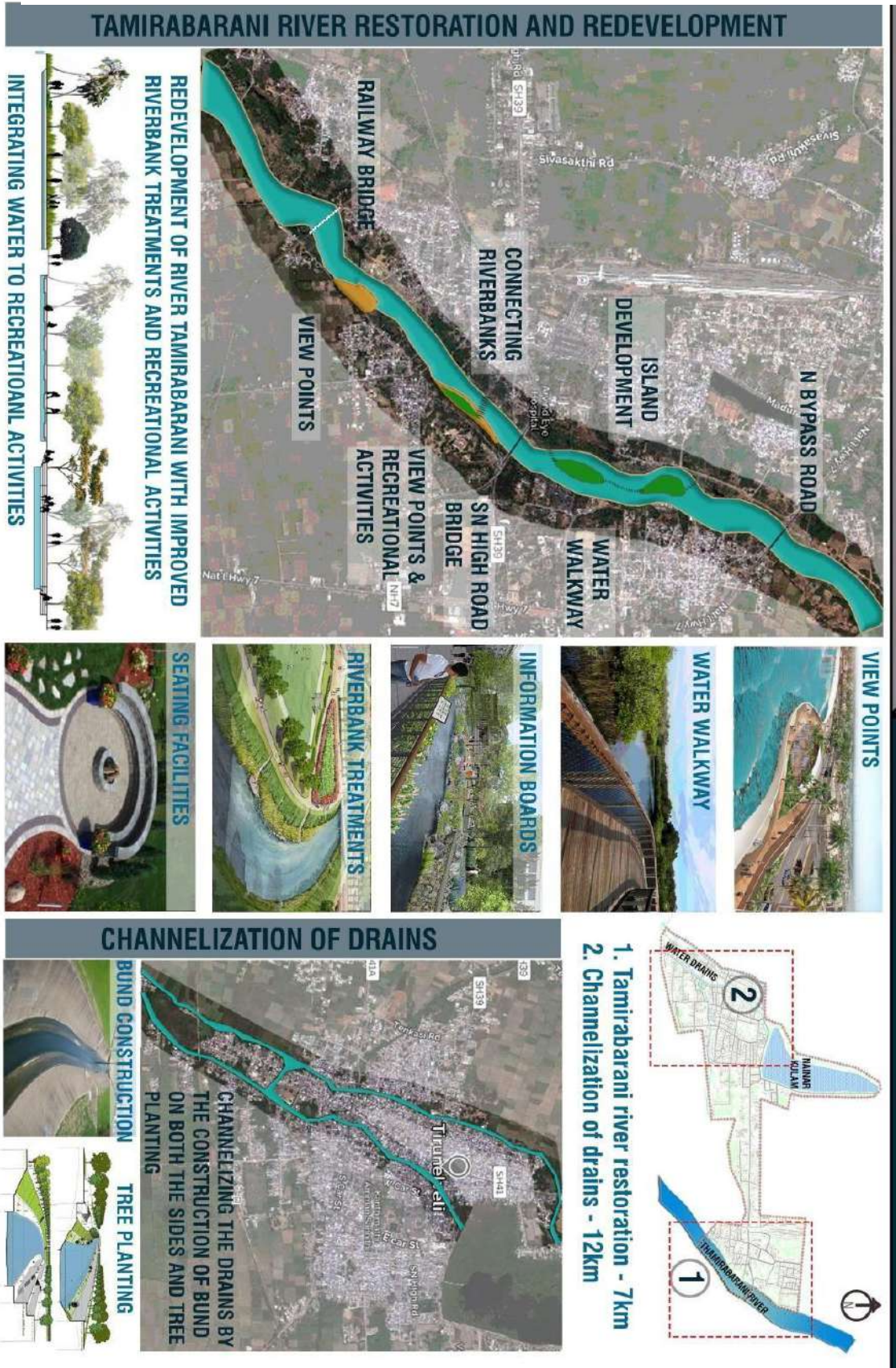
Efforts to enhance the waterfront of the Tamirabarani River within the Tirunelveli Corporation area involve a comprehensive approach, combining Topographical and Photogrammetric Survey Methods for precise identification and design. The waterfront serves as a vital interface between urban development and the water, presenting an irreplaceable resource characterized by interactions among land, water, air, sunlight, and vegetation. The proposed restoration and development plan for a 7 km stretch of the Tamirabarani river channel include strengthening bunds, creating a flowing green open space along the canal, establishing four parks, a viewpoint, bicycle bridges, water walkways, and commercial kiosks. Additionally, a 12 km channelization of drains, de-silting, dredging, stone pitching of banks, and other conservation measures will contribute to the revitalization of this crucial water body. These initiatives aim to not only improve aesthetics but also create recreational spaces, foster environmental sustainability, and promote community engagement.

14.2.5 VEINTHANKULAM LAKE FRONT DEVELOPMENT

The restoration project for Veinthankulam Lake, with a catchment of 2.85 sq. km, encompasses a multi-faceted approach to enhance its ecological and recreational value. Key components of the restoration plan include de-silting and dredging to rejuvenate the lake, stone pitching of banks for stability, and sewage tapping facilitated by garland drains to address water quality. To promote biodiversity and water quality, aeration fountains, fish, and bacteria culture will be introduced to reduce Biological Oxygen Demand (BOD). The project envisions transforming Veinthankulam Lake into a tourist attraction by incorporating features such as boating facilities, light and sound shows, and 2 km of lakeside pedestrian pathways. Moreover, the restored lake holds the potential for stormwater reuse, aligning with sustainable water management practices. This holistic restoration initiative aims to create a vibrant and resilient ecosystem while providing recreational opportunities for the community.



Map 14.4 CONCEPT SKETCH FOR TAMIRABARANI RIVER FRONT DEVELOPMENT





Map 14.5 CONCEPT SKETCH FOR VEINTHANKULAM LAKE
FRONT DEVELOPMENT

VEINTHANKULAM

150 two wheeler parking is provided. Solar panels can be provided at the roof of the parking.

Restaurants and provision for recreational activities are given in order to improve the livelihood of the lake.

Levelled seating with view over the lake is been provided.

Shops are provided at regular interval for the ease of users.

Shops are provided to improve the aesthetics of the surrounding.

SECTION AA

- Provides a distinctive feature and create a new signature for Tirunelveli.
- Also provides a variety of activities and experience that attract repeat visitation and invite tourists.



14.3 REVIVAL OF ABANDONED QUARRIES

In Tirunelveli Local Planning Area (LPA), the presence of defunct and abandoned quarries in an unsecured state poses a serious threat to the safety of the public, nearby cattle, and the surrounding environment. This not only jeopardizes lives but also represents a missed opportunity to utilize these abandoned quarries as valuable water resources. To address these concerns, it is imperative to appropriately demarcate and fence these abandoned quarry sites.

By securing these sites, the excess water flow in rivers and streams can be redirected into the abandoned quarries, transforming them into effective rainwater harvesting tanks. This strategic repurposing holds the potential to provide a sustainable water supply during drought times, benefiting the local community for drinking water and other essential uses. Abandoned quarry sites, meticulously identified and listed in a table, along with their locations illustrated in Map 14.6, particularly near Gangakondan, Kanarpatti, and Sheliyanalur, present a significant opportunity for transformation.



Table 14.1 DETAILS OF THE ABANDONED QUARRY SITES – TIRUNELVELI LPA

Slno	Name of Village	Survey	Sub-Division	Taluk	Existing Landuse
1	Kanarpatti	52		Manur	Quarry
2	Kanarpatti	61		Manur	Quarry
3	Kanarpatti	62		Manur	Quarry
4	Kanarpatti	66		Manur	Quarry
5	Kanarpatti	67		Manur	Quarry
6	Kanarpatti	97		Manur	Quarry
7	Madavakurichi	438		Manur	Quarry
8	Pallikkottai	4		Manur	Quarry
9	Pallikkottai	5		Manur	Quarry
10	Pallikkottai	13		Manur	Quarry
11	Pallikkottai	14		Manur	Quarry
12	Pallikkottai	15		Manur	Quarry
13	Pallikkottai	16		Manur	Quarry
14	Pallikkottai	27		Manur	Quarry
15	Pirancheri	594		Manur	Quarry
16	Pirancheri	596		Manur	Quarry
17	Pirancheri	666		Manur	Quarry
18	Pirancheri	667		Manur	Quarry
19	Pirancheri	672		Manur	Quarry
20	Pirancheri	687		Manur	Quarry
21	Pirancheri	703		Manur	Quarry
22	Pirancheri	720		Manur	Quarry
23	Pirancheri	721		Manur	Quarry
24	Pirancheri	723		Manur	Quarry
25	Pirancheri	783		Manur	Quarry
26	Pirancheri	784		Manur	Quarry
27	Sheliyanallur	136		Manur	Quarry
28	Sheliyanallur	137		Manur	Quarry
29	Sheliyanallur	138		Manur	Quarry
30	Sheliyanallur	151		Manur	Quarry
31	Sheliyanallur	152		Manur	Quarry
32	Sheliyanallur	154		Manur	Quarry
33	Sheliyanallur	155		Manur	Quarry
34	Sheliyanallur	156		Manur	Quarry



35	Sheliyanallur	962		Manur	Quarry
36	Thalaiyuthu	82		Manur	Quarry
37	Vagaikulam	454		Manur	Quarry
38	Vagaikulam	456		Manur	Quarry
39	Vagaikulam	464		Manur	Quarry
40	Vagaikulam	470		Manur	Quarry
41	Vagaikulam	471		Manur	Quarry
42	Vagaikulam	487		Manur	Quarry
43	Vagaikulam	492		Manur	Quarry
44	Vagaikulam	493		Manur	Quarry
45	Tharuvai	522		Palayamkottai	Quarry
46	Tharuvai	523		Palayamkottai	Quarry
47	Tharuvai	524		Palayamkottai	Quarry
48	Tharuvai	534		Palayamkottai	Quarry
49	Tharuvai	535		Palayamkottai	Quarry
50	Tharuvai	570		Palayamkottai	Quarry
51	Tharuvai	844		Palayamkottai	Quarry
52	Tharuvai	847		Palayamkottai	Quarry
53	Tharuvai	848		Palayamkottai	Quarry
54	Tharuvai	849		Palayamkottai	Quarry
55	Tharuvai	851		Palayamkottai	Quarry
56	Gangaikondan	25		Tirunelveli	Quarry
57	Gangaikondan	1784	1	Tirunelveli	Quarry
58	Gangaikondan	1785		Tirunelveli	Quarry
59	Gangaikondan	1786		Tirunelveli	Quarry
60	Gangaikondan	1787	2	Tirunelveli	Quarry
61	Gangaikondan	1794	1	Tirunelveli	Quarry
62	Gangaikondan	1798		Tirunelveli	Quarry
63	Gangaikondan	1799		Tirunelveli	Quarry
64	Gangaikondan	1800		Tirunelveli	Quarry
65	Palamadai	358		Tirunelveli	Quarry
66	Palamadai	359		Tirunelveli	Quarry
67	Palamadai	360		Tirunelveli	Quarry
68	Pudur	425		Tirunelveli	Quarry
69	Pudur	426		Tirunelveli	Quarry
70	Pudur	427		Tirunelveli	Quarry



One notable proposal involves repurposing the quarry near Gangaikondan, situated in close proximity to industrial areas, as a site for a sewage treatment plant. This initiative aims to treat wastewater on-site, simultaneously filling the quarries and saving costs associated with pumping wastewater to distant treatment plants. A comprehensive feasibility report will be conducted to explore the optimal utilization of these abandoned quarries for sustainable purposes.

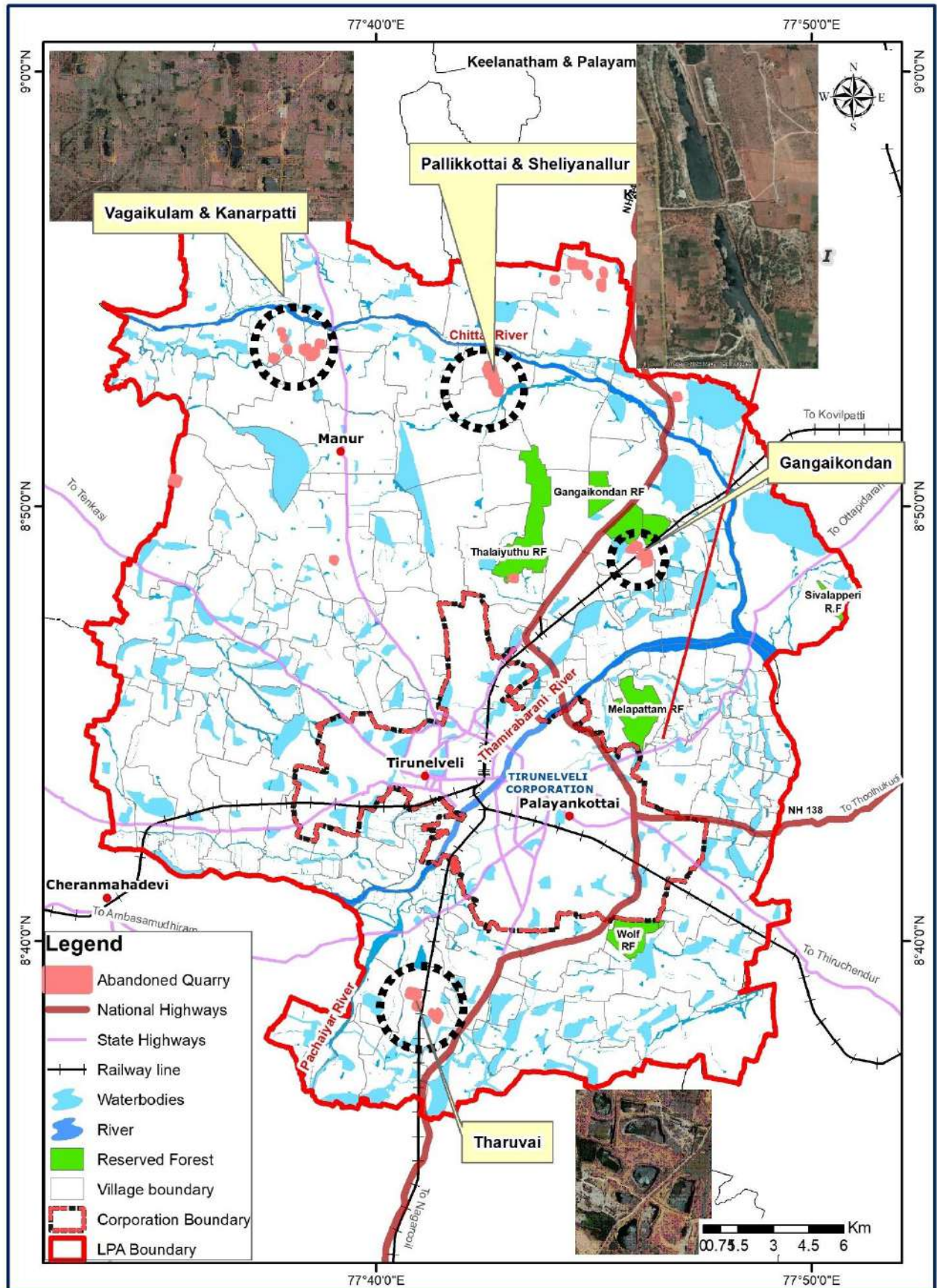
The potential reuses for these abandoned quarries are diverse and include:

- Water Recreation Areas
- Nature Reserves and Parks
- Landscaping and Gardens
- Aquaculture and Fish Farming
- Solar Farms and Renewable Energy

By considering these alternative uses, the Tirunelveli LPA can transform these abandoned quarries into valuable assets that contribute to environmental sustainability and community well-being



Map 14.6 LOCATION OF ABANDONED QUARRIES





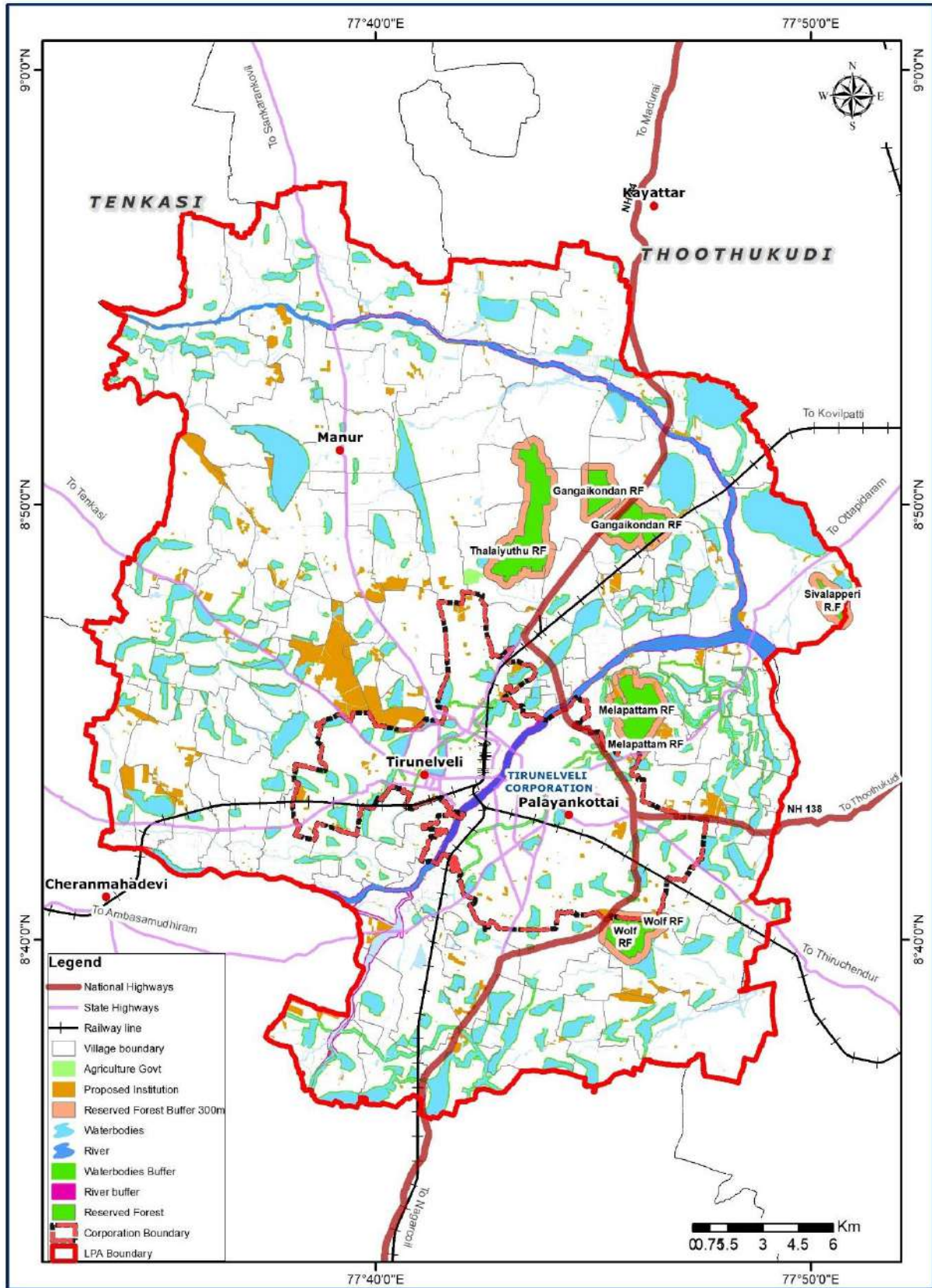
14.4 PROPOSALS FOR GREEN AND RECREATIONAL INFRASTRUCTURE

14.4.1 BUFFER ZONE FOR RESERVED FORESTS

The reserved forest (RF) is a protected forest with a natural habitat with a high degree of protection from all activities, such as hunting, poaching, grazing, cutting of trees. There are five numbers of reserved forests located in Tirunelveli LPA; namely Gangaikondan RF, Thalaiyuthu RF, Sivalaperi RF, Melapattam RF and Wolf Hill RF. The combined area of the reserved forests is 17.26 Sq. Km, which is 2.0 % of the total LPA. **A buffer of 150 m** is proposed around reserved forests and sanctuaries to enable protection of wildlife and ecology preservation, except, the sites wherever the existing industries are already established such as SIPCOT Industrial Growth Centre, Gangaikondan and the industries are functional as of now.



Map 14.7 PROPOSED BUFFER ZONE AT RESERVED FOREST AREAS





14.4.2 PROPOSAL FOR URBAN FOREST

The pressing need for an Urban Forest in Tirunelveli arises from the inadequacy of the existing green cover, currently estimated at approximately 1 sq. km. To meet planning standards and enhance environmental sustainability, there is a necessity to achieve a minimum of 2.1 sq. km of green cover. This proposal focuses on establishing an Urban Forest at the identified site in Kondanagram village, covering an extent of 2 acres, located 10 km from the Tirunelveli Central Business District (CBD).

Need in Tirunelveli:

With the existing green cover falling short of the recommended standards, the proposed Urban Forest becomes imperative for Tirunelveli. The identified site in Muthur Village provides a strategic location to address this deficiency and contribute significantly to the city's environmental health. Planting Tirunelveli local species ensures ecological relevance and promotes biodiversity.

Proposed Site:

The selected site in Muthur village is situated at an optimal distance of 9 km from the Tirunelveli CBD area, making it easily accessible to residents. Spanning 1.20 acres (0.48.50 Hectares), the site offers ample space to develop a thriving Urban Forest. The strategic location makes it a suitable area to serve as a green lung space for Tirunelveli LPA, contributing to the overall well-being of the Tirunelveli LPA. The site is situated near sivanthipatti village, the ongoing construction of Porunai museum could be an additional advantage of this area for promoting eco-tourism.

- Existing Land use in the Master plan: Agricultural use zone in the Consented Tirunelveli LPA.
- SF No: 462/1 Part
- Site Extent: 1.20 acre. (0.48.50 Hectares)
- Taluk: Palayamkottai
- Village: Muthur
- Ownership: Government Poromboke land
- Revenue Classification: Unassessed waste (Parambu)



Figure 14.3 SITE PHOTOS OF THE PROPOSED URBAN FOREST AT MUTHUR VILLAGE

**Essential Infrastructure:**

To ensure the success and sustainability of the Urban Forest, essential infrastructure components are proposed:

- **CCTV Cameras:** Strategically placed for security and monitoring purposes.
- **Drip Irrigation System:** To optimize water usage and promote plant growth.
- **Well-Defined Boundary:** Clearly demarcated to protect the forest area.
- **Regular Maintenance:** Establishing a routine maintenance schedule to ensure the forest's health and longevity.

Additional Infrastructure for Development and Maintenance:

- **Visitor Facilities:** Constructing visitor-friendly amenities such as walking trails, seating areas, and informational signage to enhance the overall experience and promote public engagement.
- **Biodiversity Monitoring System:** Implementing a system for continuous monitoring of plant and animal species to track biodiversity growth and address any potential threats.
- **Educational Center:** Establishing an educational center within the forest to conduct workshops, seminars, and awareness programs on environmental conservation and sustainable living.
- **Research Station:** Collaborating with academic institutions for the establishment of a research station focused on local flora and fauna, contributing to scientific knowledge and conservation efforts.



Benefits in Master Planning:

The integration of an Urban Forest into Tirunelveli's master planning offers multifaceted benefits. Beyond addressing the green cover deficit, the proposed forest becomes an integral part of the city's infrastructure, contributing to:

- **Recreational Space:** A designated area for residents to engage in outdoor activities, promoting physical and mental well-being.
- **Climate Resilience:** Acting as a natural buffer, the forest enhances the city's resilience against climate change, mitigating the impact of extreme weather events.
- **Urban Aesthetics:** Elevating the city's aesthetics, creating a harmonious balance between urban development and natural beauty.

Benefits in Carbon Sequestration:

The Urban Forest plays a pivotal role in Tirunelveli's commitment to carbon neutrality. By focusing on planting local species and actively sequestering carbon, the forest aligns with global initiatives for combating climate change. Key aspects include:

- **Carbon Absorption:** The strategic location of the forest facilitates efficient carbon absorption, contributing significantly to Tirunelveli's carbon neutrality goals.
- **Biodiversity Promotion:** Planting local species enhances biodiversity, creating a resilient ecosystem that sequesters carbon naturally.
- **Sustainable Development:** The forest becomes a living example of sustainable development, showcasing Tirunelveli's dedication to environmental responsibility.



Utilization of Produce:

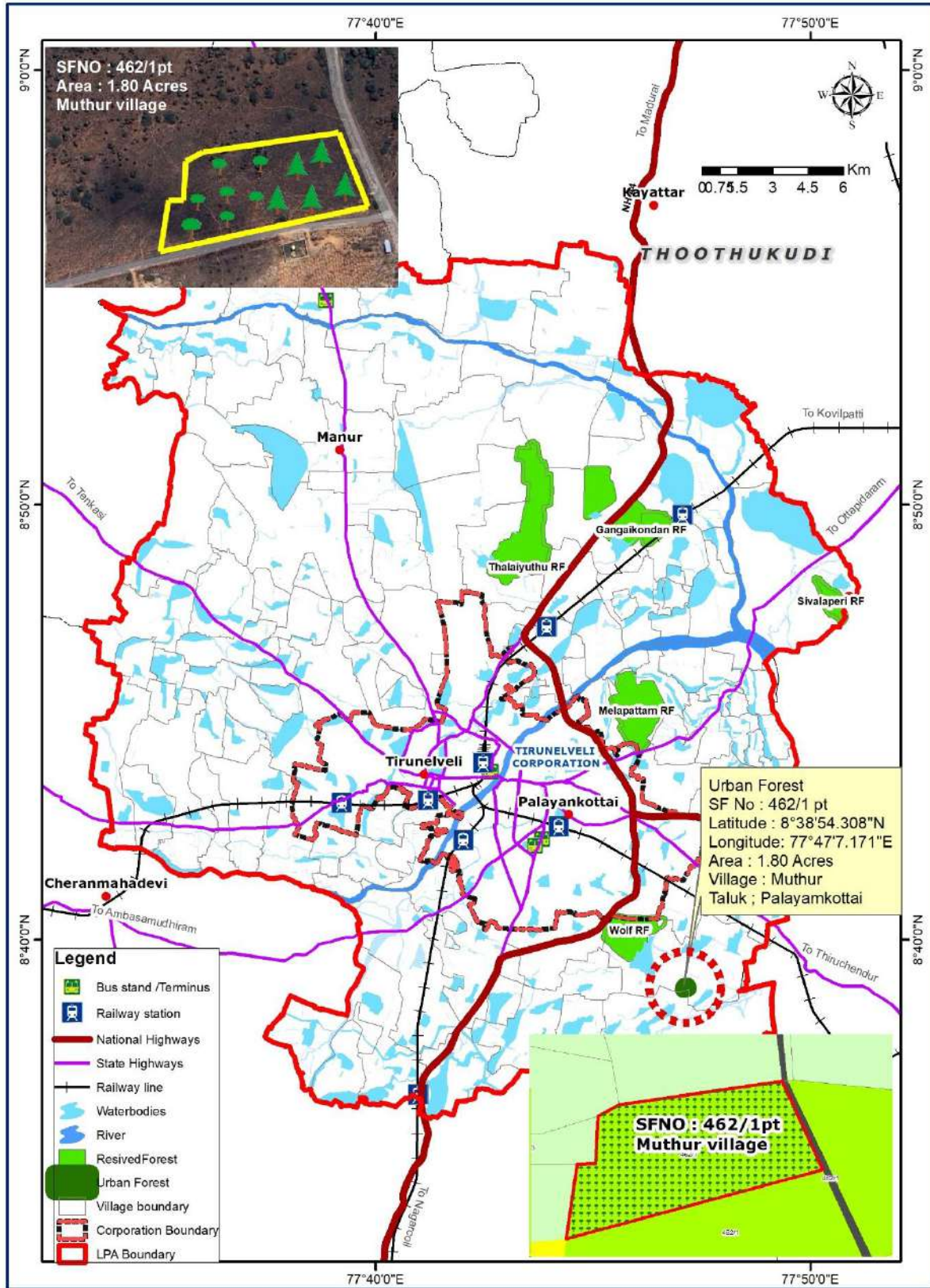
To maximize the benefits derived from the Urban Forest, a thoughtful approach to utilizing its produce is essential. This includes:

- **Community Gardens:** Allocating areas within the forest for community gardening initiatives, allowing residents to cultivate and harvest fruits and vegetables.
- **Sustainable Timber Production:** Implementing sustainable timber harvesting practices for selected tree species, providing a local source of wood while ensuring the overall health of the forest.
- **Eco-Tourism Opportunities:** Exploring the potential for eco-tourism initiatives, such as guided nature walks and educational tours, generating revenue to support maintenance and development efforts.

The establishment of an Urban Forest at the proposed site in Muthur Village is not just a response to the deficit in green cover but a holistic approach to urban development. This initiative goes beyond aesthetics, ensuring a greener, healthier, and more resilient future for Tirunelveli. The proposed Urban Forest is an investment in the well-being of the community and a testament to Tirunelveli's commitment to sustainable urban living.



Map 14.8 PROPOSED LOCATION FOR URBAN FOREST





14.4.3 PROPOSAL FOR DISTRICT PARK

A visionary initiative has been proposed for the development of a district park at Palayanchettikulam near Keelanatham, spanning an extensive area of 14 hectares. This ambitious project aims to establish a recreational hub that not only enriches the community's quality of life but also contributes significantly to the overall well-being and leisure opportunities for the residents in the surrounding areas.

Key Features:

1. **Recreational Hub:** The district park is strategically designed to serve as a central recreational hub, providing a green and open space for the community to gather, relax, and engage in various activities.
2. **Amenities:** District parks are renowned for offering a diverse range of amenities. The proposed park includes meticulously planned walking paths, play areas for children, sports facilities, and thoughtfully landscaped areas, catering to a wide spectrum of recreational interests.
3. **Green Oasis:** With a sprawling expanse of 14 hectares, the park is envisioned as a green oasis within the urban landscape. It seeks to create a harmonious blend of nature and infrastructure, fostering a serene environment for visitors.
4. **Community Engagement:** The development of such parks goes beyond physical infrastructure; it fosters community engagement and provides a platform for social interactions. The park becomes a shared space where residents can come together, strengthening the social fabric of the community.
5. **Quality of Life Enhancement:** District parks play a pivotal role in enhancing the overall quality of life for local populations. Access to green spaces has been linked to improved mental well-being, physical health, and a sense of community belonging.



Figure 14.4 SCHEMATIC REPRESENTATION OF A DISTRICT PARK

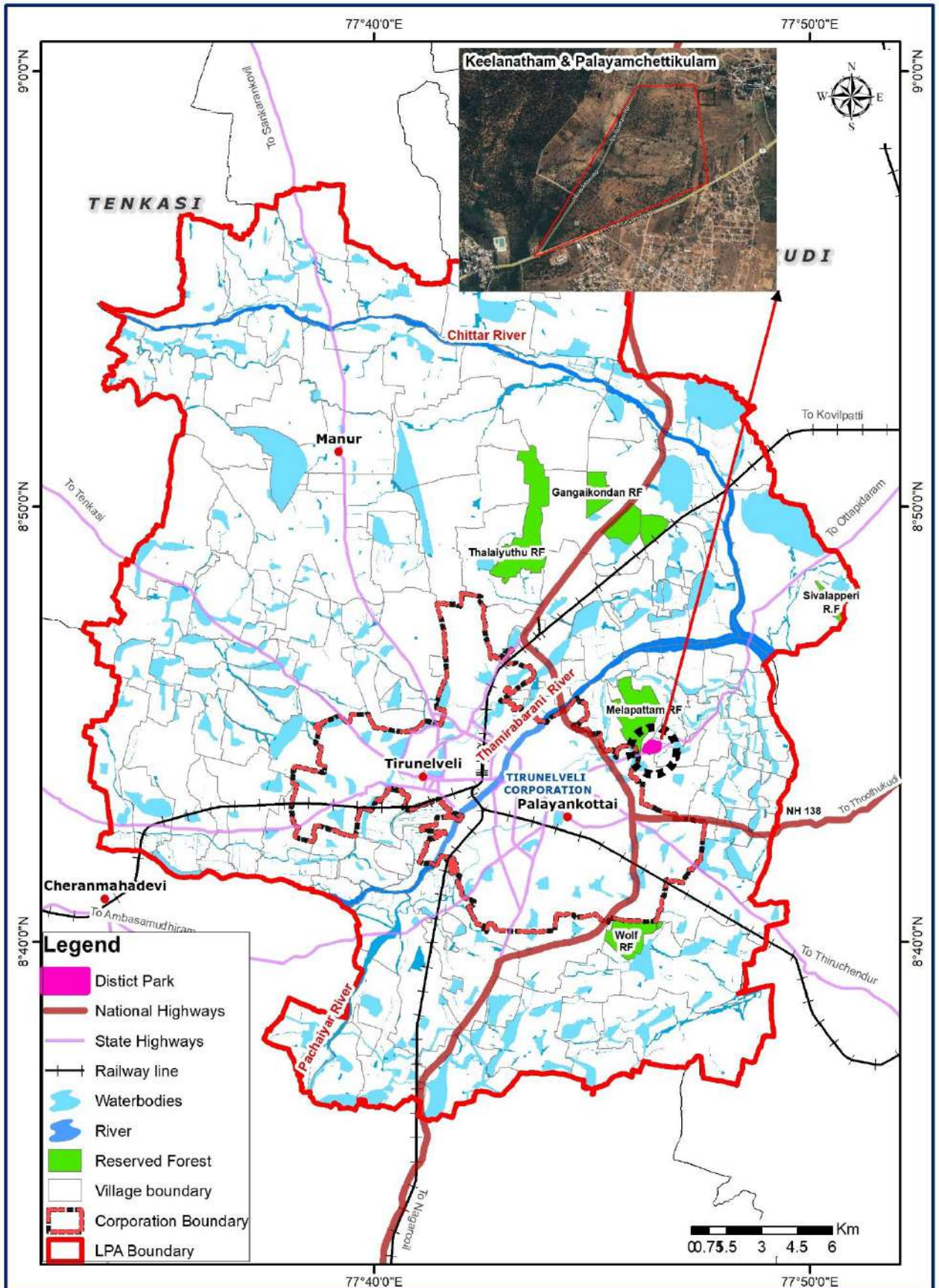
**Expected Benefits:**

- **Health and Well-being:** The provision of walking paths and sports facilities encourages physical activity, promoting a healthier lifestyle among residents.
- **Social Cohesion:** The park serves as a neutral ground where people from diverse backgrounds can converge, fostering social connections and community bonds.
- **Environmental Impact:** The incorporation of greenery and landscaping contributes to environmental sustainability, acting as a carbon sink and enhancing biodiversity.
- **Leisure Opportunities:** The park offers a range of leisure opportunities for individuals and families, providing a respite from the hustle and bustle of urban life.

In conclusion, the proposed district park at Palayanchettikulam near Keelanatham is not merely an urban development project; it is a commitment to creating a vibrant and inclusive community space. By prioritizing recreation, well-being, and community engagement, this initiative aligns with global trends promoting sustainable and people-centric urban planning. The envisioned park is poised to become a cherished asset, symbolizing the city's dedication to enhancing the overall quality of life for its residents.



Map 14.9 PROPOSED LOCATION OF DISTRICT PARK - KEELANTHAM





14.4.4 SPORTS DEVELOPMENT AUTHORITY OF TAMIL NADU PROPOSALS

The development plans for sports infrastructure in Tirunelveli include: A transformative project is on the horizon for **Mathvakurichi village in Manur Taluk** – the development of an Integrated Sports Complex and Mini Stadium spanning a total extent of **13.81 acres**. This visionary facility is meticulously designed to serve as a comprehensive sports hub, featuring a mini stadium and catering to a diverse array of sporting activities and events. The undertaking of such infrastructure underscores a dedication to nurturing a robust sports culture in the region and offering world-class facilities for athletes and sports enthusiasts.



Figure 14.5 SCHEMATIC REPRESENTATION OF A SPORTS COMPLEX

Key Features:

1. **Comprehensive Sports Facilities:** The Integrated Sports Complex is envisioned to be a one-stop destination for a myriad of sports. The facility will house state-of-the-art infrastructure to accommodate various sporting disciplines, encouraging the participation of individuals with different athletic interests.
2. **Mini Stadium:** At the heart of the complex, a mini stadium is set to be a focal point for sports events and competitions. This stadium, designed with modern amenities, will provide a dynamic venue for both local and potentially larger-scale sporting events.
3. **Training and Coaching Facilities:** To support aspiring athletes, the complex will incorporate dedicated areas for training and coaching. This ensures that the facility becomes a nurturing ground for talent development in the sporting arena.
4. **Community Engagement:** Beyond its role in organized sports, the complex aims to be a hub for community engagement. It provides a space for residents to come together, participate in sports, and foster a sense of camaraderie and healthy competition.



5. **Infrastructure for Events:** With a focus on hosting events, the facility will be equipped with amenities such as spectator stands, media boxes, and facilities for hosting both local and potentially larger-scale sports competitions.

Expected Impact:

- **Sports Development:** The establishment of this sports complex signifies a commitment to the holistic development of sports in the region, potentially nurturing talent that can excel at regional, national, and international levels.
- **Health and Fitness:** The availability of modern sports facilities encourages residents to actively engage in physical activities, promoting a healthier lifestyle and well-being.
- **Community Cohesion:** Sporting events have the potential to bring communities together. The complex becomes a shared space for residents, enhancing social interactions and community cohesion.
- **Aspirational Value:** The presence of a sports complex raises the aspirational value for local youth, providing them with access to facilities that can potentially propel them into competitive sports.

The Integrated Sports Complex and Mini Stadium at Mathvakurichi Village, Manur Taluk, represent a visionary initiative that extends beyond sports infrastructure. It symbolizes a commitment to fostering a culture of sports, fitness, and community engagement. As a catalyst for holistic development, this project is poised to leave a lasting impact on the region, creating opportunities for athletes, promoting healthy lifestyles, and becoming a center for community participation and celebration.



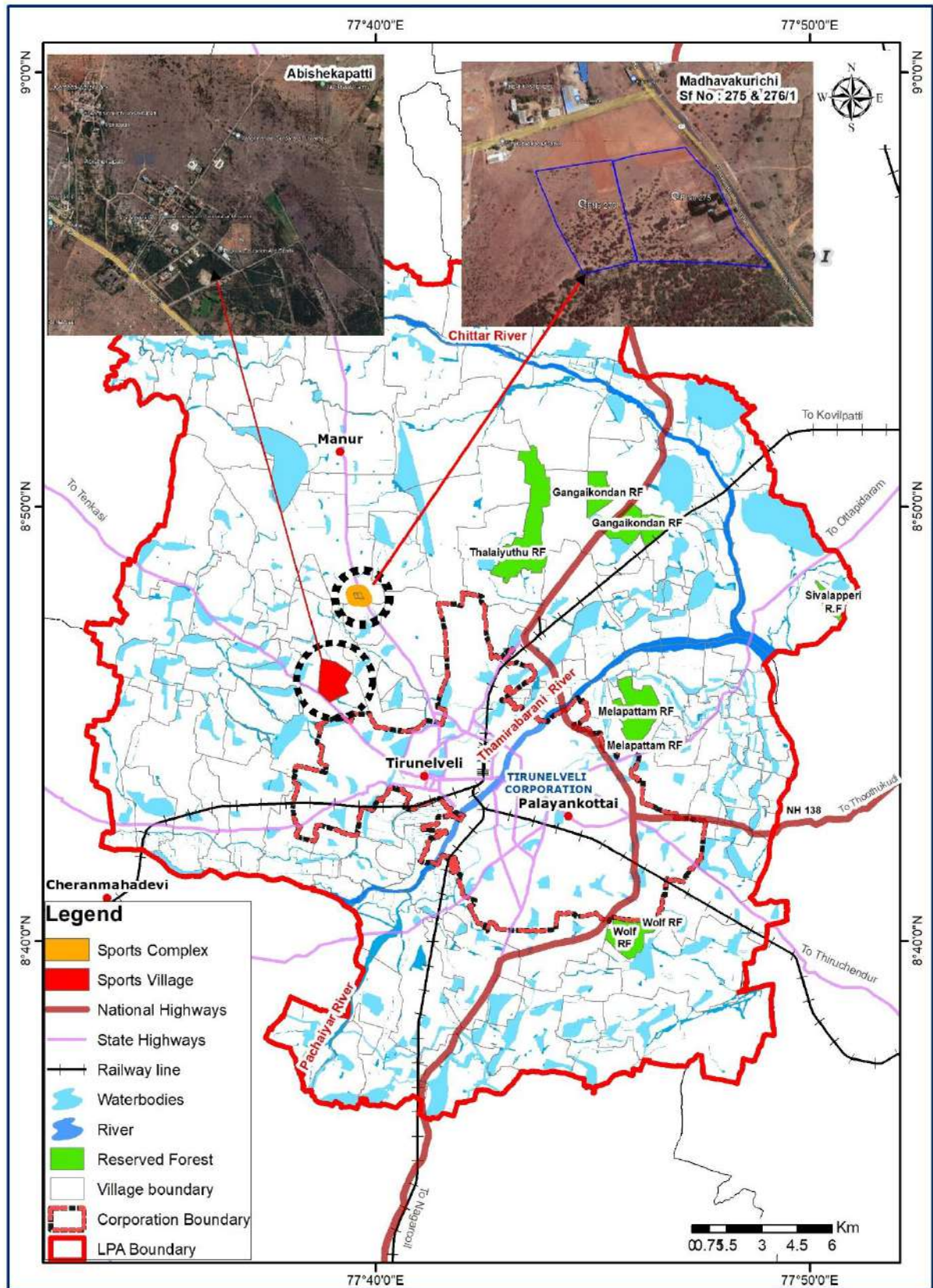
b) **Proposed Sports Village at Abhisekapatti spanning an extent of 15 acres.** The Sports Village concept implies a dedicated area for sporting activities, potentially including multiple sports facilities and amenities. This initiative aligns with the promotion of sports at an educational institution, fostering a culture of physical activity and competitive sports among students and the local community.



Figure 14.6 SCHEMATIC REPRESENTATION OF A MINI STADIUM



Map 14.10 PROPOSED LOCATION FOR SPORTS VILLAGE AND SPORTS COMPLEX



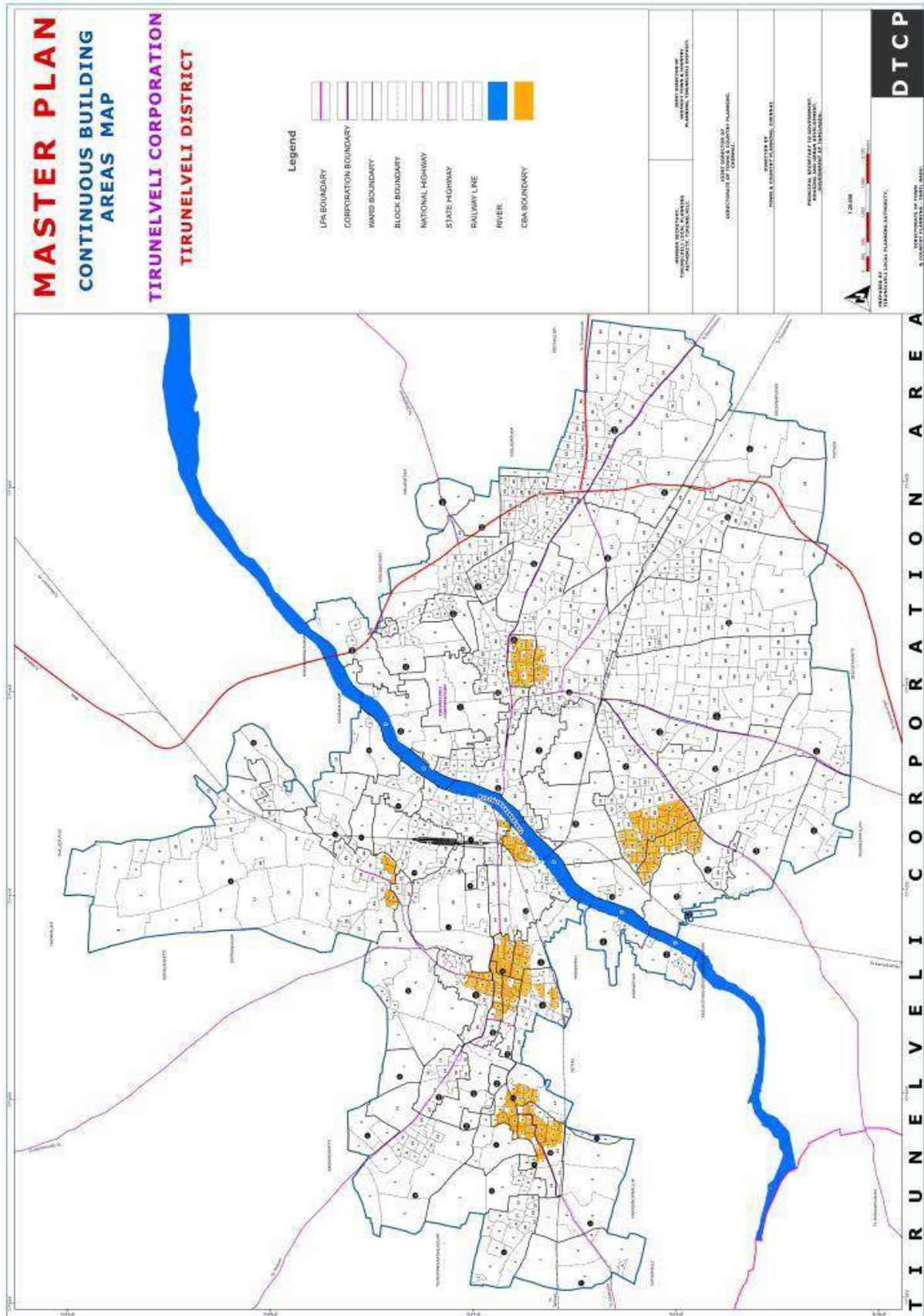


14.5 CONTINUOUS BUILT-UP AREA AND POOR CLASS AREA

Tirunelveli city exists for more than 20 Centuries. The area around Swami Nellaiappar temple and the existing habitations along the periphery of river Tamirabarani and the town area are very old settlements. The TNCDBR, 2019 envisages the regularization of continuous built-up area under section 30. On the basis of resolution passed by the Tirunelveli City municipal corporation in resolution no.227 dated 07/03/2019, the proposal regarding the above has been submitted to DTCP vide letter no 5370/2020 TLPA dated 30/12/2020. Hence, the proposal received from Tirunelveli Municipal Corporation is incorporated in the schedule of the proposed land use in respective of Tirunelveli Municipal Corporation. The total CBA area around **6.80 Sq.km** and the schedule for continuous built-up area is annexed with the report.



Map 14.11 PROPOSED CONTINUOUS BUILDING AREA MAP 2041





14.6 PROPOSALS FOR ECONOMIC SECTOR

Tirunelveli LPA is significant to enhance urban-rural linkages because they are often more accessible to rural populations and also act as a bridge between rural populations and city.

They present strategic locations for linkages to rural areas, and can promote more equitable economic growth in rural regions and spur balanced development, manage urbanization, attract investment and meet the demand for housing, land, infrastructure and basic services. The LPA need to focus on decentralization of economic activities and give impetus to development in LPA based on their potential. LPA need to strengthen the infrastructure and become the hub of creating new economic opportunities.

14.6.1 ONGOING PROPOSAL FOR SKILL DEVELOPMENT CENTER - RURAL SELF EMPLOYMENT AND TRAINING INSTITUTE

A key component of the proposed urban development plan includes the establishment of a Skill Development Center named rural self-employment and training institute at Melapalayam. This center is designed to serve as a hub for imparting essential skills and vocational training to the local community, thereby enhancing employability and contributing to economic growth. The Skill Development Center aims to offer a diverse range of training programs tailored to the needs of various industries, fostering a skilled workforce in alignment with the evolving job market. By focusing on skill development, the center aspires to empower individuals, promote entrepreneurship, and bolster the overall socio-economic development of the Melapalayam area.

14.6.2 DESIGNATED STREET VENDOR SPACE

As part of the urban development initiatives, a designated space for street vendors is proposed in the vicinity of Nainar kulam, specifically near Vannarapettai junction. This strategic allocation aims to organize and streamline street vending activities, providing vendors with a designated area to conduct their businesses. The establishment of this designated street vendor space is intended to enhance the overall urban environment, ensuring a harmonious coexistence between vendors, pedestrians, and other stakeholders. Through proper planning and allocation, the goal is to create a vibrant marketplace that contributes positively to the local economy while maintaining order and convenience for both vendors and the public.

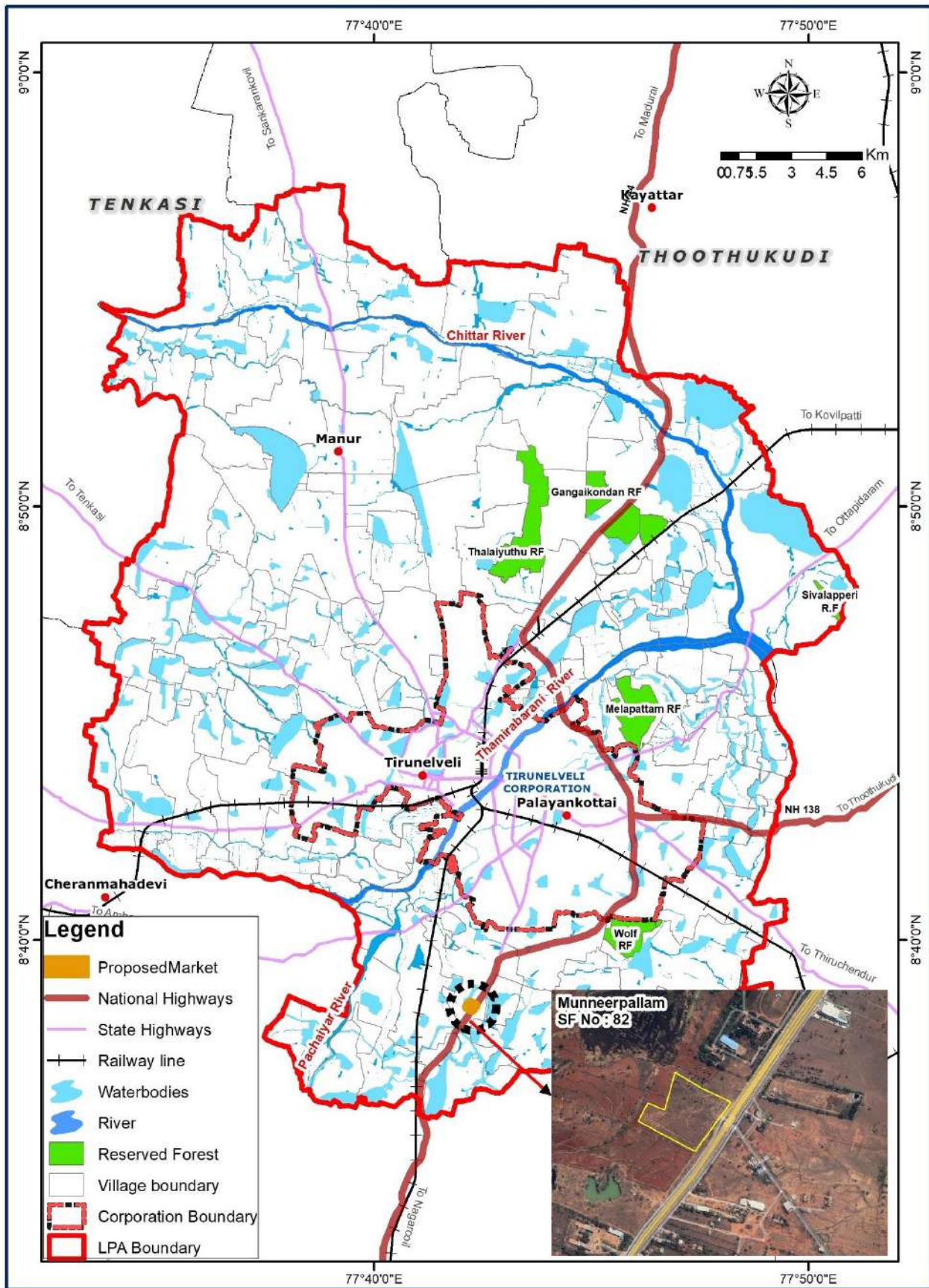


14.6.3 DEVELOPMENT OF INTEGRATED MARKET COMPLEX

A comprehensive **integrated market complex** is proposed as a long-term proposal for construction, spanning an area of **3.5 hectares in Muneerpallam**. This market complex is envisioned to serve as a centralized facility for various commercial activities, providing a well-organized and accessible space for traders and customers alike. The development includes the construction of designated spaces for wholesale and retail trade, catering to the diverse needs of the community. Additionally, this initiative involves the relocation of the wholesale grain market from the west and north car street area, creating a more efficient and structured trading environment. The repurposed areas vacated by this relocation will be utilized for retail trade, further optimizing land usage in the region.



Map 14.12 PROPOSED LOCATION FOR INTEGRATED MARKET COMPLEX





14.6.4 SHIFTING OF WHOLESALE GRAIN MARKET

As part of the proposed urban planning strategy, there is a plan to shift the wholesale grain market from the current locations in the west and north car street areas. The primary objective of this relocation is to optimize the utilization of space and streamline the trading activities in the region. The areas vacated by the wholesale grain market will be repurposed for retail trade, enhancing the overall efficiency and organization of commercial activities in the locality. This strategic move aims to create a more structured and accessible marketplace for both wholesale and retail trade, contributing to the sustainable development of the urban area.

14.6.5 SIPCOT INDUSTRIAL EXPANSION

Gangaikondan SIPCOT Industrial Growth Centre was created with 2000 acres on the city outskirts. The estate houses ATC Tyres, Nova Carbons, Ramco Asbestos, beverage bottling plants and a few more small and medium manufacturing units attracting investments to the tune of Rs.5000 crore. Recently Germany based Bosch has started manufacturing its hi-tech sensors, Britannia has invested Rs. 550 crore on 80 acres of land employing around 350 persons. TATA Power Solar and Vikram Solar have planned to invest Rs. 2000 crore directly employing more than 800 persons. Deemed as renewable manufacturing centre, Industries Department has proposed an expansion for Gangaikondan SIPCOT Industrial Growth Centre by proposing expansion / acquisition of around 1500 acres of land. GUIDANCE TN has planned for regional clusters - Tirunelveli (Cookware) by offering capital subsidy for new investments in the regions.

Industrial investments need to be concentrated promoting Tirunelveli as a manufacturing and processing hub in order for the City to witness a surge in development and growth.



14.7 PROPOSALS FOR MOBILITY PLAN / TRANSPORTATION NETWORK

The proposals for the transportation sector for the Tirunelveli LPA is based on the recommendations of CMP plan prepared in the year 2021. To ensure that mobility solutions for Tirunelveli are integrated to be people centric and are in conformity with sustainable mobility, the following goals have been targeted for the horizon year 2041:



For the current study, four horizon year scenarios were developed based on the future development directions and required transport network considering the various transportation improvements. The scenarios developed as part of the study are follows:

Scenario 1: Business as Usual (BAU, Demographic Changes) Scenario

Scenario 2: Do- Something Scenario (BAU + Committed Projects)

Scenario 3: Sustainable Urban Transport Scenario (BAU + Committed Proposals + Proposed Projects + Transit-Oriented Development)

On assessing the impacts on transport and travel characteristics, Sustainable Urban Transport (SUT) scenarios were developed in line with the CMP vision and objectives. The development of the scenarios included socio – economic (land use transitions, population and employment) projections. Table 14.1 below shows a comparative statement of model output across the various scenarios discussed above. It is proposed that to improve the overall mobility of the city and at the same time reduce the transport related emissions, the city adopts Scenario 3, i.e. the Sustainable Urban Transport Scenario.



Table 14.2 COMPARATIVE STATEMENT OF MODEL OUTPUT ACROSS THE VARIOUS SCENARIOS

Mode	2032 BAU	2042 BAU	2032 something Do	2042 something Do	2032 SUTP	2042 SUTP
Two-Wheeler	46.9%	49.5%	43.21%	47.51%	29.53%	27.69%
Car	17.8%	18.8%	16.40%	18.04%	11.20%	10.49%
Auto-Rickshaw	8.88%	9.42%	8.08%	8.93%	5.48%	5.12%
PT	14.3%	12.8%	13.43%	12.16%	35.10%	37.24%
Cycle	2.48%	1.82%	2.22%	1.70%	3.13%	3.11%
Walk	9.53%	7.50%	16.66%	11.66%	15.57%	16.35%

14.7.1 MOBILITY STRATEGIES FOR TIRUNELVELI

In order to achieve the objectives of the Comprehensive Mobility Plan for Tirunelveli, a multipronged approach consisting of the various strategies, as given below, have been envisaged. It is important to note that each of the identified strategies is equally important and the order of listing does not imply priority. Each of the broad strategies includes sub-strategies, which are elaborated in the following sections:





14.7.2 LAND USE & TRANSPORT INTEGRATION

To achieve a balanced “Integrated land use and transport development”, it is proposed that the city of Tirunelveli may be developed on the lines of Hybrid Development. This model is proposed in Tirunelveli due to the following reasons:

- (i) Major activity area currently is focused in core areas (CBD) with mixed land use along roads.
- (ii) In order to enhance and promote the high NMT mode share of the city and to retain the lower average trip length of the city;
- (iii) To promote and provide a conducive environment for mixed-use development in the city.

To integrate transport and land use in Tirunelveli, the following are being proposed (refer to Figure 14.7)

- Develop each of the upcoming development areas as activity nodes.
- Identify and develop urban mobility corridors to connect the nodes.
- Promote high density/mixed use development along major hubs, national highways and bypasses to encourage short trips.
- Propose corridors for High Density Development



High Density Mixed Land Use

Thus. High Density Mixed Land Use zones are proposed to be developed which are as follows:

- Tirunelveli town to Palayamkottai (East to West)
- Palayamkottai to IRT Polytechnic College via Trivandrum Road.
- Shankarnagar to New MGR Bus Stand Via Bypass

Future developments are expected along the cardinal directions of the study area, as mentioned above, especially the north- south corridor which has a lot of vacant land with development potential. The above proposed mixed use zones will, thus, aid this development to improve the accessibility of the region. The maximum permitted FSI in urban bodies of Tamil Nadu is 2 (without considering premium FSI). For the purpose of encouraging High Density Development, the mobility plan recommends an FSI up to 3 in all the influence areas of the high mass transit corridor.

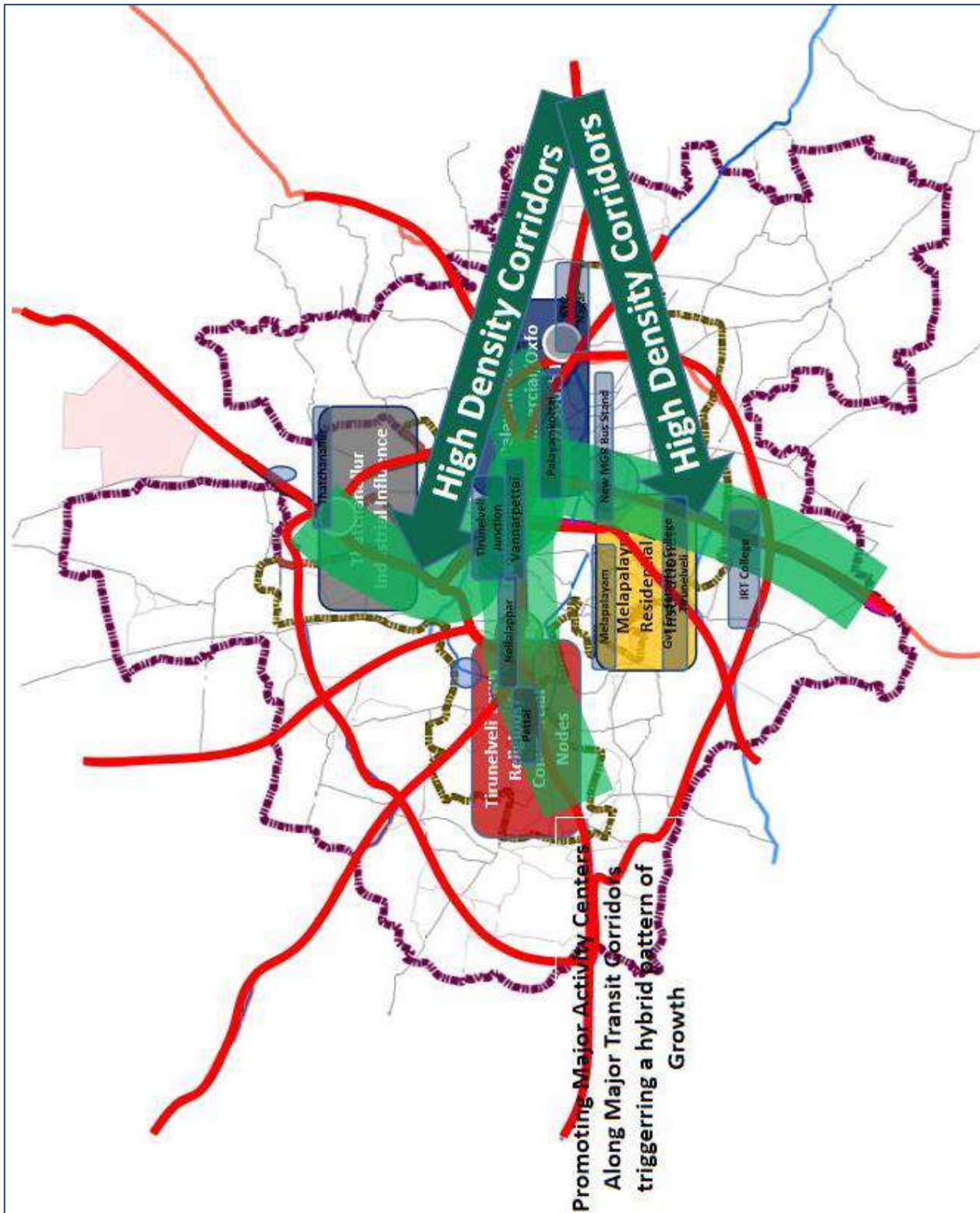


Figure 14.8 PROPOSED CORRIDORS FOR HIGH-DENSITY DEVELOPMENT



14.7.3 ROAD NETWORK STRATEGY

Road improvement proposals are required to be developed such that they cater to all types of road users and help in decongesting the junctions, improving the PT speeds and safer NMT movements. The proposals of improving road network include:

- Development of network of roads
- Road widening
- River Bridge & Flyover Proposals

14.7.4 PROPOSAL FOR NEW ROADS (ROW OF 18M OR MORE)

Development of network of roads

With the existing Madurai-Kanyakumari national highway (NH-44) situated on the eastern side of the Tirunelveli City, the proposed by pass will complete the loop on the western side and will give a radial outlook for the city. The road stretch would commence at Thalaiyuthu located on the north side of the city on NH-44 and passes through 11 villages in the LPA area and will end at Muneerpallam on the south side of the city.

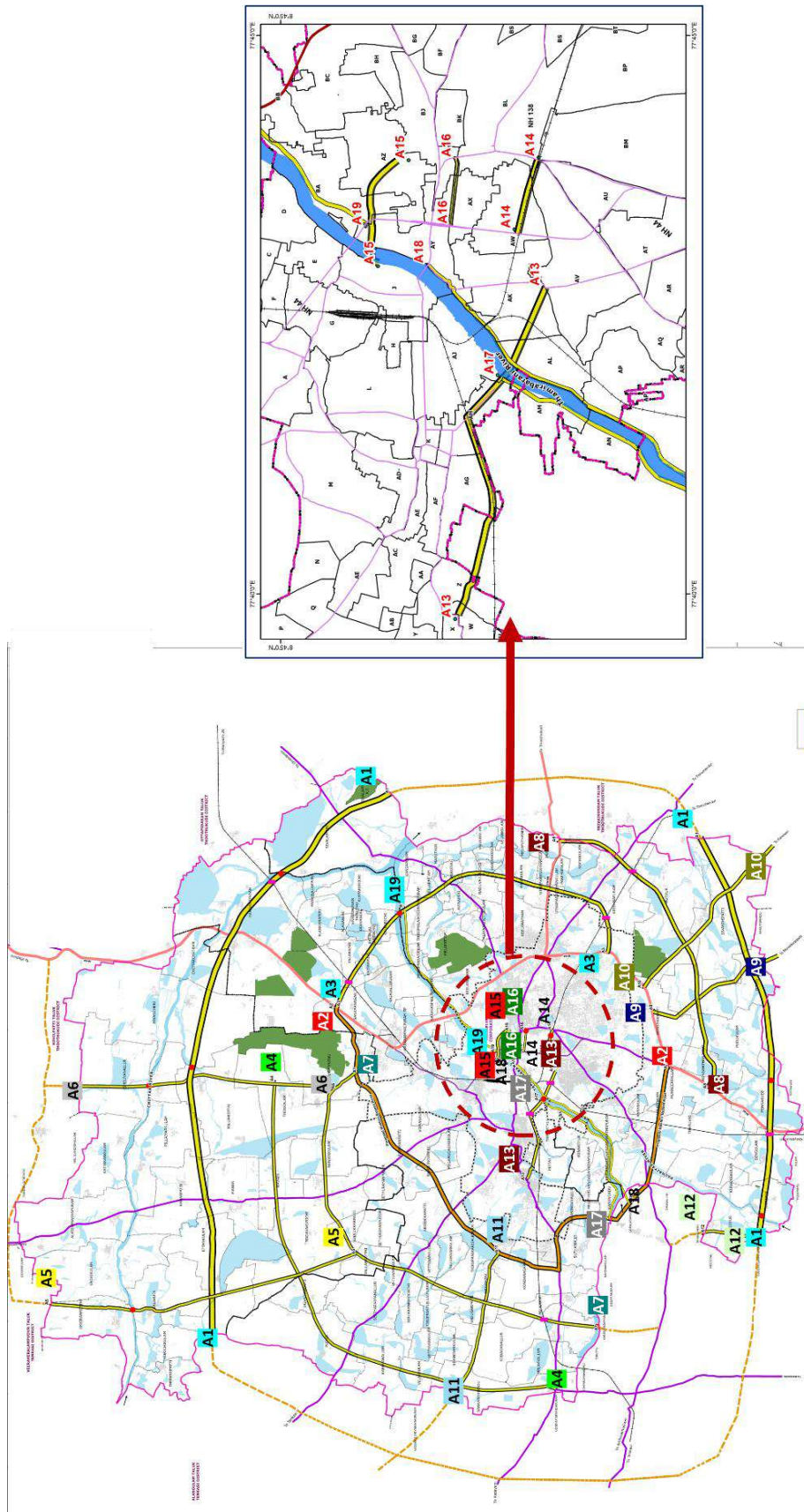
The proposed western bypass road (Thalaiyuthu-Muneerpallam) would pass through 11 villages in the LPA area which will provide major solution to the heavy traffic congestion prevailing in the city by mitigating the vehicular traffic encountered during passing of vehicles bound for Nagercoil and Kerala. Similarly, the following Grid of roads is planned to ensure proper connectivity with a total length of 230 km.



Road ID	Name	Road Type	Width in m	Length in Km
A1-A1	Pirancheri To Maranthai	Sub Arterial Road	30.5	24.5
A2-A2	Melathidiyur to Ettankulam (Via Sengulam, Seydunganallur & Sevalaperi)	Sub Arterial Road	30.5	52
A3-A3	Western Bypass Road (Thalaiyuthu to Munneerpallam) Highway Proposal	Sub Arterial Road	30.5	32.5
A4-A4	Shankar Nagar to Thirumalai Nagar Link Road	Sub Arterial Road	30.5	19.13
A5-A5	Tenkalam Pudur to Sankanthiradu	Sub Arterial Road	30.5	25
A6-A6	Thulukarpatti to Devarkulam	Sub Arterial Road	30.5	15.9
A7-A7	Thenkalam to Sheliyanallur	Sub Arterial Road	30.5	13
A8-A8	Thalaiyuthu to Pathamadai	Sub Arterial Road	30.5	21
A9-A9	Caussanelpuram to Paraikulam	Sub Arterial Road	30.5	16.33
A10-A10	Reddiyapatti to Itteri	Sub Arterial Road	30.5	7.2
A11-A11	Reddiyapatti to Sivanthipatti	Sub Arterial Road	30.5	9.5
A12-A12	Tirupanikarisalkulam to Odaimarichan	Sub Arterial Road	30.5	7.4
A13-A13	Pranchei to Melathidiyur	Collector Street	24	2.75
A14-A14	Pettai to Melapalayam Link Road (CMP Proposal)	Collector Street	24	5.9
A15-A15	Railway Feeder Road to South By Pass Link Road (CMP Proposal)	Collector Street	24	1.25
A16-A16	North Bypass Balabagya Nagar Link Road (CMP Proposal)	Collector Street	24	1.15
A17-A17	South Bypass to Thiruvanthapuram Road (BSNL to Nehruji Ground) Link Road	Collector Street	18	1.2
A18-A18	Western Bypass Road (Gopalsamudiram Bridge) to Kurukkuthurai	Collector Street	15	8.15
A19-A19	Western Bypass Road (Kothankulam) to Kokkirakulam (Near Collectorate)	Collector Street	15	9.8
A20-A20	Vannarapettai Northern ByPass to Thirumalaikolunthupuram	Collector Street	15	9.1



Map 14.13 PROPOSED ROAD NETWORK MAP 2041



A2 –A2 Proposed Western bypass road by highways department - land acquisition and other works are in progress



Road Widening

A total of 30 km roads has been proposed for widening/upgrading in the Tirunelveli Urban area.

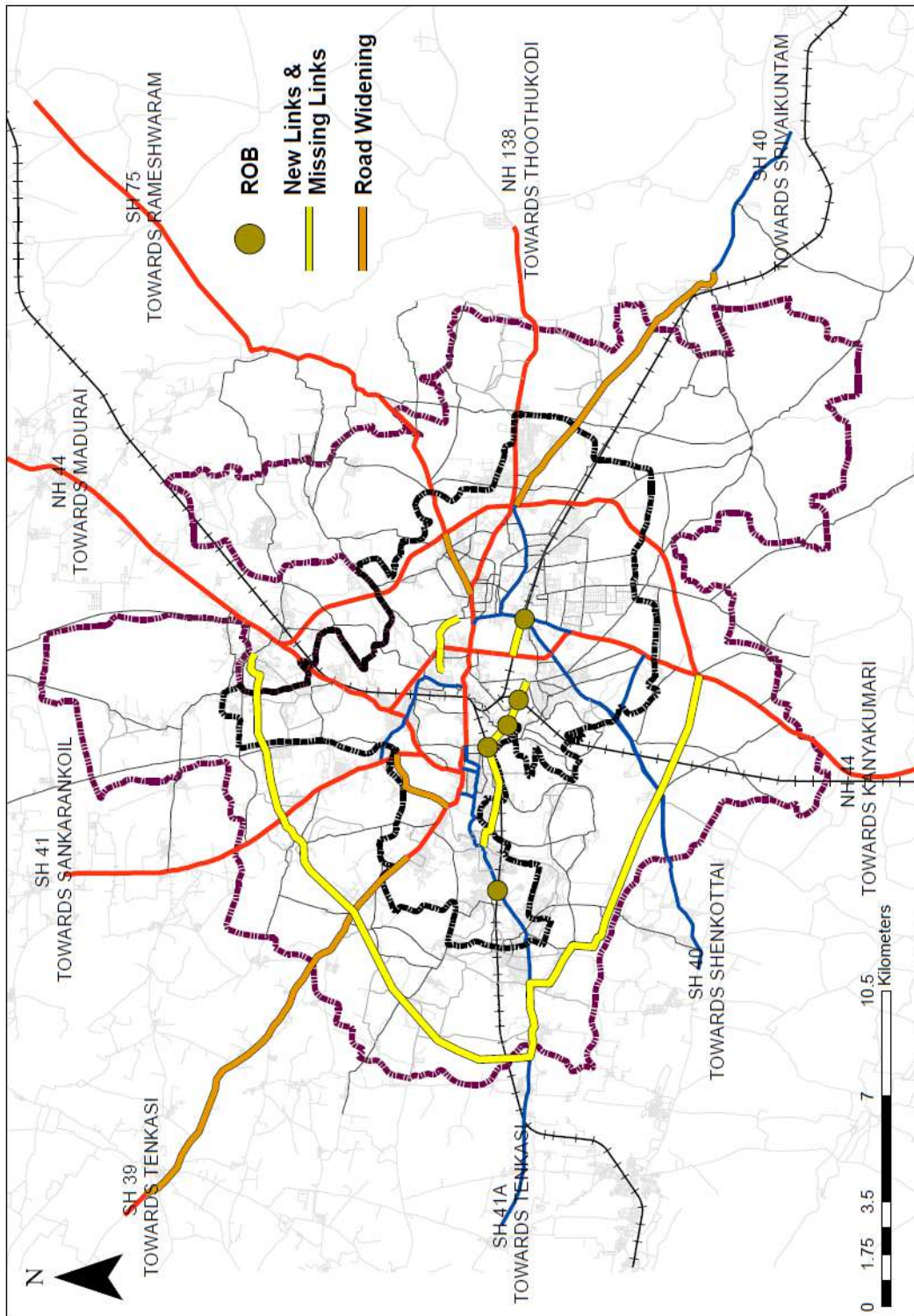


Figure 14.9 ROAD WIDENING PROPOSAL



14.7.5 PUBLIC TRANSPORT STRATEGY

The following proposals are identified in this regard:

- Replacement of the bus fleet.
- Creation of supporting transport infrastructure
- Dedicated high demand public transport corridor
- Guidelines for organizing IPT System

Phased Expansion of City Bus Fleet

The city currently has a fleet of 587 buses (147 private buses and 440 TNSTC city buses) for a population of 14,64,422; which as per the urban fleet specification of 50 buses per lakh population falls short by 145 buses. The CMP proposes a phased fleet expansion to estimate the fleet requirement to meet the horizon period population. The fleet requirement is given in the table below.

Table 14.3 FLEET REQUIREMENT FOR HORIZON YEARS

SUTP	Population	Fleet	Replacement (10% of the Existing Fleet)	Additional Fleet Required (replacement surplus buses required based on population growth)
2022	735285	391	0	0
2027	792477	396	40	46
2032	849668	425	42	71
2042	964051	482	48	105

Creation of Supporting Infrastructure

For the new routes proposed, bus stops have been proposed at every 500 m interval to improve the accessibility for the commuters and, thus, encourage more public to use the bus service. It has also been observed that many of the bus stops in the city are located very close to the intersections which is not ideal for traffic flows. It is hence proposed to shift all such bus stops at least 100 m away from the intersection. Though the city corporation has renovated 60 bus stops within the corporation limits as a part of smart city, the CMP also proposes to provide additional bus stops to improve accessibility.



Table 14.4 ESTIMATED NUMBER OF BUS STOPS REQUIRED IN TIRUNELVELI LPA

Existing Number of Bus Stops in Corporation Area	90
Number of Bus Shelters Required in the LPA area (both sides of the road)	470

Proposed Depots & Terminals

- Periyar Bus Stand should be redeveloped as a multi modal hub.
- Four proposed Regional Bus Terminals should also serve as the depot/terminals for the city buses and regional transport service buses.

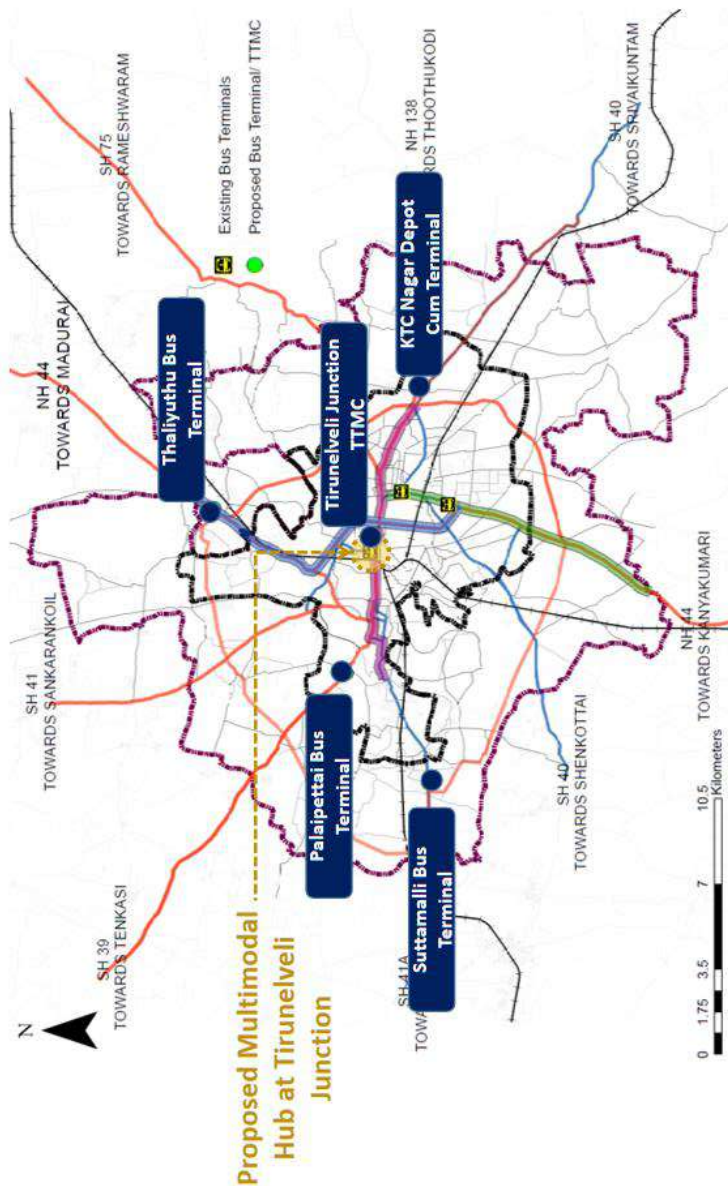


Figure 14.10 LOCATIONS OF SUPPORTING TRANSPORT INFRASTRUCTURE



14.7.6 NON-MOTORIZED TRANSPORT STRATEGY

In Tirunelveli, currently, the city lacks adequate pedestrian infrastructure with a complete absence of cycle tracks. Some of the intersections are devoid of safe pedestrian and NMT crossings, which have an adverse impact on the safety of pedestrians. Keeping this in mind, the following NMT proposals are devised for Tirunelveli LPA:

- Development of footpath facilities
- Pedestrian friendly links
- Development of cycle track facilities

Footpath Network Development

As part of short-term measures, it is proposed to develop about 150 km of footpaths across the city. The proposal is as given in figure 62.

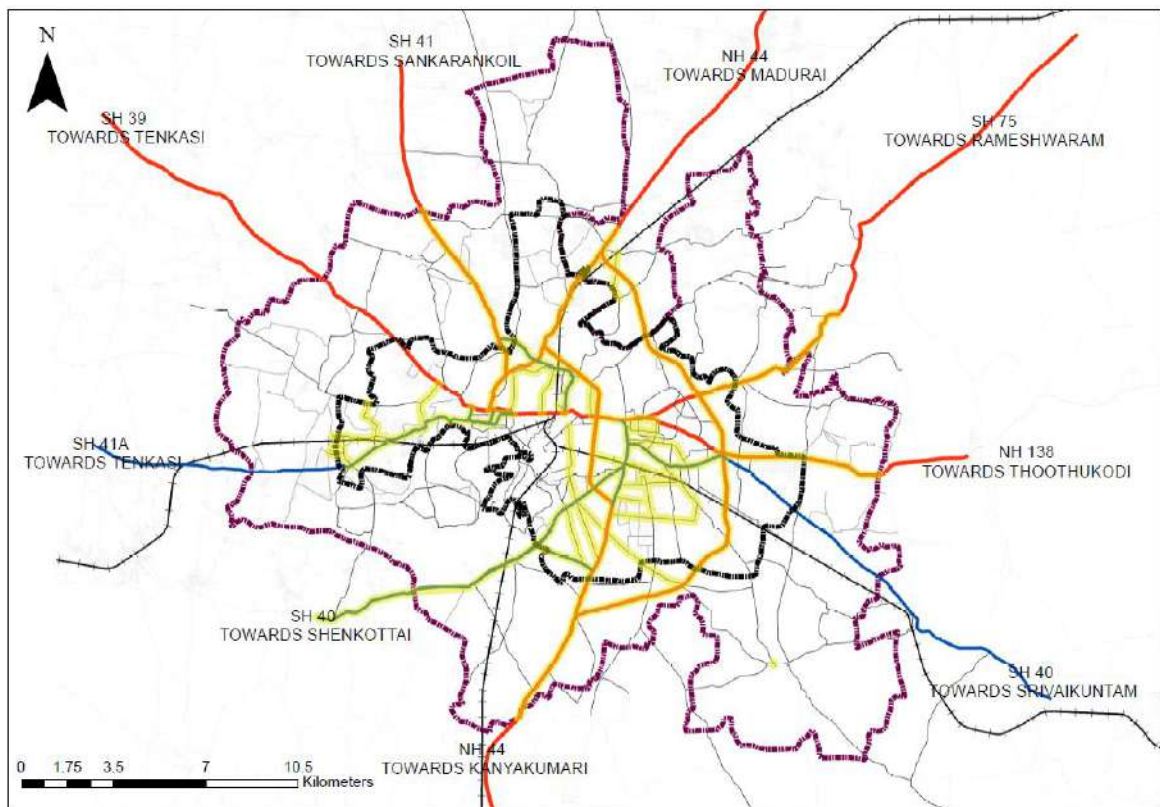


Figure 14.11 PROPOSED FOOTPATH



Development of Cycle Friendly Infrastructure

It is, thus, proposed to have a total of 40 km of cycle track network comprising dedicated and shared tracks, details of which can be seen in Figure 63

Shared cycle lanes – 19 km of shared cycle tracks of which 7.8 km in the second phase and 10.5 km in the third phase

Dedicated cycle tracks – 21 km of segregated cycle tracks of which 18 km in the first phase covering areas other than the city core and 3 km in the second phase.¹

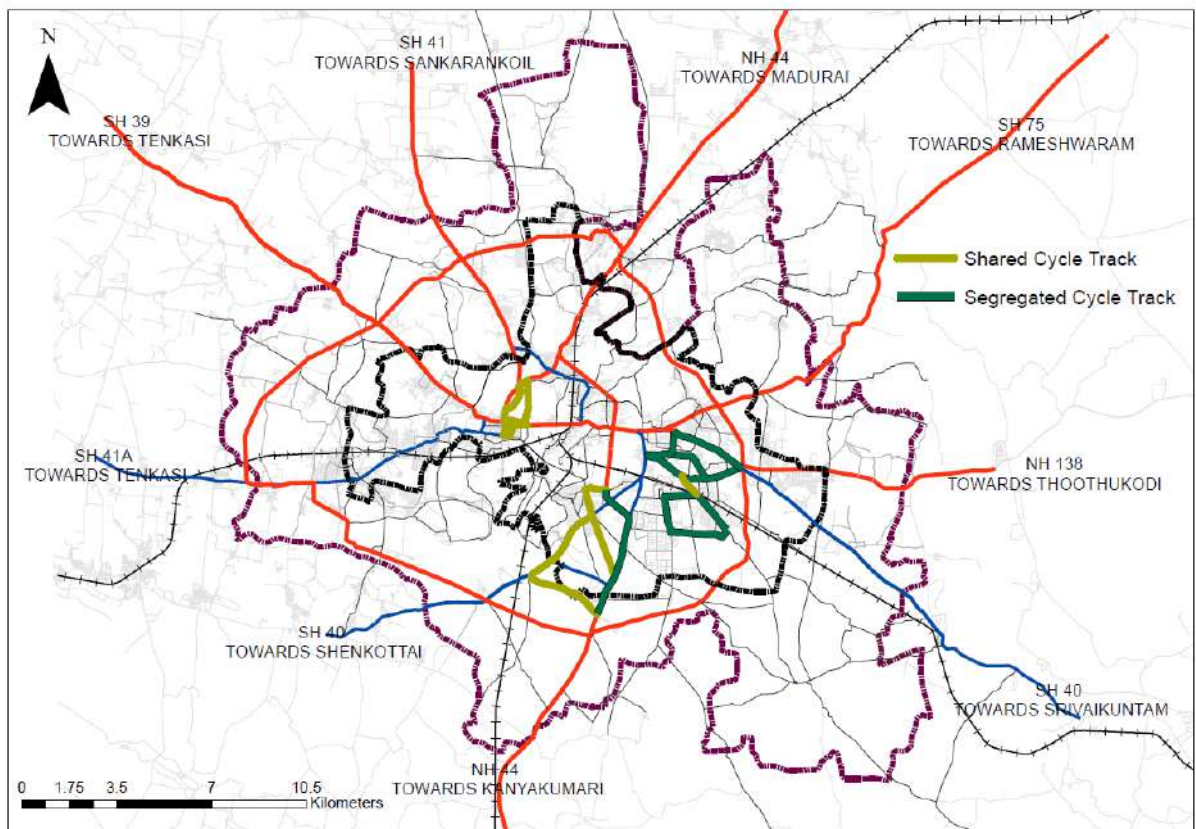


Figure 14.12 PROPOSED CYCLE NETWORK

All Weatherproof Road

TM Road which is the link between Tirunelveli Junction railway station and Tirunelveli Junction bus stand (presently under construction) is another major link which needs to be considered for the pedestrian network improvement. The 120 m stretch of street is currently encroached with on street parking and shops jutting into the footpath.

¹ In addition, all new major roads shall have the provision for dedicated cycle tracks and foot paths, subject to the availability of land



14.7.7 AREA IMPROVEMENT PLANS

Area Improvement Plan for Core City

Traffic issues in some of the areas in Tirunelveli are critical and require a mix of traffic proposals given above. These areas have been categorized under area specific traffic management proposals, and the selected areas are as follows:

- Car Street (Core City, Nellaiappar temple Complex)
- Vannarpettai Junction
- Roti Kadai Mukku

1. Improvement of existing cross-sections

- Reclaiming encroached spaces
- Marked and designated lanes
- Well-defined pedestrian walkways
- Speed Reduction Measures


2. Pedestrian-Friendly roads


3. Traffic Rerouting


4. Parking Facilities


5. Freight Management



-  *One Way Bus Route towards Town Arch*

 *Pedestrian access to the bus boarding points to be developed*

 *Only Two Wheelers and Electric IPT allowed on CAR Street*

 *Alternate bus route towards the buses currently moving towards Car Street (all buses towards Pettai needs to be rerouted towards Anuragini Theatre road)*


 *New Bus Boarding & Alighting Points*

Figure 14.13 CAR STREET AREA BASED MANAGEMENT PROPOSAL



14.7.8 FREIGHT MANAGEMENT STRATEGY

To ensure that the Tirunelveli Road network allows **efficient and reliable handling and distribution of goods vehicles, minimize the impact of congestion** while strengthening the location advantage of the city under the freight management strategy, freight policy, truck terminals, and freight corridor are proposed in accordance with various other studies.

- i. Truck Terminal has been developed along Palai Pettai Link Road as a part of Smart city, to which the existing truck parking along the Tank Bund Road will be shifted soon,
- ii. The CMP also proposes freight consolidation centre in the market near Nainarkulam.
- iii. A freight corridor has been proposed along the link connecting Gangaikondan SIPCOT with Tuticorin Port, which currently experiences heavy freight traffic.

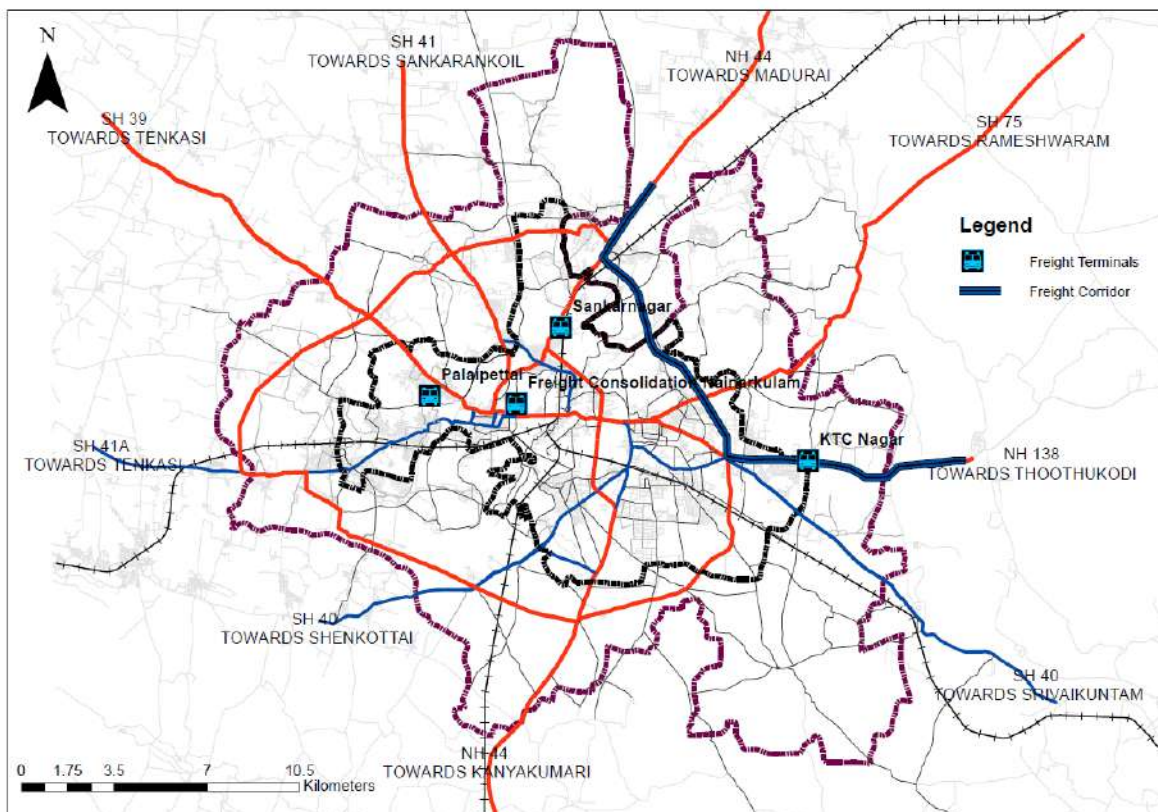


Figure 14.14 EXISTING AND PROPOSED FREIGHT FACILITIES



14.7.9 TRAFFIC MANAGEMENT STRATEGY

In Tirunelveli, the CMP proposes, a total of 13 junctions have been identified for junction improvement² as shown in Table 14.6 & Figure 14.16.

Table 14.5 SHORT-TERM JUNCTION IMPROVEMENT

S.No.	Junction Locations
1	Vannarpettai Junction
2	Town Arch Junction
3	Katta Bomman Statue- SN High Road Junction
4	Reliance Junction
5	Tenkasi- Tirunelveli- Sankarankoil- Tirunelveli Road (S. Street) Junction
6	Trivandrum Road South Bypass Road Junction
7	Thachenellur Junction
8	V C Chatram Junction on NH-44
9	Palai Bus Stand Junction
10	Reddiyarpatti Junction
11	Govt College of Engineering Junction
12	IRT Polytechnic College Junction

As a part of the CMP SN High Road was selected for the corridor improvement proposal which involved measures like geometric corrections and beautification. Based on the high traffic numbers at the important junctions, 5 junctions have been identified for smart signals, all of which have been proposed for Phase I. The list of junctions identified for smart signals in the future years is given below.

Table 14.6 SMART SIGNAL LOCATIONS

S.No.	Junction Locations
1	Town Arch Junction
2	Vanarapettai Junction
3	Railway Station Road- Irattai Paalam Junction
4	NH 44 Tiruchendur Road Junction
5	South Bypass Road Trivandrum Road Junction

² Further, it is suggested that all junctions on new roads or road being widened to be developed as per IRC guidelines or urban road codes

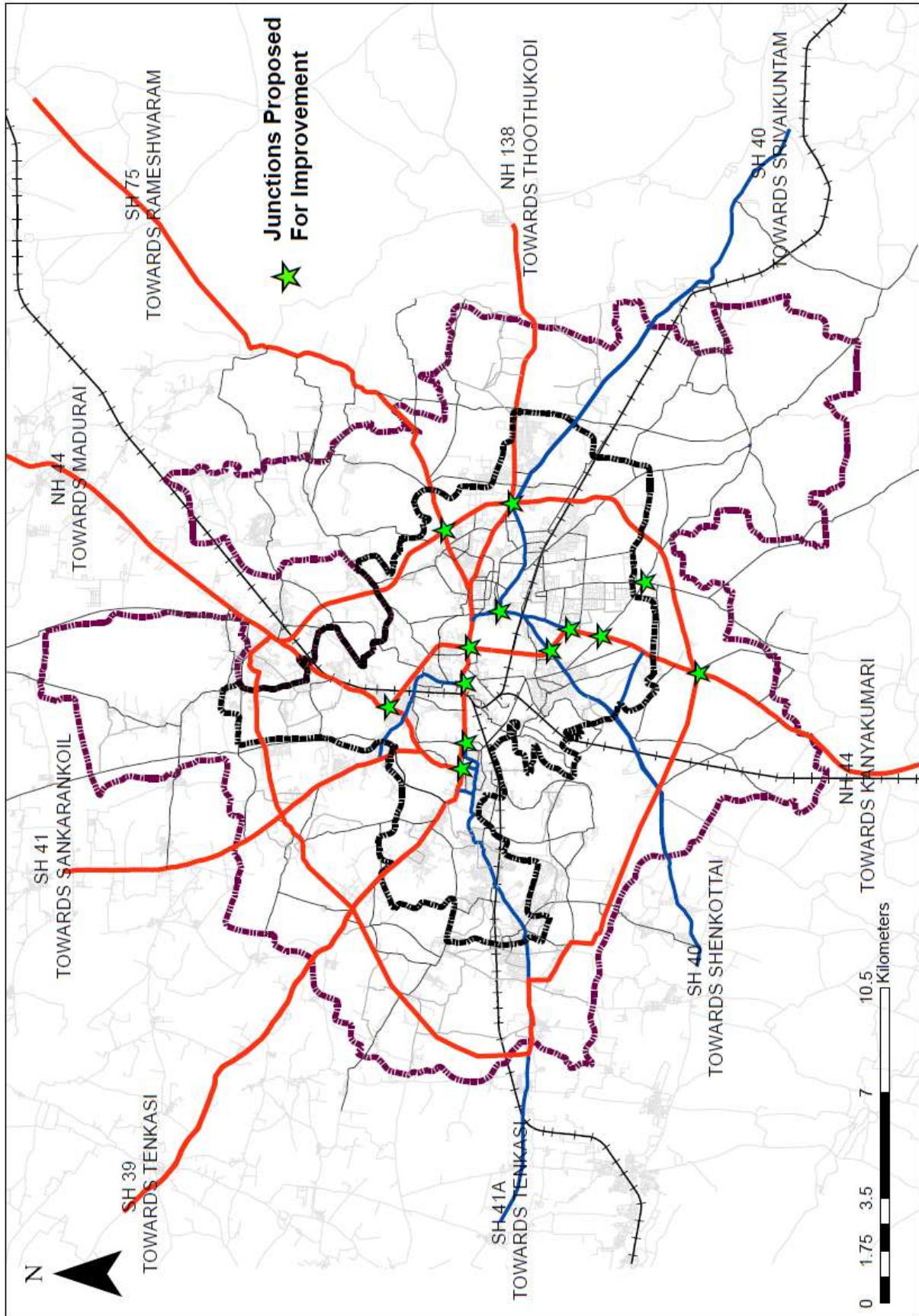


Figure 14.15 JUNCTIONS IDENTIFIED FOR JUNCTION IMPROVEMENT



14.7.10 PARKING MANAGEMENT STRATEGY

From the parking survey, it was observed that all the major roads of the city have high on-street parking. The maximum parking was observed near the Tirunelveli Junction Railway Station and new MGR bus stand.

Based on the parking demand assessed for the horizon year 2042, the following on-street and off-street parking locations are proposed for the city:

- On-street parking management is proposed on all major links in the city especially along: High Ground Road, Trivandrum Road
- Off Street parking is proposed at Suttamalli, Thalayoothu, KTC Nagar and near Nellaiappar Complex.

Also, for the effective utilization of the proposed parking spaces, measures like smart parking, parking pricing and enforcement are also proposed.

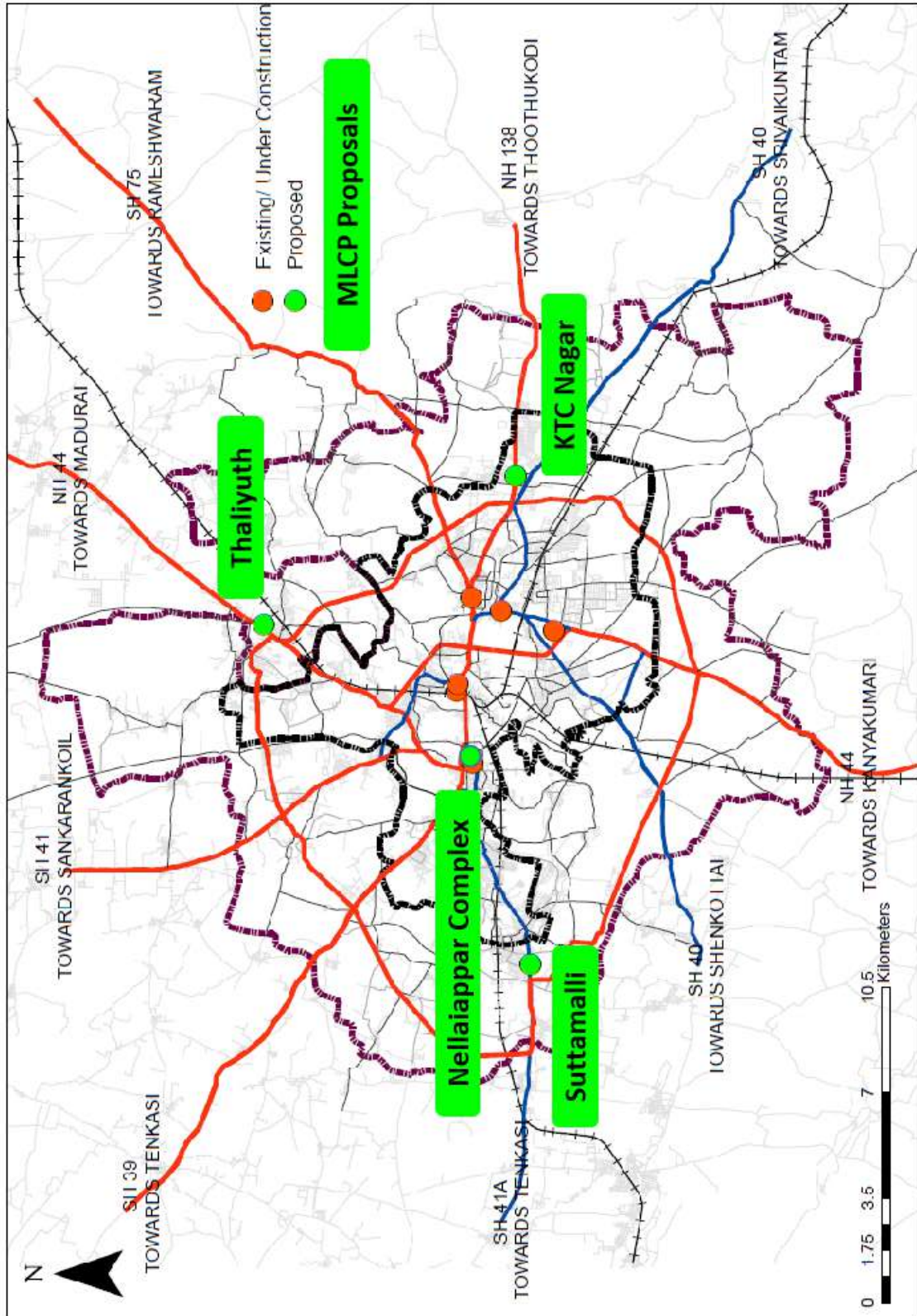


Figure 14.16 PROPOSED OFF STREET PARKING LOCATIONS



14.7.11 DEDICATED HIGH DEMAND PUBLIC TRANSPORT CORRIDOR

It is envisaged that buses will continue to be the major mode of public transport in Tirunelveli, and keeping in mind the increase in population and future growth of the city, High Demand Public Transit Corridors have been identified for the study area covering a span of 39 km. Figure 14.17 and Table 14.7 shows the proposed High Demand Public Transport Route.

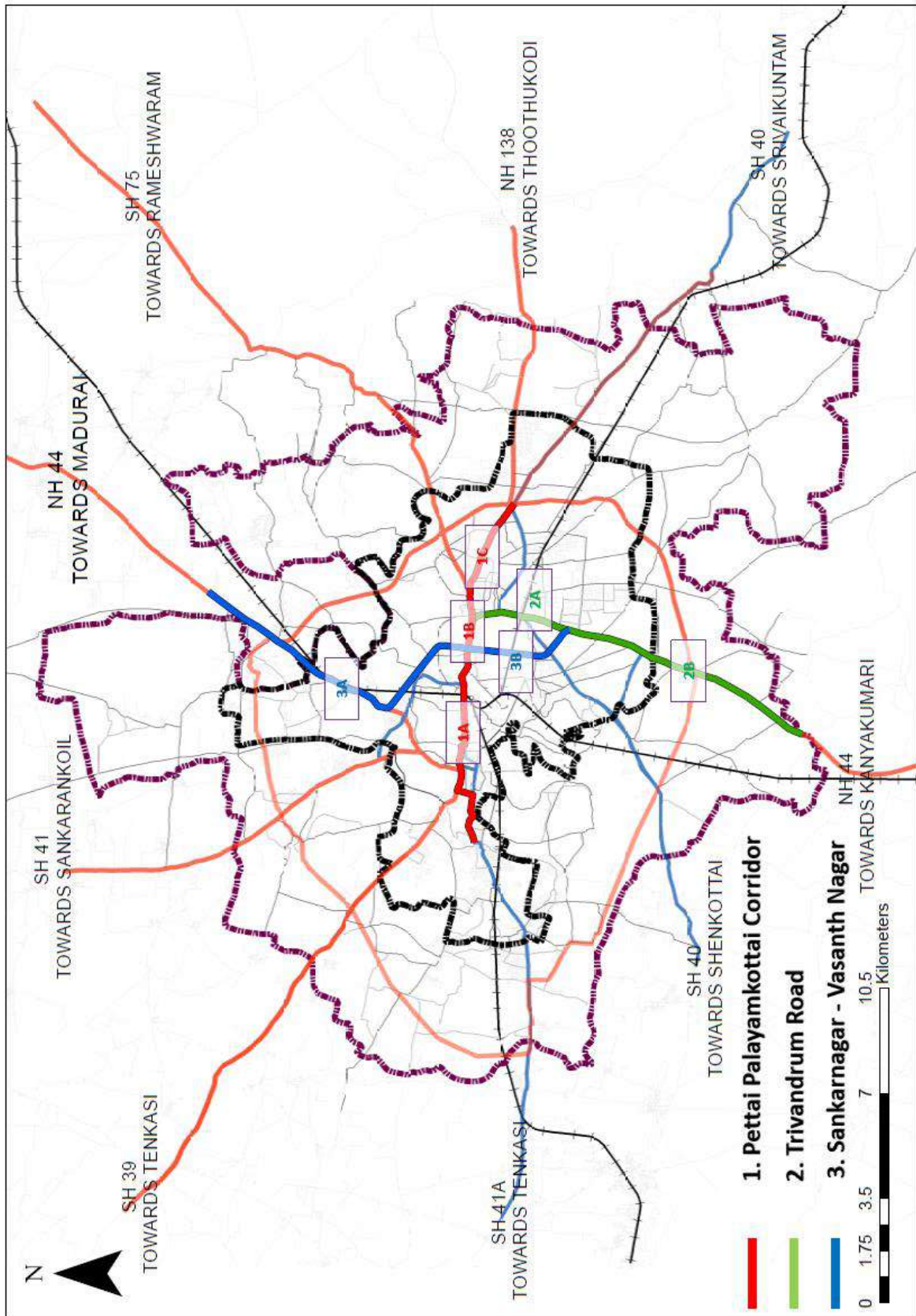
Table 14-7: PROPOSED HIGH DEMAND PUBLIC TRANSPORT CORRIDOR

Corridors Details				SUTP 2032		SUTP 2042		
	Link Name	Link Details	Length	Cross sectional Values	PPHPD	Cross sectional Values	PPHPD	
1	SN High Road (Pettai to Palayamkottai)	1A	Pettai to Vannarpettai via SH 41 A & SN High Road	7.18	5495	2748	9352	4676
		1B	Vannarpettai to Murugankurichi Junction via Trivandrum Road	0.885	8617	4309	13518	6759
		1C	Murugankurichi Junction to KTC Nagar via Tirunelveli Tenkasi Road	4.32	6679	3340	10364	5182
2	Trivandrum Road (Murugankurichi to Punnakudi)	2A	Murugankurichi Junction to Trivandrum South-Bypass Junction via Trivandrum Road	3.43	2672	1336	4552	2276
		2B	Trivandrum Bypass Junction to Punnakudi via Trivandrum Road	8.6	1115	558	3332	1666
3	Bypass (Sankarnagar to Vasanth Nagar)	3A	Sankarnagar to Vannarpettai via North Bypass Road	10.9	4167	2084	7008	3504
		3B	Vannarpettai to Trivandrum South-Bypass Road Junction	3.75	5330	2665	9167	4584

Based on CMRL's DFR, Tirunelveli is gearing up to introduce a bus-based transportation system instead of Metro Neo/ Lite, which will span a total of 39.07km across three specific routes.



Figure 14.17 PROPOSED MASS TRANSIT CORRIDORS



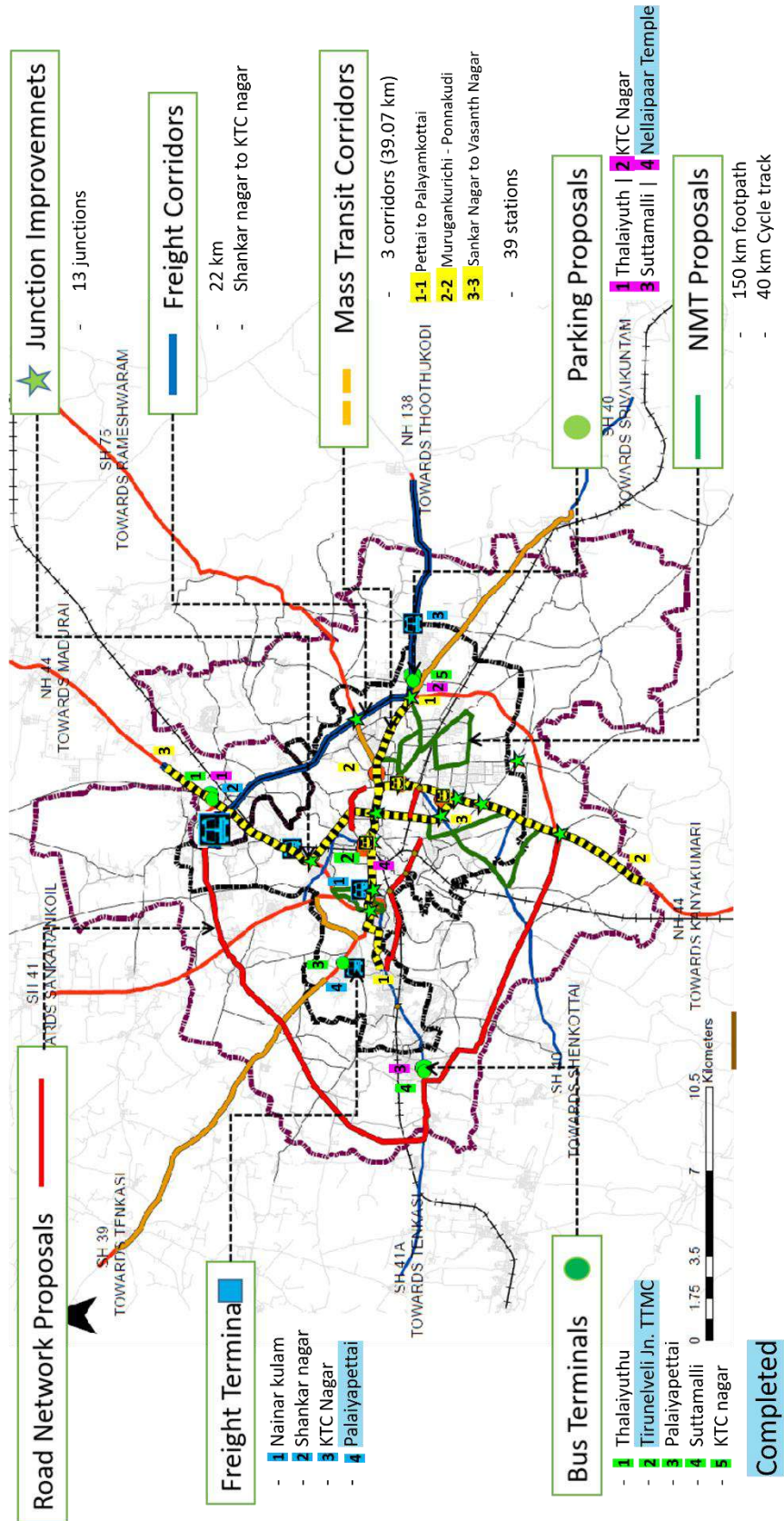


Figure 14.18 SUMMARY OF ALL TRANSPORT PROPOSALS IDENTIFIED FOR TIRUNELVELI



14.8 DENSIFICATION OF LAND USE

Densification of land use along the proposed three Bus Rapid Transit System (BRTS) corridors – SN High Road (lies in the CBD area, connects Tourist places, commercial and residential nodes), Trivandrum Road and By-pass road (connects industrial, commercial and residential nodes) is a key strategy in urban land use planning to promote sustainable development, enhance transit-oriented development (TOD), and improve overall urban efficiency. Here are some strategies for densification along BRTS corridors in land use planning:

14.8.1 TRANSIT-ORIENTED DEVELOPMENT (TOD)

Promote mixed-use developments: Encourage the construction of buildings that integrate residential, commercial, and office spaces along the BRTS corridor. This creates a vibrant environment where people can live, work, and shop in close proximity to transit nodes.

Higher density zoning: Implement zoning regulations that allow for higher-density developments, especially near BRTS stations. This can lead to increased population density and a more efficient use of land.

14.8.2 INFRASTRUCTURE INVESTMENT

Improve infrastructure: Invest in infrastructure improvements along the BRTS corridor to make it more attractive for development. This may include better sidewalks, cycling paths, and green spaces to enhance the overall quality of life in the area.

Upgrade utilities: Ensure that utilities such as water, electricity, and waste management systems are capable of supporting higher-density developments.

14.8.3 INCENTIVES AND REGULATIONS

Provide incentives: Offer developers financial incentives or tax breaks for constructing high-density, transit-oriented projects along the BRTS corridor. This can encourage private investment in the area.

Implement zoning incentives: Establish zoning regulations that encourage developers to build mixed-use, higher-density projects within a specified distance from BRTS stations.



14.8.4 PUBLIC SPACES AND AMENITIES

Create public spaces: Design and develop public spaces along the BRTS corridor, such as parks, plazas, and recreational areas. This contributes to the overall livability of the area and attracts more people to the corridor.

Improve amenities: Ensure that essential amenities such as schools, healthcare facilities, and community centers are easily accessible from the BRTS corridor, promoting a self-sustaining community.

14.8.5 COMMUNITY ENGAGEMENT

Involve the community: Engage with local communities to understand their needs and aspirations for the area. This can help in creating a development plan that is responsive to the community's requirements.

Participatory planning: Foster a participatory approach in the planning process, involving residents, businesses, and other stakeholders to contribute to the decision-making process.

14.8.6 TRANSPORTATION DEMAND MANAGEMENT (TDM)

Promote non-motorized transportation: Encourage walking and cycling by providing dedicated lanes and pedestrian-friendly infrastructure along the BRTS corridor. This can further reduce dependency on private vehicles.

Implement parking policies: Discourage excessive parking and promote the use of public transportation by implementing parking policies that prioritize transit-oriented development.

14.8.7 MONITORING AND EVALUATION

Regularly assess progress: Implement a monitoring and evaluation system to track the progress of densification strategies along the BRTS corridor. This allows for adjustments and improvements based on the evolving needs of the community.

By integrating these strategies, urban planners can create vibrant, sustainable, and transit-friendly communities along BRTS corridors, fostering a more efficient use of land and resources.



14.9 PROPOSALS FOR HERITAGE AND TOURISM

Transforming the Nellaiappar Temple into a Heritage Hub is proposed as a significant cultural and tourism initiative. The Nellaiappar Temple, with its rich historical and architectural significance, can serve as a focal point for preserving and promoting the region's heritage. The proposed Heritage Hub envisions a comprehensive approach to showcase the cultural, artistic, and historical aspects associated with the temple.

Key elements of the Heritage Hub proposal may include:

1. Cultural Exhibitions: Displaying artifacts, sculptures, and artworks related to the temple's history and cultural significance.
2. GIS based mapping of cultural and natural heritage assets.
3. Develop Heritage Management Plan including conservation/ adaptive reuse plans
4. City maps and brochures, Digital Display /Information Board, Wi-Fi-Access Zones, e- vehicle shuttle services
5. Development of Heritage walks, religious trails, Street furniture, shifting of hanging wires, poles and transformers around Nellaiappar Temple – **Car streets**.
6. Development of **Porunai museum at Sivanthipatti** (Ongoing)
7. Development of a Tourism circuit connecting heritage / archaeological sites and other recreational spots.
8. Interactive Learning Spaces: Establishing educational spaces to inform visitors about the temple's architectural marvels, religious practices, and historical context.
9. Digital Interpretation: Implementing digital technologies such as augmented reality or virtual reality to offer immersive experiences and virtual tours of the temple. Conservation and Restoration: Undertaking efforts to conserve and restore the temple's structures, ensuring their longevity and preserving the heritage.
10. Cultural Events and Festivals: Hosting cultural events, festivals, and religious ceremonies to celebrate the temple's traditions and attract tourists.



11. Tourism Promotion: Collaborating with tourism authorities to promote the Nellaiappar Temple as a key heritage destination, attracting both domestic and international tourists.

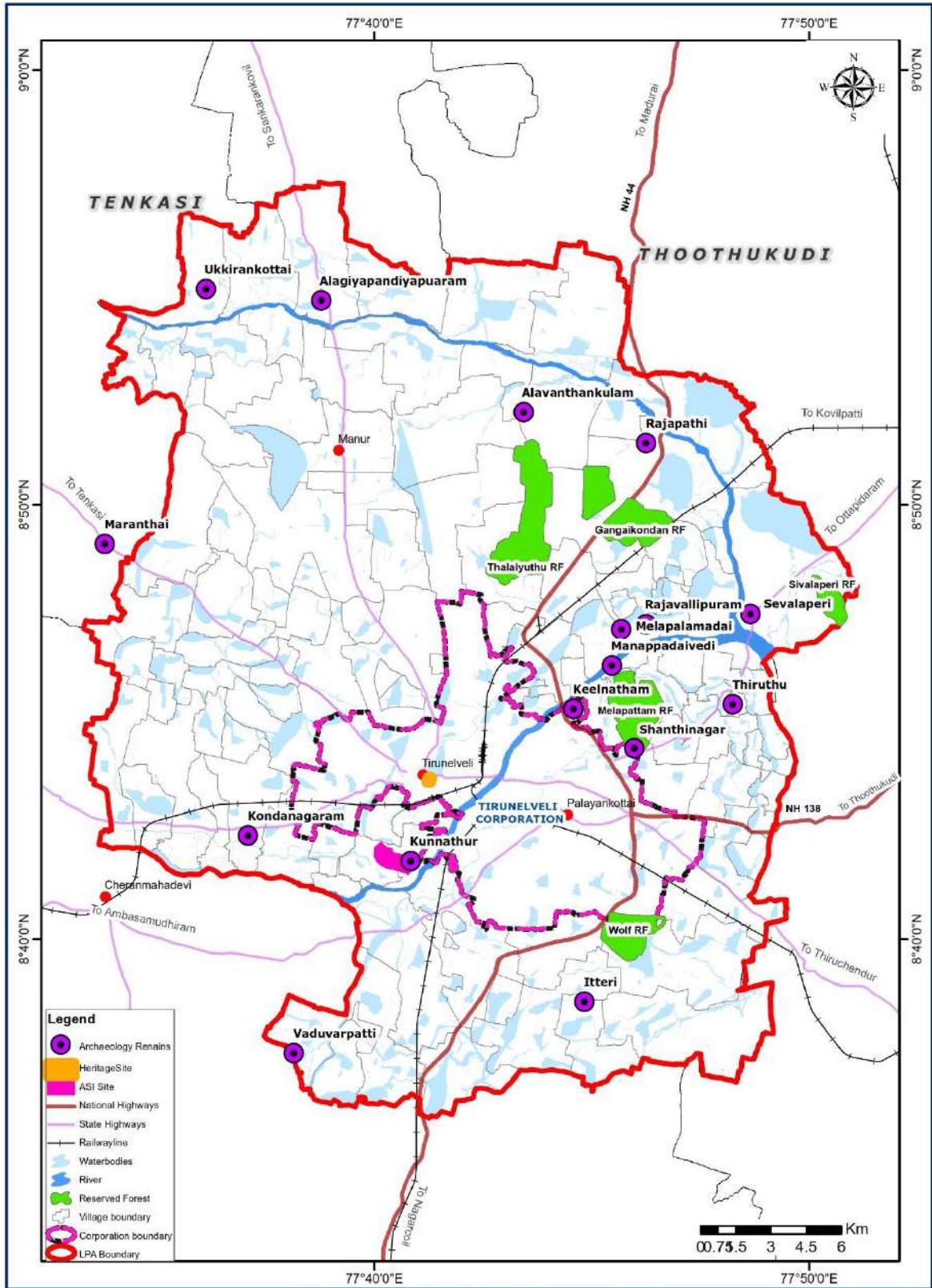
12. Infrastructure Development: Enhancing the surrounding infrastructure to accommodate increased visitor numbers, including parking facilities, pathways, and amenities.

By establishing the Nellaiappar Temple as a Heritage Hub, the goal is to not only preserve its historical value but also to create a dynamic and engaging space that contributes to cultural awareness, tourism, and community development.



Map 14.14 TOURISM AND ARCHAEOLOGICAL MAP

**LOCATION OF ARCHAEOLOGICAL REMAINS & EXCAVATIONS
TIRUNELVELI LOCAL PLANNING AREA**





14.10 DEVELOPMENT OF PERI URBAN AREA

A proposal for the development of peri urban villages situated within LPA is received from the directorate of rural development and Panchayat Raj department.

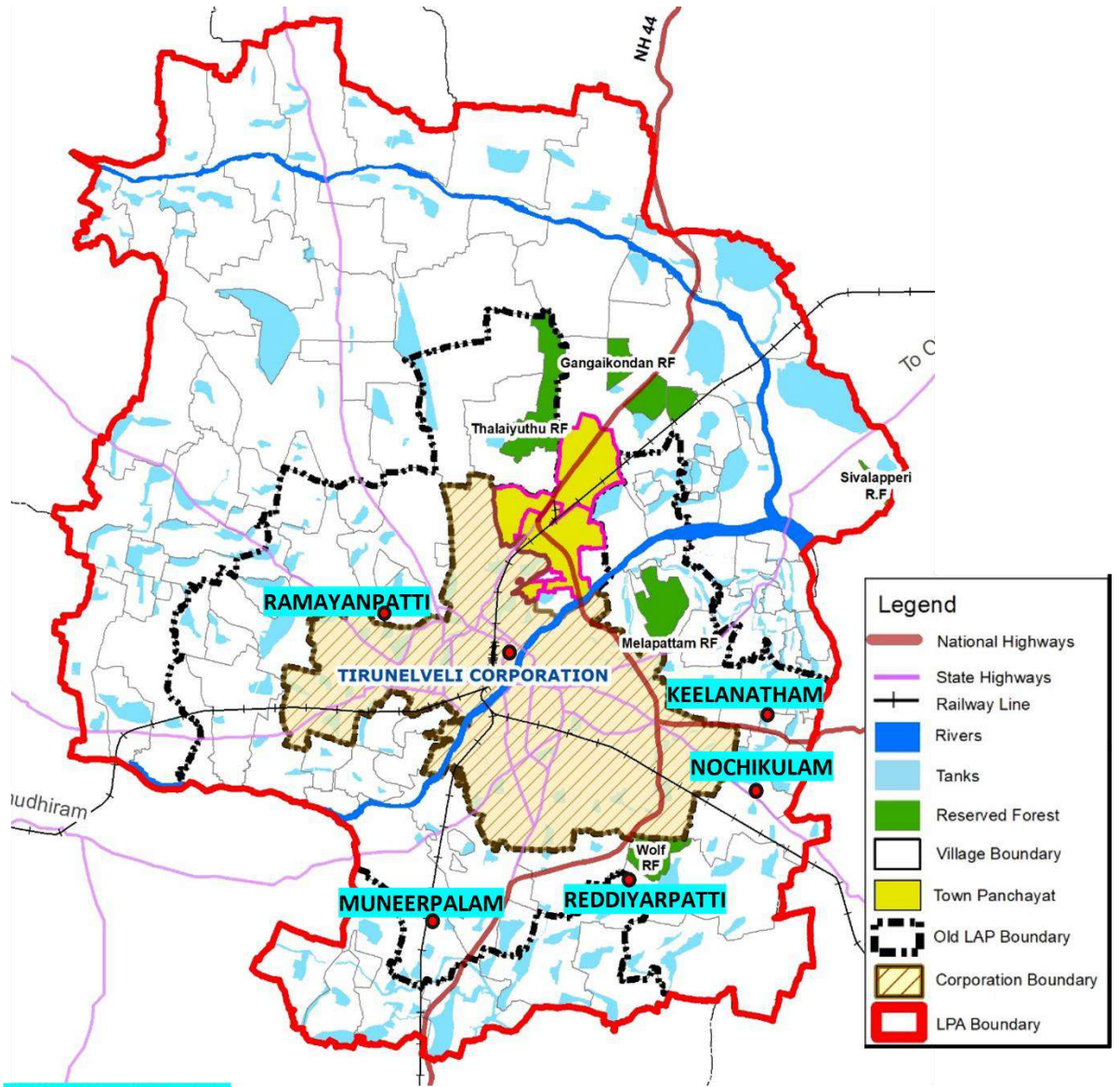
The identified peri urban villages and their distance from city center are

1. Gangaikondan – 20.2KM
2. Nochikulam – 6.8KM
3. Munnerpallam – 9.9KM
4. Keelanatham – 2.5KM
5. Reddiarpatti – 8.0KM

At an estimated cost of **7.82 crores** rupees, the formation of roads and improvement of streets will be undertaken, utilizing the funds available under the head of account of development charges collected in Tirunelveli local planning authority.



Map 14.15 LOCATION OF PERI-URBAN VILLAGES



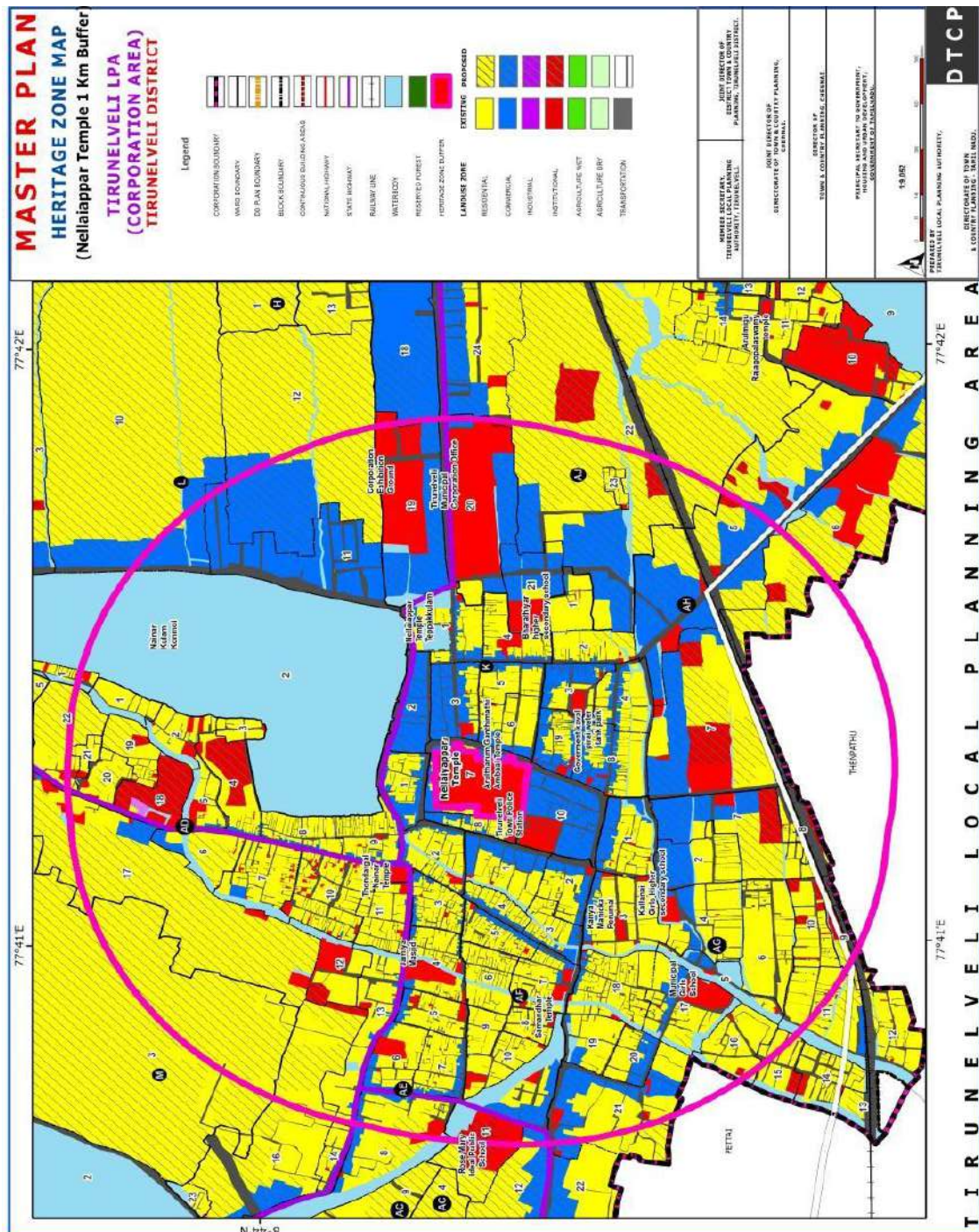
PERI-URBAN VILLAGES - RAMAYANPATTI, KEELANATHAM, MUNERPALAM, NOCHIKULAM, REDDIYARPATTI



14.11 HERITAGE-BUFFER

A buffer of 1 Km is proposed around Nellaiappan Temple to enable protection of Heritage value. As per G.O. Ms.No.22 Municipal administration and water supply department dated 30.01.1997 and the height restriction of proposed buildings to a height of 9m around a Nellaiappan temple.

Map 14.16 BUFFER HUB-AROUND NELLAIAPPAN TEMPLE





14.12 ARCHAEOLOGICAL REMAINS WITHIN TIRUNELVELI LPA

POOLAUDAYAR KALVETTU

This hillock has been called as Marukal Thalai hill and Poovilvudayar hill. 7 stone beds were chiseled and over hung by a great brow of natural rock. The face of the rock has also been chiseled as inscription in Tamil Brahmi characters which may be dated back to 1st Century BCE and mentioned about the maker of stone beds named as “VENKASIBAN.

An inscription belongs to 18th ACE is also found very near to unfinished stone bed on eastern side. This inscription denotes the staying of “Samy Azhagiya Ama”. The other archaeological remains found in the LPA is listed in the below table

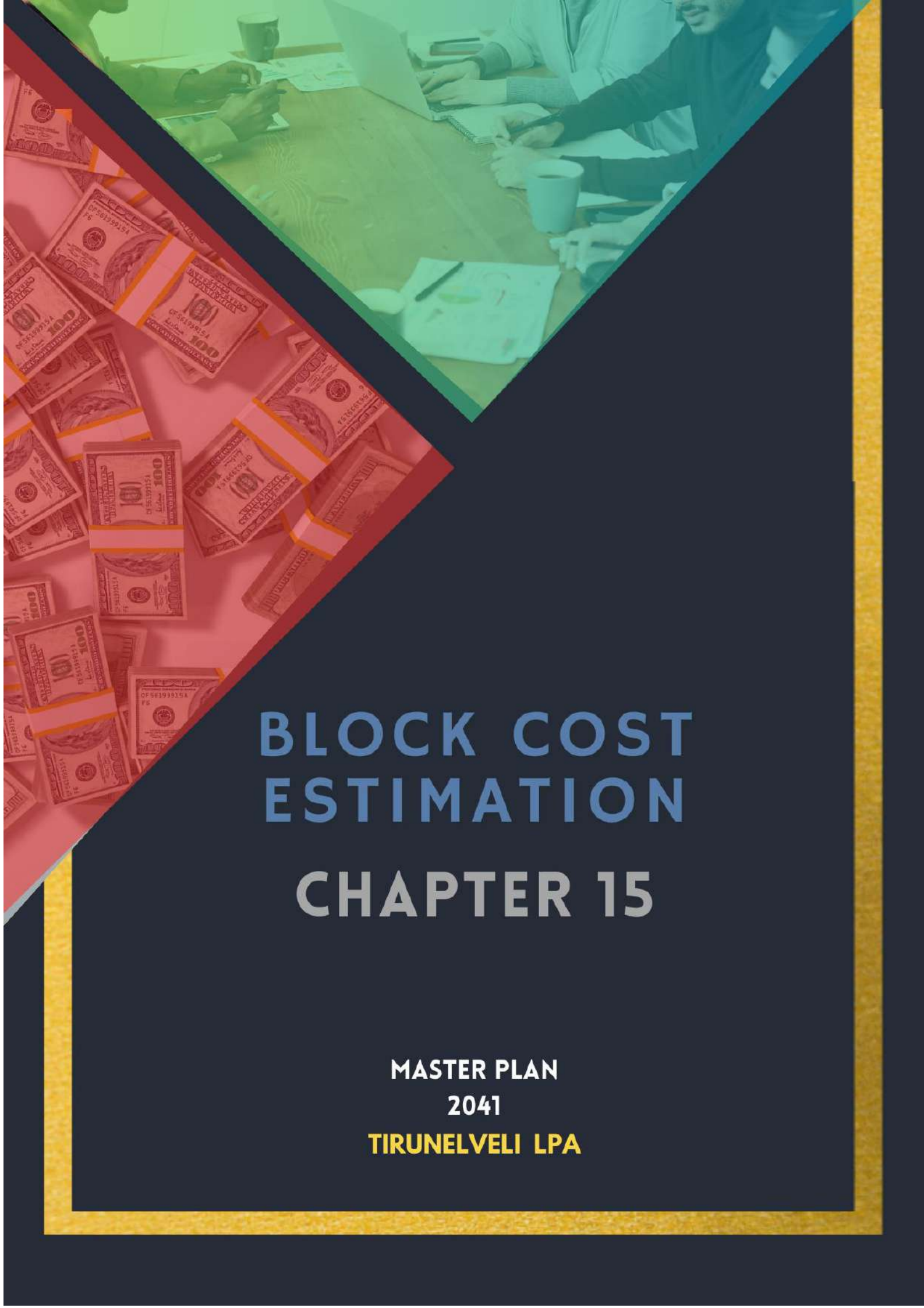
Palayamkottai Taluk

1	Vaduvarpatti village(77*38'09"E 08* 37'23"N) Iron age-Burial Urns, Black and Redware pottery, Blackware pottery
2	Ittadi village(77*45'50"E 08* 38'34"N) Iron age-Burial Urns, Black and Redware pottery, Black ware pottery
3	Manappadaividu village(77*45'28"E 08* 45'18"N) Iron age-Burial Urns, Black and Red pottery, Black pottery
4	Thiruthu village(77*46'06"E 08*45'38"N) Iron age-Archaeological site, Black and Red ware pottery, Bronze Tools
5	Keelanatham village(77*44'35"E 08* 45'18"N) Iron age- Archaeological site , Black and Red pottery, Bronze Tools
6	Kottaikarungulam village(77*74'48"E 08* 34'05"N) Iron age-Burial Urns, Medieval age sivan temple inscriptions (vattezhuthu)
7	Kunnathur village(77*40'50"E 08 41'48"N) Iron age-Burial Urns,Medieval age China ware pottery, Chaina pottery tiles Lower vembanad inscription
8	Shanathi nagar (77*45'59"E 08 44'24") Iron age-Burial Urns, Black and Red ware pottery



Tirunelveli Taluk

1	Kondanagaram village(77*36'31''E 08* 42'31"N) Iron age-Burial Urns, Iron melter
2	Ukkirankottai village(77*35'26''E 08* 54'55"N) Old name-Karavanthapuram Iron age-Burial Urns, Archaeological site Medieval age-samana sculpture, Brick masonry, inscriptions Orkalkuthu nadu, country Black
3	Rajapathy village(77*46'15''E 08* 51'25"N)
4	Rajavallipuram village(77*44'59''E 08*47'15"N) Iron age- Burial Urns,
5	Maranthai village(77*33'48''E 08* 49'06"N) Iron age- Burial Urns, Black and Red pottery, Black pottery
6	Melapalamadai village(77*45'41''E 08*47'08"N) Iron age-Burial Urns, Black and Red pottery, Black pottery
7	Alagiapandiapuram village(77*38'47''E 08* 54'42"N) Iron age-Burial Urns, Black and Red pottery, Black pottery
8	Alavanthankulam village (77*43'26''E 08* 52'08"N) Old stone age-medieval stone age tools
9	Vallavankottai village (77*43'26''E 08* 52'08"N) Mesolithic age-Blade, points ,scrapper, chert and Quartz



BLOCK COST ESTIMATION CHAPTER 15

MASTER PLAN
2041
TIRUNELVELI LPA



15. BLOCK COST ESTIMATION

The previous chapters (Chapters 13 and 14) identify the planning proposals for the LPA. In the following sections the block cost for each sector is listed down. A list of components and their corresponding unit cost has been tabled. Following this a summary of the costs for each category has been arrived at.

Cost Components Excluded:

The following cost components are not included

- Cost of construction in Railways properties and Subways
- Cost of private land for roads is not included, as it is recommended to acquire it through land pooling scheme
- Cost of preparing Water Management Plan, Climate Action Plan, DDPs, Mobility related plans

15.1 BLOCK COST FOR ENVIRONMENT

S. No	Description	Quantity	Development Cost (INR Crores)	Total Cost (INR Crores)
1	Providing 150m buffer on all the sides of Reserved Forest (m)	17,260.00	1.86	1.86
2	Thamirabarani Riverfront development – Construction of road along river bund on both sides(KM)	15.00	75.00	75.00
3	Development of Urban forestry (acre)	2.00	5.00	5.00
4	Integrated Sports complex & Sports village @ Abisekapatti (acre)	28.81	10.00	10.00
5	Proposed district park at Palayanchettikulam near Keelanatham (Hectare)	14.00	5.00	5.00
			92.86	96.86



15.2 BLOCK COST FOR REJUVENATING WATER RESOURCES

S.No.	Description	Quantity	Development Cost (INR Crores)
1	Rejuvenation of water bodies (in sq.km)	121.97	26.47
2	Desilting and deepening all water bodies (Nainar kulam, Veithankulam, Palamadai kulam) (Cu.M)	3371	0.07
3	Rejuvenation of river (Thamirabharani, chithar (in km)	71	15.62
	Total		42.16

15.3 BLOCK COST FOR TOURISM DEVELOPMENT

S.No	Description	Development Cost (INR Crores)	Total Cost (INR Crores)
1	Porunai Museum (in acres) Work under process	55.00	55.00
2	GIS based mapping of cultural and natural heritage assets.	0.05	0.05
3	Develop Heritage Management Plan including conservation/ adaptive reuse plans	0.05	0.05
4	City maps and brochures, Digital Display /Information Board, Wi-Fi-Access Zones, e- vehicle shuttle services	0.15	0.15
5	Development of Heritage walks, religious trails, Street furniture, shifting of hanging wires, poles and transformers around Nellaiappar Temple – Car streets.	0.05	0.05
6	Development of a Tourism circuit connecting heritage / archaeological sites and other recreational spots.	1.00	1.00
7	Smart toilet facilities (nos.)	2.21	2.21
8	Seating area (nos.)	0.05	0.05
9	Drinking water supply facility (nos.)	0.30	0.30
	Total	58.86	58.86



15.4 BLOCK COST FOR SOCIAL INFRASTRUCTURE

S.No.	Description	Land Area	Private Land Cost	Development Cost (INR Crores)	Total Cost (INR Crores)
			(INR Crores)		
1	Fire Station/ Fire Sub Station (in ha)	2		3.00	3.00
2	Parks & green spaces (in Sq.km)	2.1	-	10.00	10.00

15.5 BLOCK COST FOR TRANSPORTATION PROPOSALS

Strategy	Type	Unit	Quantity	Average Unit Rate in Cr	Total Cost in Cr	Total Cost in Cr Phase 1	Total Cost in Cr Phase 2	Total Cost in Cr Phase 3
Public Transport Strategy	Fleet Replacement	No	352	1.75	616	151	198	268
	Bus Shelter Numbers	No	470	0.12	57.6	0	28.8	28.8
	Bus Terminal/ Depot	No	5	11.82	65	10.7	27.2	27.2
	Mass Transit System	Km	39	50	1953	0	501	1452
Total					2692	161	754	1776

Strategy	Type	Unit	Quantity in Sqm	Average Unit Rate in Rs	Total Cost in Cr	Total Cost in Cr Phase 1	Total Cost in Cr Phase 2	Total Cost in Cr Phase 3
NMT Strategy	Footpath Proposal	sqm	532800	1,811.00	96	96		
	Pedestrian Crossing Infrastructure	sqm	33979	2,663	9	9		
	Bicycle Tracks	sqm	30000	1,821	5	1	4	
	Pedestrian Priority Streets/ All-weather walkway	km	0.8	1,06,50,150	1	1		
	Total					112	108	4



Strategy	No	Type	Unit	Quantity in Sqm	Average Unit Rate in Rs	Total Cost of Parking Management Strategy in Crores	Total Cost in Cr Phase 1	Total Cost in Cr Phase 2	Total Cost in Cr Phase 3
Traffic Management	1	Junction Improvement	No	18	475000	8.4	8.4	0	0
	2	Corridor Improvement	sqm	37120	1084.67	12.79	12.79	0	0
	3	Smart Signals	No	5	532508	0.266	0.266	0	0
	4	Road Pavement Marking	sqm	112.5	151	0	0	0	0
	5	Signage	No	1200	3906	0.47	0.47	0	0
		Total				22	22	0	0

Strategy	Type	Unit	Quantity (sqm)	Unit Rate (per sqm)	Total Cost of Parking Management Strategy in Crores	Total Cost in Cr Phase 1	Total Cost in Cr Phase 2	Total Cost in Cr Phase 3
Parking Management	Off Street (4 locations)	SQM	6879.6	5325	3.66	0.43	2.15	1.08

15.6 BLOCK COST FOR DEVELOPING INFRASTRUCTURE PROPOSALS – WATER SUPPLY

S.No.	Description	Quantity	Cost
			(INR Crores)
1	Over Head Tank (OHT) (in MLD)	38.54 MLD(Corporation) + 19.0 MLD (Rest of LPA)	108.72
2	Installation of water Meters (in nos.)	1,63,872 HHs (Corporation) + 87,588 HHs (Rest of LPA)	150.88
3	Drinking Water Treatment System (in ML)	38.54 MLD(Corporation) + 19.0 MLD (Rest of LPA)	90.6
	Total		350.2



15.7 BLOCK COST FOR ECONOMIC SECTOR

S. No	Description	Quantity	Development Cost (INR Crore)	Total Cost (INR Crores)
1	Rural Skill Development and training center at Melapalayam-plan approved	1	1.10	1.10
2	Construction of integrated market complex at an extent of 3.5 Hectare in Muneerpallam.	3.5	5.00	5.00
3	Designated street vendor space near Nainar kulam, Vannarapettai junction		2.00	2.00
4	Shifting of wholesale grain market from the west and north car street area (area vacated will be used for retail trade)	Nil	2.00	2.00
5	Expansion of industrial areas at Gangaikondan (sq.km)	66.4	300.00	300.00
6	Carbon neutral city		100.00	100.00
	Total		410.10	410.10

15.8 BLOCK COST FOR DEVELOPING INFRASTRUCTURE PROPOSALS – ELECTRICITY

Description	Quantity	Land Cost	Development Cost (INR Crores)	Total Cost (INR Crores)
		(INR Crores)		
Electric substation – 110/11KV (7 nos.) (in ha)	2.8		98.00	98.00
Underground Electric Lines (proposed CBD area) (km)	43	Nil	107.50	107.50
LED solar Street Lights with panel (for exiting & proposed roads) (in nos.)	3,00,000	Nil	150.00	150.00
Electric Smart meters (in nos.)	2,51,460	Nil	213.74	213.74
Total		-	569.24	569.24



15.9 BLOCK COST FOR DEVELOPING INFRASTRUCTURE PROPOSALS - COMMUNICATION

S.No.	Description	Quantity	Development Cost (INR Crores)
1	Optical Fibre Cable Network (in m)	43000	0.86
	Total		0.86

15.10 SUMMARY OF BLOCK COSTS

Table 15.1 SUMMARY OF BLOCK COSTS

S.No.	Description	Development Cost (INR Crores)	Total Cost (INR Crores)
1	Social Infrastructure & other Amenities	13.00	13.00
2	Transport Infrastructure	5,024.30	5,024.30
3	Water Supply	350.20	350.20
4	Recycled water network	9.20	9.20
5	Sewerage	475.89	475.89
6	Storm Water Drainage and RWH	1,241.82	1,241.82
7	Solid Waste Management	6.30	6.30
8	Electricity	569.24	569.24
9	Communications	0.86	0.86
10	Environmental	133.86	133.86
11	Water Resources Rejuvenation	42.16	42.16
12	Tourism	16.86	16.86
13	Economic Sector	410.10	410.10
	TOTAL	8,293.80	8,293.80



15.11 PHASING COST - DETAILED

S.No.	Sector-wise Items	FY 24-28 (INR Crores)	FY 28-33 (INR Crores)	FY 33-38 (INR Crores)	FY 38-41 (INR Crores)	Sub Total (INR Crores)
1	Environment					
1.1	Development of Urban forestry	5.00				5.00
1.2	Providing 150m buffer on all the sides of Reserved Forest	1.86				1.86
1.3	Proposed district park at Palayanchettikulam near Keelanatham		5.00			5.00
1.4	Integrated Sports complex & Sports village @ Abisekapatti	2.00	3.00			5.00
1.5	Thamirabharani Riverfront development -Construction of road along river bund on both sides				75.00	75.00
	Sub total	53.86	8.00	-	75.00	92.86
2	Water Resources					
2.1	Rejuvenation of water bodies (in sq.km)	5.00	5.00	10.00	6.47	26.47
2.2	Desilting and deepening all water bodies (Nainar kulam, Veithankulam, Palamadai kulam) (Cu.M)	0.07	-			0.07
2.3	Rejuvenation of river (Thamirabharani, chittaru (in km)	5.00	5.62	5.00		15.62
	Sub total	10.07	10.62	15.00	6.47	42.16
3	Heritage and Tourism					
3.1	Porunai Museum		13.00			13.00
3.2	GIS based mapping of cultural and natural heritage assets.	0.05				0.05
3.3	Develop Heritage Management Plan including conservation/ adaptive reuse plans	0.05				0.05
3.4	City maps and brochures, Digital Display /Information Board, Wi-Fi-Access Zones, e- vehicle shuttle services	0.15				0.15
3.5	Development of Heritage walks, religious trails, Street furniture, shifting of hanging wires, poles and transformers around Nellaiappar Temple - Car streets.		0.05			0.05



3.6	Development of a Tourism circuit connecting heritage / archaeological sites and other recreational spots.	0.05	0.48	0.47		1.00
3.7	Smart toilet facilities (nos.)	1.00	1.00	0.21		2.21
3.8	Seating area (nos.)	0.05				0.05
3.9	Drinking water supply facility	0.30				0.30
	Sub total	1.65	14.53	0.68	-	16.86
4	Social Infrastructure, Recreation and Public Amenities					
4.1	Fire Station/ Fire Sub Station	1.00	1.00	1.00		3.00
4.2	Parks & green spaces		2.00	2.00	6.00	10.00
	Sub total	1.00	3.00	3.00	6.00	13.00
5	Mobility & Transportation					
5.1	Ring road		189.10			189.10
5.2	Missing Link		12.90	20.00	22.20	55.10
5.3	Widening		169.30	12.90		182.20
5.4	Fleet Replacement	151.00	198.00	268.00		617.00
5.5	Bus Shelter Numbers		28.80	28.80		57.60
5.6	Bus Terminal/ Depot	10.70	27.20	27.20		65.10
5.7	Mass Transit System			501.00	1,452.00	1,953.00
5.8	Footpath Proposal	96.00				96.00
5.9	Pedestrian Crossing Infrastructure	9.00				9.00
5.10	Bicycle Tracks	1.00	4.00			5.00
5.11	Pedestrian Priority Streets/ All-weather walkway	1.00				1.00
5.12	Block Cost- Freight Management Strategy			5.00	16.00	21.00
5.13	Junction Improvement	8.40				8.40
5.14	Corridor Improvement	12.79				12.79
5.15	Smart Signals	0.27				0.27



5.16	Signage	0.47	0.47			0.94
5.17	Off Street (4 locations)	0.43	2.15	1.08		3.66
5.18	Build the new arterial road (52 km)				260.00	260.00
5.19	Build sub-arterial roads (166.96 km)			200.00	134.00	334.00
5.20	Build collector street (39.3 km)	100.00	100.00	100.00	217.30	517.30
5.21	Railway overbridges (16 nos.)	100.00	100.00	120.00		320.00
5.22	New roads and upgrading old roads				100.00	100.00
5.23	Build slow streets (41 km)	4.00	10.00	10.00	26.00	50.00
	Sub total	495.06	841.92	1,293.98	2,227.50	5,024.30
6	Physical Infrastructure - Water Supply					
6.1	Over Head Tank (OHT) (in MLD)	25.00	25.00	25.00	33.72	108.72
6.2	Installation of water Meters (in nos.)	37.72	37.72	37.72	37.72	150.88
6.3	Drinking Water Treatment System (in ML)	20.00	20.00	20.00	30.60	90.60
	Sub total	82.72	82.72	82.72	102.04	350.20
7	Physical Infrastructure - Recycled Water Supply and Sewerage					
7.1	Network length for supplying recycled water	2.00	2.00	2.00	2.00	8.00
7.2	Network to discharge treated water into the nearest waterbodies - Decentralised systems	0.20	0.80	0.20		1.20
	Sub total	2.20	2.80	2.20	2.00	9.20
8	Physical Infrastructure - Solid Waste Management					
8.1	MCC proposed in urban area	2.00	2.00	2.00		6.00
8.2	MCC proposed in rest of LPA	0.30				0.30
	Sub total	2.30	2.00	2.00	-	6.30
9	Physical Infrastructure - Storm Water Drain & Rain Water Harvesting					
9.1	Storm Water Collection Drain Network (in m)	200.00	200.00	200.00	563.01	1,163.01
9.2	Trash Guards Installation in Storm Water Drain (in nos.)	5.00	5.00	5.00	5.20	20.20
9.3	Covering existing open drains (in m)	9.44	9.44	9.44	9.44	37.76



9.4	Rainwater harvesting system along with grit chamber (in nos.)	5.00	5.00	5.00	5.52	20.52
	Sub total	219.44	219.44	219.44	583.17	1,241.49
10	Physical Infrastructure - Electricity					
10.1	Electric substation - 110/11KV (7 nos.) (in ha)	5.00	20.00	20.00	53.00	98.00
10.2	Underground Electric Lines (proposed CBD area) (km)	20.00	20.00	20.00	47.50	107.50
10.3	LED solar Street Lights with panel(for exiting & proposed roads) (in nos.)	20.00	35.00	35.00	60.00	150.00
	Sub total	45.00	75.00	75.00	160.50	355.50
11	Physical Infrastructure - Communication Infrastructure					
11.1	Optical Fibre Cable Network (in m)	0.40	0.46			0.86
	Sub total	0.40	0.46	-	-	0.86
12	Economy					
12.1	Skill Development center at Melapalayam	1.10				1.10
12.2	Construction of integrated market complex at an extend of 3.5 Hectare in Muneerpallam.	5.00				5.00
12.3	Designated street vendor space near Nainar kulam, Vannarapettai junction				2.00	2.00
12.4	Shifting of wholesale grain market from the west and north car street area (area vacated will be used for retails trade)				2.00	2.00
12.5	Expansion of industrial areas at Gangaikondan (sq.km)				300.00	300.00
12.6	Carbon neutral city				100.00	100.00
	Sub total	6.10	-	-	404.00	410.10



15.12 PHASING COST – SECTOR WISE

S.No.	Sectors	FY 23-28 (INR Crores)	FY 28-33 (INR Crores)	FY 33-38 (INR Crores)	FY 38-43 (INR Crores)	Sub Total (INR Crores)
1	Environment	4.86	8.00	-	75.00	87.86
2	Water Resources	10.07	10.62	15.00	6.47	42.16
3	Heritage and Tourism	1.65	14.53	0.68	-	16.86
4	Social Infrastructure, Recreation and Public Amenities	1.00	3.00	3.00	6.00	13.00
5	Mobility & Transportation	495.06	841.92	1,293.98	2,227.50	5,024.30
6	Physical Infrastructure - Water Supply	82.72	82.72	82.72	102.04	350.20
7	Physical Infrastructure - Recycled Water Supply and Sewerage	2.20	2.80	2.20	2.00	9.20
8	Physical Infrastructure - Solid Waste Management	2.30	2.00	2.00	-	6.30
9	Physical Infrastructure - Storm Water Drain & Rain Water Harvesting	219.44	219.44	219.44	583.17	1,241.49
10	Physical Infrastructure - Electricity	45.00	75.00	75.00	160.50	355.50
11	Physical Infrastructure - Communication Infrastructure	0.40	0.46	-	-	0.86
12	Economy	6.10	-	-	404.00	410.10
	Total	870.80	1,260.49	1,694.02	3,566.68	7,557.83

**15.13 PHASING COST SUMMARY – 5 YEARS**

S.No.	Phasing Years	Sub-Total (INR Crores)
1	FY 23-28	870.80
2	FY 28-33	1,260.49
3	FY 33-38	1,694.02
4	FY 38-43	3,566.68
	TOTAL	7,557.83



15.14 IMPLEMENTATION AGENCIES OF THE PROPOSALS

S.No.	Sector-wise Items	Nodal Agencies	Other Agencies	PPP Possibility
1	Environment			
1.1	Development of Urban forestry	Department of Forest, Tirunelveli Municipal corporation	Local Planning authority	No
1.2	Providing 150m buffer on all the sides of Reserved Forest	Department of Forest	Nil	No
1.3	Proposed district park at Palayanchettikulam near Keelanatham	Department of Horticulture and Plantation crops	Department of Forest	Yes
1.4	Integrated Sports complex & Sports village @ Abisekapatti	Youth Welfare and Sports Development Department	Nil	Yes
1.5	Tamirabarani Riverfront development –Construction of road along river bund on both sides	Department of Highways	Local bodies, Local Planning authority	Yes
2	Water Resources			
2.1	Rejuvenation of water bodies (in sq.km)	Water Resources Department	Ground Water Circle (PWD), Central Ground Water Board (CGWB), Central Water Commission (CWC), Indian Metrological Department	Yes
2.2	Desilting and deepening all water bodies (Nainar kulam, Veithankulam, Palamadai kulam) (Cu.M)	Water Resources Department	HR&CE, Tirunelveli Municipal Corporation, Rural Development and Panchayat Raj Department	Yes
2.3	Rejuvenation of river (Thamirabarani, chittaru (in km)	Water Resources Department	HR&CE, Tirunelveli Municipal Corporation, Rural Development and Panchayat Raj Department	Yes



3	Heritage and Tourism			
3.1	Porunai Museum	Department of Museum	Nil	Yes
3.2	GIS based mapping of cultural and natural heritage assets.	Department of Art & Culture	TNGIS	Yes
3.3	Develop Heritage Management Plan including conservation/ adaptive reuse plans	Department of Art & Culture	Department of Tourism	Yes
3.4	City maps and brochures, Digital Display /Information Board, Wi-Fi-Access Zones, e- vehicle shuttle services	Information and Public Relations Department	Nil	Yes
3.5	Development of Heritage walks, religious trails, Street furniture, shifting of hanging wires, poles and transformers around Nellaiappar Temple – Car streets.	Department of Art & Culture	Department of Tourism,HR&CE	Yes
3.6	Development of a Tourism circuit connecting heritage / archaeological sites and other recreational spots.	Department of Tourism	Department of Art & Culture	Yes
3.7	Smart toilet facilities	Commissionerate of Municipal Administration	Local bodies,	Yes
3.8	Seating area	Commissionerate of Municipal Administration	Local bodies,	Yes
3.9	Drinking water supply facility	Municipal Administration and Water Supply Department	Local bodies,	Yes
4	Social Infrastructure, Recreation and Public Amenities			
4.1	Fire Station/ Fire Sub Station	Tamilnadu Fire & Rescue Services	Nil	No
4.2	Parks & green spaces	Department of Horticulture and Plantation crops	Local bodies,	Yes
5	Mobility & Transportation			
5.1	Ring road	National Highways Authority of India, State Highways	Nil	Yes
5.2	Missing Link	State Highways	local bodies	Yes
5.3	Widening	State Highways	local bodies	Yes



5.4	Fleet Replacement	Department of Transportation	Nil	No
5.5	Bus Shelter Numbers	Department of Transportation	Nil	No
5.6	Bus Terminal/ Depot	Department of Transportation	Nil	Yes
5.7	Footpath Proposal	State Highways	local bodies	No
5.8	Pedestrian Crossing Infrastructure	State Highways	Nil	No
5.9	Bicycle Tracks	State Highways	Nil	No
5.11	Junction Improvement	State Highways	Nil	No
5.12	Corridor Improvement	State Highways	Nil	No
5.13	Road Pavement Marking	State Highways	Nil	No
5.15	Build the new arterial road (52 km)	National Highways Authority of India, State Highways	Nil	No
5.16	Build sub-arterial roads (166.96 km)	National Highways Authority of India, State Highways	Nil	No
5.17	Build collector street (39.3 km)	National Highways Authority of India, State Highways	Nil	No
5.18	Railway overbridges (16 nos.)	National Highways Authority of India, State Highways	Nil	No
5.19	New roads and upgrading old roads	National Highways Authority of India, State Highways	Nil	No



6	Physical Infrastructure - Water Supply			
6.1	Over Head Tank (OHT) (in MLD)	Municipal Administration and Water Supply Department	Public Works Department	Yes
6.2	Distribution Network for Non-Municipal area (in m)	Municipal Administration and Water Supply Department	local bodies	Yes
6.3	Installation of Leak Detection system to supply network (in nos.)	Municipal Administration and Water Supply Department	local bodies	Yes
7	Physical Infrastructure - Recycled Water Supply and Sewerage			
7.1	Network length for supplying recycled water	TWAD (Tamilnadu Water Supply and Drainage Board)	Nil	Yes
7.2	Network to discharge treated water into the nearest waterbodies - Decentralised systems	TWAD (Tamilnadu Water Supply and Drainage Board)	Nil	Yes
8	Physical Infrastructure - Solid Waste Management			
8.1	MCC proposed in urban area	Commissionerate of Municipal Administration	local bodies	Yes
8.2	MCC proposed in rest of LPA area	Commissionerate of Municipal Administration	local bodies	Yes
9	Physical Infrastructure - Storm Water Drain & Rain Water Harvesting			
9.2	Storm Water Collection Drain Network (in m)	Commissionerate of Municipal Administration	local bodies	Yes
9.3	Trash Guards Installation in Storm Water Drain (in nos.)	Commissionerate of Municipal Administration	local bodies	Yes
9.4	Covering existing open drains (in m)	Commissionerate of Municipal Administration	local bodies	Yes



10	Physical Infrastructure - Electricity			
10.1	Electric substation – 110/11KV (7 nos.) (in ha)	TNEB,TANGETGO	Nil	No
10.2	Underground Electric Lines (proposed CBD area) (km)	TNEB,TANGETGO	Nil	No
10.3	LED solar Street Lights with panel(for exiting & proposed roads) (in nos.)	Department of Renewable Energy	Nil	No
11	Physical Infrastructure - Communication Infrastructure			
11.1	Optical Fibre Cable Network (in m)	Tamil Nadu FibreNet Corporation Limited (TANFINET)	Nil	No
12	Economy			
12.2	Skill Development center at Melapalayam	Department of Agriculture	Nil	Yes
12.3	Construction of integrated market complex at an extend of 3.5 Hectare in Muneerpallam.	Department of Agriculture	Nil	Yes
12.4	Designated street vendor space near Nainar kulam, Vannarapettai junction	Department of Agriculture	Nil	Yes
12.5	Shifting of wholesale grain market from the west and north car street area (area vacated will be used for retails trade)	Department of Agriculture	Nil	Yes
12.6	Expansion of industrial areas at Gangaikondan (sq.km)	Department of Industries	SIPCOT, SIDCO, SEZ	Yes

MONITORING AND IMPLEMENTATION OF MASTER PLAN

CHAPTER 16



MASTER PLAN
2041
TIRUNELVELI LPA



16. MONITORING AND IMPLEMENTATION OF MASTER PLAN

16.1 ACHIEVING OUTCOMES

The Vision 2041 is to make Tirunelveli more livable, Sustainable Urban Transport, economically vibrant and with better assets for the future generations. In this effort DTCP has to work with a wide range and large number of stakeholders in the government, private and non-governmental sectors and with different sections of citizens and groups. The Master Plan has therefore laid down policies and strategies and Action Plans for implementation by the various stakeholders.

A very important role of DTCP is to evaluate on a regular basis the progress made towards achieving the vision, the objectives and the programme so as to effect appropriate and timely corrections during the period of the Master Plan. For this purpose, it needs to identify measurable indicators in the several sectors to monitor the progress made by the stakeholders individually as well as collectively.

16.2 LIVABILITY INDICES

The levels of improvement in urban quality as reflected through amelioration of poverty and unemployment and remediation of environmental pollution and damage, strengthening of transport network and infrastructure would be the visible signs which portray how the city is moving towards its vision.

16.3 USE OF URBAN INDICATORS

The use of urban indicators worldwide has become widespread based on the successful outcome of the recommendations from Agenda 21 of Rio Conference. Many cities have already established a system of indicators for assessing the quality of life as also levels of sustainability achieved in their City and comparing it with other cities.



16.4 DEVELOPMENT INDICATORS FOR TIRUNELVELI LPA

The Plan proposes to evolve its own set of indicators and facilitate the stakeholders to assemble the required information on a regular basis and make it available to all

- To raise public awareness in City improvements and
- To measure the progress made.

The indicators are proposed to be established in thirteen sectors as worked out by Asian Development Bank for managing the cities. These indicators, which have been worked out with wide consultations among various cities, would provide a basic framework for measuring the progress in Tirunelveli also. The indicators would be clustered under the following major heads:

- Population, migration and urbanization
- Income disparities, unemployment and poverty
- Health and education
- Urban productivity and competitiveness
- Technology and connectivity
- Urban land
- Housing
- Municipal services
- Urban environment
- Urban transport
- Culture
- Local Government finance and investments
- Urban governance



16.5 MECHANISM FOR IDENTIFICATION OF INDICATORS

The specific indicators under each sector would be identified by the Monitoring Committees proposed under the Master Plan in consultation with the parastatal organization and departments of Government particularly the Corporation, The highways and Industrial and Labour Department, local bodies, private sector actor including industrialists and real estate promoters and builders and other civil society and citizen stakeholders.

16.6 STUDIES

The studies made earlier and the proceedings of the consultations and deliberations of the committees set up to examine the objections and suggestions made by the public have broadened the perceptions of problems and approaches needed to tackle them. DTCP through the monitoring and review committees proposed will initiate fine tuning of the policies and strategies included in this Master Plan for effective implementation of the Master Plan.

The Monitoring Committees will also identify areas of further studies in the various sectors, which would need to strengthen benchmarking as well as providing the necessary data for assessing the progress made. Some of the studies that will be initiated and/or facilitated by DTCP are already indicated in the relevant chapters. A few more studies in areas where information is lacking or inadequate may be necessary to strengthen policy formulation. In this effort the combined energies of departments of Government as well as academics are proposed to be fully mobilized. The suggested list of studies is given in the Annexure. II

Based on the policies and strategies proposed Master Plan, detailed investments in each sector during this plan period up to 2041 have to be worked out. Project planning and implementation programmes have to be worked out by the concerned agencies and implemented. Long term investments / programmes by the local bodies and other agencies may be prepared in collaboration with the Local Planning Authority (LPA).

It may be monitored and reviewed by a committee as may be decided by the government for effective implementation to achieve the goal.



17. URBAN GOVERNANCE

17.1 CITIZEN CHARTER

The Tirunelveli LPA has proposed to introduce its "Citizens Charter" with a primary focus on transparency, accountability, and user-friendliness in service delivery. The charter outlines specific objectives, including making information about municipal services easily accessible, addressing grievances efficiently, and simplifying service processes for residents' convenience. It sets clear service standards, promoting efficiency and reliability, and aims to empower citizens for active participation in local governance. The charter commits to continuous improvement through periodic reviews and updates, ensuring that the Tirunelveli LPA operates responsively and is accountable for the Tirunelveli LPA services it provides. Overall, the Citizens Charter aligns Tirunelveli LPA services with good governance principles to meet the needs of Stakeholders effectively. Inform the public about time limits to address the problems.

1. Promote transparency in administration.
2. Enhance the quality of administration for improved service delivery
3. Execute development projects, schemes and the master plan proposals with utmost care.
4. Ensure the delivery of Tirunelveli LPA services with special care and in a systematic, time-bound manner.

The Directorate of Town and Country Planning and Tirunelveli Local planning authority plays a crucial role in urban governance, particularly in the planning and development of towns and cities. The urban governance structure in Tamil Nadu typically involves various levels of administration and planning processes, including the Directorate of Town and Country Planning and local planning authority.

Key aspects of urban governance under the Directorate of Town and Country Planning and Tirunelveli Local planning authority may include:



1. **Master Planning:** The Directorate of Town and Country Planning & Tirunelveli LPA is responsible for formulating and implementing master plans for urban areas. These plans serve as comprehensive frameworks for the orderly development of cities and towns, considering factors such as land use, infrastructure, transportation, and environmental sustainability.
2. **Zoning and Land Use Regulation:** The Directorate of Town and Country Planning & Tirunelveli LPA oversees zoning regulations and land use planning to ensure that different areas within a city or town are designated for appropriate purposes, such as residential, commercial, industrial, and recreational use.
3. **Urban Development Schemes:** It may be involved in the design and execution of urban development schemes aimed at improving infrastructure, housing, and amenities within LPA areas.
4. **Building Regulations:** The Directorate of Town and Country Planning & Tirunelveli LPA establishes building regulations to ensure that construction activities adhere to safety standards and align with the overall urban planning objectives.
5. **Environmental Planning:** Addressing environmental concerns and incorporating sustainable practices into urban planning is a crucial aspect. The Directorate of Town and Country Planning & Tirunelveli LPA may be involved in strategies to mitigate environmental impact and promote eco-friendly development.
6. **Infrastructure Development:** Planning and coordinating with Local bodies regarding implementation of infrastructure projects, including transportation, water supply, sewage, and other public utilities, are integral components of urban governance.
7. **Public Participation:** Inclusive governance often involves engaging the public in the planning process, gathering feedback, and ensuring that the community's needs and aspirations are considered in urban development initiatives.



17.2 Suggested list of Monitoring and Review committees

The following Monitoring and Review committees are proposed as a part of Urban governance to oversee the implementation of the Tirunelveli LPA master plan-2041

Name of Committee	Main Topics included
Economy and employment committee	State Urban development policy, demography, economy, employment and skill training
Land use and environment committee	Land use zoning, Development Regulations, Urban design, Urban renewal, Heritage building conservations, Recreation, Environment, Greening, Disaster mitigation and management.
Traffic and Transportation committee	Traffic, Transportation including road and rail transport, Para transit
Shelter and infrastructure committee	Housing for all categories, water Supply, Sanitation, Drainage, Solid and liquid waste, Health, Electricity, Communication, Education and other social infrastructure.
Investment Planning and governance committee	Investment planning, Governance and GIS



ANNEXURES



Annexure-I

Suggested List of Studies

1. (a) Income and employment in formal and informal jobs – income distribution
(b) Land needs for informal and small-scale enterprise
2. Rate of urban growth and level of investments in infrastructure
3. Primary health care and incidence of diseases
4. School enrolment and vocational training needs
5. Land availability for affordable housing
 - (A) Slum growth, homelessness and housing stock generated
 - (b) Slum resettlement assessment
6. (a) Quantity and quality of protected water supply to low-income households
(b) Practical ways of augmenting water resources locally
7. Levels and impact of household's sewage disposal methods
8. (A) Generation of solid waste and quantity treated
(b) Study on hazardous and e-waste management
9. (A) Water quality in rivers – Tamirabarani, Canals etc. and temple tanks
(b) Air quality monitoring study
10. (a) Modal split and travel time study
(b) Maximizing walk and cycle facility
11. Citizen participation opportunities and levels in urban bodies
12. Public investments in infrastructure and outcomes
13. Extent of Urban sprawl and non-compliance with zoning
14. Parks and playgrounds – inventory of green areas and maintenance
15. Unauthorized construction and buildings not in compliance with planning norms
16. Study to develop prototype Area Development Plans for



- (a) A City zones
 - (b) A Municipal ward
 - (c) A Peri-urban Locality
17. Mapping study of urban land values
 18. Housing outlays by government
 19. Finance from banks and institutions for micro enterprises and low-income housing.



Annexure –II

Zoning Regulations

Residential use zone

1. In this zone buildings or premises shall be permitted only for the following purposes and accessory uses. Permissible non-residential activity shall be limited to one in a sub-division.
 - i. Any residence including dwelling, detached, semi-detached, tenements or flats and service apartments.
 - ii. Nursery schools, Primary Schools, High Schools, Higher Secondary Schools, Libraries and reading rooms.
 - iii. Parks play grounds, farms, gardens, nurseries, including incidental buildings thereon.
 - iv. Cottage, Industries listed in G.O.Ps.Nos.565 and 566 dated 12.3.1962.
 - v. Installation of Motor for pumping water, Air conditioning, Lifts, Solar Heaters, Dish Antennas, etc.
 - vi. Storage of domestic cooking gas cylinders subject to the conditions prescribed in G.O.Ms No.329 dated 24.2.1977 viz. the applicant should obtain necessary clearance from the Director of Fire and Rescue Services and from the Dept. of Explosives of the Govt. of India.
 - vii. Working women hostels, old age homes
 - viii. Professional consulting offices, Schools of Commerce including Tutorial Institutions, Govt./Semi Govt. Offices, Banks, Pay Offices, Post Office, Offices of Electricity Board, Chennai City Corporation, Tamil Nadu Cooperative Milk Producers Federation Limited, etc. occupying a floor area not exceeding 300 sq.m.
 - ix. Public Utility Buildings like sewage pumping stations, water works, Fire stations, Telephone exchanges.
 - x. Swimming Pool
 - xi. Daily or weekly markets serving local needs.
 - xii. Transport depots, Bus Terminus and Railway Stations.
 - xiii. Burning, Burial grounds, crematoria and cemeteries.
 - xiv. Air-conditioned Cinema Theatres abutting min. 12 m wide road.



- xv. Banks and Safe Deposit Vaults, Business Office and other Commercial or Financial Institutions occupying floor area not exceeding 500 Sq.M. provided the width of the abutting road is minimum 10m.
 - xvi. Hotels, Restaurants occupying a floor area not exceeding 500 Sq.M. Hostels, Dormitories, Boarding and Lodging houses and Welfare Institutions occupying a floor area not exceeding 500 Sq.M.
 - xvii. Clinics, Hospitals, Dispensaries, Nursing Homes and other Health facilities occupying a floor area no. 1t exceeding 500 sq.m. provided the width of the abutting road is minimum 9m
 - xviii. Establishments and shops retailing in vegetables, fruits, flowers, fish, meat and such other daily necessities of the residents, including provisions, soft drinks, newspapers, tea stalls, milk kiosks, cycle repair shops, internet / computer centres, ATMs etc. departmental stores occupying floor area not exceeding 500 sq.m. or organized markets.
 - xix. Bakeries, Confectionaries, Laundries, tailoring, Goldsmith shops, hairdressing saloons occupying floor area not exceeding 500 sq.m.
 - xx. Fuel filling stations, and automobile service stations with installation not exceeding 30 HP.
 - xxi. Industries listed by the Tamil Nadu Pollution Control Board as 'Green' Industries listed in Annexure - VI and subject to maximum installation of 30 HP.
 - xxii. Taxi stands and car parking including multilevel parking
 - xxiii. Automobile workshop with floor area not exceeding 300 Sq.M and electrical installations not exceeding 15 H.P.
 - xxiv. Religious buildings and welfare institutions occupying a floor area not exceeding 500 Sq.M.
2. All uses / activities not specifically mentioned under sub-rule (1) above shall be prohibited in this zone.

Commercial use zone

1. In this zone, buildings or premises shall be permitted only for the following purposes and accessory uses:
 - (i) All activities that is permissible in Residential Zone without restriction of floor area (except industries)
 - (ii) All commercial and business uses including all shops, stores, markets,



shopping centers and uses connected with the display and retail sale of merchandise but excluding explosives, obnoxious products and other materials likely to cause health hazards and danger to lives.

- (iii) Fuel filling stations, automobile service stations and workshops with installation not exceeding 50 HP.
 - (iv) Industries listed out by the Tamil Nadu Pollution Control Board as “Green” Industries listed in Annexure - VI and as “Orange Industries” listed in Annexure - VII subject to a maximum installation of 50 HP.
 - (v) Research, Experimental and Testing laboratories not involving danger of fire, explosives or health hazards.
 - (vi) Warehouses and other uses connected with storage of wholesale trade in commodities not notified under the Specified Commodity Act, but excluding storage of explosives or products which are either obnoxious or likely to cause health hazards.
 - (vii) Buildings for development of software and its associated computer technology applications, IT Parks
 - (viii) Broadcasting, telecasting and telecommunication stations.
 - (ix) Helipads subject to clearance by Civil Aviation department, Directorate of Fire and Rescue Services and police department.
 - (x) Manufacture of computer hardware
 - (xi) Preview theatres and dubbing theatres.
 - (xii) Colleges, higher educational, technical and research institutions.
 - (xiii) Foreign Missions, Embassies and Consulates.
 - (xiv) Air-conditioned Cinema Theatres along roads of width min. 12 m and Assembly Halls and Kalyana Mandapam along roads of width min. 15 m and Multiplex / Malls along roads of width min. 18m.
2. All uses/activities not specifically mentioned under sub-rule (1) shall be prohibited.

**Industrial use zone**

- (1) In this zone, buildings or premises shall be permitted only for the following purposes and accessory uses:
- i. In approved layouts residential, commercial, and institutional and other activities as designated therein.
 - ii. Using electrical H.P or with employees not exceeding 100 in number but excluding industries of obnoxious and hazardous nature by reasons of odour, effluent, dust, smoke, gas, vibration or otherwise likely to cause danger or nuisance to public health or amenity.
 - iii. Residential buildings for security and other essential staff required to be maintained in the premises.
 - iv. All use permissible in Residential and commercial use zones
 - v. Storage of petroleum timber and explosives and inflammable and dangerous materials
 - vi. All industries (without restrictions of H.P or floor area or number of workers) except those industries listed under as Red category in Annexure of these regulations.
 - vii. Container terminals (at sites abutting or gaining access from minimum 18-meter-wide public road)
- (2) All uses not specifically mentioned under sub-rule (1) shall be prohibited in this zone.

Special and Hazardous Industrial use zone

- (1) In this zone buildings or premises shall be permitted only for the following uses and accessory uses:
- (i) All Industrial activities permissible in Industrial zone
 - (ii) All special and hazardous industries (classified as 'Red' by the Tamil Nadu Pollution Control Board) without restriction of Horse Power that are likely to be dangerous to human life or health or amenity, but sufficient precaution to the satisfaction of the TNPC Board have been taken to eliminate noxious or dangerous effluents and to alleviate danger to human life or health or amenity.
 - (iii) Uses involving storage, handling and other uses, incidental to such industries.



(iv) Residential, commercial, Institutional and recreational uses incidental to the uses listed above.

(2) All uses not specifically mentioned under sub-rule (1) above shall be prohibited.

Institutional use zone

1. In this zone buildings or premises shall be permitted only for the following purposes and accessory uses:
 - i. Educational institutions including colleges and institutions of higher education, research, technical and training in nature.
 - ii. Govt. and quasi Govt. offices and institutions
 - iii. Professional and business offices
 - iv. Art galleries, Archives, Museums, Public Libraries, Social and Cultural Institutions and Religious buildings.
 - v. Hospitals, Sanatoria, and other medical and public health institutions.
 - vi. Parks, Play fields, Swimming pools and other public and Semipublic open spaces.
 - vii. Broadcasting, telecasting, installations and Weather stations.
 - viii. Public utilities, municipal and community facilities.
 - ix. Nursery, Primary and Secondary Schools.
 - x. Social and Cultural Institutions including Sabha.
 - xi. Residential and commercial spaces not exceeding 500 Sq.M. Permissible in this use zone.
 - xii. Transport terminals, bus and railway stations, Airport, Harbor, and parking lots including multilevel parking lots
 - xiii. Cinema theatres and others entertainment centres and Kalyana mandapam.
 - xiv. Clubs, community halls, Assembly halls, Auditoriums and Theatres
 - xv. Sports stadium, Recreation Complexes, Exhibition, Fares.
 - xvi. Burial Ground, Burning Ground, Cemeteries, crematoria
 - xvii. Buildings for development of software and its associated computer technology applications I.T.Parks
 - xviii. Manufacture of computer hardware
 - xix. Bio- informatics centres.
 - xx. Container terminals at sites abutting and gaining access from public roads of width minimum 18 meters



- xxi. Foreign mission, Embassies, Consulates
- xxii. All public and semi public recreational uses and open spaces, parks and play grounds, zoological and botanical gardens, nurseries, waterfront developments, museums and memorials.
- xxiii. Theme parks and amusement parks
- xxiv. Open Air Theatre, Exhibitions, Circuses, Fairs and Festival grounds, public utilities.
- xxv. Installations that may be necessary for the uses mentioned above

2. All uses not specifically mentioned under sub-rule (1) shall be prohibited.

Note: In the rest of the state, areas zoned for public and semi public use zone and educational use zone shall be equated to institutional use zone and the activities shall be regulated accordingly.

Agricultural use zone:

1. In the Agricultural use zone buildings or premises shall be normally permitted for the following purpose and accessory uses: A. Normally permissible uses:
 - i. All Agricultural uses.
 - ii. Farm houses and buildings for agricultural activities.
 - iii. All the uses permissible in the residential use zone within the natham boundaries (settlements)
 - iv. Dairy and cattle farms
 - v. Piggeries and poultry farms
 - vi. Forestry
 - vii. Storing and drying of fertilizers
 - viii. Installation of electric machinery of not exceeding 15 horse power may be allowed for the uses mentioned above.
 - ix. Sewage farms and garbage dumping sites.
 - x. Mills for grinding, hulling, etc. of cereals, pulses, food grains and oil seeds provided the site has proper access and installations do not exceed 50 H.P.
 - xi. Burning and Burial grounds, Crematoria and Cemeteries.
2. All uses not specifically mentioned in sub rule (1) shall be prohibited.



Open Space and Recreational use zone

(1) In this zone buildings or premises shall be permitted for the following purposes and accessory uses:

- I. All public and semi-public recreational uses and open spaces, parks and play grounds, zoological and botanical gardens, nurseries, waterfront developments, museums and memorials.
- II. Theme parks and amusement park Open Air Theatre, Exhibitions, Circuses, Fairs and Festival grounds, public utilities. Burial and burning grounds or crematoria.
- III. Incidental residential uses for essential staff required to be maintained in the premises.
- IV. Incidental commercial use
- V. Hotels and restaurants not exceeding 300 sq.m.
- VI. Beach cottages each not exceeding 100 sq.m. in floor area and 7.5 m in height.
- VII. Sports stadia and recreational complexes.
- VIII. Installations that may be necessary for the uses mentioned above.

(2) All uses not specifically mentioned in sub UXOe (1) shall be prohibited.



Annexure –III

Detailed Development Plan status

Detailed Development Plan status					
Name Of the District: Tirunelveli					
Sl. No	Name of the Detailed development Plan	Area in Sq.M	Present Status	Village/ Town Ward	Survey Number
1	Suthamalli Town Planning Scheme-1	591100	Review approved	Suthamalli Village	S.Nos.763 to 779
2	Suthamalli Town Planning Scheme-2	766200	Review approved	Suthamalli Village	S. Nos. 780 to 788, 791 to 802, 806 to 819, 826 to 834, 856 A, 836 A, 847 A, 848A, 849 A, 850 A, 884, 885, 889, 890
3	Suthamalli Town Planning Scheme-3	74068	Review approved	Suthamalli Village	S.No. 835 B,836 B,843 to 846,847 B, 848 B,849 B,850 B,851 to 870,874,875
4	Kuttakarai Town Planning Scheme	688000	Review approved	Tirunelveli Ward	Ward-5, Block-3, T.S. No.176 to 335 Ward-5, Block- 4, T.S. No.336 to 435 Ward-5, Block-8, T.S. No.865 to 1044 Ward-5, Block- 9, T.S. No.1045 to 1296
5	Perumalpuram Town Planning Scheme-1	493717	Review approved	Kulavanigar puram Village	S.Nos.448/1pt, 449/3 pt, 450/2pt, 489 to 525, 526pt, 528pt, 529 pt, 531
6	Perumalpuram Town Planning Scheme-2	594000	Review approved	Kulavanigar puram Village	S.Nos. 404A, 405, 406, 407A, 408A, 412A, 413 to 420, 421,423A,424 to 426,428A, 429, 430, 431A, 438A, 439 to 447, 448pt, 453pt, 454pt, 456pt, 457pt, 256pt, 527, 528pt, 529pt, 530pt, 536pt, 537 to 541, 542pt, 543pt, 548pt, 549 to 551



7	Perumalpuram Town Planning Scheme-3	596500	Review approved	Kulavanigar puram Village	S. Nos. 395A, 396A, 397 A, 398A, 399, 400A, 552 to 559, 563 to 578
8	Perumalpuram Town Planning Scheme-4	1141300	Approved	Kulavanigar puram Village	S.Nos. 562, 579 to 581, 1015 to 1069, 1076
9	Perumalpuram Town Planning Scheme-5	1206900	Review approved	Kulavanigar puram Village	S.Nos. 530pt, 532 to 534, 535pt, 536pt, 542pt, 543pt, 544 to 547, 548pt, 560, 561, 582 to 590, 598 to 648
10	Perumalpuram Town Planning Scheme-6	1099100	Review approved	Kulavanigar puram Village	S.Nos. 870 to 885, 888 to 903, 905 to 942
11	Perumalpuram Town Planning Scheme-7	1074900	Approved	Kulavanigar puram Village	S.Nos.800 to 869,943 to 947
12	Perumalpuram Town Planning Scheme-8	467000	Review approved	Kulavanigar puram Village	S.Nos.759 to 762,769 to 799
13	Perumalpuram Town Planning Scheme-9	1027700	Review approved	Kulavanigar puram Village	S.Nos.707 to 758, 763 to 768, 886, 887, 904
14	Perumalpuram Town Planning Scheme-10	11770796	Review approved	Kulavanigar puram Village	S.Nos.591 to 597, 649 to 706
15	Perumalpuram Town Planning Scheme-11	905120	Review approved	Kulavanigar puram Village	S.Nos. 1070 to 1075, 1077 to 1097
16	Pettai Town planning -1	739600	Map No.2 Approved	Narasinganallur Village	S.Nos.1 to 53, 170 to 175
				Pettai Village	S.Nos.632 to 643



17	Pettai Town planning -2	535400	Map No.2 Approved	Narasinganallur Village	S.Nos.118A,118B,119 to 139,140A,498 to 501 Ward-2, Block- 10, T.S.No. 938 to 942
18	Palaya Pettai Town Planning Scheme	386900	Review approved	Tirunelveli Ward	Ward-8, Block- 12, T.S.No.1962 to 1967 Ward-8, Block- 13, T.S.No.1968 to 2013, 2015 Ward-8, Block- 14, T.S. No.2017 to2029 Ward- 8, Block-21, T.S. No. 2400 to 2479
19	Narasinganallur Town Planning Scheme	989300	Approved	Narasinganallur Village	S.Nos.142, 146, 147A, 148 to 169, 176 to 200, 503 to 512
20	Town Railway-Feeder Road Town Planning Scheme	267200	Approved	Tirunelveli Ward	Ward-5, Block-5, T.S. No.579 to 583 Ward-5, Block- 7, T.S.No.692 to 735 Ward-6, Block- 2, T.S.No.355 to 472, 475 to 496 Ward-6, Block - 7, T.S.No.1157 to 1176 Ward-6, Block- 8, T.S. No.1177 to 1230



21	Swamy Nellaiappar High Road Town Planning Scheme	115040 0	Approved	Tirunelveli Ward	Ward-4, Block - 1, T.S.No.96 to 294 Ward-4, Block - 4, T.S.No.6756 to 905 Ward-5, Block - 1, T.S. No.1 to 49,1620 Ward-5, Block - 2, T.S. No.50 to 174, 1621 to 1624 Ward-5, Block- 5, T.S.No.585 to 599 Ward-10, Block- 3, T.S. No.281,282 Ward-10, Block- 17, T.S. No. 1341 to 1355 Ward- 10, Block - 18, T.S. No.1356 to 1406 Ward- 10, Block- 19, T.S.No.1407 to 1441 Ward- 10, Block- 20, T.S.No.1442 to 1456 Ward-10, Block- 21, T.S. No.1457 to 1466 Ward- 10, Block - 22, T.S.No.1467 to 1521, 1598 to 1608 &1610 to 1619 Ward-10, Block-23, T.S. No. 1620 to 1709
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22	High ground Area Town Planning Scheme-1	904150	Approved	Palayamkottai Ward	Ward-3, Block- 22, T.S.No.1701 Ward-3, Block- 23, T.S. No. 1702pt., 1704pt., 1705, 1706 Ward-3, Block- 24B, T.S.No.1 to 96 Ward-A, Block- 2, T.S. No.1 to 95, 96pt, 99pt, 100 to 104, 105pt, 106pt, 107 to 113, 114pt, 115 to 133, 134pt, 135 to 147, 149pt, 150 to157, 158pt., 159pt., 160pt., 161pt., 169pt., 170pt., 171pt., 172pt., 173pt., 201pt Ward-A, Block- 3, T.S.No.1 to 150 Ward-A,Block- 4, T.S. No.1 to 126 Ward-A, Block- 5, T.S. No.1 to 86, 87pt, 96pt, 97 to 105 106pt, 110pt, 111 to 116, 117pt, 118pt
23	Ilanthaikulam Area Town Planning Scheme	510100	Approved	Palayamkottai Ward	Ward-3, Block- 20, T.S.No.1604 to 1607, 1630pt, 1636, 1637 Ward-3, Block- 23, T.S.No.1708 to 1743 Ward-3, Block-24B, T.S.No.1 to 78
				Melapalayam Ward	Ward-4, Block- 1, T.S.No.2 to 7 Ward-4, Block- 5B, T.S.No.342 to 346



24	Vannarpettai-Palayamkottai Highroad Town Planning Scheme-1	517100	Approved	Palayamkottai Ward	Ward-6, Block- 7, T.S.No.560, 561 Ward-6, Block - 8, T.S.No.654 to 670 Ward-6, Block-9, T.S.No.671 to 697, 698pt, 699 to 742 Ward-6, Block- 10, T.S.No.743 to 754, 779, 780, 782 Ward-6, Block- 16, T.S.No.1 to 50,52,53
25	Vannarpettai-Palayamkottai Highroad Town Planning Scheme-2	308000	Approved	Palayamkottai Ward	Ward-6, Block-9, T.S.No.698pt Ward-6, Block- 16, T.S.No.51, 54 to 125 Ward-6, Block- 17, T.S.No.1 to 72
				Palayamkottai Village	S.Nos.45,46,73 to 75,86 to 93,846 to 849, 857 to 860, 862 To 864, 872 to 881, 894pt., 898, 900, 901, 903 to 906, 917, 918, 920 to 936
26	Vannarpettai Bye-Pass Road D.D.P.- 1	550000	Approved	Palayamkottai Village	S.Nos.94 to 97, 103 to 196, 201, 915, 916
27	Vannarpettai Bye-Pass Road D.D.P.- 2	1007653	Map No.2 Approved	Palayamkottai Village	S.Nos.5,6,27 to 34,39 to 44,228,229,232 to 306, 791 to 843,850 To 856, 865 to 871, 882 to 893, 894pt, 895 to 897, 899, 959
28	Sindupoondurai D.D.P.	250000	Approved	Sindupoondurai Village	S.Nos.16, 21, 29 to 44, 57 to 72, 81 to 101, 102A, 102B, 103, 104A, 104B, 105, 106, 199, 233



29	Melapalayam D.D.P.-1	843239	Consent	Melapalayam Ward	Ward-4, Block- 5, T.S.No.357 to 359, 360pt, 361 to 372 Ward-4, Block- 6, T.S.No.373 to 473 Ward-4, Block- 7, T.S.No.523pt,527 to 563, Ward-4, Block- 32, T.S.No.3107 to 3124,3127 to 3142 Ward-4, Block- 33, T.S.No.3145 to 3185 Ward-4, Block- 34, T.S.No.3186 to 3223 Ward-4, Block- 35, T.S.No.3224 to 3283 Ward-4, Block- 36, T.S.No.3284 to 3344 Ward-4, Block- 37, T.S.No.3345 to 3368 Ward-4, Block- 38, T.S.No.3369 to 3420
30	Melapalayam D.D.P.-2	1839700	Review approved	Keelaveeraragav apuram Village	S.Nos.475 to 481,498 to547
				Kulavanigar puram Village	S.Nos.948 to 958,960 to 1014
31	Melapalayam D.D.P.-3	785150	Approved	Melapalayam Village	S.Nos.9A,9B,10,11,20 to 24,491pt,492
32	Melapalayam D.D.P.-4	2043700	Approved	Melapalayam Village	S.Nos.1 to 8,12 to 19, 61 to 63, 87, 489, 490, 491pt, 492
				Keelaveeraragav apuram Village	S.Nos.489 to 497,582 to 586,629,630
33	Melapalayam D.D.P.-5	843239	Review consent	Melapalayam Village	S.Nos.55,56,64 to 86
34	Melapalayam D.D.P.-6	783050	Approved	Melapalayam Village	S.Nos.25 to 54,57 to 60,493 to 495
35	Thatchanallur D.D.P.-1	500000	Approved	Tirunelveli Village	S.Nos.46 to 170



36	Thatchanallur D.D.P.-2	530000	Approved	Tirunelveli Village	S.Nos.171 to 261,265 To 296, 299 to 312,761
37	Thatchanallur D.D.P.-3	517950	Map No.2 Approved	Thatchanallur Village	S.Nos. 1to 22, 23A, 23B, 24, 25, 26 A, 26B, 27 to 37,38A,38B,39 to 52,53A,53B,54 to 83,91,92,93A,93B,94 to 99, 100A, 100B, 318,319,320pt
38	Thatchanallur D.D.P.-4	257600	Consent	Thatchanallur Village	S.Nos.101,102A,103 to 108,109A,114 to 119,121,122A,122C,1 39B,140,141A,141B,1 42 to145,150 to 153,159 to 163,164A, 165A,213B,214 to 218,226 to 228,246B, 247 to 254, 258, 259,260A,272B,273 to 276,278,283,284A,32 5
39	Thatchanallur D.D.P.-5	474950	Approved	Thatchanallur Village	S.Nos. 102B,109B,110 to 113,122B, 123,131,136 to 138,139A,164B,165B, 166 to 171,173 to 212,213A,219A,229 to 245, 246A,260B,261 to 270,271B,277 to 281, 284B,285 to 309,320pt,321, 322,323,324
40	Thatchanallur D.D.P.-6	532250	Approved	Thatchanallur Village	S.Nos.262,263,313,31 5 to 320,322 to 437



41	Udiarpatti D.D.P.	625214	Approved	Manimoorthi swaram Village	S.Nos.32,33,34,37 to 41,42A,42B, 43A, 43B, 44, 45,46,47 A,47B,48 to 56, 57A, 57B, 58 to 64, 65A, 65B, 66 to 82, 83A, 83B, 83C, 84A, 84B, 85, 86, 87A, 87B, 88 to 101, 102A, 102B, 103 to 107, 108A, 108B, 109 to 121, 122A, 122B, 123 to 133, 137 to 144
42	Sivanadiyarkulam D.D.P.	555850	Approved	Sivanadiyarkulam Village	S.Nos.1 to10
43	Rajagopalapuram D.D.P.- 1	754530	Approved	Rajagopalapuram Village	S.Nos.92A,92B,93A,93B,94A,94B,95,96A,96B,97A,97B,98,99A,99B,100 to 108,115 to 118
44	Rajagopalapuram D.D.P.- 2	810070	Approved	Rajagopalapuram Village	S.Nos.1,2,3A,3B,4 to 14, 40 to 43, 52 to 72,73A,73B,74A,74B, 75 to 83,84A,84B, 85,86A,86B,87A,87B, 88 to 91,109 to114
45	Rajagopalapuram D.D.P.- 3	868800	Approved	Palayamkottai Village	S.Nos.15 to 39,44 to 51
46	Rahumath Nagar D.D.P.	2040000	Approved	Palayamkottai Village	S.Nos.666 to 733, 734A, 734B, 735 to 747, 954, 956
47	V.M.Chattram D.D.P.-1	681800	Approved	V.M.Chathiram Village	S.Nos.1 to 9,11 to 21
48	V.M.Chattram D.D.P.-2	806100	Review approved	V.M.Chathiram Village	S.Nos.22 to 30, 32 to 38
49	V.M.Chattram D.D.P.-3	1116900	Approved	V.M.Chathiram Village	S.Nos.31, 52 to 56
50	V.M.Chattram D.D.P.-4	853700	Approved	V.M.Chathiram Village	S.Nos.57 to 61,66 to 70,101 to 103,105,11
51	V.M.Chattram D.D.P.-5	526400	Approved	V.M.Chathiram Village	S.Nos.39 to 51,62 to 65
52	V.M.Chattram D.D.P.-6	583400	Consent	V.M.Chathiram Village	S.Nos.10,165,166,170 to 179,181 to 186



53	V.M.Chattram D.D.P.-7	566000	Approved	V.M.Chathiram Village	S.Nos.187 to 196, 205, 206, 211
54	V.M.Chattram D.D.P.-9	879900	Approved	V.M.Chathiram Village	S.Nos.125, 126, 130 to 151
55	V.M.Chattram D.D.P.-10	650600	Map No.2 Approved	V.M.Chathiram Village	S.Nos.87 to 100, 104, 106 to 110, 112, 113, 129
56	V.M.Chattram D.D.P.-11	894300	Map No.2 Approved	V.M.Chathiram Village	S.Nos.71 to 86
57	V.M.Chattram D.D.P.-12	681900	Map No.2 Approved	V.M.Chathiram Village	S.Nos.197 to 203, 326, 327, 340, 341, 358
58	V.M.Chattram D.D.P.-13	627100	Notification	V.M.Chathiram Village	S.Nos.301 to 306, 324, 325, 342 to 353, 387, 388
59	V.M.Chattram D.D.P.-14	986100	Map No.2 Approved	V.M.Chathiram Village	S.Nos.354 to 357,359 to 379, 384
60	V.M.Chattram D.D.P.-15	1172700	Map No.2 Approved	V.M.Chathiram Village	S.Nos.380, 381, 382, 383, 385, 386
61	Nadukkamudiyar kulam D.D.P.	501500	Notification	Nadukkamudiya r kulam Village	S.Nos.1 to 14
62	Pettai Rural D.D.P.1	366700	Map No.2 Approved	Pettai Rural Village	S.Nos.24 to 37,69 to 78, 80, 85, 86, 87, 102 to165
63	Pettai Rural D.D.P.2	398700	Notification	Pettai Rural Village	S.Nos.166 to 176,180 to 201, 204 to 212, 213/A, 214B, 215A, 216A, 219B, 220B, 221 to 231, 232B, 233A, 234A, 245B, 246A, 247B, 248, 249, 250A, 349B, 350B, 351 to 357 &792
64	Krishnapuram D.D.P.1	705350	Approved	Krishnapuram Village	S.Nos.265B, 266 to 277, 278C, 280B, 281 to 289, 290B, 291B, 292B, 293 to 295, 296B, 297, 298, 299B, 300B, 316B, 317B &524



65	Krishnapuram D.D.P.2	609350	Consent	Krishnapuram Village	S.Nos.183 to 213, 214B, 215, 216B, 217B, 219B, 220B, 221B, 222B, 223B, 224, 225, 226B, 227B & 228B
66	Krishnapuram D.D.P.3	581750	Approved	Krishnapuram Village	S.Nos.116, 117B, 129B, 130B, 131 to 134, 165 to 182
67	Krishnapuram D.D.P.4	598530	Map No.2 Approved	Krishnapuram Village	S.Nos.93 to 97, 98B, 104B, 105B, 106B, 111B, 112 to 115, 135 to 138, 141 to 164
68	Krishnapuram D.D.P.5	610600	Notification	Krishnapuram Village	S.Nos.265A, 278A, 278 B, 279, 280A, 290A, 291A, 299Apt, 330 to 359
69	Krishnapuram D.D.P.6	650550	Consent	Krishnapuram Village	S.Nos.296A,299Apt,3 00A,301 to 315,316A, 317A,318 to 329, 360, 361 & 362
70	Keelanatham D.D.P.1	646600	Map No.2 Approved	Keelanatham Village	S.Nos.1 to 26, 109, 112, 113, 116, 117, 120, 121, 124 & 125
71	Keelanatham D.D.P.2	628350	Approved	Keelanatham Village	S.Nos.27 to 46, 89 to 95, 97 to 108, 138 to 147
72	Keelanatham D.D.P.3	830260	Approved	Keelanatham Village	S.Nos.47 to 88,148 to 172, 312 to 319, 322, 323, 326, 327, 330, 331, 334, 335
73	Keelanatham D.D.P.4	798760	Map No.2 Approved	Keelanatham Village	S.Nos.320,321,324,325, 328, 329, 332, 333, 336 to 337
74	Keelanatham D.D.P.5	980600	Approved	Keelanatham Village	S.Nos.173 to 182, 257 to 311
75	Keelanatham D.D.P.6	702350	Map No.2 Approved	Keelanatham Village	S.Nos.110,111,114,11 5,118,119, 122, 123,126 to 137,183 to 210 & 881
76	Keelanatham D.D.P.7	737800	Map No.2 Approved	Keelanatham Village	S.Nos.211 to 256
77	Vengalaneer Samudram D.D.P.1	947700	Map No.2 Approved	Vengalaneer Village	S.Nos.20 to 77,98 to 104



78	Vengalaneer Samudram D.D.P.2	1044100	Notification	Vengalaneer Village	S.Nos.1 to 19, 78 to 97
79	Kokkatikulam D.D.P.1	494200	Map No.2 Approved	Kokkatikulam Village	S.Nos.37 to 40,44 to 81
80	Kokkatikulam D.D.P.2	404400	Notification	Kokkatikulam Village	S.Nos.1 to36,41,42,43
81	Chathiram Pudukulam D.D.P.1	601350	Map No.2 Approved	Chathiram Pudukulam Village	S.Nos.67 to 181,183 to188,190 to 221
82	Chathiram Pudukulam D.D.P.2	605400	Notification	Chathiram Pudukulam Village	S.Nos.222 to243,392 To 507
83	Keela Veera Ragava Puram D.D.Plan	566150	Notification	Keela Veera Ragava Puram Village	S.Nos.6 to 12,14 to 70,81 to 88, 185 to 188, 189B, 199B,200,204,205B,205B,3 71B,372 to 378, 379B, 400B, 401 to 404, 405B, 418B, 419 to 428
84	Vella Koil D.D.Plan	398350	Notification	Vella Koil Village	S.Nos.102 to 129,179 to 184, 192A, 192B, 193 to 203, 261, 262, 265,266 & 267
85	Vannarpettai Bye-Pass Road D.D.P.3	605800	Notification	Thatchanallur Ward	Ward - 6, Block-1, T.S.No.2 to 5,7 to 12,62 to 66,67pt,70pt Ward -6, Block-4, T.S.No.329 to 337 Ward -6, Block-5, T.S.No.338 to 341, 130 to 178,185 to 190, 191A, 191B, 205 to 223 & 263
				VellaKoil Village	S.Nos.130 to 178,185 to 190,191A,191B,205 to 223 & 263



86	Vannarpettai Bye-Pass Road D.D.P.4	978210	Notification	Kulavanigar puram Village	S.Nos.1 to 4,5A,8B,9 to 20, 21B,25B,26 to 38, 39B, 46, 52B, 53 to 67,68B, 78B,79 to 88, 89B, 97B, 98 to 111, 112B, 119B, 120 to 131, 132B, 137 to 149, 150B, 153B, 154 to 168, 170B, 171 to 205, 207, 209,210 to 214,216, 217,218
87	Lolgapuram D.D.Plan	483200	Notification	Kandiaperi Village	S.Nos.118 to 124, 128, 129, 130, 134 to 138, 187 to 198, 205 to 215, 220 to 227, 228pt, 229 to 237
				Tirunelveli Ward	Ward -9, Block-6, T.S.No.2546 to 2606 Ward -9, Block-13, T.S.No.2394 to 2462, 2463A,2464 to 2470 Ward -9, Block-17, T.S.No.2607 to 2624
88	Krishnaperi D.D.Plan	396250	Map No.2 Approved	Tirunelveli Ward	Ward -7, Block-11pt, T.S.No.2051 to 2059 Ward -7, Block-12, T.S.No.2060 to 2081 Ward -6, Block-22, T.S.No.2036 to 2059 Ward -6, Block-21, T.S.No.2591 to 2635 S.Nos.19 to 30,51,52,53 and54
				Kandiaperi Village	S.Nos.19 to 30, 51, 52, 53 & 54
89	Vm chathiram DD plan 8		Dropped		



Annexure -IV

**ABSTRACT**

Local Planning Area – Inclusion of additional areas in Tirunelveli Local Planning Area under clause (b) of sub-section (1) of section 10 of the Tamil Nadu Town and Country Planning Act, 1971 (Tamil Nadu Act 35 of 1972) – Intention – Notified.

=====

Housing and Urban Development [UD4(2)] Department

G.O. (Ms).No.178

Dated:08.11.2017

ஹேவிளம்பி வருடம், ஐப்பசி திங்கள் 22,
திருவள்ளூர் ஆண்டு 2048.

Read:

1. G.O.(Ms).No.1565, Housing and Urban Development Department, dated 25.11.1988.
2. G.O.(Ms).No.448, Housing and Urban Development Department, dated 16.06.1993.
3. From the Commissioner of Town and Country Planning, Chennai-2, Letter No.9015/2012/MT2/Dated 19.11.2013, 30.01.2014, 21.03.2014 and 25.06.2015.

Read Also:

4. G.O.(Ms).No.151, Housing and Urban Development (UD4(2) Department, dated 20.06.2013.
5. From the Commissioner of Town and Country Planning, Chennai-2, Letter No.9015/2012-MT2, dated 13.01.2017.

ORDER:

Tirunelveli Local Planning Area was notified and declared under sub-section (1) and (4) of section 10 of Tamil Nadu Town and Country Planning Act, 1971 (Tamil Nadu Act 35 of 1972) in the Government orders first and second read above respectively.

2. The Budget Announcement No.5 (2013-2014) reads as follows:-
"Expansion of Composite Local Planning Areas in Tirunelveli, Tuticorin, Vellore and Nagercoil will be taken up".

3. Based on the aforesaid Announcement, the Commissioner of Town and Country Planning in his letter 3rd read above has requested the Government to include additional areas in Tirunelveli Local Planning Area citing the population and industrial growth in and around Tirunelveli Local Planning Area, under clause (b) of sub-section (1) of Section 10 of Tamil Nadu Town and Country Planning Act, 1971 (Tamil Nadu Act 35 of 1972).

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 Copy to:
The Secy.
Ch.

4. In the Government order 4th read above, the Government declared the intention to include additional areas in the Tirunelveli Local Planning Area under clause (b) of sub-section (1) of section 10 of the Tamil Nadu Town and Country Planning Act, 1971 (Tamil Nadu Act 35 of 1972).

5. The Commissioner of Town and Country Planning(i/c) in his letter 5th read above has requested the Government to include some more additional areas in Tirunelveli Local Planning Area, and to issue fresh orders under clause (b) of sub-section (1) of section 10 of Tamil Nadu Town and Country Planning Act, 1971 (Tamil Nadu Act 35 of 1972).

6. The Government, after careful consideration of the proposal of the Commissioner of Town and Country Planning(i/c) have decided to declare the intention of the Government to include additional areas in the Tirunelveli Local Planning Area in supersession of the Government order 4th cited. The appended notification will be published in the Tamil Nadu Government Gazette.

7. The Collector of Tirunelveli District is directed to republish the Notification in the District Gazette.

8. The Director of Translation, Chennai-600 009, is directed to arrange to have the notification translated into Tamil and to forward the translation urgently to the Collector of Tirunelveli District under intimation to the Government.

9. The Collector of Tirunelveli District is directed to report to the Government, the date of republication of the notification in the District Gazette.

(BY ORDER OF THE GOVERNOR)

S.KRISHNAN
PRINCIPAL SECRETARY TO GOVERNMENT.

To
The Works Manager,
Government Central Press,
Chennai-600 079.
(for publication of notification
in the Tamil Nadu Government Gazette).
The Collector,
Tirunelveli District.
The Commissioner of Town and Country Planning(i/c),
Chennai-600 002.
The Director of Translation, Chennai-09.

..3..



ABSTRACT

Local Planning Area - Tirunelveli Local Planning Area - Inclusion of additional areas - Intention notified under clause (b) of sub-section (1) of section 10 of the Tamil Nadu Town and Country Planning Act, 1971 (Tamil Nadu Act 35 of 1972) - Confirmation under sub-section (4) of section 10 of the said Act - Orders - Issued.

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Housing and Urban Development [UD4(2)] Department

G.O.(Ms.)No.173

Dated:17.12.2018

விளம்பி, மார்கழி 2,
 திருவள்ளூர் ஆண்டு 2049

Read:

1. G.O.(Ms.)No.448, Housing and Urban Development Department, dated 16.06.1993.
2. G.O.(Ms.)No.178, Housing and Urban Development Department, dated 08.11.2017.

Read also:

2. From the Commissioner of Town and Country Planning, letter No.9015/2012/MP2, dated 16.08.2018.

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ORDER:

In the Government order first read above, the Tirunelveli Local Planning Area was declared under sub-section (4) of section 10 of the Tamil Nadu Town and Country Planning Act, 1971 (Tamil Nadu Act 35 of 1972).

2. In the Government order second read above, the Government notified its intention to include additional areas covered under the Tirunelveli Local Planning Area and the same was published in notification No.II(2)/HOU/989/2017 at pages 897-899 of Part-II Section 2 of the Tamil Nadu Government Gazette, dated the 29th November 2017 and also in the Tirunelveli District Gazette, dated the 4th May, 2018 for general information as required under clause (b) of sub-section (1) of section 10 of the Tamil Nadu Town and Country Planning Act, 1971 (Tamil Nadu Act 35 of 1972).

3. In the letter third read above, the Commissioner of Town and Country Planning has stated that objections and suggestions were not



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received from the public in this matter and he has requested for confirmation of Notification under sub-section (4) of section 10 of the said Act.

4. The Government, after careful examination, accept the proposal of the Commissioner of Town and Country Planning in para 3 above. Accordingly, the Government declare the area specified in the Notification appended to this order, to be the Tirunelveli Local Planning Area.

5. The appended Notification will be published in the next issue of Tamil Nadu Government Gazette.

(BY ORDER OF THE GOVERNOR)

**S.KRISHNAN,
PRINCIPAL SECRETARY TO GOVERNMENT.**

To
The Works Manager,
Government Central Press,
Chennai -600 079.
(for Publication of Notification in the Tamil Nadu Government Gazette)
The Commissioner of Town and Country Planning,
Chennai-600 002.
The District Collector of Tirunelveli, Tirunelveli.
The Member Secretary,
Tirunelveli Local Planning Authority,
Xavier colony, South Bypass Road,
Tirunelveli- 627 005.

Copy to:-

The Deputy Secretary to Deputy Chief Minister,
Chennai-600 009.
O/o. the Deputy Chief Minister, Chennai-600 009.
The Principal Private Secretary to
Principal Secretary to Government,
Housing and Urban Development Department,
Chennai-600 009.
The Law (Hg&UD-Sty) Department,
Chennai-600 009.
SF/SC.

//FORWARDED BY ORDER//

18.12.18
SECTION OFFICER.



APPENDIX.
NOTIFICATION.

In exercise of the powers conferred by sub-section (4) of section 10 of the Tamil Nadu Town and Country Planning Act, 1971 (Tamil Nadu Act 35 of 1972), the Governor of Tamil Nadu hereby makes the following amendment to the Housing and Urban Development Department Notification No. II(2)/HOU/ 3583/93 Published at pages 787-788 of Part-II -Section 2 of the Tamil Nadu Government Gazette, dated the 28th July 1993, the intention to do so having been previously published as required by clause (b) of sub-section (1) of section 10 of the said Act:-

AMENDMENT.

In the said Notification, for the TABLE the following table shall be substituted, namely:-

"THE TABLE.

Name of the Local Planning Area (1)	Number and Names of Revenue Villages. (2)												
TIRUNELVELI	<p>1. Tirunelveli Corporation Area</p> <p>2. Naranammalpuram Town Panchayat Tirunelveli Taluk Villages included in 1) 24-Ananthakrishnapuram 2) 25- Naranammalpuram(Part) 3) 50- Arugankulam</p> <p>3. Sankarnagar Town Panchayat Tirunelveli Taluk Villages included in 1) 25- Naranammalpuram(Part)</p> <p>4. TIRUNELVELI TALUK</p> <table border="1"> <thead> <tr> <th style="text-align: center;">Village New No.</th> <th style="text-align: center;">Name of Villages</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">12</td> <td>Gangalkondan</td> </tr> <tr> <td style="text-align: center;">13</td> <td>Padhinalamperi</td> </tr> <tr> <td style="text-align: center;">14</td> <td>Alangaraperi</td> </tr> <tr> <td style="text-align: center;">15</td> <td>Kuppakurichi</td> </tr> <tr> <td style="text-align: center;">16</td> <td>Sivagurunathan thiruthu</td> </tr> </tbody> </table>	Village New No.	Name of Villages	12	Gangalkondan	13	Padhinalamperi	14	Alangaraperi	15	Kuppakurichi	16	Sivagurunathan thiruthu
Village New No.	Name of Villages												
12	Gangalkondan												
13	Padhinalamperi												
14	Alangaraperi												
15	Kuppakurichi												
16	Sivagurunathan thiruthu												



- 17 Alaganeri
 18 Udayaneri
 19 Kalkurichi
 20 Kattalai udayaneri
 21 Palamadai
 22 Kattampuli
 23 Rajavallipuram
 35 Pudur
 36 Uganthanpatti
 37 Seethaparpanallur
 38 Karuvanallur
 39 Velarkulam
 40 Vettuvankulam (Bit I)
 Vettuvankulam (Bit II)
 Vettuvankulam (Bit III)
 41 Sirukkankurichi
 45 Abishekapatti
 46 Ramayanpatti
 47 Veppankulam
 59 Thenpathu (Part)
 60 Pettai (Part)
 62 Megamudaiyarkulam
 63 Ramalinganeri
 65 Thirupanikarisalkulam
 66 Thulukkarkulam
 67 Thiruppani Neiaiahpuram
 68 Sivaniyarkulam
 69 Sankanthiradu
 70 Melakkallur
 71 Kodaganallur
 72 Palavoor
 73 Vaduganpatti
 74 Thuvarasi
 75 Kondanagaram
 76 Suthamalli (part)
 80 Narasinganallur (Part)
 81 Karungadu
 Gangaikondan R.F

5. MANUR TALUK

- 1 Ukkirankottai
 2 Therkkupatti
 3 Kurichikulam
 4 Kalakudi
 5 Vagaikulam

6
7
8



- 6 Alagiapandyapuram
- 7 Kattarakulam
- 8 Pillaiyarkulam
- 9 Sheliyanallur
- 10 Pirancheri
- 11 Chittarchatram
- 26 Thalaiyuthu
- 27 Thenkalam
- 28 Pallikkottai
- 29 Kanarpatti
- 30 Ettankulam
- 31 Manur
- 32 Mavadi
- 33 Nanjankulam
- 34 Madavakurichi
- 42 Vallavankottai
- 43 Thulukarpatti
- 44 Sethurayanpudur
Talaiyuthu R.F.

6. PALAYAMKOTTAI TALUK

- 1 Sivalapperi
- 2 Kansapuram
- 3 Maruthur
- 4 Thiruthu
- 5 Keelapattam
- 6 Thirumalaikolunthupuram
- 7 Melapattam
- 8 Manappadaiveedu
- 9 Keelanatham
- 10 Palayamchettikulam (Part)
- 11 Avinaperi
- 12 Naduvakurichii
- 13 Udaiyarkulam
- 14 Vagaikulam
- 15 Velankulam
- 16 Melaputhaneri
- 17 Ariyakulam
- 18 Uthamapandiyankulam
- 19 Paraikulam
- 20 Nochikulam
- 21 Parppakulam
- 22 Krishnapuram
- 23 Muthur
- 35 Reddiarpatti
- 42 Kunnathur



- 43 Melathiruvengadanathapuram
- 44 Keelathiruvengadanathapuram
- 45 Aaraikulam
- 46 Munneerpallam
- 47 Tharuvai
- 48 Melathidiyur
- 49 Thidiyur
- 50 Kuravarkulam
- 51 Sengulam
- 52 Ponnakudi
- 53 Konganthanparai
- 54 Pudukulam
- 55 Itteri
- 56 Sivanthipatti
Wolf Hill R.F
Melapattam R.F
Sivalapperi R.F."

S.KRISHNAN
PRINCIPAL SECRETARY TO GOVERNMENT.

/True Copy/

18/12/18
Section Officer
Section Officer.



கோப்பு எண்.895/2023/திலிமா3

திருநெல்வேலி உள்ளூர் திட்ட குழுமம்,
திருநெல்வேலி.

மாவட்ட ஆட்சித் தலைவர், திருநெல்வேலி/ தலைவர், திருநெல்வேலி உள்ளூர் திட்டக் குழுமம், அவர்கள் முன்னிலையில் 17.11.2023 அன்று நடைபெற்ற 2023-ம் ஆண்டிற்கான நான்காவது உள்ளூர் திட்டக் குழும நிகழ்ச்சிப் பதிவு.

கூட்டப் பொருள்:29

கோப்பு எண். 6152/2020/திலிமா3

முழுமைத்திட்டம் - மாவட்ட நகர் ஊரமைப்பு அலுவலகம், திருநெல்வேலி உள்ளூர் திட்டக் குழுமம் - திருநெல்வேலி மாவட்டம் - AMRUT திட்டத்தின் கீழ் திருநெல்வேலி முழுமைத் திட்டம் தயாரித்தல் தொடர்பாக மத்திய நிதியமைச்சகத் துறையிடமிருந்து Supplementary Guideline பெறப்பட்டது - முழுமைத்திட்ட பகுதியில் Urban Forestry அமைக்க இடம் தேர்வு செய்து தெரிவிக்க கோருதல் - தொடர்பாக.

தீர்மானம் எண்:99

Urban Forestry அமையவுள்ள இடம் நிலம் தேர்வு செய்யப்படும் பட்சத்தில் மாவட்ட வருவாய் அலுவலரின் முன் ஒப்புதல் பெறப்பட வேண்டும். Urban Forestry என்ற பெயரினை மாற்றும் செய்து Urban Green Park/ Urban Green Space/ Urban Eco Park என்ற ஏதாவது ஒரு பெயரில் பூங்கா அமைக்க வேண்டும். Urban Forestry என அமையும் பட்சத்தில் Forest Conservation authority-யின் விதிகளுக்குட்பட்டு வளர்ச்சிகள் மேற்கொள்ளப்பட வேண்டியிருப்பதால் மேற்படி பூங்கா அமைக்கும் இடத்தினை உள்ளாட்சியின் பராமரிப்பிலேயே பராமரிக்க வேண்டும் என மாவட்ட ஆட்சித் தலைவர் அவர்களால் அறிவுறுத்தப்பட்டது.



**PROCEEDINGS OF THE DISTRICT COLLECTOR, TIRUNELVELI
PRESENT: Dr.K.P.KARTHIKEYAN, I.A.S.,**

Roc.COLTNV/9359/2023-G2

Dated:09.01.2024.

Sub: Permission – Tirunelveli District - Palayamkottai Taluk – Muthur Village - Survey No.462/1 – Extent 8.45.50 Hectare – Parambu Poramboke – 0.48.50 Hectare given to the Department of Town and Country Planning for the scheme for Special Assistance to states for Capital Investment 2023-2024 part II (Urban Planning reform) permission given to the create urban green space - regarding.

Read:

- 1 Member Secretary /Joint Director, District Town and Country planning, Tirunelveli letter No. 6152/2020/3 Dated. 11.12.2023.
- 2 Palayamkottai Tahsildar Roc.No. B5/ 3574/2023 dated; 09.01.2024
- 3 Tirunelveli District Revenue Officer, Inspection Report dated. 08.01.2024
- 4 Other Connected Records.

Order:

The Member Secretary /Joint Director of Town and Country Planning, Tirunelveli has requested permission to grant 0.48.50 Hectare of land in S.No. 462/1 of Muthur Village Palayamkottai Taluk. Tirunelveli District for creation of Urban Foresty under the scheme for Special Assistance to states for Capital Investment 2023-2024 part II (Urban Planning reform).

The Tahsildar, Palayamkottai also recommended to grant 0.48.50 Hect. Of land in S.No.462/1 total extent 8.45.50 Hect, Parambu Poramboke in Muthur Village Palayamkottai Taluk and also stated that there is no historical monuments. HPT lines in the above said land permission may be granted to create urban green space.

Four boundaries of the above land:

North: Survey No.480
East : Survey No 462/1 Part
South: Survey No 462/1 Part
West : Survey No 477



As per request from the Member Secretary /Joint Director of Town and Country Planning, Tirunelveli and the recommendation report received from the Tahsildar, Palayamkottai an extent of 0.48.50 Hect. in S.No.462/1 (total extent 8.45.50 Hect) Parambu Poramboke in Muthur Village Palayamkottai Taluk permission is hereby granted to the above department for creation of Urban green space under the scheme for Special Assistance to states for capital Investment 2023-2024 part II (Urban Planning reform) with the following conditions.

Conditions:

1. The Land should not be used for any purpose other than the purpose for what it is provided.
2. No buildings should be constructed on the said land.
3. The green space shall not be treated as "Forest" as per the Forest conversation act and shall not fall under the perview of Forest Department.

(s/d) K.P.Karthikcyan
District Collector,
Tirunelveli

To

✓ Member Secretary /Joint Director,
Town and Country Planning,
Tirunelveli

Copy To

1. The Divisional Officer,
Tirunelveli.
2. The Tahsildar,
Palayamkottai.

//True copy//

10/1/24 3/3
District Revenue Officer,
Tirunelveli.

09.01.24



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1. District Census Hand Book 1981 To 2011
2. Tamil Nadu Town And Country Planning Act, 1971
3. Urban And Regional development plans Formulation and implementation (URDPFI)Guidelines
Volume 1 And Volume 2
4. Central Public Health and Environmental Engineering Organisation manual (CPHEEO),2018
5. The Right of Children to Free and Compulsory Education Act,2009
6. National Building Code of India 2016 (NBC 2016)
7. The Atal Mission for Rejuvenation and Urban Transformation (AMRUT) guide lines
8. Tamilnadu State Disaster Management Perspective Plan 2018 – 2030
9. <https://tirunelveli.nic.in/pwd-thambraparani-irrigation-system/#:~:text=The%20total%20No%20of%20Irrigation,are%20situated%20in%20Thoothukudi%20District>
10. Comprehensive Mobility Plan for Tirunelveli LPA,2022 prepared by Urban Mass Transit Company
11. Review Consented Master plan 2010 – Tirunelveli LPA
12. A Strategic Framework for Managing Urban River Stretches in the Ganga River Basin
13. National disaster management toolkit for urban planning
14. Disaster Risk Reduction: A Handbook for Urban Managers